ORIGINAL ARTICLE

Clinical Utility of the Care Dependency Scale for Stroke Patients in Indonesia: A Descriptive Study

Nursiswati Nursiswati[1], Ruud JG Halfens[2], Christa Lohrmann[1]

[1] Medical University of Graz, Institute of Nursing Science, Universitätsplatz 4, 8010 Graz, Austria.
[2] Maastricht University, Department of Health Services Research, Caphri, Duboisdomein 30, 6229 GT Maastricht, The Netherlands

ABSTRACT

Introduction: Nurses require a care dependency instrument that can be useful for caring stroke survivors. This study aim was to evaluate the clinical utility of the care dependency scale (CDS) in stroke patients. **Methods:** This is descriptive study with a consecutive sample of 36 nurses included from a pool of 45 eligible nurses. Nurses who had experience using the CDS to assess stroke patients on inpatient wards and in outpatient clinics in four hospitals in Indonesia were asked to use a Staff View Assessment Instrument (SVAI) to evaluate the CDS. The SVAI includes closed-ended and open-ended questions. A descriptive analysis of the answers to the closed-ended questions was performed, while a text analysis were conducted to analyze the answers to the open-ended questions. **Results:** Thirty-six nurses participated in this study. The results indicate that most nurses agreed that the CDS had clinical utility in the assessment of stroke patients in the hospitals. The majority of nurses stated that the use of the CDS helped them monitor care (in) dependency and support care planning. In addition, the CDS could be used to improve communication among members of the care team between different institutions, as well as help educate family caregivers. The median time required to perform the assessment using the CDS was 15 minutes. **Conclusion:** Concerning the usefulness of the instrument in practice, we conclude that using the CDS in both inpatient and outpatient care settings presents a solution to the challenge of offering continuous care for stroke patients.

Keywords: Hospitals, Nursing assessment, Nurses, Stroke, Care dependency

Corresponding Author:
Nursiswati Nursiswati, MN
Email: nursiswati.nursiswati@stud.medunigraz.at;
nursiswati@unpad.ac.id
Tel: +6281294885959

INTRODUCTION

In 2016, 80.1 million prevalent cases of stroke were reported worldwide, as well as 5.5 million deaths and 116.4 million disability-adjusted life years (DALYs) due to stroke (1). Stroke is an important topic for patients, family members and nursing care personnel because it has serious physical and psychosocial consequences. A comprehensive approach must be taken to provide the best care for patients with stroke-related disabilities and help each patient become more independent after suffering a stroke. Most practitioners agree that this approach should involve initial and ongoing care dependency assessments (2, 3). Care dependency is defined as the degree to which people need help when carrying out their basic activities of daily living (4). Caregivers can define realistic and attainable goals by performing assessments of the patient's care dependency, allowing planned interventions or activities to be effectively carried out (5). Nursing care personnel apply

care dependency assessment tools to design appropriate interventions that help patients reach these goals.

Three popular tools are used most commonly to measure care dependency in stroke research and practice. These tools, namely, The National Institutes of Health Stroke Scale (NIHSS), the Barthel Index (BI) and the Modified Rankin Scale (mRS), have been thoroughly reviewed (2). These instruments can be used to define degrees of global disability, assess neurological impairment and assess the patient's ability to perform basic activities of daily living (ADL), respectively. However, concerns have been raised about the sensitivity and comprehensiveness of each of these tools (2).

The Care Dependency Scale (CDS) is considered to be relatively more comprehensive than the aforementioned three tools. The CDS contains fifteen items that address physical and psychosocial human need aspects. The physical aspect is highly specific, referring to behavior related to eating and drinking, continence and mobility, while the psychosocial aspects encompasses important items, such as communication, an understanding of rules and the ability to learn (6). The Care Dependency Scale has been tested in a wide range of cases (7) across multiple care settings (8) and has been compared

internationally (9).

With respect to neurological cases, the CDS has been tested and reported to be a valid, reliable and straightforward tool that can be used to measure care dependency in neurorehabilitation patients (10). In the specific area of stroke care, a recent study conducted in Indonesia revealed that the CDS could be used to monitor changes in the degree of care dependency over time (11). In Indonesia, most stroke patient are discharged after receiving acute care in a hospital and return to the hospital periodically to receive outpatient follow-up care. In the outpatient clinic, stroke patients receive a medical evaluation, nursing care, physical therapy, occupational therapy and speech-language therapy. The CDS has proved to be a reliable and valid instrument for use in stroke patients (i.e., its Cronbach alpha score is high), and its acceptable validity in Indonesian hospitals was observed in a subsequent study (11). However, the practicability and clinical utility of the CDS in the area of stroke care has not yet been sufficiently explored. The clinical utility is currently defined on the basis of practitioners' judgments regarding the usefulness of an intervention for or in clinical practice (2). To facilitate the identification of a proper care dependency measurement tool for use in nursing practice in Indonesia, this study was carried out to explore the actual clinical utility of the CDS, and specifically its utility in stroke care both on inpatient wards and in outpatient clinics.

