Nursing in long-term institutional care

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NURSING
in long-term institutional care

AN EXAMINATION OF THE PROCESS OF CARE

Astrid Tuinman

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An examination of the process of care

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Voor Willem

“I can travel all the road, you see
Cause I know you’re there with me”
(Danny Vera)

CONTENTS

CHAPTER 1

GENERAL INTRODUCTION

In the past decades, the amount as well as the complexity of care in long-term institutional care for the older population has increased.[1] Nursing staff care for residents who are older and are experiencing an increasing number of severe physical and cognitive limitations.[1,2] Across the developed world, the quality of long-term institutional care has been of concern though regulations differ between countries.[3,4] Inadequacies are often associated with the number and the composition of nursing staff.[5-7] While there is tentative evidence that the total number of nursing staff in long-term institutional care is associated with better quality of care outcomes, inconsistent results are found concerning the relationship between the type of nursing staff (eg, nurses, nursing assistants) and care outcomes.[5-7] Studies into staffing and quality of care mainly rely on secondary survey data such as (self)report care outcomes at the facility level.[5-7] Resident acuity factors that influence these outcomes are often disregarded,[5,6] and little is known about what is actually done by nursing staff in the process of care that may have led to better or worse outcomes.[5-7] It has been argued that what is done, how much, by whom, and how all influence the quality of care of residents.[5,8] In addition, selected quality of care outcomes may be, to a greater or lesser extent, sensitive to interventions performed by nurses.[7] This dissertation aims to provide insight into the process of nursing care by acquiring empirical knowledge. This first chapter introduces key concepts and presents the aim and outline of the dissertation.

THE CONTEXT OF LONG-TERM INSTITUTIONAL CARE

Long-term institutional care (LTIC) in this dissertation refers to nursing and residential care facilities that provide accommodation, intensive care, and support with psychosocial functioning to older people as a package.[1] The demand for long-term care is expected to increase[1,4] as a result of a growth in the number of older people. It is estimated that, by 2050, the number of people aged 65 years and older will be 28% of the total worldwide population. In particular, there will be an increase in the number of those over 80 years with an average of 5% in 2015 to more than 10% by 2050.[2,9] The oldest old (≥ 85 years) often have a multitude of serious physical and cognitive chronic conditions, and their care needs tend to be more intensive and complex.[4,10,11] Although, in many countries, government policies encourage home care and the use of informal networks,[1,12] these complex care needs together with social changes such as more people living alone, smaller family networks, and older informal caregivers[1,9,13] can lead to admission into a long-term care facility for people who require 24-hour care and supervision.[1, 12] Residents previously resided in a facility for an extended period of time, however, this has now been reduced to an average length of stay varying from approximately 9[14] to 18 months,[14,15,16] and the care concerns environmental, physical, psychological, and social needs.[12,17] As a result, these developments have intensified the work of nursing staff and affect the staff qualifications that are needed.[1,18] However, worldwide,

there are concerns about the appropriate mix of nursing staff with the correct skills and providing care in the right places to better respond to the changing residents' care needs.[19]

NURSING STAFF IN LONG-TERM INSTITUTIONAL CARE

The scope of practice and educational background of nursing staff vary widely between and even within countries.[1,20] In LTIC, approximately 70% are less educated staff such as certified nursing assistants or nursing aides.[1] In the Netherlands, nursing staff in LTIC largely comprise certified nursing assistants followed by registered nurses and health care assistants. To facilitate worldwide comparison, the International Standard Classification of Occupations (ISCO-08) was developed by the International Labour Office.[21] Table 1 provides an overview of Dutch nursing staff categorized into relevant ISCO-08 occupations.

Dutch registered nurses may have obtained a bachelor's degree (BRN) or not (RN) after 4 years of education. There is no distinction between them by law, and both are recognized and legally registered as professional nurses.[22] However, the Dutch nurses' professional association may stipulate that specific tasks require a nurse with a bachelor's degree, or employers make a distinction through job descriptions. For example, district nurses are required to obtain a bachelor's degree in order to identify residents' care needs, assign acuity levels, and estimate the number of staff and the staff mix.[23] After obtaining their degree, BRNs have the option to become a nurse specialist or nurse practitioner by following master's programs. Certified nursing assistants (CNA) are not legally registered as nurses but do have a legally protected diploma after 2 to 3 years of education. They not only implement care as documented in resident care plans (Table 1) but, as (B)RNs, are allowed to establish them.[24] After additional training (± 35 weeks), they may become what is referred to as primary caregivers who monitor the care process of a group of residents and serve as a contact for family and health professionals.[25]

To achieve improved quality of care in nursing homes, minimum nurse staffing standards are being developed in various countries.[26-28] Although they are a necessary precondition to provide quality care,[29] an increase in the number of nursing staff has not necessarily led to better quality of care outcomes.[29,30] One reason for this may be that it is currently unclear what nursing staff actually do, whether this is in accordance with the care needs of residents and thereby contributes to the quality of care for residents. Considering this and the worldwide shortage of nursing personnel,[20] it is important that nursing staff are deployed according to their qualifications and scope of practice and that knowledge is gathered about the input of nursing staff into the process of care.

Table 1. Dutch nursing staff and educational years categorized into ISCO-08[21] unit groups

Dutch nursing staff	Educational years	ISCO-08 Unit group	Summary scope of practice ISCO-08
BRN	4	Nursing professionals (2221) Examples occupation: - Professional nurse, - District nurse, - Public health nurse.	Providing treatment, support and care services, and responsible for the planning and management of care including the supervision of other health care workers. They work autonomously or in a team with other health care professionals.
RN	4	Nursing professionals (2221) Examples occupation: - Professional nurse.	Providing treatment, support and care services, and responsible for the planning and management of care, including the supervision of other health care workers. They work autonomously or in a team with other health care professionals.
CNA	2 - 3	Nursing associate professionals (3221) Examples occupation: - Enrolled nurse, - Practical nurse, - Assistant nurse.	Providing basic and personal nursing care. Generally working under the supervision of, and in support of, implementation of health care, treatment and referral plans established by medical, nursing, and other health professionals.
NA	2	Health care assistants (5321) Examples occupation: - Nursing aid, - Patient care assistant, - Psychiatric aid.	Providing direct personal care and assistance with activities of daily living. Generally working in implementation of established care plans and practices under the direct supervision of medical, nursing, or other (associate) health professionals.

BRN = Bachelor registered nurse, RN = Registered nurse, CNA = Certified nursing assistant, NA = Nurse aid.

A FRAMEWORK OF QUALITY OF CARE

Quality of care has been described in several ways depending on the context. Regardless of differences, there are also a number of similarities. A concept analysis of Allen-Duck et al.[31] found that: "Healthcare quality is the provision of effective and safe care, reflected in a culture of excellence, resulting in the attainment of optimal or desired outcome."[31] The World Health Organization (WHO) defines quality of care as "the extent to which health care services provided to individuals and patient populations improve desired health outcomes."[32] They state that the main concern of health care professionals is to ensure that the services they provide are of the highest possible standard and meet the needs of individuals and their families.[33] Furthermore, the WHO[33] and Dutch legislation[34] describe that the provided care should be patient centered, effective, efficient, equitable, safe, and accessible. These

descriptions accord with the opinion that care must be tailored to the needs of the care recipients, and the selection of (evidence based) interventions performed by health professionals should yield better outcomes for care recipients.

One of the most well-known and much quoted approach for assessing quality of care is the conceptualization into structure-process-outcome by Donabedian[35,36] which has been adopted for the research in this dissertation. Structure refers to the characteristics of the setting in which care occurs and establishes the conditions of caregiving. It includes the human (eg, personnel such as different types of nursing staff), physical (eg, equipment such as care plans), and organizational (eg, budget resources such as time) factors that are required to provide care.[35,36] According to Donabedian, good structure establishes the conditions for good outcomes.[35] Process refers to what actually occurs in providing and receiving care. A distinction is made in a technical and interpersonal component. The technical performance comprises the knowledge and judgement of nursing staff in using appropriate care strategies such as care planning and skills to implement them. The interpersonal component concerns the relationship between nursing staff and residents in which the necessary information is exchanged in order to establish diagnoses and interventions based on the care recipients' preferences.[35,36] Processes of care are more directly related to outcomes than structure characteristics.[36] Outcomes are the effects of the provided care on the care recipients' health and well-being. To make a judgement on quality, it should be able to be stated that the care that was provided was responsible for the outcome that was observed.[36] While a measurement of a diagnosis (eg, risk for pressure ulcer) specific outcome will indicate if a specific objective has been attained (eg, pressure ulcer prevented), a measurement of a generic outcome is meant to provide an estimate of the care recipients health status (eg, mortality, quality of life). Specific outcomes are more dependent and sensitive to variations in the quality of the care that is provided.[36]

FOCUS OF THIS DISSERTATION

This dissertation focusses on the process of care. Donabedian contends that an assessment of the process is made by either direct observation or by reviewing recorded information.[35] Both methods are applied in this dissertation. An accurate, complete, and process oriented record is fundamental for quality of care.[35] Health-care professionals, physicians, and nurses maintain an individualized record of their care recipients. It has been argued that accurate nursing documentation contributes to the continuity of care, safety, and well-being of care recipients.[37] Furthermore, it facilitates the evaluation of the outcomes of care[37,38] and serves as a data source for managers in LTIC for purposes of quality of care, financial reimbursement, and deployment of nursing staff.[39,40] Direct observations of care delivery can provide the

independent information that is needed and identify important quality data that are absent from the record. Thereby, observational data are empirical data that reflect the actual care that is given.[41]

Donabedian states that there should be pre-existing knowledge that an association exists between structure and process, as well as between process and outcome.[35] Hence, a specific group of care providers is accountable through their educational level or scope of practice for performed interventions and that these contributed to specific outcomes. Nursing classification systems can serve as a knowledge base in which there is consensus about the nurses' responsibilities. The use of an internationally known nursing classification compared to colloquial terms allows for data aggregation and analysis across countries and settings[42-44] thereby facilitating the comparability of data for research and management purposes. For the purpose of this dissertation, the Nursing Interventions Classification (NIC) and the Nursing Outcomes Classification (NOC) were adopted.

AIM AND OUTLINE

Aim

The overall aim of this dissertation was to provide insight into the process of nursing care by acquiring empirical knowledge using the quality framework of Donabedian. More specifically, it aims to 1) identify and examine the amount of time spent on nursing interventions in relation to the type of nursing staff while taking into account the resident population; and examine 2) the accuracy of nursing documentation; 3) the consistency between documented and actually provided nursing interventions by types of nursing staff; and 4) the association between the types of nursing staff and nursing-sensitive outcomes.

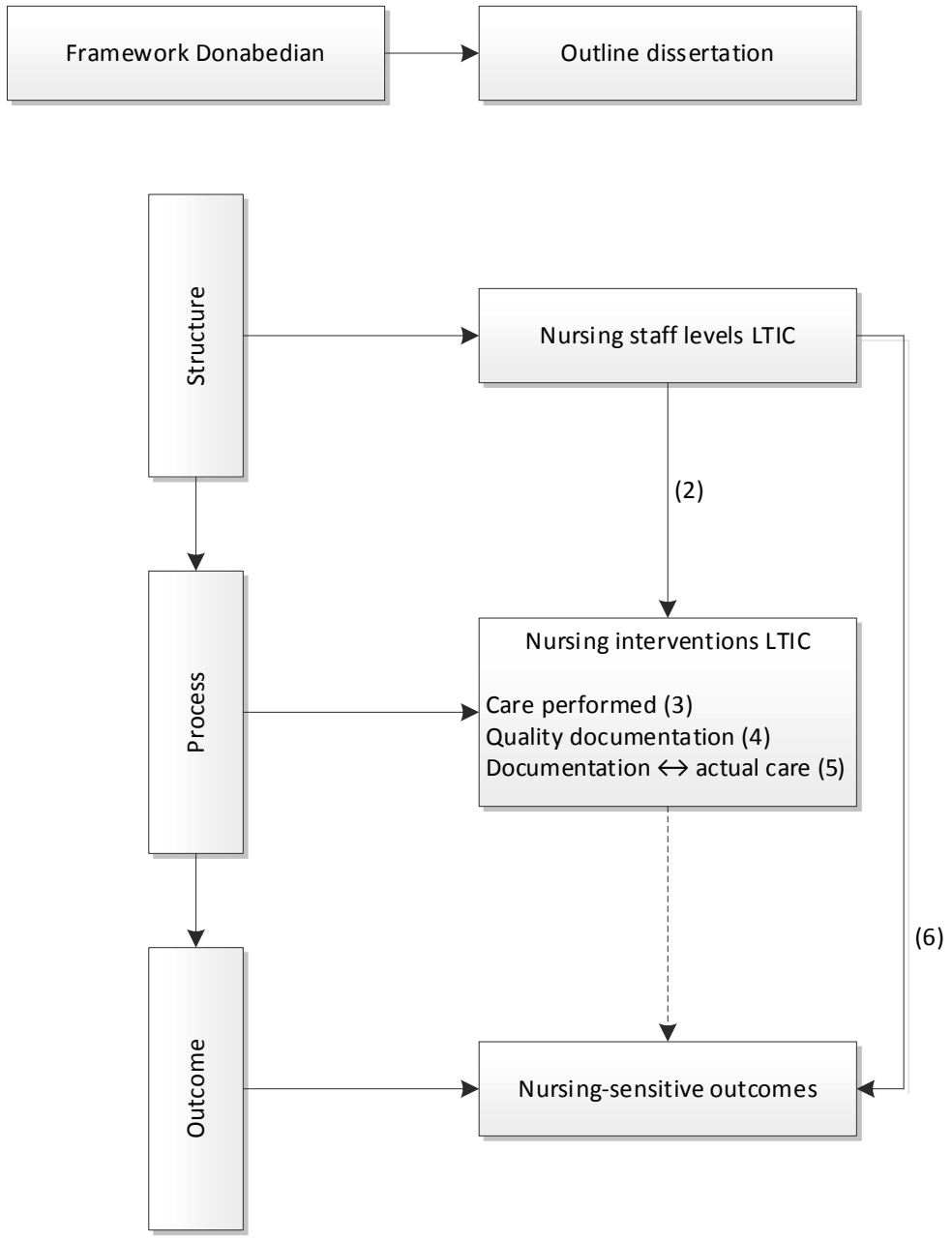

Figure 1. Outline and structure dissertation.
LTIC= long-term institutional care. Numbers in brackets refer to the chapters of the dissertation.

Outline

Chapter 2 describes the development and testing of an observational instrument, the GO-LTIC, using the NIC as a conceptual framework in order to identify and examine the amount of time spent on nursing interventions in LTIC. **Chapter 3** presents the results of a cross-sectional study on the relationship between time use and the type of nursing staff, residents' acuity levels, and type of unit utilizing the GO-LTIC. Whereas **Chapter 4** provides insight into the accuracy of nursing documentation in residents' care plans, **Chapter 5** reports on a cross-sectional study into the consistency between planned care as documented in residents' care plans and the care actually provided by the type of nursing staff using the NIC. **Chapter 6** presents the results of a systematic review on the association between the type of nursing staff in LTIC and nursing-sensitive outcomes using the NOC. In **Chapter 7**, a general discussion of the study results is provided including methodological and theoretical challenges and directions for further research and practice.

RESEARCH PROGRAM

This PhD project was a component of the research program "Care for the well-being of elderly. Program for skill mix, task allocation, and IT support of emotion-oriented care for elderly."[45] The program was funded by the Taskforce for Applied Research which is part of the Netherlands Organization for Scientific Research (NWO) and is financed by the Ministry of Education, Culture, and Science (Grant number pro-1-035 and TOP.UP01.013). The overall objective of the program was to contribute to the composition of an optimal nursing staff mix in relation to the safety and well-being of residents in long-term care institutions and to increase the significance of IT in support of person-centered care. The program consisted of 2 interrelated PhD projects. Project 1 (described in this dissertation) aimed to gain insight into the process of care of nursing staff and the quality of nursing documentation in (electronic) care plans in support of this care process. In Project 2, the aim was to develop an electronic care plan in co-creation with nursing staff and subsequently implement and evaluate it. The program was a partnership between the University of Groningen, University Medical Center Groningen, Hanze University of Applied Sciences, NHL Stenden University of Applied Sciences, and 3 large chains of long-term care facilities all located in the northern part of the Netherlands.[45]

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CHAPTER 2

ASSESSING TIME USE IN LONG-TERM INSTITUTIONAL CARE: DEVELOPMENT, VALIDITY AND INTER-RATER RELIABILITY OF THE GRONINGEN OBSERVATIONAL INSTRUMENT FOR LONG-TERM INSTITUTIONAL CARE (GO-LTIC)

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BMC Nursing, 2016; 15:13

ABSTRACT

Background: Limited research has examined what is actually done in the process of care by nursing staff in long-term institutional care. The applied instruments employed different terminologies, and psychometric properties were inadequately described. This study aimed to develop and test an observational instrument to identify and examine the amount of time spent on nursing interventions in long-term institutional care using a standardized language.

Methods: The Groningen Observational instrument for Long-Term Institutional Care (GO-LTIC) is based on the conceptual framework of the Nursing Intervention Classification. Developmental, validation, and reliability stages of the GO-LTIC included: 1) item generation to identify potential setting-specific interventions; 2) examining content validity with a Delphi panel resulting in relevant interventions by calculating the item content validity index; 3) testing feasibility with trained observers observing nursing assistants; and 4) calculating inter-rater reliability using (non) agreement and Cohen's kappa for the identification of interventions and an intraclass correlation coefficient for the amount of time spent on interventions. Bland-Altman plots were applied to visualize the agreement between observers. A one-sample student *T*-test verified if the difference between observers differed significantly from zero.

Results: The final version of the GO-LTIC comprised 116 nursing interventions categorized into 6 domains. Substantial to almost perfect kappa's were found for interventions in the domains basic (0.67 – 0.92) and complex (0.70 – 0.94) physiological care. For the domains of behavioral, family, and health system interventions, the kappa's ranged from fair to almost perfect (0.30 – 1.00). Intraclass correlation coefficients for the amount of time spent on interventions ranged from fair to excellent for the physiological domains (0.48 – 0.99) and poor to excellent for the other domains (0.00 – 1.00). Bland Altman plots indicated that the clinical magnitude of differences in minutes was small. No statistical significant differences between observers ($P > .05$) were found.

Conclusions: The GO-LTIC shows good content validity and acceptable inter-rater reliability to examine the amount of time spent on nursing interventions by nursing staff. This may provide managers with valuable information to make decisions about resource allocation, task allocation of nursing staff, and the examination of the costs of nursing services.

BACKGROUND

Being confronted with the increasing dependency levels of frail residents and limited budgets, managers of long-term institutional care (LTIC) search for an optimal staff, which means an appropriate number of nursing staff and a mix of staff levels, to enhance or maintain quality of care standards while reducing costs.[1]

To gain insight into quality of care, the conceptual model of Donabedian[2] indicates that information regarding structure (eg, number and type of nurses), process, and outcomes (eg, pressure ulcers) is needed. The total number of nursing staff in LTIC appears to be associated with better quality of care.[3,4] However, reviews show mixed results concerning the relationship between the type of nursing staff (eg, nurses, nursing assistants) and quality of care outcomes.[3-5] Due to the secondary survey data utilized by most studies, the interventions performed by nursing staff in the process of care remained unclear and, therefore, so did their contribution to quality of care outcomes.[3-5]

Arling et al.[6] contend that the amount of time spent with a resident has a great impact on quality of care. What is done, how much, by whom, and how, all influences residents' care.[3] This increases the importance of the deployment of nursing staff in the provision of care.[7] Identifying nurses' interventions and the amount of time spent on them may clarify their contribution to quality of care and support task allocation to the type of nursing staff according to their specific scope of practice.

According to Donabedian, process is defined as what is actually done in providing and receiving care and this can be assessed by direct observation.[2] Observational studies addressing the process of care in LTIC provide insight into time use of registered nurses[8,9] and health care aids.[8,10.11] Psychometric properties of the applied ins-truments were either missing or briefly described, and instruments varied in the content and categorization of nursing activities which made it difficult to compare study results.

Instruments based on an internationally known standardized nursing language compared to colloquial terms allow for data aggregation and analysis between settings.[12] A widely used standardized language that defines and categorizes nursing interventions is the Nursing Intervention Classification (NIC). The NIC describes a nursing intervention as any treatment based on the judgment and clinical knowledge of a nurse aiming to increase the recipient's care outcomes.[13] The NIC provides labels and definitions of interventions and categorization into classes and domains. Per intervention, a list of activities describes the specific nurses' behaviors or actions.[13] An advantage of the NIC is that it provides estimates of the amount of time to perform the intervention along with the type of nursing staff to deliver the intervention.

Studies have employed the NIC as a framework for identifying interventions for groups of patients in hospitals,[14] ambulatory nursing,[15] parish nursing,[16] and advanced nursing practice.[17] A number of studies used the NIC to describe the amount of time spent on interventions to examine workload[18,19] or personnel staffing.[20] No studies were found related to LTIC.

The aim of the current study was to develop and test the content validity and inter-rater reliability of an observational instrument using the NIC as a conceptual framework in order to identify and examine the amount of time spent on nursing interventions in LTIC.

METHODS

Several stages have been completed to develop and test the observational instrument based on recommendations by Streiner et al.[21,22] The stages were: 1) item generation; 2) examining content validity; 3) testing feasibility; and 4) inter-rater reliability assessment.

POPULATION, SETTING AND SAMPLING

The population was nursing staff working in LTIC. A purposive sample was performed to provide for a diversity of facilities, units, and personnel. In total, 4 nursing homes, 2 care centers (combined residential care and nursing home), and 3 residential care homes in the north of the Netherlands consented to participation. The recruitment of nursing staff working in different types of units (somatic, psycho-geriatric, and residential care) was performed in cooperation with facility managers. The inclusion criterion was at least 1 year of working experience in LTIC.

DATA COLLECTION

Stage 1 Item generation

The NIC described 542 interventions classified into 30 classes and 7 domains.[23] Potential study setting-specific nursing interventions were identified by observing nursing staff during day shifts. Bachelor nursing students (5) in their final year of education and the principal investigator (AT) (further referred to as research team), all with expertise in long-term care (average working experience of 2 years) and knowledge of the NIC, conducted the observations without a predefined list of activities. Afterwards, the observed care activities were linked to NIC interventions, which resulted in an initial inventory of interventions that was presented to a Delphi panel.

Stage 2 Content validity

A two-round postal Delphi survey was conducted to obtain consensus on the relevance of the initial inventory. Nine experts including 5 registered nurses and 4 nursing assistants of participating facilities agreed to contribute. Experience with the NIC was not a prerequisite. The survey comprised concept labels and definitions per NIC intervention. In the first Delphi round, experts were asked to rate the relevance of each intervention by the frequency of occurrence in their facility on a 5-point Likert scale (1 = never; 2 = rarely, less than one time per week; 3 = sometimes, more than one time per week, but less than every day; 4 = often, one time every day; and 5 = very often, more than once per day). An additional column was included for comments.

The second Delphi round comprised interventions on which no consensus was obtained to either include or exclude in the observational instrument. This time, experts were asked to rate an intervention as: 1 = "relevant, could have occurred in the last 3 weeks", or 2 = "not relevant".

Stage 3 Feasibility

The feasibility test was performed to support the Delphi results and to test the data collection method to be used (structured continuous observations).[24] As a component of the data collection method, 5 observers (nursing students of the research team) who had gained basic knowledge of the NIC through their professional education were trained during 3 two-hour sessions. They individually mapped the interventions that were performed by nurses in video fragments to NIC interventions. The mapping procedure implied that an observed intervention, comprising specific nurses' activities, was linked to the most accurate NIC intervention by comparison of relevant intervention labels and definitions. Discrepancies between observers were discussed until consensus was reached on which NIC intervention was most appropriate, and a log of these decisions was kept. An interventions' duration was recorded by writing start and end times using a stopwatch. The mapping procedure was subsequently tested in a residential care home and nursing home where 2 observers simultaneously observed 1 nursing assistant continuously during a day shift.

Stage 4 Inter-rater reliability

Continuous observations of nursing staff took place in 2 care centers, 2 residential care homes, and a nursing home. Different types of nursing staff were observed during day shifts in different types of units. Observations took place with 4 (out of 5) paired observers whereby the combination alternated. Observers linked their observations independently to NIC interventions according to the mapping procedure.

STATISTICAL ANALYSES

Stage 2 Examining content validity

Descriptive statistics were used to present the characteristics of the Delphi experts. Based on the ratings of the experts, the content validity was computed on the item level for each NIC intervention with the item content validity index (I-CVI) and on the scale level for NIC domains with the scale content validity index (S-CVI)[24] in Microsoft Excel® 2010 (Microsoft Corp., Redmond, WA). The I-CVI was computed as the number of experts rating a 3, 4, or 5 divided by the total number of experts which is the proportion of agreement per intervention.[24] The S-CVI was obtained by averaging the proportion of items that were rated as relevant across the experts and divided by the number of items, the S-CVI/Ave. An I-CVI of 0.80 was considered acceptable[24] whereby the intervention was included in the observational instrument. An S-CVI/Ave of 0.90 was considered acceptable.[24]

Stage 4 Inter-rater reliability assessment

The interventions' duration in minutes was entered into IBM SPSS Statistics 19 (Armonk, NY: IBM Corp). Interventions were categorized into the NIC domains. Inter-rater reliability was computed for each observer pair per domain. Inter-rater agreement for the identification of interventions, meaning the extent to which observers mapped observed activities to the same NIC interventions, was calculated by (non) agreement percentages with 95% confidence intervals (CI). In order to do so, the time recordings of the ratio scale were dichotomized per intervention (0 = time noted, 1= no time noted). The (non) agreement was calculated to determine whether observers agreed when care did or did not occur.[25] So as not to overestimate the level of agreement, a Cohen's kappa (unweighted) with a 95% CI was also calculated. A kappa (K) value of 0 - 0.20 was considered as slight agreement; 0.21 - 0.40 as fair; 0.41 - 0.60 as moderate; 0.61 - 0.80 as substantial; and 0.81 - 1 as an almost perfect agreement.[26]

To verify the level of inter-rater reliability of time spent on interventions, an intra-class correlation coefficient (ICC) was computed using a two-way random effects model with absolute agreement. Single measures with a 95% CI are reported. Values less than 0.40 were considered poor; between 0.40 and 0.59 as fair; 0.60 and 0.74 as good; and between 0.75 and 1.0 as excellent.[27]

Bland-Altman plots were used to visualize and quantify agreement between all paired observations per domain. Means and 95% limits of agreement were calculated and provided visual judgement of how well observers agreed on the amount of time spent on a domain. A smaller range between the upper and lower limits indicates a better agreement. A range of agreement is defined as a mean bias ±1.96 standard deviation (SD).[28,29] A one-

sample student *T*-test was performed in order to examine if the difference between observers differed significantly from zero, indicating fixed bias. The statistical significance level was set at $P < .05$.

ETHICAL CONSIDERATIONS

This study was conducted in accordance with the guidelines of Good Clinical Practice[30] which principles have their origin in the Declaration of Helsinki.[31] Approval was obtained from the Medical Ethics Review Board of the University Medical Center Groningen, The Netherlands. Informed consent was obtained from the residents or their legal representatives to allow observers entrance to residents' rooms. Facility managers did not allow that the 2 observers entered psycho-geriatric units at the same time as this was considered too disruptive for these residents with cognitive impairments.

RESULTS

The results follow the chronological order in which the 4 stages occurred. A flowchart of the instruments' development is provided (Figure 1).

The initial observations of nurses' activities were linked to 281 (out of 542) potentially setting-specific NIC interventions resulting in an inventory that was forwarded to the 9 experts of the Delphi panel in the first round.

Seven experts responded in the first round. Their median age was 32 (interquartile range [IQR] 25) and working experience 5 years (IQR 17.5) (Table 1). The experts concurred on 75 interventions that frequently occur in LTIC (I-CVI ≥ 0.86) (Figure 1). Their written comments suggested the inclusion of another 91 interventions with an I-CVI of 0.57 or 0.71. These 91 interventions were again sent to the 7 experts in the second round. Then, 6 experts with a median age of 27 (IQR 26) years and a working experience of 4 years (IQR 15.6) (Table 1) responded.

