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CAREGIVER NEED ASSESSMENT TOOL

A DOCTORAL PROJECT

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By

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ABSTRACT

Hospitalized older adults (OA), aged 70 and above, are 30% more likely to sustain a new activity of daily living (ADL) disability by discharge. Research supports that OAs discharged to the home environment with more than three ADL deficits are at a higher risk of 30-day readmission. Likewise, OAs discharged to skilled nursing facility (SNF) from a hospital have higher number of ADL impairments and are at a greater risk of 30-day readmission. Consequently, OAs who are discharged to home from a SNF require caregiver (CG) support to assist them with ADL needs. Thus, a caregiver need assessment tool (CNAT) is crucial in effectively determining the appropriate level of CG support that will be necessary in the home setting. The purpose of this project was to develop a reliable-and valid CNAT that would enable the determination of the level and type of CG assistance needed by OAs in the home. Orem's Self-Care Deficit Theory of Nursing (SCDTN) Model guided the development of the CNAT. In two phases, a panel of 10 expert clinicians working in the SNF evaluated the tool for content validity. The panel established the relevancy of the items, the relationship to the identified ADLs represented by the model, and the ease of implementation and interpretation. The final CNAT consisted of 13-items and a 4-point Likert scale that represented four universal domains: cognition, mobility, support, and environmental setting. CNAT scores for readability were 39.2 on the Flesch Reading Ease and 10.3 for grade level (Flesch Kincaid). The CNAT is a valid, user-friendly, and standardized tool that can be used to

decrease 30-day hospital readmission by assist clinicians in determining the level of CG support needed in the home after SNF discharge.

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BACKGROUND

The population of older adults (OA) in the United States has rapidly increased from 35.9 million in 2003 to 44.7 million within the last decade, with OAs aged 65 and over accounting for 14.1% of the population. It is projected that by the year 2060, OA population will double to 98 million (ACL, 2013).

From 1994 to 2004, the percentage of hospitalized OAs remained at 35% (HCUP, SB #14, 2006). On the other hand, the percentage of hospital discharges to skilled nursing facility (SNF), for this same group, rose from 9.2% to 13.7% within this same time frame (1996 to 2010) (Burke et al., 2015). Home discharges from the hospital setting have declined from 90.8% in 1998 to 86.3% in 2010. This decline was the result of an increased number of admissions to SNFs. In 2008, 29% of OAs aged 75 to 84 and 44% aged 85 and above were admitted to long term care facilities (e.g., SNF and nursing home) post hospitalization (HCUP, SB # 103, 2008). Most OAs were admitted into SNFs for daily skilled nursing care and rehabilitation therapy due to their inability to perform prior level of activities of daily living (ADL) (Ottenbacher et al., 2014). In addition, OAs already encountered with an increased disability in their ADL such as bathing, dressing and mobility (Brown et al., 2014; Hoyer et al., 2013; Lin, Beck, Finch, Hummer, & Masters, 2012; Nikolova, Demers, Beland, & Giroux, 2011; Wolinsky et al., 2011).

Covinsky, Pierluissi, and Johnston (2011) found that 30% of OAs aged 70 and above sustained a new ADL disability upon hospital discharge. In other words, prior to hospitalization, OAs were able to perform five ADLs independently. However, upon hospital discharge, there was a decline of independent performance to three ADLs. In addition, 21% of OAs aged 60 to 69 and 42% aged 70 to 79 OAs were already impaired

with regards to their performance of ADL at the time of hospital admission (Brown et al., 2014). The decline in ADL ability had many negative effects. These OAs were at a higher risk for morbidity and mortality (Boyd et al., 2008). They were also at a higher risk of ADL dependency (Boyd et al., 2008). For example, the decline in ADL functioning becomes a major concern for patients who suffered a hip fracture, due mostly to frequent assistance with ADL and safety monitoring to prevent future falls (Wu et al., 2013).

Efforts to decrease readmission rates of patients discharged from SNFs back to hospitals had been the focus of many task forces (Berkowitz et al., 2013; Bernatz, Tueting, & Anderson, 2015). There were many studies, which focused on the interventions to improve the quality of the transitional care period from hospital to home and decrease hospital readmission rates. On average, within 30 days of discharge from a SNF, the typical readmission rate was 22.1% to the acute care hospital setting and 14.8% for general hospital readmissions (Kripalani, Theobald, Anctil, & Vasilevskis, 2014; Toles et al., 2014). Older adults who were previously identified as functionally disabled prior to hospitalization were at a greater risk of readmission within 30 day from SNF discharge than OAs who were not functionally disabled (Garcia-Perez et al., 2011; Hoyer et al., 2013; Ottenbacher et al., 2014). The Depalma et al. (2013) study indicated that OAs discharged home from the hospital without caregiver (CG) support for ADL disability were more likely to be readmitted to the hospital within 30 days. Furthermore, the readmission rates increased significantly in OAs when there were three or more deficits in ADL in comparison with OAs who had intact functional status (Kripalani et al., 2014). This increase in hospital readmission was even more profound in OAs who are admitted with heart failure, pneumonia, and myocardial infarction (Greysen, Stijacic

Cenzer, Auerbach, & Covinsky, 2015). Additionally, OAs admitted to a SNF after hospitalization for a hip fracture were at a higher risk of hospital readmission when discharged from the SNF to home (Pollock et al., 2015).

Kripalani et al. (2014) conducted a literature review in order to determine the best practices for reducing the hospital readmission rate for OAs. The review also provided recommendations for future strategies in ADL functioning and caregiver support. The authors noted that interventions, which targeted high risk OAs, specifically those with increased age, functional impairment, and poor social support, had a significant decrease in hospital readmission from 28% to 11%. The authors recommended the use of a structured assessment of OAs' needs in the home setting after hospital discharge in order to provide specific interventions to address those needs. The needs were typically identified as limitations in ADL functioning. Limitations such as difficulties with bathing and dressing were modifiable risk factors. Caregivers were able to intervene and address these ADL limitations. The authors also acknowledged that caregiver stress was significant in the cases reviewed. Caregivers identified respite, training, and education as areas needing the most support.

In a study conducted by Altfeld et al. (2013) of 360 patients who were discharged to home from the hospital, they found that 83.3 % experienced significant issues related to self-care and CG support (e.g., self-management, caregiver burden, communication with provider, and medication management). Caregiver burden accounted for 35% of the significant issues experienced by OAs. Caregiver burden was the stress perceived by informal home care providers (i.e., family members or other non-professional caregivers) who undertook the responsibility of providing continual care to an OA (e.g., medication

management, follow up services, communication with provider). This study highlighted the need to address the transitional period following hospital discharge to home.

The skilled rehabilitation program aims to help the OA regain their lost or impaired ADLs. However, the possibility of full recovery of ADLs may not be always achievable due to multiple causes, which can include the onset of a new medical condition (e.g., stroke with hemiparesis), worsening prior chronic diseases, or prolonged hospitalization (e.g., severe deconditioning). It was determined that 68% of OAs discharged to home post-acute care rehabilitation were not at their same functional status as prior to hospitalization (Falvey, Mangione, & Stevens-Lapsley, 2015). An integrated systematic review by Graham, Ivey, and Neuhauser (2009) indicated that hospital transition to home was a critical period for OAs. This was due to their inability or impaired ability to navigate a complex system of a worsening chronic disease, the addition of a new disease, or a new level of functional disability. It can be argued that many OAs discharged home from a SNF may have at least one or more impaired ADL. A review of the literature conducted in the area of discharge from SNF to home yielded few evidence-based studies on the topic (Berkowitz et al., 2013).

A study conducted by Berkowitz et al. (2013) evaluated the interventions directed at decreasing hospital readmission rate when OAs were discharged from SNF to home. The researchers modified the hospital-based intervention called ReEngineered Discharge (RED) in order to use it within the SNF setting (Berkowitz et al., 2013). The RED intervention consisted of a checklist tool of 11 items. The RED detailed a list of tasks that the discharge team completed prior to discharging a patient to home. The tasks ranged from arranging follow up appointments with primary and specialty providers,

medication management (e.g., reconciliation, procurement, and medication taking), diagnosis education, confirming comprehension of the discharge plan, communication of new diagnosis, follow up plans for pending tests and referrals, emergency responses, and ordering durable medical devices. The purpose of the RED was to standardize the process of discharge for patients leaving the SNF to home in order to decrease hospital readmission rates.