MATERIALS AND METHODS

Study design
A descriptive study was performed on stroke inpatient wards and in outpatient clinics in four selected Indonesian government hospitals.

Participant and setting
A convenience sample was used to recruit nurses at four general hospitals on Java Island, Indonesia. Data collection was conducted over a period of two weeks (last week of June and first week of July 2016). These hospitals agreed to participate in the study, and the CDS was implemented in the care of resident stroke patients. CDS training was delivered by the first author at each participating hospital; a total of 45 nurses attended this training session. This study is conducted three month after the training. Only nurses who provided care to stroke patients, had three years of working experience in stroke care and had used the CDS in their daily nursing practice for a minimum of three months were included in this study. The participating nurses were also familiar with the use of the other care dependency instruments, such as the Barthel Index.

Ethical considerations
Ethical approval was granted to conduct the study by the responsible ethical committees (approval numbers 589/Panke.KKE/XI/2015 and 565/UN6.C1.32/Kep/

PN/2015). Nurses who participated in this study received information regarding the purpose of this study from the first author (NN) during the face-to-face meeting held after the CDS training session. All participating nurses signed an informed consent form.

Data collection
Data collection was conducted over a period of two weeks. This data collection was conducted on the stroke inpatient wards and in stroke outpatient clinics. Participant nurses were asked to fill out a paper-based Staff View Assessment Instrument (SVAI) at their workplace.

The SVAI was first used to evaluate the implementation of the Residential Assessment Instrument/Minimum Data Set (RAI/MDS) in Sweden (12). This instrument was modified (e.g., the wording was changed to improve its clarity, and questions were added for a comprehensive evaluation) and used in the evaluation of the Care Dependency Scale for rehabilitation research (13). These authors reported that the Cronbach alpha was 0.95 for the SVAI, and the corrected item-total correlation for all items fell between 0.64 and 0.80 (13). These results indicated that the SVAI had excellent internal consistency. The corrected item-total correlation was revealed to be 0.40 higher than the recommended score (14). The author had permission from the previous researcher. The Indonesian-language version of SVAI using in this study includes eighteen closed-ended questions and three open-ended questions. The English version of the SVAI that was used in this rehabilitation research study was adapted for use in the current study in that it was professionally translated into the Indonesian language and then back-translated into English as recommended (14).

This instrument was used to evaluate the views of nurses regarding the use of the CDS in stroke patients. All closed-ended question were formulated in a positive direction (e.g., Does the CDS provide care-relevant information?). The closed-ended questions required participants to either express agreement or disagreement using a four-point Likert-type scale (1 = emphatically disagree, 2 = moderately disagree, 3 = moderately agree and 4 = entirely agree). The sum score of the closed-ended questions on the SVAI ranged from 18 to 72. The Indonesian version of the SVAI revealed a Cronbach alpha of 0.95. The open-ended questions asked the participants to describe the advantage(s) and disadvantages (s) of using the CDS, as well as the amount of time needed to complete CDS, and queried how its use compared with that of other care dependency instruments.

Data analysis
Descriptive statistical analyses were carried out using IBM® SPSS® version 25 (Chicago, IL, USA). Baseline characteristics of the nurses were obtained, and the

usefulness of the CDS was calculated per item and expressed as a percentage. Regarding the closed-questions, an assessment of the level of agreement (expressed as a percentage) among the nurses was conducted. Regarding the open-ended questions, a text analysis was performed to identify the appearance of meaning and connotation as a general direction of the responses (15) and categorize the nurses' answers. This analysis was performed by two reviewers: the first author (NN) and an independent reviewer from among the other authors (GS). The results of this text analysis were categorized based on frequency (most often or least often).

RESULTS

Sample characteristics
In this study, a consecutive sample of 36 nurses included from a pool of 45 eligible nurses (i.e., nine nurses were omitted from the sample because they were either on maternity leave or vacation). More than 90.0% of these nurses were female, with a mean age of 37.5 years (range 27-54). The average of the length of work experience held by the nurses was 13.7 years (range 3-32 years). The majority of the participating nurses had graduated with bachelor's degree in nursing (58.0%) from an institution of higher learning.