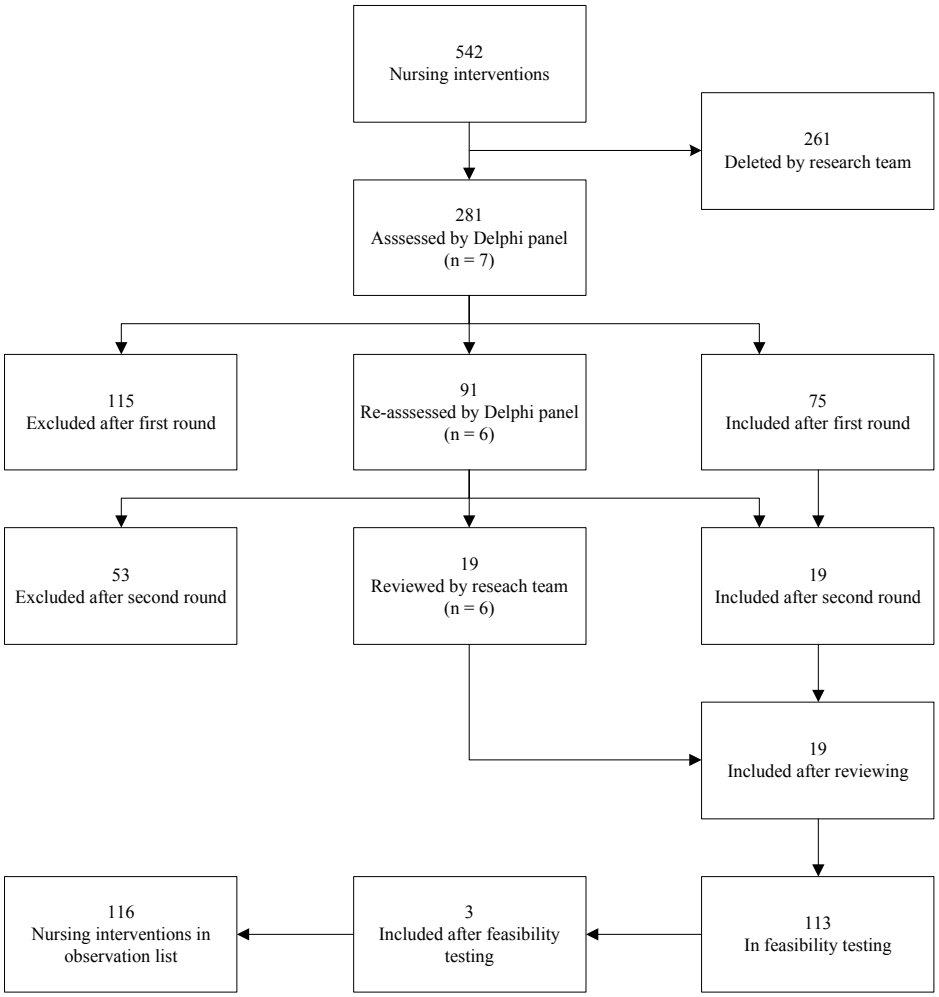

Figure 1. Flowchart of instrument development

Table 1. Expert characteristics and response to Delphi rounds

Expert	1	2	3	4	5	6	7
Gender	female	female	male	female	female	female	female
Age	46	32	41	21	22	21	50
Educational level[a]	RN	NA	NA	RN	RN	RN	NA
Working experience	5	11	20	2,5	3	1	38
Type LTIC[b]	CC	NH	CC	NH	RC	NH	RC
Response round 1	X	X	X	X	X	X	X
Response round 2	X	X	-	X	X	X	X

[a] RN = registered nurse; NA = nursing assistant.
[b] LTIC = long-term institutional care; CC = care centre with residential care, somatic- and psycho-geriatric units; NH = nursing home with somatic and psycho-geriatric units; RC = residential care home.

Following this, 19 interventions with an I-CVI ≥ 0.83 were added to the observational instrument (Figure 1). Subsequently, interventions with an I-CVI of 0.50 and 0.67 (19) were critically reviewed by the research team. Considering their individual experience in long-term care, the research team considered these interventions as relevant (Figure 1). With this inclusion, the observational instrument comprised 113 interventions (Figure 1) in 24 classes and 6 domains (Table 2). The S-CVI/Ave of domains ranged from 0.79 to 0.93. An overview of included NIC domains and classes with examples of interventions is provided in Table 2.

Table 2. Included NIC[a] domains and classes with 2 examples of interventions per class

Domains	Definition domain	Classes	Examples of interventions (NIC code)
Physiological: basic	Care that supports physical functioning	Self-care facilitation, elimination management, immobility management, nutrition support, activity and exercise management, physical comfort promotion.	Self-care assistance (1800), bathing (1610), tube care: urinary (1876), urinary incontinence care (0610), positioning (0840), transfer (0970), feeding (1050), nutritional monitoring (1160), body mechanics promotion (0140), energy management (0180), pain management (1400), environmental management: comfort (6482).
Physiological: complex	Care that supports homeostatic regulation	Electrolyte and acid-base management, drug management, skin/wound management, neurologic management, respiratorymanagement , thermoregulation, tissue perfusion management.	Hyper- and hypoglycemia management (2120/2130), medication administration (2300), medication management (2380), pressure ulcer prevention (3540), skin surveillance (3590), unilateral neglect management (2760), aspiration precautions (3200), asthma management (3210), temperature regulation (3900), Fever Treatment (3740), fluid management (4120), circulatory care: venous insufficiency (4066).

Table 2. (Continued)

Domains	Definition domain	Classes	Examples of interventions (NIC code)
Behavioral	Care that supports psychosocial functioning and facilitates life style changes	Behavior therapy, cognitive therapy, communication enhancement, coping assistance, patient education, psychological comfort promotion.	Activity therapy (4310), behavior management (4350), memory training (4760), reality orientation (4820), active listening (4920), socialization enhancement (5100), security enhancement (5380), activity therapy (4310), socialization enhancement (5100), support system enhancement (5440), emotional support (5270), teaching: prescribed medication (5616), teaching: disease process (5602), anxiety reduction (5820), calming technique (5880).
Safety	Care that supports protection against harm	Risk management	Fall prevention (6490), elopement precautions (6470).
Family[b]	Care that supports the family	Lifespan care	Home maintenance assistance (7180).
Health System	Care that supports effective use of the health care delivery system	Health system mediation, health system management, information management.	Case management (7320), visitation facilitation (7560), preceptor: student (7726), delegation (7650), shift report (8140), documentation (7920).

[a] NIC = Nursing Interventions Classification.
[b] Only comprising the intervention home maintenance assistance.

The feasibility test revealed 3 additional interventions that frequently occurred in practice: spiritual support (praying), circulatory care: venous insufficiency (eg, compression therapy), and airway management (eg, teach usage of prescribed inhalers). This resulted in a final observational instrument of 116 interventions – the GO-LTIC (Groningen Observational instrument for Long-Term Institutional Care).

Concerning the mapping procedure, it appeared that the definition and label of NIC interventions was not always clear enough to assign an observation to, for instance, when to classify an intervention as 'dressing' or 'self-care assistance'. After a consensus discussion with all of the observers it was decided which was the most accurate fit. Consensus discussions continued during the stage of inter-rater reliability testing if necessary. The usability of the GO-LTIC was improved by organizing NIC classes on frequency of occurrence. It was decided that time recordings were rounded to 30 seconds.

Regarding inter-rater reliability, 4 nursing assistants, 2 primary caregivers (nursing assistants with additional training in coordinating care), and 1 registered nurse were observed during 7 day shifts. They performed interventions on 108 residents in 4 somatic units (n = 44) and 3 residential care units (n = 62). Two residents' units were unknown. Residents' average age was 87.1 years; they were primarily female (n = 81). From the 116 interventions, 55 were identified by observers, and the amount of time was registered (Table 3). Unobserved interventions mainly concerned the safety and behavioral domains.

Table 3. Overview of identified interventions and number of observations

	Interventions in domain	Interventions identified (% of domain)	Number of observations (O1 and O2[a])
Domain Physiological: basic	47	25 (53)	529
Domain Physiological: complex	20	12 (60)	232
Domain Behavioral	28	8 (29)	72
Domain Safety	6	1 (17)	6
Domain Family	1	1 (100)	180
Domain Health System	14	8 (57)	336
Total domains	116	55 (47)	1355

[a] O1 = observer 1 and O2 = observer.

The inter-rater agreement for the identification of interventions yielded from 0.93 to 1.00 except for interventions in the family domain (Table 4). When corrected for chance, substantial to almost perfect agreement was perceived within the domains of basic physiological care (K = 0.67, CI: 0.54 – 0.81 to K = 0.92, CI: 0.84 – 0.99) and complex physiological care (K = 0.70, CI: 0.42 – 0.99 to K = 0.94, CI: 0.82 – 1.00) (Table 3). Values were fair to almost perfect agreement in the behavioral domain (K = 0.40, CI: 0.00 – 1.00 to K = 1.00, CI: 1.00), family domain (K = 0.40, CI: 0.12 – 0.77 to K = 1.00, CI: 0.74 – 1.00), and health system domain (K = 0.30, CI: 0.00 – 0.77 to K = 0.76, CI: 0.62 – 0.90). Interventions in the safety domain were often not identified, resulting in few time recordings, therefore kappa could not be calculated.

Good to excellent inter-rater reliability for the time spent on interventions was found for the domain of basic physiological care (ICC = 0.64, CI: 0.14 – 0.89 to ICC = 0.99, CI: 0.99 – 1.00) and fair to excellent for the domain complex physiological care (ICC = 0.48, CI: 0.07 – 0.76 to ICC = 0.93, CI: 0.81 – 0.98). Poor to excellent values were found for the domains behavioral (ICC = 0.00, CI: -0.40 – 0.40 to ICC = 0.99, CI: 0.95 – 1.00), safety (ICC = 0.00, CI: -0.40 – 0.40 to ICC = 0.29, CI: -0.33 – 0.74), family (ICC = 0.24, CI: -0.18 – 0.60 to ICC = 1.00, CI: –) and health system (ICC = 0.03, CI: -0.38 – 0.46 to IC = 0.96, CI: 0.85 – 0.99).

Table 4. Point estimates of inter-rater reliability tests per NIC domain

Domain labels (number of observations[a])	Number of residents	Occurrence (CI)[b]	Non-occurrence (CI)[b]	Cohen's Kappa (CI)[b]	ICC Single (CI)[b]
Physiological: basic, 47 interventions					
Observers 3 & 4 (47*11=517)	11	0.97 (0.96 - 0.98)	0.97 (0.95 - 0.98)	0.78 (0.67 - 0.89)	0.64 (0.14 - 0.89)
Observers 2 & 4 (470)	10	0.99 (0.98 - 1.00)	0.99 (0.97 - 1.00)	0.92 (0.84 - 0.99)	0.94 (0.54 - 0.99)
Observers 3 & 1 (517)	11	0.96 (0.94 - 0.97)	0.96 (0.93 - 0.97)	0.67 (0.54 - 0.81)	0.97 (0.88 - 0.99)
Observers 1 & 2 (846)	18	0.99 (0.99 - 1.00)	0.99 (0.98 - 1.00)	0.83 (0.69 - 0.97)	0.87 (0.69 - 0.95)
Observers 1 & 2 (658)	14	0.98 (0.97 - 0.99)	0.98 (0.96 - 0.99)	0.79 (0.69 - 0.90)	0.95 (0.83 - 0.99)
Observers 3 & 4 (987)	21	0.99 (0.98 - 1.00)	0.99 (0.98 - 1.00)	0.82 (0.70 - 0.94)	0.99 (0.99 - 1.00)
Observers 3 & 4 (1081)	23	0.99 (0.99 - 1.00)	0.99 (0.99 - 1.00)	0.76 (0.60 - 0.93)	0.82 (0.63 - 0.92)
Physiological: complex, 20 interventions					
Observers 3 & 4 (20*11=220)	11	0.99 (0.97 - 1.00)	0.99 (0.97 - 1.00)	0.90 (0.77 - 1.00)	0.81 (0.33 - 0.95)
Observers 2 & 4 (200)	10	0.99 (0.97 - 1.00)	0.99 (0.97 - 1.00)	0.94 (0.82 - 1.00)	0.67 (0.16 - 0.91)
Observers 3 & 1 (220)	11	0.98 (0.95 - 0.99)	0.98 (0.95 - 0.99)	0.70 (0.42 - 0.99)	0.58 (0.05 - 0.87)
Observers 1 & 2 (360)	18	0.98 (0.97 - 0.99)	0.98 (0.97 - 0.99)	0.81 (0.64 - 0.98)	0.48 (0.07 - 0.76)
Observers 1 & 2 (280)	14	0.98 (0.96 - 0.99)	0.98 (0.96 - 0.99)	0.70 (0.43 - 0.96)	0.93 (0.81 - 0.98)
Observers 3 & 4 (420)	21	0.99 (0.98 - 1.00)	0.99 (0.98 - 1.00)	0.88 (0.74 - 1.00)	0.59 (0.23 - 0.81)
Observers 3 & 4 (460)	23	0.99 (0.98 - 1.00)	0.99 (0.98 - 1.00)	0.89 (0.77 - 1.00)	0.72 (0.44 - 0.87)
Behavioral, 28 interventions					
Observers 3 & 4 (28*11=308)	11	0.99 (0.98 - 1.00)	0.99 (0.98 - 1.00)	0.50 (0.00 - 1.00)	0.99 (0.95 - 1.00)
Observers 2 & 4 (280)	10	0.99 (0.97 - 1.00)	0.99 (0.97 - 1.00)	0.40 (0.00 - 1.00)	0.47 (-0.09 - 0.83)
Observers 3 & 1 (308)	11	1.00 (0.98 - 1.00)	1.00 (0.98 - 1.00)	0.86 (0.57 - 1.00)	0.43 (-0.25 - 0.81)
Observers 1 & 2 (504)	18	0.99 (0.98 - 1.00)	0.99 (0.98 - 1.00)	0.78 (0.58 - 0.97)	0.89 (0.73 - 0.96)
Observers 1 & 2 (392)	14	0.99 (0.97 - 1.00)	0.99 (0.97 - 1.00)	0.75 (0.50 - 0.99)	0.93 (0.80 - 0.98)
Observers 3 & 4 (588)	21	1.00 (0.99 - 1.00)	1.00 (0.99 - 1.00)	0.75 (0.40 - 1.00)	0.21 (-0.22 - 0.58)
Observers 3 & 4 (644)	23	1.00 (0.99 - 1.00)	1.00 (0.99 - 1.00)	1.00 (1.00)	0.00 (-0.40 - 0.40)
Safety, 6 interventions					
Observers 3 & 4 (6*11=66)	11	0.98 (0.92 - 1.00)	0.98 (0.92 - 1.00)	0.66 (0.00 - 1.00)	0.29 (-0.33 - 0.74)
Observers 2 & 4 (60)	10	1.00 (0.94 - 1.00)	1.00 (0.94 - 1.00)	—[c]	0.00 (-0.60 - 0.60)

Table 4. (Continued)

Domain labels (number of observations[a])	Number of residents	Occurrence (CI)[b]	Non-occurrence (CI)[b]	Cohen's Kappa (CI)[b]	ICC Single (CI)[b]
Observers 3 & 1 (66)	11	1.00 (0.95 - 1.00)	1.00 (0.95 - 1.00)	—	—
Observers 1 & 2 (108)	18	1.00 (0.97 - 1.00)	1.00 (0.97 - 1.00)	—	—
Observers 1 & 2 (84)	14	0.99 (0.94 - 1.00)	0.99 (0.94 - 1.00)	0.00 (0.00 - 1.00)	—
Observers 3 & 4 (126)	21	1.00 (0.97 - 1.00)	1.00 (0.97 - 1.00)	—	—
Observers 3 & 4 (138)	23	0.99 (0.96 - 1.00)	0.99 (0.96 - 1.00)	0.00 (0.00 - 1.00)	0.00 (-0.40 - 0.40)
Family, 1 intervention					
Observers 3 & 4 (1*11=11)	11	0.91 (0.62 - 0.98)	0.83 (0.44 - 0.97)	0.82 (0.48 - 1.00)	0.43 (-0.14 - 0.80)
Observers 2 & 4 (10)	10	0.70 (0.40 - 0.89)	0.40 (0.12 - 0.77)	0.40 (0.00 - 0.97)	0.41 (-0.13 - 0.80)
Observers 3 & 1 (11)	11	0.82 (0.52 - 0.95)	0.67 (0.30 - 0.90)	0.65 (0.20 - 1.00)	0.80 (0.38 - 0.94)
Observers 1 & 2 (18)	18	1.00 (0.82 - 1.00)	1.00 (0.77 - 1.00)	1.00 (1.00)	0.99 (0.97 - 1.00)
Observers 1 & 2 (14)	14	0.93 (0.69 - 0.99)	0.80 (0.38 - 0.96)	0.84 (0.53 - 1.00)	0.94 (0.82 - 0.98)
Observers 3 & 4 (21)	21	1.00 (0.85 - 1.00)	1.00 (0.74 - 1.00)	1.00 1.00)	0.24 (-0.18 - 0.60)
Observers 3 & 4 (23)	23	0.87 (0.68 - 0.96)	0.84 (0.62 - 0.95)	0.64 (0.27 - 1.00)	1.00 (-)
Health System, 14 interventions					
Observers 3 & 4 (14*11=154)	11	0.99 (0.95 - 1.00)	0.99 (0.95 - 1.00)	0.66 (0.19 - 1.00)	0.38 (-0.20 - 0.78)
Observers 2 & 4 (140)	10	0.94 (0.89 - 0.97)	0.94 (0.89 - 0.97)	0.30 (0.00 - 0.77)	0.96 (0.85 - 0.99)
Observers 3 & 1 (154)	11	0.94 (0.89 - 0.97)	0.94 (0.89 - 0.97)	0.65 (0.20 - 1.00)	0.12 (-0.48 - 0.65)
Observers 1 & 2 (252)	18	0.99 (0.97 - 1.00)	0.99 (0.97 - 1.00)	0.57 (0.08 - 1.00)	0.03 (-0.38 - 0.46)
Observers 1 & 2 (196)	14	0.93 (0.89 - 0.96)	0.93 (0.88 - 0.96)	0.63 (0.44 - 0.82)	0.84 (0.57 - 0.95)
Observers 3 & 4 (294)	21	0.99 (0.97 - 1.00)	0.99 (0.97 - 1.00)	0.40 (0.00 - 1.00)	0.73 (0.44 - 0.88)
Observers 3 & 4 (322)	23	0.97 (0.94 - 0.98)	0.96 (0.94 - 0.98)	0.76 (0.62 - 0.90)	0.64 (0.33 - 0.83)

NH = nursing home; CC = care centre, combining psycho-geriatric, somatic, and residential care units; RC = residential care home; NA = nursing assistant; PCG = primary caregiver, NA with additional training; RN = registered nurse.

[a] Including occurrence + non-occurrence + disagree.

[b] CI = 95% confidence interval.

[c] — = not possible to calculate due to too many zero's caused by a limited number of observations.

Bland-Altman plots illustrated differences between observers' paired observations. The mean differences in domains were: physiological basic 0.53 minutes (SD 4.34), physiological complex 0.02 minutes (SD 2.16), behavioral 0.16 (SD 0.99), safety 0.03 (SD 0.29), family -0.25 (SD 1.81), and health system 0.15 minutes (SD 5.25) (Figure 2). The one-sample student T-test indicated no significant differences between observers ($P > .05$).

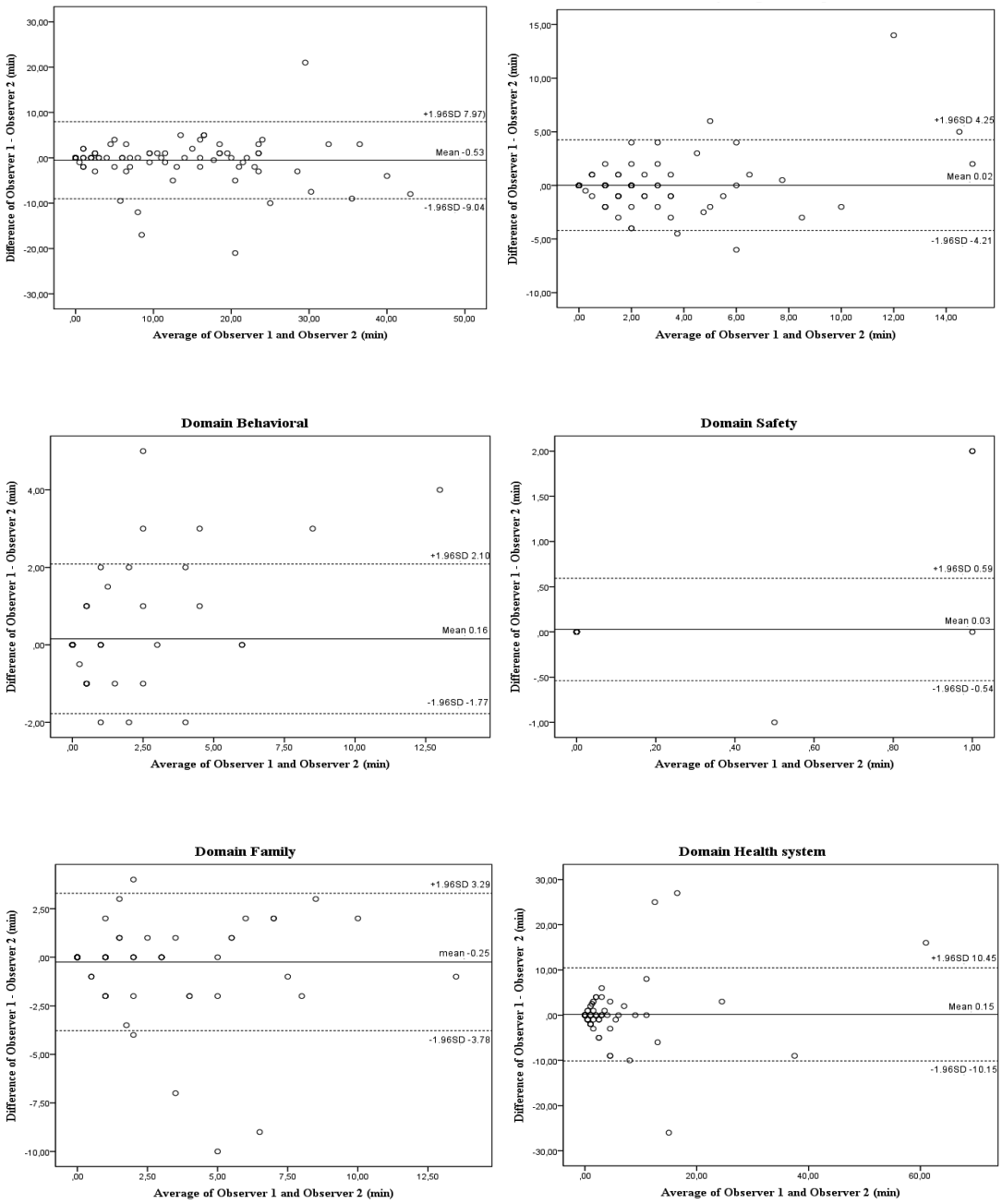

Figure 2. Bland-Altman plots with mean differences (solid lines) and 95% confidence intervals (dashed lines) in minutes

DISCUSSION

This study shows that the GO-LTIC has good content validity and acceptable inter-rater reliability to identify nursing interventions and the amount of time spent on these in LTIC. Based on the conceptual framework of the NIC, the instrument comprises 116 interventions categorized into 24 classes and 6 domains.

Though the content validity of the GO-LTIC was good (I-CVI ≥ 0.80) for most interventions (n = 94), a limited number of interventions (n = 19) showed a value lower than the cut-off point (0.80). A low I-CVI can mean that experts were not sufficiently proficient.[32] Only working experience was an inclusion criterion. The experts' identification of interventions may have been complicated since the terms employed in a standardized nursing language such as the NIC lack complete alignment between terms that nurses use during their daily practice.[33]

With the exception of interventions in the family domain, reliability assessment concerning the identification of interventions yielded, inter-rater agreements from 0.93 to 1.00, which is in concordance with observational LTIC studies of Dellefield et al.[9] (0.82 – 0.85) and Munysia et al.[34] (0.90). In order to claim adequate inter-rater reliability, agreement should be 0.90.[35] When corrected for chance, inter-rater reliability varied between 'almost perfect' for the physiological domains (K = 0.67 – 0.94) and from 'slight agreement' to 'almost perfect' for the other domains (K = 0.30 – 1.00). This is lower than a study of Cardona et al.[36] who found a Cohen's kappa of 0.88. An explanation may be that Cardona et al.[36] used work sampling as a data collection technique while this study conducted structured continuous observations which are labor-intensive,[37] therefore, data collector fatigue may have resulted in less accurate recordings. However, in time studies, this technique should be considered as it is more accurate especially when results can affect policy decisions concerning, for example, task allocation.[37] In this study, no data were obtained in psycho-geriatric units which may have resulted in fewer observations, especially in the safety and behavioral domains (eg, elopement precautions, behavior management). Because the number of observations (= prevalence) influences Cohen's kappa,[38] this may explain the lower values in these domains.

In addition, the observational instrument of Cardona et al.[36] comprised 24 interventions specifically for the use in a locked unit where residents exhibited disruptive behavior. The GO-LTIC comprises 116 interventions for the purpose of examining the time use of nursing staff in different types of units. Ferketich[39] contends that instruments should have a minimal length and represent a specific population and purpose while achieving acceptable support for their reliability and validity. The GO-LTIC showed good content validity and acceptable inter-rater reliability, therefore, it was decided not to exclude any interventions. Furthermore, it has been argued that a greater set of activities in time studies is feasible when data are collected by continuous observations because one observer will observe only one subject.[37]

The inter-rater reliability for the amount of time spent on interventions varied, and ICC's ranged from fair to excellent for the physiological domains (0.48 – 0.99) and poor to excellent for the other domains (0.00 – 1.00). Bland Altman plots indicated that the clinical magnitude of most differences in minutes was small. Only the standard deviation of the domains physiological basic and health system exceeded the a priori set acceptable mean bias of 1.96 SD. In addition, a one-sample student *T*-test showed no statistical significant differences between observers.

Structured observations require trained observers with knowledge of the phenomena under investigation and pretesting of instruments in addition to a category system for classifying.[24] In this study, observers with a nursing background were recruited and trained to map activities performed by nursing staff to the most accurate NIC intervention. This, followed by the feasibility test, contributed to the reliability. An advantage of the GO-LTIC is that it is based on a standardized language whereby the work of staff is uniformly represented. This may increase the comparability of studies and, furthermore, could promote benchmarking of LTIC facilities at local, regional, national, and international levels.[33] The instrument shows good content validity and acceptable reliability in the Dutch LTIC context. As instruments are continuously being used in different circumstances and with other groups of people, reliability and validity are never ending processes.[22]

CONCLUSION

This study describes the potential of the GO-LTIC for examining what interventions nursing staff spend their time on during the process of care. The instrument demonstrates good content validity in the Dutch LTIC context. When the observations are conducted by adequately trained observers with a nursing background, the instrument shows acceptable inter-rater reliability. The value of the GO-LTIC is that it allows for the identification of nursing interventions that are performed for a specific population which could also increase the visibility of nursing staffs' contribution to quality of care outcomes. Furthermore, if it is known who is doing what and the time involved with this, the GO-LTIC has the potential to enable managers' decisions regarding task allocation of nursing staff according to their specific scope of practice, resource allocation, and the examination of the costs of services. Furthermore, by using a standardized nursing language, the GO-LTIC may be valuable to the analysis across settings and promote benchmarking of LTIC facilities at local, regional, national, and international levels.

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CHAPTER 3

EXAMINING TIME USE OF DUTCH NURSING STAFF IN LONG-TERM INSTITUTIONAL CARE: A TIME-MOTION STUDY

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ABSTRACT

Objectives: Increasing residents' acuity levels and available resources in long-term institutional care require insight into the care provided by nursing staff in order to guide task allocation, optimal use of resources, and enhance quality of care. The purpose of this study was to examine the relationship between time use and type of nursing staff, residents' acuity levels, and unit type by using a standardized nursing intervention classification.

Design: A multi-center cross-sectional observational study was performed using time-motion technique.

Setting: Five Dutch long-term institutional care facilities participated. In total, 4 residential care units, 3 somatic units, and 6 psycho-geriatric units were included.

Participants: Data were collected from 136 nursing staff members: 19 registered nurses, 89 nursing assistants, 9 primary caregivers, and 19 health care assistants.

Measurements: A structured observation list was utilized based on the Nursing Interventions Classification (NIC). Residents' acuity levels, representing residents' needs, were based on the Dutch Care Severity Index. Medians and interquartile ranges were calculated for time spent on interventions per type of nursing staff and units. Linear mixed models were used to examine the relationship between time spent on nursing interventions and the type of nursing staff, residents' acuity levels, and unit type.

Results: Observations resulted in 52,628 registered minutes for 102 nursing interventions categorized into 6 NIC domains for 335 residents. Nursing staff spent the most time on direct care interventions, particularly in the domain of basic physiological care. Variances in time spent on interventions between types of nursing staff were minimal. Unit type was more significantly ($P < .05$) associated with time spent on interventions in domains than the type of nursing staff. Residents' acuity levels did not affect time spent by nursing staff ($P > .05$).

Conclusion: The current study found limited evidence for task allocation between the types of nursing staff which may suggest a blurring of role differentiation. Also, findings suggest that residents received similar care regardless of their needs, implying that care is predominantly task-oriented instead of person-centered. Managers may reconsider whether the needs of residents are adequately met by qualified nursing staff considering the differences in education and taking into account increasing acuity levels of residents and available resources.

