Development and Validation of a Self-Care Ability Measure

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Self-care is an outcome of nursing care that is instrumental for promoting recovery and preventing complications following hospitalization. The Therapeutic Self-Care (TSC) measure was developed to assess self-care ability in acute-care settings. Its content was derived from a conceptualization of self-care generated from an extensive literature review. Clinical experts considered the 13 items of the TSC measure as relevant, supporting its content validity. Findings of 1 study indicate that the items are internally consistent and loaded on 1 factor. The TSC scores correlate with relevant concepts. The TSC measure quantifies patients' perceived ability for self-care, operationalized in behaviours related to taking medications, recognizing and managing symptoms, carrying out activities of daily living, and managing changes in condition. It can be used to guide and evaluate nursing care.

Keywords: self-care, measure, acute care, content validity, internal consistency reliability, construct validity, conceptualization

Résumé

Élaboration et validation d'un instrument de mesure de la capacité d'autogestion des soins

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L'autogestion des soins est un résultat de soins infirmiers déterminant pour le rétablissement du patient et la prévention des complications après une hospita-lisation. Dans le but d'évaluer la capacité d'autogestion dans un contexte de soins actifs, nous avons élaboré un instrument de mesure appelé Therapeutic Self-Care (TSC). Son contenu est dérivé d'une conceptualisation de l'autogestion fondée sur une vaste synthèse de la recherche sur le sujet. Des experts cliniques ont confirmé la pertinence de ses 13 items et corroboré la validité de son contenu. Une étude a montré que les items ont une cohérence interne et sont représentés par un seul facteur. Les scores corrèlent avec les concepts pertinents. L'instrument quantifie la capacité d'autogestion des soins telle que perçue par le patient, opérationnalisée notamment dans les comportements touchant la prise des médicaments, la reconnaissance des symptômes et leur gestion, l'exécution des activités de la vie quotidienne et la modification de l'état de santé. Il peut servir à guider la prestation des soins infirmiers et à évaluer celle-ci.

Mots clés : autogestion des soins, mesure, soins actifs, validité de contenu, fiabilité de la cohérence interne, validité conceptuelle, conceptualisation

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Introduction

Within the context of current changes in the health-care system, self-care, or self-management, represents an important component and outcome of nursing care (Dodd & Miaskowski, 2000). The emphasis on responsible cost-containment imposes a reduction in the length of hospital stays for patients presenting with acute illnesses or exacerbation of chronic diseases and comorbid chronic conditions. Nurses attending to patients admitted to acute-care units for the management of acute and chronic conditions are in a position to plan, initiate, and implement interventions as well as coordinate services to promote patients' ability to care for themselves at home after discharge. Nurses need to assess patients' perceived self-care ability in order to determine the effectiveness of the interventions they provide to enhance this outcome and the patients' readiness to engage appropriately in self-care activities once discharged home. Whereas self-report instruments are available to assess self-care ability, their content is usually disease-specific; it covers self-care activities that patients with particular conditions such as type 2 diabetes and heart failure are expected to perform. The Therapeutic Self-Care (TSC) measure is a generic measure of self-care ability that can be administered to patients admitted to hospital with a variety of acute medical and surgical conditions. Its development and initial psychometric evaluation are described in this article.

Background

Self-care is viewed as a process underlying the performance of health-related activities. The process involves the recognition of changes in a health condition that require remediation and the selection of and engagement in activities to address these changes (Sidani, 2011). The ultimate goal is to maintain an acceptable level of functioning, thereby preventing illness or complications and promoting health and well-being. The self-care process is initiated by the individual independently or in collaboration with nurses.

