Same client, different care?

Investigating Practice Variation in Home Care Needs Assessment

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Speciale dank voor alle cliënten, wijkverpleegkundigen en organisaties die hebben meegedaan aan de studies.

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PROEFSCHRIFT

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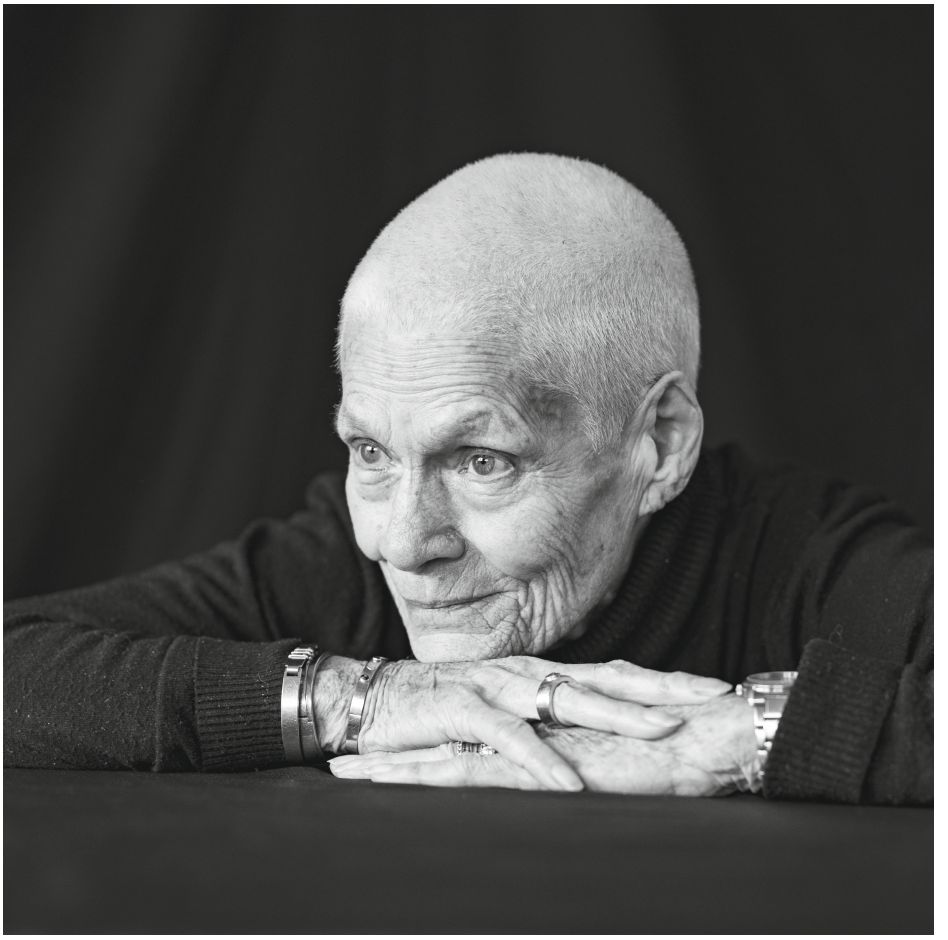
Prof. dr. R.J.J. Gobbens, Tilburg University
Dr. W. Paans, Hanze Hogeschool Groningen

CONTENT

The size of your dreams must always exceed your current capacity to achieve them.
If your dreams do not scare you, they are not big enough.
(Ellen Johnson Sirleaf)

Voor Inge:
"Is het groot genoeg?"



1

GENERAL INTRODUCTION

In the introduction to this thesis, the growing challenges in healthcare are first outlined, followed by an overview of home care nursing in Europe and the Netherlands. A timeline illustrates the policy changes from 1997 to 2015 that impacted the development of the home care nursing profession during this period. At the end of the introduction, the needs assessment conducted by home care nurses and the phenomenon of practice variation are explained to highlight the importance of this thesis's aim.

GROWING CHALLENGES IN HEALTHCARE

European countries struggle to organise sustainable healthcare due to an ageing population and shrinking workforces. The average age of the population is increasing, and consequently, the cohort of individuals aged 65 and older is projected to grow to 4.8 million (25%) of the total population in the Netherlands by 2050 (1). Alongside this rise, the prevalence of multi-morbidity in the Netherlands increased from 3.3 million people in 2015 to 5.4 million in 2019, and this number is expected to continue rising (2). Moreover, the number of years spent in good health also shifts, with the last 1.2 years in worsening conditions. Approximately the last seven to ten years of life show an increase in care dependency because of frailty and multimorbidity issues (3). However, sickness can be partly prevented by avoiding risk factors like insufficient activity (3). Lifestyle factors such as alcohol consumption, substance abuse and poor nutrition are responsible for a substantial proportion (21%) of deaths in Europe (3). Based on these forecasted figures, the demand for care will increase. However, the shortage of care workers is intensifying (4-6). The ageing population and shrinking workforces worldwide will significantly impact healthcare provision in the upcoming years. By 2040, it is anticipated that one in three individuals will be required to work in healthcare to meet the growing demand. The Dutch Nurses Association predicts that an additional 125,000 care professionals will be required by 2025 (5).

In response to these healthcare challenges, most European countries' policies focus on interventions to support ageing in place (7, 8). Ageing in place stands for a process that enables individuals to live for as long as possible at a place of choice, growing older (9). Most older people opt for ageing in place to keep their independence for as long as possible and live in familiar surroundings, even when they require nursing care (9). The cost-effectiveness of home care nursing instead of institutional care helps policy to ease the financial pressure following the growing demand for care (10, 11).

Home care nursing in the Netherlands

Different terms are used worldwide to describe home care nursing, including community nursing, district nursing, and home health care. In this thesis, the term

'home care nursing' is used. Genet et al. (2013) examined home care nursing across Europe and found differences in the coverage of home care nursing. They define home care nursing as 'professional care provided at home to adult individuals with formally assessed needs, encompassing rehabilitative, supportive, technical nursing care and domestic aid, personal care, and respite care for informal caregivers' (12). Although this definition is broadly formulated, not all countries consider all these types of care as home care nursing. In most European countries, home care nursing encompasses integrated professional care consisting of personal and technical nursing care provided at the client's home (13). In the Netherlands, domestic home care is regulated and financed under separate policies from home care nursing (i.e. personal and technical nursing care) (14). Home care nursing in the Netherlands is funded under the Health Insurance Act. The entitlement under the Health Insurance Act includes home care nursing for adults and children up to 18, as well as all kinds of specialised home care nursing, such as dementia care, wound care, palliative care, and preventive care, including education about healthy lifestyles (15).

In 2019, in the Netherlands, 3,070 organisations, primarily competitive and commercial, were providing home care nursing services to 586,000 clients, representing a 2.5% increase from the previous year in the Netherlands (12). Among the home care nursing clients, 19,000 received care from non-contracted organisations or self-employed professionals. Non-contracted care accounted for only 5.7% of the 3.5 billion euros in home care nursing costs (16). This amounts to an average of 6.300 euros per capita, comparable to other European countries (13). Home care nursing workforce operates in interdisciplinary teams, ranging from European Qualification Framework (EQF) level 2 to level 7, as shown in Table 1 (17). They deliver home care nursing to individuals with chronic conditions or disabilities and provide short-term care for those recently discharged from the hospital. Home care nurses collaborate with specialised nurses within these organisations, such as dementia or wound care nurses. In 2015, there were 7,560 active home care nurses, and it was estimated that between 10,000 and 13,500 bachelor-educated home care nurses would be needed by 2025 (4).

Table 1. Qualifications and educational levels of the home care nursing workforce (17)

European Qualification Level (EQF)	***Educational level***
EQF 2	Care Assistant
EQF 3	Certified nursing assistant with vocational training
EQF 4*	Associate degree registered nurses with vocational training
EQF 6	Bachelor-educated registered nurses
EQF 7	Master-educated registered nurses

*Specifically for the Netherlands
Note: In this thesis, 'home care nurse(s)' refers to nurses with level EQF 6.

The needs assessment for home care nursing in the Netherlands

The professional and/or organisation responsible for assessing client needs varies across Europe (12). The needs assessment determines the amount, type, and duration of home care nursing required for clients. In France, a social worker or nurse conducts assessments (12). In Germany, the Medical Review Board, operated by sickness and long-term care funds, is responsible (18). In the United Kingdom, local authorities determine the needs of clients (12, 19). In the Netherlands, the home care nurse is responsible for the assessment of the client's home care nursing needs (20).

Nurses conducting needs assessments are educated to follow the five-phase nursing process systematically. This process includes assessment, diagnosis, goal setting, planning interventions, evaluation, and forming a structured care plan (see Figure 1) (20, 21). In the assessment phase, Dutch home care nurses assess client information holistically, gathering details about the client and their context. Physical needs are assessed, as well as psychological, social and spiritual needs (22). The nurse uses this information to set the nursing diagnoses, followed by informing the client about goals that can improve the client's situation. After formulating SMART goals (specific, measurable, achievable, relevant, and time-bound), they decide on the necessary interventions. The final phase concerns the evaluation phase, where the outcomes of interventions are discussed, and care plans may be adjusted based on the evaluation results (23). This decision-making process is guided by clinical reasoning, which involves assessing, analysing, and interpreting client information to make informed decisions about diagnosis, treatment, and care, using critical thinking and clinical knowledge to ensure accuracy in nursing care (24, 25).

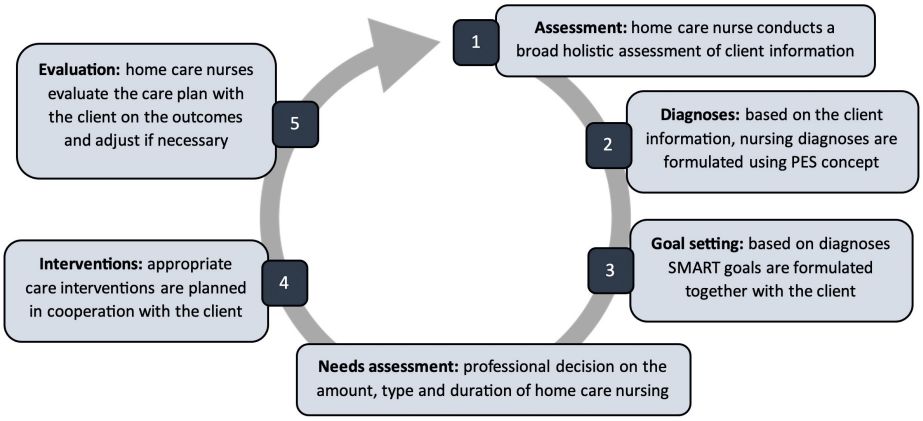


Figure 1. Illustration of the needs assessment in the nursing process (23)

Government decisions, educational developments, and professional advancements in home care nursing in the Netherlands: a timeline.

To understand the development of home care nursing and its current role, it is necessary to step back in history and examine how policy changes and events have influenced the profession's development, particularly in relation to needs assessment (see Figure 2).

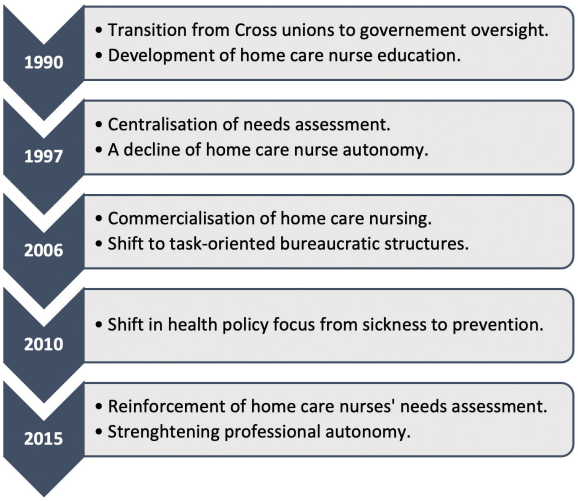


Figure 2. Timeline of government decisions, educational developments, and professional advancements in home care nursing in the Netherlands

1990: Transition from Cross Unions to government oversight and development of home care nurse education

Until 1980, home care nurses were employed predominantly by Cross Unions, originating from Catholic and Protestant roots. In 1980, the government took over home care nursing, assuring high-quality and cost-effective services (26-30). By 1990, the professionalisation of home care nurses had progressed with the development of educational programs. Nurses were required to obtain a specialised Social Healthcare (MGZ) qualification, available through either a three-year part-time bachelor's program for nurses with an associate degree or a four-year Bachelor of Nursing with a Social Healthcare specialisation (30, 31). These programs emphasise a holistic approach, clinical reasoning, and nursing theories for assessing needs. With the necessary education, home care nurses assess clients' needs and provide the appropriate care.

1997: Centralisation of needs assessment and a decline of home care nurse autonomy

To address inconsistencies in home care nursing provision (31), the government established 18 Regional Assessment Organs (RIOs), which were later taken over by the Centre for Assessing Care Needs (CIZ) in 1997. CIZ assumed responsibility for determining care needs based on objective medical diagnoses rather than individual circumstances (32). The professional role of home care nurses diminished as needs assessment was no longer part of their profession; they could only provide clients with care at home. During this same period, the MGZ qualification in the Bachelor of Nursing was discontinued due to declining interest and demand (30, 31).