A study by Iyengar and Kopardekar (2015) focused on a transitional care model using follow up doctor's appointments within the home setting once the patient was discharged from the SNF. This allowed the doctor to follow up with medication reconciliation, review discharge instructions with patient and caregiver, and communicate with the community physician regarding changes during hospitalization and follow up need. This study is in press and was presented as an abstract within the Journal of the American Geriatrics Society.

Kanaan et al. (2013) studied adverse drug events in OAs discharged to home from SNF. The authors found that 28% of these events were preventable. This study demonstrated the vulnerabilities faced by OAs when being discharged to home from SNFs. This study did not focus on interventions to decrease hospital readmission rate, but rather medication safety during SNF transition to home, which also had been known to be a factor related to readmission rates.

Another study by Toles, Hanson, Taylor, Schwartz, and Colon-Emeric (2015) identified the key indicators for a successful home transition from the SNF by examining preparedness to go home, unmet self-management needs, follow-up

appointments with primary care providers, obtaining medications, and hospital readmissions.

Whether an OA was in the hospital or at a SNF, their functional level was evaluated through the use of tools such as Functional Independent Mobility (FIM), Katz Index of Activities of Daily Living (Katz Index) and/or Minimal Data Set (MDS) (Ahmed, Graham, Karmarkar, Granger, & Ottenbacher, 2013; "Katz Index of Independence in Activities of Daily Living (ADL)," 2007). These tools did not quantify the amount or type of CG support needed in the home setting after SNF discharge. Thus, inadequate CG support could be due to inadequate CG needs assessment and recommendation by the SNF's clinicians (e.g., physician, nurse practitioner or physician assistant, extended care coordinator nurse, and social worker). This inadequate CG support could also be the result of the patient's or family member's lack of awareness of CG needs or the reluctance to hire a caregiver.

Therefore, the need for appropriate caregiver support after SNF discharge to supplement the impaired ADLs in this population was essential for a successful adaptation back to the community environment. This became more vital when OAs were discharged to home from the SNF due to their unique characteristics often associated with extended stays within a SNF (e.g., older, increased cognitive impairment and functional disability, and complex comorbidity).

Problem Statement

The number of OAs will continue to rise and the number of them who will be admitted to a SNF on the transitional process from hospital to home will continue to escalate. Most OAs who have been admitted to a SNF for skilled rehabilitation are compromised due to the presence of multiple comorbidities and prior ADL and Instrumental ADL (IADL) impairment. These OAs will most likely be discharged home with recommended CG support. Older adult SNF patients, who were discharged to home, often had not been adequately assessed for their self-care needs. This led to an inadequate caregiver support and could contribute to readmission to an acute care facility, increase further self-care disability, and escalate health care costs that were related to hospital readmissions. However, currently there was no standardized tool to evaluate CG needs and determine the level and type of CG support that was needed based on their ADL disability.

Project Purpose

The purpose of this Doctorate of Nursing Practice (DNP) project was to develop an evidence-based, valid, and comprehensive CG need assessment tool (CNAT) that could be utilized by clinicians (e.g., physician, advanced practiced providers, case manager nurse, and social worker) to assist the OA in the transition from the SNF to home. The tool assisted the clinicians in assessing the CG need for self-care activities of the OA and determining the level (full-time or part-time) and type (formal or informal) of CG support needed by the OA in the home setting. An expert panel validated the tool's content validity and ease of implementation and predictability.

The primary goal of this DNP project was to assist in the successful transition of OAs being discharged to home from a SNF through the use of a comprehensive and valid CG need assessment tool (CNAT). The main objective was to ensure that the OA and family member or responsible parties, be informed and educated about the need for appropriate CG support at SNF discharge to home. The tool was developed to address the following areas:

- The ability of the OA in meeting basic life-maintaining activities
- Areas of functional deficits or limitations identified.
- Concrete CG needs based on the deficits identified by the tool.
- The types and levels of CG support needed as identified by the tool.

Significance of the Project

The significance of this project was to develop a comprehensive tool that provided an evidence based approach to determine the level and type of CG support that OAs needed in the home once discharged from a SNF. The usage of a comprehensive tool enhanced the shared-decision discussion between the OA, the family member or responsible party, and the clinical team during the discharge process. The comprehensive tool increased the level of understanding of the OA and their caregivers in providing them a realistic view of their functional needs. The CNAT demonstrated to the OA and their caregivers the need for CG support in the home.

The tool provided a descriptive analysis of the need for caregiver support. It helped the OA and family member or responsible party understand their limitations in caring for their functional ADL needs. This led to an increased willingness on the part of the OA to arrange for a CG support system. In addition, the project assisted in

ameliorating OA's and family's apprehension at home discharge. Caregiver need was identified and specified, as were the type of CG training and resources that needed to be established prior to home discharge. Thus, the CNAT contributed to a decrease in further ADL disability, hospital readmission and associated health care cost (Fabbian et al., 2015). This tool quantified the CG needs using a standardized process, which was used across multiple settings from long-term care (LTC) facilities, SNFs, to hospitals.

Conceptual Framework

The ability of an individual to initiate and perform daily self-care activities or ADL was the focus of the Self-Care Deficit Theory of Nursing (SCDTN) Model (see Figure 1). Pioneer nurse researcher, Dorothea Orem, developed the SCDTN Model in 1956 (Hartweg, 1991). The SCDTN Model was widely recognized as the model for self-care across all human developmental stages from infancy to late adulthood (Padula, 1992). The use of this model to describe the SC deficit of the OA was appropriate, given that the project was seeking to identify CG support in late adulthood. The SCDTN Model was the integration of three systems: self-care (SC), self-care deficit (SCD), and nursing system (Hartweg, 1991). The main theme of the SCDTN Model was the ability to perform SC activities to meet fundamental life needs which change over time. There are intrinsic and extrinsic factors called basic conditioning factors in the SCDTN Model, which can negatively affect self-care activities. Intrinsic factors are the internal influences such as chronic illness, body systems and functions, and cognitive abilities. Extrinsic factors are things in the environment such as social support, living conditions, or arrangements. A deficit in either one of these areas activates the nursing system component of the SCDTN Model. At this point, the nurse helped the OA and their families to identify and teach

them how to overcome deficits in order to maintain life and well-being (Hartweg, 1991)

(see Figure 1).

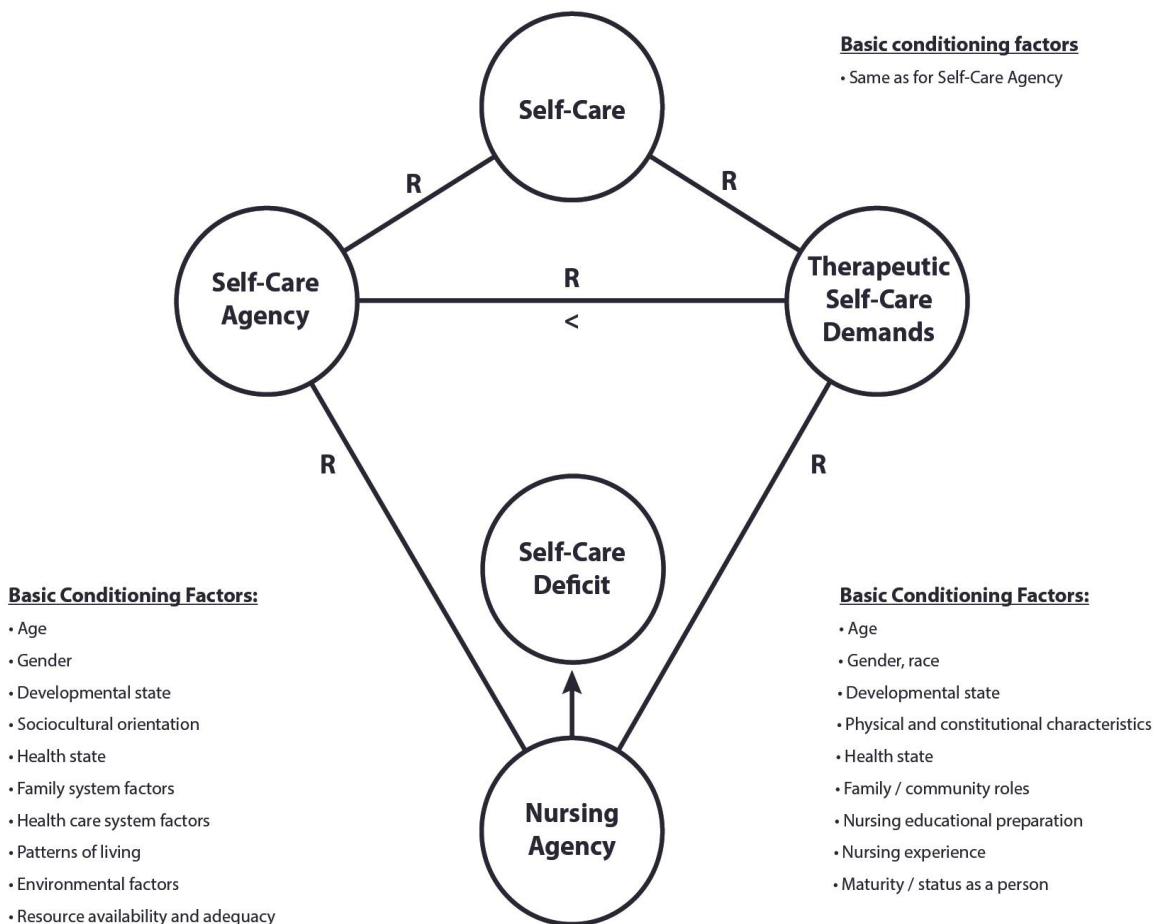


Figure 1. Conceptual structure of the Self-Care Deficit Theory of Nursing. R = relationship < means that a self-care deficit exists when self-care agency is less than therapeutic self-care demand. Adapted from *Dorothea Orem: Self-care deficit theory* (p. 70),” by D. Orem, 1987, London: Sage Publication. Adapted with permission.