The clinical utility of the Indonesian version of CDS
The results of the analysis of the closed questions are shown in Table I. Based on the open questions of SVAI,

more than 75% of the nurses either moderately or entirely agreed that the CDS had clinical utility when applied in stroke patients. All nurses agreed on five statements: The CDS provides care-relevant information, provides information about the patients' physical needs/resources, provides knowledge about the patients' psycho-social needs/resources, can be used to monitor care (in) dependency and can be used to support the planning and evaluation of nursing interventions regarding their psychosocial aspects. Most nurses (80.6%) agreed that the use of the CDS helped facilitate the patient's move/transfer/discharge from the inpatient ward to the outpatient clinic. More than 80% nurses also agreed that use of the CDS supported communication among nurses on the team, supported interdisciplinary work and communication and supported inter-institutional communication. Only one nurse (2.8%) emphatically disagreed with two statements regarding the CDS: The CDS is easy and quick to use, and the CDS is easy and quick to analyze/interpret. The mean score of SVAI was 58.33 and fifty percent of nurses gave the score more than the average.

The advantages and disadvantages of CDS and its comparison with other care dependency instruments
Nurses revealed the advantages of using the CDS, as compared to other care dependency instruments. The nurses most often stated that the CDS helped them determine and monitor the degree of care dependency and that it addressed all aspects of the patients' human needs. Some of the nurses said that the CDS was easy

Table I: Evaluation of the clinical utility of the Indonesian version of CDS with SVAI on a single-item level

The CDS	entirely agree	moderately agree	moderately disagree	emphatically disagree	mean
provide care relevant information	33.3	66.7	0	0	3.33
provide knowledge of patients' physical needs/resources	25	75	0	0	3.25
provides knowledge of patients' psycho-social needs/resources	25	75	0	0	3.25
helps to monitor care (in) dependency	33.3	66.7	0	0	3.25
is basis for care planning	36.1	61.1	2.8	0	3.33
enables individual and structures care planning	41.7	52.8	5.6	0	3.36
supports performance and evaluation care	36.1	55.6	8.3	0	3.28
enables exact nursing documentation	38.9	47.2	13.9	0	3.25
increases the quality of care via individual care planning	36.1	55.6	8.3	0	3.28
supports planning and evaluation of nursing interventions regarding psychosocial aspects	33.3	66.7	0	0	3.33
supports nurse's communication on care (in) dependency	36.1	61.1	2.8	0	3.33
supports nurse's communication on nursing interventions	36.1	55.6	8.3	0	3.28
supports team cooperation on nursing care	44.4	47.2	8.3	0	3.36
supports interdisciplinary work and communication	38.9	44.4	16.7	0	3.22
supports inter-institutional communication	27.8	61.1	11.1	0	3.17
Facilitate patient move/transfer/discharge	25	55.6	19.4	0	3.06
Easy and quick to use	25	52.8	19.4	2.8	3.00
Easy and quick to analyze/interpret	19.4	55.6	22.2	2.8	2.92

to interpret and use and supported the continuous collection of data. Some nurses commented that the CDS had a particular range scale for each item and that the CDS could be used to help educate the family members as caregivers.

The most frequent disadvantage of the use of the CDS that was mentioned by nurses was that they needed more time to become familiar with the CDS. A few nurses said that the recreation item (recreational activities) was not applicable. When nurses were asked to compare the CDS with another instrument, they most frequently mentioned the fact that the CDS was more comprehensive and had a more detailed Likert-type scale. A few nurses also commented that the CDS had clearer items than other care dependency instruments.

The time needed to complete the CDS
The responses indicated that the median time required to perform the assessment using the CDS was 15 minutes. Approximately half of the nurses (47.2%) stated that they needed 15 minutes per patient, and around one-third (33.3%) revealed that they needed 10 minutes to use CDS per patient.

DISCUSSION

These study results indicate that the CDS has clinical utility when used to assess care dependency in stroke patients in four hospitals in Indonesia. Most nurses agreed with the positive statements regarding the CDS, and all nurses agreed on five statements that the CDS could be used to obtain care-relevant information, provide information about the patients' physical needs, provides information about the patients' psychosocial needs, help monitor degrees of care (in) dependency and support care planning and evaluation. These findings are in accordance with those of a previous study carried out in a rehabilitation setting in Austria, in which most nurses agreed that the CDS provided care relevant information, helped monitor care (in) dependency and provided information about patients' physical needs (13). Thus, we conclude that the CDS is perceived by nursing staff as a useful care dependency assessment instrument for stroke patients in Indonesia. These results are essential because care dependency is of primary clinical interest to nurses, and the use of the CDS facilitates the ease of its identification and monitoring. Care providers must recognize these needs to provide the best support and assistance during the stroke survivor's recovery period (16).

Because the nurses clearly indicated that the CDS provided them with useful information about the patients' psychosocial needs, this finding addresses the gap indicated by the author of the previous study, who indicated that appropriate instruments were needed to examine psychosocial aspects (2). Our previous study that investigated the changes of care dependency level in Indonesia indicated that the CDS could be applied to support planning and evaluation of nursing interventions regarding psychosocial aspects in stroke survivors (11), and the level of agreement observed among nurses included in the current study provides additional support for this hypothesis. The data collection strategy will depend on the degree of the patient's impairment, allowing nurses to arrange any appropriate aids and appliances (5).