2006: Commercialisation of home care nursing and shift to task-oriented bureaucratic structures

Home care nursing organisations consolidated and adopted bureaucratic, task-oriented structures, prioritising efficiency over professional nursing practice (26, 33). The home care nursing workforce was divided into teams, differentiated based on educational levels. Teams consisting of team members with EQF level 2 and EQF level 3, or teams with EQF levels 4 and 6, diminishing the distinction between associate and bachelor-educated nurses (34). At that time, home care nurses provided clients with nursing care in clients' homes, the same care that their colleagues with vocational training often delivered within the same team. Because the work did not require highly educated home care nurses, many left these organisations to find jobs that were more appealing to their educational level (31). These changes further eroded home care nurses' professional autonomy.

2010: Shift in health policy focus from sickness to prevention

The Institute for Healthcare and Environment (RIVM) reintroduced the Lalonde model, emphasising the impact of social determinants — such as financial and social status — on perceived health outcomes (35). This shift in focus from sickness

and care to prevention aligned with nursing principles but conflicted with the intervention-driven nature of home care nursing at the time. The Dutch government launched the 'Visible Connector' (in Dutch: Zichtbare Schakel) initiative, recognising the potential role of home care nurses in promoting health within communities (36, 37). Home care nurses had to renew their focus from merely providing home care nursing to broadly assessing clients' needs and determining what was necessary. Only a few home care nurses, located mainly in disadvantaged urban neighbourhoods and often dealing with multicultural issues, participated in these initiatives. These Visible Connectors offered guidance and coordination of care and support, sometimes organised separately from the provision of home care nursing (36). Concurrently, the Dutch Association of Nurses introduced the Home Care Nurses' Area of Expertise for Home Care Nurses, based on the CanMEDS framework, to clarify the advanced skills required for home care nursing and prevent the profession from being divided (21).

2015: Reinforcement of home care nurses: needs assessment and strengthening professional autonomy

The termination of the General Act on Exceptional Medical Expenses (AWBZ) and integration of home care nursing into the Health Insurance Act (Zvw), in 2015, restored home care nurses' responsibility for needs assessment (15) and their professional role in the community. This shift positioned nurses as caretakers of community health, working alongside general practitioners to prevent more costly healthcare interventions (21). However, after 18 years without assessment experience, home care nurses faced challenges reclaiming this role. At that time, the newly implemented curriculum of the Bachelor of Nursing 2020 did not offer specialised routes for home care nurses anymore (38).

The Dutch Association of Nurses developed the Six Standards Framework to support this transition, outlining key principles for autonomous, clinically reasoned assessments (20). Although the Six Standards Framework is not a formal guideline, it outlines key norms to apply to:

1. Needs assessments must be based on professional, autonomous decision-making.
2. Only nurses with at least a bachelor's degree (EQF level 6) can perform assessments (17).
3. Assessments should promote client self-management and independence.
4. Clinical reasoning within the nursing process must guide assessments.
5. Documentation must align with professional guidelines (39).
6. According to nursing standards, client information must be appropriately recorded and transferred.

Home care nurses relied on their Home Care Nurses' Area of Expertise and the Six Standards Framework to further support this role (20, 21). These measures helped restore professional autonomy and reinforce the expertise of home care nurses in theory. Some home care nursing organisations provided government-funded training on needs assessment (40). Additionally, insurance companies encouraged the adoption of Electronic Health Records (EHRs) to manage costs and ensure quality control. While most organisations adopted the Omaha System (41), approximately 20% used NANDA-NIC-NOC (NNN) classifications (42-44). However, classification choices were driven by organisational preferences that focused more on implementation readiness and financial security than on guaranteeing support for the nursing process according to professional nursing standards (20, 39, 45).

The main aim of assessing client needs in the Netherlands is to enhance self-management while honouring autonomy, as specified in the Six Standards Framework (17). While this framework was created to guide and standardise the needs assessment process, its uptake and application among home care nurses have been suboptimal (46). Furthermore, despite the absence of specialised home care nursing training for several years, expertise in this area has decreased. Moreover, due to home care nurses handling tasks similarly to vocationally trained nurses, more highly educated nurses have been lost (30, 31, 36, 47).

Signs of practice variations in home care nursing needs assessment

Since home care nurses regained their responsibilities throughout the nursing process under the Health Insurance Act, anecdotal evidence of variations in decisions regarding client needs has emerged. These signals referred to similar clients receiving different types and amounts of care. In addition to this anecdotal evidence, Buijs and colleagues demonstrated practice variation among care-intakers assessing cases based on vignettes (46). Furthermore, a small-scale study focusing on a single client case revealed variations in the assessed hours of care per week and the nursing diagnoses formulated by home care nurses (47). This suggests that inconsistencies in practice may affect the quality and uniformity of care provided to clients. Quality of care, as the Institute of Medicine (IOM) describes, compiles safe (not harmful), effective (based on evidence), timely (no waiting list), client-centred (based on the individual needs), efficient (reducing waste and costs) and equitable (ensuring benefits for all) client care (48). A study by Cowley in England highlighted that varying approaches and classification systems could lead to discrepancies in assessing needs and delivering care (49). This underscores the potential for inconsistencies in the application of assessment tools, which may influence the outcomes of care for clients. While it has been recognised that practice variation most likely exists in home care nursing, the full scope and specific causes of this variation remain unclear. Also, there is insufficient knowledge regarding whether such variation is warranted or unwarranted. For instance, clients in similar

circumstances may receive different amounts and types of home care nursing, yet this discrepancy does not necessarily imply that the variation is unjust (47, 50).

Practice variation in other settings

In the medical profession, practice variation has a long history; the first study on this topic was conducted by McPherson et al. in 1938 (51). This phenomenon occurs in all regions and medical practices and is not exclusive to any particular profession (52, 53). Practice variation is "the extent to which health suppliers differ in the frequency or manner in which care is offered to clients with similar care problems" (54). This variation can be unwarranted when factors such as the type or severity of the illness, or patients' preferences and wishes, do not account for the variation (55). However, clients and their circumstances are unique, making practice variation inevitable and not consistently negative or unwarranted. The client's preferences and wishes would influence the professionals' decisions, leading to care that fits the client, which makes variation between clients warranted variation (56).

Factors influencing practice variation

In addition to these definitions for the medical field, factors influencing or causing practice variation in the medical profession were identified at both the client and professional side, each in three different aggregation levels: micro, meso, and macro (57). For example, the client's characteristics, the number of medical diagnoses, and wishes and preferences are factors on the client's micro level. At the meso level, the client's social environment and the presence of a supportive family are factors that count. At the client's macro level, the structures and organisation of healthcare, for example, the availability of healthcare providers, are factors to consider in practice variation (52, 53). Factors such as specific education, personal characteristics, experience, and the use of guidelines are found at the micro level of the professional (52). Factors at the meso level, such as team culture, social context, and team competencies, may influence practice variation (57). At the professional's macro level, access to evidence and guidelines, and the availability of technological tools to support professionals, can influence practice variation (57). Moreover, De Jong et al. found that factors interact and influence each other, such as being a recently graduated professional with limited experience and becoming a member of a social group with established norms to act upon, as described in a sociological model (58). In addition, Greer et al. showed that influencing factors may have opposite effects. For example, guidelines steer in one direction, but the client's wishes and preferences steer in another (59). Clients' wishes and preferences, when taken into account in shared decision-making, also influence practice variation, as demonstrated by Brabers et al. (56).

Research findings from medical professions indicate that similar factors contributing to practice variation may also exist in home care nursing. While the literature

provides ample knowledge related to the medical field, insights into nursing practice remain limited. Variations may arise in the needs assessment process for home care nursing, shaped by factors operating at different levels akin to those in the medical domain. Figure 3 illustrates the interaction between the client and the home care nurse, showcasing three levels on both sides, with examples of the influencing factors that lead to potential practice variation. This conceptual model for practice variation in needs assessment in home care nursing is grounded in De Jong's sociological model, which considers the perspectives of both the client and the home care nurse. (58).

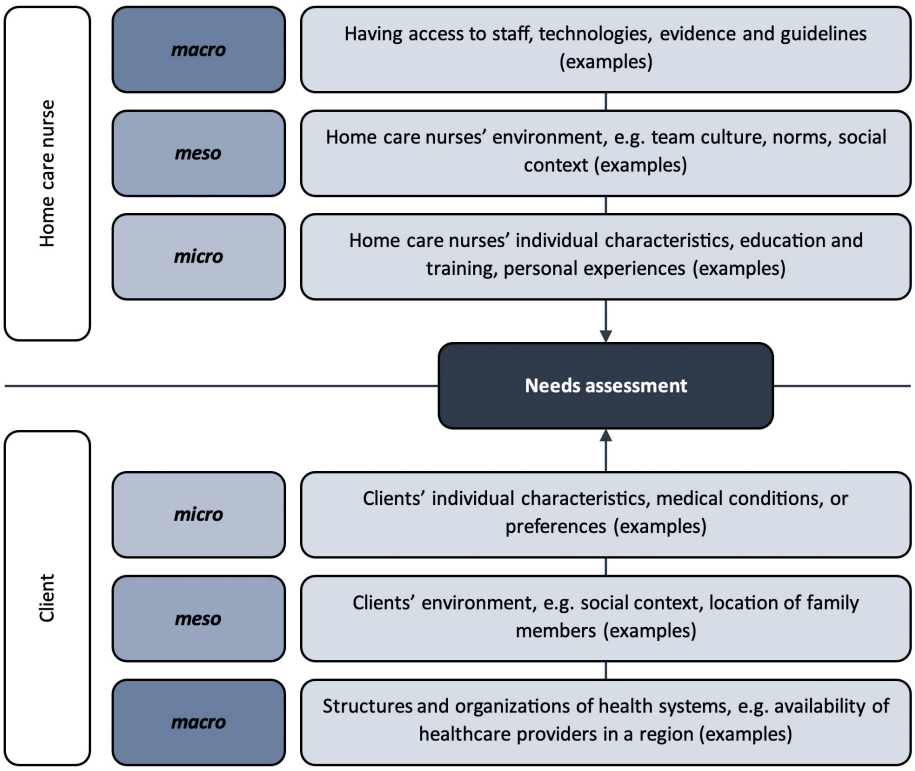


Figure 3. Conceptual model for practice variations in needs assessments in home care nursing (50, 58)

Aims and outline of this thesis

The needs assessment is regarded as the foundation of adequate, high-quality home care nursing, reflecting the demands of the Institute of Medicine (48). This was also stated in the 2018 Headline Agreement of the Dutch government on home care nursing (60). Practice variation can occur at the micro, meso and macro levels. While variation at the client level may be warranted, it could harm the client when

the practice variation is clustered within home care nurses and organisations. Due to the limited knowledge available about the extent, type and underlying causes of practice variations in needs assessments in home care nursing, research was initiated and funded by the stakeholders of the Headline Agreement (50, 60). The funding stakeholders involved were representatives of the Dutch Ministry of Health, Welfare and Sport (VWS, Volksgezondheid, Welzijn en Sport), the Dutch Healthcare Institute (Zorginstituut Nederland), the Dutch Association of Insurance Companies (ZN, Zorgverzekeraars Nederland), the Dutch Associations of Home Care Nursing Organisations (Actiz and Thuisnl), the Dutch Association of Nurses (V&VN, Verpleegkundigen en Verzorgenden Nederland) and the Dutch Patient Federation (PFN, Nederlandse Patienten Federatie) (50, 60). The research program began with a collaborative research team comprising seven members from a) the Dutch Institute for Health Services Research, Nivel Utrecht; b) the Research Centre for Healthy and Sustainable Living of the University of Applied Sciences Utrecht; and c) the Living Lab in Ageing and Long-Term Care of Maastricht University. This thesis describes one of the two PhD trajectories following this research program (50).

This thesis aims to contribute to a better understanding of practice variation in the needs assessment in home care nursing, the impact of education and organisational support and the role of home care nurses in enhancing the needs assessment process. The studies in this thesis begin by exploring the Bachelor's education in needs assessment, followed by the subject of practice variation in needs assessment in home care nursing and then focus on the micro-level of the home care nurse's role in practice variation in needs assessment in actual practice (see Figure 3). The following aims of this thesis were formulated.

- Firstly, this thesis examines how home care nurses are prepared to conduct needs assessments during their bachelor's education.
- Secondly, this thesis defines practice variation in needs assessment within home care nursing and identifies the factors that influence this assessment.
- Thirdly, it examines practice variation in needs assessment in the home care nursing practice and the influencing factors.

Table 2 presents an overview of all the studies detailed in this thesis, including the participants and objectives for each chapter.

Table 2. Overview of the studies' aim, design/method, and participants in this thesis

Aim	Chapter	Design/ Method	Participants
First aim: *Preparation in bachelor's education to conduct needs assessment.*	2	Cross-sectional, quantitative survey study	Lecturers, researchers and managers of Universities of Applied Sciences
Second aim: *Defining practice variation in needs assessment in home care nursing and identifying influencing factors.*	3	Qualitative Delphi study	Expert panel (home care nurses, nursing teachers, client representatives, nurse associations, insurers, policymakers, government representatives)
Third aim: *Examining practice variation in needs assessment in actual home care nursing practice*	4	Cross-sectional, quantitative retrospective study	Electronic client's health records, home care nurses, representatives of organisations (managers, quality, and policy officers)
	5	Qualitative Think-aloud interview study	Home care nurses
	6	Quantitative cross-sectional vignette-based survey study	Home care nurses
	7	Qualitative focus group study	Home care nurses' policy and quality officers and managers of home care nursing organisations

Chapter 8 concludes this thesis by discussing the main findings from the studies presented. This chapter also reflects on the methodology and provides research, education, and practice recommendations. In Chapter 9, the impact of the findings is described.