Self-care forms an active element of nursing interventions, including self-management education and cognitive-behavioural therapy (e.g., Grady, 2008; Kendall et al., 2007; Sit, Yip, Ko, Gun, & Lee, 2007). The interventions consist of providing persons with information and opportunities to apply strategies and activities aimed at enhancing their capacity to engage meaningfully in health-care decision-making and their ability to follow treatment recommendations. In acute-care inpatient units, nurses assume primary responsibility for patient education. As part of discharge planning, education involves informing patients about their condition and its treatment and instructing them in self-monitoring to

identify changes in their condition and symptoms indicative of post-
acute complications. Specifically, self-care education focuses on the fol-
lowing: appropriately interpreting the meaning of changes in overall
status and in symptoms, carefully assessing the suitability of alternative
strategies or activities for managing changes in status and symptoms,
selecting and properly carrying out self-care strategies or activities, and
engaging in the recommended activities to maintain physical and psy-
chosocial functioning over the post-acute recovery period. Patient edu-
cation during hospitalization is expected to enhance ability to engage in
self-care at home post–discharge. Improvement in self-care ability is crit-
ical for the successful management of the presenting acute condition and
possible comorbid conditions following discharge. Successful manage-
ment of acute and comorbid conditions contributes to the prevention of
complications, uneventful recovery, and preservation of acceptable levels
of functioning; in turn, these benefits reduce the burden of illness on
patients, such as increased time off work, and on the health–care system,
such as inappropriate health–care utilization (Doran et al., 2006; Kreulen
& Braden, 2004; Sidani, 2011).

    As an outcome of nursing care and a mediator of recovery from acute
conditions or exacerbations of chronic diseases, patients' self-care ability
should be systematically assessed within the inpatient context. Assessment
of patients' perceptions of their self-care ability, done at discharge, is
useful in determining the effectiveness of educational interventions deliv-
ered by nurses to promote their capacity to manage the post-acute con-
dition at home. Multiple self-report instruments are available to measure
self-care ability and actual performance (Sidani, 2011). Most were devel-
oped to assess sets of self-care activities or behaviours that a particular
patient population is expected to perform (Vrijhoef, Diederiks, &
Spreeuwenberg, 2000). For instance, some instruments assess the extent
to which healthy individuals engage in health promotion behaviours,
including exercise and healthy eating, such as the Personal Lifestyle
Questionnaire by Nicholas (1993). Others operationalize self–care as the
performance of usual activities of daily living such as the Inventory of
Adult Behavior (Kreulen & Braden, 2004). Several measures focus on
self-care activities specific to patients with different diseases. They capture
the use of strategies or the implementation of treatment recommenda-
tions for the management of chronic conditions such as asthma and
chronic pulmonary disease (Rootmensen et al., 2008), diabetes (Toobert,
Hampson, & Glasgow, 2000), heart failure (Baker et al., 2005; Riegel, Lee,
Dickson, & Carlson, 2009), arthritis (Lorig et al., 1996), and hypertension
(Chen, Tsai, & Lee, 2009). These measures are not relevant for assessing
the self-care ability of patients admitted for the medical or surgical man-
agement of a variety of acute and chronic conditions. The self-care activ-

ities that they capture are not expected of patients in the post-acute recovery period. For instance, patients recovering from surgery cannot reasonably be expected to engage in exercise programs following discharge. A generic measure of self-care ability is needed to enable nurses to assess this outcome, prior to discharge, as a means of documenting the effectiveness of nursing care or educational interventions in preparing patients to manage their condition at home.

The TSC measure is a generic measure of self-care ability as perceived by patients admitted for the medical or surgical management of acute conditions. The conceptualization of self-care ability that guided its development is reviewed. The development and content of the measure are described. The results evaluating its content validity, internal consistency reliability, and construct validity are summarized.

Conceptualization of Self–Care Ability

The conceptualization of self-care is derived from the results of a concept analysis (Sidani, 2011) clarifying the distinction between two interrelated concepts: self-care behaviour and self-care ability. Self-care behaviour refers to the actual performance of activities for the purpose of maintaining healthy functioning and treatment recommendations for managing an illness or disease. Self-care ability reflects the capacity to engage in self-care behaviour. It rests on an adequate understanding of the health condition, identification of alterations in functioning, and knowledge of activities that are appropriate in promoting health and in addressing changes in functioning. Self-care ability denotes perceived capabilities for recognizing changes in functioning, assessing the appropriateness of strategies or activities to manage these changes, selecting relevant activities, and performing the selected activities. Accordingly, the operationalization of this concept focuses on perceived ability to engage in self-care activities.

