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Assessing pain in older adults with dementia

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ASSESSING PAIN IN OLDER ADULTS WITH DEMENTIA

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To my family and friends who have supported me from beginning to end

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ABSTRACT

As dementia progresses older adults may lose the ability to communicate their pain experiences to healthcare providers, relying on the ability of the provider to infer their pain (Kelley, Siegler, & Reid, 2008; Pesonen et al., 2009). In the long-term care setting, the licensed nurse and certified nurse aide provide direct patient care to these residents and may be more likely to identify nonverbal behaviors that may indicate pain (Nygaard & Jarland, 2006; Pautex, Herrmann, Michon, Giannakopoulos, & Gold, 2007). The Conceptual Model for Assessing Pain in Nonverbal Persons with Dementia highlights provider, patient, and method-related factors that can hinder the process of inferring pain in nonverbal persons with dementia. The purpose of this dissertation is to explore the impact of these potential barriers on pain assessment/screening. Each chapter of this dissertation explores provider, patient, or method-related factors that impair the judgment of pain in others, either through an integrative review of the literature or by secondary analysis of a data set that was originally collected for the psychometric evaluation of the Non-communicative Patient's Pain Assessment Instrument. Statistical analysis was completed using SPSS version 21.0. Results indicate that nurse-related factors are well supported in the literature as barriers to pain assessment and can impair the nurses' pain assessment decisions. Ethnic differences in the expression of the nonverbal pain behavior "pain words," signify the role of patient-related factors on the pain assessment process. Lastly, examination of method-related factors support the benefits of training staff to use nonverbal pain assessment tools, with those staff members who were trained having greater accuracy in pain assessment when compared to untrained raters. In closing, this dissertation has implications for nursing science, education, policy, and practice and serves as a valuable contribution to the current literature.

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CHAPTER 1. INTRODUCTION: ASSESSING PAIN IN NONVERBAL OLDER ADULTS WITH DEMENTIA IN THE NURSING HOMES

Specific Aims

"Pain is an unpleasant sensory or emotional response associated with actual or potential tissue damage or described in such terms" (American Pain Society [APS], 1992). It is estimated that 45% to 80% of residents in the nursing home suffer from pain (Winn & Dentino, 2004; Zwakhalen, Koopmans, Geels, Berger, & Hamers, 2009). Of that, studies show that nearly 25% of older adults, who experience pain, receive little to no analgesia, highlighting that pain assessment and management are of significant concern in the nursing home (Won et al., 2004).

For older adults with dementia, the chronic loss of cognitive function that progresses over a long period of time, the expression of pain becomes more challenging as they may have difficulty in remembering or describing their pain experiences (Kelley, Siegler, & Reid, 2008; Pesonen et al., 2009). Cognitively impaired older adults with mild or moderate dementia can provide reliable pain ratings, yet as dementia worsens the ability to provide subjective reports of pain diminishes (Kelley et al., 2008; Lukas Niederecker, Gunther, Mayer, Nikolaus, 2013; Pesonen et al., 2009). Consequently, these older adults with severe dementia may lose the complete ability to speak, rendering them nonverbal and solely dependent on the observations of healthcare providers to identify their pain. Healthcare providers can identify or assess pain in nonverbal residents using pain behaviors as indicators of the presence of pain (American Geriatric Society [AGS]. 2002), but may lack adequate training in identifying these behaviors. With the reliance on healthcare providers to observe these signs of pain, many pain experiences for nonverbal older adults with dementia often go undetected and therefore untreated (Herman, Johnson, Ritchie, & Parmelee, 2009).

To help facilitate the assessment of pain in nonverbal older adults with dementia, pain assessment tools were developed and serve as a guide through the pain assessment process (Hadjistavropoulos et al., 2007; Herr, Coyne, McCaffery, Manworren, & Merkel, 2011) . Currently, there are approximately 35 pain assessment tools focused on the assessment of pain in older adults with dementia and available for use in research and practice (Husebo, et al., 2012). The majority of these tools have been designed to be used by licensed and registered nurses, but two tools have been developed specifically for use by the certified nursing assistants (CNAs) as screening tools for pain behaviors (Cervo et al., 2007; Snow et al., 2004).

The CNA provides the bulk of direct patient care and spends large volumes of time with nonverbal older adults in comparison to the rest of the healthcare team. Consequently, they may be more likely to identify changes in a resident's behaviors related to the expression of pain (Nygaard & Jarland, 2006; Pautex, Herrmann, Michon, Giannakopoulos, & Gold, 2007). CNAs are also capable of conducting initial screenings of pain in nonverbal older adults. However, the initial screening for pain must be followed by a licensed nurse's full assessment of pain (Snow et al., 2004). Of the two tools that were originally created to be used by CNAs for pain screenings, only one tool was validated with minority staff members, which is a vital component of this dissertation. The Non-communicative Patient's Pain Assessment Instrument (NOPPAIN) developed by Snow et al. (2004) is the pain assessment tool that was developed as a pain screening tool for CNAs and validated with a sample of minority staff members (see Figure 1).

Unfortunately, adequate assessment of pain in nonverbal older adults is confounded by many variables in addition to older adult's inability to speak as a result of progressive dementia. Snow and colleagues (2004) developed a conceptual model that highlights factors that directly affect pain assessment in older adults with dementia, which are attributed to both the provider and the patient (see Figure 2). First, there are

nurse-related factors that can hinder the pain assessment process and serve as barriers to unbiased pain assessment. Included in this list of nurse-related factors are demographic characteristics, pain history, pain knowledge/beliefs, relationship with the patient, and secondary gain. There are also patient-related factors that can hinder the pain assessment process when inferring pain in others. Of particular concern to this dissertation is the resident's demographic characteristics with an emphasis on ethnic background. Lastly, the conceptual model highlights the role of method-related factors, such as rater type, data collection methods, and constructs characteristics. This dissertation aims to advance understanding of barriers to pain assessment by focusing on pain assessment in older adults with dementia and using the Conceptual Model for Pain Assessment for Non-communicative Persons with Dementia as a guide. Provider, patient, and method-related factors will be explored with the following specific aims:

1. To conduct an integrative review of the literature that analyzes the presence of nurse-related factors that serve as barriers to adequate pain assessment in nonverbal older adults with dementia.
2. To examine nonverbal pain behaviors are commonly expressed by residents with dementia and identify ethnic differences in the display of those behaviors between African American, Hispanic, and Caucasian older adults with dementia when assessed by CNA raters, through evaluation of patient-related factors that alter the pain assessment process.
3. To explore method-related factors by examining the impact of training on pain assessment decisions when CNA raters assess for nonverbal signs of pain in persons with dementia using the NOPPAIN.

Background and Significance

Pain in Older Adults with Dementia in the Nursing Home

The presence of pain has been directly associated with other health-related symptoms that can have negative effects on one's quality of life, including: increased

anxiety, altered mood, depression, and disturbed sleep patterns (Leong & Nuo, 2007; Meleger, Froude, & Walker, 2013; Pilkington, 2013). Older adults are at increased risk for experiencing pain due to physiological changes associated with aging or age-related disease processes. Many older adults suffer from three or more co-morbid conditions, which can also result in the experience of pain (Wallace, 2008). Additionally, disorders such as osteoporosis, arthritis, and peripheral vascular disease are common among older adults and are examples of the conditions that often result in painful experiences (Takai, Yamamoto-Mitani, Okamoto, Koyama, & Honda, 2010). Musculoskeletal pain is the most common source in older adults, although cardiac pain, stroke pain, gastrointestinal pain, and headaches are also common sources of pain (Closs, Barr, & Briggs, 2006).

Having identified that older adults will experience pain, it is also important to consider how their living environments impact pain assessment, which is a key step to proper management. Pain in older adults is prevalent in all environments. In a community setting, older adults are able to administer medications independently or with the help of a caregiver (Schulz, Porter, Lane, Cornman, & Branham, 2011). However, approximately 5% of older adults reside in nursing homes and are not living in independent environments (Wallace, 2008). Older adults living within these nursing homes are completely dependent on healthcare providers to assess and manage pain due to facility regulations for medication administration (Walsh, Lane, & Troyer, 2013). Since the prevalence of pain in nursing homes is higher than other environments, as healthcare providers are presented with multiple challenges to assessing and managing pain in nursing home environments (Gloth, 2001; Jones et al., 2005). For example, nurses in nursing homes are often faced with heavy workloads that make it difficult for them to invest large amounts of time in pain assessment and management, indirectly resulting in unrelieved pain experiences for older adults (Jablonski & Ersek, 2009). Alexander et al. (2005) suggest that increasing the awareness of the presence of pain, adequate training on systematic assessment tools, and strong leadership are vital to

improving pain assessment practices in nursing homes. Kaasalainen et al. (2012) implemented a pain protocol that included a series of steps to guide pain assessment and the use of pain algorithms/flow sheets, which resulted in improved pain assessment in the nursing home environment.

When assessing pain, verbal self-report of pain is the best way to identify the presence of pain in older adults. Verbal self-reports can be offered freely by the older adult, prompted by the healthcare professional, and/or facilitated using a pain assessment tool designed to obtain verbal self-reports of pain (Hadjistavropoulos et al., 2007; Herr et al., 2011). Although the gold standard for identifying the presence of pain is the verbal self-report of pain, this may not be possible for all older adults in the nursing home, especially for those with dementia (Hadjistavropoulos et al., 2007).

There are approximately 4.5 million U.S residents suffering from Alzheimer's disease, the most common cause of dementia among older adults (Wallace, 2008). Dementia is typically classified as mild, moderate, or severe based on the degree of cognitive functioning that is lost. Older adults with mild or moderate dementia can still provide reliable self-reports of pain, yet as dementia progresses and becomes more severe, the language and cognitive processing required to facilitate communication may be lost (Herr et al., 2011; Lukas et al., 2013). Also, for older adults with severe dementia the expression of pain becomes more challenging as they may have difficulty in remembering or verbally describing their pain experiences (Shega et al., 2008).

Consequently, pain prevalence rates in these older adults with dementia range from 41% to 52%. However, this percentage is potentially higher in older adults with severe dementia who have a limited ability to verbally self-report pain (Closs et al., 2006). Closs et al. (2006) support that as dementia progresses, older adults tend to report fewer painful conditions, even though they suffer from the same painful diagnoses. Therefore, while the issue of pain assessment for older adults in nursing homes continues to be an ongoing challenge, older adults in nursing homes, who are unable to verbally

self-report their pain and may be nonverbal, face even greater difficulties (Zwakhalen et al., 2009).

Pain Assessment in Older Adults with Dementia in Nursing Homes

The first step to properly alleviating pain is to complete a thorough, accurate, and detailed pain assessment. The process for assessing pain in nonverbal older adults with dementia differs from that of cognitively intact/verbal residents. Expert consensus statements suggest the following hierarchy should be used to assess pain in nonverbal older adults with dementia:

> 1. Attempt to collect a verbal report of pain as older adults with mild to moderate dementia could potentially respond to verbal pain assessment scales.
> 2. Search for potential causes of pain, recognizing that certain age-related diagnoses place older adults at an increased risk for pain.
> 3. Observe patient behaviors: The current recommendation for assessment of pain in nonverbal older adults is for healthcare providers to use an established nonverbal pain assessment tool to infer pain in others. The established nonverbal pain assessment tools should highlight the following pain behaviors originally developed by AGS (2002): Facial expressions (slight frown, sad, frightened face, grimacing, wrinkled forehead, closed or tightened eyes, any distorted expression, or rapid blinking); body movements (rigid, tense, body posture, guarding, fidgeting, increased pacing, rocking, restricted movement, gait, or mobility changes); changes in interpersonal interactions (aggressive or combative behaviors, resisting care, decreased social interactions, being socially inappropriate, disruptive, withdrawn, or verbally abusive); changes in activities (refusing food, changes in appetite, increase in rest periods or sleep, changes in rest pattern, sudden cessation of common routines, or increased wandering); or mental status changes (crying or tears, increased confusion, irritability, or distress).
> 4. Consider proxy reports of pain from family and caregivers since they are familiar with the resident's behaviors and likely to identify typical behaviors that indicate the presence of pain.
> 5. Attempt an analgesic trial with appropriate titration to the estimated intensity of the resident's pain. (Herr, Bjoro, & Decker, 2006, p.172; Herr et al., 2011)

Once an older adult has lost the ability to communicate, pain behaviors must be used to detect the presence of pain. Pain behaviors that are used to identify pain in nonverbal older adult, include: facial expressions, body movements, changes in interpersonal interactions, changes in activities, and mental status changes

(Hadjistavropoulos et al., 2007; Herr et al., 2011). To help healthcare providers identify these pain behaviors in residents, pain assessment tools were developed that highlight nonverbal expressions of pain or pain behaviors. There are currently approximately 35 nonverbal pain assessment tools identified in recent reviews that were developed to help healthcare providers identify pain behaviors in nonverbal older adults (Husebo et al., 2012). Varying in quality, the majority of the developed nonverbal pain assessment tools included some or all of the pain behavior categories that AGS (2002) has recognized as observable signs of pain (listed above). Overall, the tools also have varying levels of psychometric testing, but several have been well-validated and can be used to adequately assess pain in nonverbal older adults with dementia. Some assessment tools will require that the older adult be observed at rest as well as during physical activity. Doing so may be helpful to highlight the presence of a persistent pain problem (Hadjistavropoulos et al., 2007; Herr et al., 2011).

Most tools were developed for use by licensed or registered nurses, since nurses have the skill-set and scope of responsibility to assess pain and treat it appropriately. However, since CNAs spend more than 80% of their time with the patient and are readily available to identify pain in their residents (Nygaard & Jarland, 2006; Pautex et al., 2007), nonverbal pain assessment tools were developed for use by CNAs in pain screenings that are focused on inferring pain in others using pain behaviors (Snow et al., 2004; Cervo et al., 2007). Previous work by Snow and colleagues (2004) asked CNAs to screen six videos of a professional actress expressing pain behaviors and score the "patient" using the NOPPAIN, a pain screening tool developed for use by CNAs. During this study, CNAs were also asked to compare videos to identify which patient was experiencing the worst level of pain. The researchers concluded that CNAs are capable of screening residents for pain and that the NOPPAIN can be used to detect pain in nonverbal older adults (Snow et al., 2004).

Using Nonverbal Pain Behaviors to Identify Pain

Before proceeding, it is important to confirm that pain behaviors are indeed an adequate measure to infer pain in others. Several studies have explored the use of pain behaviors to assess pain (Labus, Keefe, & Jensen, 2003; Mentes, Teer, & Cadogan, 2004; Prkachin, 2005; Prkachin, 2007; Prkachin & Solomon, 2008; Prkachin & Rocha, 2010). Attempting to first validate that pain can be inferred by others using pain behaviors, Prkachin and Solomon (2008) explored the reliability and validity of using pain behaviors to determine the presence of pain. In their study of cognitively intact patients experiencing shoulder pain, Prkachin and Solomon (2008) assessed the validity of pain behaviors by examining the extent to which pain behaviors and verbal self-reports of pain corresponded, finding that specific pain behaviors (brow-lowering, orbit tightening, and eye closing) significantly corresponded to verbal self-reports of pain. Brow-lowering and orbit tightening also increased in intensity when pain was induced. Similarly, Prkachin (2005) showed that there is a direct relationship between intensity of painful experiences and exhibited pain behaviors.

Labus, Keefe, and Jensen (2003) conducted a meta-analysis of studies that examined the relationship between verbal self-reports of pain intensity and direct observations for pain behaviors. Labus et al. (2003) suggest the following:

> Direct observations of pain behaviors are more likely to be significantly related to each other when the individual being studied has acute pain, when the self-report of pain intensity data are collected soon after the observation of pain behavior, when global composite measures are used to quantify pain behavior, and when the person being observed suffers from low chronic back pain. Other factors not found to be significant moderators include: extent of observer training, relevance of the pain-inducing task, and pain behavior observation measure used. (p.121)

Similarly, Lukas, Barber, Johnson, & Gibson (2013) evaluated the relationship between verbal self-report of pain and the observation of nonverbal pain behaviors to identify pain behaviors in older adults with dementia. Study findings revealed moderate correlations between self-reports of pain and provider observation of nonverbal pain behaviors.

Overall, a direct relationship between pain behaviors and the presence of pain was established. There are, however, physiological changes associated with aging that are similar to pain behaviors, but in actuality these behaviors are related to the aging process not the presence of pain. For example, wrinkles in the forehead due to a change in the integumentary system may be mistaken for furrowing of the brow, a pain behavior used to detect pain in others. Changes in visual acuity may cause the older adult to squint when viewing objects and may also be mistakenly accepted as facial grimacing or furrowing of the brow (Haidet, Tate, Divirgilio-Thomas, Kolanowski, & Happ, 2009). Therefore, knowing the older adult and having some familiarity with their normal behavior is essential in inferring their pain (McAuliffe, Nay, O'Donnell, & Fetherstonhaugh, 2009).

Barriers to Pain Assessment: Provider-Related Factors

The Inference of Pain in Others

In this dissertation, the term "provider" will be used to refer to members of the nursing team, either the licensed nurse or the CNA. The conceptual model for assessing pain in older adults with dementia, developed by Snow et al. (2004), acknowledges five provider-related factors that can hinder the pain assessment process in older adults, including demographic characteristics, personal pain history, pain knowledge/beliefs, relationship with the patient, and secondary gain.

Demographic characteristics can affect the nurse's pain assessment decisions. Davitz and Pendleton (1969) examined if the nurse's ethnic background affected their inference of pain in others. Of the 130 nurses who participated in this study, 20 were African American with similar levels of education. The nurses were given vignettes of residents experiencing suffering and asked to infer their experiences using a 0-6 likert scale. Statistically significant differences were noted between the inferences of pain for the five ethnic groups that were represented in the study (African American, Caucasian, Korean, Puerto Rican, and Thai).

Sometimes, nurses also make pain assessment decisions based on the resident's demographical characteristics. Hirsh and colleagues (2010) examined the insights of 54 nurses in how they perceive pain in their residents. They found that 48% of the nurses used the residents (in this case virtual humans) sex, age, and/or race to make decisions about the level of pain intensity that the patient was experiencing. Nurses also rated females, older residents, and African-Americans as having higher pain-intensity and unpleasantness ratings (Hirsh, Jensen, & Robinson, 2010).

Personal experiences with pain may also affect the nurse's readiness to assess pain in others. Holm, Cohen, Dudas, Medema, and Allen (1989) suggest that nurses who have experienced intense pain are more likely to sympathize with patients who are experiencing pain. A more recent study by Green, Tripp, Sullivan, and Davidson (2009) established continued support of the relationship between empathy and inference of pain. Their study suggested that observers, who experienced higher levels of empathy for patients portrayed in videos, were more likely to identify the presence of pain in patients.

Foundational work by Davitz and Davitz (1975) explored how nurses empathized with their patients experiencing suffering in an attempt to provide insight into nursing judgments, emotional reactions, and personal attitudes. When asked to describe an experience where the nurse did not empathize with a patient who was experiencing pain, one nurse shared, "I get a different feeling when someone my own age comes in, or someone reminds me of my parents, or even friends" (Davitz & Davitz, 1975, p.1506). Another nurse summed up the experience of empathy for patients by stating "Each nurse is especially sympathetic to certain kinds of patients, some respond particularly to the young, some to the old, others to those who remind them of parents or friends" (Davitz & Davitz, 1975).

Lastly, work experience or pain knowledge can alter the nurse's pain assessment decisions. Davoudi and colleagues (2008) found that the nurse's work experience affects their interpretations of pain. Nurses with 2-5 years of nursing experience tend to

overestimate pain experiences, while nurses with less than two or greater than five years of experiences underestimated pain experiences. Other works have found similar findings showing changes in pain assessment decisions with more nursing experience (Halfens, Evers, & Abu-Saad, 1990; Lenburg, 1970a; Lenburg, 1970b; Loveman & Gale, 2000). The potential for secondary gain, potential benefits of unrelieved or continued pain experiences (extended work hours or sense of fulfillment), can also affect the nurse's readiness or willingness to assess pain in others (Dersh, Polatin, Leeman, & Gatchel, 2004).

Understanding the role of these provider-related factors on pain assessment decisions is essential to eliminating barriers to pain assessment in persons with dementia who rely on the inference of others to identify and eventually manage their pain. Consequently, this dissertation will include an integrative review of the literature that explores these provider-related factors in greater detail with an emphasis on the licensed nurse.

Observing for Nonverbal Pain Behaviors

Nurses may also have personal opinions about which nonverbal pain behaviors are indicative of pain, which can in turn hinder their identification of nonverbal signs of pain in nursing home residents. A study by Cohen-Mansfield and Creedon (2002) evaluated the opinions of a diverse group of nursing staff member's perceptions of pain behaviors that were noticed when nonverbal older adults presented with pain. The researchers also asked staff members to indicate which behaviors they felt occurred most often and were most reliable for measuring pain in nonverbal older adults. The most common behaviors that were observed in patients experiencing pain include: rubbing, touching, whining, decreased appetite, and reluctance to move (Cohen-Mansfield & Creedon, 2002).

In exploring the use of pain behaviors to identify the presence of pain, McCaffery and colleagues (2000) administered case studies of a verbal patient who smiles and jokes and another patient who lies in bed quietly grimacing to 400 practicing nurses. Both of the patients in the scenarios had previously reported a pain rating of 8 on a 10-point scale, which indicates severe pain. Study results showed that the nursing staff members were more likely to record a patient's pain rating of severe pain and increase opioid dosing if the patient was grimacing instead of smiling. Findings in this study suggest that facial grimacing is a significant pain behavior that is used in practice to infer pain in others (McCaffery, Ferrell, & Pasero, 2000). Sheu, Versloot, Nader, Kerr, and Craig (2011) support these provider perceptions, showing that pain assessment tools that included facial descriptors have better psychometric properties and perform better at determining the intensity of pain.

Mentes et al. (2004) conducted a similar study and it was determined that pain assessment of the face and eyes, and noticing pain on movement were all major themes in the detection of pain in nonverbal patients. To add additional clarity, this dissertation will describe the frequency of expression for six nonverbal pain behaviors, in hopes of giving providers a greater understanding of the behaviors that may be frequently expressed as an indicator of pain in persons with dementia.

Barriers to Pain Assessment: Patient-Related Factors

Cultural Variations in Pain Norms

There are some factors related to pain that can either facilitate or hinder the pain assessment process. One factor is cultural variations in the experiences of pain. For this dissertation, culture will be defined as the "widely shared ideals, values, formation and uses of categories, assumption about life, and goal oriented activities that become unconsciously or subconsciously known as 'right' and 'correct' by people who identify themselves as members of a society" (Brislin, 1990, p. 11). Culture is directly related to the terms race and ethnicity. Race refers to physical characteristics such as skin color,

facial features, and hair type (Betancourt, 1993). Ethnicity can be considered the umbrella term to describe people who share the same language and culture as it is linked directly to traditions, background, religion, and language usage (Ezenwa et al., 2006). This proposal will focus on three ethnic groups that have unique cultural backgrounds: African Americans, Hispanics, and Caucasians.

In regards to pain, the expression and experience of pain can differ based on the patient's ethnic background. For example, experience of pain, perception of pain, and the expression of pain for African Americans differ from their Caucasian counterparts, with African Americans having higher levels of pain intensity and experiencing more depressive symptoms (Shavers, Bakos, & Sheppard, 2010). In exploring tolerance for pain, African American women demonstrate lower pain tolerance when compared to Caucasian women (Grewen, Light, Mechlin, & Girdler, 2008). Portenoy et al. (2004) surveyed a large sample of African American, Caucasians, and Hispanics, and reported that African American were more likely to miss work commitments as a result of pain. African Americans are also more concerned with pain interference with activities, showing higher rates of reporting of lack of energy and functional impairment as a result of pain, than Caucasian and Hispanic counterparts (Im et al., 2007).