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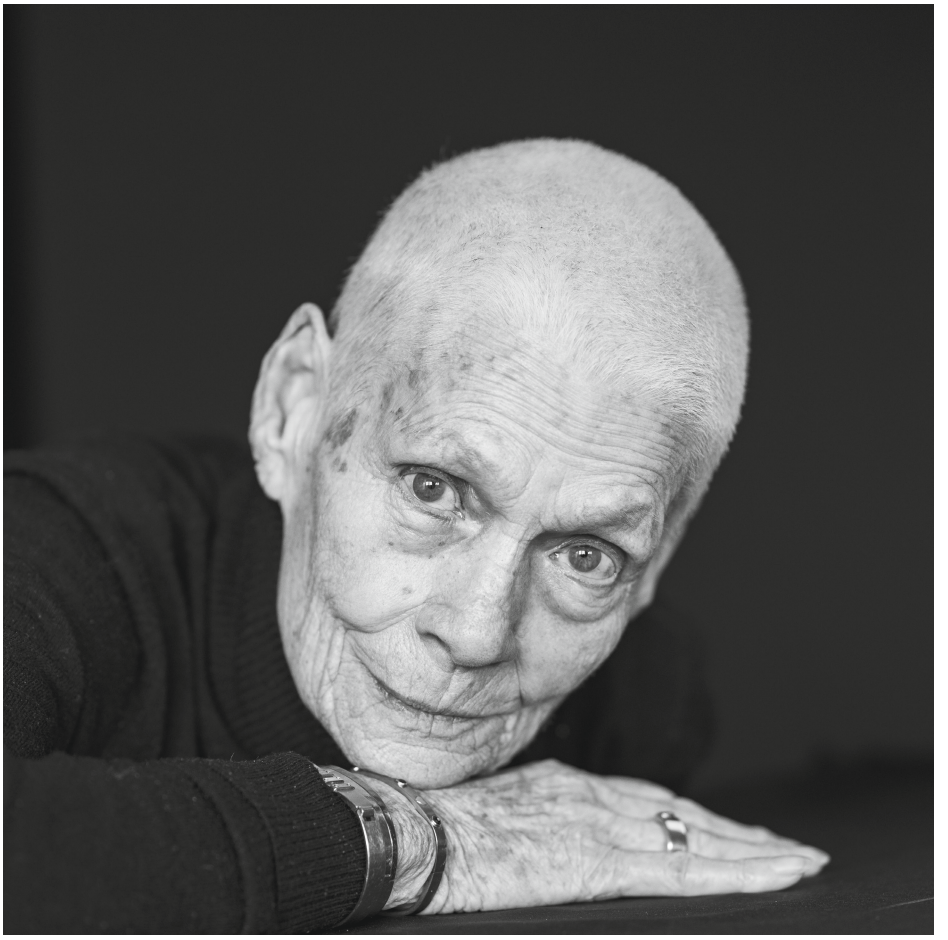

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FROM CLASSROOM TO HOME CARE NURSING:

clinical reasoning in the nursing process in bachelor's education: a cross-sectional study

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ABSTRACT

Aim: To explore the extent to which and how to incorporate clinical reasoning as part of the nursing process when completing a professional needs assessment in home care nursing during the Dutch bachelor education for nurses.

Method: A cross-sectional survey of 21 Dutch Universities of Applied Sciences (UAS) examined how clinical reasoning is integrated into nursing curricula. Data from lecturers, researchers, and managers covered learning objectives, assessments, and curriculum content. Descriptive statistics and correlation analyses were used for analysis.

Findings: In this study, 72 lecturers, researchers, and managers from 18 UAS responded. Clinical reasoning and nursing process credits varied, averaging 68 and 52 EC, respectively. Bakker's ProActive Nursing was widely taught, with NANDA-NIC-NOC and Gordon as common classification systems. Despite adherence to the BN2020 profile, no correlation was found between EC and readiness for home care nursing.

Discussion: The study highlights variability in teaching clinical reasoning across curricula, the misalignment between education and home care practice, and the need for curriculum updates. Recommendations include curriculum revision and further research.

Conclusion: Despite a unified educational profile, this study reveals differences in UAS curricula, particularly in ECs for clinical reasoning and the nursing process. Home care nursing preparation is inconsistent, impacting professional readiness.

INTRODUCTION

Since 2015, home care nurses in the Netherlands have been granted expanded responsibilities. As of that year, they are authorised to conduct needs assessments for home care nursing under the Health Insurance Act *(Zorgverzekeringswet)* (9). These needs assessments must be carried out by at least a bachelor-qualified nurse, who determines the nature, scope and duration of the care by following the phases of the nursing process (10,11). The needs assessment must comply with the 'Standards Framework for Assessing and Organising Nursing and Care at Home', established by the Dutch Nurses' Association (V&VN, *Verpleegkundigen & Verzorgenden Nederland)* (12). This framework consists of six standards, one requiring that needs assessments be carried out using the nursing process (consisting of the nursing assessment, diagnosis, care outcomes, interventions, and evaluation) (13-16). Conducting a needs assessment thus involves completing all phases of the nursing process.

Clinical reasoning is a metacognitive skill used continuously to arrive at an appropriate needs assessment. Therefore, clinical reasoning is an indispensable competence for nurses (2). There are various definitions of clinical reasoning. Some, such as the one by Bakker, are based on the medical model (17), while others focus on client outcomes and are, therefore, more relevant to nursing (18). Alfaro-LeFevre, for instance, defines clinical reasoning broadly as: "Clinical reasoning is a complex cognitive process that uses both formal and informal thinking strategies to collect and analyse information, evaluate its relevance, and consider alternative actions—essential for accurate care planning and documentation." (19). The new BN2030 educational profile defines clinical reasoning as: "The continuous, systematic collection and analysis of data aimed at identifying the needs and problems of the client and choosing appropriate care outcomes and interventions." (8). Without clinical reasoning, nurses cannot deliver optimal care (20). It is, therefore, logical that clinical reasoning forms part of the bachelor-level nursing education. Previous studies have shown a discrepancy between what students learn during their education and the skills required in professional practice (3-7). A study examining the curricula of bachelor nursing programmes in the Netherlands in 2012 found major differences between UAS (21). These differences concerned learning objectives and topics included in the curricula, resulting in variations in the knowledge, skills and attitudes of home care nurses graduating from different UAS (2).

Until 2016, students could choose a specialisation track, such as Public Health Nursing (MGZ), which included home care nursing. Students were specifically trained for their chosen track during the third and fourth academic years (21). With the introduction of the new Bachelor of Nursing 2020 profile, nursing curricula

were radically revised (23, 24). UAS were free to adapt the curriculum to local and regional developments. Since the introduction of this profile, home care nursing has been more firmly integrated into curricula since 2016 (25, 26). However, what this integration entails in practice remains unclear, as well as how clinical reasoning, the nursing process, and home care nursing are embedded across the different curricula. This study, therefore, investigates how clinical reasoning—as a skill to carry out the nursing process—is included in the various Dutch bachelor-level nursing curricula.

METHOD

This descriptive cross-sectional study using questionnaires was conducted between February and April 2024. The STROBE checklist was followed (27). The potential study population consisted of lecturers, researchers, and managers from all 21 UAS in the Netherlands who offered a full-time bachelor's degree in nursing. Participants had to meet the following inclusion criteria: 1) work as a lecturer, researcher or manager at a University of Applied Sciences that offers a recognised full-time bachelor's degree in nursing, and 2) have knowledge of the curriculum content, with specific expertise on the subjects of clinical reasoning, the nursing process and home care nursing. Before the study, the minimum required sample size was determined using G*Power. This indicated that a sample of at least 82 participants was needed (28).

Participants were recruited via various targeted channels through the National Council of Nursing Degree Programmes (LOOV, *Landelijk Overleg Opleidingen Verpleegkunde*), LinkedIn, a national network group for nursing education, and via a snowball sampling method. All potential participants were contacted by email and received an information letter and consent form for participation. In case of questions, they could contact the researcher.

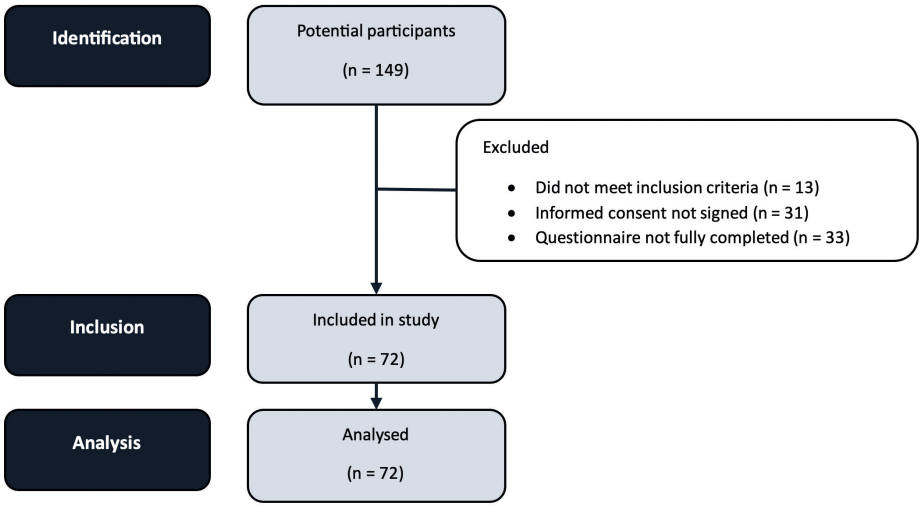

Figure 1. STROBE flowchart

To gain insight into the curriculum content, the questionnaire asked about the learning objectives regarding clinical reasoning, the nursing process, and home care nursing. In addition, it examined how clinical reasoning within the nursing process is assessed, how many credits (EC) are allocated to clinical reasoning, the nursing process per academic year, and home care nursing throughout the entire programme. Furthermore, participants were asked how home care nursing was integrated into the curricula before 2016. Participants were also asked to estimate how many students go on to work in home care nursing after graduation. The questionnaire was based on earlier research (21, 25), supplemented with questions that the research team deemed necessary to better capture the current context of home care nursing. The questionnaire consisted of 37 closed-ended questions, most Likert scale questions with five response options, ranging from 'not at all' to 'to a very high degree'. The questions on years of experience, student numbers (total number of students and the estimated number choosing home care nursing) and the number of ECs were recorded descriptively (absolute figures and percentages). Additionally, three open-ended questions were posed to participants. These open questions focused on the content of learning objectives relating to clinical reasoning, the nursing process and home care nursing within the curriculum. Several researchers tested the questionnaire before distribution, and two lecturers completed it. The survey was administered online via Qualtrics.

For data analysis, SPSS (version 28.0) was used. The three open questions were analysed descriptively. Since all questions had to be completed before moving on to the next question, and only fully completed questionnaires were included in the analysis, there were no missing values. To analyse and test the correlation between

the number of ECs devoted to both clinical reasoning and the nursing process and the extent to which participants believed students were prepared to work in home care nursing, participants were asked to use a Likert scale (ranging from 'not at all' to 'to a very high degree') to indicate the degree to which they thought students were prepared to work as home care nurses. A Pearson correlation was calculated between the perceived readiness of students for home care nursing and the number of ECs allocated to clinical reasoning and the nursing process. A significance level of 0.05 with a 95% confidence interval was used. During data analysis, the data were checked for outliers to enhance the reliability of the results.

All participants signed the consent form before participation. To safeguard their anonymity, no directly traceable data was collected. The Faculty of Health, Medicine & Life Sciences Research Ethics Review Committee at Maastricht University (FHML-REC) reviewed the study. It was deemed not subject to the Medical Research Involving Human Subjects Act (non-WMO).

Table 1. Sociodemographic characteristics of participants (n = 72)

Category	n (%)
Age (in years)	
18-29	3 (4.2)
30-39	31 (43.1)
40-49	12 (16.7)
50-59	21 (29.2)
60-69	5 (6.9)
Role	
Lecturer	46 (63.9)
Lecturer-researcher	22 (30.6)
Manager	3 (4.2)
Researcher	1 (1.4)
Teaching experience (in years)	
0-4	22 (30.6)
5-9	38 (52.8)
10-14	8 (11.1)
15-19	2 (2.8)
20-24	1 (1.4)
25+	1 (1.4)
Relevant secondary role	
Subject coordinator	36 (50.0)
Member of the curriculum committee	15 (20.8)
Subject coordinator and member of curriculum committee	4 (5.6)
No relevant secondary position	17 (23.6)

Table 1. Sociodemographic characteristics of participants (n = 72) (continued)

Category	**n (%)**
Registered nurse/home care nurse	
Nurse	67 (93.1)
Home care nurse	41 (57.0)
Category	**M ± SD**
Work experience in home care nursing (in years)	3.57 ± 4.98

Table 2. Use of nursing classification systems within the curricula (n = 72)

Category	**n UAS (%)**
Nursing classification system	
Nanda-NIC-NOC	15 (83.3)
Gordon	15 (83.3)
Carpenito	13 (72.2)
Omaha System	7 (38.9)
ICF	7 (38.9)

RESULTS

Out of the 149 potential participants from 21 UAS, 72 participants from eighteen different UAS participated in this study (see Figure 1). No participants were recruited from two private UAS and one public university (see Table 1). Most participants were lecturers (n = 46; 63.9%) or lecturer-researchers (n = 22; 30.6%). Most participants were registered nurses (n = 67; 93.1%).