INTRODUCTION

The number of elderly residents with higher acuity levels is increasing in long-term institutional care (LTIC) primarily due to population aging and governmental policies that promote home-based care.[1,2] Subsequently, nursing staff attend to people with an increasing number of severe limitations.[1]

Dutch LTIC is non-profit and mainly funded from public sources.[3] The emphasis of residential care is on housing and support with activities of daily living while nursing homes also provide skilled nursing services, recreational therapy and rehabilitation. Due to policy reforms, facilities are often combined and nursing home units have emerged in residential care homes.[4] Residents' increasing acuity levels intensify the work of nursing staff and affect the staff qualifications needed which is of concern.[5]

Deficiencies in LTIC are associated with the number of nursing staff as well as the staff mix,[6] i.e., the composition of nursing staff (eg, registered nurses and nurse assistants), that is often related to the educational level of nurses.[7,8] Reviews about nurse staffing related to quality of care in LTIC show tentative evidence that a higher number of nursing staff is associated with better quality of care.[9,10,11] Mixed results are reported concerning quality of care outcomes related to the type of nursing staff.[9,11] Studies lack information about what nursing staff is actually doing in the process of care that may have contributed to quality of care outcomes.[9,10,11] A methodological concern is that studies mainly rely upon secondary survey data that report care outcomes at the facility level thereby disregarding individual resident-acuity factors that influence these outcomes.[9,10] In addition, unit type may affect nursing staffs' activities since residents at risk of specific quality outcomes are often clustered within specific units[12,13] where residents' needs may vary and may influence the type of nursing activities and amount of time spent on these.[13,14] It has been argued that the time spent with an individual resident has the greatest effect on quality of care.[15] Primary data from observational studies into the actual time use of type of nursing staff are needed[10] and would provide more insight into the allocation between types of nursing staff which could enable matching types of nursing staff to residents' needs.

A number of explorative observational studies into nurses' activities in LTIC provided insight into time use of registered nurses,[16,17] health care aids,[16,18,19] and recreation activity officers.[16] Depending on the type of nursing staff, results show that up to 50% of the time was spent on individual resident care (direct care) and the remaining time on care activities such as communication and documentation but also walking, re-stocking, and bed making. Higher educated staff (registered nurses) were more engaged in communication and documentation activities and less in direct care activities.[16,17] Study results are difficult to compare due to the various terminologies used to describe activities. Furthermore, most of

these studies described time use of one type of nursing staff in 1 or 2 units during day shifts, and none related residents' acuity levels to the amount of time spent on activities. Using self-reports, Paquay et al.[20] did link residents' dependency levels to activities of type of nursing staff. There was tentative evidence that nursing staff spent more time on residents with higher dependency levels, however, the proportion of time was not significantly associated with the dependency levels. The small size of this study and under-recording may have been limitations.

Thus, research about the actual care provided by nursing staff is needed taking into account acuity levels of residents. This could provide insight into task allocation between type of nursing staff, facilitate matching types of nursing staff to residents' needs as well as enhancing optimal use of resources and providing insight into the contribution of nursing staff to quality of care. The purpose of our study was to examine the relationship between time use and the type of nursing staff, residents' acuity levels, and type of unit by using a standardized nursing intervention classification.

METHODS

STUDY DESIGN

This multi-center observational study employed a cross-sectional quantitative explorative design. LTIC settings were purposively sampled to represent different types of LTIC.

STUDY SETTING AND SAMPLE

Six chains of long-term care in the North of the Netherlands, including residential care facilities and nursing homes, were invited to participate. Three chains consented, 2 did not respond and 1 declined. Of the participating chains, 5 facilities representing different types of LTIC were selected. One was a nursing home (133 beds) with somatic and psycho-geriatric units; 2 were residential care homes (60 and 52 beds); and 2 were care centers (62 and 96 beds) combining residential care and nursing home care. In total, 4 residential, 3 somatic, and 6 psycho-geriatric care units were included. Residential care units varied from 36 to 60 residents who had their own rooms. Three psycho-geriatric units were large-scale, housing 10 to 36 residents. One somatic and 3 psycho-geriatric units were small-scale living units housing 8 residents. Unlike small-scale living, residents in large-scale psycho-geriatric units did not have their own room at the time of the study. All units had a shared living room where residents could have their meals together. Psycho-geriatric units were secure units.

The purposive sample of personnel represented all types of nursing staff. To qualify for a specific nursing profession, a certain level of education is required. Since educational

arrangements vary widely between, and even within, countries we used the International Standard Classification of Occupations (ISCO-08)[21] to enhance comparability. Nursing assistants (Nursing Associate Professionals, ISCO code 3221) form the majority of staff and are not legally registered as a nurse. They receive 3 years of training in which cognitive and practical skills such as basic bedside care, administering injections, and taking vital signs are learned.[22] After additional training (35 weeks), they may become primary caregivers who monitor the care process of a group of residents and serve as a contact for family and health professionals.[23] Nurses (Nursing Professionals, ISCO code 2221) may have obtained a bachelor degree (bachelor of science in nursing) or not (registered nurse) after 4 years of education. They plan and manage care and supervise other health care workers.[21] Quality indicators in LTIC require that a registered nurse is available 24 hours a day.[24] Health care assistants (ISCO code 5321) follow 2 years of education and provide care that supports basic activities of daily living such as bathing and food preparation.[22]

DATA COLLECTION AND ETHICS

Data collection was conducted in April and May 2011. Structured observations were made using time-motion technique. Nursing staff was observed during day, evening, and night shifts. Together with the facility's care coordinators, observers were linked to type of nursing staff per unit.

The Ethical Review Board of the University Medical Center Groningen approved the study. Residents or their legal representatives were asked to give their written informed consent to permit observers to enter residents' rooms.

Measurement instruments

An observation list was developed on the basis of the Nursing Interventions Classification (NIC) which provides titles and definitions of nursing interventions (542) and a categorization in classes (30) and domains (7).[25] An intervention is described as any treatment based on the judgment and clinical knowledge of a nurse that intends to increase residents' care outcomes.[26] Each intervention incorporates a series of activities that nurses perform to implement an intervention. Direct care interventions are defined as "a treatment performed through interaction with the patient"[26] including both physiological and psychosocial activities. Indirect care interventions are "treatments performed away from the patient but on behalf of the patient or group of patients"[26] including activities aimed at managing patient care and interdisciplinary collaboration.

With 2 series of structured questionnaires, a Delphi panel of 9 clinical experts reached consensus on 116 NIC interventions that occur most frequently in LTIC. These were included in the observation list and represent 24 classes and 6 domains as depicted in Table 1 which also includes examples of interventions. Non-resident related items such as breaks, in-transit activities (= time between activities, eg, walking in the corridor), and private activities (eg, toileting) were added.

Table 1. NIC[a] domains and 5 examples of included interventions per domain from the observation list

Domains	Definition	Label intervention (NIC code)
Physiological: basic	Care that supports physical functioning	Self-care assistance (1800), dressing (1630), bathing (1610), transfer (0970), feeding (1050)
Physiological: complex	Care that supports homeostatic regulation	Medication administration (2300), fluid management (4120), circulatory care: venous insufficiency (4066), skin care: topical treatments (3584), pressure ulcer prevention (3540)
Behavioral	Care that supports psychosocial functioning and facilitates life style changes	Active listening (4920), security enhancement (5380), activity therapy (4310), socialization enhancement (5100), support system enhancement (5440)
Safety	Care that supports protection against harm	Dementia management: bathing (6462), environmental management: safety (6486), fall prevention (6490), dementia management (6460), elopement precautions (6470)
Family[b]	Care that supports the family	Home maintenance assistance (7180)
Health System[c]	Care that supports effective use of the health care delivery system	Case management (7320), shift report (8140), documentation (7920), physician support (7710), preceptor: student (7726)

[a] NIC = Nursing Interventions Classification.
[b] Only comprising the intervention home maintenance assistance.
[c] Comprising indirect care interventions; the other domains are direct care interventions.

In order to identify residents' needs and to estimate the number of staff and staff mix, acuity levels are determined with patient classification approaches, such as the Resident Utilization Group System scores in North America.[14,27] Dutch residents' acuity levels are determined by independent assessors using the Dutch Care Severity Index with levels ranging from 1 to 10 (1- low level, needing little nursing care). The internal consistency of this index ranged from a Cronbach's alpha 0.50 to 0.95 and the inter-rater reliability by a Pearson r-correlation from 0.75 to 0.91.[28]

Observation protocol

Time-motion technique signifies that trained observers recorded the time that nursing staff spent on each intervention[29] whereby a nursing staff member was 'shadowed' during her shift. The time that it took that nurse to complete an intervention was determined by recording start and end time of an intervention, rounded to 30 seconds, using a stopwatch. Five observers experienced in LTIC and with knowledge of the NIC were trained in mapping nurses' activities into NIC interventions during 3 two-hour sessions using video-fragments. With structured observations, a selection must be made as to which item is used to record an observation.[30] If discussion arose as to which intervention to choose (eg, in the event of multitasking), performed activities were reviewed alongside described activities of potential NIC interventions to be able to make a choice, and a log of these decisions was kept.

To calculate inter-rater reliability, in each facility staff members were observed during their day shift by 2 observers. This was scheduled 7 times during the data collection period.

ANALYSES

The registered time of observed interventions was entered into IBM SPSS Statistics 19. Interventions were categorized into the appropriate NIC domains. Percentages, medians, and interquartile ranges (IQR) were calculated for time spent on domains per type of nursing staff and units.

Inter-rater reliability was calculated by an intraclass correlation coefficient (ICC) based upon a two-way random model with absolute agreement (single measures) with 95% confidence intervals (CI). Values less than 0.40 are considered poor; between 0.40 and 0.59 fair; 0.60 and 0.74 good; and between 0.75 and 1.0 as excellent.[31]

The following analyses were applied with R version 2.15.2. Dependencies between nursing staff and acuity levels by means of the number of times staff provided care to residents with a specific acuity level were explored by log-linear analysis. Types of nursing staff and acuity levels as well as their interaction were used as main effects. Linear mixed models were used to examine the relationship between time spent on domains and type of nursing staff, residents' acuity levels and unit type. The type of nursing staff, acuity levels (their interaction), and unit type were taken as fixed effects, and residents were taken as random effects. To decrease estimation bias, the default option of restricted maximum likelihood was selected.[32] After a log transformation, diagnostic plots of the standardized residuals indicated no signs of non-normality or heterogeneity of variance. The statistical significance level was set at $P < .05$.

RESULTS

Observations resulted in 52,628 minutes (877 hours) of time registered for 102 NIC interventions categorized in 6 domains. These interventions were performed by 19 registered nurses (RNs) (14%), 9 primary caregivers (7%), 89 nursing assistants (65%), and 19 health care assistants (14%) (Table 2). In residential care units, nursing staff were observed 65 times (48%), 40 times in psycho-geriatric units (29%), and 15 times in somatic units (11%). At times, nursing staff worked on multiple units throughout the facility (12%).

Interventions were performed with 335 distinct residents with most of them receiving care multiple times. One hundred and ninety nine resided in residential care units, 98 in psycho-geriatric units, and 38 in somatic units. Residents with similar acuity levels were clustered into a specific unit (Figure 1). In somatic units, approximately 84% of the residents were classified as acuity level 6 or higher. Following the Dutch Care Severity Index, this indicates that they receive intensive nursing care and support. In psycho-geriatric units, approximately 80% were classified as acuity level 5 and receiving intensive dementia care. In residential care units, 90% were categorized as acuity level ≤ 4 and receiving minimal support with their activities of daily living.

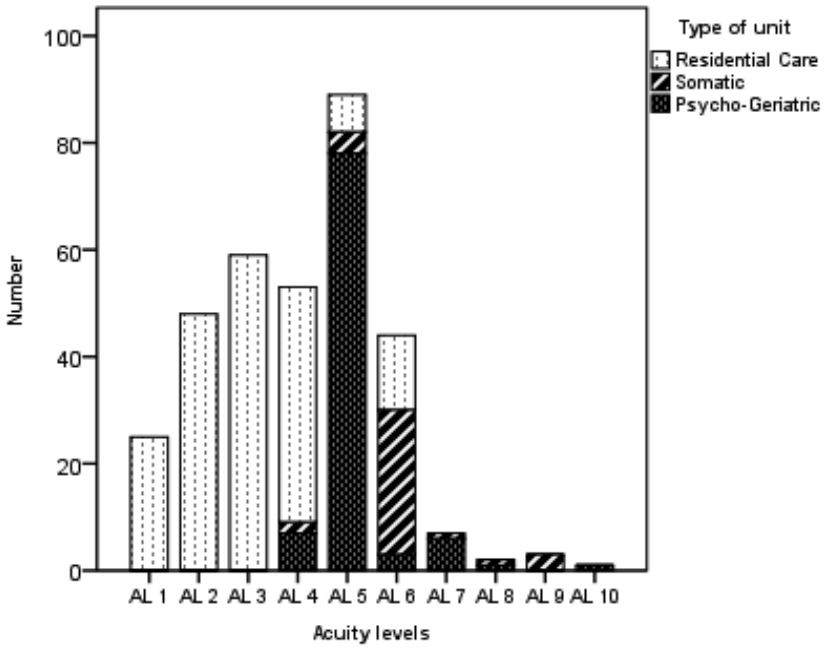

Figure 1. Acuity levels in specific units in numbers
AL = acuity level; n = 331, 4 residents' acuity levels were unknown

Inter-rater agreement of the observations was excellent for the domains of basic physiological care (ICC 0.92; CI 0.89–0.95), complex physiological care (ICC 0.76; CI 0.67–0.83), behavioral (ICC 0.87; CI 0.82–0.91), family (ICC 0.77; CI 0.69–0.84), and health system (ICC 0.79; CI 0.71–0.85). The safety domain showed a poor agreement (ICC 0.17; CI -0.02–0.35).

TIME USE OF NURSING STAFF

The total nursing staff time comprised 54% direct care interventions (domains: basic- and complex physiological care, behavioral, safety, and family), 22% indirect care (domain: health system), and 24% non-resident time.

Of the time registered with domains, most time was spent on the domain of basic physiological care (range median 104-118 minutes), especially in the somatic units (range 58-135). Within this domain, time was primarily spent on the intervention self-care assistance (50%) (Table 2).

Differences between the types of nursing staff were small (range 104-118). Differences were also small for the domain of complex physiological care (range 30-41). Of the interventions in this domain, most time was spent on medication administration (62%) and more in residential care units (range 16-36) than in other units. Time spent on interventions in the domains family, behavioral, and safety was limited.

Following basic physiological care, time was mainly spent on the health system domain with interventions such as case management (29%), shift report (24%), and documentation (18%). Largely, primary caregivers spent time on this domain in somatic (median 190) and residential care units (median 139) (Table 2).

Non-resident time was primarily spent on breaks (median 46) and in-transit activities (median 30) which was 13% and 10%, respectively, of the total observed time. After omitting the time for nightshifts, the average break time was 45 minutes.

Table 2. Time spent in minutes on NIC domains by type of nursing staff[a] in all units and per type of unit[b]

Category	Domains NIC	NIC interventions most time spent on (% within domain)[c]	Unit	RN Mdn (IQR) n = 19	PCG Mdn (IQR) n = 9	NA Mdn (IQR) n = 89	HCA Mdn (IQR) n = 19
Direct care	Physiological: basic	Self-care assistance (50), dressing (13), bathing (9), transfer (6)	*All units*	104 (44)	118 (77)	107 (68)	114 (65)
			RC	37 (34)	85 (66)	83 (58)	76 (91)
			Somatic	61 (74)	135 (0)	105 (123)	58 (30)
			PG	6 (33)	74 (77)	103 (138)	13 (80)
	Physiological: complex	Medication administration (62), fluid management (17), circulatory care: venous insufficiency (6)	*All units*	40 (23)	41 (29)	38 (32)	30 (34)
			RC	16 (21)	36 (29)	31 (32)	30 (33)
			Somatic	15 (29)	36 (0)	16 (44)	3 (3)
			PG	7 (19)	23 (49)	20 (46)	2 (6)
	Behavioral	Active listening (49), security enhancement (24), activity therapy (8), socialization enhancement (7)	*All units*	24 (29)	13 (10)	14 (24)	23 (34)
			RC	10 (26)	10 (16)	11 (25)	12 (30)
			Somatic	3 (16)	13 (0)	6 (8)	6 (2)
			PG	7 (23)	4 (5)	10 (21)	5 (7)
	Safety[d]	Dementia management: bathing (39), environmental management: safety (37), fall prevention (13), dementia management (5)	*All units*	5 (22)	3 (6)	5 (11)	3 (12)
			RC	0 (1)	0 (2)	0 (1)	0 (0)
			Somatic	0 (0)	0 (0)	0 (1)	0 (0)
			PG	0 (0)	2 (6)	1 (9)	0 (1)

Table 2. (Continued)

Category	Domains NIC	NIC interventions most time spent on (% within domain)[c]	Unit	RN Mdn (IQR) n = 19	PCG Mdn (IQR) n = 9	NA Mdn (IQR) n = 89	HCA Mdn (IQR) n = 19
	Family	Home maintenance assistance (100)	*All units*	27 (32)	23 (28)	42 (39)	34 (36)
			RC	5 (22)	21 (23)	30 (32)	21 (39)
			Somatic	5 (13)	28 (0)	19 (40)	5 (2)
			PG	0 (2)	17 (32)	45 (67)	9 (67)
Indirect care	Health system	Case management (29), shift report (24), documentation (18), order transcription (10), physician support (5)	*All units*	98 (54)	108 (117)	77 (85)	30 (35)
			RC	40 (42)	139 (134)	52 (87)	18 (25)
			Somatic	33 (35)	190 (0)	47 (105)	6 (2)
			PG	23 (115)	46 (89)	46 (80)	22 (39)

RN = registered nurse; PCG = primary care giver; NA = nursing assistant; HCA = health care assistant; Mdn = median; IQR = interquartile range; RC = residential care units; Somatic = somatic units; PG = psycho-geriatric units .

[a] n = 136.

[b] n = 198.

[c] total time registered within a domain comprises 100%, interventions occurring in less than 5% of a domain are not shown.

[d] Values of zero are due to a limited number of observations.

The relationship between time spent on domains and type of nursing staff, residents' acuity levels, and type of unit

The log-linear analysis revealed a significant interaction effect between RNs and residents with acuity level 5 (Estimate [*b*] = 1.36, *z* = 2.86, *P* = .004) and 6 (*b* = 1.31, *z* = 2.81, *P* = .005), indicating that they more frequently performed interventions on residents with AL 5 and AL 6 than on residents with lower acuity levels. Primary caregivers performed fewer interventions on residents with AL 6 (*b* = –1.04, *z* = –2.45, *P* = .014) than on residents with lower acuity levels.

Regarding the type of care provided to these residents, expressed as time spent on domains, linear mixed models showed a positive interaction effect of RNs and primary caregivers with acuity level 6 in the family domain (*b* = 1.8, *P* = .005 and *b* = 1.3, *P* = .013) and also for primary caregivers in the domain basic physiological care (*b* = 13.3, *P* = .012). (Table 3). Additional interaction effects revealed that, overall, nursing assistants and primary caregivers spent significantly less time on basic physiological care (*b* = –1.4, *P* < .001 and *b* = –1.8, *P* < .001) compared to health care assistants (reference group). Positive interaction effects indicated an increase of time when residents' acuity levels increased (Table 3). For RNs, a positive interaction effect in the family domain was also ascertained for residents with acuity level 2 (*b* = 1.6, *P* = .023), however, overall, RNs were found to spend significantly less time on the family domain (*b* = –1.2, *P* = .042) compared to health care assistants. RNs and primary caregivers, in particular, spent significantly more time on interventions in the health system domain (*b* = 1.6, *P* = .001 and *b* = 1.9, *P* < .001) than healthcare assistants. Negative interaction effects were found between primary caregivers and residents with acuity level 3 and 5 (*b* = –0.8, *P* = .032 and *b* = –0.9, *P* = .038).

Acuity levels did not show a significant effect on time spent on domains (Table 3). The type of care provided by nursing staff was often significantly associated with working in a specific unit (Table 3). Compared to residential care units (reference group), significantly more time was spent in somatic units on basic physiological care (*b* = 0.8, *P* < .001) and, in psycho-geriatric units, more time was spent on interventions in the safety domain (*b* = 1.5, *P* < .001). In both types of units, significantly more time was spent on the health system domain than in residential care units (somatic *b* = 0.7, *P* < .001); psycho-geriatric *b* = 0.6, *P* < .001); complex physiological care (somatic *b* = 0.4, *P* = .016); psycho-geriatric *b* = 0.4, *P* = .034); and the family domain (somatic *b* = 0.5, *P* = .001); psycho-geriatric *b* = 0.5, *P* = .001).

No significant effects were found for the behavioral domain for either type of nursing staff, acuity level, or unit type.

Table 3. Linear Mixed Models with log transformed data of time spent on NIC domains (dependent variables) and type of nursing staff, acuity level (and the interaction between these), and unit as explanatory fixed effects

Fixed effects of NIC domains	Estimate (*b*)	SE	df	*t* Value	*P* Value[a]	95% Confidence interval	
						Lower bound	Upper bound
Physiological: Basic							
Type of nursing staff							
- NA	-1.4	0.39	1167	-3.6	<.001	-2.1	-0.6
- PCG	-1.8	0.51	1167	-3.5	<.001	-2.8	-0.8
AL							
Type of nursing staff * AL							
- NA * AL 2	1.0	0.46	1167	2.1	.038	0.1	1.9
- PCG * AL 2	1.6	0.68	1167	2.3	.021	0.2	2.9
- NA * AL 3	1.0	0.42	1167	2.4	.015	0.2	1.9
- PCG * AL 3	1.6	0.56	1167	2.8	.006	0.5	2.7
- NA * AL 4	1.0	0.43	1167	2.3	.024	0.1	1.8
- PCG * AL 4	1.3	0.58	1167	2.3	.024	0.2	2.5
- NA * AL 5	1.2	0.44	1167	2.6	.009	0.3	2.0
- PCG * AL 5	1.7	0.60	1167	2.8	.006	0.5	2.8
- NA * AL 6	9.2	3.76	1167	2.4	.015	1.8	16.6
- PCG * AL 6	13.3	5.28	1167	2.5	.012	2.9	23.6
Unit type							
- Somatic	0.8	0.17	1167	4.6	<.001	0.4	1.1
Physiological: Complex							
Type of nursing staff							
AL							
Type of nursing staff * AL							
Unit type							
- Somatic	0.4	0.19	1092	2.4	.016	0.1	0.8
- PG	0.4	0.17	1092	2.1	.034	0.0	0.7
Safety[b]							
Type of nursing staff							
AL							
Type of nursing staff * AL							
Unit type							
- PG	1.5	0.30	259	4.9	<.001	1.5	0.9

Table 3. (Continued)

Fixed effects of NIC domains	Estimate (*b*)	SE	df	*t* Value	*P* Value[a]	95% Confidence interval	
						Lower bound	Upper bound
Family							
Type of nursing staff							
- RN	-1.2	0.60	1494	-2.0	.042	-2.4	-0.0
AL							
Type of nursing staff * AL							
- RN * AL 2	1.6	0.70	1494	2.3	.023	0.2	2.9
- PCG * AL 6	1.3	0.51	1494	2.5	.013	0.3	2.3
- RN * AL 6	1.8	0.63	1494	2.8	.005	0.5	3.0
Unit type							
- Somatic	0.5	0.15	1494	3.4	.001	0.2	0.8
- PG	0.5	0.15	1494	3.5	.001	0.2	0.8
Health system							
Type of nursing staff							
- NA	0.9	0.27	1801	3.2	.001	0.337	1.4
- PCG	1.9	0.35	1801	5.4	<.001	1.194	2.5
- RN	1.6	0.46	1801	3.4	.001	0.653	2.5
AL							
Type of nursing staff * AL							
- PCG * AL 3	-0.8	0.39	1801	-2.1	.032	-1.589	-0.1
- PCG * AL 5	-0.9	0.42	1801	-2.1	.038	-1.676	-0.0
Unit type							
- Somatic	0.7	0.12	1801	5.8	<.001	0.448	0.9
- PG	0.6	0.11	1801	5.2	<.001	0.373	0.8

RN = registered nurse; PCG = primary caregiver; NA = nursing assistant; HCA = health care assistant; AL = acuity level; RC = residential care units; Somatic = somatic units; PG = psycho-geriatric units. Reference categories: HCA (staff level), AL 1 (acuity levels), residential care (unit), HCA : AL 1 (staff level : acuity levels).
n = 1883 (12 ALs unknown);

[a] Only parameters with $P < .05$ are displayed, no significant results within the behavioral domain were found.

[b] In the safety domain no sufficient amount of data for AL ≥ 7 was available, data were aggregated to AL ≥ 6.

DISCUSSION

This study found that nursing staff spent most of their time on direct care with an emphasis on interventions in the domain basic physiological care. Limited time was spent on interventions in the family, behavioral, and safety domains. Time spent on domains was explained more by type of unit rather than residents' acuity level or type of nursing staff.

The emphasis on basic physiological care is consistent with results of other studies in LTIC.[19,20] An explanation could be that, due to physical and cognitive diseases, approximately 90% of residents experience moderate to serious limitations in activities of daily living[2] which are the main reasons for admission.[33]

No significant association was found between nursing staffs' time spent on domains and residents' acuity level which may indicate that residents receive similar care regardless of their acuity level. According to the Dutch Care Severity Index,[34] besides physical impairments, residents classified into acuity levels 4, 5, and 7 (45% of residents in this study) experience behavioral or cognitive problems and need counseling. However, no significant effect was found for the time spent on the behavioral domain, which includes psychosocial interventions such as emotional support and socialization enhancement. Furthermore, the amount of time spent on this domain was limited. This result appears to be congruent with a study of Ausserhofer et al.[35] who found that nursing care activities most frequently unattended in hospitals concerned 'psychosocial care', especially 'comfort/talk with patients'. They contend that management decisions regarding the amount and types of resources allocated to a unit will influence how nursing staff prioritize their care.

Limited time was spent on the safety domain. An explanation could be that the safety domain is defined by the NIC as "care that supports protection against harm"[26] and interventions include crisis and risk management. Interventions concerning, for example, pressure ulcers are categorized within skin management in the domain of complex physiological care.

Except for the behavioral domain, unit type had a significant effect on time spent on all domains and reflected, to a certain extent, the somatic or psycho-geriatric character of a unit. Identical acuity levels were predominantly clustered into the same unit type suggesting that residents had similar care needs. However, Hingstman et al.[36] found that, if acuity levels increase and the volume and complexity of care subsequently increases, then changes in staffing of the unit often lag behind the actual care needs of residents.

Since acuity levels were not associated with the type of care provided, unit type may have influenced the interaction effects between type of nursing staff and acuity levels. For instance, acuity level 6 was particularly associated with an increase of time spent on basic

physiological care by primary caregivers. This association is believed to be affected by the time spent by primary caregivers in somatic units. Residents with acuity level 6 lived primarily in somatic units which significantly influenced the time spent on this domain.

In accordance with Paquay et al.,[20] it was found that variances in the time spent between types of nursing staff were minimal and suggested a blurring of role differentiation. Furthermore, in our study, primary caregivers spent significantly more time on the health system domain (indirect care) with interventions such as case management and documentation. This is in contrast with results of other studies that found that RNs spent most time on indirect care activities (eg, documentation).[17, 20] This may be related to job descriptions and deployment of RNs or may indicate that Dutch primary caregivers play a more prominent role in the coordination of care. We found that RNs performed interventions with residents with higher acuity levels (5 and 6) more often, which is similar to other studies.[20,36] However, no evidence was found that this significantly influenced the type of care provided by RNs to these residents except for time spent on home maintenance assistance, a non-nursing task.

Differences of our results compared to other studies may be due to study samples, data collection techniques, and the categorization of activities. For instance, communication was a separate category in a study of Munyisia et al.[16] wherein the majority of nurses' time was spent on oral communication. Furthermore, their category 'multi-tasking' showed that most time was spent on the combination of the category direct care with communication. In our study, communication is an activity that is a component of most interventions and is guided by the NIC which further describes that a communication intervention such as 'active listening' requires a genuine "interest in the resident" and a "complete focus on the interaction".[23] Nursing staff speak with residents or each other when they perform either direct care (eg, bathing a resident) or indirect care interventions (eg, shift report). When the purpose of communication was, for instance, to implement the intervention 'bathing', this was not recorded separately. This may have resulted in an underestimation of recorded time in the behavioral domain in which interventions concerning communication (eg, active listening) are grouped.

Non-resident related time, such as breaks and in-transit activities, was in contrast to the results of other studies where lower percentages for breaks and in-transit activities were reported.[16,18] Under Dutch legislation, staff is entitled to a 30-minute break for every 5 consecutive hours of work.[37] Breaks in excess of this were found when shifts were longer than 5 hours. This is perceived as unpaid personal time by facility management. The physical layout of a unit, such as the organization of supplies, influences in-transit activities.[19] In our study, residents' rooms were frequently situated in long corridors which may explain the amount of time spent on these in-transit activities.

This study focused on *what* nursing staff was doing for which the NIC provides a framework. Benefits of a standardized language are that it enables comparison across studies, identifies interventions that are performed on a routine basis for a specific population which facilitates planning of personnel,[26] and increases the visibility of nursing contributions which could enhance data collection for evaluating nursing care outcomes.[38] This appeals for the use of a standardized language in future research.

A limitation was that potential confounders such as workload, work experience, or age of nursing staff were not examined in this study. Also, the cognitive processes that led to the choice of interventions or how nursing staff performed their interventions were not the focus. However, by conducting continuous observations during all shifts and in multiple facilities and units, comprehensive knowledge was gathered of the care that is actually delivered by nursing staff.