In the context of acute illness or acute exacerbation of chronic conditions treated in acute-care inpatient units, patients are expected to acquire the ability to (1) recognize symptoms or changes in condition, particularly those indicative of complications; (2) identify, select, and implement relevant strategies or activities to successfully and promptly manage the changes; (3) carry out the recommended treatment regimen; and (4) resume usual activities. Four categories of factors have been hypothesized to influence self-care ability. The first is cognitive factors such as cognitive function and knowledge of the illness condition, its treatment, and self-care strategies (e.g., Zambrowski, 2008). The second comprises psychosocial factors, of which perceived self-efficacy and social support are consistently reported to be associated with self-care (e.g., Jenerette & Murdaugh, 2008). The third entails physical factors, primarily

movement or disability levels (e.g., Zambrowski, 2008). The fourth is demographic factors, notably age and gender (e.g., Rodeman, Conn, & Rose, 1995). Perceived self-care ability facilitates engagement in self-care behaviours. Performance of these behaviours contributes to the prevention of complications and the promotion of uneventful recovery, and subsequently maintenance of physical and psychosocial functioning (Kimberly, 1997; Leveille et al., 1998).

Development of the Therapeutic Self-Care Measure

The conceptualization and operationalization of perceived self-care ability presented above guided development of the TSC measure. Development of the measure proceeded according to four steps, reflecting the deductive approach to item generation.

The first step consisted of delineating the target population and the context in which self-care is assessed. The focus was adults admitted to hospital for the surgical or medical management of acute conditions or exacerbations of chronic diseases.

The second step involved identifying the aspects of self-care and specific activities that are relevant to the target population and are to be captured. Pertinent information was obtained from empirical and experiential evidence. Adults admitted for the surgical or medical management of an acute condition are expected to have the ability to manage the symptoms and changes in condition associated with their illness and its treatment, to recognize and prevent complications, and to maintain or improve physical and psychosocial functioning (Jenerette & Murdaugh, 2008; Kreulen & Braden, 2004). Nursing care is directed at assisting hospitalized patients to acquire the knowledge needed to improve their ability to engage in relevant self-care activities in the post-discharge period. Activities relevant to this period include implementing the treatment recommendations, monitoring and recognizing symptoms and changes in condition, managing these symptoms and changes, and carrying out usual activities of daily living (Barroso, 1995; Jaarsma et al., 2000). The TSC measure was designed to assess patients' perceived ability to engage in self-care at home post-discharge. Hospitalized patients often do not have an opportunity to perform self-care behaviours to their full extent; however, they should acquire the ability to do so once they are on their own, at home. High levels of self-care ability translate into appropriate performance of self-care activities (Orem, 2001). Consistent with the identified self-care activities relevant to the post-discharge period, the TSC measure captures the categories applicable to different acute conditions, as follows: taking medications as prescribed, recognizing and managing symptoms, carrying out activities of daily living, and man-

Category / Item	Mean	SD	Item–Total r	Factor Loading
Table 1 *Results of Item Analysis*				
Taking medications				
Knowing medications to take	4.5	1.2	.49	.56
Understanding purpose of medications	4.6	1.1	.58	.68
Taking medications as recommended	4.9	0.9	.59	.63
Recognizing and managing symptoms				
Recognizing symptoms	4.5	1.0	.51	.56
Understanding reasons for symptoms	4.4	1.1	.60	.65
Knowing how to manage symptoms	4.1	1.3	.68	.72
Carrying out treatment recommendations to manage symptoms	4.1	1.3	.70	.75
Carrying out treatment recommendations to avoid symptoms	4.1	1.3	.67	.74
Carrying out activities of daily living				
Getting help, as needed, to carry out activities of daily living	4.7	1.0	.50	.56
Performing activities of daily living	3.5	1.5	.47	.52
Taking care of self	3.9	1.4	.57	.61
Managing changes in condition				
Getting help in case of emergency	4.8	0.9	.51	.57
Adjusting activities of daily living in relation to symptoms	4.1	1.3	.61	.64

aging changes in condition. The specific activities within each category are presented in Table 1.