Furthermore, these study results show that nurses frequently agreed that the use of the CDS helped facilitate the patient's move/transfer/discharge from the inpatient ward to the outpatient clinic. This may be because the CDS can be used to collect information about the individual patient's needs, enabling nurses to properly prepare patients for the post-stroke discharge process. For this reason, the use of the CDS helps nurses obtain results that are clinically meaningful. According to previous research, if a tool can be used to further improve the patient's degree of independence, it should be considered by those providing nursing services (17). This finding is in accordance with the findings of the study that highlights a clinically useful instrument that supports nurses by allowing them to gain fundamental information and conduct better discharge planning (18).

The clinical utility of an instrument can also be based on whether (or to what extent) it improves communication among members of the nursing care team. This study revealed the fact that the use of the CDS supported communication among nurses on the team, supported interdisciplinary work and communication and supported inter-institutional communication.. Communication in this context referring to the use of a written communication mechanism. As mentioned in the introduction section, acute stroke care in Indonesia is succeeded by outpatient follow-up care. During the latter period, the patient regularly visits the outpatient clinic for medical evaluation and health monitoring; for this reason, written communication between teams on the inpatient ward and in the outpatient clinic is vital. Nurses in the outpatient clinic can examine the patient's medical record to determine the latest care dependency score and reassess their patient using the same care dependency instrument. This result is in accordance with that of a previous study, which revealed that the use of the CDS for rehabilitation could improve communication among members of the nursing team or between members of various professions and at different institutions (13). Other studies have emphasized that communication can influence care teamwork (19).

However, other studies have reported that the discontinuation of care presents one challenge facing stroke care patients (20-22). Stroke care offered as part of health care services requires continuity (23, 24). Using the CDS as an assessment tool in both inpatient and outpatient settings can help increase the continuity of

care, improve communication, allow for more effective coordination within each ward and support the quality of health services. Furthermore, increased communication among care providers will additionally support the continuity of care (25), and if CDS can improve this, it is highly valuable in stroke nursing care.

The clinical utility of the CDS is also supportive in that it can be used to help educate family members. This finding is in accordance with that of a previous study, which revealed that nurses have to educate family members so that they can deliver an appropriate level of help and support at home, allowing the stroke patients to become more independent. Educational training for family members, including the appropriate management of care dependency within stroke care, is essential (26, 27). As the CDS is a tool that can provide relevant information and help monitor care dependency, it can be used to support the patients and family members as they cope with the various care dependency stages. This support can, in turn, lead to improvements in the patient's daily functions and quality of life (28).

Thus far, all available evidence indicates that the CDS supports the quality of nursing care in Indonesia. Nevertheless, the responses to the open-ended questions indicated that Indonesian nurses need to become more familiar with the CDS, use it more consistently throughout their nursing practice and continue to implement it. These findings are, in part, because the CDS was introduced as a care dependency assessment instrument in Indonesia relatively recently. Due to the comprehensive nature of this tool, the relative disadvantages of the CDS noted by the nurses can be offset by performing continuity training during its implementation and carrying out a periodical evaluation of the CDS utilities. Different training methods, such as instruction through videos and infographics, can be used to help younger nurses understand how easy it is to use the "new" CDS instrument in practice. This study revealed that the majority of a nurse needed 15 minutes to fill out the CDS, results that are in accordance with those of a previous study conducted in Indonesia (29). Another study reported that less time was needed (i.e., 12 minutes on average) (13). The use of an effective assessment instrument should be as quick as possible, and decreasing the time needed to use a tool will be advantageous (30). Nevertheless, 15 minutes is an acceptable amount of time for the use of an improved assessment instrument.

Study limitation of this study includes data for this study were collected in four hospitals on Java Island that implemented the CDS in the assessment of stroke patients. Forty-five nurses attended the training session and used CDS in their daily care of stroke, and 36 of these nurses evaluated the use of the CDS, providing valuable insight into the usability of CDS in nursing practice. In the future, the period of the study and the number of participants can be increased to overcome time and size limitations.

CONCLUSION

This study has demonstrated that nurses agreed that the use of the CDS helped them monitor care (in) dependency and helped them provide better stroke care on inpatient wards and in outpatient clinics. The nurses purposefully incorporated their criteria for an improved care dependency instrument into their everyday routines. This evaluation could not separate the use of the CDS from the learning process of using the CDS; carry out the process and comprehend the results and retain information. More investigations on how the CDS is used in stroke care settings over longer periods need to be carried out to gather additional important knowledge and evidence regarding the success of interventions that are consistent with the continuity of care in stroke patients. It would also be of interest to evaluate the clinical utility of this tool with other populations of health care professionals, as well as family caregivers who provide care for stroke survivors at home, to obtain valuable supplemental knowledge.

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