The SC component of the SCDTN Model could be pertained specifically to the OA and his or her ability to perform SC tasks. Self-care is defined as a collection of self-initiated and purposeful activities performed by each individual in order to sustain life, health and well-being (Zaccagnini & White, 2014). Self-care is a learned behavior that results from interactions with those from within the OA's social group (Hartweg, 1991). Therefore, individual SC has its own social, cultural, and environmental value (Hartweg, 1991). The phenomenon of daily self-care deficit among OAs was significant (Chatterji, Byles, Cutler, Seeman, & Verdes, 2015; Wolinsky et al., 2011). The SC activities among OAs could be compromised due to increasing disability caused by situation-specific demands placed on the OA who developed impaired mobility as a sequelae of a cerebral vascular accident (Chatterji et al., 2015; Denyes, Orem, Bekel, & SozWiss, 2001).

Older Adult as Self-Care Agency

Self-Care Agency (SCA) is the second component of the SCDTN Model. Self-care agency is intra-individual and pertains to the OAs ability to engage in SC activities (Zaccagnini & White, 2014). The OA who was capable of engaging in the practice of self-care was the self-care agency. In the present paper, SCA was referred to as the OA. The OA was both the intended receiver and performer of SC activities (Denyes, 2001). The OA has been affected by sociocultural and environmental factors such as educational level and economic status. The OA and his/her SC activities evolved through developmental stages of life. Self-Care activities begin with the activities learned during childhood, and then the SC activities continue to evolve as the person matures through adulthood and begin to decline in late adulthood (Hartweg, 1991). Thus, the OA as a self-care agency was susceptible to self-care deficits, especially in situations where intrinsic

factors (e.g., chronic illnesses or falling injuries) may worsen the musculoskeletal and cognitive disability.

Therapeutic Self-Care Demand

Hartweg (1991) defines Therapeutic Self-Care Demand (TSCD) as a collection of SC activities that are performed consistently in order to meet life's basic needs and maintain a healthy well-being. Therapeutic Self-Care Demand is composed of three interrelated systems: universal SC requisites, developmental health care requisites, and health deviation SC requisites (Hartweg, 1991). Universal SC Requisites (USCRs) consist of eight fundamental components: air, water, food, elimination, activity and rest, safety (prevention of hazards and fall), solitude and social intervention, and promotion of functioning and well-being (Hartweg, 1991). Fall prevention is of high importance among OAs as it is the number one cause of injury and increases the potential for mortality. Falling is the most common cause of hospital admissions due to trauma sustained in the fall. Furthermore, falls lead to other complications such as traumatic brain injury, limited mobility and disability of functional status (Centers for Disease Control and Prevention [CDC], 2013).

Developmental Self-Care Requisites (DSCRs) are the maturation (adjusted for age and developmental stage) and situational self-care required in order to maintain life and health. Extrinsic factors such as a fall can prevent an OA from engaging in SC activities (Hartweg, 1991). Health Deviation Self-Care Requisites (HDSCRs) are intrinsic factors, which encompass areas of disease, genetic, constitutional defects, and human structural and functional deviations that affect SC (Hartweg, 1991). These basic components of TSCD as described in the SCDTN Model represent the basic fundamental

life needs, the changes caused by intrinsic, and extrinsic factors (e.g., new diagnosis of hypertension, fall, and natural disasters). The changes in TSCD lead to new expectations being placed on the OA for meeting their SC activities (Hartweg, 1991).

Clinician as Nursing System

The last component of the SCDTN Model is the Nursing System (NS), which is defined as “the package of nursing responsibilities, roles, relationships, and actions that are organized to meet the client’s therapeutic self-care demands” (Zaccagnini & White, 2014, p. 18). In the present paper, the NS was referred to as the clinician (e.g., physician, advanced practice providers (nurse practitioner (NP) and physician assistant (PA)), and nurses). According to the SCDTN Model, the OA was evaluated to determine their ability to meet their TSCD. The clinician was pivotal in the implementation of the SCDTN Model. The actions of the clinician were divided into five categories: acting, guiding, supporting, providing, and teaching (Hartweg, 1991). The clinician was responsible for assessing the ability of the OA to navigate the new therapeutic of SC demands. The clinician then determined the presence of deficits and developed nursing care plans or plans of actions in order to assist the OA in performing SC activities to meet the TSCD (Hartweg, 1991).

Integration of SCDTN Model into the Present Project

Self-Care Deficit Theory of Nursing Model served as the conceptual framework for this DNP project. The model’s fundamental components provided the background domains to identify the need for caregiver support through the development of a CG needs assessment for OAs. The final product of this DNP project was the development of a clinical tool to identify the amount (level and type) of CG support needed within the

home setting when the OA was discharged from a SNF. Once an OA was discharged to home from a SNF, the TSCD consisted of new needs, which were not present prior to hospital admission. The SCDTN Model stipulated that this was where the clinician stepped in to make changes and improve quality of life. The clinician taught and guided the OA and their caregivers to remediate the deficits between the SC activities and therapeutic self-care demands. The actions of the clinician, in the present project using the CNAT, were to first, identify the new self-care deficits based on the basic conditioning factors of the OA, and second, to determine appropriate type and level of CG support needed based upon the scoring rubric of the CNAT. The integration of the SCDTN Model into the CNAT development was outlined in Figure 2 below.

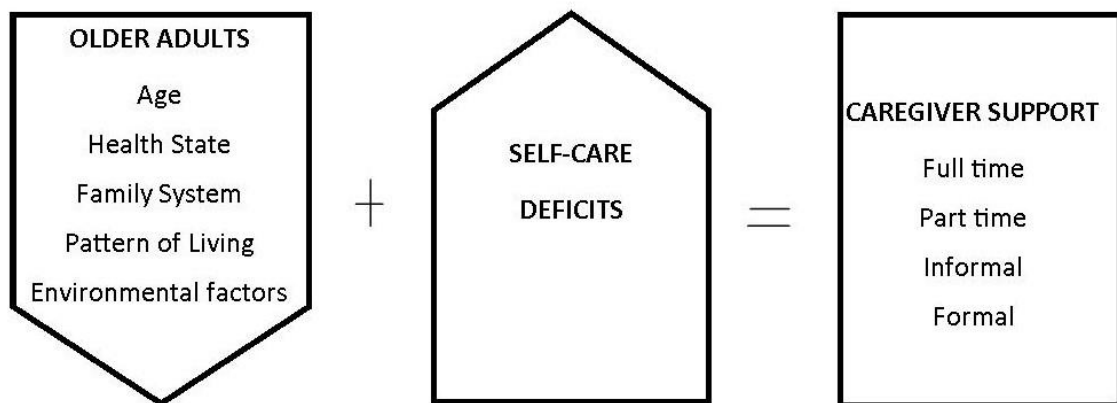


Figure 2. Conceptual Structure of the CNAT Self-Care Deficit and Care Giver Support System. Source: Author.

Progression of the OA SC needs and Caregiver Support

The level of CG support had always been a fleeting discussion among OAs and their clinicians. There had been no consistent means for addressing the level and type of caregiver support needed within the home once an OA was discharged from a SNF. A clinician should have a standardized tool to identify the OA's deficits based on BCFs and be able to determine the appropriate level and type of caregiver support needed. The BCFs were the determinants used to design the clinical tool and quantify the need and the amount of caregiver support at SNF discharge to home. While the OA was in the SNF they were said to be in a transitional phase, since the purpose of being at the SNF was to regain as much as possible their prior functional status. The OA was provided with many forms of therapy, which include physical, occupational, and speech, all while receiving nursing services. The OA may have had minor or major physical and cognitive impairments that affected their ability to meet their new therapeutic SC demands (Ottenbacher et al., 2014).