CONCLUSION

The current study found limited evidence for task allocation between RNs, primary caregivers, and nursing assistants, which may suggest a blurring of role differentiation. Also, findings suggest that residents received similar care regardless of their needs implying that care is predominantly task-oriented instead of person-centered. Whether the needs of residents were adequately met by qualified nursing staff considering the differences in education of nursing staff and taking into account acuity levels of residents is of importance to managers. Optimal deployment of nursing staff could ensure the use of available resources and optimize quality of care.

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CHAPTER 4

ACCURACY OF DOCUMENTATION IN THE NURSING CARE PLAN IN LONG-TERM INSTITUTIONAL CARE

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ABSTRACT

Nursing staff working in long-term institutional care attend to residents with an increasing number of severe physical and cognitive limitations. To exchange information about the health status of these residents, accurate nursing documentation is important to ensure the safety of residents. This study examined the accuracy of nursing documentation in 197 care plans of 5 long-term institutional care facilities. Based on the phases of the nursing process, the D-Catch instrument measures the accuracy of the content and coherence of documentation. Inadequacies were especially found in the description of residents' care needs and stated nursing diagnoses as well as in progress and outcome reports. In somatic and psycho-geriatric units, higher accuracy scores were determined compared with residential care units. Investments in resources (eg, time), reasoning skills of nursing staff, and implementation of professional standards in accordance with legal requirements may be needed to enhance the quality of nursing documentation.

INTRODUCTION

Nursing documentation is an essential activity that attempts to effectively facilitate information exchange about care recipients' health status and provide evidence of nursing care.[1,2] Accurate nursing documentation contributes to the continuity of care, safety, and well-being of residents.[1] During the previous decade, the amount as well as the complexity of care in long-term institutional care (LTIC) has increased.[3] Nursing staff care for residents who are experiencing an increasing number of severe physical and cognitive limitations. As other health professionals are involved, accurate nursing documentation is even more relevant.[1] Furthermore, managers in LTIC require specific, timely, and accurate nursing documentation as they are ultimately responsible for the quality of care, financial reimbursement, and deployment of nursing staff.[4,5]

Donabedian's conceptual model of quality of care indicates that an accurate, complete, and process oriented record is fundamental for quality of care.[6] The interrelated phases of the nursing process, first identified and described by Orlando's Nursing Process Discipline Theory,[7] are internationally acknowledged for structuring nursing documentation.[8,9] The nursing process is based on an analysis of care needs with the care recipient.[10] The phases involve: (1) an assessment resulting in (2) the identification of residents' physical, mental, and social needs or problems, (3) the description of outcomes to be achieved, (4) a selection of appropriate interventions, and (5) the evaluation of care.[10,11] In addition, (inter)national professional standards emphasize the importance of a nursing diagnosis statement that addresses the residents' problems (P), etiology or related factors (E), and signs and symptoms (S) of the problems (PES structure) because this will guide choices for appropriate nursing interventions and outcomes.[12,13]

Dutch legal documentation requirements correspond to the phases of the nursing process, and an individual care plan developed in dialogue with the resident or legal representatives is mandatory.[14,15] The philosophy of Dutch LTIC is on person-centered care (PCC).[16] PCC is a holistic approach to care delivery, and 'knowing the person' is important when meeting residents' care needs.[17,18] PCC endorses negotiation and emphasizes the residents' choice with respect to the care delivery.[18,19]

Numerous studies have examined the quality of nursing documentation describing the presence, content, and internal relationships of the phases of the nursing process. However, there is a lack of studies on the quality of nursing documentation in LTIC.[9] Furthermore, information regarding the development, piloting, and psychometric properties of applied assessment instruments is often inadequate[9,20] which complicates comparing study results. Earlier studies in LTIC illustrated insufficiencies in content and concordance between different phases of the nursing process.[21] A limited number of current studies

into the quality of nursing documentation in LTIC concerned specific topics such as person-centered care[22] and delirium.[23] Though not all phases of the nursing process were described, deficiencies were found regarding the assessment, interventions,[22] and progress notes.[23] Only 1 study reported about all phases of the nursing process,[24] however, the examination of care plans by 1 assessor in this study may have been a limitation.

Actual insight into the quality of nursing documentation is important from a resident, policy, and health management perspective especially considering the transformation of LTIC in high acuity settings. To support this, the purpose of this study was to examine the accuracy of nursing documentation in long-term institutional care.

METHODS

STUDY DESIGN, SETTING, AND SAMPLE

This multi-center explorative study used a retrospective cross-sectional design to determine the accuracy of nursing documentation. Data were collected using nursing notes in resident care plans from the previous 6 months.

Dutch LTIC is non-profit and primarily funded from public sources.[25] LTIC facilities comprise residential care homes, nursing homes, and care centers which consist of residential care and nursing home units.[26] In somatic units, residents receive intensive skilled nursing services, rehabilitation, and recreational therapy primarily due to physical chronic diseases. In psycho-geriatric units, residents receive intensive dementia care. Residents in residential care units receive personal care, some support with their activities of daily living, and medication supply.[27] The average length of stay in residential care is 3.7 years and in nursing homes 2.8 years.[28] This has recently decreased to approximately 1 year due to government policies that promote home-based care if less care is required.[29]

There are no national standards for the amount and level of nursing staff in Dutch LTIC. Temporary minimum nursing staff standards describe the presence of at least 1 staff member who is qualified for the necessary care tasks. One registered nurse is required and must be available on site within 30 minutes if needed.[16] Nursing assistants (CNA) comprise approximately 70% of nursing staff[3,30] and, on average, work per 30 residents/day 23 hours in residential care units, 38 hours in somatic units, and 39 hours in psycho-geriatric units.[31] For registered nurses, this is 9 hours in somatic units and 5 in psycho-geriatric units. Registered nurses do not work in residential care units.[31]

Purposive sampling was utilized at the facility and unit levels to support generalizability. Six chains including a variety of long-term care facilities in the north of the Netherlands

were invited to participate of which 3 consented. Of the participating chains, 5 facilities were selected: 1 nursing home (133 beds), 2 care centers (62 and 96 beds), and 2 residential care homes (60 and 52 beds). Four residential care units (housing 193 residents), 3 somatic units (43 residents), and 6 psycho-geriatric care units (100) participated that house, in total, 336 residents.

Care plans were examined if residents had been admitted for at least 6 weeks in the facility. On admission, information was collected about residents' lives and their physical, mental, and social needs which was input for an initial care plan. Information was continuously collected during the actual care delivery. Based on this, the care plan was refined within 6 weeks which is the mandatory time for approval of a resident care plan.[14,15]

Measurement instrument

A literature search for measurement instruments that examine the accuracy of nursing documentation based on the phases of the nursing process resulted in 3 potential instruments: the Cat-ch-Ing,[32] the Quality of Diagnoses, Interventions and Outcomes (Q-DIO) instrument,[33] and the D-Catch.[34] All of the instruments showed good validity and reliability in the hospital setting. No instruments were found related to LTIC. Because the Cat-ch-Ing was modified in the D-Catch, and the latter meets legal Dutch guidelines, it was decided to employ the D-Catch.

The D-Catch quantifies the accuracy of the record structure, nursing diagnosis, nursing interventions, progress and outcome evaluations, and the legibility (Table 1).[34] Except for the record structure and legibility, it assesses the accuracy of items with quantity and quality criteria. Quantity criteria examine if the components of the documentation are present. For example, is a problem label, etiology or related factors, and signs and symptoms described in the nursing diagnosis (Table 1). Quality criteria examine the description with respect to relevance, ambiguity, and linguistic correctness. Both criteria assess the content and the appropriateness of the documentation in relationship to the phases of the nursing process (Table 1). The criteria are scored on a 4-point Likert scale. Quantity criteria can be scored as: complete = 4 points; partially complete = 3 points; incomplete = 2 points; and none = 1 point. Quality criteria can be scored as: very good = 4 points; good = 3 points; moderate = 2 points; and poor = 1 point.[34]

Table 1. D-Catch items and explanation

Item	Explanation
1. Care plan structure	An individual care plan is present that allows archiving of: 1) personal details of the resident; 2) assessment form and admission data, 3) inventory of nursing diagnosis (care problems/care needs); 4) nursing interventions inventory; 5) daily progress report and outcome evaluations inventory.
2a. Admission report quantity criterion	The admission report describes the personal details of the resident, reason for admission, and the health condition of the resident.
2b. Admission report quality criterion	The admission report contains the medical diagnosis and reason for admission with relevant aspects of recorded nursing diagnoses. The notes are clear, linguistically correct, and contain all relevant information needed to admit the resident.
3a. Diagnosis report quantity criterion	There is a description of the care problem (nursing diagnosis label) with the etiology (a cause), signs and symptoms are listed, and the problem implies the possibility of an intervention.
3b. Diagnosis report quality criterion	The diagnosis is supported by one or more relevant notes from the concerned report. These notes are not contradicted by other notes in the same care plan. The diagnosis raises no other diagnostic questions and is linguistically correct.
4a. Intervention report quantity criterion	Each nursing intervention in terms of nursing actions is linked to or can be directly related to a diagnosis. These interventions are described in terms of the aim for which they are used and are logical results of the diagnosis.
4b. Intervention report quality criterion	Interventions are clearly formulated, linguistically correct, concise, and contain relevant information needed to act. The intervention date is mentioned.
5a. Progress and outcome report quality criterion	The progress reports are fully available and updated daily. They are related to nursing diagnoses and outcomes. Interventions are described in terms of the health situation of the resident and are logical results of the diagnosis and the intervention.
5b. Progress and outcome report quality criterion	The progress reports are clearly, unambiguously, and linguistically correct, and describe and contain all relevant information to understand the residents' health condition. The evaluation date is stated.
6. Legibility	The text is written legibly or clearly typed.

The construct validity of the D-Catch distinguished 2 constructs, specifically, the chronologically descriptive accuracy and diagnostic accuracy construct.[34,35] Internal consistency reliability of the D-Catch varied from a Cronbach's alpha of .72[34] to .77.[35] Inter-rater reliability, measured with a Cohen's kappa (K) (weighted)[34] and intraclass correlation coefficient (ICC),[35] ranged from K_w = .74 to .90 and ICC = .85 to 1.00, respectively.

Prior to the current study, the face validity of the D-Catch in LTIC was examined by a registered nurse of each participating facility (5). Subsequently, pilot testing was done to examine the feasibility of the D-Catch and the methods to be used in the current study. Two fourth-year bachelor nursing students with working experience in LTIC completed a training and examined 12 care plans of 3 participating facilities. Minor adaptations were made such as changing words like patient into resident and adding the different types of LTIC facilities and units. The Cronbach's alpha was .80.

DATA COLLECTION

Data were collected from November 2011 to February 2012. Assessors included bachelor nursing students in their final year who had completed at least one internship in long-term care. Prior to the study, they completed a 20-hour training in which the examination procedure with the D-Catch was practiced using 4 care plans. Assessors independently examined each care plan and scored the items on the D-Catch instrument. The individual scores were subsequently discussed until consensus on the final accuracy score was reached. During the data collection period, care plans were examined by 5 paired assessors. Nursing staff provided access to residents' care plans which were examined up to the date of the last care evaluation. Dutch legislation requires that outcomes of care are evaluated with the resident at least twice a year[15] whereby the care plan is either continued or adjusted to the residents' current health status.

ETHICAL CONSIDERATIONS

Retrospective record research is not subject to mandatory approval by an ethics committee in the Netherlands.[36,37] The research protocol followed the guidelines of Good Clinical Practice[38] derived from the Declaration of Helsinki[39] which require written informed consent. Residents of included units received written and verbal information about the study's aim and content. Care plans were included if the residents or their legal representatives signed a written consent.

DATA ANALYSIS

Data were analyzed using SPSS Statistics version 22. A Spearmans' rank test (r_s) was used to calculate the correlation between quantity and quality scores per item in order to determine whether the 2 scores could be summed to 1 accuracy score per item.[34] A value between 1.0 and -.5 or .5 and 1.0 was considered a strong association[40] that would justify summing.

Based on measurement and distribution levels, descriptive statistics were applied to describe sample characteristics and the accuracy of nursing documentation per D-Catch item. An overall accuracy score for the constructs of the D-Catch was determined by summing the scores assigned to quantitative and qualitative items for the chronologically descriptive construct (items 1, 2, 4, 5, and 6) and the diagnostic construct (item 3).[35] To enable comparability between the 2 scores, construct scores were standardized on a 100-point scale.[34] Higher construct scores per care plan mean higher nursing documentation accuracy.

Cronbach's alpha (α) was calculated to evaluate the D-Catch's internal consistency reliability. A Chi-square test was used to examine the association between nursing documentation and unit type. The statistical significance was set at $P < .05$. Inter-rater reliability was computed by Cohen's Weighted Kappa (K_w) for the 5 assessor pairs separately and per D-Catch item. A value of 0– .20 was considered as slight agreement; .21– .40 as fair; .41– .60 as moderate; .61– .80 as substantial; and .81– 1 as an almost perfect agreement.[41] Confidence intervals (CI 95%) were calculated.

RESULTS

Out of the 336 residents, 213 (63%) consented for the examination of their care plan. A total of 197 (93%) care plans were assessed due to a time limitation. The majority of them were from residents living in residential care units (64%) (Table 2). Care plans were in a hard copy or electronic form; those that were electronic were a digital version of the original paper based plan.

Table 2. Number of examined care plans and diagnoses per unit

	RC1	RC2	CC1	CC2	NH	Care plans	Diagnoses	Median (IQR)
Somatic unit	-	-	8	6	11	25	275	9 (13)
Psycho-geriatric unit	-	-	19	4	24	47	540	10 (8)
Residential care unit	32	19	36	38	-	125	977	6 (6)
Total care plans	32	19	63	48	35	197	-	-
Total diagnoses	289	316	356	256	575	-	1792	7 (9)

RC = residential care facility, CC = care center, NH = nursing home, IQR = interquartile range.

The number of diagnoses ranged from 1 care plan with no diagnosis to 5 care plans with 25 diagnoses. The median number of diagnoses per plan was 7 (IQR 9). The number of diagnoses in residential care units (median 6, IQR 6) was less than in somatic (median 9, IQR 13) and psycho-geriatric units (median 10, IQR 8) (Table 2).

Except for the admission report, $r_s(197) = .54$, $P < .001$, 95% CI [.43, .63], the correlation between quantity and quality scores was weak to moderate. For the diagnosis report, it was $r_s(196) = .13$, $P = .06$, 95% CI [-.01, .27]; for the progress and outcome report, $r_s(197) = .16$, $P = .02$, 95% CI [.02, .30]; and, for the interventions report $r_s(197) = .45$, $P < .001$, 95% CI [.34, .56].

The internal consistency reliability of the D-Catch was $\alpha = .61$. Inter-rater reliability was substantial to almost perfect for the items of the care plan structure (K_w .88, 95% CI [.80, .96]); admission report (quantity criterion K_w .72, 95% CI [.61, .83]; quality criterion K_w .73, 95% CI [.64, .82]); diagnosis report (quantity criterion K_w .74, 95% CI [.71, .77]; quality criterion K_w .68, 95% CI [.64, .71]); intervention report (quantity criterion K_w .72, 95% CI [.63, .81]; quality criterion K_w .70, 95% CI [.61, .79]); and progress and outcome report (quantity criterion K_w .76, 95% CI [.68, .85]). A fair agreement was found for the quality criterion of the progress and outcome report (K_w .33, 95% CI [.18, .48]) and the legibility (K_w .35, 95% CI [.20, .50]).

ACCURACY OF NURSING DOCUMENTATION

Of the total number of care plans, 52.8% were structured accordingly to all phases of the nursing process. An inventory of the nursing diagnoses lacked in 47.2% (Table 3). All admission reports encompassed the personal details of the resident. Information about the reason of admission (medical diagnosis) or health condition of the resident was partially present in 37.6% of the reports (score 3, quantity criterion). In terms of residents' reported care needs that would logically lead to the stated nursing diagnoses, the admission reports were not relevant and moderately described in 49.7% (score 2, quality criterion) and not described at all in 4.6% (score 1, quality criterion) (Table 3).

Information concerning the etiology or signs and symptoms lacked in 49.6% of the nursing diagnoses reports (score 2, quantity criterion). In 9%, no diagnosis statement was made (score 1, quantity criterion). The relevance of the stated nursing diagnoses was supported in 41.8% with progress and outcome reports, and their description was linguistically correct (score 4, quality criterion). Of 15.9% of the diagnoses reports, the nursing diagnosis statement is unclear (score 2, quality criterion). In 13.4%, a nursing diagnoses statement was described but not supported by any progress or outcome report (score 1, quality criterion) (Table 3).

Interventions were entirely related to nursing diagnoses in 11.2% (score 4, quantity criterion) of the intervention reports and partially in 45.2% (score 3, quantity criterion).

For 43.7%, their purpose was unclear (score 2, quantity criterion). Furthermore, relevant information that was required in order to act was inadequate in 44.7% of the intervention reports and completely lacking in 5.1% (score 1, quality criterion) (Table 3).

Concerning the progress and outcome reports, 63.5% were not related to the stated nursing diagnoses and interventions and lacked for several days in a week (score 2, quantity criterion). The progress and outcome reports were clearly written, information to understand the residents' current health status was available, and evaluation dates were specified in 19.8% (score 4, quality criterion). In 68.5% of the reports, the language was incorrect and created ambiguities and, some of the evaluation dates lacked (score 3, quality criterion) (Table 3).

Table 3. Accuracy of nursing documentation per D-Catch item

Items	**Accuracy scores in percentages**				**N**
	1	2	3	4	
Care plan structure	-	-	47.2	52.8	197
Admission documentation quantity criterion	-	1.0	37.6	61.4	197
Admission documentation quality criterion	4.6	49.7	16.8	28.9	197
Diagnosis documentation quantity criterion	9.0	49.6	27.5	13.8	196
Diagnosis documentation quality criterion	13.4	15.9	28.9	41.8	196
Intervention documentation quantity criterion	-	43.7	45.2	11.2	197
Intervention documentation quality criterion	5.1	44.7	39.1	11.2	197
Progress and outcome documentation quantity criterion	-	63.5	32.0	4.6	197
Progress and outcome documentation quality criterion	-	11.7	68.5	19.8	197
Legibility	-	1.0	39.1	59.9	197

N = number of care plans assessed.
Scale scores quantity/quality: 1 = none/poor, 2 = incomplete/moderate, 3 = partially complete/good, 4 = complete/very good.

The mean score for the chronological descriptive construct was 67.3 (*SD* 10.2) and for the diagnostic construct 54.3 (*SD* 22.2). There was a significant association between unit type and the accuracy of the quality criterion of the admission report (X^2 (2, 197) = 10.2, P = .006); the quality criterion of the diagnosis report (X^2 (2, 196) = 16.5, P < .001); and of the quantity criterion of the progress and outcome reports (X^2 (2, 197) = 59.5, P < .001) (Table 4). For these items, higher accuracy scores were determined in somatic and psycho-geriatric units compared to residential care units (Table 4).

Table 4. Percentages of the accuracy of nursing documentation and associations per unit type (N = 197)

Units	Psycho-geriatric		Somatic		Residential care		X^a	*P*
Item accuracy scores	1	2	1	2	1	2		
Care plan structure	-	100	-	100	-	100	-	-
Admission documentation quantity criterion	2.1	97.9	-	100	0.8	99.2	0.89	.640
Admission documentation quality criterion	34.0	66.0	60.0	40.0	60.8	39.2	10.23*	.006
Diagnosis documentation quantity criterion (N = 196)	59.6	40.4	68.0	32.0	64.5	35.5	0.58	.748
Diagnosis documentation quality criterion (N = 196)	10.6	89.4	32.0	68.0	43.6	56.5	16.47*	<.001
Intervention documentation quantity criterion	44.7	55.3	44.0	56.0	43.2	56.8	0.03	.984
Intervention documentation quality criterion	44.7	55.3	48.0	52.0	52.0	48.0	0.77	.682
Progress and outcome documentation quantity criterion	23.4	76.6	40.0	60.0	83.2	16.8	59.45*	<.001
Progress and outcome documentation quality criterion	8.5	91.5	8	92.0	13.6	86.4	1.23	.540
Legibility	2.1	97.9	4.1	96.0	-	100	4.08	.130

Scale scores quantity/quality: 1 = incomplete/poor, 2 = complete/good.
[a] Association between item accuracy scores and unit type $P < .05$.

DISCUSSION

This study showed deficiencies in the accuracy of content and coherence of nursing documentation in LTIC. Inadequacies were especially determined in the nursing diagnoses as well as the progress and outcome reports.

Although admission reports included residents' personal information and medical diagnoses, residents' care needs whereby a problem statement or nursing diagnosis would logically follow were often not described. This result appears to be congruent with a study of Broderick et al.[22] who found that assessment records were incomplete which made person-centered care problematic. In addition, an inventory of nursing diagnoses were lacking in almost half of the care plans. This may indicate that nursing diagnoses are not the basis for care delivery which is corroborated by the lower accuracy score on the diagnostic construct

(M = 54, SD 22) compared to the chronological descriptive construct (M = 67, SD 10). When nursing diagnoses were indicated, a description of the etiology and/or signs and symptoms of residents' problems were frequently missing. Not addressing the etiology of a care problem may lead to the selection of ineffective interventions and place residents at risk for adverse outcomes.[24] In addition, missing or misinterpreting relevant signs and symptoms for a particular resident contributes to errors in nursing care and may signify inappropriate judgment of the nurse.[42]

Numerous determinants are known to influence the prevalence and accuracy of nursing documentation such as the organizational context (eg, time, workload, number, and type of nursing staff), the complexity of care, and nursing staff's educational background and competencies.[43,44] In LTIC, CNAs provide most of the daily care and administer documentation about changes in residents' health and behavior.[3,45] A lower level registered nurse (without a baccalaureate degree) is often deployed over multiple units and involved in Dutch LTIC for 5 to 9 hours per day.[31] A study of Sund-Levander et al.[45] determined that NAs in LTIC had problems valuing resident information gathered by assessment and evaluation and, consequently, passed this information on to a registered nurse to decide about nursing diagnoses and interventions. However, a study of Fossum et al.[46] indicated that registered nurses that are employed in nursing homes did not demonstrate any diagnostic reasoning, and considerable variation was discovered in their assessments and choice of interventions.

In addition to educational background and competencies, insufficient amounts of time and inadequate staffing may be explanations for inaccuracies in nursing documentation in LTIC. Ausserhofer et al.[47] showed that one nursing activity most often left undone was 'planning and documenting care' when resources such as time are limited. A study of Fossum et al.[46] found that, due to understaffing, limited time was spent on data collection at admission, evaluation, and the problem definition. In Dutch LTIC, significantly more nursing staff is deployed in somatic and psycho-geriatric units.[31] Residents with higher acuity levels reside in these units, and significantly more time is spent on indirect care (eg, documentation).[48] This may explain why the present study found significantly higher accuracy scores in somatic and psycho-geriatric units than in residential care regarding the coherence between care needs and nursing diagnoses as well as the timeliness of progress notes. Since accurate documentation facilitates person-centered care[22] and contributes to the continuity of care, safety, and well-being of residents,[1] this could plead for more resources, especially considering the increase in the amount and complexity of care in LTIC. An additional explanation for inaccuracies in nursing documentation may be the preference of nursing staff to orally exchange residents' information. CNAs consider oral communication to be more effective than written information in resident care plans partly because documentation systems are not considered as supporting their needs.[49]

Similar to Wang et al.,[24] the current study found limited information about the documentation of achieved nursing outcomes. Progress and outcome reports generally described residents' current health status but were largely unrelated to the stated nursing diagnoses, and progress notes were not completed for several days within a week. This is of concern because outcomes refer to the effect of care measured by a change in the residents' health status as a response to interventions that are a direct result from diagnoses.[50] In the present study, the purpose of a substantial number of planned interventions was ambiguous, and there was insufficient relevant information to act upon. Because the majority of nursing staff in LTIC work part-time[3] and staff turnover is high, the continuity of care may be hindered and adversely affect nursing outcomes.[51]

A limitation of this study may be the internal consistency reliability of the D-Catch (α = .61). Studies performed in hospitals showed higher Cronbach's alpha's (.72 and .77).[34,35] This may be explained by the percentage of individuals receiving residential care in this study (64%). They require less care which does not correspond with patients in hospitals or residents in somatic and psycho-geriatric units. Furthermore, nursing documentation in LTIC was found to be extensive due to residents' length of stay which may have complicated the examination. Paans et al.[34] found that the length of and redundancies in Dutch hospitals' patient records affected the inter-rater reliability. In the current study, the inter-rater reliability was substantial to almost perfect for 8 out of 10 accuracy items. Assessors with a nursing background were recruited and trained in the use of the D-Catch to examine the accuracy of the care plans. We believe that this contributed to the reliability of the D-Catch in LTIC. Because the complexity of care in LTIC increases and the elderly who require less care will receive home-based care, we consider the D-Catch as an appropriate measurement instrument for examining the accuracy of nursing documentation in LTIC.

This study focused on the accuracy of nursing documentation and did not take into account the actual care that was delivered. We suggest that direct observations may have added more knowledge about the accuracy of nursing documentation. For example, a study of De Marinis[52] found that the consistency between activities performed by nurses and their documentation is only 40% (nurses do much more). In addition, the current explorative study did not take into account the covariance of the educational background of nursing staff, working experience, workload, or staff turnover when examining nursing documentation. However, it was believed that comprehensive knowledge was obtained of the actual accuracy of nursing documentation in LTIC by examining care plans in multiple facilities and units. By using a measurement instrument based on the internationally acknowledged phases of the nursing process, the possibility of generalizing results to other LTIC settings has increased. We further believe that the results of our study may be helpful for determining the content and structure of future electronic care plans in the electronic medical record, so as to facilitate the accuracy of nurses' reports.

CONCLUSION AND IMPLICATIONS

The current study found inaccuracies in the content and coherence of nursing documentation in long-term institutional care. This may complicate communication between health professionals, data extraction by managers for quality and reimbursement purposes, and also jeopardize residents' safety and well-being. Taking into account the increasing acuity levels of residents, managers should reconsider whether the available nursing staff and resources are sufficient to provide for accurate nursing documentation. Investments in resources (eg, time, structured (electronic) care plans) may be required to facilitate accurate documentation. Furthermore, the reasoning skills of nursing staff should be investigated and trained, tailored to their educational background and scope of practice, to ensure that they competently perform their care-planning job responsibilities. Implementation of professional standards in accordance with legal requirements and regular audits may further enhance the quality of nursing documentation.

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CHAPTER 5

THE CONSISTENCY BETWEEN PLANNED AND ACTUALLY GIVEN NURSING CARE IN LONG-TERM INSTITUTIONAL CARE

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ABSTRACT

Continuous information exchange between healthcare professionals is facilitated by individualized care plans. Compliance with the planned care as documented in care plans is important to provide person-centered care which contributes to the continuity of care and quality of care outcomes. Using the Nursing Interventions Classification, this study examined the consistency between documented and actually provided interventions by type of nursing staff with 150 residents in long-term institutional care. The consistency was especially high for basic (93%) and complex (79%) physiological care. To a lesser extent for interventions in the behavioral domain (66%). Except for the safety domain, the probability that documented interventions were provided was high for all domains (≥ 91%, $P > .05$). NAs generally provided the interventions as documented. Findings suggest that HCAs worked beyond there scope of practice.The results may have implications for the deployment of nursing staff and are of importance to managers.

INTRODUCTION

As a result of governmental policies that promote home-based care, long-term institutional care (LTIC) has evolved into high acuity settings in which residents' average length of stay is reduced to less than 1 year.[1,2] The treatment and care of these residents is provided by a team of professionals such as nursing staff, geriatricians, psychologists, and physiotherapists, which makes effective information exchange vital.[3]

As nursing staff provide 24-hour care and coordinate, monitor, and deliver care also on behalf of involved professionals, they are important in the information exchange about residents.[4,5] Though different information exchange methods exist (eg, meetings, progress notes or change of shift reports),[6] it has been recommended to document residents' information in one central document, such as the individualized care plan.[4,5,6]

In the United States' (US) as well as Dutch LTIC, an essential element in the provision of person-centered care (PCC) is the care plan.[5,7,8] Legal requirements[9,10] and professional standards[11,12] indicate that the care plan is developed in dialogue with the resident or (legal) representatives is in accordance with the interrelated phases of the nursing process. These are first identified and described by Orlando's Nursing Process Discipline Theory[13] and internationally acknowledged for structuring nursing documentation.[14,15] This means that residents' care needs are assessed, and objectives of care are subsequently established followed by the selection of interventions and evaluation of care.[9,10,13] The nursing process aims to ensure consistency between residents' needs and care delivery[16] as well as the assignment of staff according to their competencies.[4,9]

An important nursing activity is the documentation in care plans. Nursing documentation aims at displaying the health status and well-being of residents as well as the planned and provided nursing care.[17,18] When accurately documented and executed, it has been contended that nursing documentation contributes to the continuity of care, safety, and well-being of residents,[18] and facilitates the evaluation of the outcomes of care.[17,18] In addition, managers in LTIC use it as a proxy measure for purposes of quality of care, financial reimbursement, and deployment of nursing staff.[19,20]

The quality of nursing documentation has primarily been assessed by content analysis methods for which information is derived from nursing records. These methods lack information regarding the consistency between documented care as agreed upon with the resident and the care that is actually provided.[21] To what extent nursing staff comply to the planned care as agreed with the resident is unclear. Therefore, it has been suggested that additional observational methods serve as a better validation of the quality of nursing documentation[15,19] and provide insight into the contribution of nursing staff to quality of care outcomes.[19]

Evidence about the implementation of care plans in clinical practice is sparse.[18,19] A limited number of studies examined the consistency between planned and actually given care. These studies were mostly conducted in hospitals and found inconsistencies between care that was documented but not provided as well as care that was provided but not documented.[21,22,23,24] However, sample sizes were small, psychometric characteristics of the applied instruments were missing, and inter-observer reliability was not assessed.