Clinical reasoning

UAS assess clinical reasoning in the bachelor's programme in various ways. At all UAS, the skills are evaluated at least during a practical placement. In addition, several UAS conduct a practical exam (16/18 UAS), a theoretical exam (15/18 UAS), or an individual project (13/18 UAS) to assess students' clinical reasoning skills. The method of clinical reasoning taught is, at nearly all UAS (17/18), the ProActive Nursing method by Marc Bakker. In addition, a small number of UAS teach the Wilkinson model (5/18) or the Hesselink model (3/18). The average number of EC allocated to clinical reasoning throughout the full-time programme is 68 EC (ranging from 33 to 110 EC). The number of EC devoted to clinical reasoning varies per institution and academic year. The correlation between the number of EC for clinical reasoning and the extent to which the participant estimated that a student is ready to work in home care nursing immediately after graduation was low ($r(21) = -0.155$; $p = 0.480$). Two outliers of 231 EC were removed from the dataset as they were considered unrealistic/impossible by the researchers.

The nursing process

All phases of the nursing process are taught to students at all UAS. In addition to theoretical knowledge, each institution ensures the translation of this theory into practice. Assigning care to the appropriate caregiver is also taught. Financing and legislation are covered extensively, although not necessarily with a focus on the context of home care nursing at every institution. All UAS assess students' knowledge and skills regarding the nursing process during practical placements. In addition, some UAS assess these competencies using an individual assessment (14/18 UAS) and a theoretical exam (11/18 UAS). During the programme, various nursing classification systems are taught to support clinical reasoning within the nursing process. Most UAS make use of NANDA-NIC-NOC and Gordon (see Table 2). The average number of ECs devoted to the nursing process throughout the full-time programme is 52 EC (ranging from 5 to 96 EC). In most curricula, the nursing process is part of teaching in the program's first year. The correlation between the number of ECs for the nursing process and the extent to which the participant believed the student was ready to work in home care nursing immediately after graduation was low ($r(21) = -0.029$; $p = 0.895$). One outlier of 240 EC was removed from the dataset as the researchers deemed it unrealistic/impossible. Teaching of the nursing process mainly takes place in the first and second academic years (see Figure 2).

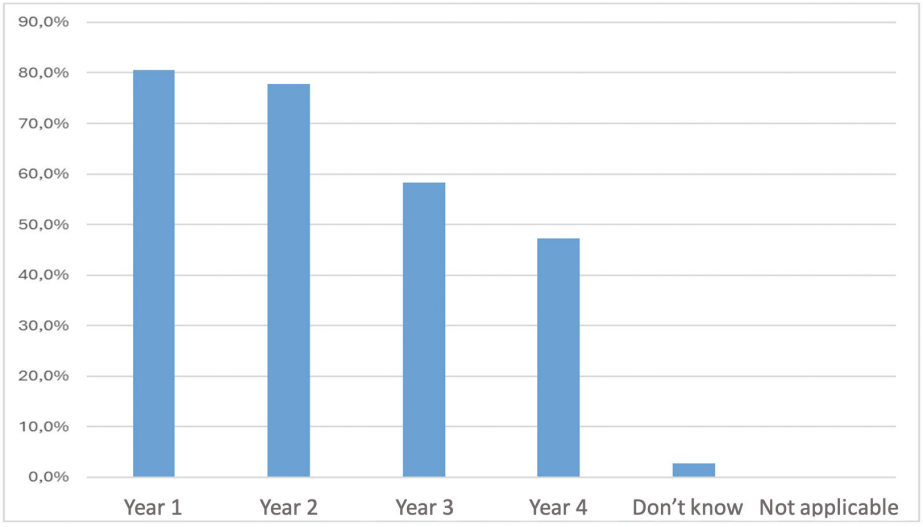

Figure 2. Completion of the nursing process: to what extent is this topic addressed per academic year?

Home care nursing

The extent and manner home care nursing is addressed within the curriculum vary by institution. Five UAS offer a minor specifically focused on home care nursing. Four UAS previously offered such a minor but discontinued it due to low student enrolment. At five UAS that offered the Public Health Nursing (MGZ) graduation profile before 2016, placement in home care nursing was a mandatory part of the programme until 2016. It is unclear how many UAS currently require a home care nursing placement. The number of weeks of (mandatory or optional) home care nursing placements varies from 20 to 51 weeks per institution. Participants were also asked to estimate the percentage of students who choose home care nursing after graduation. This is 25.7% on average, with a minimum of 10% and a maximum of 90% (n = 28).

DISCUSSION

Summary of the findings

Concerning clinical reasoning and the nursing process, UAS apply different teaching methods and definitions of clinical reasoning. Bakker's ProActive Nursing method is widely taught. Clinical reasoning was most often assessed through placements and practical or theoretical exams. The nursing process is evaluated primarily during placements and through individual assignments or theoretical exams. UAS offers various curriculum nursing classification systems, with NANDA-NIC-NOC and Gordon being the most frequently used. There are substantial differences in the number of study load hours (ECs) that UAS allocate to clinical reasoning and the nursing process. However, every University of Applied Sciences includes all phases of the nursing process within the curriculum. Regarding home care nursing, the attention given to this subject within the curricula varies across UAS, with differing learning outcomes applied. Knowledge of legislation and financing regulations in home care nursing is essential to conducting proper needs assessments. At several UAS, this is not structurally included in the curriculum. Some UAS offer specific minors focused on home care nursing. Additionally, there is variation between UAS, whether placement in home care nursing is optional or mandatory, and the number of hours for such placements also differs.

Comparison with the literature

This study shows apparent differences between UAS in their curricula. There is great variability in the number of study load hours allocated to clinical reasoning and the nursing process. This is notable, considering the BN2020 educational profile and associated learning outcomes are the same for all UAS. The definitions and conceptual foundations of clinical reasoning also vary between programmes, leading students from different UAS to approach the same case differently. This variation has also been observed in medical education, where efforts are underway

to standardise teaching content (28). In addition, there is a considerable variation in how much and in what way home care nursing is addressed within the different curricula; in several UAS, the topic of home care nursing is integrated into various subjects and academic years. Due to this variation, the degree to which students are prepared for home care nursing practice depends on the institution where they received their education. This study also shows that the nursing process is mainly addressed in the first two academic years of the programme. However, what is being taught and how it is taught to students is unclear. A recent study by Pérez-Perdomo and Zabalugui showed that using technology in education can contribute to effectively teaching clinical reasoning skills (29). This includes, for example, simulation and serious gaming. The same study examined the number of study load hours dedicated to clinical reasoning, ranging from thirty minutes to one year. This wide variation aligns with the findings of our study.

The current study found no significant relationship between the extent to which students choose home care nursing after graduation and various curriculum characteristics (including the number of study load hours for clinical reasoning, the nursing process, and whether or not a minor in home care nursing is offered). Van Iersel et al. previously showed that strengthening the position of home care nursing within the curriculum does not automatically lead to a different perception of this field among students (30). Earlier research by Van Moorsel et al. also revealed that the number of weeks of mandatory placement in home care nursing varied (22), which is in line with the findings of this study. Developing a curriculum focusing more on home care nursing may help improve students' skills in selecting appropriate interventions within the nursing process (31). The study shows that the nursing classification systems NANDA-NIC-NOC and/or Gordon are most frequently used during the programme. A classification supports clinical reasoning, underpins decision-making, and enables documentation of the various nursing process components. Approximately eighty per cent of home care nursing organisations in the Netherlands use the Omaha System (32). Because the Omaha System is not standardly included in the curricula, students may not be optimally prepared for home care nursing.

Limitations and strengths of the study

The number of participants from private UAS was relatively low. This may be because most lecturers at private UAS are self-employed and only teach part of the curriculum. As a result, only a few lecturers have an overview of the entire curriculum. On the other hand, participants were recruited from nearly every University of Applied Sciences and took part in this study. It was impossible to conduct a targeted subgroup analysis—for example, between private and public UAS or between UAS that previously offered a home care nursing specialisation

and those that did not—because too few participants were included to make such comparisons. The results must, therefore, be interpreted with the necessary caution.

Multiple respondents from the same organisation gave differing answers, so providing conclusive answers to every question was impossible. This limitation is partly because clinical reasoning is a skill that can be assessed to a certain extent, but is difficult to link directly to the number of ECs. Some of the questions in the questionnaire proved less easy to answer unequivocally and should be explored further in subsequent qualitative research.

Although conducting a needs assessment in home care nursing is a task that is specific to home care nurses, it is often not taught as a separate topic during the bachelor's education in nursing. Many skills nurses need to carry out a needs assessment can be traced back to clinical reasoning within the nursing process. However, these skills cannot be directly translated to the specific context in which the home care nurse works. One of the missing elements is knowledge of the client's regional social care network (sociale kaart), which is considered a prerequisite for carrying out a proper needs assessment. This study did not investigate this topic, which makes further research necessary to explore how home care nurses can acquire knowledge of issues such as the social care network in their working area.

Recommendations for practice

This study is based on the BN2020 educational profile, while at the end of 2023, the new educational profile BN2030 was published (8). UAS will adapt their curricula accordingly, with the implementation of BN2030 set to begin in 2026. Therefore, this study's conclusions can be used in developing the new curriculum based on BN2030. For example, by promoting alignment between UAS regarding how clinical reasoning and the nursing process can be integrated into the curriculum more structured and consistently. Such alignment can contribute to greater consistency in the language used by nurses. However, it must be considered that nurses are trained as generalist professionals and not specifically as home care nurses. Nevertheless, clinical reasoning skills, essential for navigating the nursing process, are universally relevant for all bachelor-trained nurses. Through clinical reasoning, under- or overtreatment can be avoided, care can be tailored to the client's needs and wishes, and it contributes to client safety and autonomy. Clinical reasoning may influence the quality of care more than any other factor (33, 34). This makes it essential for UAS to emphasise teaching these skills when revising the curriculum and adopt a more uniform approach regarding the definition and method of clinical reasoning taught. The definition provided in BN2030 may serve as a sound guiding principle (8).

Recommendations for future research

This study is based on the current standards framework from V&VN (12). As of January 1st, 2025, this framework will be replaced by a revised version for conducting needs assessments (35). The content regarding clinical reasoning and the nursing process will remain the same, but the precise details are unknown. Revising the standards framework may also require modifying nurses' skills to conduct needs assessments in home care nursing. In-depth interviews with lecturers from UAS could enrich the results of this study, provide further context to the findings, and clarify contradictory results. The standards from the framework could be used as a guideline to explore how they are currently reflected in education programmes.

CONCLUSION

Despite a shared educational profile (BN2020) for all UAS, this study reveals major differences in curriculum content. It also shows differences in how home care nursing is incorporated into the various curricula; at several UAS, it is integrated across different subjects throughout the academic years. The various curricula include all components of clinical reasoning and the phases of the nursing process. However, the definition and method of clinical reasoning differ between UAS. Because the specific legislation and regulations regarding the financing of home care nursing are not consistently included across curricula, students are not optimally prepared to conduct needs assessments in home care nursing directly after graduation, and additional training is recommended.

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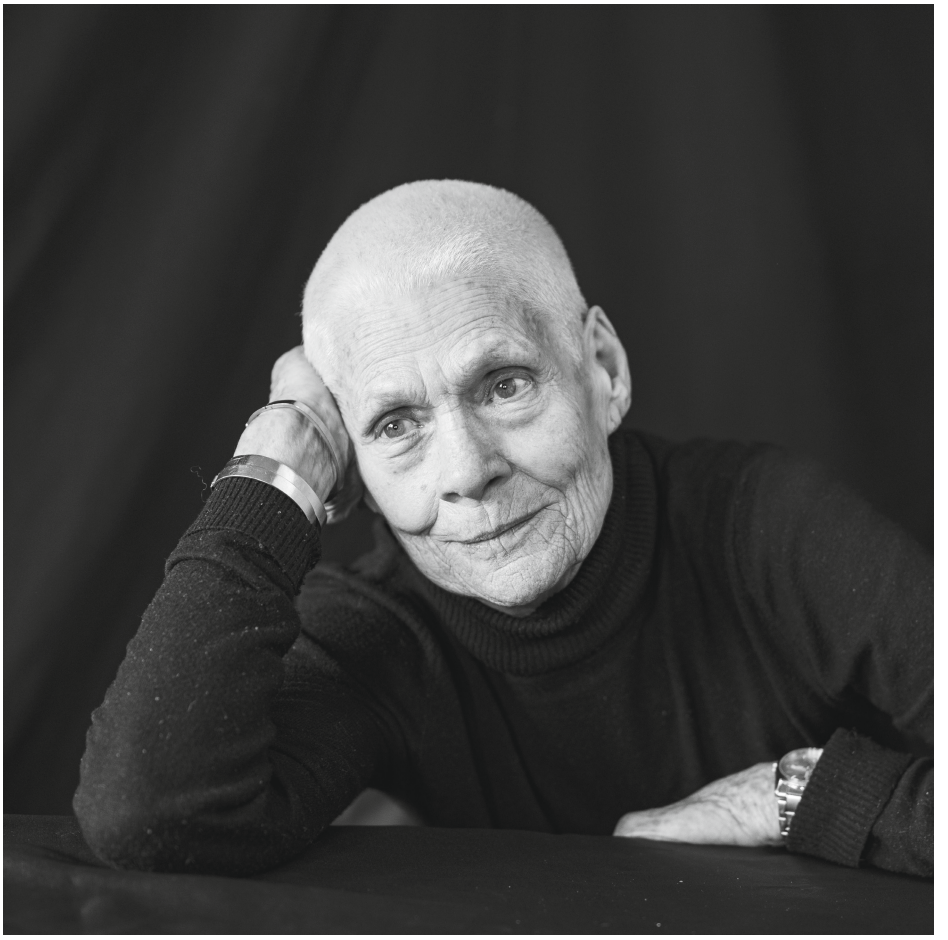

3

DEFINING PRACTICE VARIATION AND EXPLORING INFLUENCING FACTORS ON NEEDS ASSESSMENT IN HOME CARE NURSING:

A Delphi study

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ABSTRACT

Aim: To describe a Delphi study regarding practice variation in needs assessment by Dutch home care nurses, to define practice variation in home care nursing and explore which factors may have a role in this needs assessment.