Older adulthood was a developmental state identified within the BCFs. The overall cognition and physical mobility of the OA was evaluated based on the review of systems (ROS) of health state. The ROS was an overview of the bodily systems and how they functioned per patient's perception. It consisted of the cognitive state and the physiological systems that work together to help the OA perform their ADLs. SNF admissions were most often the result of a sentinel event resulting in either functional or medical impairment. These included falls with or without fractures, stroke with or without complications (e.g., hemiplegia, dysphagia, and aphasia), chronic illness exacerbation (e.g., heart failure, chronic obstructive pulmonary diseases, and neurological

disorders) (Ottenbacher et al., 2014). Some patients were also admitted due to systemic infection requiring continuation of intravenous antibiotic administration, hospitalization associated deconditioning or debility (i.e., inability to perform prior SC activities without new musculoskeletal disabilities or cognition decline) (Falvey et al., 2015; Ottenbacher et al., 2014).

Limited mobility and cognitive impairment were major factors when considering the individual's ability to perform ADLs. Hemiplegia was a complication from a stroke that can cause limited mobility of a limb. A stroke also caused the OA to experience cognitive impairment (e.g., aphasia, delirium, and dementia). A bone fracture caused limited mobility due to the inability of the OA to bear weight on a limb. These cognitive and physical impairments decreased the fundamental BCFs of the OA. Consequently, the OAs' ability to initiate and complete their own SC activities to fulfill the needs of the TSCD to "maintain life, health and well-being" was impaired (Zaccagnini & White, 2014, p. 18).

The SCDTN Model of basic universal self-care requisites for air, food, water, elimination, rest, and activity were similar to the ADL of eating, bathing, dressing, and toileting. The OA at SNF discharge needed additional help to engage in ADL on their own (68% of OAs discharged from post-acute care function below their prior-hospitalization functional status (Falvey et al., 2015)). For example, in order to be able to breathe well, the OA needed to use an inhaler and be able to manage their breathing which were impaired by chronic obstructive air disease (COPD). This activity would be impaired if the OA was not able to use his immobilized limb due to a stroke. Other areas of need include: (1) assistance with meal preparation and feeding, (2) assistance with

toilet transfer and hygiene, (3) assistance to get up and out of bed, (4) assistance with transfer or supervision to prevent falls, (5) assistance with removing themselves from hazardous situations, (6) assistance or supervision of activities to promote and maintain muscle strength and tolerance, (7) assistance to attend social activities outside the home environment. The ability of the OA to perform these above-mentioned activities were assessed in the areas of cognition, musculoskeletal, environmental setting, and family support. The assessment of deficits of the OA in these areas formed the basic structures of the CNAT.

The DNP project used the basic conditioning factors of SCDTN Model as the basic framework to determine the need for caregiver support in terms of ADLs. The universal and health deviation self-care requisites within the TSCD were the basis for the development of the clinical tool. For example, eating is an ADL, represented in the TSCD Model as the need for food and fluid intake. The OA may need CG support in the area of eating/feeding to ensure adequate food and fluid intake is maintained of life and good health per SCDTN Model.

Another universal self-care requisite was the need for mobility. This was composed of two integrated systems: safe environment and fall prevention. It was imperative that the OA and their family members understood the necessity for a safe environment when the OA was discharged from a SNF. A safe environment is identified as an area in which the OA could move about without the risk of injury. A caregiver could be needed to assist the OA in their mobility within a safe environment. The OA, family member, or responsible party needed to be knowledgeable of the fact that the OA

could require some level of supervision regarding their mobility within the home setting to be safe.

The second system entailed mobility in the prevention of falls. A fall was the number one cause of injury or death among OAs. Falls were the most frequent reason for hospitalizations (CDC, 2013). The need for fall prevention was vital among OAs, especially those with dementia who lacked awareness regarding safety concerns. Therefore, sufficient caregiver support in the area of mobility assisted in fall prevention.

Prior to SNF admission, most OAs were able to care for themselves. They engage in such SC activities as dressing, bathing, and toileting themselves. These SC activities require the coordination of purposeful and balanced activities of both upper and lower extremities and the OA's ability to recognize their own needs. These activities were impaired if the OA had limited use of his/her extremities or was cognitively deficient. Medical illnesses such as stroke with hemiparesis or cognitive impairment, and fractured extremities with weight bearing restrictions ultimately resulted in deficits in self-care (Ottenbacher et al., 2014). While at the SNF, the OA received skilled physical and occupational therapy in order to remediate their SC deficits. Once discharged to home, the OA may require additional CG support if they were not able to care for themselves in order to maintain their basic life needs.

In conclusion, the SCDTN Model provided the conceptual framework for the development of the clinical tool specifying the needs and quantity of CG support. This model was scientifically based, and outlined the basis for the argument of providing CG support to OAs when discharged to home from a SNF.

REVIEW OF LITERATURE

A literature review of the electronic databases of CINAHL, Medline, PubMed, and Google Scholar was used. Search terms included Orem theory in older adults, Orem theory, Orem, self-care deficit, self-care theory, self-care agency, self-care, therapeutic self-care demand, universal self-care requisites, nursing system and nursing agency. There was no timeframe limit placed in the gathering of articles regarding Orem's theory since it was first developed in 1950. Additional search terms for caregiver need consisted of: caregiver, U.S. older adult population, older adults, readmission within 30 days, hospital discharge of older adults, hospital readmission, 30- day readmission rate, ADL tool, and functional independence measure. The literature search was limited to 2008 to present in order to allow for the most up-to-date research available on the topic. Articles selected were limited to English language only.

There were 150 published research articles worldwide, which had utilized Orem's Self-Care Deficit Theory of Nursing with 89 published in US journals. Most of the research focused on the OA (30%), universal self-care requisites (1%), and nursing care agency (less than 1%). The articles addressed the use of the SCDTN Model within hospitals, primary care offices, home health and hospice care services, and long-term care settings. However, there were no articles based on the transitional care setting of SNFs (Biggs, 2008).

An analysis and evaluation of the selected articles provided the evidence to support the development of a clinical tool to assess the caregiver support needs of OAs when discharged to home from a SNF. This review of literature focused on the following topic areas: (a) the trends in SNF discharge of hospitalized OAs, (b) the factors

contributing to functional disability in OAs, (c) the association of functional disability and hospital readmission rates, (d) the assessment tool used to determine functional status and caregiver need for SNF discharge to home.

Trend of Hospital Discharge Destination for Older Adults

The number of OAs discharged to a SNF, rather than to home, has increased significantly in the last decade. Burke et al., (2015) studied the trend of hospital discharge in 386 million Medicare recipients from 1996 to 2000. The authors noted that the rate of discharges from acute hospital settings to post-acute care facilities had doubled in a 15-year time span (9.2% in 1996 to 13.2% in 2010). Mor, Intrator, Feng, and Grabowski (2010) examined the cost of 30-day hospital readmission from SNF among OAs. The authors identified that there was a significant increase in skilled care utilization among OAs following hospitalization from 1.3 million in 2000 to 1.79 million in 2006.

Hartholt, Stevens, Polinder, van der Cammen, and Patka (2011) demonstrated that there was an increase in the number of OAs who were hospitalized due to injuries related to falls from 2001 to 2008. Adults aged 75 and older, especially females, were more susceptible to fall with related injuries. Fracture and head contusion were the most frequent reasons for hospital admission among this population. An extensive literature review yielded one study, which identified that lower extremity fractures were one of the six largest diagnostic impairment categories of inpatient rehabilitation, such as skilled rehabilitation that occurs at SNFs (Ottenbacher et al., 2014). Overall, the number of OAs who sustained a fall related injuries were more likely to be admitted to a SNF for further skilled rehabilitation in order to regain prior functional status.

Contributing Factors of Functional Disability in Older Adults

Lin et al. (2012) studied the trends of functional disability among a cohort of OA from 1885 to 1940. The authors found that ADL disability increased with age, especially in OAs aged 80 and above. In addition, this study also confirmed the trend of early ADL disability in cohorts younger than 70, which could be attributed to the increase in ADL disability when these OAs moved into the older age cohort. Therefore, age was an important content domain of caregiver needs assessment among OAs.