The purpose of our study was to examine the consistency between planned care as documented in residents' care plans and the care actually provided by type of nursing staff in LTIC.

METHODS

Study design, setting, and sample

This multi-center study used an exploratory cross-sectional design. Data collection consisted of a review of nursing documentation concurrently with structured continuous observations.

Facilities, units, and nursing staff, were purposively sampled to represent Dutch LTIC and have been described in detail elsewhere.[25] In the current study, 1 nursing home (133 beds), 1 care center (96 beds), and 2 residential care homes (40 and 59 beds) participated. In total, 3 residential care, 1 somatic, and 11 psycho-geriatric units were included.

Although widely discussed,[26] US federal law requires nursing homes to have an RN for 8 consecutive hours 7 days per week, a licensed nurse 24 hours a day, and further sufficient nursing staff to meet the needs of residents.[27] Dutch quality standards require that a registered nurse (RN) or bachelor registered nurse (BRN) must be available within 30 minutes 24 hours a day.[28] In the US, as in other countries,[1] mainly (certified) nursing assistants (70%) provide the day-to-day care. There are no standards for how many need to be present,[27,28] however, in Dutch LTIC, at least 1 care provider who has the knowledge and skills to provide care activities in line with care needs of residents should be available. During intensive care moments (eg, going in/out bed) there should be two.[29] Dutch NAs may become primary caregivers (PCG) after additional training (± 35 weeks) and then monitor the care process of a group of residents and serve as a contact for family and health professionals.[30] (B)RNs as well as NAs establish care plans.[31] Nursing staff included in this study were all licensed personnel: RNs, PCGs, NAs, and health care assistants (HCA). BRNs were not employed at the time of this study. Agency staff and trainees were excluded.

Residents were included when they had been admitted for at least 6 weeks. By that time, it is mandatory that the initial care plan has been completed and approved by the resident or their legal representative.[9] Residents were excluded when they were < 65 years old.

Data collection

Data collection was conducted from November 2012 to May 2013. The Nursing Interventions Classification (NIC) was used as a framework. This is a widely used standardized nursing terminology[14] that provides titles and definitions of nursing interventions (542) and a categorization in classes (30) and domains (7).[32] Each intervention incorporates a series of activities that nurses perform to implement an intervention.[32] The NIC based GO-LTIC, originally developed for continuous structured observations,[33] was employed as a basis for identifying documented interventions and for observing them. The GO-LTIC comprises 116 nursing interventions that occur in the daily care of LTIC categorized into 24 classes and 6 domains.[33] The instrument demonstrates good content validity and inter-rater reliability.[25,33]

Table 1. NIC[a] domains and 5 examples of included interventions per domain from the GO-LTIC

Domains	Definition	Label intervention (NIC code)
Physiological: basic	Care that supports physical functioning	Self-care assistance (1800), positioning (0840), transfer (0970), bathing (1610), dressing (1630)
Physiological: complex	Care that supports homeostatic regulation	Medication administration (2300), wound care (3660), circulatory care: venous insufficiency (4066), pressure ulcer prevention (3540) skin surveillance (3590)
Behavioral	Care that supports psychosocial functioning and facilitates life style changes	Activity therapy (4310), active listening (4920), distraction (5900), communication enhancement: hearing (4974), spiritual support (5420)
Safety	Care that supports protection against harm	Fall prevention (6490), environmental management: safety (6486), surveillance: safety (6654), vital signs monitoring (6680), dementia management: bathing (6462)
Family[b]	Care that supports the family	Home maintenance assistance (7180), family involvement promotion (7110), caregiver support (7040), respite care (7260)
Health System[c]	Care that supports effective use of the health care delivery system	Case management (7320), supply management (7840), surveillance: remote electronic (6658), documentation (7920), transport: interfacility (7892)

[a] NIC = Nursing Interventions Classification.
[b] Only comprising these 4 interventions.
[c] Comprising indirect care interventions, the other domains are direct care interventions.

Because an increase in the complexity of care may have changed care practices, a feasibility test was conducted prior to this study which resulted in an adapted GO-LTIC of 126 nursing interventions. An overview of the 6 NIC domains with examples of interventions is provided in Table 1. Additional interventions primarily concerned the NIC domain health system (7) (eg, quality monitoring).

The complexity of care as determined by the care profiles of the Dutch Care Severity Index was used with acuity levels ranging from 1 to 10 (1 = needing little nursing care).[34,35]

Protocol

Fourteen bachelor nursing students in their graduation phase with knowledge of LTIC and the NIC were qualified as reviewer of care plans or observer of nursing staff after completing a 20-h training. Using anonymized resident care plans and video fragments, students were trained in manual mapping whereby a source term is linked to the most accurate target term.[36,37] Students independently linked documented or observed interventions to the most accurate NIC intervention by comparing relevant intervention labels and definitions. Subsequently, the individual scores were discussed until there was consensus on the final NIC intervention. When uncertain as to which NIC intervention to choose (eg, with observations in the event of multitasking), a documented or observed intervention was reviewed alongside the activities of potential NIC interventions in order to be able to make a choice. Throughout the data collection period, this procedure was followed and a log of decisions was kept.

Documented interventions were processed in an Excel file by 4 paired reviewers after which interventions were independently linked to NIC interventions. The individual outcomes were subsequently discussed until consensus was reached.

Six observers "shadowed" different types of nursing staff during day, evening, and night shifts. To be as unobtrusive as possible and minimize a Hawthorn effect, observers were instructed to talk as little as possible with nursing staff.[38,39] Observed interventions were recorded in the GO-LTIC. To calculate inter-rater reliability, staff members in each facility were observed during their day shift by paired observers. This was scheduled 6 times. Reviewers were blinded to the data obtained by observers and vice versa.

Ethical considerations

This study was part of a larger project into the employment of nursing staff in Dutch LTIC[40] and approved by the Ethical Review Boards of the University Medical Center Groningen (M12.126835) and Regional Review Committee for Resident-Related Research Leeuwarden (RTPO 879a). Residents and nursing staff received written and verbal information about the aim and content of the study. Residents or their legal representatives were asked to provide

their written informed consent to review their care plans and permit observers to enter residents' rooms. Together with the facility's care coordinators, observers were linked to the type of nursing staff per unit. Each nursing staff member was contacted ahead of time to determine willingness to be shadowed for the upcoming shift.

Statistical analyses

All documented and observed interventions were per resident entered into IBM SPSS Statistics 23 (IBM SPSS Statistics, IBM Corporation, Chicago, IL). Interventions were categorized into the appropriate NIC domains. To summarize data, descriptive statistics were used.

Per intervention and domain, data were dichotomized as no, not documented/observed (0) and yes, documented/observed (1).

Inter-rater reliability for paired reviewers and observers was assessed through Cohen kappa (K) statistics with K ≤ 0.20 meaning slight agreement, 0.21–0.40 fair, 0.41–0.60 moderate, 0.61–0.80 substantial, and ≥ 0.81 almost perfect agreement.[41] Confidence intervals (CI 95%) were calculated.

The following analyses were applied with R version 2.15.2.[42] To examine the consistency between documented and observed interventions, 2 x 2 contingency tables were constructed per NIC domain. Due to the explorative nature of the design, structural zeros occurred in the frequencies because interventions were planned and/or observed with residents based on their health status. Structural zeros refer to residents who did not need a specific intervention as mentioned by the GO-LTIC at the time of the assessment (thus not documented in the care plan). Hence, analyses focused on frequencies and the probability that documented interventions were actually provided to residents. The analysis focused on calculating proportions *P (Observed = yes) = P (conditional Observed = yes | Documented = yes).* Otherwise stated, the probability of interventions being observed with a resident equals the conditional probability of being observed given that the interventions are documented in the residents' care plan. This was calculated by dividing the frequency of observed and documented interventions by the total number of interventions observed and/or documented. The hypothesis of equality of proportions was subjected to Chi-squared testing, where *P*-values > .05 indicate the data to be in accordance with the hypothesis.

For the analysis of the consistency of the frequency between documented and observed interventions and type of nursing staff, 4 x 3 contingency tables were constructed. Variances between nursing staff were investigated by Poisson log-linear analysis per NIC domain. Types of nursing staff and documented and observed interventions as well as their interaction were used as main effects. Zero interactions would indicate independence. *P*-values < .05 were considered significant.

RESULTS

Of a total of 238 residents, 150 (63%) consented to view their care plan as well as to observations, mainly living in residential care units (49%) and psycho-geriatric units (36%), and women (79%). Residents' average age was 85.5 ± 6.9 years. Approximately 72% of them were classified with acuity level > 4. Care plans were either electronic (66%) or paper based (34%).

Of the total of 143, mainly female (93%) nursing staff members were observed; 15% were RNs, 12% PCGs (12%), 51% NAs, and 22% HCAs. Observations were primarily conducted during day shifts (55%). Most residents received care multiple times per shift.

Inter-rater agreement for the identification of documented interventions was substantial for the domains complex physiological care, behavioral, family, and health system (range K 0.61, 95% CI [0.52, 0.71] to K 0.65, 95% CI [0.56, 0.73]). Values were moderate for basic physiological care (K 0.47, 95% CI [0.38, 0.56]) and the safety domain (K 0.60, 95% CI [0.50, 0.70]). For observed interventions agreement was almost perfect for the behavioral domain (K 0.81, 95% CI [0.68, 0.94]), and substantial for the domains basic- and complex physiological care and family (range K 0.63, 95% CI [0.48, 0.77] to K 0.77, 95% CI [0.64, 0.89). A fair agreement was found for the health system domain (K 0.23, 95% CI [0.10, 0.37]). Interventions in the safety domain were often not identified therefore kappa could not be calculated.

Nursing interventions documented and observed

The total of 1417 documented interventions primarily comprised NIC domains basic and complex physiological care (46% and 27%), and the behavioral domain (15%). Thirteen documented interventions that mainly concerned the safety (7) of residents (eg, surveillance) were not in the GO-LTIC. The total of 16035 observed interventions largely comprised the health system domain (30%) and basic (30%) and complex physiological care (18%).

Consistency between documented and observed interventions by resident

The consistency between documented and observed interventions was 93.3% for basic physiological care (eg, self-care assistance), 79.3% for complex physiological care (eg, medication administration), and 65.5% within the behavioral domain (eg, activity therapy) (Table 2). Observed but not documented behavioral interventions (27.6%) concerned mainly 'humor', 'limit setting', and 'calming technique'.

Regarding the safety domain, a number of identical interventions (eg, fall prevention) were found to be implemented in line with the documentation in the care plan (43.7%) but also only observed (35.6%) (Table 2). Other interventions (eg, surveillance) were only documented in the care plan (20.7%).

Consistency within the family and health system domain was limited to 5.4% and 18%, respectively (Table 2). Observed interventions, especially 'assistance with home maintenance' (family), 'case management', and 'supply management' (health system) were often not documented.

Except for the safety domain, the probability to observe documented interventions was high (≥ 91%) (Table 2). No significant difference in proportions was found between the probability and conditional probability for all domains *(P* > .05), meaning the probability of observing interventions is equal to the probability of observing interventions that were documented.

Table 2. Consistency between documented and observed interventions per NIC domain

Domain[a]	**Documented and observed (%**[b]**)**	**Only documented (%)**	**Only observed (%)**	**P (%)**	**CP (%)**	***P* value**[c]
Physiological: basic (n=150)	140 (93.3)	3 (2)	7 (4.7)	98	98	1
Physiological: complex (n=150)	119 (79.3)	3 (2)	28 (18.7)	98	98	1
Behavioral (n=145)	95 (65.5)	10 (6.9)	40 (27.6)	93	91	.603
Safety (n=135)	59 (43.7)	28 (20.7)	48 (35.6)	55	64	.079
Family (n=148)	8 (5.4)	0 (0)	140 (94.6)	100	100	-
Health system (n=150)	27 (18)	0 (0)	123 (82)	100	100	-

P = probability of interventions being observed with residents; CP = conditional probability of interventions being observed given that interventions were documented in residents' care plan.

[a] Domains' interventions did not occur with all residents (n = 150) during the study period depending on their health status (structural zero's).

[b] The number of distinct interventions within a domain is 100%.

[c] *t*-test equality proportions, a *P*-value > .05 indicates the data to be in accordance with the hypothesis.

The consistency between documented and observed interventions by type of nursing staff

Documented interventions regarding basic physiological care were provided by the majority of nursing staff (range 74% - 91.6%). Significant negative interaction effects were found for NAs (Estimate [*b*] = -2.1, *z* = -3.8, *P* < .001) and HCAs (*b* = -1.7, *z* = -3.0, *P* = .003). These negative interaction effects indicate consistency between documented and observed interventions (Table 3). Except for HCAs (47%); the same applied for complex physiological care (range 72% - 82.3%), and significant negative interaction effects were found for NAs (*b* = -1.8, *z* = -2.5, *P* = .013). For HCAs, a significant positive interaction effect was found (*b* = 1.7, *z* = 3.5, *P* < .001) suggesting less consistency between documented and observed interventions (Table 3).

Regarding interventions in the behavioral domain, a significant positive interaction effect was found for PCGs (*b* = 1.0, *z* = 2.2, *P* = .028). The documented interventions were provided mainly by NAs (65.4%) and HCAs (62.8%) (Table 3).

Concerning the safety domain, interventions were significantly more often documented than observed (*b* = 1.73, *z* = 3.9, *P* < .001). A significant negative interaction effect was found for NAs (*b* = -2.59, *z* = 5.2, *P* < .001) (Table 3).

Regarding the family and health system domains, interventions were significantly more often observed than documented in the care plan (respectively, *b* = 3.78, *z* = 3.7, *P* < .001 and *b* = 1.1, *z* = 3.3, *P* < .001). No interaction effects were found (Table 3).

Table 3. Log-linear models of frequency of documented and observed interventions in residents (n = 372) on NIC domains and type of nursing staff (and the interaction between these)

Effects of NIC domains[a]	Documented and observed (%[b])	Only documented (%)	Only observed (%)	Estimate (*b*)	SE	*z* value	*P* value[c]
Physiological: Basic (n = 371)							
Type of nursing staff							
- RN (intercept)	37 (74.0)	12 (24.0)	1 (2)				
- PCG	66 (77.6)	16 (18.8)	3 (3.5)	0.6	0.21	2.8	.005**
- NA	131 (91.6)	5 (3.5)	7 (4.9)	1.3	0.19	6.8	<.001***
- HCA	85 (91.4)	5 (5.4)	3 (3.2)	0.8	0.20	4.2	<.001***
Documented/Observed (ME)							
- DOnly				-1.1	0.33	-3.4	<.001***
- OOnly				-3.6	1.0	-3.6	<.001***
Type of nursing staff * DOnly (IE)							
- NA * DOnly				-2.1	0.56	-3.8	<.001***
- HCA * DOnly				-1.7	0.57	-3.0	.003**
Physiological: complex (n = 355)							
Type of nursing staff							
- RN (intercept)	38 (77.6)	6 (12.2)	5 (10.2)				
- PCG	59 (72.0)	10 (12.2)	13 (15.9)	0.4	0.21	2.1	.034*
- NA	116 (82.3)	3 (2.1)	22 (15.6)	1.1	0.19	6.0	<.001***
- HCA	39 (47.0)	35 (42.2)	9 (10.8)				
Documented/Observed (ME)							
- DOnly				-1.8	0.44	-4.2	<.001***
- OOnly				-2.0	0.48	-4.3	<.001***
Type of nursing staff * DOnly (IE)							
- NA * DOnly				-1.8	0.73	-2.5	.013*
- HCA * DOnly				1.7	0.50	3.5	<.001***
Behavioral (n = 339)							
Type of nursing staff							
- RN (intercept)	26 (57.8)	9 (20.0)	10 (22.2)				
- PCG	30 (40.0)	29 (38.7)	16 (21.3)				
- NA	87 (65.4)	14 (10.5)	32 (24.1)	1.2	0.22	5.4	<.001***
- HCA	54 (62.8)	17 (19.8)	15 (17.4)	0.7	0.24	3.1	.002**
Documented/Observed (ME)							
- DOnly				-1.1	0.39	-2.7	.006**
- OOnly				-1.0	0.37	-2.6	.010*

Table 3. (Continued)

Effects of NIC domains[a]	Documented and observed (%[b])	Only documented (%)	Only observed (%)	Estimate (*b*)	SE	*z* value	*P* value[c]
Type of nursing staff * DOnly (IE)							
- PCG * DOnly				1.0	0.47	2.2	.028*
Safety (n = 298)							
Type of nursing staff							
- RN (intercept)	6 (15.0)	34 (85.0)	0 (0)				
- PCG	6 (9.4)	43 (67.2)	15 (23.4)				
- NA	59 (45.0)	25 (19.1)	47 (35.9)	2.29	0.429	5.3	<.001***
- HCA	15 (23.8)	37 (58.7)	11 (17.5)				
Documented/Observed (ME)							
- DOnly				1.73	0.443	3.9	<.001***
Type of nursing staff * DOnly (IE)							
- NA * DOnly				-2.59	0.503	-5.2	.001**
Family (n = 357)							
Type of nursing staff							
- RN (intercept)	1 (2.2)	1 (2.2)	44 (95.7)				
- PCG	3 (3.7)	0 (0)	79 (96.3)				
- NA	8 (5.7)	0 (0)	132 (94.3)	2.08	1.06	2.0	.050*
- HCA	4 (4.5)	0 (0)	85 (95.5)				
Documented/Observed (ME)							
- OOnly				3.78	1.01	3.7	<.001***
Health system (n = 371)							
Type of nursing staff							
- RN (intercept)	13 (25.5)	0 (0)	38 (74.5)				
- PCG	17 (20.0)	0 (0)	68 (80.0)				
- NA	26 (18.2)	0 (0)	117 (81.8)	0.7	0.34	2.0	.041*
- HCA	16 (17.4)	0 (0)	76 (82.6)				
Documented/Observed (ME)							
- OOnly				1.1	0.32	3.3	<.001***

RN = registered nurse; PCG = primary caregiver; NA = nursing assistant; HCA = health care assistant; ME = main effect; IE = interaction effect; Documented or observed = only documented (DOnly) or only observed (OOnly).
Reference categories: RN (Staff level), Documented and Observed (Documented/Observed); RN : Documented and Observed (Staff level : Documented/Observed).
[a] Domains' interventions were not performed with all residents (n = 372) by all types of nursing staff.
[b] The number of interventions by type of nursing staff within a domain is 100%.
[c] Only parameters with $P < .05$ are displayed; * $P < .05$. ** $P < .01$. *** $P < .001$.

DISCUSSION

This study found that the consistency between documented and observed interventions is high for basic and complex physiological care and moderate for interventions in the behavioral domain. Except for the safety domain, the probability that documented care was actually provided was high. NAs primarily and significantly provided interventions as recorded in care plans.

The high consistency between documented and observed basic and complex physiological care interventions is in contrast with results obtained by hospital studies reporting lower percentages.[23,24]

In this study, 54% of the residents were classified into acuity levels 4, 5, and 7, indicating they experience behavioral or cognitive problems often due to (incipient) dementia.[34] Though only 15% of the documented interventions concerned the behavioral domain, the relatively high consistency (65.5%) may be explained by the management of dementia symptoms. Behavioral and psychological symptoms occur in more than 80% of residents with dementia.[43] To address this and in order to reduce restrictive care, it is mandatory that Dutch LTIC facilities look for behavioral interventions.[44] The most challenging that nursing staff deal with is aggressive behavior[45] which may explain observed interventions (27.6%) that were not documented. Aggressive behavior frequently occurs during basic physiological care.[46] Nursing staff then use approaches such as redirecting,[47] explaining/reassuring (calming techniques), asking the resident to stop[48] (limit setting), or humor.[49] Documentation of these resident specific approaches would enhance the person centeredness and continuity of care and facilitate information exchange across different shifts with nursing staff and other healthcare professionals.[50]

Little consistency within the safety domain was found. Documented interventions, mostly concerning surveillance, were significantly not observed which suggested that care was not provided. This is in accordance with Jones et al.[51] who found surveillance activities among the top five of missed care. While CNAs, for example, could have implemented components of the resident care plan such as taking vital signs, surveillance involves the "purposeful and ongoing acquisition, interpretation, and synthesis of clinical data for clinical decision making."[32] which is specifically within the training and scope of RNs' practices.[52] However, in Dutch LTIC, RNs are often deployed over multiple units for 5 to 9 hours per day.[53] This may hinder getting to know the resident which is pivotal in PCC[54] and in integrating and synthesizing data to accomplish quality of care[52,55] Lack of time may contribute to the prioritization of care leading to missed care[51] and subsequently contribute to adverse events.[56]

Observed interventions in the family domain were largely not documented and concerned mainly home maintenance assistance, a non-nursing task, and promotion of family involvement. In this study, reviewers were focused on nursing interventions and may have excluded documented family interventions. However, family is increasingly involved in the care for relatives including interventions concerning hands-on assistance, managing care, and socio-emotional support.[57] Not documenting these interventions may lead to ambiguity regarding roles of family and nursing staff which may contribute to stress and conflict.[57]

Interventions in the health system domain largely comprise indirect care (eg, case management). These interventions are not directly performed with the residents but on behalf of them and aim at the management of resident care and interdisciplinary collaboration.[32] They are generally not documented in care plans which can explain why interventions were significantly only observed.

The overall high probability that documented interventions were observed (≥ 91%, $P > .05$) indicates that care as agreed with the resident is provided by nursing staff. Especially NAs, adhered to the planned care which is in accordance with their scope of practice as they generally work in support of the implementation of care plans (ISCO code 3221).[58] Although HCAs provided significantly less frequently complex care interventions as consistent with documented interventions than RNs and NAs, they nevertheless provided them to residents (47%) which is beyond their scope of practice (ISCO code 5321).[58] Due to the focus of the current study, it is unknown whether HCAs were trained to perform these interventions and/or were delegated and supervised by a RN.

In the present study, residents' care plans were reviewed as they are a formal organizational tool for exchanging information and an initial step in PCC.[7,8,10] However, nursing staff perceive barriers in the documentation as well as in the implementation of PCC due to inadequate time and staffing.[59] Residents' complex care needs and, therefore, nursing interventions can change within a short period of time[16] which leads to inconsistencies between planned and given care. Whether, how, when, and by whom information about residents' changing care needs are shared with all of the involved healthcare professionals should be further investigated.

This explorative study did not take potential confounders, such as work experience or staff turnover, into account which may be limitations. Nor was the focus on why and how nursing staff prioritize care which may contribute to inconsistencies. Furthermore, structured continuous observations are labor-intensive and, therefore, data collector fatigue may have resulted in less accurate recordings.[60] However, by concurrently reviewing care plans and observing nursing staff in multiple facilities and units, comprehensive knowledge was gathered about the care as agreed with the resident and the care that is actually provided by nursing staff.

CONCLUSION

The current study found evidence that nursing staff largely comply to care as agreed upon with residents concerning basic and complex physiological care and, to a lesser extent, behavioral interventions. Except for the safety domain, the probability that documented interventions were provided was high for all domains. NAs generally provided the interventions as documented. Findings suggest that HCAs worked beyond there scope of practice. Lack of time or resources may contribute to the prioritization of care and task allocaction beyond the scope of practice of nursing staff. The results may have implications for the deployment of nursing staff and are of importance to managers.

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CHAPTER 6

A SYSTEMATIC REVIEW OF THE ASSOCIATION BETWEEN NURSING STAFF AND NURSING-SENSITIVE OUTCOMES IN LONG-TERM INSTITUTIONAL CARE

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Submitted

ABSTRACT

Aims: To examine the association between type of nursing staff and nursing-sensitive outcomes in long-term institutional care.

Design: This systematic review included studies published in English, German, and Dutch between January 1997 - January 2020.

Data Sources: The databases Medline (PubMed), CINAHL, PsycINFO, Embase and the Cochrane Library were searched. Original quantitative studies were included.

Review methods: The Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) guidelines were followed. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist was used to critically appraise the reporting of the studies.

Results: Fifteen articles were included. Of 33 quality of care outcomes, 21 were identified as nursing-sensitive outcomes of which 13 showed a significant association with nursing staff, specifically: ADL, aggressive behavior, bladder/bowel incontinence, contractures, expressive language skills, falls, infection (incl. vaccination), range of motion, pain, pressure ulcers, and weight loss. However, regarding the same outcome, the association between registered nurses, licensed practical nurses, certified nursing assistants, and health care assistants, these nursing-sensitive outcomes could be positive (more staff leading to better outcomes), negative (more staff leading to worse outcomes), or no association for either type of nursing staff.

Conclusion: Future research should be expanded with structure and process variables of which the mediating and moderating effect on nursing-sensitive outcomes is known. These may explain variances in quality of care and guide quality improvement initiatives. Researchers should consider fully applying Donabedian's structure-process-outcomes framework as it is a coherent entirety for quality assessment.

Impact: This review provides an overview of quality of care outcomes that are responsive to nursing interventions in long-term institutional care. As the effects can be monitored and documented, quality assessment should focus on these nursing-sensitive outcomes. The inconclusive results make it difficult to provide recommendations on who should best perform which care.

INTRODUCTION

Worldwide, there are concerns about the appropriate composition of nursing staff to provide care that meets quality criteria such as patient safety and patient-centeredness.[1] To ensure quality of care in long-term institutional care, minimum nursing staff standards have been established in several countries[2] including the Netherlands.[3,4] Despite these important preconditions,[5] an increase of nursing staff does not necessarily lead to better quality of care.[5,6] Inadequacies in quality of care in long-term institutional care are also associated with the composition of nursing staff (skill mix), that is related to the educational level and licensure of staff.[7]

Long-term institutional care (LTIC) refers to nursing and residential care facilities that provide a combination of accommodation, intensive care, and support with psychosocial functioning for older people.[8] Due to population aging and governmental policies that promote homebased care, LTIC has evolved into high acuity settings.[8] Residents experience an increasing number of severe physical and cognitive limitations[9] and their care concerns physical, psychological, social, and environmental needs.[10,11] Furthermore, the average length of stay has reduced, varying from nine[12] to 18 months.[12,13] These developments have intensified the work of nursing staff and affect the staff qualifications that are needed.[8]

Reviews about the association between nurse staffing and quality of care in LTIC show mixed results regarding specific types of nursing staff (eg, registered nurses, nursing assistants) and better or worse quality of care outcomes.[14-16] For example, either a positive, negative, or no association was determined for registered nurses (RN) and licensed practical nurses (LPN) with the quality outcomes of catheter use, restraint use, and hospitalization.[14,16] Besides methodological considerations such as study design or sample size of included studies,[14-16] this may be related to the selection of quality outcomes. Selected outcomes may be to a greater or lesser extent sensitive to nursing care in general and/or specific staff types depending on their scope of practice.[15,17]

Considering the worldwide shortage of nursing personnel[18] and concerns about quality of care in LTIC, it is important to understand which outcomes are specifically sensitive to nursing interventions and, therefore, for which of them nursing staff can be held accountable. This review adds to previous research by providing an overview of the contribution of different types of nursing staff to nursing-sensitive outcomes in LTIC.

BACKGROUND

A well-known and much quoted approach to assess quality of care is the conceptualization into structure-process-outcome by Donabedian[19] that guided this review. Structure

encompasses the characteristics of the setting in which care occurs, including human (eg, personnel), physical (eg, equipment), and organizational (eg, budget resources) factors needed to provide it.[19,20] Process refers to what occurs while providing care. It comprises technical and interpersonal competencies of nursing staff in implementing the interventions that are necessary to establish care outcomes based on residents' care needs. Outcomes are the effects of the provided care on the residents' health status. Concerning quality assessment, preexisting knowledge should be available regarding the relationship between structure and process, as well as between process and outcome. Only then will a good structure set the condition for good outcomes, and the care provided will be responsible for the observed outcomes.[19,20] Translated to this review, this means that nursing staff perform interventions within their scope of practice that aim to achieve care outcomes that result from their interventions, also called nursing-sensitive outcomes.

The Nursing Outcomes Classification (NOC), a research-based standardized language for nursing outcomes,[17] was adopted for this review. A nursing-sensitive patient outcome is described in the NOC as an individual, family, or community state, behavior, or perception that is measured through indicators along a continuum in response to nursing care.[17] The NOC describes labels and definitions of outcomes that are sensitive for nursing interventions and provides a categorization into domains, classes, outcomes, and indicators.[17] Thus, in this review, the structural (independent) variables concerned the type of nursing staff and the outcome (dependent) variables regarded nursing-sensitive outcomes. Research questions included:

- Which quality outcomes described in studies can be identified as nursing-sensitive outcomes?
- What is the association between the type of nursing staff and nursing-sensitive outcomes?