When reporting pain, African Americans were more likely to seek assistance from a health care provider when compared to their Hispanic counterparts. Yet, when compared to white counterparts, research suggests that African Americans tend to underreport coexisting symptoms that are related to pain and delay reporting signs of illness (Shavers et al., 2010). This may suggest that African Americans delay reporting pain until the symptoms of pain are so severe that they exceed their pain tolerance levels, thus it is important to remember that African Americans have a tendency to perceive sickness as a sign of weakness and assume that pain is a natural part of progressing in age (Shavers et al., 2010).

In discussing the nonverbal expression of pain and the use of nonverbal pain behaviors to identify pain in others, it is important to also consider ethnic differences in the display of nonverbal pain behaviors when experiencing pain. For example, Hispanic residents may be stoic in their expression of pain (Anderson et al., 2002) or rely on prayer or religious coping to eliminate healthcare disorders (Katz et al., 2011). Riley et al. (2002) found that cognitively intact African Americans have an increased use of nonverbal pain behaviors to express pain in comparison to Caucasian counterparts, an area of research that warrants further investigation. The conceptual model for assessing pain in persons with dementia does not included demographic characteristics as a patient-related factor. However, the previously stated work and subsequent chapters in this dissertation will build a case for considering patient demographic characteristics as a potential barrier to adequate pain assessment.

Barriers to Pain Assessment: Method-Related Factors

Snow et al. (2004) recognized several method-related barriers to adequate pain assessment in older adult with dementia. Of particular concern is the role of data collection methods and rater types on adequate pain assessment in nonverbal persons with dementia.

Differences in Data Collection Methods

In research, when assessing pain in nonverbal older adults with dementia there are two primary methods to complete a pain assessment, either in real-time or by using video analysis. In cognitively intact residents, real-time assessments are the preference over retrospective recall because it eliminates the biases associated with memory lapses where one typically remembers the intense and more recent pain experiences, but does not easily recall the moments without pain or more distant painful experiences (Stone & Broderick, 2007). When ethical standards are upheld, however, video recordings of residents in pain can be valuable, as recordings allow for comparison between trained raters and review of behaviors when raters disagree (Caldwell & Atwal, 2005; Castorr et

al., 1990). With video recordings, observations can also be played back repeatedly for deeper analysis or can be used to archive data to look for trends over a course of time. Video recordings also allow for a standardized assessment where the rater can be uninfluenced by extraneous variables (Castorr et al., 1990).

Furthermore, the use of videos eliminates the subjectivity that may be present when only one rater observes a patient for pain. Using videos also allows for multiple raters to observe the same scenario and provides an opportunity to establish inter-rater reliability and make a collective decision about the pain experience (Caldwell & Atwal, 2005; Haidet et al., 2009). Lastly, video recording can reduce or eliminate issues with rater fatigue, which may affect the rater's pain assessment decisions. However, researchers must understand that some clients may change their behaviors when they know they are being observed and even more so if they are being videotaped (Caldwell & Atwal, 2005; Haidet et al., 2009), though it is unlikely that persons with dementia will have this level of cognitive control. This dissertation incorporates video analysis to assess pain in persons with dementia between three different types of raters: trained, untrained, and physician raters.

Rater Types: Trained vs. Untrained

When inferring pain in others, raters should be trained to execute the pain assessment or screening by the preferred method of using a pain assessment tool as a guide. Training has also been shown to improve the rater's overall performance and increase inter-rater reliability scores, particularly when being trained by an experienced trainer (Alcott et al., 1999; Mist, Ritenbaugh, & Aickin, 2009). Additionally, trained raters will typically have more familiarity with an assessment tool, as training provides more opportunities for practice, feedback, and role modeling (Cusick et al., 2005). However, few studies have explored the benefits of training when using pain assessment tools and even less have explored the benefits of training in the assessment of pain in persons with dementia. This dissertation compares the pain screenings of trained and

untrained CNA raters to physician gold-standards to assess the accuracy of the CNA raters' judgments regarding pain.

Conceptual Framework

The Conceptual Model for Pain Assessment for Non-Communicative Person with Dementia highlights the impact of the provider/rater, patient, and method-related factors on adequate pain assessment in this special population. In the model, demographic characteristics, the rater's personal pain history, knowledge of pain and beliefs, relationship with the patient, and secondary gain, are identified as factors that are directly related to the inference of pain in others. The model also highlights specific patient-related factors that may be present and impact both pain perception and pain sensation, including: gender, physical status, emotional status, cognitive content, behavior, dementia, and pain history. Lastly, the conceptual model suggests that method factors may be present and alter pain assessment decisions, including: rater type, data collection methods, assessment tools, and construct characteristics. The conceptual model developed by Snow et al. (2004) recognizes that underlying factors may be present that directly affect not only the expression of pain, but also the inference of pain by the healthcare providers. The conceptual model for pain assessment in nonverbal older adults asserts that both the patient's and the provider's experiences with pain are a key component to the pain assessment process. It also illustrates that differences in rater types, particularly their training and experience, may affect pain assessment decisions when inferring pain in others.

Methodology

Paper 1: Nurse-Related Barriers to Pain Assessment

The purpose of this study is to identify nurse-related barriers to pain assessment in older adults with dementia using work by Davitz and Davitz from the early 1970's as a guide.

Methodology: CINAHL, PubMed, Cochrane Database of Systematic Reviews, PsychINFO, and Academic Search Complete were used to search for articles. To be included, articles were related to the care of adults or older adults, focused on pain assessment, specifically focused on nurse-related factors or nursing perceptions, available in English, and were works of originally published research.

Measures: The Strength of Recommendation Taxonomy (SORT) was used to critique articles for inclusion in this study (Ebell et al., 2004). SORT rates the quality, quantity, and consistency of evidence and can be used to assess individual studies and/or a full body of evidence (Ebell et al., 2004). Articles in this study were assessed individually using the SORT algorithm, which describes the level of evidence for individual studies and ranks them from one to three, with a score of one being reserved for true experiments that have a control, randomization, and an intervention. Studies that lack one of the essential factors listed above received a score of a two, unless the finding are based on personal opinions or case studies, in such cases, the study was given the lowest ranking of three.

Paper 2: Patient-Related Barriers to Pain Assessment

The purpose of this study is to identify ethnic differences in the expression of nonverbal pain cues by older adults with dementia.

Methodology: This study is a secondary analysis of data from a primary study conducted by Snow et al. (in review) which examined the psychometric properties of the NOPPAIN. Older adults were recruited from four nursing homes in Tuscaloosa, Alabama from the same for-profit chain. Older adults with moderate to severe dementia (3 or greater on MDS-COGS) and a related diagnosis that could potentially cause dementia (e.g. organic brain disease, cardiovascular accident, head injury) were included in the study (Snow, in review). All of the residents also had pain-related diagnoses, with the most common diagnoses being arthritis (41%), “pain” (39%), osteoporosis (28%), and

fractures (28%). Informed consent was received by the family member or durable power of attorney and resident assent was obtained.

A total of 83 older adults with dementia participated in the study. Residents were assisted by a CNA (hired from a temporary employment agency) while completing or simulating morning activities of daily living and were videotaped using a hand-held recorder for 5 to 15 minutes (Snow, in review). A total of 78 videos of the older adult's morning activities were created (5 of the elders declined videotaping). Of the available 78 video recordings, 28 videos were randomly selected to be analyzed for the presence of nonverbal pain behaviors using the NOPPAIN. These 28 subject videos were reviewed by 6 CNAs who were trained to use the NOPPAIN. The CNA training was completed beforehand in a one-hour training session, which consisted of an introduction to standardized assessments, orientation to the NOPPAIN assessment tool, practice using the assessment tool on 6 training videos, and developer feedback. Each CNA reviewed the 28 video recordings and rated the presence and intensity of pain behaviors using the NOPPAIN, resulting in 168 completed assessments. CNAs asked the subjects if they were experiencing pain (yes or no) and also rated the overall pain intensities using a 0-10 scale.

Measures: The NOPPAIN is a 17-item assessment tool that was designed for use by CNAs to screen for indicators of pain in persons with dementia. The tool includes an activity chart for pain assessment during different levels of activity, a body diagram, a pain response section for identification of nonverbal pain behaviors, and a reminder to ask the resident if he/she was in pain. The NOPPAIN includes 6 categories of nonverbal pain behaviors (pain words, pain noises, pain faces, rubbing, bracing, and restlessness), as well as descriptions of the types of nonverbal pain behaviors that could be included in each category. The tool also includes a 6- point Likert scale (0-5) for rating the intensity of each observed nonverbal pain behavior (Snow et al, 2004).

Statistical Analysis: Quantitative analysis of video ratings was completed using SPSS version 21.0. Frequencies were calculated for the use of the six nonverbal pain behaviors for the entire sample and separately for those residents who are identified by the CNAs as having pain. Mean overall pain intensity scores, as rated by CNAs, were calculated for the entire sample, for those residents identified as having pain, and across the three different ethnic groups. For all residents, chi-square was used to compare ethnic differences in the presentation of nonverbal pain behaviors. Using ANOVA, ethnic differences in overall pain intensity ratings were evaluated.

Paper 3: Method-Related Barriers to Pain Assessment

The purpose of this study is to compare trained and untrained CNA raters in their identification of nonverbal pain behaviors using physician raters at the gold-standard.

Methodology: This study is a secondary data analysis of the data that was originally collected by Snow (in review) to assess the psychometric properties of the NOPPAIN. Older adults were recruited from four nursing homes in Tuscaloosa, Alabama from the same for-profit chain. Older adults with moderate to severe dementia (3 or greater on MDS-COGS) and related diagnoses that could potentially cause dementia were included in the study (Snow, in review). Informed consent was received by the family member or power of attorney and resident assent was obtained. A total of 83 older adults with dementia participated in the primary study. Residents were assessed by a CNA for pain while completing or simulating morning activities of daily living. While completing the activities, residents were videotaped using a hand-held recorder for 5 to 15 minutes (Snow, in review). While all residents were assessed for pain using the NOPPAIN by a CNA in real-time, only 78 videos of the older adults morning activities were created, as 5 of the older adults did not agree to videotaping.

Of the available 78 video recordings, 18 videos were randomly selected to be assessed by two additional groups of CNAs also hired from the temporary agency. The first group of CNAs were trained to use the NOPPAIN in a one-hour training session that

consisted of an introduction to standardized assessments, orientation to the NOPPAIN assessment tool, practice using the assessment tool on 6 training videos, and developer feedback. The second group consisted of 5 CNAs who did not receive formal training on how to use the NOPPAIN pain assessment tool or how to identify nonverbal pain behaviors, but did receive a basic introduction to the tool. Each group of CNAs (trained and untrained) reviewed the 18 video recordings and scored the residents for pain using the NOPPAIN. Lastly, three physicians assessed the same 18 videos of residents for pain using the NOPPAIN. Prior to completing the assessments the physicians reviewed the resident's chart, which included the resident's medical diagnoses, analgesic use, pain assessment and management details, progress notes, current list of medications, and medication administration records.

Statistical Analysis: Quantitative analysis was completed using SPSS version 21.0. Frequencies for the identification of six nonverbal pain behaviors (pain noises, pain faces, pain words, bracing, rubbing, and restlessness) were calculated for trained CNAs, untrained CNAs, and physicians. Chi-Square analysis was used to assess differences in the observation of nonverbal pain behaviors between the trained and untrained groups of CNAs. Differences in the mean overall pain intensity ratings between trained, untrained, and physician raters were evaluated using ANOVA. Lastly, due to the nature of the data, it was not possible to examine inter-rater reliability using Kappa. Instead, Pearson's Correlations were used to examine the relationships between trained, untrained, and physician average ratings of the intensity of each individual pain behavior.

Limitations

There are a few extraneous variables that may impact the results of the study, such as the CNA's level of education and the CNA's years of experience in nursing homes. Due to the sample size it was not possible to control for these extraneous variables, but alternative conclusions were proposed within the appropriate dissertation chapter.

Furthermore, the use of video analysis, as opposed to completing the pain assessments in real-time, is an additional limitation to this study. Residents who are aware of the video recordings may change their behavior, particularly when the recording takes place over a short period of time. Intentional behavior change may also occur if the residents have not acclimated to the presence of the video camera (Caldwell & Atwal, 2005; Haidet et al., 2009). While this is not a major concern in persons with dementia, some residents did refuse to be videotaped, which in turn affected the sample in terms of size and representation.

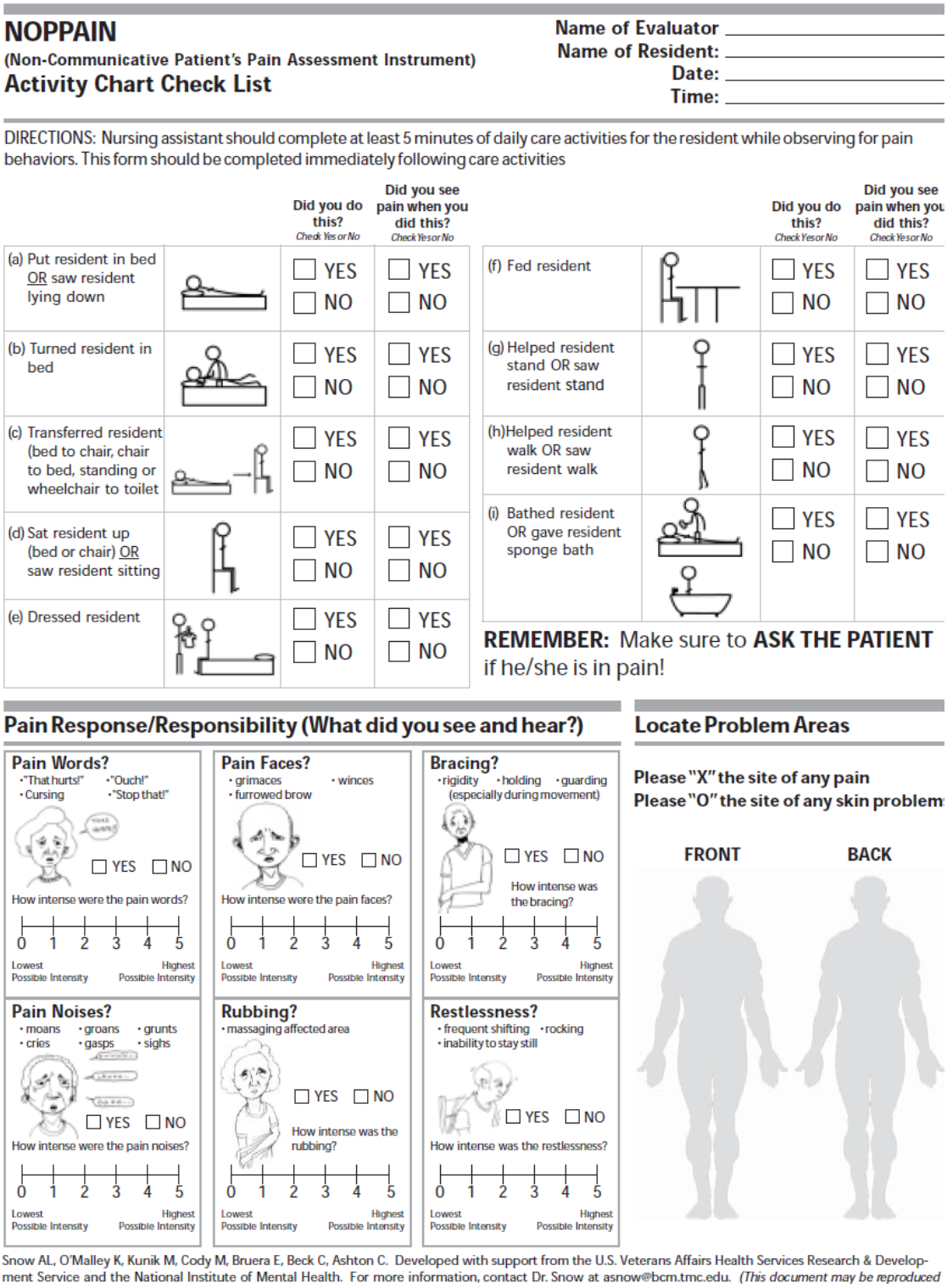
Haidet et al. (2009) states that "observational checklist tools intended for use in direct observation can also be applied to video recordings," although it's important to pilot test instruments and calculate their reliability coefficients (p. 468). While the NOPPAIN was not developed specifically to be used for video analysis, it was pilot tested in previous studies in which CNAs rated patient videos (Snow et al., 2004). Haidet et al. (2009) also suggests avoiding completing the ratings when raters are emotionally upset or ill, as such circumstances can influence their rating tendencies. In this study, a direct effort was not made to assess the emotional or physical stability of the CNAs included in this study, an additional limitation. Finally, since this study is focused on older adults, raters may have difficulty distinguishing between normal changes associated with aging and actual pain behaviors, and some of the CNA raters in this study were not trained to differentiate between normal changes of aging (wrinkles in the forehead vs. furrowing of the brow, etc.) and pain related behaviors (Haidet et al., 2009).

In regard to the design of the study, a limitation is using a non-experimental design which lacks control. Without control the external validity (generalizability) and internal validity (ability to say that ethnicity, not confounding variables, is truly associated with the change in inference tendencies) are limited. The use of a small sample and secondary use of the data set is another limitation.

Ethical Considerations for Human Subjects Involvement

Since this is a secondary data analysis and all identifying information has already been removed from the data set, the University of Iowa Human Subjects Review Board (IRB) determined formal IRB review was not required. A letter of exemption is provided in Appendix A. Additionally, the data set was kept on a password protected computer and was only shared with members of the committee and/or a statistics consultant upon request. Caution was used when sharing the database electronically.

Figure 1: Non-Communicative Patient's Pain Assessment Instrument



NOPPAIN

(Non-Communicative Patient's Pain Assessment Instrument)

Activity Chart Check List

Name of Evaluator _____
Name of Resident: _____
Date: _____
Time: _____

DIRECTIONS: Nursing assistant should complete at least 5 minutes of daily care activities for the resident while observing for pain behaviors. This form should be completed immediately following care activities

	Did you do this? Check Yes or No	Did you see pain when you did this? Check Yes or No
(a) Put resident in bed OR saw resident lying down	☐ YES ☐ NO	☐ YES ☐ NO
(b) Turned resident in bed	☐ YES ☐ NO	☐ YES ☐ NO
(c) Transferred resident (bed to chair, chair to bed, standing or wheelchair to toilet	☐ YES ☐ NO	☐ YES ☐ NO
(d) Sat resident up (bed or chair) OR saw resident sitting	☐ YES ☐ NO	☐ YES ☐ NO
(e) Dressed resident	☐ YES ☐ NO	☐ YES ☐ NO
(f) Fed resident	☐ YES ☐ NO	☐ YES ☐ NO
(g) Helped resident stand OR saw resident stand	☐ YES ☐ NO	☐ YES ☐ NO
(h) Helped resident walk OR saw resident walk	☐ YES ☐ NO	☐ YES ☐ NO
(i) Bathed resident OR gave resident sponge bath	☐ YES ☐ NO	☐ YES ☐ NO

REMEMBER: Make sure to **ASK THE PATIENT** if he/she is in pain!

Pain Response/Responsibility (What did you see and hear?)

Pain Words?
• "That hurts!" • "Ouch!" • Cursing • "Stop that!"
☐ YES ☐ NO
How intense were the pain words?
0 1 2 3 4 5
Lowest Possible Intensity — Highest Possible Intensity

Pain Faces?
• grimaces • winces • furrowed brow
☐ YES ☐ NO
How intense were the pain faces?
0 1 2 3 4 5
Lowest Possible Intensity — Highest Possible Intensity

Bracing?
• rigidity • holding • guarding (especially during movement)
☐ YES ☐ NO
How intense was the bracing?
0 1 2 3 4 5
Lowest Possible Intensity — Highest Possible Intensity

Pain Noises?
• moans • groans • grunts • cries • gasps • sighs
☐ YES ☐ NO
How intense were the pain noises?
0 1 2 3 4 5
Lowest Possible Intensity — Highest Possible Intensity

Rubbing?
• massaging affected area
☐ YES ☐ NO
How intense was the rubbing?
0 1 2 3 4 5
Lowest Possible Intensity — Highest Possible Intensity

Restlessness?
• frequent shifting • rocking • inability to stay still
☐ YES ☐ NO
How intense was the restlessness?
0 1 2 3 4 5
Lowest Possible Intensity — Highest Possible Intensity

Locate Problem Areas

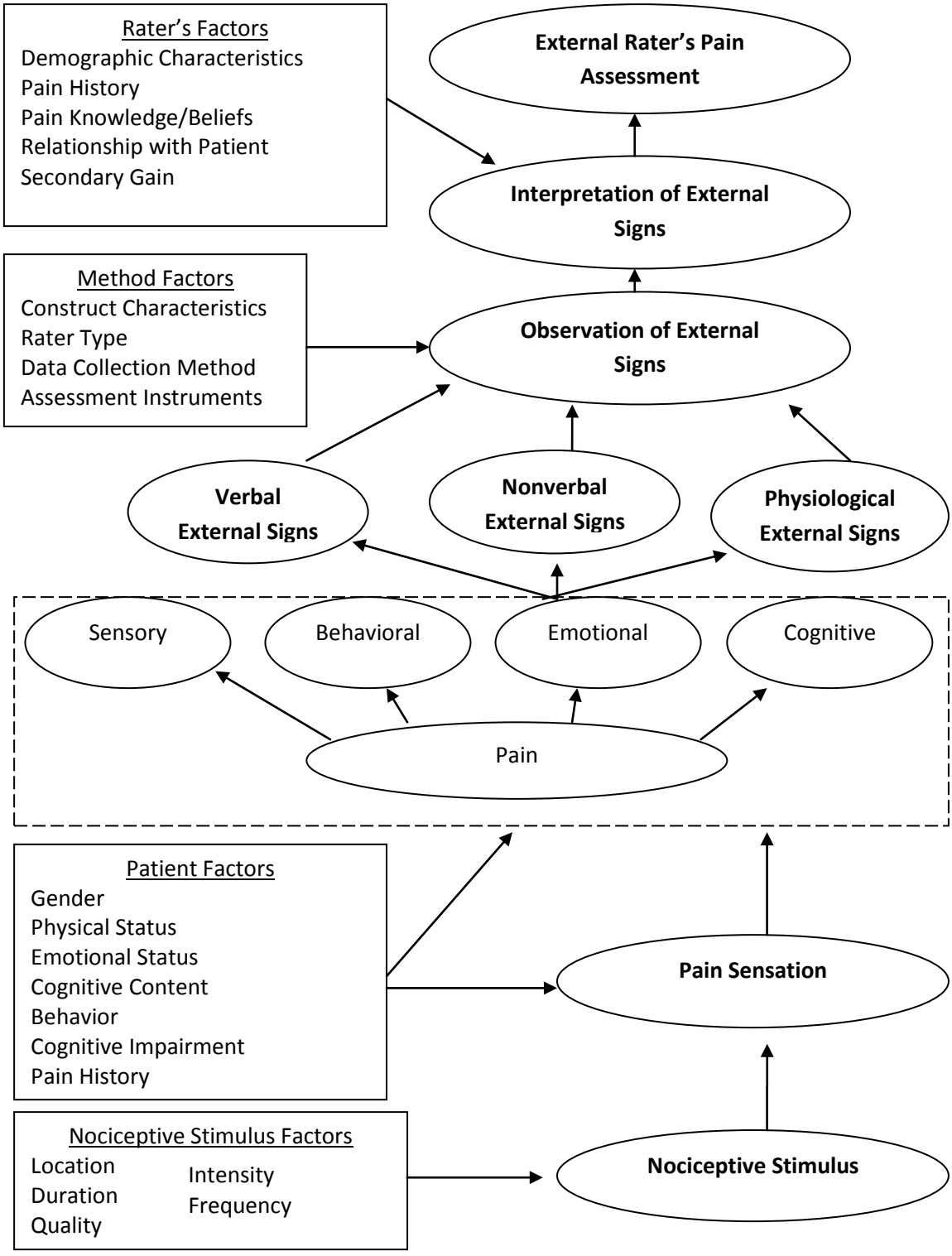
Please "X" the site of any pain
Please "O" the site of any skin problem

FRONT BACK

Snow AL, O'Malley K, Kunik M, Cody M, Bruera E, Beck C, Ashton C. Developed with support from the U.S. Veterans Affairs Health Services Research & Development Service and the National Institute of Mental Health. For more information, contact Dr. Snow at asnow@bcm.tmc.edu. *(This document may be reproduced*

(Snow et al., 2004)

Figure 2: Conceptual Model for Pain Assessment for Non-communicative Persons with Dementia



(Snow et al. 2004)

CHAPTER 2. INFERRING PAIN IN NONVERBAL PERSONS WITH DEMENTIA: CONSIDERING THE ROLE OF NURSE-RELATED FACTORS ON PAIN ASSESSMENT DECISIONS.