Fall-related injuries such as fractures contributed to increased ADL disability in OAs. Wu et al. (2013) demonstrated that there was an increase in caregiver need for ADL support after fracture in a Taiwanese OA community. The study identified the most difficult caregiver tasks that were required for OA with hip fractures. The study showed that sit to stand, getting in and out of bed, bathing, dressing, toilet use, nighttime assistance, and safety monitoring were the areas of most significant need. Caregivers ranked basic ADL as the most difficult tasks to perform (e.g., transferring, bathing, dressing, and toileting). Fractured-related injuries impaired basic ADL functioning such as transfers (e.g., sit to stand, bed to chair). Thus, these basic ADL represented areas where caregiver need required an assessment of appropriate caregiver support.

Cognitive impairment appeared to be an indicator of functional disability. Diminished global cognitive functioning was shown to be associated with general functional disability; non-amnestic impairment was strongly correlated with health and safety (Bangen et al., 2010). Tao, Ellenbecker, Chen, Zhan, and Dalton (2012) studied the relationship between the cognitive functioning components of basic conditioning factors

of self-care agency. The authors concluded that higher cognitive functioning corresponded to lower functional disability.

In a retrospective study by Millan-Calenti et al. (2012) of 600 adults aged 65 and older regarding the association between cognitive status and functional dependence, they found that cognitive impairment was directly correlated to the dependence of functional status. This correlation provided the evidence that basic ADL functioning such as bathing, dressing, and toileting were increasingly affected by lower cognitive status. Another study conducted by Helvik, Selbaek, and Engedal (2013) of 365 OAs aged 65 to 98 found that cognitive impairment was associated with increased ADL disability one year after hospital discharge. Thus, cognitive impairment was a robust indicator for caregiver support when assessing caregiver needs for ADL.

Boyd et al. (2008) examined the recovery of ADL in OAs after hospitalization and found that OAs who sustained new or additional functional impairment had a worse recovery of functional status. Boyd et al. (2008) demonstrated that only 30% of OAs with new or additional functional disability regained their ADL baseline after one year. The authors also noted that the rate of recovery helped to predict overall recovery of ADL functional status. If an OA was able to recover their ADL functions within one month, healthcare providers could predict a strong recovery over a one-year period. Thus, hospitalization contributed to worsening ADL disability in OAs.

Functional Disability and Hospital Readmission

Functional impairment (i.e., ADL disability) had been identified as a major contributor to hospital readmission within 30 days of discharge (Fabbian et al., 2015; Garcia-Perez et al., 2011). Researchers have determined that an increased number of

ADL disability was a reliable predictor for an increase in a 30-day hospital readmission rate (Greysen et al., 2015; Hoyer et al., 2013). Greysen et al. (2015) found that OAs with more than three ADL disabilities had a higher hospital readmission rate (18.5%) in comparison with OAs who had fewer than three ADL disability (13.5%).

Hoyer et al. (2013) demonstrated that OAs with lower functional independent measurement scores (i.e., independence of performing ADL) had a higher rate of 30-day hospital readmission. The authors further identified that motor disability was the primary indicator for hospital readmission. Hoyer et al. (2013) attributed the impaired functional disability to a variety of reasons such as length of stay in the hospital, comorbidities, and deconditioning. They did not, however, identify that hospital readmission was specifically due to the lack of caregiver support in the areas of ADL functional deficits within the home setting. Greysen et al. (2015) found that the increased rate of hospital readmission was not only associated with functional disability, but also with comorbidity of chronic illnesses such as heart failure, pneumonia, and chronic obstructive pulmonary disease (COPD).

Boyd et al. (2008) found that ADL disability was a compelling predictor of hospital readmission, similar or equal to that of research findings with comorbidity of chronic diseases and fall-related fractures leading to hospital readmission. Consequently, OAs discharged from the hospital with functional ADL disability had higher hospital readmission rates. A Caregiver Need Assessment Tool, which accurately assessed the ADL needs and predicted the level of CG support needed, contributed to lower rates of hospital readmission and kept the OAs living in their own community environment.

Wolinsky et al. (2011) studied the long-term decline in ADL and IADL of OAs post hospitalization. They found that OAs experienced 36.6% ADL disability and 30.9% mobility disability two years after hospitalization. The authors also found that post hospitalization functional disability was the determining factor for future ADL disability. Older adults with higher occurrences of hospitalization endured greater ADL disability. The authors concluded that reducing hospitalization and re-hospitalization would contribute to decreasing ADL disability among OAs.

Assessment Tools Used For Caregiver Need Assessment

The Functional Independence Measurement (FIM) was used by clinicians to determine the level of independence of OAs in performing their ADLs (Young, Fan, Hebel, & Boulton, 2009). The FIM tool evaluated 18 activities and each activity was graded on a seven-point scale from 1 = totally unable to 7 = totally independent (Young et al., 2009). Furthermore, the FIM required the clinician to be trained and certified prior to the administration of the tool (Young et al., 2009). The complexity of the FIM made this tool difficult for use among OAs due to the high level of training required to administer it. In addition, it was difficult to interpret the results of the tool to the OAs. A search for the use of FIM in studies identifying the correlation between FIM score and caregiver quantification did not yield any result. The use of FIM did not help to quantify the amount or type of caregiver support needed in the home setting.

Katz Index of Independence in ADL (Katz ADL) was another tool used by clinicians since 1970 to assess functional status of OAs ("Katz Index of Independence in Activities of Daily Living (ADL)," 2007). The Katz ADL assessed the ability of OAs in six ADL areas: bathing, dressing, toileting, transferring, continence, and feeding. A 2-

point ordinal scale (1 = independence, 0 = dependence) was used to evaluate each ADL. A score of six indicated full function while a score of four was moderate functioning, and two was severe impairment. Although the Katz ADL has been used by many health care disciplines, it did not have a formal reliability and validity ratings ("Katz Index of Independence in Activities of Daily Living (ADL)," 2007). The Katz ADL determined the ADL needs in two discrete levels of either independence or dependence, allowing minimal flexibility of caregiver support determination. In addition, the Katz ADL did not elicit information regarding the type and level of caregiver support needed by the OAs in the home setting when the OA was discharged home from the SNF.

Fens et al. (2015) developed a new assessment tool called the Assessment Tool for Long-Term Consequences After Stroke (ACAS). The tool assessed the needs of patients post stroke. One limitation of this tool was that it predominately measured social factors and did not address the level of caregiver support for ADL deficits. According to Rothwell, Boaden, Bamford, and Tyrrell (2013), the Greater Manchester Stroke Assessment tool (GM-SAT) was a good tool for identifying the long-term needs of OAs post stroke. However, the GM-SAT only measured the met and unmet needs of OAs. The tool was a subjective measure and was not reliable for predicting CG need. The tool consists of 38 items ranging from medication management, to vision, and dental needs. Activities of daily living, mobility, and care and support needs were addressed using only three single items. The tool took 74 minutes to administer. The tool was designed to be administered in the home environment after the patients were home. This tool did not provide OAs with concrete information regarding the level and type of CG support that they would need in the home after stroke.

There was no universal or standardized tool to measure the level and type of CG support needed in the home setting when the OA was discharged home. There were a number of studies that identified ADL functional disability as contributing to hospital readmission rates among OAs. However, there was a lack of studies that examined the use of evidence-based clinical tools that quantify the level of CG support needed for ADL deficits when OAs were discharged from SNF to home. In addition, there was a lack of studies that evaluated the efficacy of caregiver support that OAs received within the home setting. This project targeted the lack of a clinical tool to evaluate the need of caregiver support in this population. The development of a Caregiver Need Assessment Tool (CNAT) was the focus of this project.

METHODS

The purpose of the project was to develop a clinical tool to assess CG needs for ADL disability among OAs transitioning to the home setting after SNF discharge. The CNAT was developed to assess the CG needs in order to determine the level and type of CG support. Content validity was established in order to ensure the domains represented the items that identified the CG needs. Content validity refers to the ability of the items to measure an intended construct (Polit & Beck, 2012; Waltz, Strickland, & Lenz, 2010). Content validity of an instrument is established by first determining the content validity index of the items (I-CVI), then the scale content (S-CVI) is validated based upon universal agreement or average among experts.

As recommended by Lynn (1987) and Polit and Beck (2012), construction of a tool must be processed through the necessary and progressive phases of validity in order to appropriately develop a tool with excellent content validity prior to testing it in the sample population. Thus, the CNAT was developed in four phases: (1) instrument design: determination of items representing the construct using conceptual framework and support from literature review, (2) determination of the item content validity index (I-CVI), (3) finalization of CNAT items based upon the result of I-CVI, and (4) determination of the I-CVI and scale content validity index (S-CVI) of the final CNAT.