Design: A Delphi study was conducted with the participation of home care representatives.

Method: A Delphi questionnaire was developed, preceded by literature research and an expert meeting. The Delphi study took place between December 2020 and February 2021. The goal was to achieve a consensus level of at least 70%.

Results: After three rounds, thirty-two experts reached a consensus about definitions regarding variation in needs assessment, warranted and unwarranted variation. In total, 59 factors were determined related to 1) the client and health, 2) the clients' context, 3) nurses, and 4) the nurses' context. Thirty-four factors scored warranted of influence and 18 (out of 34) were client related. Most of the factors that scored unwarranted influencing needs assessment (17 out of 26) were related to the home care nurses' context.

Conclusion: Having a consensus about the definition of practice variation in needs assessment and possible influencing factors support the professionals to discuss and improve the unity and quality of their decision-making process in home care. This may contribute to more righteous care for clients in need of home care.

Impact: Since 2015, home care nurses in the Netherlands are responsible for determining the amount, type, and duration of care for clients in need of home care. This so-called needs assessment legitimizes the payment by health insurers. Signals of practice variation in needs assessment are heard in home care field. Although practice variation may be justified, it can lead to over or underuse of care, which may affect clients' outcomes. If we can identify influencing factors and find patterns that contribute to practice variation, we might gain a better understanding of the process and improve home care.

INTRODUCTION

In Europe, a substantial increase in individuals aged 65 and over is anticipated i.e., from 20.2% of the total European population in 2019 to 30.8% in 2080 (1). Deinstitutionalisation is necessary to cope with the increasing demand for healthcare caused by an ageing population with multiple chronic conditions and their wish to continue living in a familiar place (2). In the Netherlands in 2020, 20% of the population was aged 65 or over, and 20% of them received home care (1). Consequently, in most European countries, nurses are expected to deliver more care at home (3). Governments and care organisations have anticipated future challenges by developing a vision of home care, taking initiatives to facilitate it, and ensuring equal access for all clients in need (4).

In 2015, the Dutch government decided to extend the responsibilities of home care nurses to strengthen the gateway to more expensive forms of intramural care such as nursing home care and hospital care. They increased the authority of bachelor-educated home care nurses by making them responsible for access to home health care based on a basic benefits package of obligatory health insurance, for which no out-of-pocket payment for home care clients is necessary (5). To determine whether a client is eligible for paid access to home care, these home care nurses specify needs assessment, as part of the nursing process, in terms of the amount, type, and duration of care needed. Home care nurses alongside general physicians—as both groups have generalist knowledge of live-at-home clients — connect with professionals from various disciplines and invest in preventing the health of people with chronic conditions from deteriorating. They organise and deliver care for people in their own homes to make ageing in a familiar, comfortable space possible (4).

In most European countries, home care nursing concerns integrated nursing, personal care, and any kind of technical nursing care in the homes of the recipients (6). In the Netherlands, caretakers of different educational levels, such as helpers, vocationally trained carers, and bachelor-educated nurses deliver home care (5). To assess needs, nurses with a generalist approach have to be bachelor-educated according to the requirements stated in the Six Standards Framework of the Dutch Professional Nursing Association, developed to support the implementation of home care nurses' responsibility (7).

Because these nurses determine access to home care, several representatives of the home care field—for example, insurers and patient representatives—have reported variations of practice (8). A small previous study confirmed a variation in the indicated hours per week and nursing diagnoses by different home care nurses in an identical client case (9). These signals, alongside the published research,

suggest that in apparently similar situations, clients in need of home care receive a different amount, type, and duration of care. Subsequently, practice variation may be problematic because it may be a sign of under- or overuse of care and may undermine the principle of equal access and quality of care as formulated by the Institute of Medicine (10). To determine whether this variation in needs assessment is a hazard to the quality of home care, more knowledge is necessary regarding the definition of practice variation in needs assessment and the factors that may influence this needs assessment.

BACKGROUND

Conducting a needs assessment is a systematic part of the nursing process that serves as a guide for all nursing actions to deliver client-centred care (11, 12). Following the nursing process is one of the norms in the Six Standards Framework (V&VN, 2014). The nursing process is a systematic professional method based on critical reasoning and available scientific evidence (11, 13). It starts by assessing relevant information about the client's health status. Followed by diagnosis to determine nursing interventions after setting healthcare goals and then indicate the hours needed for the planned interventions. The last step in the nursing process concerns evaluating the results of the interventions taken and, if needed, adjusting the care plan to reach the goals together with the client (14).

In the literature, there are multiple general definitions of practice variation originating from medical care. Kievit et al. (2015) described practice variation as "the extent to which health suppliers differ in the frequency and/or way in which care is offered to clients with similar care problems" (15). However, there is a difference between warranted and unwarranted practice variation (16). In his research, Wennberg (2002) defined practice variation as being warranted when "the variation is caused by the nature, or seriousness of the disease, or preferences of the patient" (16). Practice variation could be warranted if, for example, a patient has a medical condition that requires medical treatment but the patient chooses otherwise because of possible negative consequences of the proposed medical treatment. Clients are unique and have different preferences, and their client support networks vary largely. Providing client-centred care may, therefore, justify the variation in delivered care. However, practice variation is unwarranted when the variation in care provision cannot be explained by the client's medical condition or preferences. An example is the case of organisational differences in care provision because some organisations are mainly money-driven and others may be more focused on client-centredness, and thus, client care needs. Consequently, home care clients of the money-driven organisation may receive more care than needed. Unwarranted variation can even result in harmful care provision and is a burden for society in terms of societal costs (16).

Although practice variation in needs assessment in home care nursing is a rather understudied area, it is not a new topic in medical professions. The first study on practice variation in patients undergoing a tonsillectomy was conducted in 1938 (17)). Existing reviews by Corallo et al. (2014) and Paul-Shaheen et al. (1987) showed that medical practice variation exists and confirmed large variations across regions and settings for almost all medical procedures (18, 19).

Previous research, mainly in medical professions, has focused on possible causes of practice variation. The factors found at different aggregation levels, (micro, meso, and macro) might contribute to practice variation (Brabers et al., under review). The micro level includes a wide variety of factors concerning the patients' characteristics, medical conditions, and/or preferences. The meso level, which comprises the patients' environment, including the social context of the patient and/or whether family members live close by, influences practice variation (20). In addition, the micro level of the individual care provider includes individual choices based on experiences rather than the use of available guidelines as well as specific education and training, which are possible factors that influence practice variation (Brabers et al., under review). At the meso level, factors like team culture and team norms might have an influence. At the macro level, the availability of evidence, guidelines, and resources (such as personnel and technology) play a role. These factors have been frequently mentioned in the literature as causes of practice variation (Brabers et al., under review). According to Greer (2002), the professional use of evidence and guidelines to choose medical treatment may conflict with the patient's values and preferences and thus may cause practice variation (20). The macro level includes influencing factors related to the health system and its structure and institutions, including out-of-pocket payments or the density of care providers in a region. De Jong (2015) described a sociological model for understanding medical practice variation and showed that factors interact and, therefore, may influence each other (21).

Although all these factors may also be relevant for home care nursing, the majority of the literature was on medical practice variation (Brabers et al., under review). A recent editorial by Brabers (2019) shows that research on practice variation in needs assessments conducted by home care nurses is scarce (22). Cowley (2000) already mentioned the existence of practice variation in needs assessment two decades ago, but only very few studies have been reported on possible influencing factors (23). Possible influencing factors in literature specific to needs assessment in home care are the clients' context, the ability of self-reliance and self-direction, and living circumstances, as well as time shortage for home care nurses to accomplish their tasks. In addition, the various ways in which classifications are used and interpreted to assess client needs may also be an influencing factor (9).

A definition of practice variation in needs assessment in home care nursing is lacking. Defining it is crucial because variation may lead to unequal care and hence, affect the quality of care provided. Identification of the potential influencing factors at the client, nurse, and environment level enables a better understanding of practice variation and provides guidance for interventions to reduce it in home care nursing. At this moment, practice variation in needs assessment is an understudied area, leaving us with many questions. As a first step to gaining insight into this underexplored area, we focus on clearly defining the concept of practice variation in home care nursing and exploring which factors may have a role in this needs assessment.

The aim

The aims of this Delphi study were 1) to establish a definition of practice variation in needs assessment by home care nurses and determine when it is warranted and unwarranted, and 2) to explore which factors may have a role in this needs assessment according to various stakeholders (including government representatives, client representatives, insurers, and care workers) in the home care field.

METHOD

Design

The Delphi study is part of a larger research programme. In the current study, we focus on defining practice variation in needs assessment, both warranted and unwarranted, and identifying influencing factors. The research programme aims to investigate the presence of practice variation in needs assessment by home care nurses and will eventually develop interventions to reduce possible unwarranted practice variation.

Table 1. Overview of all factors and sources

	Client-related factors	*Professional-related factors*	*Total*
1. Broad literature search:	12	39	51
2. Small literature search:	7	26	33
3. Expert meeting:	7	26	33
4. Cases provided by insurance companies:	9	0	9
5. Feedback round:	0	0	0
Excluding doubles -	11 -	18 -	29
The total amount of factors	24 client-related factors	73 professional-related factors	97 factors

A Delphi survey was conducted between December 2020 and March 2021. The Delphi technique is a widely used method to reach a consensus among experts by using several rounds of feedback collection. It investigates and understands factors that influence a specific issue, topic, or problem (24). In the current study, an online modified Delphi survey was conducted to elicit the opinions of a panel of experts via several non-in-person rounds to reach a consensus level of 70% (established a priori) on the proposed definitions of practice variation (warranted and unwarranted). In addition, the potentially influential factors were presented to the panel to investigate if and how they influence needs assessment. The target group of this study was 9,000 home care nurses with bachelor registration (NLQF level 6 stands for Dutch Qualification Framework level 6). Before the start of the Delphi survey, a literature review was conducted to identify scientific papers that describe definitions of practice variation and influencing factors. The results (definitions and factors determined) of this study were used as a starting point when designing the Delphi survey.

Participants

In this Delphi study, a panel of experts (panelists) was recruited. Experts were defined as people with demonstrable experience and or knowledge on the subject under study, such as representatives of clients living at home, experts from home care practising nurses, policymakers, health insurers, quality assurance, nursing teachers, and researchers who were otherwise involved in researching the field of home care. Potential panelists were approached via the Dutch Professional Nursing Association (V&VN), the so-called Scientific Table for home care nursing via the members of The Head Line Agreement 2019-2022 group (HLA), and via a call in a professional journal (25,26).

Panelists who showed interest in contributing to the study were selected based on convenience sampling (24). Generally, a minimum of 10 panelists is considered sufficient for a Delphi study depending on the number of questions asked, although a larger group of panelists reduces the risk of error and improves the reliability of the results (24). Therefore, and because of the convenience sampling, we invited 47 panelists for each round and aimed for a minimum of 30 panelists (24).

The Delphi Questionnaire

A Delphi questionnaire was developed especially for this study. It included three literature-derived definitions (15, 16). These definitions were presented in the first Delphi round, and they defined practice variation and warranted and unwarranted practice variation.

1. Practice variation is the way healthcare providers differ in the frequency and manner in which they offer care to clients with similar care problems (15).
2. Practice variation is warranted if caused by the nature or the severity of the disease or the preferences of the client, especially in situations where there are clinically comparable effective options (16).
3. Practice variation is unwarranted if not caused by the nature or severity of the disease or the preferences of the client, especially in situations where there are clinically comparable effective options (16).

In addition to the definitions, the Delphi study included possible influencing factors. These factors were based on triangulated sources, namely, an extensive scoping review on practice variation and influencing factors (Brabers et al., under review), an expert meeting, and case descriptions received from the Dutch Association of Health Insurers (Zorgverzekeraars Nederland in Dutch). In Table 1, an overview of 97 influencing factors is presented, which were detected from various resources (An overview of all factors and sources is available and can be requested from the authors by email). Initially, these factors were judged by the research group to decide if the derived items met the following definition of a factor influencing needs assessment. A factor influencing the needs assessment is a measurable element or circumstance that directly influences the client or the home care nurse in determining the care need in home care nursing within the legislation of health insurance policy (12, 27).