Background and Significance

Nonverbal older adults with severe dementia are often at a disadvantage for receiving adequate healthcare services, particularly in pain assessment and management practices, due to their inability to verbally self-report pain experiences (Ersek, Polissar, & Neradilek, 2011). Consequently, these older adults are solely reliant on others to identify their pain experiences and pain prevalence rates in older adults with dementia remain elevated, ranging from 41% to 52% (Zwakhalen et al., 2009). Their dependency on others to identify pain places a major emphasis on the provider's assessment decisions, which is particularly alarming when one considers the discrepancies that can be identified between patient and provider perceptions of pain in cognitively intact older adults (Calvillo & Flaskerud, 1993; Davoudi, Afsharzadeh, Mohammadalizadeh, & Haghdoost, 2008; Duignan & Dunn, 2008; Idvall, Berg, Unosson, & Brudin, 2005). Nurses were found to underestimate resident's experiences of pain, particularly underrating the resident's pain intensity (Calvillo & Flaskerud, 1993; Davoudi et al., 2008; Duignan & Dunn, 2008; Idvall et al., 2005).

Nurses can play a major role in the pain assessment process. A recent research study explored the amount of time nurses have for residents and found that nurses spend approximately 37% of their time providing direct patient care (Westbrook, Duffield, Li, & Creswick, 2011), placing them in the position to identify pain in this population of older adults. For this reason, it is particularly essential to consider the nurse-related

factors that contribute to pain assessment decisions when inferring pain in others, especially when inferring pain in nonverbal persons with dementia.

Snow et al. (2004) developed a conceptual model for assessing pain in nonverbal persons with dementia that highlights factors that directly affect pain assessment in older adults with dementia. According to the conceptual model, the provider/rater's demographic characteristics, personal pain history, knowledge/beliefs of pain, relationship with the patient, and secondary gain are all identified as factors that are directly related to the inference of pain in nonverbal persons with dementia. Research has explored the patient-related factors that affect pain assessment decisions; however, further exploration of nurse-related factors affecting pain assessment decisions in persons with dementia is needed.

To advance the understanding of nurse-related factors that affect pain assessment decisions in persons with dementia, it is important to consider the seminal work that laid the foundation for research in this area. In an effort to build support for the current model for assessing pain in nonverbal person with dementia developed by Snow et al. (2004), this integrative review will focus on connecting current literature to the more classical works of Davitz and Davitz (Baer, Davitz, & Lieb, 1970; Davitz & Pendleton, 1969; Davitz & Davitz, 1975; Davitz & Davitz, 1981; Davitz, Davitz, & Higuchi, 1977; Leiderman, Davitz, & Higuchi, 1977; Lenburg, Burnside, & Davitz 1970a; Lenburg, Glass, & Davitz, 1970b). Davitz and Davitz's work explores the nurse-related factors that affect pain assessment decisions, specifically highlighting the role of ethnicity in the pain assessment process. Although their findings do not specifically address pain in older adults or those with advanced dementia, it provides a foundation for future exploration of how these nurse-related factors affect the inference of pain in nonverbal persons with dementia.

Methodology

Using CINAHL, PubMed, Cochrane Database of Systematic Reviews, PsychINFO, and Academic Search Complete, searches were conducted for articles using a combination of the following keyword search terms: nurses' inference, pain assessment, nurses' perceptions, nurses' characteristics, and provider judgments. To be included, articles had to be related to the care of adults or older adults, focused on pain assessment, focused specifically on nurse-related factors or nursing perceptions, available in English, and works of originally published research. A total of 548 articles were identified within the databases. Additionally, using the "related citations" link in PubMed, those with the most relevancy to the topic of this review of the literature were considered (Acheson, 1989), resulting in an additional 101 articles. Lastly, selected articles were audited by hand resulting in an additional 6 relevant articles. Of the 655 articles that were reviewed, 32 studies were relevant to the topic, but only 28 of those studies met the inclusion criteria and focused specifically on the impact of the nurses' characteristics on pain assessment, and thus were critiqued for inclusion in this integrative review of the literature.

The Strength of Recommendation Taxonomy (SORT) was then used to evaluate the 28 articles that met the inclusion criteria (Ebell et al., 2004). SORT rates the quality, quantity, and consistency of evidence and can be used to assess individual studies and/or a full body of evidence (Ebell et al., 2004). Articles in this study were assessed individually using the SORT algorithm, which describes the level of evidence for individual studies. SORT ranks articles from one to three with a score of one being reserved for true experiments and a ranking of three representing work that is based on personal opinions. Table 1 describes the studies included in this integrative review and provides the critique/rating of the study quality.

Moreover, three well-supported conceptual models for inferring pain in others and the factors that affect pain assessment decisions were identified (Prkachin, Solomon, &

Ross, 2007; Snow et al., 2004; Tait, Chibnall, & Kalauokalani, 2009). All of the conceptual models address specific provider-related factors that contribute to the decision-making process during pain assessments, but Snow et al. (2004) was selected as a foundation for this integrative review since this conceptual model was the only one that focused specifically on the inference of pain in older adults with dementia.

Nursing-Related Factors Impacting Pain Assessment Decisions

In their conceptual model, Snow et al. (2004) identify provider factors that have been shown to directly impact pain assessment decisions when inferring pain in others including demographic characteristics, pain beliefs, the relationship with the patient, pain history, pain knowledge, and secondary gain. Most of these factors were previously explored in classical works by Davitz and Davitz (Baer et al., 1970; Davitz & Pendleton, 1969; Davitz & Davitz, 1975; Davitz & Davitz, 1981; Davitz et al., 1977; Leiderman et al., 1977; Lenburg et al., 1970a; Lenburg et al., 1970b) and expanded upon in more current literature with an emphasis on nurses.

Demographic Characteristics

The nurses' ethnic background and perceptions of pain may hinder or facilitate the pain assessment process; as cultural perceptions of pain are not only relevant to the patient (Forsythe, Thorn, Day, & Shelby, 2011; Grewen et al., 2008; Horgas & Dunn, 2001; Im et al., 2007; Juarez et al., 1998; Shavers et al., 2010) but may also be common perceptions held by the healthcare provider. Narayan (2010) suggests that ethnocentrism, the belief that one's own cultural norms are superior to others, implies that nurses will use their own culturally-constructed interpretations of pain to determine which behaviors are "right" or appropriate, with most people naturally believing that behaviors that coincide to their own practices as acceptable and those that conflict as abnormal. Few studies have explored the demographic characteristics that affect the rater's assessments of pain in older adults with dementia, but research has noted that nurses' ethnic, gender, and marital status can affect the pain assessment process (Calvillo & Flaskerud, 1993;

Davitz & Pendleton, 1969; Davitz et al., 1977; Davoudi et al., 2008; Dudley & Holm, 1984; Hirsh, Callander, & Robinson, 2011; Leiderman et al., 1977; Lenburg et al., 1970a; Robinson et al., 2001; Wandner, Scipio, Hirsh, Torres, & Robinson, 2012)

Foundational work by Davitz and Pendleton (1969) examined whether nurses from different cultures inferred different degrees of suffering in response to identical stimuli. Statistically significant differences were noted between the inferences of pain for the five ethnic groups of nurses that were represented in the study (African American, Caucasian, Korean, Puerto Rican, and Thai). More specifically, African American nurses inferred the lowest levels of suffering for the patient vignettes, suggesting their inference tendencies differ from other ethnic groups and have a tendency to be lower than actual experiences of pain. The results suggests that inferences of suffering may be related to cultural influences on behavioral responses and that inferences of pain can vary based on the rater's ethnic background (Davitz & Pendleton, 1969).

Davitz et al. (1977) continued to build on their work by exploring the impact of ethnicity on pain inference tendencies for American, Japanese, Puerto Rican, Korean, Taiwanese, and Thai nurses. In this study, Korean and Japanese nurses inferred the highest levels of pain from patient vignettes, while Puerto Rican nurses inferred the lowest levels of pain. Differences noted in pain inference tendencies further suggest that ethnicity impacts pain assessments decisions for nurses (Davitz et al., 1977; Leiderman et al., 1977). Contrarily, in later works exploring the relationships between nurses' ethnic background and pain assessment decisions, Calvillo and Flaskrud (1993) found no significant relationship between pain assessment scores and the nurse's ethnic background. Unlike, Davitz et al. (1977), Calvillo and Flaskrud (1993) focused on cholecystectomy pain and conducted assessments on residents in real-time as opposed to reviewing patient vignettes, which may account for the discrepancies in these findings. Although significant differences were not identified based on the nurse's ethnicity, Calvillo and Flaskrud (1993) findings did support other works suggesting that the

resident's ethnicity can affect pain assessment decisions made by nurses (Hirsh et al., 2011; Wandner et al., 2012).

With regard to gender differences in pain inference, it is generally accepted that male raters respond more objectively while female raters respond more subjectively in emotionally-charged situations (Lenburg et al., 1970a; Lenburg et al., 1970b). Recent research by Davoudi et al. (2008) suggests that female nurses inferred higher pain ratings than male nurses. Furthermore, Robinson et al. (2001) found that women expected men to have higher pain endurance and to be less likely to report pain. Men in turn expected the opposite behaviors from women. Robinson et al. (2001) suggests that these expectations about the gender differences in pain norms support gender role theories that claim men and women are socialized to respond to pain differently and hold different expectations regarding pain. Contrarily, Eritz and Hadjistavropoulos (2011) did not find a relationship between gender and pain assessment decisions made by informal caregivers. Differences in the sample (nurses vs. undergraduate students vs. informal caregivers) may account for the discrepancies in the findings in the studies described above.

Both marital status and age have been investigated in regards to its contribution to the pain assessment process. Interestingly, Davoudi et al. (2008) also found that marital status impacted pain assessment decisions, with those nurses who were single rating pain experiences higher than nurses who were married. Yet, in comparing the demographic characteristics of 50 registered nurses to their pain assessment decisions, Dudley and Holm (1984) did not find a significant relationship between the nurse's age and pain assessments ($r = -0.11$). Similar work also support that age and pain assessment decisions are not directly linked (Eritz & Hadjistavropoulos, 2011).

Personal Pain Beliefs/Perceptions

In the absence of verbalization of painful experiences, as is often the case for older adults with dementia, nurses are more likely to use preconceived schemas as a basis for their judgments. These personal biases and preconceived ideas can affect nurses'

decision-making abilities when inferring pain in others, thus negatively impacting the pain assessment process (Brockopp, Ryan, & Warden, 2003). Several studies have explored the impact of personal pain perceptions on pain assessment decisions for cognitively intact older adults. Differences in pain assessments have been noted for residents based on nurses' preconceived ideas related to the resident's demographic characteristics, perceived right to complain, and patient diagnoses (Acheson, 1989; Brockopp et al., 2003; Burgess, van Ryn, Crowley-Matoka, & Malat, 2006; Calvillo & Flaskerud, 1993; Davitz & Pendleton, 1969; Hirsh et al., 2010; Hirsh et al., 2011; Hunt, 1995; Loveman & Gale, 2000; Martel, Thibault, & Sullivan, 2011; Salmon & Manyande, 1996; Wandner et al., 2012).

When inferring pain in others, nurses may unconsciously use residents' demographic characteristics, particularly ethnic background, to guide pain assessment decisions (Acheson, 1989; Wandner et al., 2012). Unfortunately, these preconceived ideas regarding a resident's ethnic background are typically found to have a negative impact on pain assessment decisions (Davitz & Davitz, 1981). Calvillo and Flaskerud (1993) found that nurses' pain ratings were decreased in regards to race, patient level of education, citizenship, ability to speak English, and religion (Catholic residents were rated lower than Protestant counterparts); many of these factors are common for minority residents. Zborowski (1952) also support ethnic differences in pain expression based on socio-economic, educational , and religious backgrounds.

Hirsh and colleagues (2010) examined the insights of 54 nurses in how they perceive pain in their residents and found that 48% of the nurses used the resident's (in this case virtual humans) sex, age, and/or race to make decisions about the level of pain intensity that the patient was experiencing. In the end, nurses rated women, older residents, and African-Americans as having higher pain-intensity and unpleasantness ratings (ranging from not at all unpleasant to most unpleasant imaginable). Contrarily, Wandner et al. (2012) also explored the impact of residents' demographic characteristics

on pain perception in others, finding that raters (in this case undergraduate students) assumed that white residents were more sensitive to pain than their Black, Asian, and Hispanic counterparts. The raters in this study (Wandner et al., 2012) lacked the formal training of a health care professional, which may account for the discrepancy in this finding. However, their ratings demonstrate that preconceived ideas related to the resident's demographic characteristics impact the pain assessment process when inferring pain in others. Finally, early work by Acheson (1989) noted Caucasian nurses rating Southeast Asian residents with higher pain severity and psychological distress than their Mexican-American, American Indian, and White American counterparts.

In their review of the literature, Burgess et al. (2006) discussed the role of stereotyping on pain assessment decisions, suggesting that when an individual is aware of personal prejudices, they will typically attempt to avoid making decisions solely based on those preconceived ideas. However, nurses are typically unaware of personal biases and preconceived expectations (Brockopp et al., 2003; Hirsh et al., 2010). Further exploration into motivators affecting a nurse's decision-making has revealed that nurses do not admit (self-report) using age, race, or sex in determining the presence of pain, even though statistically significant differences are noted in patient assessments based on those demographic factors (Davitz & Pendleton, 1969; Hirsh et al., 2010; Hirsh et al., 2011). Consequently, the nurses' ethnically-based perceptions and personal biases can have negative impacts on the resident's pain experience.

When inferring intensity of painful experiences, providers tend to use gender-based stereotypes to make decisions during pain assessment, typically rating women as having higher pain intensities then men (Martel et al., 2011). Davitz and Pendleton (1969) also noted statistically significant differences in inferred suffering based on the resident's socioeconomic status, with vignettes of upper-class residents being rated lower than middle and lower class residents. Classical work by Davitz and Davitz (1981) suggests that nurses had preconceived ideas about which residents had the "right" to

complain about pain and which residents were simply “complainers”. Based on the nurse’s personal interpretations, the complainers were typically viewed as an annoyance to nurses and their pain complaints were more likely to be ignored or not taken seriously. Similarly, Salmon and Manyande (1996) found that nurses had negative impressions of residents who were unable to cope with their pain experiences.

In a study of nurse’s attitudes about residents’ pain, orthopedic nurses suggested that residents should expect to suffer some pain after surgery, a preconceived assumption that may decrease the nurse’s sensitivity to pain reports (Hunt, 1995). Nurses also rated oncology patients as having higher levels of pain than surgical patients, suggesting that the nurse’s perceptions of the patient’s diagnoses can impact pain assessment decisions (Loveman & Gale, 2000). Lastly, Nash, Edwards, and Nebauer (1993) suggests that the nurse’s perception of control over the pain assessment process affects their intention to conduct pain assessments, with higher levels of perceived control being more likely to result in a completed pain assessment.

Relationship with the Patient: Empathy

According to Jackson, Meltzoff, and Decety (2005), empathizing with others involves the sharing of another’s emotional state, often by recalling how pain felt when it was personally experienced, imagining the intensity of the pain when it was induced, and/or viewing it from the perspective of the other person. Empathy has been shown to have a positive impact on pain assessment tendencies (Davitz & Davitz, 1975; Green et al., 2009; Hall-Lord & Larsson, 2006; Jackson et al., 2005; Steeves, Kahn, & Benoliel, 1990).

Early work by Davitz and Davitz (1975) explored how nurses felt when their patients were experiencing suffering in an attempt to provide insight into nursing judgments, emotional reactions, and personal attitudes. When asked to describe an experience where the nurse did not empathize with a patient who was experiencing pain, one nurse shared, “I get a different feeling when someone my own age comes in, or

someone reminds me of my parents, or even friends" (Davitz & Davitz, 1975, p. 1506). Another nurse summed up the experience of empathy for patients by stating, "Each nurse is especially sympathetic to certain kinds of patients. Some respond particularly to the young, some to the old, others to those who remind them of parents or friends" (Davitz & Davitz, 1975, p. 1506). In the end, Davitz and Davitz (1975) recognized that nurses do not feel honestly empathetic towards everyone. Work by Steeves et al. (1990) exploring perceptions of suffering suggests that suffering was a subjective personal experience, which was often difficult to measure. Lastly, nurses personalized the experience of suffering realizing that they also contributed to patient suffering and were personally impacted by the patient's experiences with suffering (Steeves et al., 1990).

Later work by Hall-Lord and Larsson (2006) compared registered nurses and nursing students, suggesting that personality factors influence pain assessment decisions. Their findings showed that emotional stability and sense of coherence (two factors associated with more extroverted and empathetic personalities) affected pain assessment decisions (Hall-Lord & Larsson, 2006). A more recent study by Green et al. (2009) showed continued support of the relationship between empathy and inference of pain, noting that observers who experienced higher levels of empathy for residents portrayed in videos were more likely to identify the presence of pain in residents. Furthermore, evidence suggests the same brain centers are stimulated when perceiving pain in others and when personally experiencing pain (Jackson et al., 2005). Lastly, Brockopp et al. (2003) suggests that nurses feel more responsibility for managing painful experiences when the patient has not contributed to or caused their own suffering, which may be the case with drug abusers. Contrarily, Eritz and Hadjistavropoulos (2011) used informal caregivers to assess videos of residents in pain and did not find a relationship with level of empathy and pain assessment decisions. Nonetheless, the above literature suggests that empathy can have a significant impact on the pain assessment decisions made by nurses, which in turn adds to the concern for nonverbal residents with dementia who may

be unable to develop the social relationships necessary to evoke empathy from their healthcare providers.

Pain History

Cohen-Mansfield and Creedon (2002) found that the majority of the nursing staff members in their study had experienced intense pain at some point in their lifetime, as have most people. Holm et al. (1989) findings suggest personal experiences with pain may affect the nurse's readiness or ability to assess pain in others. Their finding suggests that nurses who have personally experienced intense pain or similar diagnoses are more likely to empathize with residents who are experiencing pain, thus more willing to conduct an adequate pain assessment (Holm et al., 1989). The subjective nature of pain assessments, which can be affected by the nurses' personal pain history, places the nonverbal older adult with dementia at an even greater disadvantage for receiving adequate pain assessment and management.

Pain Knowledge

The type of education or formal training a provider may receive and overall pain knowledge can also affect pain assessment inferences for nonverbal persons with dementia (Allcock & Standen, 1999; Baer et al., 1970; Davitz & Pendleton, 1969; Davoudi et al., 2008; Dudley & Holm, 1984; Halfens et al., 1990; Lenburg et al., 1970a; Lenburg et al., 1970b; Prkachin & Rocha, 2010; Wilson & McSherry, 2006). Seminal work by Baer et al. (1970) documented differences in inferences of physical pain and psychological distress between health care professions when comparing ratings of patient vignettes among nurses, physicians, and social workers. Their finding suggests that the more exposure a provider has to residents (as is the case with nurses and physicians), the more likely they are to underrate pain symptoms, as social workers inferred higher levels of pain than physicians and nurses in their study (Baer et al., 1970). The same was true in a later comparison of nuns, nurses, physicians, and teachers, with nurses and

physicians inferring lower levels of pain once again (Lenburg et al., 1970a; Lenburg et al., 1970b).

Perhaps, frequent exposure to residents may result in an enhanced need to empathize with residents and subsequent numbness to pain experiences, which can decrease the nurse's willingness and/or ability to infer pain in others. Wilson and McSherry (2006) suggest that nurses who work on specialty floors where pain is a frequent symptom (i.e. oncology, medical surgical, hospice, etc.) may become desensitized to pain experiences and tend to underreport the pain experiences of residents compared to general nurses in an effort to adapt to the work environment. Nurses in this study (Wilson & McSherry, 2006) were asked to rate 6 patient vignettes, but in foundational work by Davitz and Pendleton (1969) nurses were asked to rate 26 patient vignettes; which were divided into specific specialty groups: medical surgical, pediatric, psychiatric, and obstetric specialties. Unlike Wilson and McSherry (2006), Davitz and Pendleton (1969) did not find statistically significant differences in inferred suffering based on the nurse's specialty and the increased number of patient vignettes may account for this discrepancy. Prkachin and Rocha (2010) evaluated the relationship between overexposure to pain behaviors and the completion of accurate pain assessments in undergraduate students assessing an excessive number of patient videos for pain, in order to identify a change in the student's inference tendencies. Their findings illustrate that frequent exposure to pain assessment results in a decreased likelihood that raters will reliably infer pain in subsequent interactions (Prkachin & Rocha, 2010).

The nurse's work experience affects their inference of pain in others as well, with nurses with 2-5 years of nursing experience tending to overestimate pain experiences, while nurses with less than two or greater than five years of experiences underestimated pain experiences (Davoudi et al., 2008). Other works have found similar findings showing changes in pain assessment decisions with more nursing experience (Halfens et al., 1990; Lenburg et al., 1970a; Lenburg et al., 1970b; Loveman & Gale, 2000).

Comparing registered nurses to nursing students at various levels, Halfens et al. (1990) found differences in pain assessment decisions related to variations in the nurse's experience with lower level nursing students rating less pain in hypothetical residents. Contrarily, Lenburg et al. (1970a) found that lower level nursing students inferred higher levels of physical pain when compared to their upperclassmen counterparts. Halfens et al. (1990) had their residents assess only one patient vignette, while Lenburg et al. (1970b) had residents assess 40 vignettes. This increased exposure to patient vignettes may either account for some of the differences in the finding between the two studies or show that additional assessments give a better indication of rater tendencies. Allcock and Standen (1999) contradicted both studies showing that pain inferences of nursing students did not change over the course of their program despite the assumed increase in nursing knowledge, refuting the idea that nursing students become desensitized to pain as they gain more clinical experience. Yet, in their study, residents assessed 60 patient vignettes, which some evidence suggests that excessive exposure to pain may lead to inaccuracy in pain assessment decisions-making possibly due to rater fatigue and changes in attention span, potentially accounting for the inconsistency between the findings in these three studies (Prkachin & Rocha, 2010).