The third step was generating items to assess the 13 specific activities. The item statement illustrated knowledge about or ability to engage in relevant behaviours. The language was simplified and lay words were used to clarify the meaning of some terms. The activities were described in general terms to make them relevant and applicable to patients with different conditions. For instance, *knowing how to control symptoms* was stated as "I know what to do to control changes in my body (symptoms)" and *taking medications* was stated as "I am able to take the medications as prescribed."

The last step in developing the TSC measure was selecting the dimension to be assessed and the respective response options. To be consistent with the operationalization of self-care ability, the dimension measured by the TSC is level of self-care ability as perceived by patients.

A numeric rating scale was used, anchored with *not at all* (0) and *very much so* (6). High scores indicated high levels of self-care ability.

Content Validity

An adapted group cognitive interview technique (Oremus, Cosby, & Wolfson, 2005) was used to examine the relevance of the self-care activities captured by the TSC measure in the context of acute-care inpatient settings and to validate their applicability to patients admitted for the management of different conditions. The group sessions were conducted with staff nurses employed in general medical and surgical inpatient units. Nurses are in a position to judge the relevance of the self-care activities captured by the TSC measure to different inpatient populations (Schilling et al., 2007). They plan and implement interventions to enhance self-care ability and can use the measure to assess self-care ability of patients assigned to their care.

Research Methods

Five group sessions were held with nurses working in university-affiliated and community hospitals. Each session was attended by three to six nurses, for a total of 35. The small number of nurses in each session promoted meaningful participation of individual nurses and group agreement on the relevance and applicability of the self-care activities (Krueger & Casey, 2009). The sessions were semi-structured. After describing the task at hand, the moderator read an item of the TSC measure and requested participants to reiterate, in their own words, the content (i.e., specific self-care activity) conveyed. This step is a means for exploring comprehension of the item. The moderator then engaged the nurses in a discussion of the activity's relevance in capturing patients' self-care ability at discharge and its applicability to a variety of inpatient populations.

The study protocol was approved by the university's Research Ethics Board. With participants' consent, the group sessions were audiorecorded and transcribed verbatim. The transcripts were content analyzed to determine nurses' qualitative judgement of the items' relevance in reflecting self-care ability related to activities in which patients with various acute conditions are expected to engage at home post-discharge. The content analysis was done first at the level of each group session and then across all sessions.

Results

In general, nurses found the three activities operationalizing the self-care category of *taking medications* as prescribed to be relevant and applicable

to patients receiving surgical or medical treatment for different acute conditions and exacerbations of chronic conditions. They agreed that the items' content is clear, simple, and easy to understand. Nurses indicated that the five activities pertaining to *recognition and management of symptoms* are relevant and applicable. The items' content was judged as comprehensible; however, they suggested use of the word "manage" instead of "control" with respect to symptoms. Nurses considered the three activities representing the self-care category of *carrying out activities of daily living* to be relevant and applicable. Finally, they agreed that the two activities reflecting the category of *managing changes in condition* to be relevant and applicable and the respective items easy to understand.

Overall, the results of the cognitive group sessions indicate that nurses were in agreement about the relevance of the activities in assessing the self-care ability of patients at discharge from hospital. The findings validated the content of the 13 items forming the TSC measure. Based on nurses' feedback, the word "control" was changed to "manage" in the respective items. The revised 13-item scale was subjected to psychometric testing.

Psychometric Evaluation

The initial psychometric evaluation of the TSC measure focused on examination of its internal consistency reliability, factorial structure, and construct validity. The psychometric properties were evaluated in a study of the effects of changes in nursing staff-mix complement (i.e., introduction of registered practical nurses and patient care assistants) and the nursing care delivery model (i.e., introduction of care leader role to coordinate patient care) on nurses and patient outcomes (Irvine Doran, Sidani, Keatings, & Doidge, 2002). Significant associations between the TSC and relevant concepts (i.e., receipt of patient education, physical and psychological factors) were evidence supporting construct validity.

Study Design

A cross-sectional design was used. Eligible patients completed the TSC measure and items assessing related concepts (receipt of patient education, physical and psychological factors) within 24 to 48 hours prior to discharge. This time frame for assessing self-care ability is consistent with its conceptualization and is appropriate to determine whether patients have the capacity to engage in self-management at home post-hospitalization. Staff nurses helped the research assistants to identify eligible patients and to explore patients' interest in the study. The research assistants described the study to interested patients, addressed their questions, obtained their written consent, and made arrangements for data collec-

tion prior to the expected day of discharge. The study protocol was approved by the Research Ethics Board at the participating site and the University of Toronto.