Factors that did not meet this definition were eliminated from this list of possible influencing factors and were not included in the Delphi questionnaire. To avoid possible misinterpretation of factors during the Delphi study, the factors were clearly formulated in a sentence structure. No additional context was provided in the sentences to prevent influencing the choices of experts. Finally, 58 factors were included in the Delphi study. Following Elissen et al. (2017), the researchers divided the factors into four categories (28). The first category corresponding to the micro level of the client included the client- and health-related factors. The second category corresponding to the meso level of the client included the clients' context-related factors. The third category, corresponding to the micro level of the nurse, included the home care nurse-related factors. Finally, the fourth category, corresponding to the meso level of the nurse, included the home care nurse context-related factors (28). These factors were presented in the Delphi study and judged by a panel of experts on if (yes, no, or I do not know) and how (very warranted, warranted, neutral, unwarranted, or very unwarranted) they influence the needs assessments. In addition, the panelists were given the option to add missing factors.

Data collection and procedure

The questionnaire included two parts: the three definitions of practice variation and the influencing factors. The first round took place during the first half of

December 2020, and the second and third rounds occurred in January and February 2021, respectively. Each Delphi round took approximately 1 month to execute the survey—including sending out two reminder emails (after 1 week and 1 day before closure)—, analyse the results, and complete a new survey by including the collected comments, before sending out the next round. All questions required an answer in order to be able to complete the survey. This response, analysis, feedback, and response process were repeated until the panelists reached the a priori consensus level of 70%. It took three rounds to reach this consensus level.

First Delphi round

The first Delphi round started with the informed consent procedure; the participants were asked to provide background information about their age, sex, job title, and organisation. Then, the panelists were presented with the definitions. Subsequently, they were asked to report on a 5-point Likert scale whether they totally agreed, agreed, were neutral, disagreed, or totally disagreed with the proposed definition. In addition, they were invited to formulate alternatives and make suggestions to possibly redefine the definition in an open text box. After each definition, the panelists were offered the possibility for suggestions and remarks.

Second Delphi round

In the second round, after collecting informed consent and demographic information, the refined definitions were presented to the panelists. The panelists then rated each definition and provided feedback as described for the first Delphi round. Besides the definitions, influencing factors on needs assessment were presented in this round. Panelists were asked to judge whether they considered each factor as being influential by answering yes, no, or I do not know. Finally, panelists could add missing factors.

Third Delphi round

In this round, after collecting informed consent and demographic information, the refined definitions were presented to the panelists. The panelists then rated each definition and provided feedback as described for the first and second Delphi rounds. In addition, a new, redefined overview of influencing factors, based on the analyses in the second round, was presented. In this round, the panelists were asked to score the presented factors on a 5-point Likert scale whether they considered the factors very warranted, warranted, neutral, unwarranted, or very unwarranted in the way they influence the needs assessment. Questionnaires of all three Delphi rounds are available and can be requested from the authors by email.

Table 2. Timeframe and contents of Delphi rounds

	Content of Delphi questionnaire	When
First round	Rating three definitions of practice variation, warranted practice variation, and unwarranted practice variation.	December 11, 2020 – December 26, 2020
Second round	Rating the three adjusted definitions of practice variation. Rating which factors are influencing variation in the needs assessment.	January 6. 2021 – January 24, 2021
Third round	The final rating on the three adjusted definitions of practice variation. Rating which factors are influencing practice variation on needs assessment in a warranted or unwarranted way.	February 16, 2021 – February 28, 2021

Data analysis

Data were collected using Qualtrics® XM and subsequently imported into SPSS® version 27 for data analysis. The responses of each round were summarised, and the level of agreement was analysed using descriptive statistics. The results of the analyses obtained from the panelists' remarks on each definition and influencing factor in the previous round were presented again to the panelists in the following round. In between rounds, a summary of the results with the most given remarks and the consensus rate on the definitions were presented to the panelists in the introduction of the questionnaire for the next round. For example, the amount and type of comments suggesting the use of specific words in the definition were presented to the panelists. In this way, substantiation of adjustments in definitions and a list of influencing factors supported the panelists in their response for the next round.

After the last Delphi round, how the factors influence needs assessment was analysed using Qualtrics® XM, reports, and the number and percentages of panelists scoring very warranted to very unwarranted.

Ethical approval

All panelists were informed that participation was voluntary and that all data would be processed anonymously and used only for research purposes. The study did not fall under the scope of the Dutch Medical Research Act (WMO). This study was conducted in accordance with the principles of the Declaration of Helsinki.

FINDINGS

Participants

In total, 45 of the 47 invited panelists (96%) completed the first round of the Delphi study. The average age of the panelists was 44 years, and 86% of them were women (see Table 3). The panelists consisted of home care nurses (n = 22), nursing teachers (n = 10), client representatives (n = 5), nurse associations (n = 2), insurers (n = 3), policymakers (n = 1), and government representatives (n = 2). In rounds two and three, the same 47 panelists were invited again to fill in the questionnaire. During rounds two and three, the response declined to 82% (n = 39) in round two and 68% (n = 32) in round three. In the third round, 68% (n = 32) of the panelists completed the Delphi questionnaire. Most of the participants who dropped out were home care nurses and nursing teachers. The response in the other groups, such as policymakers, client representatives, nurse associations, insurers, and government representatives, was the same.

Table 3. Panelists' response per Delphi round

Participants	Round 1	Round 2	Round 3
Home care nurses	22	15	13
Client representatives	5	6	6
Policymakers	1	1	1
Insurers	3	3	2
Association of nurses	2	2	2
Nursing teachers	10	10	6
Representatives from government	2	2	2
Invited (n = 47) and response	45 (96%)	39 (83%)	32 (68%)

Definitions of practice variation and influencing factors

The findings of the three rounds are presented per round. The first round included the three definitions, the second round included the three definitions and influencing factors, and the third round included the results of the definitions as well as the influencing factors. Table 4 shows the development of the definitions in the three Delphi rounds based on analysis and adjustments of the remarks, and finally, the adapted definitions included the consensus rate on practice variation in needs assessment by home care nurses, warranted practice variation, and unwarranted practice variation.

First Delphi round

The first round resulted in 35 remarks on the definition of practice variation in needs assessment and a consensus rate of 68.9%. The remarks concerned the usage of different terms as well as missing words to further explain the terms used. By using the word "client" instead of "patient", the definition catered to a more nurse-oriented phrase. "Healthcare providers" have been changed to "home care nurse". The frequency and manner in which they offer care have become the nature, amount, and duration of care. On the definition of warranted practice variation, there were 31 remarks and a consensus rate of 46.7%, and on the definition of unwarranted practice variation, there were 27 remarks and a consensus rate of 44.4%. In both definitions, remarks were made about the importance of the clients' context, using "client" instead of "patient", and replacing "clinically comparable" and remarks about nurses who need to substantiate their decisions. In addition, the panelists remarked about the scarcity of available proven interventions in home care nursing, and therefore, these words were removed from the definitions and replaced with "achieving goals". Based on the remarks, the definitions were adjusted and proposed again in the second Delphi round.

Second Delphi round

In the second round, the three redefined definitions were presented, and in addition, the factors of influence were presented to the panelists. In round two, 29, 22, and 18 remarks were made about the three refined definitions, respectively (Table 2). Most of the remarks concerned the terminology used – for example, providing care, recovering, well-being, and content of care. The relevance of these remarks to the scope of the definition led to replacing the words "practice variation" in definitions two and three with "variation in needs assessment" to clarify the scope. The consensus rate for the first, second, and third definitions was 66.7%, 82.1%, and 74.4%, respectively.

In round two, the possible factors of influence (n = 58) were presented in four categories as shown in Table 5. The panelists reported the following three missing factors: clients' living circumstances, the insurance companies' influence, and the organisation being money driven. In addition, one factor categorized under the clients' personal- and health-related factors (the client's capacity for self-reliance) was extended with the words and self-direction. Finally, the factors of clients' and home care nurses' gender were found to be irrelevant by the panelists and were, therefore, removed from the Delphi list of possible influencing factors.

Third Delphi round

In round three, a survey was disseminated including the three redefined definitions and the adjusted list of influencing factors. In round three, panelists reached a consensus on all three definitions, 100% on the definition of practice variation on

needs assessment, 90.7% on warranted practice variation on needs assessment, and 87.6% on the definition of unwarranted practice variation on needs assessment. On the influencing factors, the panelists scored 34 of the total 59 factors influencing needs assessment as warranted. The majority of these 34 factors (n = 18) were client related. Most of the factors (17 out of 26) scored as unwarranted were related to the home care nurses' context. More specifically, these include factors such as the organisation being money driven and the insurance companies' influence but also the size of the organisation and the workload of the team workers. In contrast, the availability of guidelines and standards in an organisation and the availability and dissemination of scientific evidence at a national level are scored warranted to influence needs assessment. Several factors are undecided such as the home care nurses' attitudes and beliefs as well as the client's age and education level. Three panelists expressed difficulty and uncertainty in scoring some of the factors warranted or unwarranted. The light green coloured factors in Table 6 show more or less undecided scores distributed over warranted, neutral, and unwarranted to influence needs assessment. They referred to specific situations in which it could be both. They scored neutral in these cases.

Table 4. Development of the definitions, remarks, and consensus throughout the Delphi study

	Round 1		Round 2		Round 3
Participants	45 (of 47) completed	35 remarks about:	39 (of 47) completed	29 remarks about:	32 (of 47) completed
Definition 1	Practice variation is the way healthcare providers differ in the frequency and manner in which they offer care to patients with similar care problems.	Use client instead of patient. Add the nature, extent, frequency, and duration of care and by whom given. The context of the client and the process of decision-making by the home care nurse. Use the word care professionals instead of healthcare providers.	Practice variation is the extent to which home care nurses differ in the frequency, manner in which, time, and duration of the care that is indicated and delivered to clients with similar client situations focusing on activities that contribute to health and lead to recovery.	Providing care, recovering, well-being, and content of care.	Variation in needs assessment is the way the home care nurses differ in the nature, amount, and duration of care they indicate for clients in similar situations.
Consensus %	68.9%	31 remarks about:	66.7%	22 remarks about:	100%
Definition 2	Practice variation is warranted if this is caused by the nature or the severity of the disease or the preferences of the patient, especially in situations where there are clinically comparable effective options.	The context of the client is missing, use of client instead of patient, efficiency, quality of life, and traceable decision-making. Replacing clinically comparable.	Practice variation is warranted if caused by client situation based on a professionally substantiated decision-making process in which home care nurses take characteristics and preferences of the client into account.	The context of the client, the professional and shared decision-making of the home nurse is missed, setting goals.	Variation in needs assessment is warranted if caused by clients' characteristics, context, and preferences with regard to achieving goals that are taken into account by the home care nurse in a professional, substantiated decision-making process.

Consensus %	46.7%	27 remarks about:	82.1%	18 remarks about:	90.7%
Definition 3	Practice variation is unwarranted if it is not caused by the nature or severity of the disease or the preferences of the patient, especially in situations where there are clinically comparable effective options.	The context of the client, replace clinically. Use client instead of patient. There are only a few proven effective interventions in home care nursing. Traceable decision–making is missing.	Practice variation is unwarranted if not caused by client situations based on a professionally substantiated decision-making process in which home care nurses take characteristics and preferences of the client into account.	The context of the client and the traceable shared decision-making process of the home nurse are missed, in setting goals.	Variation in needs assessment is unwarranted if not caused by clients' characteristics, context, and preferences of the client with regard to achieving goals that are taken into account by the home care nurse in a professional, substantiated decision-making process.
Consensus %	44.4%		74.4%		87.6%

Table 5. Categories with added, adjusted, or removed influencing factors on variation in the needs assessment

Four categories	Presented factors round 2 (n = 58)	Presented factors round 3 (n = 59)	Added or adjusted factors (+) and/or removed factors (-)
1. The personal client- and health-related factors.	15	14	*-The clients' gender.* *The clients' capacity for self-reliance and self-direction. (adjusted)*
2. The clients' context-related factors.	6	7	*+The clients' living circumstances.*
3. The personal home care nurse-related factors.	13	12	*-The home care nurses' gender.*
4. The home care nurses' context-related factors.	24	26	*+The insurance companies' influence.* *+The organisation is money driven.*
Total	58	59	

DISCUSSION

After three Delphi rounds, the experts reached an agreement on the operational definitions of practice variation and warranted and unwarranted variation in needs assessment in home care nursing. In addition, they identified 59 possible influencing factors, categorised according to Elissen et al. (2017), whose influence could be warranted, neutral, or unwarranted (28). In category one, personal client- and health-related factors, most factors (11 of 14) were warranted to influence needs assessment, and in category two, one of seven client context-related factors were unwarranted to influence needs assessment. In category three, personal home care nurse-related factors, 5 of 12 factors were unwarranted to influence needs assessment. Finally, in category four, home care nurse context-related factors, 17 out of 26 were unwarranted to influence needs assessment. This study gives us a better understanding of practice variation in needs assessment in home care nursing and whether it is warranted or unwarranted, according to the panel of experts.