Instrument Design

The first version of the CNAT consisted of a 22-item tool in which clinicians rated the OA's ability to engage in various ADLs and other factors related to these abilities. The 22 items represented the five domains of basic conditioning factors of the SCDTN Model. The five basic conditioning factors were: age, health state, family system

factors, patterns of living, and environmental factors. The five basic conditioning factors formed the structural background for the ADLs and the affecting factors of cognitive, social, and environmental concerns. An extensive literature search was conducted, and it was determined that the testable CNAT would not include gender, resource availability and adequacy because these factors were not supported in the literature. The age category of 85 and older was included in the CNAT. This helped to identify OAs who met criteria for the frail elderly category. This was identified as a factor impacting ADL disability (Brown et al., 2014; Buchman et al., 2014).

The health state domain evaluated the OA's cognition, musculoskeletal skills, and genitourinary system. Cognition was evaluated through the use of the Mini Cognitive Assessment Instrument (Mini-Cog). Musculoskeletal skills relates to mobility and movement. Genitourinary system included toilet management (i.e., toilet self-hygiene and self-clothing). The Mini Cog test was used to assess the cognition because it takes only two to four minutes to administer this test and the instrument has 98% specificity for identification of cognitive impairment (Simmons, Hartmann, & DeJoseph, 2011). Cognition was selected to be included in the testable CNAT because the literature review supported the effects of cognition on the ability of OAs to perform ADLs after hospitalization (Helvik et al., 2013; Millan-Calenti et al., 2012).

Family system factors were evaluated to consider the availability (at all times or some of the time) of CG support provided from family members or other social support systems (e.g., church and friends). Pattern of living encompassed two living arrangements: alone or with others (family member or non-family others). Environmental factors included the location of living quarters within the home (first or 2nd floor) and

presence of steps or stairs. Each item in the categories of age, cognition, and pattern of living were endorsed as either a yes or a no. A “yes” was equal to 1 point on the scale and a “no” was equal to 0. Each item of the health state assessed the frequency of the assistance needed for the OA to complete basic self-care activities. A four-point Likert scale (0 = never or seldom, 1 = sometimes or occasionally, 2 = most of the time, 3 = all the time) was used to identify the frequency of assistance needed by the OA (Polit & Beck, 2012). A total score was the summation of the 22-items on the scale.

The score total was categorized into score ranges to create a rubric. The score ranges indicated the level and type of CG support (full time or part time/formal or informal) the OA needed to be safe in the home. The CNAT used the summative score style because this system allowed a single score for each level of the required assistance needed for each individual item then the sum represented the conceptual theme of CG need (Waltz, Strickland, & Lenz, 2010). In this method, the larger the sum was an indication of a higher level of CG need and support.

The 4-point Likert scale of the frequency was used to assess CG need and quantity of CG support. The frequency measure allowed the evaluator to capture how often the OA needed assistance with ADL. Thus, the CG support level of either full-time (around the clock) or part-time (less than around the clock) was determined. The scoring rubric was based on the frequency scale with the sum total of more than 50% of the items receiving at least a 2 (most of the time) to 3 (all the time) on each item. This indicated that the OA needed full-time and formal CG support. The lower the sum total was an indication of lower level of assistance. Lower scores were an indication of the OA needing lower level and type of CG support, which was part-time and informal.

Informal CG support was usually a family member or other person who could provide non-paid assistance to the OA (Tao et al., 2012). These individuals did not have any formal training in providing care. Formal or paid caregivers received paid to assist OAs with ADL in the home setting. Paid caregivers were hired through a CG agency and had been screened in their abilities to provide the needed CG support for the OAs (Lindquist et al., 2012). There was no evidence-based literature to provide a definition of full-time or part-time caregiver. The definition of full-time and part-time CG were derived clinically from job sites, which identified full and part-time positions. A full-time position was 40 hours worked and part-time was less than 40 hours worked per week. Thus, the amount of CG support was labeled in a similar fashion.

The development process of the CNAT considered both the clinician and OAs as the target population. This was an important factor as it helped to determine the usability of the tool by the user. The readability of a measurement tool should match the reading level of the target population (Polit & Beck, 2012). Readability is defined as the objective measures of the ability of an individual to understand the material when reading the written text (Badarudeen & Sabharwal, 2010).

Many health organizations (e.g., National Institute of Health, American Medical Association) endorsed sixth-grade reading level as the highest readability of patient information for general population. The Centers of Disease Control and Prevention supported a lower than eighth-grade readability. In addition, readability of OA population was even lower than the general norm (Badarudeen & Sabharwal, 2010). Thus, the CNAT readability was established to be at the fifth to sixth-grade reading level to match the reading level of the intended OA population. The CNAT, similar to patient

information material, was assessed for the readability using the Microsoft Word function of “Readability Statistic” (Polit & Beck, 2012).

Expert Panel

In establishing the content validity of the tool, an expert panel of qualified practitioners was used to evaluate the tool items (Polit & Beck, 2012). A convenient expert panel was selected among the colleagues of this DNP candidate’s work site. The expert panel had 10 experts, which met the recommended number of judges for content validation. It was recommended that expert panels have a minimum of five experts but no more than 10 experts to decrease chance agreement (<5 experts) and chance disagreement (>10 expert) (Lynn, 1987; (Polit & Beck, 2006). The experts had 10 or more years of work related experience in the SNF setting. This expert panel met the recommended criteria with regards to credentials, clinical experience, knowledge of the key constructs and target population (Polit & Beck, 2012). The expert panel included two physicians, two advanced practice (one adult geriatric Nurse Practitioner, one Physician Assistant), two physical therapists, and two occupational therapists (see Table 1).

Table 1

Expert Panel Qualifications

Expert	Credential	Clinical experience	Knowledge of key construct and target population
A	Geriatrician	20 years at SNF	High
B	Family Practice physician	15 years at SNF	High
C	Physician Assistant	20 years at SNF	High
D	Adult Nurse Practitioner	20 years at SNF	High
E	Physical therapist	20 years in SNF	High
F	Physical therapist	15 years in SNF	High
G	Occupational therapist	15 years in SNF	High
H	Occupational therapist	12 years in SNF	High

Each expert member received a package of materials, which included a cover letter, a table with domain items, and a relevancy scale used for evaluating the content validity of each item. A sample of the CNAT guidelines was given to each expert, along with quantification of the level of CG support and score rubric, and space for the expert to make comments of the usability, understandability, and potential for predictability of the CNAT scale to measure the ADL. The cover letter introduced the purpose of the author's project, reasons, and implication for use of the CNAT. Each member of the expert panel rated each item of the tool on a relevancy scale of 0 to 4 with 4 = highly relevant, 3 = quite relevant, 2 = somewhat relevant, and 1 = not relevant. Their responses of relevancy were used to determine the content validity index of the testable CNAT.

Content Validity Index

There were two types of content validity indexes (CVI): item CVI (I-CVI) and scale CVI (S-CVI). The I-CVI was used both in the first and second phase to determine the validity of items to be presented on the CNAT. The S-CVI was used in the second

phase of tool development to confirm the content validity of the whole scale ((Denise F. Polit & Beck, 2012). It was highly recommended that tool developers reported all three types of content validity indexes and clearly denoted the specific types of index reported for the developed tool (D. F. Polit & Beck, 2006). A tool with I-CVI of .78 or higher and a S-CVI/UA of .90 or higher meets the requirement for an excellent content validity of a tool (Polit & Beck, 2012).

Content validity of the item was the proportion of the content to measure the given item with a relevance of 3 to 4 (i.e., quite relevant to highly relevant). Item CVI ranged from 0 to 1 with 1 representing the highest value. An item with I-CVI of 1 meant that all of the experts rated the relevancy as 3 to 4, indicating the item represented the construct (Polit & Beck, 2006). The I-CVI was calculated by first grouping the responses of “quite relevant (3) and highly relevant (4)” into one group, and the responses of “not relevant (1) and somewhat relevant (2)” into the second group. The I-CVI was then calculated by dividing the number of experts giving the item a score of 3 to 4 across the total number of experts. This resulted in an I-CVI score of .78 and above indicated high or acceptable relevancy (Polit & Beck, 2012), and the item was included in the final tool design.