Setting and Sample

The study was conducted on medical, surgical, and cardiac inpatient units in a tertiary-care hospital located in a large city. Patients were eligible if they were at least 21 years of age, English-speaking, and cognitively intact (as ascertained by nursing staff), were admitted to a general medical, general surgical, or specialized (e.g., cardiology, oncology, orthopedic) unit, and had a hospital stay of more than 48 hours. A total of 396 patients completed the questionnaire. The sample size exceeded the 10 cases per item required for internal consistency and factor analysis (Streiner & Norman, 2008).

Variables and Measures

Demographic characteristics (age, sex, marital status, education) were assessed by means of standard questions. Self-care ability was measured using the 13-item TSC measure. Receipt of education was assessed using one item; patients reported whether or not nurses instructed them in how to take care of themselves. Physical factors included functional status and experience of a physical symptom (pain). Functional status was measured using four items adapted from Cassard, Weisman, Gordon, and Wong (1994) and inquiring about their perceived readiness to resume usual activities (e.g., return to work, activities of daily living such as bathing, and visits with family and friends); the items were internally consistent (Cronbach's alpha = .89) in this study. The physical symptom was pain, which was assessed using a one-item numeric rating scale. The psychological factors related to the four states of anxiety, depression, confusion, and anger. They were measured using items developed by Sutherland, Lockwood, and Cunningham (1989).

Analysis

Descriptive statistics were used to describe the patients' demographic profile, responses to the TSC items, and levels for relevant concepts. To test internal consistency reliability, the corrected item-to-total correlation coefficient and the Cronbach's alpha coefficient were computed. Inter-item correlation coefficients were reviewed for redundancy ($r > .85$) among items. Item-to-total correlation coefficients $> .30$ and alpha coefficient $\geq .70$ supported the TSC measure's internal consistency reliability. Factorial structure was examined using exploratory factor analysis. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was $\geq .60$, indicating suitability of the data for factor analysis. The principal axis fac-

toring method was used for factor extraction. A factor was accepted if it met the following criteria: (a) eigenvalue > 1.0, (b) percentage of variance in items' responses accounted for by a factor of ≥ 10%, (c) loadings ≥ .30 on a factor and a difference > .20 for loadings on other factors, and (d) interpretability of a factor that is consistent with the conceptualization of self-care underpinning the TSC measure (Streiner & Norman, 2008). Statistically significant correlation coefficients of the hypothesized direction (i.e., positive or negative) provided evidence of construct validity. Pearson's *r* coefficient was used when the variables were continuous and Hη coefficient was used when one variable was dichotomous and the other continuous.

Results

On average, participating patients (*n* = 396) were middle-aged (53.6 ± 16.8). Slightly more than half were women (52.4%) with at least a high-school education (58.8%). Most were married (65.5%). About half of the patients were admitted for surgery (52%) and the remainder for general medical (26%) and cardiac (22%) conditions.

Table 1 presents the results of the TSC item analyses. Patients who completed the TSC items selected the full range of response options, suggesting that the TSC numeric rating scale is acceptable. The mean item scores were relatively high. Upon discharge, patients reported high levels of perceived ability to take medications as prescribed and to recognize and manage symptoms, and slightly lower levels of perceived ability to carry out activities of daily living and to manage changes in condition. There was no evidence of item redundancy, as none of the inter-item correlation coefficients was over .85. These coefficients varied between .08 and .72, with a mean of .38. The 13 items were internally consistent: the item-to-total correlation coefficients were over .30, ranging from .47 to .74; Cronbach's alpha was .89. Results of exploratory factor analysis supported a one-factor model. The factor had an eigenvalue of 5.29 and accounted for 41% of the variance in item responses. The factor loadings varied from .52 to .75.