Secondary Gain/Tertiary Gain

The nurse may experience some gains and losses, which can impact their willingness and readiness to adequately assess pain in residents. The original conceptual model (Snow et al., 2004) incorporates the term secondary gain, which describes the possible unconscious or conscious benefits or gains that the resident's may experience as a result of unrelieved pain or continued disability (Fishbain, Cutler, Rosomoff, & Steele-Rosomoff, 2002). However, in reviewing the literature the term tertiary gain, which describes the specific benefits that others may gain from a resident's illness, seems to be more fitting in a discussion on nurse-related factors, thus the term tertiary gain will be used in this review of the literature (Dersh et al., 2004). Dersh et al. (2004) have

compiled a list of 11 gains that the provider may experience from a residents illness. Included in that list are admiration and respect from the patient, establishing one's position as compassionate to patient experiences, validating one's own illness of the same type, and financial rewards related to increased patient census (Dersh et al., 2004). However, the provider may also experience some losses associated with the resident's illness, which can also influence their readiness to assess pain. Providers may experience or be fearful of negative judgments from their peers as being dishonorable. Providers may also blame themselves for disabling the patient (Dersh et al., 2004). These tertiary gains and losses can have both negative and positive effects on the provider's pain assessment decisions, either leading to an enhanced decision-making process or resulting in avoidance and/or inadequate pain assessments.

Conclusion

Quantitative and qualitative works presented by Davitz and Davitz in the 1970's provided a foundation for follow-up and needed future research to explore the relationships between inference tendencies and nurse-related factors during pain assessment. These classic works highlighted disparities in pain assessment practices, explored nurses' subjective reasoning for pain assessment decisions, and supported the presence of ethnic differences in pain norms. For nonverbal older adults with dementia, who rely solely on the assessment decisions of nurses, the effect of these factors could result in increased risks for unrecognized and untreated painful experiences. However, research exploring the role of nursing-related factors in this specific population of nonverbal older adults is limited.

This review of the literature highlights six specific nurse-related factors that contribute to pain assessment decisions when inferring pain and may relate to nonverbal persons with dementia. In addition to pain perceptions, the nurse's relationship with the patient and pain knowledge has been supported by the literature as significant contributors to pain assessment decisions. In short, the findings of this integrative review

suggest that more experiences with pain may result in less sensitivity to pain during assessments. Furthermore, preconceived ideas about subjective norms for pain expression, level of empathy, and personal prejudices can impact pain assessment decisions for nurses. The nurses' demographic characteristics, particularly ethnic background and sex, can also play a role in pain assessment decisions. Finally, the provider may experience gains and losses from adequately assessing the resident's pain, which can also affect their decision-making abilities during pain assessments.

Similarly, Tait et al. (2009) provided a detailed review of the literature about factors that affect providers' judgments of pain. They concluded that the providers experience, affect, and level of empathy all impacted pain assessment decisions. Similar to this integrative review of the literature, these authors found that increased work experience often resulted in the underestimation of resident's pain and supported the role of empathy in pain assessment decisions (Tait et al., 2009). However, affect was an additional provider variable that was not discussed in this integrative review and was identified in their review suggesting that a negative affect may lead to decreased sensitivity to patient symptoms. Finally, Tait et al. (2009) provide a conceptual model for the factors that influence provider judgments of patient symptoms highlighting both patient and provider contributions to the pain assessment process. The current integrative review differs from the prior work of Tait et al. (2009) in its specific focus on nurse-related factors and their role in pain assessment decisions as it applies to persons with dementia.

In a review of the literature, Allcock (1996) also found that the nurse's work experience, ethnic background, personal experience with pain, and level of education can impact pain assessment decisions. Similar to the current review, Allcock (1996) also suggested that the nurse's age does not affect pain assessment decisions. Allcock's work was specifically focused on postoperative pain, included a review of patient-related factors, and their research implications were geared toward the role of nursing education

in desensitizing nursing students to pain (Allcock, 1996). This integrative review updates the work of Allcock (1996) by focusing on a different patient population and highlighting more recent works that explore the role of nursing-related factors on pain assessment decisions and its impact on the pain experiences of persons with dementia.

Conceptual Model Revisions

This review also suggests a need to revise the conceptual model for assessing pain in nonverbal persons with dementia presented by Snow et al. (2004). The model acknowledges secondary gain as directly impacting the rater's decisions in pain assessments, both consciously and unconsciously (Snow et al., 2004). However, further review of the literature suggest that secondary gain focuses on benefits to the patient that encourage continued pain complaints and may lead to prolonged disability (Fishbain et al., 2002; Matthias et al., 2010). In regards to the provider, the term tertiary gain more accurately describes the provider's motivations and the role it plays in the pain assessment process (Bokan, Ries, & Katon, 1981; Dersh et al., 2004). Consequently, the conceptual model should be adapted to include the term tertiary gain instead since it describes the benefits of unrelieved pain for others.

In addition to the current factors that are listed on the conceptual model as contributors to pain expression and assessment, ethnicity should be added to the patient list of contributing factors. This review of the literature suggests there is often misuse of the resident's ethnic background when making pain assessment decisions. Previous research has highlighted the presence of culturally-constructed pain norms for cognitively intact residents, although it is unclear whether these norms are maintained in mild-moderate levels of dementia (Forsythe et al., 2011; Grewen et al., 2008; Horgas & Dunn, 2001; Im et al., 2007; Juarez et al., 1998; Shavers et al., 2010). The literature also supports that pain assessment decisions are influenced by the resident's socioeconomic background (Calvillo & Flaskerud, 1993). Therefore, demographic characteristics should be added to the model for patient factors as an umbrella term that encompasses the

previously stated impact of gender differences, ethnic differences, and the role of socioeconomic background on pain decisions.

Furthermore, pain "perceptions" highlights the sometimes unconscious nature of outside influences on pain assessment decisions, therefore this term should be used instead of "pain beliefs" (Debner & Jacoby, 1994). This review also supports "empathy" as a nurse-related factor, which is the specific factor exhibited when a nurse develops a relationship with the patient and that relationship influences pain assessment decisions. Consequently, "empathy" should also be added to the current list of rater factors. Finally, an additional "arrow" needs to be added to represent the relationship between the rater factors and "observation of external signs," as this integrative review supports the impact of rater factors on the ability and willingness to identify signs of pain. Figure 3 incorporates the suggested changes (in red) to the original conceptual model (Snow et al., 2004).

Future Research

To help facilitate the assessment of pain in nonverbal older adults, pain assessment tools have been developed for use by health care providers when assessing pain in persons with dementia. There are currently over 35 pain assessment tools that have been developed specifically to assess pain in older adults with dementia (Husebo et al., 2012). Varying in quality, the majority of the developed nonverbal pain assessment tools included some or all of the pain behaviors identified as observable signs of pain in early clinical practice guidelines (AGS, 2002). Yet, nonverbal pain assessment tools developed for pain assessment have yet to be tested in older adults in a way that addresses the role of nurse-related factors on pain assessment tendencies, highlighting a need for further research.

This integrative review focuses on nurse-related factors, but there is also a need to expand this work to other members of the health care team, particularly the CNA. While the majority of the pain assessment tools were designed to be used by nurses, two tools

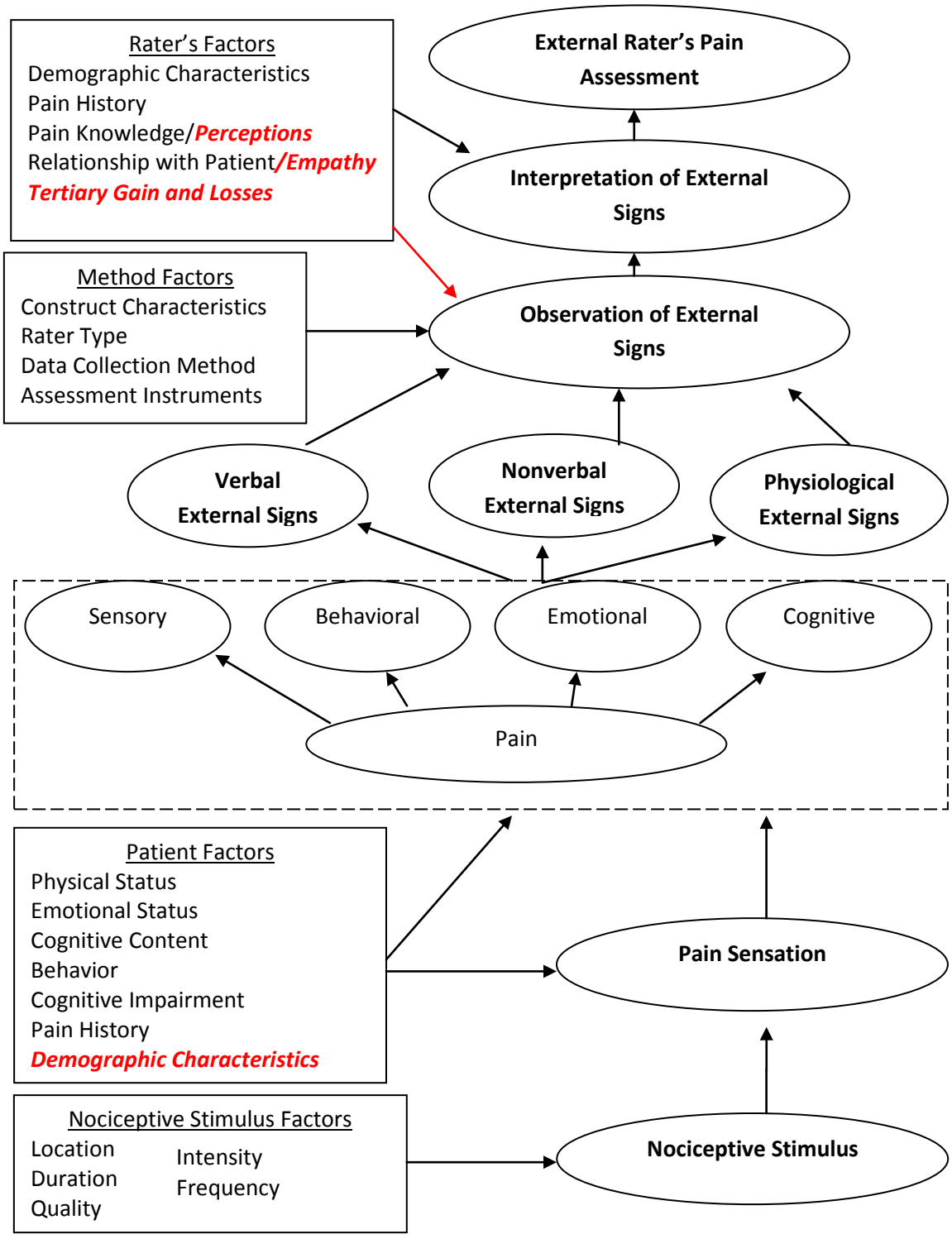
were developed to be used by CNAs as screening tools for pain behaviors (Cervo et al., 2007; Snow et al., 2004). For nonverbal older adults with dementia, the CNA is in an ideal position to readily screen for the presence of pain, as research suggests that CNAs spend greater amounts of time with nonverbal older adults in comparison to the rest of the healthcare team and may be more likely to identify changes in resident's behaviors related to the expression of pain (Cohen-Mansfield & Creedon, 2002; Nygaard & Jarland, 2006; Pautex et al., 2007). CNAs are also capable of conducting initial screenings of pain in nonverbal older adults; however, these initial screenings for pain must be followed-up by a nurse's full assessment of pain (Snow et al., 2004). Considering the amount of time that CNAs spend providing direct patient care to nonverbal older adults with dementia, it is imperative that future work explores the impact of CNA-related factors on pain screening tendencies for persons with dementia. While little research has explored the CNA-related factors on pain assessment, preliminary research has assessed CNA's use of nonverbal pain behaviors to screen for pain in this population (Cohen-Mansfield & Creedon, 2002; Mentes et al., 2004, Snow et al., 2004).

Future research should also focus on expanding the current evidence that addresses the impact of nurses' pain history on pain assessment decisions, as little research is currently available to support this nurse-related factor. Lastly, this review has highlighted the presence of differences in cultural perceptions of pain and the misuse of demographic characteristics, particularly ethnicity, in pain assessment decision-making by nurses. In turn, this analysis of perceptions gives rise to additional research questions regarding the impact of these factors on pain assessment decisions in nonverbal older persons with dementia when the provider and patient are from different versus similar ethnic backgrounds.

One of the major limitations of this integrative review in addressing pain inferences in nonverbal persons with dementia is the lack of studies focused specifically on this target population, as all of the works presented here were conducted with

cognitively intact older adults. While these findings may be applied to pain assessments in cognitively impaired persons, future empirical research is critically needed to specifically explore the role of nurse-related factors when assessing pain in nonverbal persons with dementia from diverse backgrounds, as well as factors impacting the role and inferences of other healthcare team members.

Figure 3: Revised Conceptual Model for Pain Assessment for Non-communicative Persons with Dementia



(Snow et al., 2004)

Table 1: Critique and Summary of Research Articles

The Strength of Recommendation Taxonomy (SORT) rates the quality, quantity, and consistency of evidence and can be used to assess individual studies and/or a full body of evidence. SORT ranks articles from one to three with a score of one being reserved for true experiments, two representing studies that lack one of the criteria for an experiment, and a ranking of three representing work that is based on case studies or personal opinions (Ebell et al., 2004).				
Citation	**Sample/ Methods**	**Results**	**SORT Rank**	**Comments**
(Acheson, 1989)	Authors conducted a descriptive exploratory study to evaluate the impact of the resident's culture on the nurse's inference of pain and psychological distress. 61 registered nurses were randomly selected to assess pain in culturally diverse patients using The Standard Measure of Inference of Suffering Questionnaire, a 7-point rating scale that rates both pain and psychological distress.	Nurses used the patient cultural background to determine the level of pain and psychological distress each patient was experiencing. Southeast Asian patients were identified as having higher pain then Mexican-Americans and more psychological distress then American Indians, Mexican-Americans, and White Americans.	II	Vignettes instead of real patients. Random selection.
(Allcock & Standen, 1999)	217 nursing students completed the Measures of Inferences of Suffering Questionnaire to assess pain and psychological distress. Subjects rated 60 patient vignettes using a 7-point rating scale.	Positive correlations were noted for pain and psychological distress ratings. Students inferred more pain for children. Psychological distress ratings were higher for women and increased in children and adults while remaining stable in the	II	Based in the U.K. Longitudinal descriptive, non-experimental study. Used patient vignettes instead of real humans. Large sample size.

Table 1-Continued

		elderly. The student's age did not affect psychological distress ratings, but did affect their inference of pain. Other tested factors did not impact pain or psychological distress ratings, including: previous nursing experience, the student's gender, and branch of the college the student attended or planned to attend.		
(Baer et al., 1970)	25 nurses, 25 social workers, and 24 physicians assessed patients for physical pain and psychological distress using 16 paired -vignettes of various patient scenarios and two 0-6 rating scales, one for physical pain and the other for psychological distress.	Social workers infer higher levels of pain than nurses and physicians. In all cases, nonverbal behaviors for pain result in lower inferences of pain than verbal indicators. Those providing the greatest amount of direct patient care inferred the lowest levels of pain.	II	Used patient vignettes that had not be tested previously. Explored across disciplines. Convenience sample.
(Brockopp et al., 2003)	157 registered nurses and 265 nursing students were surveyed to identify the amount of time and energy they would invest in assessing pain in specific groups of patients: suicide attempters, substance abusers, elderly patients, AIDS patients, and cancer patients. 64 critical care nurses were also interviewed.	In addition to the resident's pain reports, cancer and suicide diagnoses resulted in greater attention to pain. Less attention was warranted for suicide, substance abusers, and the elderly. Qualitative interviews of the 64 critical care nurses resulted in three themes	III	Mixed methods.

Table 1-Continued

		"control vs. uncertainty, desire to live vs. desire to die, and the dilemma of aging. Nurses were less likely to identify pain in patients who had contributed in to their own suffering as is the case with suicide attempters and substance abusers.		
(Calvillo & Flaskerud, 1993)	32 nurses and 60 patients (Mexican American and Anglo American) participated in the study. The nurses assessed the patient for cholecystectomy pain using the Present Pain Intensity scale. Nurses' assessments were compared to resident's reports of pain and evaluated based on the resident's demographic characteristics.	There was no difference noted in the resident's reports of pain between Mexican and Anglo Americans. Nurses rated Anglo Americans has having significantly higher pain severity than Mexican American patients. In comparing patient and nurse reports of pain, nurses underestimated the resident's pain intensity. A relationship was noted between pain and anxiety and pain and self-esteem. Lastly, No significant difference was noted between the nurse's ratings and their years of experience, type of training program, ethnicity, or place of birth. However, significant associations were noted for patient characteristics	II	Real patients and nurse comparisons. Psychometric properties of the tool were previously examined.

Table 1-Continued

		and pain assessments, including: professional occupation, education status, US citizenship, ability to speak English, and religious preference.		
(Davitz & Davitz, 1975)	More than 200 female nurses were interviewed in small groups about their experiences with pain assessment and how they felt about patient suffering.	Emerging themes included: from school to practice, differences in reactions to patients, the complaining patient, dealing with emotional problems, the problem with over involvement, and reactions to death and dying	III	Themes well supported, though methods are not clearly defined.
(Davitz et al., 1977)	544 female registered nurses from different ethnic backgrounds (American, Japanese, Puerto Rican, Korean, Thai, and Taiwanese) assessed 60 vignettes of patients using the Standard Measure of the Inference of Suffering instrument (translated into the nurse's native language). The nurses rated the patient physical pain and psychological distress using a 7-point rating scale.	Results are presented in part 2.	II	Patient Vignettes. Convenience Sample. Translated versions of the tool have not been tested, though some psychometric testing of the English version.
(Davitz & Pendleton, 1969).	**Study 1:** 32 Korean nurses, 30 Thai nurses, 23 Puerto Rican Nurses, 20 African American, and 25 Caucasian nurses rated 30 patient vignettes, which were previously translated into their	**Study 1:** Statistically significant differences were noted between African American, Caucasian, and Puerto Rican nurses, with	II	Vignettes. Convenience sample.

Table 1-Continued

	native language. Nurses rated the degree of suffering using a 7-point rating scale. **Study 2:** Nurses from four clinical specialties (32 medical surgical, 25 pediatric, 26 psychiatric, and 33 obstetric nurses). Each nurse rated 26 patient vignettes using a seven-point rating scale. **Study 3:** 94 nurses with various levels of experience rated 48 patient vignettes with a 7-point rating scale. The vignettes varied based on the resident's diagnoses (burns, depression, leukemia, and diabetes). **Study 4:** 67 female nurses rated 40 patient vignettes using a 7-point rating scale. The patient varied in characteristics with emphasis on age, sex, and socioeconomic class. The nurses rated their level of suffering.	Puerto Rican nurses having the highest ratings and African American nurses having the lowest ratings. **Study 2:** Statistically significant differences were not found between the four specialties. **Study 3:** Items related to burns were significantly rated higher than other patient scenarios. Depression and Leukemia produced the next highest ratings. **Study 4:** Statistically significant differences were noted between inferences of suffering for the patient' age and socioeconomic status. Younger patients were noted has having higher levels of suffering than older counterparts. Also, patients with higher socioeconomic were rated lower than middle or lower class patients.		

Table 1-Continued

(Davoudi et al., 2008)	65 registered nurses assessed resident's pain intensity using the 0-10 numeric rating scale. A secondary data analysis was also conducted using nurse and patient ratings that were previously collected using the VAS. Patient and nurse assessments were compared for congruency.	Mean pain scores of nurses were significantly lower than patient scores. Nursing work experience affected pain assessment decisions as well as gender and marital status.	II	Secondary data analysis. Compared to real patient reports of pain. Non-experimental: descriptive-correlational, lacked randomization of subjects.
(Dudley & Holm, 1984)	50 registered nurses reviewed patient vignettes and rated the degree of pain and psychological distress using the Standard Measure of Inference of Suffering assessment tool.	Nurse had significantly higher ratings of psychological distress than pain. Correlations between years in practice, age, job satisfaction, and ratings tendencies were insignificant. Chi-square analysis did not reveal significant associations between educational preparation, clinical practice setting, and shift worked.	II	Used vignettes instead of real human experiences. Findings are consistent with other foundational works. Non-experimental: descriptive-correlational design. Randomly selected subjects, lacked control.
(Eritz & Hadjistavropoulos, 2011)	Older adults with dementia were video recorded at rest and during a potentially painful activity. Informal caregivers were asked to assess the videos for the level of pain experienced.	Nonverbal pain behaviors were not related to the caregiver's assessment of pain. Empathy, mood, sex, age, and relationship to the patient were not related to pain assessments. Caregivers who spent greater amounts of	II	Patient videos. Assessed by family caregivers.

Table 1-Continued

		time with the resident assessed pain more accurately.		
(Green et al., 2009)	130 undergraduate psychology students were asked to assess five-second video clips of facial expressions of individuals and rate their level of pain. Observer's pain ratings were then compared to resident's self-reports of pain. Level of empathy was assessed using the Davis Empathetic Concern Scale (DECS).	Observers generally underestimated the resident's pain experience. Raters who were more empathetic to resident's experiences had higher pain ratings than those who were less empathetic, but were also more accurate in their pain assessments. Gender was not a significant factor in the level of pain assessed.	II	Video of patients. Convenience sample.
(Halfens et al., 1990)	133 student nurses and registered nurses were randomly assigned to review one of 24 patient vignettes using a 1-10 scale. Subjects also estimated the patient characteristics using a nine-trait dimension scale.	Nurses attributed more pain to patients who were depressed and those showing positive physical pathology. Also found that the nurses' level of education influenced pain assessment decisions. No relationship was noted between nursing characteristics and perceptions of pain.	II	Quasi-Experimental design. Used patient vignettes. Nurses scored the patient characteristics. Included nursing students.
(Hall-Lord & Larsson, 2006)	71 registered nurses and 184 student nurses assessed pain and distress in 3 patient vignettes on four pain dimensions: sensory, intellectual,	Assessment decisions were influenced by the resident's age and diagnoses. Nurse's personality factors and nursing	II	Quasi-experimental Based in Sweden. Used hypothetical patients.

Table 1-Continued

	emotional, and existential. Resident's personality factors were also rated to look for relationships between pain assessment decisions and nursing characteristics using a 1-5 scale.	experience influenced pain assessment decisions, as the nurse's emotional stability and sense of coherence affected pain assessment decisions.		
(Hirsh et al., 2010)	54 registered nurses viewed 32 computer simulations of virtual patients in pain via the internet. Each video was accompanied by a text vignette containing clinical information and medical diagnoses. Nurses were asked to assess the resident's mood in the context of pain. Following the video assessments nurses were asked to identify in text format which patient information they used to make their pain assessment decisions. The text was then themed and coded.	33 nurses had a significant pain assessment pattern. 48% of the nurses that had a reliable pain assessment pattern used the resident's sex, age, and race in making pain assessment decisions. 92% of those with a pain assessment policy and 59% overall, also used facial expression to determine the presence of pain, particularly in assessing pain unpleasantness. None of the 54 nurses self-reported using sex, age, or race in their pain assessment decision making. Yet, 13-31% of the 54 nurses had statistically significant findings based on the resident's sex, race, and age in their pain assessment decisions. In the end, nurses rated females, older patients, and African-Americans as having higher pain-intensity and unpleasantness ratings.	II	Virtual humans, mixed methods.