THE REVIEW

AIMS

The aim of this systematic review was to synthesize the evidence of the association between the type of nursing staff and nursing-sensitive outcomes to assess their impact on quality of care in LTIC. The results of this review may support managers in optimizing the deployment of nursing staff to enhance quality of care.

DESIGN

This systematic review adhered to the Preferred Reporting Items for Systematic review

and Meta-Analysis Protocols (PRISMA-P).[21] The study protocol is registered in the International Prospective Register of Systematic Reviews (PROSPERO; registration number CRD42020189668).

SEARCH METHODS

Inclusion and exclusion criteria

Studies were eligible if they 1) examined the association between nursing staff in LTIC and nursing-sensitive outcomes, 2) were written in English, German, or Dutch, 3) were published in peer reviewed journals, and 4) described quantitative original research. Excluded were literature reviews, letters to editors, reports, book chapters, and doctoral dissertations.

LTIC is defined as facilities that provide accommodation and long-term care services for older people with moderate to severe functional and cognitive limitations.[8] In this review, this includes nursing homes, residential care, and assisted living. Excluded were hospital based nursing homes and specialized skilled facilities such as hospices or rehabilitation units as they are fundamentally different in terms of staffing and resident population.[22]

Nursing staff is defined as paid LTIC staff who provide direct care, assistance with activities of daily living (ADL), and other personal support.[8] Nursing staff can be expressed in *type and number*.[23] *Type* of staff included are registered nurses (RNs), licensed practical/vocational nurses (LPNs/LVNs), certified nursing assistants (CNAs), and health care assistants (HCAs)[8] such as nurse aides or personal care workers. Excluded were 'licensed nursing staff' when this merged RNs and LVNs/LPNs into 1 category. Also, studies reporting on the association between 'total staffing' and outcomes or with a focus on contract, temporary, or specialized (eg, medication aid, administrative RN) nursing staff were excluded. Regarding the *number* of nursing staff, studies were included when they differentiated per type of nurse, for example, RN full-time equivalent per resident day or RN nursing hours per resident day.

Quality outcomes, also referred to as quality indicators, that were described in the studies were included when they could be associated with a nursing-sensitive outcome as described in the NOC[17] by comparison of relevant outcome labels and definitions. Furthermore, Donabedian[19] distinguishes between *specific* and *generic* outcomes of care. *Specific* outcomes indicate whether a specific (clinical) objective has been attained. They are more likely to be sensitive to interventions of a single discipline and to variations in provided interventions.[17,19] *Generic* outcomes are intended to provide an estimate of the health status of a care recipient regardless of a diagnosis and are influenced by a variety of factors other than the care provided.[19] For that reason, generic outcomes such as mortality, hospitalization, quality of live, and patient satisfaction were excluded. Additionally, studies using a composite quality of care outcome or deficiency citations were omitted.

Search strategy

The search strategy was developed with the assistance of an information specialist/librarian of the university. Combinations of terms included Medical Subject Headings (MeSH), text words, and word variants with respect to place of residence and nursing staff as well as terms related to quality of care (Box 1). An electronic search was conducted of studies published from January 1997 (first edition of the NOC) to January 2020 in the following databases: Medline (PubMed), CINAHL, PsycINFO, Embase and the Cochrane Library.

Box 1. Search strategy PubMed

("Nursing Homes"[Mesh] OR "Residential Facilities"[Mesh:NoExp] OR "Assisted Living Facilities"[Mesh] OR "Homes for the Aged"[Mesh] OR nursing home*[tiab] OR "homes for the aged"[tiab] OR residential[tiab] OR elderly care[tiab] OR assisted living[tiab] OR care home*[tiab] OR long term care[tiab] OR long term institutional care[tiab] OR longterm care[tiab] OR long term facilit*[tiab])

AND

("Personnel Staffing and Scheduling"[Mesh] OR "Nursing Staff/organization and administration"[Mesh:noexp] OR "Nursing Staff/supply and distribution"[Mesh:noexp] OR skillmix[tiab] OR "skill mix"[tiab] OR staff mix[tiab] OR staffing[ti] OR skill level*[tiab] OR (occupancy[tiab] AND rate[tiab]) OR (task[tiab] AND "differentiation"[tiab]) OR "nurse staffing"[tiab] OR staffing level*[tiab] OR (nurse-patient[tiab] AND ratio[tiab]))

AND

("Quality of Health Care"[Mesh] OR "Nursing Audit"[Mesh] OR "Patient Reported Outcome Measures"[Mesh] OR "Outcome Assessment (Health Care)"[Mesh] OR (quality[tiab] AND indicator*[tiab]) OR clinical indicator*[tiab] OR nursing audit*[tiab] OR patient reported outcome measures[tiab] OR (quality[tiab] AND outcome*[tiab]) OR quality of care[tiab] OR nursing outcome*[tiab] OR nurse outcome*[tiab] OR patient outcome*[tiab] OR nursing sensitive[tiab] OR outcome*[ti] OR quality[ti])

Search outcomes

References from the search were downloaded into the bibliographic software package RefWorks (ProQuest LLC, 2019). The initial search yielded 3902 publications out of which 1008 duplicates were removed. After screening titles and abstracts, of 116 potential relevant publications full text articles were obtained. Following the assessment of these, 18 studies were critically appraised of which 15 were included in the present review. Figure 1 displays the PRISMA flow diagram of article selection and reasons for exclusion.

AT (principal author) and PR independently screened publications' titles and abstracts for eligibility. Subsequently, a list of potentially relevant studies was created, including those with uncertainty, and full text articles (116) were obtained. These were assessed by AT in accordance with the inclusion and exclusion criteria. If multiple publications were available

for a study, data from the most recent and/or complete publication were included. When there was ambiguity regarding whether to include or exclude a study, PR and MdG were involved to reach consensus about the inclusion of studies for quality appraisal. References of included articles (15) and relevant reviews were searched for additional studies and yielded no additional publications. A log of decisions was kept throughout the selection process.

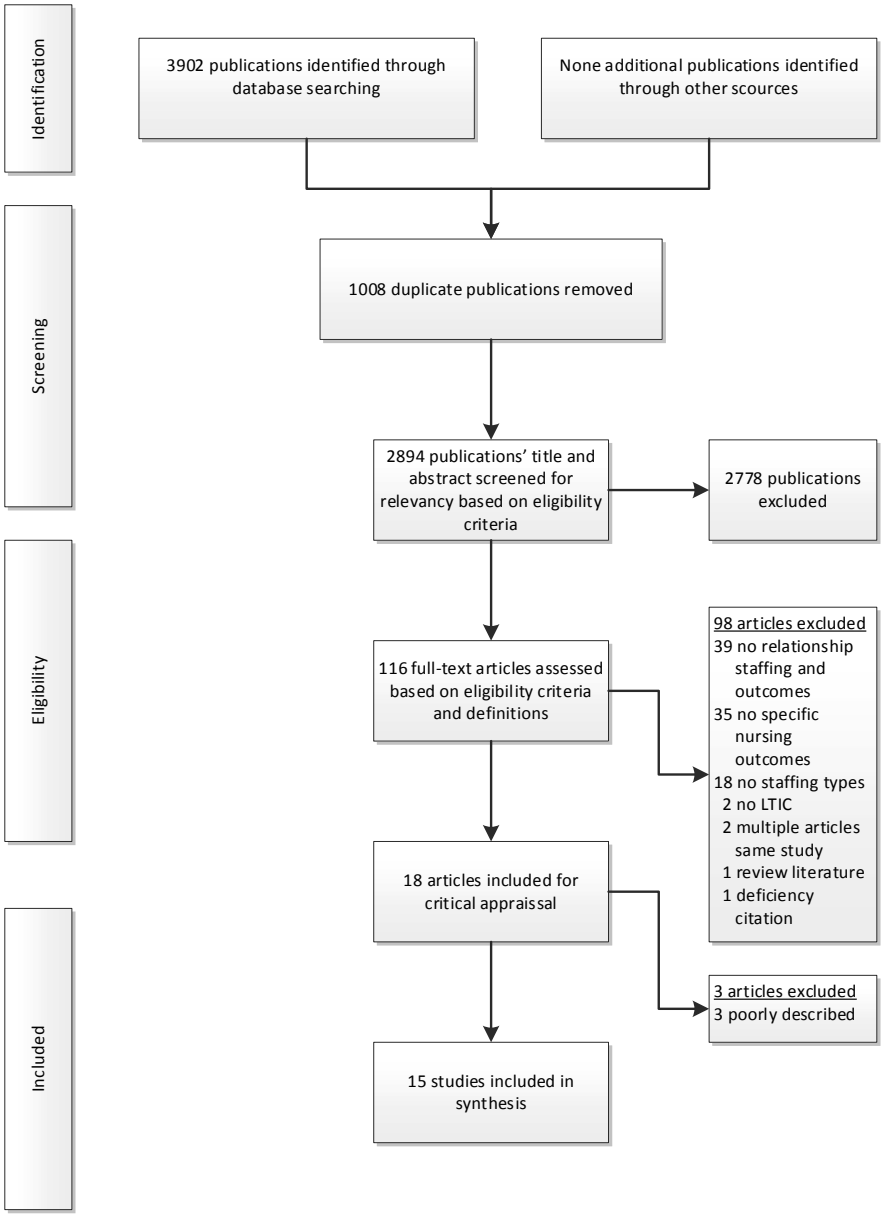

Figure 1. PRISMA flow diagram of article selection

QUALITY APPRAISAL

The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist was used to critically appraise the reporting of the studies. The checklist addresses 3 main types of studies, i.e., cohort, case-control, and cross-sectional studies, and consists of 22 items related to studies' title, abstract, introduction, methods, results, and discussion.[24] The appraisal was conducted by AT and MdG independently. A record was kept whereby, per STROBE item, comments were written and recommendations about inclusion or exclusion of the study. Subsequently, studies were discussed and differences were resolved by consensus.

DATA ABSTRACTION AND SYNTHESIS

Data extraction was conducted by AT with a standardized template that included first author, year of publication, country, design, setting, population, sample size, data sources and measurements, staffing variables, outcome variables, co-variates, statistical methods, and key results of studies.

After consultation with a statistician, it was decided that the heterogeneity of included studies precluded meta-analytic techniques. Instead, the results of studies were summarized via content analysis which facilitates categorizing and summarizing data according to key concepts and themes.[25] The findings were summarized per type of nursing staff and nursing-sensitive outcome.

RESULTS

STUDY CHARACTERISTICS

Table 1 provides a summary of included studies. Studies were mostly conducted in the U.S.A. (N = 10). Study designs were either cross-sectional (N = 9), longitudinal (N = 5), or cohort (N = 1) with follow-ups varying from 90 days to 4 years. The majority of studies applied secondary analyses using administrative survey data, such as the Minimum Data Sets (MDS) (N = 7) and the On-line Survey Certification and Reporting System (OSCAR) (N = 5). Analyses were primarily conducted on the facility level (N = 11) with nursing home samples ranging from 19 to approximately 17.000 facilities. Four studies performed resident level analyses with samples ranging from 257 to 6145 residents of which 2 studies also analysed on the unit level with samples ranging from 156 to 282 units. Except for the study of Alexander,[26] resident (eg, gender, age) facility (eg, size, ownership), or market (eg, reimbursement, population ≥ 65 years) co-variates were included that were considered to moderate the effect on nursing-sensitive outcomes.

Staffing variables were mostly defined as hours per resident per day (hprd) (N = 7), full time equivalent per 100 residents (fte/100 residents, beds) (N = 3), and staff-to-resident ratio (N = 2).

IDENTIFIED NURSING-SENSITIVE OUTCOMES

Of the total of 33 distinct quality of care outcomes described in the included studies, 21 (64%) could be identified as nursing-sensitive outcomes (NSOs). Table 2 displays an overview of these 21 outcomes with examples of an NSO according to the NOC. Generally, the outcome variable pressure ulcer (N = 8) was studied followed by weight loss (N = 6) and infection (N = 6) (Table 1). Quality outcomes that were not identified as NSOs primarily concerned physical restraints, drug use, range of motion exercises, toileting program, or ADL training.

Table 1. Summary of characteristics of included studies

First author; Year, Country	**Study design** (Follow-up)	**Sample population and size**	**Data source and level of analysis**	**Nursing Staff**[a]	**Quality outcome**[b]	**Significant findings**[c]
Alexander[26]; 2008, USA	CS	510 NH	QO from MDS in NHC Staffing from NHC Facility level analyses	RN/LPN/ CNA – hprd	ADL Depressed or anxious High risk PU Incontinence bowel/ bladder Move in/around room	↑RN then ↓ADL ↑LPN then ↓ADL ↑CNA then ↓Incontinence bowel and bladder
Arling et al.[27]; 2007, USA	LO (90 days)	105 NH 156 units 5.314 residents	QO from self-report staff Staffing from self-report staff Unit and resident level analyses	RN/LPN/Aid – RSTprd	ADL Continence	↑NA time then ↓ADL
Backhaus et al.[28]; 2017, The Netherlands	CS	95 LTCF 282 units 2.604 residents SOM units 3.541 residents PG units	QO from LPZ Staffing from LPZ Unit and resident level analyses	BRN – hprd	Falls PU	Somatic wards ↑BRN then ↓falls
Castle et al.[29]; 2008, USA	CS	6.005 NH	QO from MDS in NHC Staffing from surveys Facility level analyses	RN/LPN/NA – fte/100 residents	PU high risk PU low risk Pain	↑RN then ↓PU low risk ↑NA then ↓Pain

Table 1. (Continued)

First author; Year, Country	**Study design** (Follow-up)	**Sample population and size**	**Data source and level of analysis**	**Nursing Staff**[a]	**Quality outcome**[b]	**Significant findings**[c]
Castle et al.[30]; 2017, USA	LO (9 months)	±17.000 NH 1.128.418 residents	QO from MDS Staffing from OSCAR Facility level analyses	RN/LPN – fte/100 residents	UTI	Residents with catheter ↑RN then ↓UTI Residents without catheter ↑RN then ↓UTI ↑LPN then ↓UTI
Dyck[31]; 2006, USA	CS	2.951 NH 363.895 residents	QO from MDS Staffing from OSCAR. Facility level analyses	RN/LPN/CNA – hprd	Dehydration WL	↑NA3hrs then ↓WL
Konetzka et al.[22]; 2008, USA	LO (3 years)	1.366 NH 399.206 residents	QO from MDS Staffing from OSCAR Facility level analyses	RN – hprd	PU UTI	↑RN then ↓PU ↑RN then ↓UTI
Lee et al.[32]; 2014, USA	CS	195 NH	QO from MDS Staffing from state surveyors Facility level analyses	RN – hprd	PU UTI WL	↑RN then ↓PU
Lin[33]; 2014, USA	LO (1999 to 2003)	3275 NH	QO from OSCAR Staffing from OSCAR Facility level analyses	RN/LPN/CNA – hprd	Contracture PU	↑RN then ↓PU ↑RN then ↓Contracture

Table 1. (Continued)

First author; Year, Country	**Study design** (Follow-up)	**Sample population and size**	**Data source and level of analysis**	**Nursing Staff**[a]	**Quality outcome**[b]	**Significant findings**[c]
Reid et al.[34]; 2003, Canada	LO (1 year)	257 residents	QO from validated scales Staffing from NH survey Resident level analyses	RN/CA – to-resident ratios	Agitation Cognitive function Expressive language skills Physical function Social skills	↑CA then ↓expressive language skills
Shin et al.[35]; 2015, Korea	CS	19 NH	QO from NH survey Staffing from NH survey Facility level analyses	RN/CNA/QCW - hprd	ADL increase Aggressive behavior Dehydration Depression Cognitive decline Falls Incontinence PU ROM decreased UTI WL	↑RN then ↓falls ↑RN then ↓ROM (deteriorated) ↑QCW then ↑aggressive behavior
Shin et al.[36]; 2019, Korea	CS	60 NH	QO from survey Staffing from NH survey Facility level analyse	RN (direct-care) - hprd	WL	-
Weech-Maldonado et al.[37]; 2004, USA	CS	1.134 NH	QO from MDS+ Staffing from OSCAR Facility level analyses	RN – fte	Cognitive decline Mood decline PU	↑RN then ↓PU

Table 1. (Continued)

First author; Year, Country	**Study design** (Follow-up)	**Sample population and size**	**Data source and level of analysis**	**Nursing Staff**[a]	**Quality outcome**[b]	**Significant findings**[c]
Zimmerman et al.[38]; 2002, USA	LO (2 years)	59 NH 2.015 residents	QO from resident and medical records Staffing from Form 671 Resident level analyses	RN/LPN/NA – fte/100/beds/ week	Infection	↑LPN then ↑infection, ↓NA then ↑infection.
Zimmerman et al.[39]; 2018, Germany	CS	166 NH 8.665 residents	QO from care documentation Staffing from Project EQisA Facility level analyses	RN/CNA/ACS – to-resident ratio measured in fte	WL	<u>Residents' without CI</u> ↑RN residents then ↓WL ↑ACS residents then ↓WL

ACS = additional care staff; ADL = activities of daily living; CA = care aid; CH = cohort; CNA = certified nursing assistant; CS = cross-sectional; LO = longitudinal; LPN = licensed practical nurse; LTCF = long-term care facility; LVN = licensed vocational nurse; MDS = Minimum Data Set; NA = nurse aid; NH = nursing home; NHC = Nursing Home Compare; NU = nursing unit; OSCAR = Online Survey, Certification and Reporting;
PG = psychogeriatric; PR = physically restrained; PU = pressure ulcer; QCW = quality care worker; QO = quality outcome; RN = registered nurse; ROM = range of motion; SOM = somatic; UTI = urinary tract infection; WL = weight loss; hprd = hours per resident day; RSTprd = resident specific time per resident day.

[a] Only nursing staff which met in- and exclusion criteria are displayed.

[b] Only quality outcomes which met in- and exclusion criteria are displayed.

[c] $P < .05$ nursing-sensitive outcomes; ↑, increase; ↓, decrease.

Table 2. Linkage of quality outcomes described in included studies with 1 example of a nursing-sensitive outcome from the NOC[a] and frequency of occurrence in included articles

Quality Outcome	NOC domain	NOC class	Nursing-sensitive outcome (NOC code)	Definition	Number	First author; year
ADL (e.g., decline in, needs increased)	Functional Health	Self-Care	Self-Care: ADL (0300)	Personal actions to perform the most basic and physical tasks and personal activities independently with or without assistive device.	3	Alexander[26], 2008, Arling et al.[27]; 2007, Reid et al.[34]; 2003
Agitation	Psychosocial health	Psychological Well-Being	Agitation Level (1214)	Severity of disruptive physiological and behavioral manifestations of stress or biochemical triggers.	1	Reid et al.[34]; 2003
Aggressive behavior (e.g., verbal, physical)	Psychosocial health	Self-Control	Aggressions Self-Restraint (1401)	Personal actions to refrain from assaultive, combative, or destructive behavior towards others.	1	Shin et al.[35]; 2015
Anxious	Psychosocial Health	Psychological Well-Being	Anxiety level (1211)	Severity of manifested apprehension, tension, or uneasiness arising from an unidentifiable source.	1	Alexander[26]; 2008
Bladder incontinence (e.g., loss of control, increase in)	Physiologic Health	Elimination	Urinary Continence (0502)	Control of elimination of urine from the bladder.	3	Alexander[26]; 2008, Arling et al.[27]; 2007, Shin et al.[35]; 2015
Bowel incontinence (e.g., loss of control, increase in)	Physiologic Health	Elimination	Bowel Continence (0500)	Control of passage of stool from the bowel.	3	Alexander[26]; 2008, Arling et al.[27]; 2007, Shin et al.[35]; 2015
Cognitive (e.g., decline, function)	Physiologic Health	Neurocognitive	Cognition (0900)	Ability to execute complex mental processes.	3	Reid et al.[34]; 2003, Shin et al.[35]; 2015, Weech-Maldonado et al.[37]; 2004

Table 2 (Continued)

Quality Outcome	NOC domain	NOC class	Nursing-sensitive outcome (NOC code)	Definition	Number	First author; year
Contracture	Functional Health	Mobility	Joint Movement (0206)	Active range of motion with self-initiated movement.	1	Lin[33]; 2014
Dehydration	Health Knowledge & Behavior	Risk Control	Risk control: Dehydration (1937)	Personal actions to understand, prevent, eliminate, or reduce the threat of inadequate water in the intracellular and extracellular compartments of the body.	1	Dyck[31]; 2006, Shin et al.[35]; 2015
Depressed	Psychosocial Health	Psychological Well-Being	Depression Level (1208)	Severity of melancholic mood and loss of interest in life events.	2	Alexander[26]; 2008, Shin et al.[35]; 2015
Expressive language skills	Physiologic Health	Neurocognitive	Communication: Expressive (0903)	Expression of meaningful verbal and/or non-verbal messages.	1	Reid et al.[34]; 2003
Falls	Health Knowledge & Behavior	Safety	Falls Occurrence (1912)	Number of times an individual falls.	2	Backhaus et al.[28]; 2017, Shin et al.[35]; 2015
Infection/vaccination (Vaccination)	Physiologic Health	Immune Respons	Immune Status (0702)	Natural and acquired appropriately targeted resistance to internal and external antigens.	1	Alexander[26]; 2008
Infection (e.g., UTI)	Health Knowledge & Behavior	Risk Control	Risk Detection (1908)	Personal actions to identify personal health threats.	6	Alexander[26]; 2008, Castle et al.[30]; 2017, Konetzka et al.[22]; 2008, Lee et al.[32]; 2014, Shin et al.[35]; 2015, Zimmerman et al.[38]; 2002

Table 2 (Continued)

Quality Outcome	NOC domain	NOC class	Nursing-sensitive outcome (NOC code)	Definition	Number	First author; year
Mood (decline)	Psychosocial Health	Psychological Well-Being	Mood equilibrium (1204)	Appropriate adjustment of prevailing emotional tone in rsponse to circumstances.	1	Weech-Maldonado et al.[37]; 2004
Move in/around the room	Functional Health	Mobility	Mobility (0208)	Ability to move purposefully in own environment independently with or without assistive device.	1	Alexander[26]; 2008
Range of motion (decreased)	Functional Health	Mobility	Mobility (0208)	Ability to move purposefully in own environment independently with or without assistive device.	1	Shin et al.[35]; 2015
Pain (acute, chronic)	Perceived Health	Symptom Status	Pain Level (2102)	Severity of observed or reported pain.	2	Alexander[26]; 2008, Castle et al.[29]; 2008
Pressure ulcers (high and low risk)	Health Knowledge & Behavior	Risk Control	Risk control: Pressure injury (1942)	Personal actions to understand, prevent, eliminate, or reduce the threat of developing pressure-induced tissue damage.	8	Alexander[26]; 2008, Backhaus et al.[28]; 2017, Castle et al.[29]; 2008, Konetzka et al.[22]; 2008, Lee et al.[32]; 2014, Lin[33]; 2014, Shin et al.[35]; 2015, Weech-Maldonado et al.[37]; 2004
Social skills	Psychosocial Health	Social Interaction	Social Interaction Skills (1502)	Personal behaviors that promote effective relationships.	1	Reid et al.[34]; 2003

Table 2 (Continued)

Quality Outcome	NOC domain	NOC class	Nursing-sensitive outcome (NOC code)	Definition	Number	First author; year
Weight loss	Health Knowledge & Behavior	Health behavior	Weight Maintenance Behavior (1628)	Personal actions to maintain optimum body weight.	6	Alexander[26]; 2008, Dyck[31]; 2006, Shin et al.[35]; 2015, Lee et al.[32]; 2014, Shin et al.[36]; 2019, Zimmerman et al.[39]; 2018

ADL = activities of daily living; NOC = Nursing Outcomes Classification; UTI = urinary tract infection.
[a] Example of nursing-sensitive outcome directly related to interventions that could be performed by nurse staffing to achieve/prevent the outcome. Depending on the health status of the resident and his/her preferences other nursing-sensitive outcomes good be relevant.

ASSOCIATION BETWEEN REGISTERED NURSES AND NURSING-SENSITIVE QUALITY OF CARE OUTCOMES

All of the 15 studies investigated the association between RNs and outcomes of which 5 solely included RNs (Table 1). Five out of the 8 studies examining the outcome 'pressure ulcer' showed that more RN staff was significantly associated with a decrease in pressure ulcer prevalence. Six studies examined the outcomes 'infection' and 'weight loss'. Two found that more RN staff was significantly associated with a decrease in the percentage of infections, and 1 study determined that more residents per RN led to an increase of residents with weight loss. One out of 3 studies examining the outcome 'ADL' found that more RN staff significantly increased residents' needs for help with it. Two studies investigated the outcomes 'falls' and 'pain'. More RN staff was significantly associated with fewer falls in 1 study but the other ascertained that more RN staff on somatic wards increased the probability that residents experienced a fall. One out of 2 studies showed that more RN staff was associated with a decrease of residents experiencing pain. The outcomes 'contractures' and 'range of motion' were investigated with each being in different studies. More RN staff was significantly associated with fewer residents having contractures and deteriorated range of motion. No significant association was found for the association between RNs and the outcomes 'aggressive behavior' (1 study), bladder/bowel incontinence' (3), 'cognition' (3), infection/vaccination (1), and 'expressive language skills' (1) (Table 1).

ASSOCIATION BETWEEN LICENSED PRACTICAL NURSES AND NURSING-SENSITIVE QUALITY OF CARE OUTCOMES

Eight studies (53%) assessed the association between LPNs and outcomes (Table 1). One out of 4 studies examining the outcome 'pressure ulcer' showed that more LPN staff was significantly associated with a decrease of residents with pressure ulcers. Two out of 4 studies found that more LPN staff was associated with more residents having an infection. One out of 2 studies examining the outcome 'ADL' determined that more residents needed help with their ADL when more LPN staff was available to assess their status. A significant association between the number of LPNs and the outcomes 'aggressive behavior' (1), bladder/bowel incontinence' (3), 'cognition' (1), 'contracture' (1), 'falls' (1), infection/vaccination (1), and 'range of motion' (1), 'pain' (2), and 'weight loss' (4) was absent (Table 1).

ASSOCIATION BETWEEN CERTIFIED NURSING ASSISTANTS AND NURSING-SENSITIVE QUALITY OF CARE OUTCOMES

The association between CNAs and outcomes was assessed by 5 (33%) studies (Table 1). No association was found in all 3 studies examining the outcome 'pressure ulcer'. One out of 4 studies examining the outcome 'weight loss' found that, when a facility had $\geq$ 3 hours of NA

time per resident per day, a decrease of residents with unintentional weight loss occurred. Two studies that examined the outcome 'incontinence' determined that more NA staff was significantly associated with an increase of residents with bladder and bowel incontinence. Studies about the association between NAs and the outcomes 'ADL' (1), 'aggressive behavior' (1), 'cognition' (1), 'contracture' (1), 'falls' (1), infection' (2), infection/ vaccination (1), 'range of motion' (1), and 'pain' (1) showed no significant results (Table 1) .

ASSOCIATION BETWEEN HEALTH CARE ASSISTANTS AND NURSING-SENSITIVE QUALITY OF CARE OUTCOMES

Six studies (40%) assessed the association between HCAs and outcomes (Table 1). There were 2 studies for each investigated outcome that included 'pressure ulcer', 'infection', 'weight loss' and 'ADL' of which 1 study consistently found significant results. More HCA staff was associated with a decrease of residents with pressure ulcers. Lower numbers of HCAs were associated with a higher occurrence of infections. More residents per HCA increased the percentage of residents with unintentional weight loss. The more time that HCAs spent with residents, the more that residents experienced a decline in ADL. The outcomes 'pain', 'aggressive behavior', and 'expressive language skills' were individually examined by 1 study per outcome. More HCA staff was significantly associated with a decrease of residents experiencing pain and an increase of residents showing aggressive behavior. The higher the HCA-to-resident ratio, the greater the decline in expressive language skills. A significant association between the number of HCAs and the outcomes of bladder/bowel incontinence (2), falls (1), and range of motion (1) was absent (Table 1).

No significant association was determined in any of the studies between the type of nursing staff and the outcomes of agitation, anxiety, cognition, dehydration, depression, mood, move in/around the room, and social skills.

DISCUSSION

Out of the 33 quality of care outcomes described in the included studies, 21 were identified as nursing-sensitive outcomes according to the NOC of which 13 showed a significant association with nursing staff. The impact of the number of nursing staff was found in: ADL, aggressive behavior, bladder/bowel incontinence, contractures, expressive language skills, falls, infection (incl. vaccination), range of motion, pain, pressure ulcers, and weight loss. According to the NOC, these outcomes respond to nursing interventions, and the effects can be monitored and documented. This means that nursing staff is of decisive importance for the quality of care with regard to these outcomes.[17] However, the evidence of the association between the type of nursing staff and NSOs was inconclusive which is in accordance with

Backhaus et al.[14] and Castle.[15] For RNs and HCAs, either a significant positive association (more staff leading to better outcomes) or no association was reported by different studies examining the same outcome. For LPNs and CNAs, this could be a significant positive, negative (more staff leading to worse outcomes), or no association.