The findings provide initial evidence of construct validity. A small but statistically non-significant difference in the TSC total scores was observed between the group of patients who reported having received instructions for self-care and the group who did not. The correlation coefficient was .19, implying that those who received education had higher levels of self-care ability. The association between perceived self-care ability and functional status was positive and moderate (*r* = .36; *p* < .05), indicating that patients with high levels of functioning had high levels of self-care ability. Negative relationships were found between self-care ability and the physical symptom of pain (*r* = −.23) and the psycho-

logical symptoms of anxiety ($r = -.21$), confusion ($r = -.27$), depression ($r = -.28$), and anger ($r = -.26$; all p's $< .05$). These findings show that experience of the symptoms at high levels of severity is associated with perception of low self-care ability.

Discussion

Whether hospitalized for the medical or surgical treatment of acute and/or chronic conditions, adult patients should have the ability to manage their conditions once discharged home. Appropriate self-care is instrumental in promoting recovery, preventing complications, and avoiding re-admission (Sidani, 2011). Assessment of patients' self-care ability prior to discharge from acute care is important for evaluating their capacity for engaging in activities aimed at managing their condition at home during convalescence. The TSC measure was developed to measure self-care ability as perceived by patients with different acute conditions requiring medical and/or surgical treatment. The results of this study confirm the measure's internal consistency reliability as well as content and construct validity.

The content validity of the TSC measure was maintained throughout the systematic process followed in its development and through a careful review by nurses responsible for delivering interventions targeting self-care and for evaluating the effectiveness of interventions in improving self-care ability. The content of the measure was derived from a comprehensive and clear conceptualization of self-care ability generated from an extensive analysis of the literature. The analysis identified four categories of self-care that are relevant to hospitalized patients: taking medications as prescribed, recognizing and managing symptoms, carrying out activities of daily living, and managing changes in condition. The content of the 13 items captured specific activities representative of these categories and reflected the individuals' perceived ability to perform each activity. Nurses providing care on inpatient medical, surgical, and specialized units confirmed the relevance and applicability of the self-care activities making up the TSC measure to patients hospitalized for a variety of conditions. The suitability of the TSC's items for patients is also inferred from the responses of participating patients. Specifically, participants of different age groups, educational levels (including non-high-school graduates), and health conditions completed the measure. Issues with comprehension of item content were not reported.

The results of internal consistency and factor analyses converged in supporting the accuracy of the items in capturing patients' self-care ability and the unidimensionality of the measure. Accordingly, a total scale score can be computed as the mean of the items' scores to quantify self-

care ability. The possible range for the total scale score is 0 to 6, with higher scores (over 3, which is the mid-point of the numeric rating scale) indicating higher levels of self-care ability. However, additional analyses (e.g., confirmatory factor analysis to explore higher-order factor structure) are needed in order to examine the viability of generating scores that would quantify patients' ability to engage in activities within the four self-care categories: taking medications, recognizing and managing symptoms, carrying out activities of daily living, and managing changes in condition. Determining patients' perceived ability to engage in activities within each category would be useful for nurses in identifying self-care areas requiring interventions in preparation for discharge. The findings support the construct validity of the TSC measure. As hypothesized, patients who experienced severe symptoms reported low levels of self-care ability and those with high functional status reported high levels. The observed small magnitude of the correlation coefficients is expected with large sample sizes (Cohen, 1992). The non-significant relationship between provision of education and self-care ability requires further examination. Therefore, future research is needed to examine the association of self-care ability with the delivery of nursing interventions (such as discharge planning) aimed at enhancing overall self-care ability.

Conclusions

The TSC measure is a reliable and valid measure of self-care ability as perceived by patients about to be discharged home from hospital. Its items tap four categories of self-care that patients are expected to engage in at home post-discharge: taking medications as prescribed, recognizing and managing symptoms, carrying out activities of daily living, and managing changes in condition. The measure's content is relevant to patients receiving medical and/or surgical treatment for a variety of acute conditions or for exacerbations of chronic diseases. Therefore, it can be used in research to evaluate the effectiveness of nursing interventions and/or of overall nursing care, as well as day-to-day practice. The TSC measure is currently being used in several acute-care hospitals in Ontario. Staff nurses administer it within 24 hours prior to discharge. They view the assessment done at this time as informative of patients' readiness for discharge.

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