Table 1-Continued

(Hirsh et al., 2011)	54 registered nurses viewed 32 computer simulations of virtual patients in pain via the internet. Each video was a companied by a text vignette containing clinical information and medical diagnoses. Nurses were asked to assess the resident's mood in the context of pain.	Nurses used the resident's sex, age, race, and facial expressions of pain to complete the mood assessment suggesting that nurses will use the resident's demographics in clinical decision making in pain assessments.	II	Used virtual humans instead of real human experiences. Ratings on the visual analog scale have not been subjected to psychometric testing. Facial Action Coding System was used to develop the facial expressions of the virtual humans. Non-experimental: descriptive/ correlational, lacked randomization and control.
(Holm et al., 1989)	205 nurses were asked to complete a socio-demographic and personal pain questionnaire. The nurses also completed The Standard Measure of Inferences of Suffering Questionnaire, which contains 60 patient vignettes rated on a 7-point rating scale. In additional to the original 60 vignettes, 3 additional patient scenarios were added	The nurse's personal experiences with pain influence their assessments of pain in their resident's vignettes. Those with intense pain experiences rated patients as having higher levels of pain. Nurse who reported a religious preference rated patients lower than those	II	Proportionate random sampling. Vignettes. Adapted version of the questionnaire has not been tested (added 3 additional items).

Table 1-Continued

	to this adapted version of the tool. The questionnaire was scored for overall physical pain and psychological distress.	who did not have a religious preference. The resident's age, race, and sex did not influence the ratings significantly.		
(Hunt, 1995)	35 nurses voluntarily completed a questionnaire about their attitude toward resident's pain.	In regards to pain assessment, 18 nurses felt that patient should expect to experience some pain following orthopedic surgery. The majority of the nurses felt that pain could be assessed using patient behaviors and that the patient was the best source for determining the presence of pain. At least half of the subject agreed that the resident's self reports of pain were reliable and felt that pain assessment was a vital portion of their job.	III	70 percent response rate. Convenience sample
(Leiderman, 1977)	Methods reported Davitz et al.(1977)	Korean and Japanese nurses inferred the highest levels of pain with Korean nurses also inferring the highest levels of psychological distress. Puerto Rican nurses inferred the lowest levels of psychical pain, but were second in their ratings of psychological distress. American nurses were the second lowest inferences for	II	Patient Vignettes. Convenience Sample. Translated versions of the tool have not been tested, though some psychometric testing of the English version.

Table 1-Continued

		both pain and psychological distress.		
(Lenburg et al., 1970a)	258 first and second year nursing students were asked to score 40 vignettes for pain and psychological distress using a 7-point rating scale.	Both groups of students inferred higher levels of psychological distress then pain. First year students inferred higher levels of pain, while second year students inferred higher levels of psychological distress. Findings suggest that as nursing students build their knowledge base their inferences of pain are altered.	II	Convenience Sample. Patient vignettes.
(Lenburg et al., 1970b)	33 nurses, 32 high school teachers, 30 physicians, and 36 nuns were asked to infer pain from 36 vignettes of adult patients using two 1-7 rating scales, one for physical pain and the other for psychological distress.	Means and standard deviations revealed that nuns inferred the greatest levels of pain respectively followed by teachers, nurses, and physicians. Those with formal training and education to assess pain inferred the lowest levels. Analysis of variance supported a significant difference between the groups. The physicians were predominately male and inferred the lowest levels of pain.	II	Used patient vignettes. Convenience sample.

Table 1-Continued

(Loveman & Gale, 2000)	27 nurses rated 16 vignettes for levels of pain and psychological distress. The nurses rated the patients pain and psychological distress using a visual analog scale	Significant correlations were found between ratings of psychological distress and pain.	II	Assessments were based on previous study design. Assessed patient vignettes. Non-experimental: descriptive-correlational. Lacked randomization and control.
(Nash, Edwards, & Nebauer, 1993)	59 nurses voluntarily responded to a 22-item questionnaire about their attitudes, perceived control, intentions, and subjective norms toward pain assessment.	" The findings support the theory of planned action showing that the nurses intentions to conduct a pain assessment was predicted by their attitudes, subjective norms, and perceived control regarding pain assessment" (p. 945). The nurse's perceived control over the situation directly impacted whether or not they intended to complete a pain assessment.	III	Questionnaire completed voluntarily. 59% response rate.
(Robinson et al., 2001)	391 undergraduate psychology students completed a questionnaire that assessed Gender Role Expectations of Pain (GREP)	Both men and women felt that women were more likely to report pain experiences. Participants believed that men were less sensitive to pain and had higher pain endurance. The	II	Psychometric testing of GREP questionnaire. Convenience sample.

Table 1-Continued

		tool had good test-retest reliability and internal consistency.		
(Salmon & Manyande, 1996)	15 nurses completed pain questionnaires on 56 patients. The patients also completed the pain questionnaires without conferring with the nurses. The results from the nurses' questionnaires were then compared to patient responses.	Nurses accurately assessed the resident's pain intensity, but pain coping and the need for analgesics was underestimated by the nurses. Patients who were deemed as unable to cope with their pain were viewed negatively as dependent and needy by nurses.	II	Real patient assessments.
(Steeves, Kahn, & Benoliel, 1990)	26 nursing students were interviewed to assess the interpretation of suffering, its meaning, and specific examples of suffering they encountered in practice. The data was then analyzed for codes and themes.	Informants believed that suffering was a medical condition, focusing on the cause of suffering, its manifestation, and the effects that suffering had on the patient. Informants also felt that suffering was a subjective personal experience, which was often difficult to measure. Lastly, nurses personalized the experience of suffering realizing that they also contributed to patient suffering and were personally impacted by resident's experiences with suffering.	III	Qualitative interviews based on student nurses perceptions of suffering.

Table 1-Continued

(Wandner et al., 2012)	111 students were asked to complete 4 questionnaires (demographic information, gender expectations, race/ethnic expectations, and age expectations of pain) using a web-based model.	Asians and whites were identified as being more sensitive to pain than Black and Hispanic counterparts. Whites were perceived as being more willing to report pain then Asian and Black patients. White were also more willing to report pain in comparison to the rater. Female raters identified Hispanics as being more willing to report pain and rated themselves as being more willing to report pain in comparison to others. Age differences were also noted. The older adult was perceived as being more sensitive to pain and more willing to report pain than the raters and their younger and middle-aged counterparts. Women were perceived as being more sensitive to pain, having higher pain endurance, and more willing to report pain then male counterparts.	III	Used students and not nurses or nursing students. Web-based vignettes/questionnaires.

Table 1-Continued

(Wilson & McSherry, 2006)	72 registered nurses assessed 6 patient vignettes using a 5-point rating scale. The nurses were divided into groups of specialist and generalist nurses and their pain assessments were compared	Specialist nursing inferred lower levels of pain then their generalist counterparts.	II	Used Vignettes, Quasi-experimental. United Kingdom.

CHAPTER 3.ETHNIC DIFFERENCES IN THE EXPRESSION OF NONVERBAL PAIN BEHAVIORS

Background and Significance

Unrelieved pain in older adults impacts quality of life by causing depression, sleep deprivation, poor nutrition, anxiety, and changes in mood (Leong & Nuo, 2007; Meleger et al., 2013; Pilkington, 2013). In nursing homes, between 45% to 80% of residents suffer from pain (Leong & Nuo, 2007; Winn & Dentino, 2004; Zwakhalen et al., 2009), with an estimated 14 to 38.2% of residents suffering from severe pain and 40% of residents describing their pain as intolerable (Takai et al., 2010). Musculoskeletal disorders such as arthritis, osteoporosis, and fractures are common sources of pain for older adults in the nursing home (Takai et al., 2010). Consequently, older adults in the nursing home may be at an increased risk for experiencing some of the previously stated consequences of unrelieved pain.

A subset of older adults in the nursing home at higher risk for unidentified and undertreated pain are those with dementia. Prevalence reports estimate that 41% to 52% of older adults with dementia experience pain in the nursing home (Zwakhalen et al., 2009). With the chronic progressive loss of cognitive function in dementia (Wallace, 2008), the expression of pain becomes more challenging as they may have difficulty in remembering or verbally describing their pain experiences (Shega et al., 2008) and are therefore more reliant on others to identify and assess their pain. Consequently, as dementia progresses, older adults tend to report fewer painful conditions (Burfield et al., 2012), even though they may suffer from the same painful diagnoses as cognitively intact older adults (Closs, Cash, Barr, & Briggs, 2005; Husebo et al., 2008; Reynolds, Hanson, DeVellis, Henderson, & Steinhauser, 2008). Burfield et al. (2012) found that 47.7% of cognitively intact older adults reported experiencing pain daily, while only 18.2% of

older adults with severe dementia (and similar diagnoses), 29.4% of the moderately impaired, and 39.6% of those older adults with mild dementia reported painful experiences. These findings suggest that pain is less likely to be detected and treated in persons with dementia, particularly as the dementia worsens. Consequently, pain in residents with dementia often goes unnoticed, leaving these older adults to endure painful experiences without treatment interventions, which ultimately impacts quality of life (Herman et al., 2009).

To help alleviate pain in older adults with dementia, it is therefore important that providers are proactive in screening and assessing for possible pain in this special population. Experts recommend using a hierarchy of pain assessment techniques where providers first attempt to obtain a verbal self-report of pain (the gold standard), followed by an identification of potential causes of pain, an observation of residents for nonverbal pain behaviors, a retrieval of proxy-reports of pain, and lastly ends with the implementation of an analgesic trial (Bjoro & Herr, 2008; Hadjistavropoulos et al., 2007; Herr et al., 2011).

Established recommendations support the use of nonverbal pain behaviors to assess pain in nonverbal persons with dementia and providers' ability to recognize nonverbal behaviors as signs of pain, particularly when they are accompanied by a painful diagnosis (Hill & Craig, 2004; Wilson et al., 2013). Six categories of nonverbal pain behaviors (facial expressions, vocalizations, body movements, changes in interpersonal interactions, changes in activities, and mental status change) were identified by an expert panel of the American Geriatric Society in 2002, which provided the foundation on which tool development proceeded. The behaviors identified during painful experiences provide signals to healthcare providers that the patient is experiencing pain (Decker, 2009; Hadjistavropoulos et al., 2007). These nonverbal pain behaviors are included on nonverbal pain assessment tools to guide providers in focusing on known pain-related indicators during pain assessment in this population. There are

over 35 nonverbal pain assessment tools available for use in older adults with dementia (Husebo et al., 2012). These tools vary in content and quality, but contain nonverbal pain behaviors that may be observed during pain assessment or screenings and serve as a guide for healthcare providers (Herr et al., 2011).

Some pain assessment tools were specifically developed for use by the CNA (Cervo et al., 2007; Snow et al., 2004). In the nursing home, CNAs often serve in the care giving role and can provide proxy reports of pain for older adults with dementia (Snow et al., 2004). Since CNAs spends high volumes of time with the older adult providing direct patient care, they are most familiar with the older adult's typical behaviors and can identify changes in behavior (Eritz & Hadjistavropoulos, 2011). Providers who spend 10 hours or more with the resident (like the CNA) are more likely to identify nonverbal pain behaviors in older adults than those with less regular contact (Eritz & Hadjistavropoulos, 2011).

The Non-communicative Patient Pain Assessment Instrument (NOPPAIN) is one pain assessment tool that was designed to be used by the CNA and was psychometrically evaluated in older adults with dementia (Horgas, Nichols, Schapson, & Vietes, 2007; Sheu et al., 2011; Snow et al., 2004). Previous work by Snow and colleagues (2004) asked CNAs to screen six videos of a professional actress expressing pain behaviors and score the "subject" using the NOPPAIN. During their study, CNAs were also asked to compare videos to identify which residents were experiencing the worst level of pain. The researchers concluded that CNAs are capable of screening residents for pain and that the NOPPAIN can be used to detect pain in nonverbal older adults. However, it is important to note that CNAs do not have the training and skill-set needed to conduct assessments for pain, but they may perform the initial screening of pain so long as it is followed by a thorough assessment completed by the licensed nurse (Snow et al., 2004).

As stated above, the use of nonverbal pain behaviors to express pain, and CNAs conducting the initial screening for pain in this special population are supported in the

literature (Eritz & Hadjistavropoulos, 2011; Hadjistavropoulos et al., 2007; Prkachin & Solomon, 2008). However, there is little evidence that every ethnic group will exhibit similar nonverbal pain behaviors during painful experiences, particularly in persons with dementia. Mark Zborowski's work in the early 1950's was one of the first to recognize that pain was not only a neurological and physiological experience, but a cultural one as well (Encandela, 1993). Zborowski (1952) suggests that cultural differences in attitudes and patterns of pain are primarily present on the behavioral level. These culturally-influenced norms can directly and indirectly affect the experience of pain with other members of the ethnic group displaying approval or disapproval of the individual's response to pain. In the end, fundamental work by Zborowski (1952) support two generalizations of pain expression: "1) Similar reactions to pain manifested by members of different ethno-cultural groups does not necessarily reflect similar attitudes to pain. 2) Reactive patterns similar in terms of their manifestations may have different functions and serve different purposes in various cultures" (p. 24).

Ethnic differences in the expression of nonverbal pain behaviors may affect rater's inference and judgments about presence of pain and potentially add to the difficulty of detecting pain in persons with dementia who are unable to self-report painful experiences. In cognitively intact residents, variations in pain experiences and pain preferences are established between ethnic groups (Fabian, McGuire, Goodin, & Edwards, 2011; Rahim-Williams, Riley, Williams, & Fillingim, 2012). Understanding ethnic differences in the expression of nonverbal pain behaviors requires further exploration to help reduce healthcare disparities in pain assessment and management

Early studies also found that cognitively intact African American residents have an increased use of nonverbal pain behaviors compared to white counterparts (Riley et al., 2002); however no studies have addressed this association in older persons with dementia. Given findings in cognitively intact persons, understanding whether or not those with dementia who are unable to communicate painful experiences will exhibit the

same nonverbal pain behaviors as others further exploration (Campbell & Edwards, 2012; Trawalter, Hoffman, & Waytz, 2012; Weech-Maldonado et al., 2012).

Although few studies have explored ethnic differences in the use of nonverbal pain behaviors, researchers have examined ethnic differences in the expression of emotions, which may provide additional detail regarding potential differences in the outward expression of pain behaviors (Marsh, Elfenbein, & Ambady, 2003; Mesquita & Walker, 2003; Stepanikova, Zhang, Wieland, Eleazer, & Stewart, 2012). Marsh et al. (2003) found subtle cultural variations in basic nonverbal facial expressions, suggesting that some differences do exist in the nonverbal expression of emotions (i.e. fear, disgust, sadness, surprise, happiness, and anger). The authors propose that emotional expressions convey signals about cultural preferences or display rules in the outward expression of emotions in the presence of others (Marsh et al., 2003). Display rules can be defined as culturally specific perceptions about the appropriateness of displaying emotions in various social settings and these patterns determine the resident's willingness to express emotions and are dependent on intact cognition. Most findings support an acceptance of the open expression of emotions in Western cultures (Engelmann & Pogosyan, 2013), but the maintenance of these display rules despite the onset of dementia has not been explored. Pain is defined an unpleasant sensory or emotional experience and can also be displayed using the same nonverbal facial movements as emotional expressions (APS, 1992; Decker, 2009; Sheu et al., 2011). Some similarities in the facial expression of pain and emotions are noted, like facial expressions for disgust and fear may elicit similar facial responses as pain (Simon et al., 2008). Consequently, the body of literature addressed above that explores cultural differences in emotions provides insight into the need for further research that examines potential variations between ethnic groups in regards to the display of nonverbal pain behaviors. Ethnic differences in the expression of nonverbal pain behaviors could be contributing to unrelieved and undetected pain symptoms in older adults with dementia. Therefore, it is important to develop strategies

to guide the recognition and evaluation of pain across ethnicities. To our knowledge, no studies have examined ethnic differences in the nonverbal expression of pain behaviors.

Snow et al. (2004) developed a conceptual model for assessing pain in nonverbal persons with dementia. This conceptual model highlights both provider and patient factors that inhibit the adequate assessment of pain in nonverbal persons with dementia. According to the conceptual model, there are eight specific patient-related factors that may be present and impact both pain perception and pain sensation, including gender, physical status, emotional status, cognitive content, behaviors, cognitive impairment, and pain history. Other studies have highlighted ethnic background as a contributing patient-related factor for cognitively intact older adults, which may be present despite cognitive impairment (Forsythe et al., 2011; Grewen et al., 2008; Im et al., 2007; Juarez et al., 1998; Shavers et al., 2010). These patient-related factors add to the difficulty of conducting an adequate pain assessment in nonverbal older adults with dementia. The purpose of this study was to examine ethnic differences in the presentation and intensity of nonverbal pain behaviors among African American, Caucasian, and Hispanic older adults with dementia. For this reason, the CNA's screening of nonverbal residents with dementia was used to answer the following research question:

1. What pain behaviors are most commonly expressed by African American, Hispanic, and Caucasian older adults with dementia and are there differences in the expression of these behaviors between ethnic groups, when assessed by CNAs using the NOPPAIN?

Methodology

The design of this study consisted of a secondary analysis of data from a primary study conducted by Snow et al. (in review) which examined the psychometric properties of the NOPPAIN. Older adults were recruited from four nursing homes in Tuscaloosa, Alabama from the same for-profit chain. Older adults with moderate to severe dementia (3 or greater on MDS-COGS) and a related diagnosis that could potentially cause

dementia (e.g. organic brain disease, cardiovascular accident, head injury) were included in the study (Snow et al., in review). All of the residents also had pain-related diagnoses, with the most common diagnoses being arthritis (41%), "pain" (39%), osteoporosis (28%), and fractures (28%). Informed consent was received by the family member or durable power of attorney and participant assent was obtained. Since all of the patient-identifying information was removed from the data set in the parent study (Snow et al., in review), IRB approval was not required to reanalyze the data for this dissertation (see Appendix A).

A total of 83 older adults with dementia participated in the study. Residents were assisted by a CNA (hired from a temporary employment agency) while completing or simulating morning activities of daily living and were videotaped using a hand-held recorder for 5 to 15 minutes (Snow et al., in review). A total of 78 videos of the older adults' morning activities were created (5 of the elders declined videotaping). Of the available 78 video recordings, 28 videos were randomly selected to be analyzed for the presence of nonverbal pain behaviors using the NOPPAIN. These 28 subject videos were reviewed by 6 African American CNAs who were trained to use the NOPPAIN. The CNA training was completed beforehand in a one-hour training session. Training consisted of an introduction to standardized assessments, orientation to the NOPPAIN assessment tool, practice using the assessment tool on 6 training videos, and developer feedback. Each CNA reviewed the 28 video recordings and rated the presence and intensity of pain behaviors using the NOPPAIN, resulting in 168 completed assessments. CNAs also rated the overall pain intensities using a 0-10 scale and made a "yes" or "no" determination about whether or not the resident was in pain.

Quantitative analyses of video ratings were completed using SPSS version 21.0. Frequencies were calculated for the use of the six nonverbal pain behaviors for the entire sample and separately for those residents who were identified by the CNAs as having pain. Mean overall pain intensity scores as rated by CNAs, were calculated for the entire

sample, for those residents identified as having pain, and across the three different ethnic groups. For all residents, chi-square was used to compare ethnic differences in the presentation of nonverbal pain behaviors. Using ANOVA ethnic differences in overall pain intensity ratings were evaluated.

Measures

The NOPPAIN instrument is a 17-item assessment tool that was designed for use by CNAs to screen for indicators of pain in persons with dementia. The tool includes an activity chart for pain assessment during different levels of activity, a body diagram, a pain response section for identification of nonverbal pain behaviors, and a reminder to ask the subject if he/she was in pain. The NOPPAIN includes 6 categories of nonverbal pain behaviors (pain words, pain noises, pain faces, rubbing, bracing, and restlessness), as well as descriptions of the types of nonverbal pain behaviors that could be included in each category. The tool also includes a 6- point Likert scale (0-5) for rating the intensity of each observed nonverbal pain behavior category (Snow et al, 2004).

Decent inter-rater reliability ($r=0.72$ to $r=1.0$), good internal consistency (Cronbach's alpha=0.80 to 0.97), and acceptable test-retest reliability ($r=0.68$ to $r=0.95$) was established for the NOPPAIN (Horgas et al., 2007; Snow et al., 2004). Testing of convergent validity showed moderate correlations between verbal reports of pain and nonverbal pain behaviors ($r=0.66$, $p < 0.001$) as well as moderate correlations between different nonverbal pain behaviors ($r=0.63$ to 0.65, $p < 0.001$) (Horgas et al., 2007). Construct validity was established by comparing expert responses to CNA responses, showing 18.14 ($p < 0.05$) using a goodness of fit model (Curyto, Van Haitsma, & Vriesman, 2008; Snow et al., 2004). Sheu et al. (2011) reported good distinction between moderate and severe states of pain, but some issues distinguishing between mild and moderate intensities. The NOPPAIN is also good for distinguishing pain during movement (Lints-Martindale, Hadjistavropoulos, Lix, & Thorpe, 2012). The tool is one of the few that was tested by ethnically diverse healthcare providers (Snow et al., 2004).

Unlike most tools that only rate the presence of nonverbal pain behaviors, the NOPPAIN also rates the intensity of pain behaviors (Horgas et al., 2007; Snow et al., 2004).

Results

The random sample of the 28 older adults in the subject videos used in this secondary analysis included 19(69%) Caucasians, 4(14%) African Americans, 2(7%) Hispanic, and 3(10%) other (where other includes those whose ethnic background was unknown or mixed). Five of the six CNAs in this secondary data analysis were women and all of the CNAs were African American with an average age of 37. Most of the six CNAs had received their high school diploma or GED (5 of the 6) (see Table 2).

For the 168 completed assessments (six CNAs rated 28 videos), across all residents, pain noises (29.8%), pain words (28%), and pain faces (28%) were identified most often by CNAs when screening for pain. Of the six behaviors listed on the NOPPAIN, restlessness (2.4%), bracing (0.6%), and rubbing (0%) were rarely observed as an indicator of pain. Examining the frequency of behaviors identified by ethnicity, pain noises and pain faces were frequently exhibited by all three ethnic groups to express pain with pain noises ranging from 29.8%-50% and pain faces from 28.9%-41.7% (see Table 3). However, differences were noted in the expression of pain words with 37.7% of Caucasians, 25% of Hispanics, and only 4.2% of African Americans exhibiting this pain behavior category. Of the six nonverbal behaviors, "pain words" is the only behavior that was dependent on the resident's ethnicity ($X^2 = 19.167$, $p < 0.001$). Rubbing, bracing, and restlessness were rarely observed in persons with dementia and were present only in assessments of Caucasian residents.

Data for the 62 (36.9%) completed assessments that were recognized by CNAs as being indicative of pain were also evaluated separately. Examining the six nonverbal pain behavior categories on the NOPPAIN, three behaviors were frequently identified by the CNAs: pain noises (67.7%), pain faces (66.1%), and pain words (64.5%). The display of nonverbal pain behaviors was independent of the resident's ethnic background.

In all ethnic groups, pain noises and pain faces were the most common nonverbal signs of pain. Interestingly, older adults whose ethnic background was “other” or unknown did not display pain words. Consistent with the entire sample, rubbing, bracing, and restlessness were rarely observed across ethnic groups to indicate pain and only identified in Caucasian residents (Table 3).

Despite painful diagnoses, CNAs rated only 36.9% (62 completed assessments) of the sample as being in pain when screened using a 0-10 numeric rating scale (NRS) and making a yes or no determination about whether the subject was in pain. Of the residents with pain present, only 2.4% of the sample had a CNA-identified pain NRS score of 3 or higher. The reported pain intensity by CNAs was low with the mean pain score of 0.68(0.91), as rated on a 0-10 scale. Mean pain reports by the CNA across ethnicities were also low with Hispanics mean pain rating of 0.83(0.94), Caucasians having a mean pain rating of 0.76(0.95), and African Americans mean pain rating of 0.58(0.83). Significant differences were not noted in the overall pain intensity ratings across ethnicities ($F=2.078$, $p=0.105$).