All three definitions of practice variation, warranted, and unwarranted are constructed using words that are more appropriate for home care nursing than the words used in the definitions of Kievit and Wennberg (15, 16). If we look at the definitions, we see a different use of words to formulate the meaning of the concepts than in the medical practice variation. We started the Delphi study with Kievits' definition: "Practice variation is the way healthcare providers differ in the frequency

and manner in which they offer care to patients with similar care problems" (15). We conclude with the knowledge that "variation in needs assessment is due to the way in which the home care nurses differ in the nature, amount, and duration of care they assess for clients in similar situations". Wennberg's definition states that" practice variation is warranted if it is caused by the nature or the severity of the disease or the preferences of the patient, especially in situations where there are options with clinically comparable effects" (16). "Variation in needs assessment is warranted if it is caused by the clients' characteristics, context, and preferences with regard to achieving goals that are taken into account by the home care nurse in a professional, substantiated decision-making process". Compared to Wennberg's definition, there's a difference in the words used in this study's the definition of warranted practice variation in needs assessment—"home care nurses" instead of "healthcare providers", "client" instead of "patient", and "client situation" instead of "care problems" (16). The stakeholders in the home care field needed these terms to make the definitions more specific and thus acceptable. Furthermore, in addition to the medical condition of the client, the client's characteristics, context, and preferences are also noted to provide a broader, more holistic scope of the client. Therefore, these aspects are integrated into the three definitions of practice variation in a needs assessment. These adjustments can be explained by the fact that home care is given in the clients' own environments and thus, this is an important aspect to take into account, as Brabers also stated earlier (Brabers et al., under review). Moreover, using different terms than medical ones allows the nursing profession to develop into a more autonomous profession for supporting clients' living-in-place with home care needs. On the other hand, different vocabulary can be an obstacle to inter-professional communication, for example, when client information needs to be transferred from the hospital to home care or vice versa. Notwithstanding the use of these terms, client-centredness becomes very much a part of the definitions of warranted and unwarranted practice variation in needs assessment and follows the Institute of Medicine and the central role of the nursing profession (10, 11).

Several factors are more or less undecided about the way they influence needs assessment. The light green-coloured factors in Table 6 show that, sometimes, scores are equally distributed over warranted, neutral, and unwarranted influences. It demonstrates that a factor that has warranted influence in some cases may have unwarranted influences in different circumstances. For example, on the one hand, a nurse might think that a shortage of personnel (i.e., the factor *the organisation has sufficient staff available*) indicates less home care for a client because there is simply not enough staff to provide care to all clients that need it. Therefore, this nurse finds the influence of the factor *the organisation has sufficient staff available* warranted. On the other hand, another nurse might find that the indicated amount of care should be independent of *the number of staff available*, making the influence of this factor unwarranted. More research is necessary to investigate the presence of social

mechanisms and whether they cause practice variation in the needs assessment by home care nurses (21).

Nurses all over the world are educated to perform needs assessments as part of the nursing process. However, the performance of these assessments is varied across countries. Hence, influencing factors on needs assessment might also vary among countries. For example, in the Netherlands, home care nurses need at least a bachelor's degree to allow them to conduct a needs assessment in which the preferences of the client are also considered. Moreover, home care providers are allowed to choose a nursing classification system—which forms the basis of the needs assessment—, possibly causing variations in needs assessments. In Belgium, a standardised BelRAI assessment is obligatory to assess client's needs, and only the outcome of this assessment is covered by insurance. There is no bachelor's degree needed for the use of the BelRAI. Thus, daily practice involves a more inter-professional approach to care assessment (30). Furthermore, client-related factors such as the client's preferences and wishes play no role in this assessment and therefore do not influence the needs assessment. In addition, there is no variation caused by the use of different assessment instruments by nurses. In Germany, an independent organisation is responsible for assessing the clients' needs. Therefore, the nurse context-related factors probably have less influence on needs assessment. This confirms that the governmental vision on home care influences practice variation at the macro level (29). Whether there is practice variation in needs assessment between professionals of different educational levels, who are working together in a team, is unknown. The competencies, skills, expertise, knowledge, learning attitude, and experience of the team members may be influencing factors. Consequently, additional research might be relevant to identify how the impact of factors might differ because of differences in the home care context. The broad range of influencing factors including various categories, as provided in this Delphi study, could form a good basis for this endeavour, although adding factors should not be ruled out.

The nursing process consists of various connected phases: diagnostics (clients' nursing problems), goal-setting (based on the client's possibilities and circumstances), and planned interventions to reach the client's goals (13). Before deciding the amount and nature of care that is needed, the home care nurse might consider referring to and/or collaborating with other care professionals. If the home care nurse refers (partly) to another professional, the number of home care hours indicated would diminish, whereas the necessity for coordination of care will increase (31). As a result, the influencing factor, e.g., the presence of different kinds of care providers in the region, is warranted to influence needs assessment. In this case, by inter-professional collaboration, we assume the client receives the best possible care, and that client goals are reached in less time by thorough

interventions, whilst using fewer hours of home care. From an inter-professional and client-centred care perspective, collaborating with other professionals might be the best choice. However, according to D'Amour et al. (2008), inter-professional collaboration is necessary but not natural and certainly not easy (32). As Karam et al. (2021) state, 'the higher the complexity of clients' needs, the higher the need for more multi-disciplinary and specialised interventions' (31). In addition, this increases the necessity for coordination of care and support of clients' decisions (33). However, because work pressure and shortage of staff are factors that influence all care workers at present, this may also influence collaboration possibilities. Nevertheless, future challenges like more complex client situations and fewer available healthcare professionals necessitate more focus on integrated care through inter-professional collaboration (31). Although conducting a needs assessment in the Netherlands is a mono-disciplinary intervention reserved for the generalist home care nurse, the outcome of the needs assessment often leads to inter-professional collaboration and coordination where the (complex) needs of the client are the central focus (31). Therefore, the home care nurse needs to collaborate inter-professionally and possess knowledge about other professionals' expertise in the first phases of the nursing process.

The use, assimilation, and availability of evidence and guidelines by the organisation are scored as warranted to influence needs assessments in home care nursing. This is consistent with the existing literature, in which authors have often mentioned the use and availability of evidence and guidelines as influencing factors on practice variation. In her scoping review, Brabers et al. (2023) found, that the use of evidence and guidelines might reduce practice variation because it leads to greater uniformity and predictable interventions by professionals (Brabers et al., under review). However, we have to consider more perspectives on this subject. Firstly, nursing science has little evidence on which to base its guidelines; therefore, the existing guidelines are mostly based on consensus (34). Secondly, Geense et al. (2013) and De Groot et al. (2021) state that existing guidelines are not always found, are not available, or are not applied by home care nurses (34, 35). Thirdly, according to Boyd (2005), most evidence-based guidelines that support professional decisions focus on managing a single client problem while most clients in need of home care have comorbidity conditions (36). Thus, knowing about the minimal applicability of guidelines in cases where clients have more than one problem, knowing that most home care clients suffer from more than one problem, consequently means that the use of guidelines probably makes no difference in the variation in needs assessment by home care nurses. Therefore, the influence of the use of guidelines may be overrated in home care provision. To understand the decision-making process of the home care nurse, it would be interesting to gain more insight into the motivations of home care nurses for ignoring the use of guidelines in case of complex client

situations. Their motivation may be related to the fact that the available guidelines do not apply in cases where multi problems need to be addressed (36).

Strengths and limitations

This study has several limitations, including the sampling and selection of experts, the non-in-person sessions, and the response rate in the various Delphi rounds. Experts who participated had a heterogeneous background. Subsequently, a few experts had no experience in conducting needs assessments. However, we do not think this has strongly influenced our findings, as they do have expertise in home care, and the group was rather small. Nevertheless, the results had a broad support base among the stakeholders' representatives and the clinical practice of the home care nurses. Furthermore, some panellists reported uncertainty about their comments and scoring factors influencing needs assessment in a warranted or unwarranted way. By using the non-in-person method in this Delphi study, we missed the opportunity to discuss this uncertainty together with the factors that were scored as undecided by the panellists. Not being able to discuss feelings of uncertainty may have affected the results, and panellists may have scored more neutral on some factors. Another limitation is that the response rate in the Delphi rounds dropped from 45 experts in round one to 32 experts in round three. This is a common phenomenon in Delphi studies, due to the required commitment in multiple rounds by the experts (24). In our study, home care nurses, in particular, participated less in the second and third Delphi rounds compared to the first round. The dropout in this group may be a result of the COVID-19 pandemic, in which home care nurses generally experienced high work pressure (37). This high work pressure may have affected the panellists' interpretation and scores on several nurse context-related factors, factors such as "team workers' workload" and "sufficient staff available". Moreover, the last Delphi round was sent out during a vacation period, a factor that may have affected the dropout of home care nurses. Nevertheless, the final sample in round three was more than the initial set of a minimum of 30 experts.

Future directions

With this Delphi study, the first part of a greater research programme, including an extensive literature review and the expert meeting has concluded. By defining practice variation in needs assessment and identifying influencing factors, the research continues with determining the nature and amount of practice variation in needs assessment by home care nurses in actual practice. Client files will be investigated to get insight into the amount and nature of existing variation and influencing factors present. In addition, more qualitative methods, e.g., interviewing home care nurses, will offer insight into the possible interaction of influencing factors and variation. This insight is necessary to develop interventions during the last part of the research program, which will enable home care nurses to reduce unwarranted

variation and thereby improve the quality, equality, and accessibility of clients in need of home care.

Conclusion

Up until now, there was little knowledge about the meaning of practice variation in needs assessment in home care nursing. By conducting this Delphi study, we determined definitions and influencing factors regarding practice variation in needs assessment for home care nurses and added knowledge on this subject to the profession.

Table 6. Influencing factors rated by scores on the agreement in the way they influence the needs assessments by home care nurses per category (darker coloured means stronger agreement on the influencing manner of the factor on needs assessment)

Category	Completed response n = 32	(Very) warranted number (%)	Neutral number (%)	(Very) unwarranted number (%)
1. The personal client- and health-related factors. (n = 14)	The presence of complications or risk of complications of diseases for a client.	32 (100%)	-	-
	The clients' functional status	31 (97%)	1 (3%)	-
	The clients' capacity for self-reliance and self-direction.	31 (97%)	-	1 (3%)
	The client's ability to manage his or her own health.	30 (94%)	-	2 (6%)
	The clients' capacity to learn.	29 (91%)	2 (6%)	1 (3%)
	The number of clients' nursing diagnoses.	25 (78%)	5 (16%)	2 (6%)
	The clients' preferences, wishes, and needs.	24 (74%)	4 (13%)	4 (13%)
	The number of medical diagnoses a client has.	21 (66%)	9 (28%)	2 (6%)
	The clients' history of care use.	3 (10%)	11 (34%)	18 (56%)
	The clients' medication use.	16 (50%)	15 (47%)	1 (3%)
	The clients' income and financial possibilities.	7 (22%)	8 (25%)	17 (53%)
	The clients' level of education.	13 (41%)	9 (28%)	10 (31%)

Table 6. Influencing factors rated by scores on the agreement in the way they influence the needs assessments by home care nurses per category (darker coloured means stronger agreement on the influencing manner of the factor on needs assessment) (continued)

Category	Completed response n = 32	(Very) warranted number (%)	Neutral number (%)	(Very) unwarranted number (%)
	The clients' age.	13 (41%)	11 (34%)	8 (25%)
	The clients' ethnicity or cultural background.	12 (37%)	8 (25%)	12 (38%)
2. The client's context-related factors. (n = 7)	The resilience of the clients' social network (think of the capacity and residual strength of the clients' network involved).	31 (97%)	-	1 (3%)
	The availability of a client's network (think of friends, volunteers, acquaintances, possibly school and employer).	30 (94%)	1 (3%)	1 (3%)
	The reliability of a client's network (such as making structural agreements about taking on necessary care activities).	30 (94%)	1 (3%)	1 (3%)
	The availability of other disciplines that are involved in the client's care (e.g., domestic help, physiotherapist, occupational therapist, supervisor, etc.).	24 (75%)	5 (16%)	3 (9%)
	The clients' living circumstances.	21 (66%)	8 (25%)	3 (9%)
	The region where a client lives.	5 (16%)	8 (25%)	19 (59%)
	The expectations of the client's social network (informal caregivers) with regard to care that the client needs and receives.	14 (44%)	7 (22%)	11 (34%)
3. The personal home care nurse-related factors. (n = 12)	The experienced workload of the home care nurse.	2 (6%)	1 (3%)	29 (91%)
	The home care nurses' age.	1 (3%)	4 (13%)	27 (84%)

Table 6. Influencing factors rated by scores on the agreement in the way they influence the needs assessments by home care nurses per category (darker coloured means stronger agreement on the influencing manner of the factor on needs assessment) (continued)

Category	Completed response n = 32	(Very) warranted number (%)	Neutral number (%)	(Very) unwarranted number (%)
	Knowledge about and application of new technologies (think of video calling and medication dispensers).	23 (72%)	1 (3%)	8 (25%)
	The home care nurse's knowledge about guidelines, standards, and scientific evidence.	22 (69%)	2 (6%)	8 (25%)
	Keeping up with the profession through training and refresher courses by the home nurse.	22 (69%)	2 (6%)	8 (25%)
	The expectations of other professionals, such as general practitioners, colleagues, and transfer nurses, e.g., concerning the assessment of the home care nurse.	8 (25%)	3 (9%)	21 (66%)
	The home care nurse's ability to self-reflect.	18 (56%)	4 (13%)	10 (31%)
	The home care nurse's competencies.	19 (59%)	5 (16%)	8 (25%)
	The responsibility felt by the home care nurse in their role as a home care nurse.	18 (56%)	3 (9%)	12 (35%)
	Having completed specialised home care nurse training.	16 (50%)	8 (25%)	8 (25%)
	The years of experience of the home care nurse.	7 (22%)	10 (31%)	15 (47%)
	The home care nurse's attitude and beliefs.	13 (40%)	5 (16%)	14 (44%)
4. The home care nurses' context-related factors. (n = 26)	The organisation is money-driven.	1 (3%)	1 (3%)	30 (94%)