The next step of content validity determination was the S-CVI. It was recommended that both types of scale CVI: universal agreement (S-CVI/UA) and averaging (S-CVI/AV) be used to determine the content validity of the tool (Denise F. Polit & Beck, 2012). The universal agreement S-CVI (S-CVI/UA) was the proportion of all experts that agreed on the I-CVI on the relevancy scale. The S-CVI/UA indicated the proportion of items rated as 3 to 4 by all of the experts. For example, if all of the experts

agreed on the I-CVI of 1 for four items out of the 10-item tool then the S-CVI/UA was .4. There was no specific cutoff values for S-CVI/UA. The mechanism from which the value was obtained (i.e., only items with I-CVI of 1) entailed a stringent process for scale content validity determination (Polit & Beck, 2012).

The S-CVI/AV was determined by averaging the mean of all acceptable I-CVIs (Polit & Beck, 2006). The cutoff value for S-CVI/AV was .90 or higher (Polit & Beck, 2012). The two types of S-CVI were calculated in the final phase of the tool development (Polit & Beck, 2012). The S-CVI was determined by using both the average and the universal agreement after the finalization of CNAT items based on the I-CVI results.

RESULTS

Content Validation Index

The item content validity of 22 items on the first version of CNAT were presented in Table 2. As shown, there were seven items that had high and acceptable I-CVI value of 1. The items which had an I-CVI of 1 included the Mini-Cog, getting in & out of bed, ability to sit to stand, living alone, living with others, requiring help from family, and help from others. There were six items with the second highest value of I-CVI of .88: feeding, walking, upper body dressing, lower body dressing, toilet self-cleaning, and toilet self-clothing. There were five items with the third highest I-CVI values of .75 that included: verbal cues for safety, meal tray preparation, wheelchair operation, upper body bathing, and lower body bathing. There were three items with the fourth highest I-CVI of .63 and included: age, steps, stairs, and 2nd floor living. Grooming had the lowest I-CVI value of .50.

Finalization of the CNAT

After determination of the I-CVI, the DNP candidate proceeded to the next step of tool finalization. Items with the lowest I-CVI such as grooming (.50) and age (.63) were eliminated from the tool. Items with third lowest I-CVI of .75, which included: meal tray preparation, wheelchair operation were also eliminated as the cutoff values for I-CVI were .78. However, stairs, steps, and 2nd floor living items remained in the tool despite having unacceptable I-CVI of .63 as these items related to environmental factors. Verbal cues for safety item was also not removed from the first version of the tool as it was highly related to cognition and safety. Upper body and lower body bathing items were combined as the experts had recommended. Bathing items were not eliminated as they

were part of the ADL and needed to remain on the scale. Meal tray preparation item also had I-CVI of .75 and was limited because it related to instrumental ADLs rather than a specific ADL.

Table 2

I-CVI of the First Version of CNAT

Item(s)	Item identification	Relevant (rating 3 or 4)	Not relevant (rating 1 or 2)	I-CVI	Interpretation
1	>85 year old	5	3	.63	unacceptable
2	Mini-Cog score of 1-2 with abnormal clock drawing test	8	0	1	acceptable
3	Verbal cues for safety	6	2	0.75	unacceptable
4	Grooming	4	4	0.50	unacceptable
5	Feeding	7	1	0.88	acceptable
6	Meal tray preparation	6	2	0.75	unacceptable
7	In & out of bed	8	0	1	acceptable
8	Sit to stand	8	0	1	acceptable
9	Walking	7	1	.88	acceptable
10	W/C operation	6	2	.75	unacceptable
11	Upper body dressing	7	1	.88	acceptable
12	Lower body dressing	7	1	.88	acceptable
13	Toilet self-cleaning	7	1	.88	acceptable
14	Toilet self-clothing	7	1	.88	acceptable
15	Upper body bathing	6	2	.75	unacceptable
16	Lower body bathing	6	2	.75	unacceptable
17	Steps	5	3	.63	unacceptable
18	Stair/2nd floor living	5	3	.63	unacceptable
19	Living alone	8	0	1	acceptable
20	Living with other(s)	8	0	1	acceptable
21	Help from family	8	0	1	acceptable
22	Help from other (s0	8	0	1	acceptable

Note. W/C: wheelchair. Relevant (rating 3 or 4): number of experts rated the item relevancy of 3 or 4. Not relevant (rating 1 or 2): number of experts rated the item relevancy of 1 or 2. Acceptable item: I-CVI \geq .78. Unacceptable item: I-CVI $<$.78.

The elimination of items with low I-CVI resulted in a second version of the CNAT with 15 items. The tool format was also categorized into three separate sections based on the recommendation of two experts to decrease confusion and increase usability. The second version of the CNAT was sent to six of the ten experts of the original expert panel for evaluation of item relevancy. The second expert panel consisted of six experts: one physician, one Physician Assistant, two physical therapists, and two occupational therapists. The proportion of the items rated with a relevance of 3 or 4 by each expert from the first expert panel was calculated. Three experts with proportions similar in range of 90% to 95% and three experts with proportion of similarity in a range of 65% to 77% were invited back for second assessment of content validity.

Each member of the second expert panel again received a package with the introductory letter asking them to rate the items on a one to four relevancy scale. The second version CNAT had three separate sections based on the recommendation of the expert panel during the evaluation of the first version of CNAT. The expert panel was requested to comment on the usability, understandability, and potential for predictability of the tool, and how these items may be improved. The I-CVIs of the second version of the CNAT were calculated using the same method in the first version phase as seen on Table 3. Experts endorsed the tool format of the second CNAT version, which consisted of one single table separated into three sections. The experts agreed that this arrangement decreased confusion and provided a clearer profile of the OA in relation to caregiver needs in the home setting.

Table 3

I-CVI of the Second Version of CNAT

Item(s)	Item verification	Relevant (rating 3 or 4)	Not relevant (rating 1 or 2)	I-CVI	Interpretation
1	Mini-Cog 1-2 with abnormal clock drawing test	4	2	.67	Unacceptable
2	Verbal cues for safety	5	1	.83	Acceptable
3	Feeding	8	1	.83	Acceptable
4	In and out of bed	6	0	1	Acceptable
5	Sit to stand	6	0	1	Acceptable
6	Walking	6	0	1	Acceptable
7	Upper body dressing	5	1	.83	Acceptable
8	Lower body dressing	6	0	1	Acceptable
9	Toilet self-cleaning	6	0	1	Acceptable
10	Toilet self-hygiene	6	0	1	Acceptable
11	Bathing	4	2	.67	Unacceptable
12	Steps/stair/2nd floor living	5	1	.83	Acceptable
13	Living alone	6	0	1	Acceptable
14	Help from family	6	0	1	Acceptable
15	Help from other	6	0	1	Acceptable

Item number 1 (Mini-Cog 1-2 with abnormal clock drawing test) and 11 (bathing) were removed from the revised CNAT due to the I-CVI value being below the cutoff value of a valid I-CVI of .78 as rated by the six-member expert panel. The final version of CNAT included 13 items in three separate sections. The S-CVI/UA was calculated that nine out of 13 items had the I-CVI of 1 to be equal .69. The S-CVI/AV was calculated by averaging all of the I-CVIs and the result was 0.93. The final version CNAT now had 13 items with I-CVI above .83 (above cutoff values of .78), S-CVI/UA of .69, and S-CVI/AV of .95 (above cutoff value of .90) which showed that the revised CNAT had excellent content validity and was ready to be tested for quantitative content validity on a sample population.

The readability of the CNAT was calculated using the “Readability Statistic” function of the Microsoft Word program. The Flesch Reading Ease was 39.3 and the Flesch Kincaid grade level was 10.3. The Flesch Reading Ease of the individual items of each section was 51 and the Flesch Kincaid grade level was seven.

The experts provided rich comments regarding the tool. One expert commented that the use of this tool may “address the specific education and training needs of family caregivers to reduce the adverse consequences of care giving and readmission to the hospital or SNF such tool can provide better assessment and plan of patient’s caregiver needs, leading to higher quality of care for the patient.” On the other hand, one expert stated that the CNAT would help to identify CG needs, which will better prepare the patient and their family for the home setting, thus lowering their level of stress, which can lead to better outcomes for home management.

Most experts agreed on the usability of the CNAT. One expert stated that “Scoring is helpful for families to plan where caregivers can only be family members (informal) or someone with experience (i.e., hired caregiver from agency). This information will also assist with financial planning.” Four experts provided useful comments regarding the understandability of the CNAT. They noted some confusion regarding the format and display of the tool. They indicated that the yes/no items should be separated from items using the frequency scale. Three experts recommended that items such as stair/steps and 2nd floor be collapsed into the same question as the requirements were similar.