Discussion

Potential differences in pain behavior between ethnic groups in this study have been identified and provide impetus for further investigation. For the entire sample, three nonverbal pain behavior categories were more frequently identified by CNAs in residents with dementia: pain words, pain faces, and pain noises. Lints-Martindale et al. (2012) also found that pain faces and pain words/vocalizations were the most important pain behaviors when detecting pain and can be easier to decode than other nonverbal pain behaviors. Other research in cognitively intact older adults has found that facial expressions are often used to indicate pain (Closs et al., 2005; Mentes et al., 2004). While the parent study did not specifically explore the CNA’s perceptions of pain behaviors, findings in this secondary data analysis suggest that healthcare providers may believe that pain faces, pain noises, and pain words are indicative of pain, thus look for

these behaviors when inferring pain in others. Contrarily, Hill and Craig (2004) did not find a relationship between the accuracy of pain assessments and the number or type of facial expressions that were identified by observers in cognitively intact residents.

Rubbing, bracing, and restlessness were rarely noted in residents in this study. Shega et al. (2008) also found that persons with mild to moderate cognitive impairments presented low frequencies of bracing when compared to cognitively intact counterparts. Interestingly, all of the residents who displayed bracing or rubbing in this study were Caucasian and the majority of the residents presenting these behaviors were not identified as having pain by CNA raters (n = 98%). This may suggest that CNAs do not recognize rubbing, bracing, or restlessness as nonverbal pain behaviors that are indicative of pain. Contrary to the findings of this study, some research suggests that the most common nonverbal pain behaviors seen in residents experiencing pain are rubbing and bracing (Closs et al., 2005; Cohen-Mansfield & Creedon, 2002; Mentes et al., 2004; Shega et al., 2008), but are based primarily on providers' perceptions. Instead, Tsai et al. (2011) suggest that guarding, a nonverbal pain behavior that is not included on the NOPPAIN, may be a better indicator of pain than rubbing or bracing; as cognitively impaired elders may display more guarding than any other nonverbal behavior. Guarding results in stiff and rigid movements that often worsen as dementia progresses (Shega et al., 2008), which may account for the increased likelihood that this behavior will be present in older adults with cognitive impairment. Also, residents in this study experienced considerably low intensities of pain, which may limit the interpretation of these findings. In the end, the findings of this study suggest that rubbing, bracing, and restlessness may not be good indicators of pain in older adults with dementia who are unable to communicate their pain experiences. Future research is needed, in samples of persons with dementia experiencing greater levels of pain severity, to explore possible ethnic differences in the expression of the nonverbal pain behaviors rubbing and bracing, as well as other pain behaviors not included in the NOPPAIN, like guarding.

Residents overall pain intensity ratings were low as were the intensities of pain behaviors. In looking at the completed NOPPAIN assessments for African American residents experiencing pain, African Americans also frequently exhibited pain faces, and pain noises in the presence of pain. Thus, it is interesting that CNAs did not identify more African American residents as having pain. Wandner et al. (2011) found discrepancies in pain assessments based on the resident's ethnicity with raters assuming white residents were more sensitive to pain than their African American and Hispanic counterparts. Furthermore, raters have been found to unknowingly use the resident's ethnicity to make pain assessment decisions (Hirsch et al., 2010). Trawalter et al. (2012) support these findings, but suggest that ethnic differences in pain assessment tendencies may be more related to perceptions of status and perceived ability to cope with hardship resulting in lower pain scores for diverse residents. Contrarily, Peeters and Vlaeyen (2011) show that an increase in catastrophizing behaviors led to a decrease in the expression of nonverbal pain behaviors in cognitively intact residents.

African Americans were also significantly less likely to express pain words when compared to Caucasian counterparts. These finding are of particular interest in that cognitively intact African Americans were found to have higher catastrophizing behaviors (Fabian et al., 2011). The findings in the study are unexpected in supporting infrequent presentation of pain behaviors for African American residents. Little is known about the maintenance of ethnic norms for pain tendencies, especially in older adults with dementia who have impaired cognitive function, acknowledging a need for future research. However, the display of similar nonverbal pain behaviors as supported by this study contradict the work of Riley et al. (2002), which did show African Americans as presenting higher pain behaviors. These differences in findings may be due to the cognitive status of the residents in this study and/or the relatively large sample size used by Riley et al. (2002) (N=1557) may be a better indicator of ethnic differences in pain expression, compared to small sample of older adults included in this study (N=28).

Additionally, since all of the CNAs in the current study were African American, it would be understandable if African American residents would have exhibited more pain behaviors than their Caucasian and Hispanic counterparts, as there can be an increase in the display of pain behaviors when in the presence of people from similar ethnic backgrounds (Hsieh, Tripp, & Ji, 2011). This discrepancy in findings may be due to the cognitive status of the residents, as all of the previously stated work explored the expression of nonverbal pain behaviors in cognitively intact residents and this study focuses on observing nonverbal pain behaviors in older adults with dementia, who may not have cognitive control over pain expression. It is also interesting that higher pain intensity ratings were not noted in this sample since the majority of CNAs (83%) in this study were women and women are typically more sensitive to the pain experiences of others and more likely to infer higher pain intensities (Davoudi et al., 2008).

However, it is possible that the CNAs underestimated the pain experiences, as commonly cited in the literature (Prkachin et al., 2007). Prkachin et al. (2007) explored the inferences of pain in others by observing for nonverbal pain behaviors, recognizing that healthcare providers have a tendency to underestimate pain when inferring pain in others using nonverbal pain behaviors. The lower pain rating may also be dependent upon the rater's personal biases of what behaviors are indicative of pain and/or lack of knowledge on current recommendations regarding pain behaviors identified in persons with dementia. In the end, had the ratings of pain been higher, it is possible that more nonverbal pain behaviors would have been noted during the screenings for pain, resulting in a better understanding of the role of ethnicity in the outward expression of nonverbal pain behaviors.

Finally, other studies also support the importance of pain words/vocalizations as a nonverbal indicator of pain (Decker, 2009), although not examined by ethnicity. It is interesting that Hispanic residents identified as experiencing pain, were less likely to express pain words during painful experiences. Research supports the somewhat stoic

tendencies of cognitively intact Hispanic persons, and their tendency to avoid the outward expression of pain (Duggleby, 2003; Juarez et al, 1998). Significant relationships that were noted between ethnicity and the expression of pain words may suggest that ethnic differences regarding the outward expression of pain supported in literature for cognitively intact Hispanic older adults may also be present in cognitively impaired populations, although additional research is warranted.

The presence of healthcare disparities for minority residents emphasizes the importance of research in this area (Campbell & Edwards, 2012). Minorities are less likely to receive adequate pain assessment and management, partially due to provider cultural incompetency, but also as the result of possible unknown differences in pain needs (Trawalter et al., 2012). Weech-Maldonado et al. (2012) found that greater cultural competency and awareness resulted in improved pain control for minority persons and examining this relationship in persons with dementia is a necessary step in improving pain identification in this vulnerable population.

This study is the first to identify a potential difference in the use of nonverbal pain behaviors across ethnicities in persons with dementia, suggesting a need for more research to guide staff education and development of different approaches to tailor care to ethnically diverse older persons. This study also identified difference in the display of nonverbal behaviors across ethnicities with pain words, pain faces, and pain noises being expressed more often than rubbing bracing and restlessness.

Limitations

Secondary analysis of an existing data set designed to establish psychometrics of a new pain behavior assessment tool limits the design and methods to answer the research questions proposed for this study. However, the preliminary findings noted in this paper, show a need for a prospective study that explores this area of research further. Being a secondary analysis, the findings are also limited to the existing sample and representation of ethnic diversity available. Since the same 28 residents were assessed by 6 CNAs and

their assessments were analyzed collectively, the sample size is an additional limitation of this study. Although, the small sample size leads to several limitations in interpreting findings, it does provide impetus for future research including use of larger samples of ethnically diverse persons with dementia. Lastly, the low pain intensities that were identified by CNAs suggest the sample is limited in representation of different levels of pain severity. Consequently, judgments of behavior prevalence and intensity need to be evaluated in larger studies with broader pain ranges.

A benefit to the use of this secondary data set is that all of the CNAs in this study were African American, which serves as a control for the extraneous variable of provider's ethnicity. At the same time there are benefits to the data collection method including the use of video analysis, which allows for collective decision-making by increasing the number of raters that can rate the same video and also allows for some control over rater fatigue (Caldwell & Atwal, 2005; Haidet et al., 2009). Although the secondary analysis methodology had limitations, this was the first study to examine relationships between ethnicity and the presence of observed nonverbal pain behaviors in older adults with dementia.

Future Research

In considering that approximately 5.1 million people suffer from Alzheimer's disease in the United States and the U.S Census Bureau projects an increase in African American and Hispanic populations (U.S Census Bureau, 2012; Wallace, 2008), it is imperative to have a better understanding of differences in the presentation of pain across cultures, inferences of those rating for pain, and the impact of pain recognition in ethnically diverse older adults with dementia. While a considerable amount of research has explored the relationship between pain perception and pain expression for cognitively intact older adults, future work is needed to explore the relationships between ethnicity and the use of nonverbal pain behaviors, to improve recognition of pain in this vulnerable

population, as well as to examine the influence of rater's ethnicity in recognition of pain in persons with dementia.

Table 2: Resident and CNA Demographics

Demographics	**All Residents (N=28) N(%)**	**CNAs (N=6) N(%)**
Age	N/A	36. 5
Sex N(%)		
Male	N/A	1(17%)
Female		5(83%)
Race N(%)		
Caucasian	19(67.9%)	0(0%)
African American	4(14.3%)	6(100%)
Hispanic	2(7.1%)	0(0%)
Other	3(10.7%)	0(0%)
Education N(%)		
No High School Diploma	N/A	1(16.7%)
High School Diploma	N/A	5(83.3%)

Table 3: Display of Nonverbal Pain Behaviors

	Completed Assessments		Caucasian Assessments		African American Assessments		Hispanic Assessments		Other Assessments	
	All N(%)	In Pain N(%)	All N(%)	In Pain N(%)	All N(%)	In Pain N(%)	All N(%)	In Pain N(%)	All N(%)	In Pain N(%)
	N = 168 (100%)	**n = 62 (36.9%)**	**n = 114 (67.9%)**	**n = 51 (82.3%)**	**n = 24 (14.3%)**	**n = 4 (6.5%)**	**n = 12 (7.1%)**	**n = 5 (8.1%)**	**n = 18 (10.7%)**	**n = 2 (3.2%)**
***Pain Words**	47(28%)	40(64.5%)	43(37.7%)	37(72.5%)	1(4.2%)	1(25%)	3(25%)	2(40%)	0(0%)	0(0%)
Pain Noises	50(29.8%)	42(67.7%)	34(29.8%)	32(62.7%)	7(29.2%)	4(100%)	6(50%)	5(100%)	3(16.7%)	1(50%)
Pain Faces	47(28%)	41(66.1%)	33(28.9%)	32(62.7%)	7(29.2%)	4(100%)	5(41.7%)	4(80%)	2 (11.1%)	1(50%)
Rubbing	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)
Bracing	1(0.6%)	1(1.6%)	1(0.9%)	1(2%)	0(0%)	0 (0%)	0(0%)	0(0%)	0(0%)	0(0%)
Restlessness	4(2.4%)	1(1.6%)	4(3.5%)	1(2%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)

*****Significant difference noted between ethnicities , $p<0.05$

Table 4: Mean Intensities of Pain Behaviors as Rated by the CNA

	Overall Pain Intensity		Pain Words Intensity		Pain Noises Intensity		Pain Faces Intensity		Rubbing Intensity		Bracing Intensity		Restlessness Intensity	
	All	In Pain	All	In Pain	All	In Pain	All	In Pain	All	In Pain	All	In Pain	All	In Pain
	N= 168 (100%)	n = 62 (36.9%)	N = 168 (100%)	n = 62 (36.9%)	N = 168 (100%)	n = 62 (36.9%)	N = 168 (100%)	n = 62 (36.9%)	N = 168 (100%)	n = 62 (36.9%)	N = 168 (100%)	n = 62 (36.9%)	N = 168 (100%)	n = 62 (36.9%)
	X (SD)	X (SD)	X (SD)	X (SD)	X (SD)	X (SD)	X (SD)	X (SD)	X (SD)	X (SD)	X (SD)	X (SD)	X (SD)	X (SD)
Caucasian	0.76 (0.95)	1.65 (0.74)	0.67 (1.11)	1.41 (1.30)	0.56 (1.03)	1.20 (1.25)	0.55 (1.09)	1.22 (1.36)	0.00 (0.00)	0.00 (0.00)	0.02 (0.19)	0.04 (0.28)	0.02 (0.19)	0.04 (0.28)
African American	0.58 (0.83)	1.75 (0.50)	0.08 (0.41)	0.50 (1.00)	0.67 (1.13)	2.25 (0.50)	0.67 (1.09)	2.25 (0.50)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Hispanic	0.83 (0.94)	1.60 (0.55)	0.50 (1.00)	0.60 (0.89)	1.25 (1.42)	2.40 (0.89)	0.92 (1.24)	1.80 (1.30)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Others	0.22 (0.55)	1.50 (0.71)	0.00 (0.00)	0.00 (0.00)	0.22 (0.65	1.00 (1.41)	0.22 (0.65)	1.00 (1.41)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Total	0.68 (0.91)	1.65 (0.70)	0.50 (1.00)	1.24 (1.28)	0.59 (1.06)	1.35 (1.33)	0.56 (1.06)	1.32 (1.33)	0.00 (0.00)	0.00 (0.00)	0.01 (0.15)	0.00 (0.25)	0.01 (0.15)	0.00 (0.25)

*Significant difference noted between ethnicities , $p<0.05$

CHAPTER 4

DIFFERENCES IN THE OBSERVATION OF NONVERBAL PAIN BEHAVIORS IN OLDER ADULTS WITH DEMENTIA: A COMPARISON OF TRAINED AND UNTRAINED CNA RATERS

Background and Significance

Pain is prevalent in older adults living in the nursing home and is under-recognized in persons with dementia because of challenges in communicating (Ersek et al., 2011). Best practice recommendations highlight the importance of regular observation and screening for pain behaviors that signify the presence of pain, as part of a comprehensive assessment process (Herr et al., 2011). However, identifying pain in persons with dementia in the nursing home is a challenge complicated by the limited time available to nurses due to high resident to nurse ratios, with nurses only spending approximately 37% of their time providing direct patient care (Westbrook et al., 2011).

The CNA is one member of the health care team that can assist the nurse in pain assessment by conducting the initial screenings for pain, which is particularly useful in nonverbal older adults with dementia who are unable to self-report their painful experiences. For these residents, the CNA can provide proxy-reports of pain since they typically spend high volumes of time providing direct patient care and may be more aware of behavioral patterns (Snow et al., 2004). Eritz and Hadjistavropoulos, (2011) show that providers who spend an average of 10 hours or more with the resident (like the CNA) are more likely to identify nonverbal pain behaviors in older adults than those with less regular contact. CNAs are able to screen residents for pain using nonverbal pain assessment tools, but these initial screenings should be followed-up by a licensed nurse's complete assessment of pain (Cervo et al., 2007; Snow et al., 2004), thus the health care team must work together to ensure that pain is being properly managed on a daily basis.

Other possible barriers to pain assessment in nonverbal older adults include the provider's poor identification of pain behaviors, missed opportunities for pain assessment by healthcare providers due to oversight, and inadequate staff education (Clark, Jones, & Pennington, 2004; Keeney et al., 2008; McAuliffe et al., 2009). In a conceptual model for inferring pain in nonverbal persons with dementia, Snow et al. (2004) highlighted problematic data collection methods that can also serve as barriers to identifying pain in nonverbal older adults, including: rater types, construct characteristics, and assessment instruments.

Rater Type: Trained vs. Untrained Raters

When inferring pain in others, providers should be trained to execute the pain assessment or screening by the preferred method of using a pain assessment tool as a guide. Adequate training on pain assessment improves the provider's accuracy and familiarity with the tool during assessments (Alcott et al., 1999; Cusick et al., 2005; Roch et al., 2012). Additionally, trained providers will typically have more familiarity with an assessment tool, as training provides more opportunities for practice, feedback, and role modeling (Cusick et al., 2005). Training has also been shown to improve the provider's overall performance and increase inter-rater reliability scores, particularly when being trained by an experienced trainer (Alcott et al., 1999; Mist et al., 2009). Alcott et al. (1999) explored the benefits of training on word recognition, finding that training improved the rater's accuracy and pronunciation of low reliability words. Similarly, Mist et al. (2009) also identified an enhanced ability to accurately diagnose patients using Traditional Chinese Medicine following staff training.

The type and amount of training that a provider receives can also impact their ability to provide accurate information during pain assessment. Castorr et al. (1990) support three phases of training with an observational tool 1) train the provider to use the instrument; 2) evaluate the provider's performance following the training; and 3) examine the sustainability of the behavior following the training. Frame-of-reference

training is a complementary method of training that encourages and trains providers to use common conceptualizations of performance during evaluations and has also been supported in the literature as an effective way to increase the accuracy of rater responses (Roch et al., 2012). Roch et al. (2012) conducted a meta-analysis of studies exploring frame-of-reference training methods, finding that most training sessions lasted an average of 100 minutes, included instruction on the dimensions that were evaluated, and incorporated practice vignettes for the trainees to rate. However, few studies have explored the benefits of training when using pain assessment tools in older adults with dementia, highlighting a need for future research.

Construct Characteristics

Psychometric evaluation of an observational pain assessment tool has included construct validity, the accuracy of the instrument in measuring the theoretical construct it purports to measure (Burns and Grove, 2009). However, challenges exist when considering pain-related constructs, as there are several constructs that can be easily mistaken as signs of pain, such as fear, sadness, anger, and discomfort (Marsh et al., 2003; Mesquita & Walker, 2003; Stepanikova et al., 2012). These constructs are often expressed using the same nonverbal behaviors as the presentation of pain, including grimacing, frowning, and furrowing of the brow (Marsh et al., 2003; Mesquita & Walker, 2003; Stepanikova et al., 2012). Physiological changes associated with aging may also be confused for nonverbal signs of pain (Prkachin, 2007; Prkachin & Solomon, 2008). For example, wrinkles in the forehead due to a change in the integumentary system may be mistaken for furrowing of the brow, a behavior often used to infer pain in others (Prkachin & Solomon, 2008). Changes in visual acuity may cause the older adult to squint when viewing objects and may also be mistakenly interpreted as facial grimacing or furrowing of the brow (Haidet et al., 2009). Familiarity with the resident and knowledge of normal behavior helps the healthcare provider distinguish between different presentations of behaviors. The rater's inability to distinguish these behaviors

from other constructs or physical changes that occur naturally with aging adds to the discrepancies between raters when inferring pain in others. Familiarity with the resident and knowledge of normal behaviors helps the health care provider distinguish between different presentations of behaviors, and is a factor for consideration in training and evaluation of judgments about pain severity in persons with dementia.

Assessment Instruments

The type of assessment tool and its psychometric properties can also affect the inference of pain in others. First, the number of dimensions included on the pain assessment tool can lead to discrepancies between raters; with more dimensions resulting in greater discrepancies (Roch et al., 2012). Differences in pain assessment decisions can also be based on the subjectivity and objectivity of the data, with more subjective phenomena also resulting in greater discrepancies between the ratings. Several studies have examined the psychometric properties of nonverbal pain assessment tools (Ersek, Herr, Neradilek, Buck, & Black, 2010; Fuchs-Lacelle & Hadjistavropoulos, 2004; Hadjistavropoulos et al., 2007; Nygaard & Jarland, 2006; Warden, Hurley, & Volicer, 2003; Zwakhalen, van't Hof, & Hamers, 2012), but few studies have examined the impact of training when using these tools.

Current recommendations (Herr et al., 2011) identify the following pain assessment tools as having the strongest conceptual and psychometric support: The Checklist of Non-Communicative Pain Indicators (CNPI), Certified Nurse Assistant Pain Assessment Tool (CPAT), Non-Communicative Patient's Pain Assessment Instrument (NOPPAIN), Mahoney Pain Scale, Pain Assessment Scale for Seniors with Severe Dementia (PACSLAC), Pain Assessment in Advanced Dementia Scale (PAINAD), and Pain Assessment in Non-Communicative Elderly Persons (PAINE) (Cervo et al., 2007; Cohen-Mansfield, 2006; Feldt, Ryden, & Miles, 1998; Fuchs-Lacelle & Hadjistavropoulos, 2004; Mahoney & Peters, 2008; Snow et al., 2004; Warden et al., 2003). However, it is important to note that a nonverbal pain behavior tool has yet to be

recognized as the gold standard for behavioral assessment in older adults with dementia (Thuathail & Welford, 2011).

Because the use of nonverbal pain assessment tools are prominent in recommendations for assessing pain in persons with dementia, strategies to ensure reliable tool use is essential as noted in the prior discussion. Although the importance of training providers is documented in the literature, there is little evidence of the impact of training on outcomes and reliability of reported observations on nonverbal pain behavior tools in persons with dementia. The purpose of this study is to examine differences in the inference tendencies of trained and untrained CNA raters when compared to physician ratings when assessing pain in nonverbal older adults with dementia.

Methodology

This study is a secondary analysis of data originally collected by Snow et al. (in review) to assess the psychometric properties of the NOPPAIN. Older adults were recruited from four nursing homes in Tuscaloosa, Alabama from the same for-profit chain. Older adults with moderate to severe dementia (3 or greater on MDS-COGS) and related diagnoses that could potentially cause dementia were included in the study (Snow et al., in review). Informed consent was obtained from the family member or power of attorney and resident assent was obtained. A total of 83 older adults with dementia participated in the primary study. Residents were assessed in real-time by an untrained CNA for pain while completing or simulating morning activities of daily living. While completing the activities, residents were videotaped using a hand-held recorder for 5 to 15 minutes (Snow et al., in review). While all 83 residents were assessed for pain using the NOPPAIN by a CNA in real-time, only 78 videos of the older adults were created, as 5 of the older adults did not agree to videotaping. Assessments completed in real-time were not used due to missing data and uncontrollable differences in data collection methods.

Of the available 78 video recordings, 18 videos were randomly selected to be assessed by two additional groups of CNAs also hired from the temporary agency. The first group of six CNAs were trained to use the NOPPAIN in an one-hour training session that consisted of an introduction to standardized assessments, orientation to the NOPPAIN assessment tool, practice using the assessment tool on six training videos, and developer feedback. The second group consisted of 5 CNAs who did not receive formal training on how to use the NOPPAIN pain assessment tool or how to identify nonverbal pain behaviors, but did receive a basic introduction to the tool. Each group of CNAs (trained and untrained) reviewed the 18 video recordings and scored the residents for pain using the NOPPAIN, resulting in 108 completed assessments for trained raters and 90 completed assessments by untrained raters. Lastly, three physicians, who were completing a fellowship in pain assessment and management, evaluated the same 18 videos of residents and scored them using the NOPPAIN. Prior to completing the assessments the physicians reviewed the resident's chart, which included the resident's medical diagnoses, analgesic use, pain assessment and management details, progress notes, current list of medications, and medication administration records.

Quantitative analysis was completed using SPSS version 21.0. Frequencies for the identification of six nonverbal pain behavior categories (pain noises, pain faces, pain words, bracing, rubbing, and restlessness) were calculated for trained CNAs, untrained CNAs, and physicians. Chi-Square was used to assess for differences in the observation of nonverbal pain behaviors between the trained and untrained groups of CNAs. Differences in the mean overall pain intensity ratings between trained, untrained, and physician raters was evaluated using ANOVA. Lastly, due to the nature of the data, it was not possible to examine inter-rater reliability using Kappa. Instead, Pearson's Correlations was used to examine the relationships between trained, untrained, and physician average ratings of the intensity of each individual pain behavior.