An explanation may be that the included studies primarily relied on secondary quality outcome data derived from mandatory standardized surveys such as the MDS and OSCAR. Besides reporting bias,[16] nursing-sensitive quality outcomes in these surveys may not all be equally sensitive to nursing practice in LTIC. For example, experts considered only 13 of the 35 MDS (version 2.0) quality indicators as sensitive to practice in the Canadian LTIC of which 9 were most sensitive to nursing interventions.[40] Of these 9, though not consistently, 7 corresponded to significant outcomes found in this review either in a positive direction (late loss ADL function, falls in the last 30 days, worsening pain, pressure ulcer, urinary tract infection (only RN), and unexplained weight loss) or negative direction (aggressive behavior (HCA), urinary tract infection (LPN and HCA)). Estabrooks et al.[40] contend that the focus of quality of care should be on outcomes that are sensitive to care practices in LTIC as they will have the greatest potential for functional improvement and decelerating the decline of residents. As some of these NSOs were solely examined in 1 or 2 studies included in this review (eg, pain, falls) more research is needed concerning the association between nursing staff and these specific outcomes for LTIC.

No strong evidence was determined for the association between RNs and NSOs which is in contrast to Dellefield et al.[7] Besides NSOs, their review comprised outcomes such as deficiency citations, hospitalization, and mortality, which may explain the differences. The lack of evidence may be due to the amount of time that RNs had spent with residents. Donabedian[19] contends that, in order to observe improvements in quality of care, certain thresholds such as for staffing, must be met in order to have an effect on quality outcomes. Staffing variables of the included studies were generally (7) defined as hours per resident per day. Zang et al.[41] found that thresholds of RN staffing range between 0.31 hprd (minimum for a reasonable quality of care) and 1.83 hprd (highest quality possible considering cost-effectiveness). Except for Shin et al.,[36] the included studies reported that RNs' hprd ranged from 0.08 to 0.60 (not in table) which may partially explain the lack of consistent positive associations with NSOs. As LTIC has evolved into high acuity settings, this may require more time from RNs to meet residents' complex care needs and enhance quality of care.

Besides the number of hprd, the lack of evidence may be due to factors that moderate or mediate quality of care. Though the majority of included studies controlled for resident, facility, and/or market co-variates, none of them included work environmental structure variables other than staffing that are known to have a mediating effect on quality of care outcomes such as nurse manager ability, leadership and support,[42-44] nursing foundations

(eg, use of a nursing model, nursing diagnoses, actual care plan documentation), and/or nurse-physician relationship.[43] In addition, studies did not include potential moderating characteristics of nursing staff such as work experience, education, and professional certification (eg, gerontological nursing).[23]

Though nursing staff that are less educated provide the majority of hands-on care in LTIC, only a small number of studies included in this review considered the association between CNAs (33%) and/or HCAs (40%) and NSOs. Berta et al.[45] state that these types of nursing staff are an understudied workforce. Because they are generally considered as unlicensed health care aids with an unregulated scope of practice,[45,46] this may prevent them from being recognized as a profession, which makes it difficult to collect comparable data.[8] However, their role in LTIC is evolving from providing a basic level of care (eg, assistance with ADL) to performing delegated tasks such as catheter care, medication administration, and wound care.[46,47] Tuinman et al.[48] found that nursing staff of varying levels performed comparable interventions in LTIC, suggesting a blurring of role differentiation that may affect the quality of care. In order to understand the association of unlicensed nursing staff and outcomes of quality of care, more research is needed. This should include structure variables such as training and scope of practice as these vary widely.[46,47] Moreover, as unlicensed nursing staff may only perform delegated tasks when supervised by nurses, this should also be taken into account. Effective supervision may better prepare CNAs and HCAs for delegated tasks, resulting in better care processes and subsequently lead to improved NSOs.

Regarding the process of care, included studies predominately employed data derived from standardized surveys which means that mainly a (linear) relationship between structure (number of nursing staff) and outcome variables (quality of care) has been examined. Donabedian[19] contends that outcomes are primarily the effect of care processes. Process variables include nursing staffs' competencies (knowledge, skills, and attitudes) to apply appropriate care strategies when implementing interventions. Future research into quality of care in LTIC necessitates adding mediating process variables to better understand what is actually done in providing care that contributes to the quality of care.

LIMITATIONS

This review has several strengths such as a comprehensive search guided by an information specialist, the inclusion of several languages, and independent reviewers for aspects of screening, data extraction, and quality assessment. Still, some limitations must be considered. As in any review, the findings are limited by the methodological quality of the included studies. By using the STROBE checklist, studies (3) that were poorly described were excluded.

Unlicensed personnel were categorized with a variety of names such as (certified) nursing assistant, (nurse/care) aide, quality care worker, or additional care staff. As many studies did not report educational background, the research team decided whether they were certified nursing assistants with a minimum number of training hours in basic nursing skills. When a person was referred to as a 'nursing assistant', a certification was assumed, and it was decided to label this professional as a CNA. Others were labeled as an HCA, including a nurse aid. While the choices may be arbitrary, the authors believe it did not affect the results.

For this review, the authors decided to focus on *specific* outcomes as described by Donabedian[19] because they are more likely to be sensitive to interventions of different levels of nursing staff and to variations in the executed the interventions. As a result, a complete scenario of the relationship between nursing staff and quality of care has not been provided. For example, an outcome such as 'quality of life' may be more sensitive to nursing staff such as CNAs who have more contact with residents.

Another limitation may be that the authors excluded dissertations and unpublished work, therefore, potentially important sources of information may have been missed, meaning the results may not represent all of the relevant work in this area. As the authors only included quantitative studies, it may be that publication bias was introduced. Finally, the majority of included studies were conducted in the U.S.A. (10) which may limit the generalizability of the results.

CONCLUSION

Twenty-one out of 33 quality outcomes could be identified as NSOs of which 13 showed a significant association with nursing staff. The association between RNs, LPNs, CNAs, and/or HCAs and these NSOs was inconclusive. Research into the nursing staff and quality of care relationship in LTIC should be expanded with structure and process variables of which the mediating and moderating effect on quality of care is known. These may explain variances in quality of care outcomes and guide quality improvement initiatives in addition to adding numbers of nursing staff and/or time per resident per day. Furthermore, evidence needs to be expanded about which NSOs are most sensitive to nursing interventions, specifically in view of the current complexity of care in LTIC. Finally, future research into quality of care in LTIC should consider to fully apply the theoretical framework of Donabedian since it is a coherent entirety in which good structure leads to good processes, and good processes lead to good outcomes.[19]

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CHAPTER 7

GENERAL DISCUSSION

Kleur bekennen

de Volkskrant, 27 juni 2020, Ann-Mei The

The aim of this dissertation was to provide empirical knowledge about the process of nursing care in aged long-term institutional care from the perspective of enhancing quality of care. Insight into who (types of nursing staff) is doing what (interventions) that may influence the quality of care (outcomes) is relevant for making decisions about the deployment of nursing staff according to their specific scope of practice. To be able to examine who is doing what, Chapter 2 described the development, validity, and inter-rater reliability of the Groningen Observational instrument for Long-Term Institutional Care. Following this, a multi-center cross-sectional study was conducted to examine the relationship between the amount of time spent on nursing interventions and the type of nursing staff (registered nurses [RN], nursing assistants [NA], primary caregivers [PCG], and health care assistants [HCA]); type of unit (residential, somatic, and psychogeriatric care units); and residents' acuity levels (Chapter 3). As an assessment of the process of nursing care is made by direct observation and/or by reviewing recorded information, the accuracy of nursing documentation in the residents' care plan was determined in a retrospective cross-sectional study (Chapter 4). Subsequently, since compliance with the documented care is important in meeting the care needs of residents and achieving desired outcomes, a cross-sectional study explored the consistency between planned and actually provided nursing care (Chapter 5). Finally, a systematic review was undertaken to determine outcomes that are specifically sensitive to nursing interventions in long-term institutional care (Chapter 6). This final chapter summarizes and discusses the main findings of these studies. Subsequently, methodological considerations are described and, finally, recommendations are made for practice an policy, education, and research.

SUMMARY OF MAIN FINDINGS

In order to identify and examine the amount of time spent on nursing interventions, the Groningen Observational instrument for Long-Term Institutional Care (GO-LTIC) was developed based on the Nursing Intervention Classification (NIC) (Chapter 2). Content validity procedures and a feasibility test resulted in a final GO-LTIC comprising 116 nursing interventions categorized into 6 domains. Inter-rater reliability for the identification of interventions was substantial to almost perfect for the domains basic and complex physiological care. Interventions in the behavioral, family, and health system domain ranged from fair to almost perfect. Interventions in the safety domain were often not identified. Inter-rater reliability for the amount of time spent on interventions ranged from fair to excellent for the physiological domains and poor to excellent for the other domains. The clinical magnitude of differences in minutes was small, and there were no significant differences between observers.

The GO-LTIC was then used in an observational study conducted in 13 units in 5 Dutch long-term care facilities. Data of observations with 136 nursing staff members on different shifts showed that nursing staff spent most of their time on basic physiological interventions such as self-care assistance of residents. Limited time was taken on interventions in the family (eg, home maintenance assistance), behavioral (eg, active listening), and safety (eg, dementia management) domains. The type of unit rather than residents' acuity levels or type of nursing staff was associated with time spent on interventions in domains. In addition, differences in time spent on interventions between the types of nursing staff were small.

The accuracy of nursing documentation in residents' care plans was largely structured according to the phases of the nursing process (Chapter 4). However, inaccuracies in the content and coherence were ascertained. Admission reports frequently omitted a description of residents' care needs from which the nursing diagnoses should logically follow, and an inventory of nursing diagnoses was lacking in almost half of the care plans. In addition, the purpose of planned nursing interventions was frequently ambiguous when they were not related to nursing diagnoses. Relevant information was missing in order to perform the interventions. Progress and outcome notes substantially lacked information about residents' health conditions in relation to diagnoses and performed interventions. In somatic and psycho-geriatric units, significantly higher accuracy scores regarding admission and diagnosis reports were determined compared to residential care units.

Subsequently, the study about the consistency between the documented nursing interventions in residents' care plans and those actually provided to them by the different types of nursing staff showed that this was especially high for basic and complex physiological care and, to a lesser extent, for interventions in the behavioral domain. Except for the safety domain, the probability that documented interventions were provided was high for all domains. Documented but not observed safety interventions mostly concerned surveillance. The nursing assistants generally provided the interventions as documented. Though not significant, also health care assistants provided documented complex care interventions.

Considering the mixed results of previous studies regarding the association between nursing staff and mandatory reported quality of care outcomes, it seemed relevant to determine which outcomes are actually sensitive to nursing interventions in long-term institutional care (Chapter 6). Quality of care outcomes were considered nursing-sensitive when they could be associated with an outcome as described in the Nursing Outcomes Classification (NOC). In total, 15 articles were included in the systematic review. Out of 33 quality of care outcomes, 21 were identified as nursing-sensitive of which 13 showed a significant association with nursing staff, specifically: Activities of daily living (ADL), aggressive behavior, bladder/bowel incontinence, contractures, expressive language skills, falls,

infection (incl. vaccination), range of motion, pain, pressure ulcers, and weight loss. However, the association between the different types of nursing staff and these nursing-sensitive outcomes could be positive (more staff leading to better outcomes), negative (more staff leading to worse outcomes), or no association for either type of nursing staff.

SYNTHESIS OF MAIN FINDINGS

Nursing care in long-term institutional care

Nursing staff are highly compliant to the care as agreed with residents (Chapter 5) with an emphasis on nursing interventions related to basic and complex physiological care (Chapters 3 and 5). Less attention seems to be paid to psychosocial, safety, and family interventions (Chapters 3 and 5). These findings suggest that, while the philosophy of (Dutch) long-term institutional care (LTIC) is on person centered care (PCC), the care provided is mainly physical task-oriented. This idea is reinforced as residents received care regardless of their acuity level (Chapter 3) and nursing documentation lacked a description of nursing diagnoses that are the bases of person-centered care (Chapter 4).

PCC is a holistic approach for which 'knowing the person' is important, and physiological as well as psychosocial and spiritual care needs must be met.[1,2] PCC is associated with better quality of care outcomes and quality of life of residents, varying from decreased pressure ulcers,[3] reduced neuropsychiatric symptoms in residents with dementia,[4] to residents that indicate being a part of a community.[5,6] Generally, in Dutch LTIC, residents and their families are satisfied with the provided care. However, there is scope for improvement regarding PCC.[7] Residents indicate that the care that is provided is predominantly rushed and lacks genuine personal attention and communication. They experience that there is not enough time to talk about matters that are important to them, and they regularly miss their involvement in the decision-making about their care preferences.[7] As a result, this may prevent the establishment of a relationship in which psychosocial and spiritual needs are shared. Donabedian[8] contends that the interpersonal relationship between nursing staff and residents is vital for exchanging information and arriving at the most appropriate diagnoses and interventions. The lack of communication could mean that nursing staff are not aware of these needs and may explain why nursing interventions related to the behavioral domain are less often documented in the residents' care plan (Chapter 5) and little time is spent on them (Chapter 3). In addition, nursing staff feel more competent in meeting residents' physical needs than in promoting psychosocial well□being[9,10] or coaching other staff and/or family.[10]

Considering the increase of residents with dementia in LTIC,[11,12] awareness of the importance of the interpersonal relationship will become all the more vital. In this

dissertation, approximately 50% of the residents were classified with acuity levels 4, 5, or 7 (Chapters 3 and 5) which indicates that care is required due to (incipient) dementia.[13] Although a dementia diagnosis is related to a diminishing ability in activities of daily living (ADL),[14] reasons for admission in LTIC are often multifactorial and related to behavioral and psychological symptoms of dementia[15] as well as to caregiver burden.[16] Therefore, the inclusion of psychosocial and family interventions in the resident care plan is important. Results show that, if behavioral interventions, including psychosocial nursing interventions, were documented, they were generally performed (consistency 65%) (Chapter 5). However, when nursing staff feel less competent in providing these interventions,[9,10] this may explain why only 15% of the documented interventions in residents' care plans concerned the behavioral domain.

As residents' health conditions increase the risk of becoming unstable,[13] ongoing monitoring and assessments are needed to prevent adverse events.[17] Subsequently, when the volume and complexity of residents' care needs increase, this may require changes in staffing on a unit. Once the resident care needs are accurately and timely documented in care plans, then the nursing documentation not only contributes to PCC and residents' safety but will also provide insight into whether the deployment of staff is still adequate. However, the findings of this dissertation show that there is room for improvement regarding the accuracy of documentation (Chapter 4) and the surveillance of residents (Chapter 5). Especially facility characteristics such as time and adequate nursing staff are perceived as important barriers in both accurate documentation[18,19] and providing PCC.[20,21,22] The results of this dissertation show that higher accuracy scores in documentation were demonstrated in somatic and psychogeriatric units (Chapter 4). Furthermore, significantly more time was spent on indirect care, including documentation, in these units (Chapter 3). These results suggest that more time may result in nursing documentation that is more accurate. As Hingstman et al.[23] found that more nursing staff is being deployed in these units, it may be worth investing in the number of nursing staff to improve the accuracy of nursing documentation and, hence, person-centered care.

Nursing staff in long-term institutional care

Adequate nursing staff regards the number and composition of nursing staff (skill mix) in LTIC. To fully take advantage of the knowledge and skills of different types of nursing staff in order to provide quality of care, their deployment should be in accordance with their education and scope of practice. However, hardly any evidence for task allocation between RNs, PCGs, and NAs was found in our study (Chapter 3). Furthermore, HCAs provided care beyond their scope of practice (Chapters 3 and 5). The results suggest indistinct role differentiation that may indicate that the types of nursing staff are deployed interchangeably in LTIC. This

occurs when differences in education and scopes of practice are not acknowledged and/or considered as equivalent.[24] In addition, care may be provided by nursing staff who have received a lower level of education in the absence of sufficiently qualified personnel.[25] As the number of RNs in Dutch LTIC are in short supply and they are often deployed over multiple units,[23,26] this may explain why mainly PCGs provided the majority of direct care as well as indirect care such as the coordination of care, nursing documentation, and shift report (Chapter 3). A number of studies reported that the roles of licensed practical nurses (LPNs),[25] who are somewhat comparable to Dutch CNAs (PCG and NA), and NAs[17,27] evolve beyond their scope of practice due to the absence of RNs spending time on the nursing units.[17,25] Both LPNs[25] and NAs,[17] report performing interventions for which they do not have enough skills which may lead to poorer quality of care. In addition to inaccurate nursing documentation, the most frequent factor that contributes to serious adverse events is nursing staff's lack of competence.[17]

In Dutch LTIC, nursing care is organized according to the phases of the nursing process as reflected in residents' care plans (Chapter 4). These phases provide a framework that support nurses when making decisions about resident care by clinical reasoning.[28] Clinical reasoning is defined as: "a complex cognitive process that uses formal and informal thinking strategies to gather and analyze patient information, evaluate the significance of this information and weigh alternative actions."[29] Core essences include cognition, metacognition, and incorporating knowledge that is unique to nursing within a specific practice setting.[29] Clinical reasoning is considered to be a competence that differentiates Dutch baccalaureate-educated RNs (BRN) from other nursing staff.[30] However, in Dutch LTIC, few BRNs are employed,[26] and none were employed in the included facilities in this dissertation. Though not legally registered as nurses, Dutch CNAs are allowed to establish care plans and provide care in low-complex care situations according to their professional profile.[30] However, the accountability for high-complex care situations, as currently in LTIC, is part of the (B)RNs role.[30] As studies in LTIC show differences regarding the clinical reasoning skills of LPNs[31] and CNAs[32] compared to RNs, this may lead to inaccuracies in residents' care plans such as found in this dissertation (Chapters 4 and 5). In addition, when RNs were deployed over multiple units, they spent less time with residents than CNAs in a unit and, because of that, are dependent upon information provided by CNAs and/or through documentation. This may hinder them "getting to know the resident", a prerequisite for clinical reasoning.[32,33] Studies show that RNs rarely use clinical reasoning skills to establish nursing diagnoses[33,34] and predominantly rely on actions taken on a regular basis or as a rule.[33] As theoretical knowledge and knowing the resident contribute to clinical reasoning,[33] this is what improvements should focus on.

Nursing outcomes in long-term institutional care

As the care that is provided directly influences quality of care outcomes,[8,35] the focus in LTIC should be on quality outcomes that are sensitive to nursing interventions. Since nursing staff provide 24-hour care, their interventions will have the greatest potential on maintaining and enhancing residents' well-being. The findings of the systematic review (Chapter 6) show that 64% of the quality of care outcomes that were included in the studies concerned nursing sensitive outcomes. These outcomes comprised primarily clinical outcomes (eg, prevalence of pressure ulcers). Psychosocial nursing sensitive outcomes such as the occurrence or severity of residents' 'agitation' or their 'social interaction skills' were inadequately investigated.

In general, research into the relationship between nurse staffing and quality of care in LTIC relies on secondary outcome data derived from mandatory standardized surveys (eg, Minimum Data Sets[MDS]).[36,37] The relevance of these quality outcomes for practice in LTIC is subject of discussion. According to the opinion of professionals working in LTIC, only 26% of the MDS (version 2.0) quality indicators are relevant for nursing care in LTIC.[38] Moreover, which quality of care outcomes are relevant to residents and their families and how these are influenced by nursing staff is still ambiguous.[39] More research into nursing sensitive outcomes that encompass the entire scope of person-centered care could contribute to a core set of quality of care outcomes for LTIC.

As Dutch legislation mandates that data on quality of care must be collected and registered in a systematic manner for purposes such as quality assessment or benchmarking,[2,40] a uniform language in which information has the same meaning and significance for all health professionals involved, such as the Nursing Outcome Classification, would enhance comparison of data (eg, administrative, financial).[41] However, the use of (existing) nursing classifications in Dutch LTIC is still minimal.[42]

METHODOLOGICAL CONSIDERATIONS

In this paragraph, methodological considerations are described regarding the study design and data collection methods.

Study design

This dissertation mainly conducted cross-sectional designs. As there was little knowledge regarding the process of nursing care in LTIC and how this might affect quality of care, this design was considered relevant. Considering the large database of primary observational data, beneficial insight was gained into what is actually done in the process of care that, for example, may guide decisions in staff deployment. However, the causal interpretation of cross-sectional data is limited.

Observational studies are known to be susceptible to unmeasured confounding.[43] Donabedian[8,35] contends that, within the process of care, the knowledge and skills of nursing staff in using appropriate care strategies are important for achieving quality of care outcomes. Apart from a differentiation in the type of nursing staff, possible confounding factors contributing to their knowledge and skills such as working experience or further training, were not included in this dissertation.

Data collection methods

Two cross-sectional studies (Chapter 3 and 5) and the systematic review (Chapter 6) were conducted using 'manual mapping' during data collection. Manual mapping concerned the linkage of a source term (nurses' activities, quality of care outcome) to the most accurate target term (nursing intervention, nursing-sensitive outcome). A limitation of this method is the risk of misassignment of colloquial terms into a standardized terminology thereby decreasing the validity of the results.[44] This weakness was minimized by selecting data collectors that were familiar with the nursing classification systems NIC and NOC, providing a training in the mapping procedure, and consulting experts when uncertain about the most accurate target term to choose.

Continuous observations (Chapter 3 and 5) through a time-and-motion technique (Chapter 3) generate a high level of precision in empirical data.[45] This is important, for example, when management uses these data to decide on the numbers of nursing staff. However, the method is labor-intensive and costly which may result in few personnel being observed out of a large population.[45] In this dissertation, data were gathered with personnel in multiple facilities in, on average, 11 days per facility, and all types of units and shifts were included. The purposive samples of nursing staff ensured that all types of nursing staff were represented. Their recruitment was performed in cooperation with facility managers and, therefore, the samples were as large as they allowed, taking into account the privacy of residents.

The awareness of being observed may have disrupted nursing staff's normal routines which may have resulted in a Hawthorne effect.[46] To minimize it, studies that include professional performance should include large numbers of staff,[47] and data collectors should be as unobtrusive as possible and minimize their interpersonal contact.[48] The author believes this effect was reduced as observers were instructed to communicate to a limited extent with the nursing staff and a large number of nursing staff (136 and 143) have been observed.

FUTURE DIRECTIONS

Based on the findings of this dissertation, implications for practice and policy, education, and research are described.

Practice and policy

Currently, residents are classified in care profiles according to their care needs,[13] referred to in this dissertation as the acuity levels of the Dutch Care Severity Index. The findings showed that unit type rather than acuity level affected the amount of time spent on nursing interventions. Since residents with identical acuity levels were predominantly clustered into the same unit type, this suggests that these residents had similar care needs resulting in receiving the same type of nursing care. However, their specific care needs may differ in volume and complexity. Furthermore, residents' care needs may change within a short period of time due to their frail health status, requiring different nursing interventions and competencies. This stresses the importance of accurate and timely care plans. Based on their professional profiles,[30] nursing staff are responsible for accurate care plans in order to ensure that the actual care needs of residents are met. Since (Dutch) professional standards regarding nursing documentation already exist, they must be implemented, and there must be adherence to them. Regular assessments of care plans based on these standards will contribute to the quality of nursing documentation. Baccalaureate-educated RNs can play a vital role in this as they are accountable for high-complex care situations, and decisions regarding resident care are made by clinical reasoning, a competence that differentiates (Dutch) BRNs from other nursing staff.[30] In addition, nursing home management is accountable for the necessary preconditions that contribute to the quality of documentation such as time, adequate deployment of nursing staff, and continuing training to ensure that nursing staff competently perform their care planning job responsibilities.

This dissertation shows that nursing staff were inadequately deployed considering that hardly any task allocation was ascertained, especially between RNs and CNAs (PCGs and NAs). As a result, some nursing staff may work beyond their scope of practice and perform interventions for which they do not feel competent. This may lead to missed or inadequate prioritization of nursing care, feelings of being overworked, and subsequent risk of adverse events. As nursing interventions performed by RNs did not differ from those of other nursing staff, this suggests their competencies were not fully utilized. Job descriptions that clearly distinguish between the types of nursing staff based on their educational level and scope of practice will contribute to adequate deployment. For example, BRNs' unique contribution concerns the quality of care.[30] Distinguishing competencies that they need in LTIC comprise geriatric expertise and resident assessment, leadership and

coaching, communication, and evidence-based practice.[49] LTIC management should clearly describe these competencies in job descriptions when recruiting BRNs. In addition, by indicating what type of support can be expected from LTIC management, for example, supervision and additional training, can contribute to attracting and retaining BRNs.

Along with the lack of attention to residents' acuity levels and inaccuracies in their care plans, the strong emphasis on physical care suggests that the provided nursing care is task-oriented rather than person-centered. This may be due to time constraints as this is an important factor in prioritizing care in favor of physical care.[50,51] Despite Dutch governmental efforts, LTICs' residents[7] as well as nursing staff[52,53] experience an insufficient amount of time to meet residents' care needs. Direct methods for estimating staffing needs related to the actual amount of time to provide resident care could help in gaining insight into the necessary number of nursing staff that are needed to provide for these care needs.

Education

The inaccuracies in the nursing documentation and the nursing staff's lack of attention to nursing interventions other than physical care as outlined in this dissertation could indicate that nursing staff do not have the necessary knowledge and skills to competently provide for residents' person-centered care in LTIC. As good structure establishes the conditions for good processes and outcomes,[8] a vision of LTIC management in ongoing education of nursing staff is essential. This should take into account the specific scope of practice of nursing staff and their backgrounds (eg, level of education, work experience). For example, as the initial education of nursing (associate) professionals and health care assistants educate students as beginning professionals, newly graduated nursing staff are prepared with generic competencies that are required for a wide range of health care settings (eg, hospital, mental health). These may not be sufficient for the complex care in LTIC. Furthermore, Benner[54,55] contends that every nurse entering a setting where she/he has no work experience may be limited to the beginning professional (novice) level of performance. Besides orientation programs that are mostly routinely offered by LTIC, newly employed nursing staff will benefit from additional educational strategies such as intervision and supervision trajectories as well as on-the-job training.[56-58] To foster the expertise of experienced nurses, it is best to use strategies such as simulations, decision-making games, or case studies from their own practice.[54,55] Considering the high turnover in LTIC,[57,59] providing for a supportive learning culture not only contributes to the quality of care but also to the satisfaction and retainment of nursing staff.[56]

As the Dutch Government encourages a regional approach to improve the quality of care in nursing homes, infrastructures such as learning communities that support education and leadership development can be organized in collaboration with[59] institutional care and/

or regional education centers (secondary vocational education for RN, CNA, and HCA) and universities of applied sciences (BRN). Evidence-based training programs can be developed and organized regarding topics and competencies relevant to LTIC, such as geriatric expertise,[49] leadership and coaching, communication, and evidence-based practice.[49,60] Based on the findings of this dissertation, important training topics comprise person-centered care and, specifically, the identification, documentation, and implementation of behavioral and psychosocial interventions. Furthermore, as inadequacies were found in the coherence of nursing documentation and, in particular, the description of nursing diagnoses, training in clinical reasoning skills is important.

Research

This dissertation has shown that nursing staff in LTIC emphasize the implementation of nursing interventions regarding physical care. What is unknown is why behavioral and family interventions were only minimally documented and performed. Considering the increase in the numbers of residents with dementia, more research should be conducted into nursing staffs' competences and self-efficacy in performing these interventions while taking into account mediating and moderating variables such as leadership, support, and work experience. The outcomes can provide input for interventions such as training programs that are to be developed and organized in co-creation with LTIC facilities, universities of applied sciences, and regional education centers (learning communities). In addition, outcomes contribute to the scientific substantiation of nursing practice.

Quasi-experimental designs can be applied to measure the effects of educational interventions but also to measure the effects of interventions regarding nurse staffing. As the bachelor-educated registered nurse is still a new phenomenon in Dutch LTIC, it is important to investigate how they contribute directly and/or indirectly to quality of care. When BRNs are to be recruited and job descriptions are clearly specified for the different types of nursing staff, a pre- and post-test (before and after recruiting the BRN) may help to gain insight into who is doing what (process) and the effects on quality of care outcomes that are sensitive to nursing interventions (outcome) taking into account mediating work environmental (structure) characteristics. In addition, the nursing sensitive outcomes that are included should comprise quality of care (specific outcomes) and quality of life (generic outcomes) relevant for LTIC.

Since the interpersonal relationship between nursing staff and residents (and their families) is vital in providing nursing care, research regarding the interaction between nursing staff and residents will provide insight into how this relationship is built. It is relevant to know which applied communication skills of nursing staff and residents are beneficial for the

quality of nursing care. Moreover, it is pertinent to understand how residents are involved in decision-making about their care preferences and how they are encouraged to formulate these on a daily basis. The research should first focus on certified nursing assistants because they are in the majority in LTIC and spend the most time with residents.

CONCLUSION

From the perspective of enhancing quality of care in long-term institutional care for the older population, this dissertation has shown there is room for improvement regarding the process of nursing care. While the philosophy of (Dutch) long-term institutional care is on person-centered care, it was found that the care provided is mainly physical task-oriented. More attention should be paid to psychosocial and family interventions, especially because an increasing number of older people with dementia will be admitted to long-term institutional care. Though, nursing care is largely performed in accordance with the nursing documentation in resident care plans, the documentation itself shows inaccuracies that hinder person-centered care and may jeopardize the safety and well-being of residents. Limited evidence was found for task allocation among registered nurses, certified nursing assistants, and health care assistants which suggests indistinct role differentiation. The increase in complex care needs of residents in long-term institutional care warrant the employment, deployment, and training of competent nursing staff in order to ensure quality of care outcomes. These outcomes should be sensitive to nursing interventions as these will have a great potential to improve residents' well-being.