Four experts recommended the addition of the assistance scale (e.g. 1-4 for 25% to 100%) to determine the level of assistance needed by the OA. This scale enhanced the

predictability of the tool in relation to the quantity and type of CG support needed to meet the OA's needs. The assistance scale would add additional points to the sum total and enhance the quantification accuracy of CG type of formal or informal. One expert also recommended to clarify the formal CG as "paid CG" to increase understanding of the concept. As a result, the revised CNAT included "Level of Assistance" category using a scale from 1 to 4 with $1 \leq 25\%$, $2 \leq 50\%$, $3 \leq 75\%$, and $4 \leq 100\%$. An assistance level from 3 to 4 indicated a higher assistance level from CG which contributed to a scoring range for most likely formal/paid and full-time CG support. The final version of the CNAT was included in Appendix A.

DISCUSSION

The CNAT followed the structural framework of the SCDTN Model. The use of the SDTN model fit well into the design of the tool as it indicated that the CG need encompassed most of the factors in the basic conditioning factors of the SC agency. The CNAT demonstrated that OAs impaired in their basic conditioning factors resulted in self-care deficits. Thus, the clinician who has obtained an accurate assessment of CG needs and determined sufficient CG support can enable the OA to maintain life and health in the home setting. It is important to note that the total score of the CG as indicated by the score rubric did determine the type and level of CG support systems. It showed the relationship between ADL disability or deficits in basic conditioning factors of the OA needing higher CG support system in order to maintain health and life.

The final CNAT composed of 13 items. This was 60% of the original items on the testable version. There were nine out of the 13 items with an I-CVI of 1, meaning that nine of the 13 items were perceived to have high relevancy by the experts. This was about 70% of the items on the CNAT. This was a high number for the universal scale CVI, which had been perceived by researchers as stringent (Polit & Beck, 2012).

There were nine items eliminated from the first version of the CNAT due to their low I-CVI results. This helped to increase the content validity of the scale. Bathing received unacceptable I-CVI values in both rounds and was not included in final CNAT. In addition, the bathing item received a low score in the first round but was included in the second version but again was eliminated due to low I-CVI of .63. Bathing received the lowest score of relevancy from all four physical and occupation therapists in both elimination rounds. This was not consistent with the research, since bathing has always

been a part of ADL tools constructed in the past. In the present project, the experts did not perceive it as an item with high priority for CG need for this activity. This may bring attention to the fact that bathing may be considered an activity of daily living for other age groups but not a significant factor for OAs.

Another interesting finding was the elimination of item #2 on the Mini-Cog for those who received a score of 1 to 2 points with abnormal clock drawing. This item received an I-CVI score of 1 during the first round but only .67 in the second round. This result indicated that a test of memory and executive function with a specificity of 98% for cognitive impairment did not prove to be superior over the frequency and level of “verbal cues for safety” to assess a patient’s awareness of their own safety in the home environment.

Another notable point was the inclusion of environment, family system, and pattern of living. There were three out of seven of the basic conditioning factors that aligned with the key construct of caregiver needs showing that caregiver need was a complex concept not only for examining ADLs but also for other factors affecting the ability to care for oneself as explained by Orem (1970) many decades ago.

The final version of the CNAT composed of 13 items separated into three sections. The final CNAT had a readability of a tenth-grade level, by which was higher than the recommended level of sixth to eighth-grade level of reading. This reading level will not have a significant impact on the OA as the tool will always be interpreted by the clinicians. The OA will receive counsel while the clinicians explains the results to them. On the other hand, the seventh-grade readability of the CNAT would help the OA to read and understand the tool, and increase its usability. The seventh-grade reading level and

the low number of items reflected that the CNAT met one of the goals of this project in developing a user-friendly tool for the target population of older adults.

Limitations

The expert panel that determined the content validity consisted of the colleagues who worked with the DNP candidate at the same SNF in which the CNAT was developed and evaluated. Thus, their opinions were specific to the OAs at the SNF rather than the general population of OAs. There was limited representation of work settings in the expert panel. The expert panel consisted of members from only one SNF setting. The opinions of experts from different work settings such as hospital, or acute rehabilitation may provide a diversified point of view on the item relevancy. There was no nurse case manager, who greatly involved inpatient's discharge planning process, in the expert panel, which would have added to the richness of the opinions on the item relevancy.

The tool did not address activities related to housekeeping and medication management. These activities also factored into the maintenance of life and health. In addition, the tool did not address the level of assistance provided from family members. As family members may also have physical and medical limitations in their ability to provide caregiver support. The tool did not include a measure for prior functional status of the OAs, which may have helped in understanding the need for caregiver support due to increased ADL disability. This additional information would have demonstrated to the OA the need for caregiver support in the home setting. The predictability of the tool to determine the level and type of CG support was based upon the rubric. The rubric was not validated. However, a pilot project will be implemented to determine its validity. In

addition, the tool tenth-grade readability may limit its independent usability of the OAs. Future improvement of a lower grade reading level may enhance the CNAT usability.

Future Implications

The next step in the development of the CNAT is to test it on a large sample population to evaluate its quantitative assessment of the items and to assess the scale's psychometric adequacy. Testing the tool in a sample population will allow for the determination for ease of administration. Testing the CNAT in a sample population can also assess the predictability of the tool and validate the scoring rubric. The tool will be beneficial for health care clinicians and OAs if it is proven to have high predictability, thus making it a useful tool. The CNAT will also need to be assessed for reliability (i.e., stability (test-retest reliability), internal consistency (i.e., Cronbach alpha), and equivalency (i.e., interrater reliability). The use of the CNAT will not be limited for use with OAs discharged from the SNF to home, but will also be used in a variety of settings where the need for caregiver support for ADL disability is required.

In conclusion, the development of the tool provided a standardized method of assisting clinicians (e.g., master and doctorate prepared advanced practice nurse practitioners) and nurse case managers to assess CG need and determine CG support. As the longevity of the US OA population and ADL disability increases, it is extremely important for the health care and other affiliate systems to focus on the significance of an appropriate caregiver support system. This enables the OA to stay within the home setting.

The CNAT is an easy and user-friendly tool. Both the clinician and the OA can utilize it to assess the CG needs and determine the level of CG support. By supporting an

appropriate CG support system, the CNAT improves the quality of life for the OAs. In addition, the CNAT may help to decrease hospital readmission and further ADL disability by providing the CG supports needed in the home. The utilization of the CNAT by integrated health care clinicians contributes to the overall health of the OA population.

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APPENDIX

CAREGIVER NEED ASSESSMENT TOOL (CNAT)

Please complete each section.

1. Please check the items that describe the patient

		Yes (1)	No (0)
1	Living Alone		
2	Stair/Step And Two-story home		
	Sum Total of Yes		

2. Please enter the number associated with the frequency and level of assistance needed for each activity.

	Items	Almost Never (0)	Sometimes (1)	Most of the Time (2)	All of the Time (3)	Level of Assistance (1-4)	Total
1	Verbal cues for safety						
2	Eating						
3	In & Out of bed						
4	Sit to Stand						
5	Walking						
6	Upper body dressing						
7	Lower body dressing						
8	Toilet self- clothing						
9	Toilet self- cleaning						
	Sum Total						

Note. Level of Assistance: 1 ≤ 25%; 2 ≤ 50%; 3 ≤ 75%; 4 ≤ 100%.

3. Please enter the number associated with level of help that is currently available to this patient.

	Items	Almost Never (3)	Sometimes (2)	Most of the Time (1)	All of the Time (0)	Total
1	Help from family					
2	Help from others					
Sum Total						

Sum Totals for Each Section of the Tool	
The sum total from section 1	
The sum total from section 2	
The sum total from section 3	
Sum Total	

Guidelines

Full time (F/T) caregiver: 24 hrs/day

Part time (P/T) caregiver: Less than 10 hrs/day (can be in blocked time)

Formal caregiver: Paid caregiver from caregiver agency.

Informal caregiver: Family member, friends, neighbor, not hired from caregiver agency.

Scoring Rubric				
Scoring Ranges	Full time caregiver	Part time caregiver	Informal caregiver	Formal/Paid caregiver
1-20		X	X	
21-34		X		X
35-50	X		X	
51-67	X			X

Score Rubric Rationale

1-20: Score 1 to 0 for each item of all sections: lowest frequency and level of assistance: part-time and informal caregiver like family member who can provide up to 50% of assistance.

21-34: Score of 1 to 2 for each items of all sections: slight higher level of frequency or level of assistance: part-time and formal caregiver needed.

35-50: Score of 1 to 3 for each item of all sections: increased level of help frequency and assistance: full-time and informal caregiver.

51-67: Score of 3 to 4 for each item of all section: full-time and formal caregiver.