Measures

Ideally, nonverbal pain assessment tools should be completed twice, once while the resident is in a resting state and a second time while the resident is in motion (Herr et al., 2011). The assessment tool should also encompass several categories of nonverbal pain behaviors (facial expressions, vocalizations, body movements, changes in interpersonal interactions, changes in activity, and mental status changes) (Hadjistavropoulos et al., 2007) and the older adult should be able to physically respond to all of the behaviors listed on the tool (Herr et al., 2011). Psychometric properties, clinical feasibility, and usefulness in the target population should be considered during the selection of an appropriate tool (Herr et al., 2011) . Lastly, the nonverbal pain assessment tool should be tested in ethnically diverse samples of both residents and observers.

The NOPPAIN instrument encompasses three of the six categories of nonverbal pain behaviors (facial expressions, vocalizations, and body movements) and has reasonable reliability and validity measures (Horgas et al., 2007; Snow et al., 2004; Zwakhalen, Hamers, Peijnenburg, & Berger, 2007). In total, there are six behaviors listed on the NOPPAIN and each behavior includes examples of actual nonverbal signs of pain that may be observed by the rater. The intensity of each observed nonverbal pain behavior is then assessed using a 0-5 likert scale. Descriptions of the nonverbal behaviors are listed below:

1. Pain Words: “that hurts, ouch, stop that” or cursing
2. Pain Faces: grimacing, furrowed brow, or wincing
3. Bracing: rigidity, holding, or guarding
4. Pain Noises: moans, groans, grunts, cries, gasps, or sighs
5. Rubbing: massages the affected area
6. Restlessness: frequently shifting weight, rocking, or inability to stay still

The NOPPAIN was identified as an appropriate nonverbal pain behavior assessment tool to evaluate the effects of training and data collection methods (Snow et al, 2004).

Results

The five untrained CNAs were primarily African American (80%) with an average age of 34 years with a standard deviation (SD) of 13.39. All of the untrained CNAs had received their high school diploma or GED and worked in health care an average of 72 (SD=45.94) months, or approximately 6 years. Lastly, three of the untrained CNAs were women and two were men. Similarly, all of the trained CNAs were African American with a mean age of 37(SD=6.41) and five of the six trained CNAs were women. However, the trained CNAs had less work experience in the nursing profession with an average of 9 months (SD=4.08) compared to the 6 years of work experience that the untrained CNAs had gained (see Table 5). Tests for significant differences between the trained and untrained CNAs were not possible due to the sample size, but trends suggest that the groups were different with regards to work experience. The secondary use of this data set limited the availability of data describing the physician sample. Details regarding the physician's demographic characteristics and work experiences were not available.

Comparing trained versus untrained raters, significant differences were noted between groups in the observation of pain noises, pain faces, and pain words. Pain noises were identified in 45(50.0%) completed assessments by untrained CNAs and 28(25.9%) residents by trained raters. Significant differences were noted with trained raters having a lower tendency of identifying pain noises in residents with pain (X^2=13.98; p<0.001). Overall, pain noises was the most common pain behavior noted in the video analysis completed by both trained and untrained CNAs (see Table 6). Untrained CNAs also identified pain faces in 44(48.9%) completed assessments compared to 22(20.4%) observed by trained CNAs. Again, trained raters were significantly less likely to identify pain faces in persons with dementia (X^2=18.75; p<0.001). Additionally, untrained CNAs

identified pain words in 34(37.8%) completed assessments, with trained raters only identifying pain words in 17(15.7%) of the completed assessments. Differences in inference tendencies were also significant for pain words, with trained CNAs identifying significantly fewer expressions of pain words in residents experiencing pain (X^2=14.46; p <0.001).

Restlessness, bracing, and rubbing were rarely identified in residents; but, interestingly, when they were identified they were significantly more likely to be observed by the untrained CNAs. Restlessness was observed in 22(24.4%) of the completed assessments by untrained CNAs, but only 1(0.9%) assessment completed by trained CNAs noted restlessness during the pain screening (X^2=26.266; p< 0.001) (see Table 6). Bracing was also identified in 13 (14.4%) completed assessments by the untrained raters and trained CNAs noted bracing in only 1(0.9%) completed assessment when reviewing the videos (X^2=13.60; p< 0.001). Lastly, rubbing was observed in 6 (6.7%) of the completed assessments by untrained CNAs, but none of the trained raters noted rubbing (X^2=7.41; p=0.006). Review of trends did not show obvious differences in the observation of nonverbal pain behavior categories between genders (see Table 7).

Physicians and trained raters had similar frequencies of observations of pain noises 13(24.1%), pain faces 12(22.2%), pain words 4(7.4%), and rubbing 0(0%). However, physicians' observations of bracing 14(25.9%) and restlessness 6(11.1%) were more similar to untrained CNA ratings. A comparison of mean pain intensity ratings of the trained and untrained CNAs to physician ratings revealed that trained CNAs were more accurate in their overall assessment of pain intensity. Physicians rated residents overall pain intensity as an average of 0.54(0.87). Trained raters were accurate in their assessment, rating residents mean pain intensity as 0.55(0.92). However, untrained raters found a mean pain intensity rating that was significantly higher than physician ratings, 2.26(2.75). In the end, ANOVA (F=25.97, p<0.001) and LSD post-hoc testing showed significant differences were between physician's and untrained CNA's overall pain

intensity ratings ($p<0.001$), but no significant differences were noted between physician's and trained CNA's ratings of overall pain intensity ($p=0.98$).

Examining the intensity ratings of each nonverbal behavior for each patient, positive relationships of strong intensity were noted between untrained CNAs and physician ratings of pain faces ($r=0.90$, $p<0.001$). Trained CNAs ratings of pain faces were also strongly and positively correlated to physician ratings ($r=0.80$, $p<0.001$), as were ratings of restlessness for trained raters were strongly correlated to physicians ratings ($r=0.87$, $p<0.001$). However, moderate intensities were found between untrained CNAs and physician ratings with regard to pain noises ($r=0.76$, $p<0.001$) and restlessness ($r=0.69$, $p=0.002$). Correlation for rubbing could not be computed because the mean physician ratings on this nonverbal pain behavior were zero (see Table 8).

Discussion

Overall, untrained CNAs identified more nonverbal pain behaviors than trained CNAs and physician raters, suggesting that they may have misinterpreted some of the behaviors they observed as signs of pain. For three of the nonverbal pain behaviors (pain noises, pain faces, and pain words), untrained raters overestimated the occurrence of these behaviors. The remaining three behaviors were rarely noted by raters, and when they were identified, it was primarily noted by untrained raters. The preceding dissertation chapter included the same sample and suggests that rubbing, bracing, and restlessness were rarely used by residents who were experiencing pain. It is interesting that untrained raters identified these behaviors more readily than trained raters, yet the majority of the residents presenting these three pain behaviors were not recognized as having pain in preceding work. For all raters, pain noises were the most commonly recognized behavior, possibly suggesting that pain noises is an easier behavior to identify in older adults with dementia when observing for nonverbal pain behaviors.

In support of our study findings, others have also shown that rubbing, bracing, and restlessness are rarely observed in pain assessments in persons with dementia (Ersek

et al., 2010). Shega et al. (2008) also used video analysis to assess pain in cognitively intact and cognitively impaired residents with low back pain. Their findings suggest a difference in the observation of rubbing, guarding, and bracing based on cognitive status, with cognitively impaired persons presenting a higher frequency of rubbing and guarding and a lower frequency of bracing than cognitively intact counterparts (Shega et al., 2008). In the end, nonverbal pain assessment tools were shown to provide reliable measures of pain even in residents with moderate to severe dementia (Mosele et al., 2012). In considering the above findings from similar studies, training may have given raters a better understanding of the nonverbal pain behaviors, resulting in an increased ability to determine actual pain behaviors.

Trained raters were less likely to identify pain behaviors than untrained raters, but their overall decisions about pain intensity were not significantly different from physician raters. This suggests that when using behaviors to make a determination about the overall intensity of pain, trained raters may be more accurate in their assessment decisions. The effect of training was explored in other areas of research aside from pain. In an effort to improve diagnostic practices in Traditional Chinese Medicine, inter-rater reliability was examined before and after a training session (Mist et al., 2009). Training resulted in increased inter-rater reliability (increasing from $r = 0.11$ to $r = 0.62$) and improved accuracy in diagnosing residents (Mist et al., 2009). Another study comparing trained versus untrained raters, evaluated the inter-rater reliability of a national reading test where trained and untrained raters were compared on their pronunciation and recognition of words (Alcott et al., 1999). Training in this study was found to improve the rater's accuracy in word recognition, showing higher scores than their individual pre-training ratings and untrained raters. Subsequent studies also assessed video recording of residents to identify unilateral upper limb function and revealed that training improved the accuracy for novice raters (Cusick et al., 2005). Cusick et al. (2005) suggest that training increases the rater's familiarity with the

assessment tool, giving the raters more information, practice and opportunities for feedback before using the tools to complete video analysis. Similarly, findings in this study showed that trained raters were more accurate in their observation of nonverbal pain behaviors when compared to physician raters. Additional work is needed to assess differences in the types of training as some research suggests that face-to-face training is not essential for accurate scoring (Cusick et al., 2005) and may support more feasible online training approaches.

Contrarily, Vendrely & Carter (2002) did not find that familiarity with a clinical performance scoring tool had a clear effect on overall rating, highlighting the possibility of alternative conclusions for the finding of this study. It is possible that physician raters underestimated resident pain experiences as cited in the literature (Kappesser, Williams, & Prkachin, 2006), or establishing the physician as the gold standard may be an erroneous assumption. Work in cognitively intact subjects have found incongruencies between physician and patients ratings of pain (Mantyselka, Kumpusalo, Ahonen, & Takala, 2001; Marquie et al., 2003; Klopfenstein, Herrmann, Mamie, Gessel, & Forester, 2000). Mantyselka et al. (2001) identified discrepancies between patient and provider ratings. Klopfenstein et al. (2000) compared physician and nurse ratings of pain to patient pain intensity ratings, finding that both nurses and physicians underestimated the patient's pain intensity. If the physician raters in this study underestimated the pain experiences of the residents in this study as is often cited in the literature, then untrained raters were possibly more accurate in their assessments.

Also, when considering the noted differences in work experience, it could be that the novice CNAs (trained CNAs with only 9 months of work experience) were more naïve in their screenings for pain, while the experienced untrained CNAs (an average of 6 years of work experience) were more skilled in identifying typical pain behaviors and thus more accurate in their assessments. Differences in pain assessment decisions based on work experience have been noted in previous studies. Davoudi et al. (2008) suggests

that the nurse's work experience affects their inference of pain in others, with nurses with 2-5 years of nursing experience tending to overestimate pain experiences, while nurses with less than two or greater than five years of experiences underestimated pain experiences. Other works have found similar findings showing changes in pain assessment decisions with more nursing experience (Halfens et al., 1990; Lenburg et al., 1970a; Lenburg et al., 1970b; Loveman & Gale, 2000). Consequently, the untrained raters, with more practice experience, may be better at distinguishing between normal and pain-related behaviors. The untrained, but more experienced CNAs, may also have more experience in recognizing signs of discomfort and empathizing with residents (Wilson & McSherry, 2006). For example, bracing was the only behavior in this study where untrained raters assessment were similar to physician ratings, suggesting that this pain behavior may be more difficult to recognize and may require more work experience and patient exposure to accurately identify. Both interpretations of the findings would be appropriate when considering trends within the literature related to the tendency of the physicians to underestimate pain experiences in persons with dementia and the added benefits of having work experience or familiarity with residents.

Interestingly, untrained CNAs were accurate in their decisions regarding the intensity of each behavior adequate correlations to physicians' ratings of pain noises, pain faces, restlessness and bracing. Perhaps their work experience enhanced their ability to accurately rate the intensity of pain behaviors. Similar work has found that nurses with more work experience are more accurate in their assessments of pain (Halfens et al., 1990). Overall, it appears that training improves the identification of pain behaviors, but work experience may increase the ability to assess adequately assess the intensity of pain behaviors. Differences noted between trained and untrained raters signify a need for additional research to identify the most reliable and cost-effective ways to prepare staff members to use nonverbal pain assessment tools.

Limitations

Secondary use of an existing data set limits the control over the data collection methods and resulted in a smaller sample size than the parent study. Originally, the goal of this dissertation was to examine the impact of the provider's ethnicity on pain assessment decisions, but the small sample size and lack of diversity within the sample did not allow for ethnic comparisons between raters. The sample size also limited the ability to test and control for differences between the trained and untrained groups. Data collection methods used in the parent study, limited the ability to make comparison between real-time and video analysis methods. Lastly, the relatively low pain intensities is an additional limitation that could impact the frequency of observed pain behaviors, thus similar work should be conducted in patient samples with better spread of scores on the rating scales for intensity of pain.

Future Research

As we continue to invest in staff education, training approaches need to be examined further to ensure that the methods being used are reliable and produce desired results. This study provides additional support for training staff members to use nonverbal pain assessment tools. Previous work has suggested that opportunities for feedback, practice models, and the length of the training session all impact the outcomes of training. As more educational programs and research teams incorporate pain assessment tools into their training or scoring methods, it is important to continue to explore the benefits and limitations of training.

Furthermore, if the sample in this study were larger and more diverse additional research questions could have been explored. First, some literature suggests providers are more likely to identify pain experiences in persons from the same ethnic background (Hirsh et al., 2010; Hirsh et al., 2011; Wandner et al., 2012). The CNA sample in this study lacked diversity as the majority of the CNAs were African American. Consequently, the ethnic differences between the residents and the providers in this study

may have affected the CNAs inference tendencies (Hirsh et al., 2010; Hirsh et al., 2011; Wandner et al., 2012). Little is known about the impact of culturally-constructed pain assessment decisions when inferring pain in others, an intriguing research question that would have been explored here if a more diverse provider and resident sample were available.

Additionally, the secondary use of the data set limited the ability to compare video analysis to real-time assessments, another research question of interest. In real-time the residents in this study were often assessed multiple times by the same rater and not assessed by each rater consistently. Consequently, the real-time assessments were excluded from this study. The original proposal was to compare real-time ratings to untrained raters who received a similar amount of instruction on the use of the NOPPAIN, which could allow for an enhanced understanding of the differences between real-time assessment and video analysis. Future research with the ability to control data collection methods should explore the benefits of using video analysis in pain assessment for persons with dementia.

Lastly, as we continue to test, adapt and develop nonverbal pain assessment tools, consideration needs to be given to the behaviors that are most often recognized by raters as indicators of pain. The findings of this study and others suggest that pain faces, pain noises, and pain words are most commonly used when inferring pain in others (Herr et al., 2011). While other behaviors may be exhibited by nonverbal persons with dementia, it is important that assessment tools include indicators that prompt the rater to observe for the behaviors that are frequently noted (pain faces, pain noises, and pain words). As the body of literature focused on improving pain recognition and assessment in persons with dementia continues to expand, refinement of current assessment tools and approaches for observing behaviors in clinical and research settings is a priority.

Table 5: CNA Demographic Characteristics

	Trained CNAs	Untrained CNAs
Gender N(%)	Male 2(40%) Female 3(60%)	Male 1(16.7%) Female 5(83.3%)
Race N(%)	African American 4 (80%) Other 1(20%)	African American 6 (100%)
Age X(SD)	33.60(13.39)	36.50(6.41)
Months in the Profession X(SD)	72.40(45.94)	8.67(4.08)

Table 6: Observation of Nonverbal Pain Behaviors Scored on the NOPPAIN

	Pain Words N(%)	Pain Noises N(%)	Pain Faces N(%)	Rubbing N(%)	Bracing N(%)	Restlessness N(%)
Untrained CNAs	*34(37.8%)	*45(50.0%)	*44(48.9%)	*6(6.7%)	*13(14.4%)	*22(24.4%)
Trained CNAs	17(15.7%)	28(25.9%)	22(20.4%)	0(0.0%)	1(0.9%)	1(0.9%)
Physician	4(7.4%)	13(24.1%)	12(22.2%)	0(0.0%)	14(25.9%)	6(11.1%)
Test of Significance	(X^2=14.46; p <0.001)	(X^2=13.98; p<0.001)	(X^2=18.75; p<0.001)	(X^2=7.41; p=0.006)	(X^2=13.60; p.< 0.001)	(X^2=26.27; p< 0.001)

*Significant differences noted between evaluators, $p < 0.05$

Table 7: Trained and Untrained Rater's Individual Observation of Nonverbal Pain Behavior Categories

Rater ID and Gender	Pain Words n(%)	Pain Noises n(%)	Pain Faces n(%)	Rubbing n(%)	Bracing n(%)	Restlessness n(%)	Pain Intensity X(SD)
Trained Raters							
1 Female	4(22.2%)	4(22.2%)	5(27.8%)	0(0%)	1(5.6%)	1(5.6%)	0.50(0.79)
2 Male	4(22.2%)	6(33.3%)	2(11.1%)	0(0%)	0(0%)	0(0%)	0.39(0.61)
3 Female	1(5.6%)	5(27.8%)	7(38.9%)	0(0%)	0(0%)	0(0%)	0.94(1.30)
4 Female	4(22.2%)	4(22.2%)	3(16.7%)	0(0%)	0(0%)	0(0%)	0.33(0.69)
5 Female	1(5.6%)	4(22.2%)	3(16.7%)	0(0%)	0(0%)	0(0%)	0.33(0.69)
6 Female	3(16.7%)	5(27.8%)	2(11.1%)	0(0%)	0(0%)	0(0%)	0.78(1.17)
Untrained Raters							
1 Male	8(44.4%)	12(66.7%)	12(66.7%)	2(11.1%)	3(16.7%)	8(44.4%)	3.22(2.34)
2 Female	5(27.8%)	7(38.9%)	3(16.7%)	0(0%)	3(16.7%)	4(22.2%)	1.17(2.23)
3 Female	8(44.4%)	10(55.6%)	12(16.7%)	3(16.7%)	1(5.6%)	4(22.2%)	2.22(2.51)
4 Female	4(22.2%)	5(27.8%)	5(27.8%)	0(0%)	1(5.6%)	2(11.1%)	2.67(3.76)
5 Female	9(50.0%)	11(61.1%)	12(66.7%)	1(5.6%)	5(27.8%)	4(22.2%)	2.00(2.50)

Table 8: Correlation with Physician Intensity Ratings

	Overall Pain Intensity	Pain Words Intensity	Pain Noises Intensity	Pain Faces Intensity	Rubbing Intensity	Bracing Intensity	Restlessness Intensity
Untrained CNAs	*0.74	*0.48	*0.76	*0.90	Not Available	*0.49	*0.69
Trained CNAs	*0.70	*0.56	*0.57	*0.80	Not Available	*0.92	*0.87

*Significant relationships noted between evaluators, $p < 0.05$

CHAPTER 5. CONCLUSION: IMPLICATIONS FOR NURSING RESEARCH, PRACTICE, POLICY, AND EDUCATION

Snow et al. (2004) developed a conceptual model for inferring pain in older adults with dementia, which is the foundation for this dissertation. The model suggests that there are both patient and nurse-related factors that affect pain assessment decisions, as well as issues with data collection methods that can serve as barriers to adequate and accurate pain assessment. Of particular concern is the role of nurse-related factors, patient ethnic background, and provider training on pain assessment for older adults with dementia. The introduction of this dissertation provides a foundation for the work that follows in chapters two through four which includes an integrative review of the literature and two data-based papers, a secondary data analysis of the work originally conducted by Snow et al. (in review) and aims to answer research questions related to the observation and expression of nonverbal pain behaviors in older adults with dementia. A summary of this dissertation and its application to nursing research, policy, clinical practice, and education will be discussed below.

Dissertation Summary

In reviewing the literature, the impact of nurse-related factors on pain assessment decisions was investigated highlighting demographic characteristics, personal pain history, empathy, pain knowledge, pain perceptions, and tertiary gain as the primary factors that inhibit unbiased pain assessment decisions. In persons who are unable to communicate, the role of nurse-related factors is particularly important as the nurse must infer pain for these older adults and variation in pain assessment decisions may result in inaccurate or biased decisions in regards to pain management interventions. For example, it is suggested that African American nurses are more sensitive to their patient's pain experiences, particularly when the nurse and the patient share similar ethnic

backgrounds (Hirsh et al., 2010; Hirsh et al.,2011; Wandner et al., 2012). It is also proposed that the nurse's relationship with the patient determines their empathetic attitude toward the residents, with higher levels of empathy indicating a greater sensitivity to patient's pain (Green et al., 2009; Hall-Lord & Larsson, 2006; Jackson et al., 2005; Steeves et al., 1990) . While gender and marital status are supported in the literature as nurse-related factors that affect pain assessment decisions, there is no direct relationship between the nurse's age and inference tendencies (Davoudi et al., 2008; Dudley & Holm, 1984; Eritz & Hadjistavropoulos, 2011; Robinson et al., 2001) . In such cases, women and those who were single were more likely to rate pain at higher levels, than married counterparts (Davoudi et al., 2008) . The nurse's personal pain experiences also influence pain assessment decisions, where nurses who were personally subjected to pain are more likely to identify pain in their residents (Holm et al. 1989). Lastly, tertiary gain, the benefits that the provider may receive from prolonged pain experiences, may also affect the nurse's willingness and readiness to assess pain in nonverbal older adults. Possible benefits of prolonged pain include additional work hours and a sense of fulfillment (Dersh et al., 2004; Fishbain et al., 2002). It is imperative that researchers continue to explore the role of nurse-related factors in pain assessment decisions and seek a better understanding of how these factors hinder the pain assessment process. Contrary to the finding of this dissertation synthesis, Eritz and Hadjistavropoulos (2011) found that there were no provider-related factors (empathy, depression, age, sex, etc) that affected pain assessment decisions in persons with dementia. Discrepancies between the findings in this dissertation and previous work highlight the need for additional investigation.

The display of nonverbal pain behaviors was also explored in this dissertation in an effort to identify ethnic differences in nonverbal pain expression. Nonverbal pain assessment tools have been developed to help providers identify nonverbal pain behaviors such as facial expressions, body movements, and vocalizations (Herr et al. 2011). The use of these nonverbal pain behaviors to identify pain is supported in the

literature (Eritz & Hadjistavropoulos, 2011; Hadjistavropoulos et al., 2007; Herr et al., 2011). As a secondary data analysis, this study used the NOPPAIN pain assessment tool to identify ethnic differences in the display of nonverbal pain behaviors in older adults with dementia. Of the six nonverbal pain behaviors listed on the NOPPAIN, pain faces, pain words, and pain noises were displayed most often as indicators of pain; while body movements such as restlessness, bracing, and rubbing were rarely identified in older adults with dementia as indicators of pain. More specifically, significant differences were noted between ethnicities in the expression of the nonverbal pain behavior pain words, suggesting that African American and Hispanic persons were less likely to express pain using pain words. Supporting work also shows that Hispanic persons are less likely to outwardly express or vocalize pain and may be somewhat stoic in their dealings with pain (Juarez et al., 1998). However, cognitively intact African Americans demonstrated a higher sensitivity to pain, lower pain tolerance, and greater catastrophizing behaviors, thus the use of fewer pain words with the onset of dementia highlights an interesting difference between cognitively intact and cognitively impaired older adults (Fabian et al., 2011). Furthermore, all of the CNAs in this study were African American, which would suggest that African American residents may display more pain behaviors, since they are in the presence of someone from the same ethnic background (Hsieh et al., 2011). Being less likely to display pain words when compared to Caucasian counterparts despite social support, suggests that pain words may not be a good indicator of pain in African American older adults with dementia. Future research is needed to explore the reasons behind the expression or repression of pain behaviors by African American and Hispanic residents with dementia. Furthermore, there is no evidence to date that supports that all older adults will openly express nonverbal pain behaviors, indicating a need for future research. This dissertation is unique in its exploration of residents with dementia. There is evidence that supports ethnic differences in pain expression and perceptions across ethnicities for cognitively intact adults, but the

maintenance of those culturally-influenced pain norms or the ability to control nonverbal pain behaviors in those with dementia has yet to be determined.