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CHAPTER 8

SUMMARY

In the past decades, the amount and the complexity of care in long-term institutional care for the older population have increased. At the same time, its quality is a cause for concern. Inadequacies are often associated with the number and the composition of nursing staff (skill mix). While there is tentative evidence that the total number of nursing staff in long-term institutional care is associated with better outcomes, inconsistent results are found concerning the relationship between the type of nursing staff (eg, registered nurses, nursing assistants) and quality of care outcomes (eg, pressure ulcers, pain). An explanation may be that most studies relied on secondary survey data (eg, mandatory inspection surveys). Furthermore, resident acuity factors that are an important determinant of care outcomes are predominantly not included in analyses. In addition, selected quality of care outcomes might have been, to a greater or lesser extent, sensitive to interventions performed by nursing staff.

As quality of care outcomes are highly affected by nursing care, it is important to reveal what is being done during the process of caregiving. Knowledge regarding what type, how much, and by whom nursing interventions are performed will contribute to the discussion about the relationship between nursing staff and quality of care. However, little is known about this. The overall aim of this dissertation was to provide insight into the process of nursing care using Donabedian's framework of quality of care in which 'process' refers to what is actually done in providing and receiving care. An assessment of the process is made either by direct observation and/or by reviewing recorded information. As Donabedian states that outcomes are the effects of the provided care, it should be able to be stated that the care that was provided was responsible for the outcome that was observed.

Chapter 1 introduces the key concepts of this dissertation, i.e., long-term institutional care, nursing staff, and quality of care and presents the aim and outline of the dissertation.

In order to determine what is actually done by nursing staff, **Chapter 2** described the development, validity, and inter-rater reliability of an observational instrument for identifying and examining the amount of time spent on nursing interventions in long-term institutional care. The Groningen Observational instrument for Long-Term Institutional Care (GO-LTIC) is based on the Nursing Interventions Classification (NIC). The first developmental stage in which items were generated resulted in a list of 281 potential setting-specific NIC interventions. In 2 rounds, these were presented to a Delphi panel which resulted in an initial GO-LTIC of 113 relevant nursing interventions. After a feasibility test, 3 frequently occurring interventions in practice were added. The final GO-LTIC comprised 116 nursing interventions categorized into the NIC domains; basic and complex physiological care, behavioral, safety, family, and health system. Inter-rater reliability for the identification of interventions showed substantial to almost perfect Cohen's kappa for interventions in the domains of basic and

complex physiological care. The kappa's for interventions in the behavioral, family, and health system domain ranged from fair to almost perfect. Interventions in the safety domain were often not identified. Intraclass correlation coefficients for the amount of time spent on interventions ranged from fair to excellent for the physiological domains and poor to excellent for the other domains. The clinical magnitude of differences in minutes, visualized by Bland Altman plots, was small, and no statistical significant differences between observers were found. Overall, the GO-LTIC demonstrated good content validity and acceptable inter-rater reliability.

Chapter 3 described a cross-sectional observational study that aimed to examine the relationship between the time spent on nursing interventions and the type of nursing staff, type of unit, and residents' acuity levels. Five Dutch long-term institutional care facilities participated. In total, 4 residential care units, 3 somatic units, and 6 psycho-geriatric units were included. Observations were performed by means of time-and-motion technique using the GO-LTIC. Residents' acuity levels representing residents' needs were based on the Dutch Care Severity Index. Observations were conducted with 136 nursing staff members comprised of 19 registered nurses, 89 nursing assistants, 9 primary caregivers, and 19 health care assistants. A total of 877 hours was observed for 102 nursing interventions categorized into 6 NIC domains for 335 residents. The results demonstrated that nursing staff spent most of their time on basic physiological interventions such as the self-care assistance of residents. Limited time was used for interventions in the family (eg, home maintenance assistance), behavioral (eg, active listening), and safety (eg, dementia management) domains. Differences in the amount of time spent on interventions between the types of nursing staff were minimal. Linear mixed models demonstrated that the type of unit rather than residents' acuity levels or the type of nursing staff was associated with the amount of time spent on interventions in domains. This study found limited evidence for task allocation among registered nurses, primary caregivers, and nursing assistants. Additionally, findings suggest that residents received similar care regardless of their needs.

Fundamental for providing quality of care is a process oriented, accurate, and complete record that reflects the planned care as agreed upon with residents. The aim of the retrospective cross-sectional study described in **Chapter 4** was to examine the accuracy of nursing documentation in long-term institutional care. For 197 residents' care plans, the content and coherence of nursing documentation was assessed using the D-Catch. This measurement instrument is based on the interrelated phases of the nursing process and quantifies the accuracy of: 1) record structure; 2) admission data; 3) nursing diagnosis; 4) nursing interventions; 5) progress and outcome evaluations; and 6) legibility of nursing reports. Results showed that care plans were largely structured according to the phases of the nursing process. Inaccuracies were especially determined in the description of residents'

care needs and stated nursing diagnoses as well as in progress and outcome reports. Admission reports frequently omitted a description of residents' care needs from which the nursing diagnoses should logically follow, and an inventory of nursing diagnoses was lacking in almost half of the care plans. In addition, the purpose of planned nursing interventions was frequently ambiguous, and progress and outcome notes largely lacked information about residents' health condition in relation to diagnoses and performed interventions. In somatic and psycho-geriatric units, significantly higher accuracy scores regarding some phases of nursing documentation were determined compared to residential care units. The inaccuracies in its content and coherence may complicate the continuity of care, adversely affect nursing outcomes and, consequently, jeopardize residents' safety and well-being.

To examine the consistency between the planned care as documented in residents' care plans and what was actually provided to them by which type of nursing staff, a cross-sectional study was executed (**Chapter 5)**. Using the GO-LTIC, a review of nursing documentation was conducted concurrently with structured continuous observations. Four long-term care facilities participated. Data of 150 residents in 3 residential, 1 somatic, and 11 psycho-geriatric care units were collected. Observations of 143 nursing staff members of which 21 registered nurses, 73 nursing assistants, 17 primary caregivers, and 32 health care assistants were examined. The results showed that the consistency between documented and provided nursing interventions was especially high for the NIC domains of basic and complex physiological care and, to a lesser extent, for interventions in the behavioral domain. Documented but not observed safety interventions primarily concerned surveillance. Except for the safety domain, the probability that documented interventions were provided was high for all domains. Nursing assistants generally provided the interventions as documented. Though not significant, health care assistants also provided documented complex care interventions to residents which is beyond their scope of practice.

To determine if selected quality of care outcomes in long-term institutional care are actually responsive to nursing interventions, a systematic review was conducted (**Chapter 6**). The aim was to examine the association between the types of nursing staff and nursing-sensitive outcomes. Quality of care outcomes were considered nursing-sensitive when they could be associated with a nursing-sensitive outcome as described in the Nursing Outcomes Classification (NOC). In total, 15 articles were included. Of 33 quality of care outcomes, 21 were identified as nursing-sensitive of which 13 showed a significant association with nursing staff, specifically: Activities of daily living, aggressive behavior, bladder/bowel incontinence, contractures, expressive language skills, falls, infection (incl. vaccination), range of motion, pain, pressure ulcers, and weight loss. However, the results showed that, regarding the same outcome, the association between registered nurses, licensed practical nurses, certified nursing assistants, health care assistants, and these nursing-sensitive outcomes could

be positive (more staff leading to better outcomes), negative (more staff leading to worse outcomes), or have no association for either type of nursing staff. The inconclusive results make it difficult to provide recommendations on who should best perform which type of care.

In **Chapter 7**, the main findings of the studies in this dissertation were summarized and discussed regarding nursing care, nursing staff, and nursing outcomes in long-term institutional care. In addition, the methodological considerations related to the cross-sectional study designs and data collection methods were described. A recurring issue in the discussion concerned the person-centered care in long-term institutional care and the improvements that must be taken in this regard. The studies' results show that there is an emphasis on performing nursing interventions that concern the physical care needs of residents. Little attention is paid, for example, to the psychosocial needs of residents. In addition, hardly any role differentiation between nursing staff was found. If registered nurses, certified nursing assistants, and health care aids were deployed taking into account their scope of practice and specific knowledge and skills, this would improve the quality of care. Subsequently, if quality of care measurements were to include quality of care outcomes that are both relevant for long-term institutional care and are sensitive to nursing interventions, more insight would be obtained into the relationship between nursing staff and quality of care. Finally, this chapter presented the implications for practice and policy, education, and research. For example, besides clear job descriptions, management in long-term institutional care should provide for a vision in ongoing education of nursing staff. This may encompass establishing learning communities with regional schools of nursing. Furthermore, while bachelor registered nurses may contribute to the quality of care, few are yet employed in Dutch long-term institutional care. Quasi-experimental designs can help to gain insight into how they directly and/or indirectly contribute to quality of care outcomes.

SAMENVATTING

In de afgelopen decennia is de complexiteit van de langdurige intramurale ouderenzorg, waaronder verpleeghuizen, zorgcentra en verzorgingshuizen, toegenomen. Tegelijkertijd zijn er zorgen over de kwaliteit van de zorg. Tekortkomingen daarin worden in verband gebracht met zowel het aantal personeelsleden als de personeelssamenstelling. Hoewel de inzet van meer personeel in de intramurale ouderenzorg lijkt te leiden tot betere kwaliteit van zorg is nog onduidelijk welke beroepsgroep daar specifiek aan bijdraagt. Studies naar de relatie tussen de verschillende beroepsgroepen (verpleegkundigen, verzorgenden en helpenden) en kwaliteit van zorg indicatoren (bijv. decubitus, pijn) laten inconsistente resultaten zien. Een verklaring hiervoor kan zijn dat de meeste van deze studies gebaseerd zijn op secundaire bronnen, zoals jaarlijkse kwaliteitsmetingen. Deze metingen nemen niet mee welke interventies door het zorgpersoneel zijn uitgevoerd. Terwijl wat wordt gedaan, door wie en in hoeveel tijd, bijdraagt aan beter dan wel slechtere zorgresultaten. Ook de zorgzwaarte van bewoners, een belangrijke determinant van zorgresultaten, wordt vaak niet meegenomen. Daarnaast kan het zo zijn dat geselecteerde kwaliteitsindicatoren in meer of mindere mate te beïnvloeden zijn door interventies van het zorgpersoneel.

Omdat kwaliteit van zorg in hoge mate wordt beïnvloed door de zorg die door het zorgpersoneel wordt verleend, is het van belang om kennis te verkrijgen over welke interventies door wie worden uitgevoerd, en hoeveel tijd hiermee is gemoeid. Het overkoepelende doel van dit proefschrift was dan ook om inzicht te krijgen in wat zorgpersoneel doet binnen het zorgverleningsproces. Daarbij is gebruikt gemaakt van het raamwerk voor kwaliteit van zorg van Donabedian. In dit raamwerk verwijst 'proces' naar wat feitelijk wordt gedaan bij het verlenen en ontvangen van zorg. Informatie hierover wordt verkregen door directe observaties en/of uit verpleegkundige dossiers. Donabedian geeft aan dat zorgresultaten de effecten zijn van geleverde zorg, en men zou dus moeten kunnen stellen dat de zorgresultaten ook daadwerkelijk te beïnvloeden waren door de interventies uitgevoerd door het zorgpersoneel. Op basis van dit raamwerk zijn in totaal vijf onderzoeken uitgevoerd waarvan een weergave is gegeven in deze samenvatting. De uitkomsten van dit proefschrift dragen bij aan de discussie over de relatie tussen de personele bezetting en kwaliteit van zorg in de langdurige intramurale ouderenzorg.

Hoofdstuk 1 introduceert de belangrijkste concepten van dit proefschrift, te weten: 'langdurige intramurale ouderenzorg', 'zorgpersoneel' en 'kwaliteit van zorg'. Daarnaast worden de specifieke doelstellingen gepresenteerd en wordt een overzicht van het proefschrift gegeven.

Om inzicht te krijgen welke zorg door wie wordt verleend in de langdurige intramurale ouderenzorg en hoeveel tijd hiermee is gemoeid, is de Groningen Observational instrument for Long-Term Institutional Care (GO-LTIC) ontwikkeld. Deze is gebaseerd op de Nursing

Intervention Classification (NIC). **Hoofdstuk 2** beschrijft de ontwikkeling van de GO-LTIC, de inhoudsvaliditeit en de interbeoordelaarsbetrouwbaarheid. In de eerste fase van de ontwikkeling zijn items gegenereerd wat resulteerde in 281 mogelijke setting-specifieke NIC-interventies. Deze zijn vervolgens in 2 rondes voorgelegd aan een Delphi-panel, wat leidde tot een eerste versie van de GO-LTIC met daarin 113 verpleegkundige interventies. Na een haalbaarheidstest zijn nog 3 veelvoorkomende interventies uit de praktijk toegevoegd. De uiteindelijke GO-LTIC bevatte 116 verpleegkundige interventies, gecategoriseerd in de 6 NIC-domeinen; basis- en complexe fysiologische zorg, gedrag, veiligheid, gezin en familie, en gezondheidszorgstelsel. De interbeoordelaarsbetrouwbaarheid voor de identificatie van interventies liet Cohen's kappa's zien van 'voldoende tot goed' en 'bijna perfect'. De kappa's voor interventies in de domeinen gedrag, gezin en familie, en gezondheidszorgstelsel varieerden van 'redelijk' tot 'bijna perfect'. Interventies in het domein veiligheid werden vaak niet geïdentificeerd. De intraclass correlatie coëfficiënten voor de hoeveelheid tijd die aan de interventies werd besteed, varieerden van 'redelijk' tot 'uitstekend' voor de domeinen basis- en complexe zorg en 'slecht' tot 'uitstekend' voor de overige domeinen. De klinische verschillen in minuten, gevisualiseerd door Bland Altman-plots, waren klein en er werden geen statistisch significante verschillen gevonden tussen de observatoren. Daarmee liet de GO-LTIC een goede inhoudsvaliditeit en acceptabele interbeoordelaarsbetrouwbaarheid zien.

In **hoofdstuk 3** is vervolgens een cross-sectioneel observationeel onderzoek beschreven met als doel om met behulp van de GO-LTIC de relatie inzichtelijk te maken tussen de tijd besteed aan verpleegkundig interventies, het type zorgpersoneel (verpleegkundigen, verzorgenden en helpenden), de zorgzwaarte van bewoners en het soort afdeling. Vijf instellingen voor langdurige intramurale ouderenzorg in Nederland hebben hieraan deelgenomen. In totaal zijn 4 verzorgingshuis afdelingen, 3 somatische- en 6 psychogeriatrische afdelingen geïncludeerd. Als zorgzwaarte is het toegekende zorgzwaartepakket van de bewoner aangehouden. Door middel van gestructureerde continue observaties bij 136 personeelsleden waaronder 19 verpleegkundigen, 89 verzorgenden, 9 eerstverantwoordelijk verzorgenden en 19 helpenden zijn de gegevens verzameld. Dit heeft geresulteerd in een totaal van 877 uur aan observaties bij 335 bewoners. Honderdtwee verpleegkundige interventies zijn geïdentificeerd, gecategoriseerd in de 6 NIC-domeinen. Uit de resultaten kwam naar voren dat het zorgpersoneel de meeste tijd besteedt aan basis fysiologische zorg, zoals het ondersteunen van de bewoner bij de persoonlijke verzorging. De tijd die werd besteed aan interventies uit de domeinen gezin en familie (bijv. ondersteuning bij huishoudelijke taken), gedrag (bijv. actief luisteren) en veiligheid (bijv. zorg bij dementie) was gering. Het verschil tussen de typen zorgpersoneel en de tijd die werd besteed aan de interventies was klein. Lineair mixed models lieten zien dat de tijd die werd besteed aan

verpleegkundige interventies niet afhing van de zorgzwaarte van de bewoner of het type zorgpersoneel, maar van het soort afdeling. Deze resultaten suggereren dat er een beperkte roldifferentiatie is tussen het zorgpersoneel, en dat bewoners vergelijkbare zorg hebben gekregen ongeacht hun zorgzwaartepakket.

Van fundamenteel belang voor kwaliteit van zorg is een proces georiënteerd, nauwkeurig en volledig dossier dat een weerspiegeling is van de geplande zorg zoals overeengekomen met de bewoner. Het doel van de cross-sectionele studie beschreven in **hoofdstuk 4** was om de nauwkeurigheid van de verpleegkundige en verzorgende verslaglegging in zorgleefplannen van bewoners te onderzoeken, met behulp van de D-Catch. Dit meetinstrument is gebaseerd op de fasen van het verpleegkundig proces en kwantificeert de nauwkeurigheid van de inhoud en de onderlinge samenhang van: 1) de structuur van het zorgleefplan; 2) de opnamegegevens; 3) de verpleegkundige diagnoses; 4) de verpleegkundige interventies; 5) de voortgangs- en zorgresultaat rapportages; en 6) de leesbaarheid van de verpleegkundige verslaglegging. Uit de beoordeling van 197 zorgleefplannen kwam naar voren dat deze grotendeels zijn gestructureerd volgens de fasen van het verpleegkundig proces. In de opnamegegevens ontbrak geregeld een beschrijving van de zorgbehoeften van een bewoner. Uit de inventarisatie van de zorgbehoeften zouden logischerwijze de verpleegkundige diagnoses moeten volgen maar deze ontbraken in bijna de helft van de zorgleefplannen. Het doel van de geplande verpleegkundige interventies was geregeld onduidelijk. Daarnaast ontbrak in de voortgangs- en zorgresultaat rapportages vaak informatie over de gezondheidstoestand van bewoners in relatie tot verpleegkundige diagnoses en uitgevoerde interventies. De nauwkeurigheid van de verslaglegging was op somatische en psychogeriatrische afdelingen significant hoger vergeleken met verzorgingshuis afdelingen. De onnauwkeurigheden in de verpleegkundige en verzorgende verslaglegging kunnen de continuïteit van de zorg bemoeilijken en de verpleegkundige zorgresultaten negatief beïnvloeden, waardoor de veiligheid en het welzijn van bewoners mogelijk in gevaar worden gebracht.

Hoofdstuk 5 beschrijft een cross-sectionele studie naar de samenhang tussen de geplande zorg zoals vastgelegd in zorgleefplannen, en de daadwerkelijk uitgevoerde zorg bij bewoners door verpleegkundigen, verzorgenden en helpenden. Gelijktijdig met een review van de verpleegkundige en verzorgende verslaglegging in zorgleefplannen hebben gestructureerde continue observaties plaatsgevonden met behulp van de GO-LTIC. Vier instellingen voor langdurige intramurale zorg participeerden in dit onderzoek. Bij 150 bewoners, wonende op 1 somatische afdeling, 3 verzorgingshuis- en 11 psychogeriatrische afdelingen zijn de gegevens verzameld. In totaal zijn 143 personeelsleden geobserveerd waaronder 21 verpleegkundigen, 73 verzorgenden, 17 eerstverantwoordelijke verzorgenden en 32 helpenden. Uit de resultaten kwam naar voren dat de samenhang tussen de

vastgelegde verpleegkundige interventies in het zorgleefplan en daadwerkelijk uitgevoerde interventies bij bewoners vooral hoog was waar het de NIC domeinen basis- en complex fysiologische zorg betrof, en, in iets mindere mate, voor interventies binnen het domein gedrag. Interventies betreffende de veiligheid welke wel waren vastgelegd maar niet geobserveerd betroffen meestal het toezicht van bewoners, bijvoorbeeld op afstand via een elektronisch systeem. Behalve voor interventies in het veiligheidsdomein, was de kans dat gedocumenteerde interventies daadwerkelijk werden uitgevoerd voor alle domeinen hoog (≥ 91%). Met name verzorgenden voerden de gedocumenteerde interventies uit. Alhoewel niet significant, voerden ook helpenden gedocumenteerde complexe zorginterventies uit bij bewoners.

Om te bepalen of de kwaliteit van zorg indicatoren zoals in de langdurige intramurale ouderenzorg worden gehanteerd te beïnvloeden zijn door verpleegkundige interventies, is een systematische review uitgevoerd (**Hoofdstuk 6**). Het doel was om de samenhang tussen het type zorgpersoneel en verpleegkundige zorgresultaten te onderzoeken. Een kwaliteit van zorg indicator werd geïncludeerd wanneer deze kon worden gelinkt aan een verpleegkundig zorgresultaat zoals beschreven in de Nursing Outcomes Classification (NOC). In totaal zijn 15 wetenschappelijke publicaties geïncludeerd. Van de 33 uitkomsten van kwaliteit van zorg die in deze artikelen waren geselecteerd, zijn er 21 geïdentificeerd als verpleegkundige zorgresultaten, waarvan 13 een significant verband lieten zien met zorgpersoneel, te weten: algemeen dagelijkse levensverrichtingen, agressief gedrag, urine/feces incontinentie, contracturen, communicatie: expressief, valincidenten, infecties (incl. vaccinatie), mobiliteit, pijn, decubitus en gewichtsverlies. Uit de resultaten kwam naar voren dat, ten aanzien van eenzelfde verpleegkundig zorgresultaat, de samenhang met verpleegkundigen (niveau 4 en 6), verzorgenden en/of helpenden zowel positief (meer personeel leidt tot betere resultaten), als negatief (meer personeel leidt tot slechtere resultaten) kon zijn of er bleek geen verband te zijn. Dit maakt het moeilijk om aanbevelingen te doen over wie welke zorg het beste kan uitvoeren.

In **Hoofdstuk 7** zijn de belangrijkste bevindingen van dit proefschrift samengevat en besproken met betrekking tot de uitgevoerde zorg, het zorgpersoneel en de verpleegkundige zorgresultaten. Daarnaast zijn de methodologische overwegingen beschreven in relatie tot de cross-sectionele studie-designs en de dataverzamelingsmethoden. Een terugkerend punt in de discussie betrof de persoonsgerichte zorg in de langdurige intramurale ouderenzorg en de verbeteringen die hierin moeten worden doorgevoerd. De onderzoeksresultaten laten zien dat veel van de uitvoerde verpleegkundige interventies de fysieke zorgbehoeften van bewoners betreffen. Weinig aandacht is er bijvoorbeeld voor de psychosociale behoeften van bewoners. Daarnaast is er nauwelijks sprake van een functiedifferentiatie tussen het zorgpersoneel. Wanneer verpleegkundigen, verzorgenden en helpenden zouden worden

ingezet op basis van hun functieprofiel en specifieke kennis en kunde zou dit de kwaliteit van zorg verbeteren. Wanneer kwaliteitsmetingen vervolgens kwaliteit van zorg indicatoren zouden omvatten die èn relevant zijn voor de langdurige intramurale ouderenzorg èn te beïnvloeden door verpleegkundige interventies, zou meer inzicht worden verkregen in de relatie tussen zorgpersoneel en kwaliteit van zorg. Ten slotte wordt in dit hoofdstuk de betekenis van de studie resultaten beschreven voor praktijk en beleid, onderwijs en onderzoek. Zo zou het management in de langdurige intramurale ouderenzorg naast duidelijke functiebeschrijvingen een visie moeten hebben op continue deskundigheidsbevordering van het zorgpersoneel. Samenwerking met onderwijsinstellingen die opleiden tot de beroepen van verpleegkundige, verzorgende en helpende zou hiertoe kunnen bijdragen. Bijvoorbeeld in de vorm van leergemeenschappen. Ten tijde van dit promotieonderzoek en in het algemeen geldt dat relatief weinig bachelor opgeleide verpleegkundigen werken in de intramurale ouderenzorg. Met quasi-experimentele designs kan inzicht worden gekregen in hoe zij direct en/of indirect bijdragen aan de verpleegkundige zorgresultaten.

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ABOUT THE AUTHOR

Astrid Tuinman was born on April 21, 1962, in Den Haag, the Netherlands. After graduating from high school (Sint-Maartenscollege, HAVO), she began her professional education in nursing at the Wilhelmina Hospital in Assen where she earned her vocational nursing degree in 1985. For a number of years, she was employed as a registered nurse in (inter)national hospitals. While working, she embarked on furthering her education in Public Health Nursing (Rijkshogeschool, Groningen) and received her bachelor nurse degree in 1989.

In 1990, Astrid continued her career as a district nurse and worked in several home healthcare organizations. After completing a training program in oncology in 1994, she began to develop and provide training to improve the quality of oncology nursing care. From 1998 to 2003, as a staff nurse in a large home healthcare organization (Thuiszorg Groningen), she was responsible for the professional development of (B)RNs and nursing assistants through training and supervision regarding oncological and palliative care, clinical reasoning, and quality of care and advised on policies in this area. In addition, she participated in various networks of the Netherlands Comprehensive Cancer Organisation (IKNL).

In 2001, Astrid earned her degree as a second-grade nursing teacher (Noordelijke Hogeschool, Leeuwarden). In 2003, she decided to focus entirely on nursing education and, untill 2019, worked as a lecturer at the School of Nursing of the Hanze University of Applied Sciences. During that time, Astrid studied 'Nursing Science' at the University of Utrecht. Her master thesis was about the self-efficacy of nurses and nursing assistants in promoting the self-management of patients with COPD. Specifically, she developed a training program based on the Social Learning Theory of Bandura and evaluated the effect on nurses' self-efficacy in promoting the self-management of patients. After graduation in 2007, she became a member of the professorship Nursing Innovation and Positioning of the Hanze University of Applied Sciences where she commenced her PhD research in 2010 which resulted in this dissertation.

Currently, Astrid is employed as a lecturer in the department of Health and Well-being at the Windesheim University of Applied Sciences in Zwolle. She is a member and participates in research of ACENDIO, the Association for Common European Nursing Diagnoses, Interventions and Outcomes. She is board member of the Foundation for Nursing Diagnostics, Interventions, and Results (VIDR). Furthermore, she is affiliated with the Dutch professional association of nurses and nursing assistants (VenVN) and the Honor Society of Nursing, Sigma Theta Tau International (STTI), Rho Chi at-Large Chapter.

OVER DE AUTEUR

Astrid Tuinman werd geboren in Nederland op 21 april 1962 in Den Haag. Na het behalen van haar middelbare school diploma (Sint-Maartenscollege, HAVO) begon ze aan een inservice verpleegkunde opleiding in het Wilhelmina ziekenhuis Assen, waar ze in 1985 haar diploma behaalde. Gedurende enkele jaren werkte ze als verpleegkundige in verschillende (inter)nationale ziekenhuizen. In 1987 startte ze met de vervolgopleiding Maatschappelijke Gezondheidszorg, richting Algemene Gezondheids-zorg (Rijkshogeschool, Groningen) en behaalde in 1989 haar HBO-bachelor verpleegkunde diploma.

In 1990 vervolgde Astrid haar carrière als wijkverpleegkundige en werkte voor verschillende thuiszorgorganisaties. Na voltooiing van de vervolgopleiding tot oncologieverpleegkundige in 1994, ontwikkelde ze bijscholingen ter verbetering van de kwaliteit van de verpleegkundige oncologische zorg. Van 1998 tot 2003 was zij als stafverpleegkundige bij de thuiszorgorganisatie 'Thuiszorg Groningen' verantwoordelijk voor de professionele ontwikkeling van (HBO) verpleegkundigen en verzorgenden op het gebied van de oncologische en palliatieve zorg, klinisch redeneren en kwaliteit van zorg. Daarnaast had zij een beleidsadviserende rol en nam deel aan verschillende werkgroepen van het Integraal Kankercentrum Nederland (IKNL).

In 2001 behaalde Astrid haar diploma als tweedegraads docent verpleegkunde (Noordelijke Hogeschool, Leeuwarden). In 2003 besloot ze zich volledig te richten op het verpleegkunde onderwijs en werkte tot 2019 als verpleegkunde docent bij de Academie voor Verpleegkunde van de Hanzehogeschool Groningen. Ondertussen volgde ze het masterprogramma Verplegingswetenschap aan de Universiteit Utrecht. Het onderwerp van haar master thesis betrof de zelfeffectiviteit van verpleegkundigen en verzorgenden bij het bevorderen van het zelfmanagement van patiënten met COPD. Ze ontwikkelde een trainingsprogramma gebaseerd op de Social Learning Theory van Bandura en onderzocht het effect daarvan op de zelfeffectiviteit van het zorgpersoneel in het bevorderen van het zelfmanagement van patiënten. Na haar afstuderen in 2007 trad ze toe tot het lectoraat Verpleegkundige Innovatie en Positionering van de Hanzehogeschool waar ze in 2010 begon met het promotieonderzoek dat geresulteerd heeft in dit proefschrift.

Momenteel werkt Astrid als hogeschooldocent bij het domein Gezondheid en Welzijn van de Hogeschool Windesheim te Zwolle. Ze is lid van en participeert in onderzoek van ACENDIO, the Association for Common European Nursing Diagnoses, Interventions and Outcomes. Ze is bestuurslid van de stichting Verpleegkundige Diagnostiek, Interventies en Resultaten (VIDR). Verder is zij lid van de beroepsvereniging Verpleegkundigen & Verzorgenden Nederland (V&VN) en de Honor Society of Nursing, Sigma Theta Tau International (STTI), Rho Chi at-Large Chapter.

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