Having gained an understanding of nurse-related factors that hinder pain assessment in Chapter Two and ethnic differences in use of nonverbal pain behaviors in Chapter Three, Chapter Four of this dissertation explored issues in the data collection methods that can affect pain assessment decisions, particularly training methods for CNAs using nonverbal pain assessment tools. To begin, trained raters were compared to untrained counterparts in their ability to identify nonverbal pain behaviors in older adults with dementia. This study findings revealed that trained raters identified fewer nonverbal pain behaviors than untrained raters, but possibly provided more accurate screening of pain when considering the physician's gold-standard ratings as well. Untrained raters were significantly more likely to identify restlessness, rubbing, and bracing in video analysis, an interesting finding since the residents presenting these behaviors were typically not identified as having pain in the preceding dissertation chapter. While there is clear support for the benefits of training within the literature in other populations and conditions (Alcott et al., 1999; Cusick et al., 2005; Roch et al., 2012), alternative explanations for the findings of this study are also warranted.

It could be argued that the untrained CNAs were possibly more accurate in their assessment of pain in this study due to greater work experience, while the physicians and trained CNAs actually underestimated pain experiences. The untrained CNAs had more work experience with an average of 6 years as compared to the 9 months of experience that the trained raters had gained. It is possible that the trained raters were somewhat naïve in their assessments of pain, combined with the physician underestimating pain, and in actuality the untrained CNAs may have been more accurate in their responses. For example, when looking at the intensity of each pain behavior, untrained CNAs were actually accurate in their assessments, suggesting that training enhances the CNAs ability to identify pain behaviors, but work experience and a familiarity with pain-related

behaviors may help the CNA to determine pain intensity regardless of training. In the end, training CNAs to use pain assessment tools resulted in improved accuracy in the observation of nonverbal pain cues.

This dissertation work is necessary in that it explores the pain screening decisions of the CNA, a member of the health care team that has yet to be well addressed in the literature. In the nursing home, the CNA provides care under the supervision of the licensed nurse, in a fairly autonomous role where they report to the licensed nurse on an infrequent basis (Holloway & McConigley, 2009). The CNAs are crucial members of the health care team, spending nearly 80% of their time providing direct patient care (Nygaard & Jarland, 2006; Pautex, Herrmann et al., 2007). Qualitative work by Holloway and McConigley (2009) showed that CNAs described themselves as being in the "perfect position" to identify pain and at the frontline of patient care, which consequently places them at the front line of the pain assessment and screening process. Residents are more likely to share intimate details with CNAs and become emotionally attached to the CNA (Holloway & McConigley, 2009), which may increase the reporting of pain experiences. For nonverbal persons, the CNA is more likely to recognize deviations from normal behavior, which may be indicative of pain. While the nurse's role in pain assessment was explored, the role of other health care providers, particularly the CNA requires more attention.

The secondary use of an existing data set is one limitation to the findings in this study, as it limited the ability to control what data was collected, how the data was collected, and uses of the data for other means outside of its original intended purpose. The sample size is also a limitation to these findings and limited the ability to explore the original research question that examined ethnic differences between raters. However the findings of this dissertation provided trends and areas that warrant future work in larger samples that will allow for better inferences about ethnic differences in both resident nonverbal pain behavior expression and nurse inferences in judging pain presence and

severity. Lastly, the pain intensity ratings for this sample of residents were relatively low, where higher intensity levels may have provided greater insight. Despite the limitations of this research, these findings can still be used to enhance nursing research, policy, clinical practice, and nursing education.

Research Implications

Pain Assessment Tools

There are approximately 35 pain assessment tools developed for use in nonverbal older adults to identify nonverbal pain behaviors (Husebo et al., 2012). The work here both supports the use of nonverbal pain behaviors to express pain and also highlights a need for further research. Since pain faces, pain noises, and pain words were the most commonly observed pain behaviors, it can be suggested that developers of pain assessment tools should include these three nonverbal pain behaviors and evaluate the role of less noticeable behaviors, such as body movements. Additionally, while the available tools vary in psychometric properties, none of the available tools were tested in diverse samples of patients and providers. Doing so is a crucial next step to validate a pain assessment tool for use in clinical practice, especially when considering that this dissertation found ethnic differences in the expression of pain words. If additional differences between cultures exist for nonverbal older adults, then culturally-sensitive tools that include the behaviors that ethnically diverse older adults express to signal the presence of pain need to be developed in response. This work opens the door for future research to explore the maintenance of culturally-influenced pain norms despite the onset of dementia.

Also this dissertation highlights a need for additional psychometric testing of the NOPPAIN pain assessment tool, particularly in regards to sensitivity and specificity. Recent research highlights issues with the NOPPAIN in distinguishing pain intensities, particularly between mild and moderate pain levels (Sheu et al., 2011). In other words, when residents have little to no pain, similar to the residents in this dissertation, the

NOPPAIN may not distinguish between those levels of pain accurately. Patients in this dissertation had low pain intensities overall, possibly a limitation related to the psychometric properties of the NOPPAIN. Future research should also explore the construct validity of the NOPPAIN further, which may highlight a need to update the pain assessment tool to include better descriptions for the intensity ratings (Sheu et al., 2011). Furthermore, the NOPPAIN could be improved by enhancing the instructions for raters (Sheu et al., 2011), which may enhance the training process, another key point of this dissertation.

Culture and Emotions

Finding for this dissertation suggest that African American and Hispanic older adults with dementia are less likely to display pain words as signs of pain. While there is not an abundance of information available on ethnic differences in the expression of nonverbal pain behaviors, ethnic differences in the expression of emotions has been examined. Facial expressions can communicate a lot about what a person is feeling or experiencing, particularly in regards to their emotions; and may be viewed as "the most important and salient visual stimulus a human encounters" (Blais, Jack, Scheepers, Fiset, & Caldara, 2008, p.2). There are six emotions that can be identified by changes in facial expressions: happiness, sadness, disgust, fear, anger, and surprise (Simon, Craig, Gosselin, Belin, & Rainville, 2008). The nonverbal expression of pain incorporates the whole body and portrays a physical, not emotional, experience, but the assessment of facial expressions is equally useful when inferring emotional and pain experiences. Some similarities in the facial expression of pain and emotions are noted, like facial expressions for disgust and fear may elicit similar facial responses as pain (Simon et al., 2008). Also, in looking at unpleasantness ratings, pain is often rated as being the most unpleasant expression, though it is often misinterpreted as disgust or fear (Simon et al., 2008). For this reason, it is important to consider the findings related to cultural differences in the interpretation of facial expressions in emotions.

Cultural differences are noted between the interpretation and expression of emotional experiences. When inferring emotions in others, Western Caucasians tend to focus more on the eye region and mouth region, whereas Eastern Asians tend to focus on the central region of the face. Culturally-constructed beliefs about gaze avoidance and respect, may contribute to the Eastern Asians tendency and ability to infer emotions in others without making direct eye contact (Blais et al., 2008). In a study comparing 50 Western Caucasians to 50 Japan natives, Dailey et al. (2010) noted differences in facial expression styles and interpretations of facial expressions based on the patient's and provider' ethnicity. Western Caucasians had higher intensity ratings of facial expressions and Japanese patients were rated by both parties as having more severe emotional experiences. Finally, interpretations of emotions are more accurate when the rater and subject were from similar ethnic backgrounds, a finding that suggests ethnic background plays a role in the rater's interpretations and that each culture may have its own emotional dialect (Dailey et al., 2010) . The nonverbal expression of pain incorporates the whole body and is a physical experience that differs from the emotional response for happiness, sadness, fear, disgust, and surprise. Yet, research exploring the expression and interpretation of emotions opens the door to further exploration into culturally-based decisions and application of these findings to clinical scenarios, i.e. provider's inference tendencies in nonverbal persons with dementia, one aspect of this dissertation..

Language and Culture

The previously stated work and this dissertation leads to the exploration of the relationship between culture and language and leaves a few unanswered questions that need to be examined further. Is there a connection between culture and language? More importantly, is it possible to maintain cultural preferences despite language loss?

Language is communicated within the cultural group, both verbally and non-verbally. According to the Interactionist Theory, language is initially acquired through social interactions that require communication and, in response, cognitive-linguistic

abilities are developed (Betancourt, 1993). Brown (1994) proposes that language and culture are intricately woven together and cannot be separated without sacrificing the meaning of one or the other. Jiang (2000) argues that culture and language are inseparable and culture can be seen through one's language. Jiang (2000) evaluated how the translation of language is affected by culture comparing Chinese language to English. In this study, a total of 28 Chinese and 28 English speakers were surveyed to evaluate word association. The study demonstrated a possible connection between language and cultural practices and tendencies.

Of particular concern to this dissertation is the relationship between language loss and maintenance of cultural norms of pain and the previous discussion provides some insight. While the relationship between culture and language has been examined within the literature, no studies have explored the maintenance of culturally-constructed norms despite the loss of language. Previously suggests that language development is heavily dependent on context and social construction. If nonverbal older adults lose culturally-constructed norms of pain due to the inability to communicate and onset of dementia, then there is no need to continually examine ethnic differences in pain once dementia onsets. Therefore, raising the following questions: 1) What happens when an older adult loses the ability to speak? 2) Is there still a possibility that older adults can retain their culture preferences since culture and language are intricately woven together? This dissertation opens the door to explore a number of relevant research questions. Future research in nonverbal populations is needed to serve as a foundation for this area of research.

Policy Implications

Nursing Home Regulations

This dissertation also has implications for policy, as it was completed in nursing home residents and evaluates pain assessment practices of nursing home employees. The quality of nursing homes continues to be an issue for consumers, their families, and

policy makers across the nation (Li, Cai, Glance, Spector, & Mukamel, 2009; Li, Schnelle, Spector, Glance, & Mukamel, 2009). In an effort to improve the quality of care in nursing homes, the Center for Medicare and Medicaid Services developed the Nursing Home Compare initiative in 2002, which provides regular report cards on nursing homes using quality indicators (Alexander et al., 2005; Alexander, 2008). The initiative was designed to assess the quality, deficiency, and staffing in the 17,000 nursing homes that are certified to provide Medicare or Medicaid services (Arling, Lewis, Kane, Mueller, & Flood, 2007). There are a total of 19 quality indicators, which includes 14 measures of long-stay residents and 5 measures for short-stay residents (Alexander et al., 2005; Alexander, 2008). The quantitative information used for rating nursing homes comes from data that the nursing homes regularly obtain for Minimum Data Set (MDS) documentation for all residents, which addresses the residents' health, physical functioning, mental status and general well being (Li et al., 2009; Li et al., 2009). Moreover, quality indicators measure the structural factors that affect quality, the direct care that is performed by staff, and patient outcomes (Nakrem, Vinsnes, Harkless, Paulsen, & Seim, 2009) . The management of pain is a key indicator used to rate nursing homes across the nation. The pain quality indicators assess the percentage of residents experiencing moderate and severe pain within a given facility for both long-stay and short-stay residents (Mukamel et al., 2008). Reducing the amount of pain that is experienced in nursing homes relies on accurate and detailed assessment of pain.

Unfortunately, research illustrates that older adults with cognitive impairment receive significantly less pain medications than cognitively intact older adults (Allen et al., 2003). Nonverbal pain behaviors, as studied in this dissertation, can be used to identify pain in older adults residing in the nursing home setting. Work presented by Kaasalainen et al. (2012) shows positive outcomes and significant decreases in pain following the implementation of a pain protocol that included the identification of nonverbal pain behaviors for residents who are unable to verbally communicate their pain

experiences. Nonverbal pain scales were also developed for use in aging populations and give providers an efficient way to reduce the number of painful experiences in patient populations that are being overlooked (Hadjistavropoulos et al., 2007; Herr et al., 2011). This dissertation builds on the body of literature that supports the use of nonverbal pain scales and nonverbal pain behaviors to identify pain in older adults with dementia. In doing so, nursing homes are better equipped to avoid high pain intensity ratings that may serve as a red flag in quality assessments. These findings also help providers identify the factors that inhibit their unbiased assessment of pain and better understand ethnic differences in the display of nonverbal pain behaviors, enabling them to be proactive in their pain assessment approaches and ultimately improving their quality ratings.

This work may also support the need to revise the data that is collected for the MDS. In considering the consequences of unrelieved pain (depression, sleep deprivation, poor nutrition, anxiety, and changes in mood) (Leong & Nuo, 2007; Meleger et al., 2013; Pilkington, 2013), it could be argued that there is a need for additional quality indicators related to pain assessment and management. Policy makers must understand the role of unrelieved pain on overall satisfaction with long-term care services and be sure that there are high expectations for nursing homes in regards to pain assessment and management.

Clinical Implications

In the clinical setting, there are two basic methods that have been used in nursing homes to assess residents for pain: verbal methods using pain ratings scales and nonverbal methods that focus on observing the patient for nonverbal signs of pain (Alexander et al., 2005). While this research supports the use of nonverbal pain tools, it is important that practitioners continue to attempt to retrieve verbal reports of pain, in addition to using nonverbal pain scales, especially since residents have proven to be able to provide reliable measures of pain despite mild to moderate dementia (Lukas et al. 2013; Pesonen et al., 2009). Many older adults with cognitive impairment can still provide details of their pain experience when prompted by the nursing staff and verbal

pain assessment tools can be used to evaluate pain in elders with mild to moderate impairment (Brummel-Smith et al., 2002; Hadjistavropoulos et al., 2007; Taylor, Harris, Epps, & Herr, 2005). Consequently, all residents should first be asked to give subjective reports of pain and then objective measures can be used. Similar to this dissertation, Herr and colleagues (2011) recommend that a comprehensive approach be used for nonverbal pain assessments.

The benefits of staff education and training are also supported in this dissertation, suggesting better outcomes when staff members were trained to conduct pain assessments or screenings. In the clinical setting staff members should be adequately trained to use pain assessment tools, recognize nonverbal pain behaviors, and to understand the nurse-related factors that may present as barriers to pain assessment. However, the adoption of any new pain protocols requires the acceptance of culture change by the entire organization (Sanders et al., 2010). Sustainability of any quality improvement initiative will be heavily dependent on the organizational commitment which encompasses two key factors: support from leadership and willingness to adhere to expert advice (Sanders et al., 2010; Titler, 2010). Translational science findings suggest that interactive education programs can be used in the implementation and sustainability of practiced methods aimed at improving pain assessment (Jones et al., 2004). If resistance is met when attempting to implement change or new pain assessment practices in the clinical setting, change champions are valuable assets to the implementation and sustainability of new practice methods (Ploeg, Davies, Edwards, Gifford, & Miller, 2007). Change Champions are health-care workers who adopt the practice and frequently encourage other staff to implement the change (Soo, Berta, & Baker, 2009).

Finally, the findings from this study support the use of the CNA to screen nonverbal residents for pain. Maximizing the use of each team member may contribute to the overall efficiency of the facility and help to improve the quality ratings. CNAs may also feel more empowered to assist with the pain assessment/screening process

following training or increased work experiences. In the end, this dissertation opens the door to future research regarding nonverbal pain assessment in older adults with dementia, by highlighting the importance of pain screenings, the ability of the CNA to identify pain, and exploring the benefits of using different training approaches.

Educational Implications

As we train future nurses in the pain assessment of nonverbal older adults with dementia, the goal should be to equip them with the knowledge and skills needed to provide safe and competent nursing care that is evidence-based. To begin, student nurses have to be educated to understand the importance of the CNA as a member of the healthcare team. Since CNAs spend the majority of their time providing direct patient care, positive associations result from time spent with the patient and the likelihood of identifying nonverbal signs of pain is increased. The student nurse must therefore recognize the significance and value of the work that is completed by the CNA. Currently, nursing practice does not hone in on the skills and abilities of the CNA, as CNAs feel as if they have to nag the licensed nurses to conduct assessments of pain and implement pain management interventions, once the CNA had screened the patient for pain (Holloway & McConigley, 2009). This could be partly due to the lack of respect for the CNA role, as CNAs also felt that they were often treated as inferior to other members of the health care team (Holloway & McConigley, 2009). Since the majority of health care workers in the nursing home setting are CNAs, it is essential that student nurses be educated to maximize the use of the CNA and recognize them as a valuable member of the health care team (Holloway & McConigley, 2009).

The importance of using nonverbal pain behaviors must also be stressed to student nurses and is supported by the finding of this dissertation. Nonverbal pain scales are valid and reliable measures for assessing pain and significantly correlated to verbal reports of pain (Eritz & Hadjistavropoulos, 2011; Mosele et al., 2012). Unfortunately, residents with dementia suffer from similar painful diagnoses, but are less likely to have

pain assessed and receive fewer pain analgesics (Mosele et al., 2012). This dissertation also supports the use of nonverbal pain assessment tools to identify pain in persons with dementia and the benefits of training. Student nurses should therefore learn the appropriate use of nonverbal pain assessment tools, and be taught the importance of adequate pain assessment, particularly for resident with moderate to severe dementia.

Conclusion

Nursing research should guide, clinical practice, policy development, future research, and education. Although, not all research can impact policy and other domains, particularly when it is pilot in nature; thus, care must be taken to avoid making decisions when evidence is limited. However, pilot studies can foster further research questions and guide next steps similar to this dissertation. This pilot work opens the door for future studies to be conducted in larger samples and with data that is originally collected with this intent, as opposed to the secondary analysis that was conducted in this dissertation. Intriguing research questions for future research resulted from this dissertation, specifically related to the culturally-constructed inference tendencies of nurses and maintenance of culturally-constructed norms of pain for residents with dementia. The role of nurse-related factors (personal pain history, empathy, demographic characteristics, pain perceptions, tertiary gain, and pain knowledge) in pain assessment decisions were also highlighted here and can alert the provider to the potential for personal biases. Furthermore, pain assessment tools can be revised to include variations of the nonverbal pain behaviors that this study supports as being the most common signs of pain: pain faces, pain words, and pain noises, with ethnic differences in the expression of pain words. Lastly, the importance of training and work experiences were highlighted here, supporting the allocation of valuable resources to ensure that nursing staff are well educated. In conclusion, the inference of pain in nonverbal older adults with dementia requires further exploration and this dissertation opens the door to additional research in this area.

APPENDIX A. IRB EXEMPTION

"The IRB chair has provided this application a preliminary review. As there will be no identifiers in the dataset you receive and you will not have any contact with the subjects, the IRB chair has indicated this activity does not meet the regulatory definition of human subjects research and therefore will not receive formal IRB review and approval. This activity can proceed without this review and approval. Please acknowledge this message in the comment box below and return the application through workflow so HSO staff can withdraw the application. Thank you for your diligence in submitting this application. In the future, if there is a situation where it is debatable as to whether an activity is human subjects research, it is recommended you submit a Human Subjects Research Determination (HSRD) Form in HawkIRB. This shorter form goes straight to an IRB chair for this determination. If it is not human subjects research, the form provides documentation of this ruling from the IRB chair. If it is, a New Project application will be created and populated with answers from the HSRD form. That application is then completed and submitted. When ready, please route the HawkIRB application back to the HSO through the designated button at the bottom of this workflow page ('Return Routing Slip to the HSO' button). -Brian Bishop (brian-bishop@uiowa.edu)"

APPENDIX B. DISSERTATION CHAPTER 2 ABSTRACT

Background: Several nurse-related factors hinder the process of assessing pain in nonverbal persons with dementia and need to be explored in greater detail. Using the Conceptual Model for Assessing Pain in Non-communicative Person with Dementia (Snow et al., 2004) as a guide, this integrative review highlights six nurse-related factors that can have a direct impact on the pain assessment decisions: demographic characteristics, personal pain perceptions, relationship with the patient, pain history, pain knowledge, and secondary gain. These nurse-related factors are discussed in relation to classic work by Davitz and Davitz from the 1970's. **Methods:** CINAHL, PubMed, Academic Search Complete, PsychINFO, and Cochrane Database of Systematic Reviews were searched for relevant articles, resulting in 28 related articles. **Results:** Classical work by Davitz and Davitz laid a solid foundation for more recent exploration of the impact of nurse-related factors on pain assessment decisions. However, a minimal amount of evidence supports the role of the nurses' personal pain history in pain assessment decisions and there is a need to update the previously stated conceptual model. **Conclusion:** Nurse-related factors can negatively impact pain assessment decisions and bias rater judgments, which is particularly detrimental for non-communicative persons who rely on the inferences of others to identify pain. In order to eliminate health care disparities in pain assessment and management for these older adults, it is important to further consider and address these contributing nurse-related factors and to also explore those of nurse extenders, the certified nurse assistant.

APPENDIX C. DISSERTATION CHAPTER 3 ABSTRACT

Background: Research supports using nonverbal pain behaviors (e.g. grimacing, guarding, vocalizations) to identify pain in persons with dementia. It is unknown whether variations exist among ethnic groups in the presentation of nonverbal pain behaviors by African American, Hispanic, and Caucasian older adults with dementia. **Methods:** Six trained certified nursing assistants (CNAs) reviewed 28 video recordings of subjects with dementia and scored the subjects for pain behaviors using the Non-Communicative Patient's Pain Assessment Instrument (NOPPAIN). Mean overall pain intensity as rated by the CNA on a 0-10 rating scale and the frequency of each expressed nonverbal pain behavior were calculated for the entire sample, for those identified as having pain, and across the three different ethnic groups. Chi-square was used to examine differences among ethnic groups with regards to the display of nonverbal pain behaviors. Using ANOVA differences in the intensity of overall pain was examined among ethnic groups as well. **Results:** For the entire sample of 168 completed assessments, pain words (28%), pain noises (29.8%), and pain faces (28%) were observed most often as indicators of pain. Rubbing, bracing, and restlessness were rarely noted. Ethnic differences were present in the expression of pain words ($X^2 = 19.167$, $p < 0.001$). No significant differences were noted across ethnic groups with regards to overall pain intensity. **Conclusion:** Similar work in a larger more diverse sample with greater control over extraneous variables is needed to further explore ethnic differences in the presentation of nonverbal pain behaviors in persons with dementia.

APPENDIX D. DISSERTATION CHAPTER 4 ABSTRACT

Background: Nonverbal pain assessment tools have been developed for use with nonverbal older adults with dementia. Adequate training in using these pain assessment tools can improve the rater's accuracy during pain assessments. The purpose of this study was to examine differences in the inference tendencies of trained and untrained CNA raters when compared to physician ratings. **Methods:** In this secondary data analysis, certified nursing assistants (CNAs) screened subjects with a history of dementia for pain using the Non-communicative Patient's Pain Assessment Instrument (NOPPAIN). Six CNAs were trained to use the NOPPAIN and asked to rate patient videos for the presence of nonverbal pain behaviors and were compared to the ratings of five untrained CNAs. Additionally, three physicians rated the same patient videos and were used as the gold standard to assess the accuracy of the CNA's ratings. **Results:** Pain noises, pain faces, and pain words were most often observed as indicators of pain. Trained CNAs rated lower pain intensities, but were possibly more accurate in their screenings of nonverbal pain and identification of nonverbal pain behaviors when compared to untrained counterparts. Untrained raters were more accurate in their assessment of the intensity of each individual pain behavior. **Conclusion:** Training improved the CNA's identification of nonverbal pain behaviors in older adults with dementia. However, work experience appears to be more valuable in determining the intensity of those behaviors, as untrained raters were more accurate in their determinations of behavior intensity. Future work is needed to further explore the benefits of training and impact of method-related factors on pain assessment decisions.

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