Table 6. Influencing factors rated by scores on the agreement in the way they influence the needs assessments by home care nurses per category (darker coloured means stronger agreement on the influencing manner of the factor on needs assessment) (continued)

Category	Completed response n = 32	(Very) warranted number (%)	Neutral number (%)	(Very) unwarranted number (%)
	The insurance companies' influence.	1 (3%)	2 (6%)	29 (91%)
	The organisation is supply-driven.	1 (3%)	3 (9%)	28 ((88%)
	The size of the organisation.	4 (13%)	3 (9%)	25 (78%)
	The organisation works with freelancers.	1 (3%)	6 (19%)	25 (78%)
	The workload felt by the team workers.	3 (9%)	4 (13%)	25 (78%)
	The organisation only offers specific care (e.g., personal budget care, care already paid for, specialised care) or is of a more general nature.	-	8 (25%)	24 (75%)
	The availability and dissemination of scientific evidence at a national level.	23 (72%)	2 (6%)	7 (22%)
	The availability of guidelines and standards in an organisation.	23 (72%)	2 (6%)	7 (22%)
	The type of care the organisation provides is contracted or (partially) uncontracted care.	2 (6%)	8 (25%)	22 (69%)
	The organisation's policy stimulates and creates space for home care nurses to make decisions.	21 (66%)	2 (6%)	9 (28%)
	The organisation of home care has salaried employees.	6 (19%)	5 (16%)	21 (65%)
	The organisation offers educational possibilities.	20 (62%)	4 (13%)	8 (25%)
	The availability of technological tools in the organisation.	19 (59%)	5 (16%)	8 (25%)

Table 6. Influencing factors rated by scores on the agreement in the way they influence the needs assessments by home care nurses per category (darker coloured means stronger agreement on the influencing manner of the factor on needs assessment) (continued)

Category	Completed response n = 32	(Very) warranted number (%)	Neutral number (%)	(Very) unwarranted number (%)
	The team members' competencies, skills, expertise, knowledge, learning attitude, and experience.	19 (59%)	5 (16%)	8 (25%)
	The social norm within the team (think of how we do things in our team, following the leader).	7 (22%)	7 (22%)	18 (56%)
	The presence of multiple care providers of home care in the region.	4 (13%)	11 (34%)	17 (53%)
	The presence of different kinds of care providers in the region (think of care provided by municipalities, psychiatric care, and assisted living arrangements)	17 (53%)	8 (25%)	7 (22%)
	The organisation's culture.	11 (34%)	4 (13%)	17 (53%)
	The organisation of home care is centrally organised.	4 (12%)	12 (38%)	16 (50%)
	The organisation has sufficient staff available.	16 (50%)	6 (19%)	10 (31%)
	The willingness of an organisation to change.	16 (50%)	3 (9%)	13 (41%)
	The internal audits that the organisation itself carries out.	13 (41%)	4 (12%)	15 (47%)
	The external audits an organisation receives.	11 (34%)	6 (19%)	15 (47%)
	The continuity of personnel deployability or the capacity of personnel available.	13 (40%)	5 (16%)	14 (44%)
	The home care organisation is self-managing or self-organising.	8 (25%)	10 (31%)	14 (44%)

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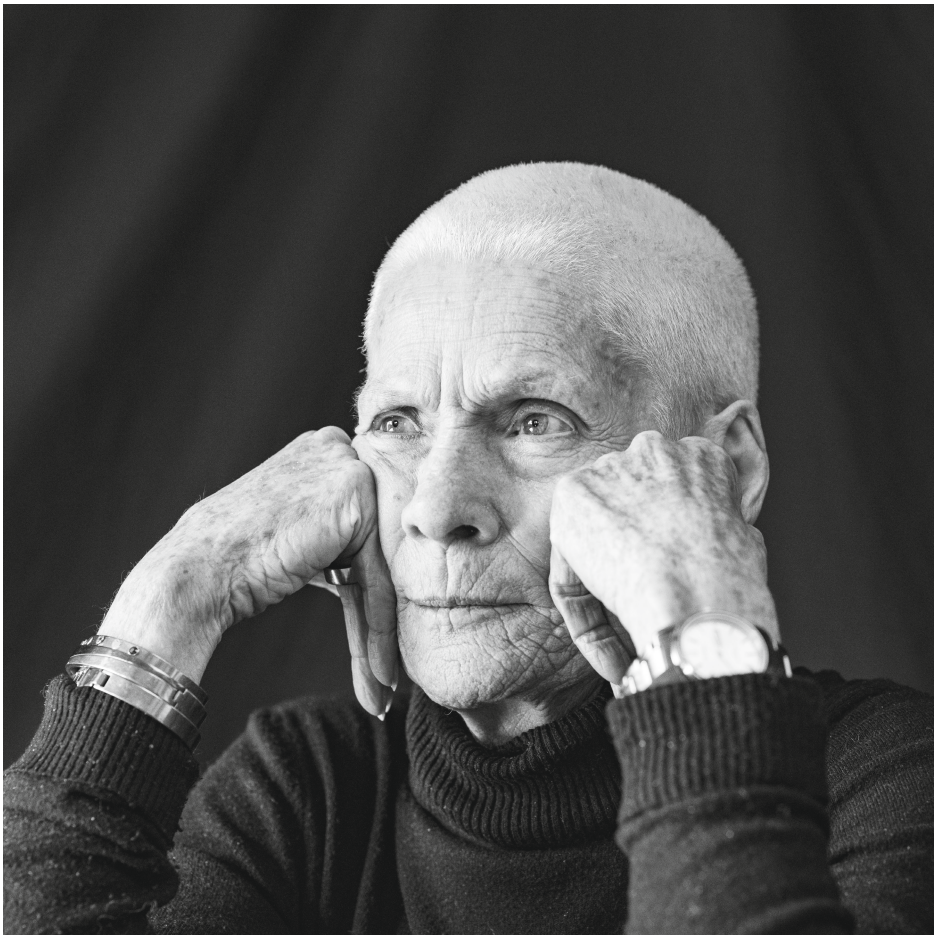

4

IS PRACTICE VARIATION DETERMINED IN THE NEEDS ASSESSMENTS PERFORMED BY DUTCH HOME CARE NURSES?

A cross-sectional multi-level analysis

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ABSTRACT

Objectives: While needs assessment is the starting point of good quality care, there is anecdotal evidence of clients receiving different care in similar circumstances. This study aims to investigate whether practice variation exists in needs assessments conducted by home care nurses and to identify the factors influencing these assessments.

Design: A cross-sectional, quantitative retrospective study.

Setting: Primary care; home care nursing in the Netherlands in 2023.

Participants: Sampling was based on criterion sampling. Home care organisations were approached based on the following inclusion criteria: organisations providing home care nursing in the Netherlands, organisations from various regions of the country and organisations offering different types of home care nursing (e.g. paediatric or palliative care), funded under the Dutch Health Insurance Act (Zvw). Organisations were excluded if they provided home care nursing funded by sources other than the Dutch Health Insurance Act. Home care nurses were recruited from participating organisations, each of whom had recently assessed the care needs of at least five clients. In total, 28 organisations and 258 home care nurses participated in this study, thereby yielding data from 1,615 clients.

Primary and secondary outcome measures: Assessed and delivered minutes of home care per client per week.

Results: Variation was primarily associated with client-related factors. After accounting for these factors, 83% (assessed minutes) and 88% (delivered minutes) of the total variation was attributed to the client level, 8% (assessed minutes) and 10% (delivered minutes) to the home care nurses' level and 9% (assessed minutes) and 2% (delivered minutes) to the organisational level. Due to inadequate documentation in electronic health records (EHRs), many missing values were identified.

Conclusions: The lack of nursing documentation suggests that missing factors may have contributed to variations in needs assessments. Thus, further research should comprehensively explore the client-related factors currently absent from nursing documentation.

Strengths and limitations of this study

- It included various types of home care organisations and nurses nationwide.

- A three-level model was employed to account for the nested nature of the data.
- However, the small number of participating organisations limited the multi-level analysis due to the COVID-19 pandemic.

*In the submitted article, the word 'patient' is used. In this and other Chapters, this term has been changed to 'client' for the purpose of this thesis.

INTRODUCTION

Across Europe, national policies focus on strengthening home care nursing to address the rising demand for care delivered in clients' homes (1). Additionally, the complexity of care needs rises with ageing due to multimorbidity issues (2). Most European countries are enhancing their primary care systems to ensure these complex problems are adequately managed (3). As care becomes more complex, providing proper, timely care is even more critical to ensure client safety, prevent worsening or complications, and prevent rising costs (4). A needs assessment is used in most European countries to legitimise access to reimbursed home care, although the organisation of these assessments varies. For instance, in Germany, an independent consultancy and assessment service conducts the needs assessment to support statutory health and care insurance providers (5). In France, a social worker or nurse assesses client needs (6), while in England, local authorities lead the process of clients (7).

In the Netherlands, home care nursing encompasses integrated nursing care, personal care, and technical nursing care to clients of all ages, short-term care, long-term care and end-of-life care under the Health Insurance Act. This care is delivered at clients' homes by professionals with varying educational backgrounds who are employed by a home care provider organisation (8): bachelor- and master-educated nurses, vocationally trained nurses and certified nursing assistants (9). Only the Bachelor- or Master-educated home care nurse acts as a gatekeeper, holding the authority and responsibility to grant clients access through the needs assessment to reimbursed home care nursing funded by health insurers. Home care nurses assess clients' needs, preferences, goals, interventions, and services needed to maintain capacity and function while clinical reasoning in the nursing process (10). During the needs assessment, home care nurses act upon client-centred care from a holistic perspective, and promote clients' self-reliance by encouraging independence and preventing unnecessary admissions to expensive care arrangements such as nursing homes or hospital care (3).

While assessing clients' needs, home care nurses decide on care plans based on their clinical decisions. In these decisions, they quantify clients' needs in terms of hours, type and duration of home care, which grants clients access to home care nursing from the Health Insurance Act (11, 12).The assessed weekly hours are estimated upfront, while insurers pay for the delivered hours per week. Although there is no standardised obligatory assessment process, the Dutch Nurses Association has developed a framework outlining the requirements that home care nurses should apply when conducting needs assessments (see textbox 1) (12). In addition, the Home Care Nurses' Area of Expertise describes the required

competencies (11). However, indications of practice variation have been observed in the Dutch home care sector (13).

Standards frameworks for assessing needs and organising home care nursing
The Dutch Nurses Association formulated the norms that the needs assessment must meet to deliver high-quality and appropriate care. The following six norms are described:

1. A needs assessment is performed based on the professional autonomy of the nurse.
2. A needs assessment is performed by a home care nurse educated in Bachelor's or Master's level of nursing.
3. A needs assessment aims to strengthen clients' self-direction and self-reliance.
4. Decision-making related to assessing needs and organising care occurs based on the nursing process.
5. Reporting and transferring information comply with the Dutch Nurses' Association guidelines.

Textbox 1: Standards framework for assessing needs and organising home care nursing (12).

Practice variation in needs assessment is defined as 'the differences in the amount, type and duration of home care indicated for clients in similar situations' (14). Client characteristics, context and preferences may cause variation but are considered warranted. (14). Research in the United States and England has already demonstrated practice variation, i.e. in the provision of nursing care based on nursing diagnoses and in the use of classification systems and tools for assessing needs (15-17). Additionally, in the Netherlands, Van Dorst et al. (2017) identified practice variation in needs assessments, revealing that clients not only received different hours of care but that home care nurses also initiated care plans based on varying nursing diagnoses for the same case (18). If practice variation is caused by factors at the home care nurse's or the organisation's level, this could harm the client because of over- or underuse of home care (19, 20). This unwarranted variation also leads to unequal access to care (14, 21). However, little is known about the extent of such variation or its causes. A recent study indicated that both client-related factors (e.g. living circumstances or lack of informal caregivers) and nurse-related factors (e.g. experience and adherence to guidelines) may contribute to this variation (14).

The present study investigated the degree of practice variation in home care nursing needs assessments. We aimed to examine whether such variation exists in home care nursing practice and to identify the factors influencing these assessments, thereby contributing to equitable access to home care nursing for clients.

METHODS

Design

A cross-sectional quantitative retrospective study was conducted. The STROBE guidelines were used to reflect and report on this study, and we used ChatGPT from OpenAI as an appropriate tool to improve our writing and shorten paragraphs.

Sample and setting

The sampling method for including participants (i.e. nurses and organisations) was primarily based on criterion sampling (22). Home care organisations were approached based on the following inclusion criteria: they must provide home care nursing in the Netherlands, operate in different parts of the country, offer various types of home care nursing (including paediatric or palliative care) and be funded under the Dutch Health Insurance Act (Zorgverzekerings Wet). Organisations were excluded if they provided home care nursing funded by sources other than the Dutch Health Insurance Act. The rationale for the number of nurses lies in the argument that a large organisation has about one hundred home care nurses. In comparison, smaller organisations have up to 10 home care nurses. Estimating that 40 organisations, with on average 20 nurses with 5-10 client cases, are included (Snijders, 2005). We aimed to include a minimum of 30–50 organisations and used the sample size information from Leyland & Groenewegen, Maas and Snijders (23-25), who state the importance of including a population big enough for multilevel analysis at the highest level. The intention was to achieve as much participation as possible at the organisational level. See Figure 1 for the recruitment process.

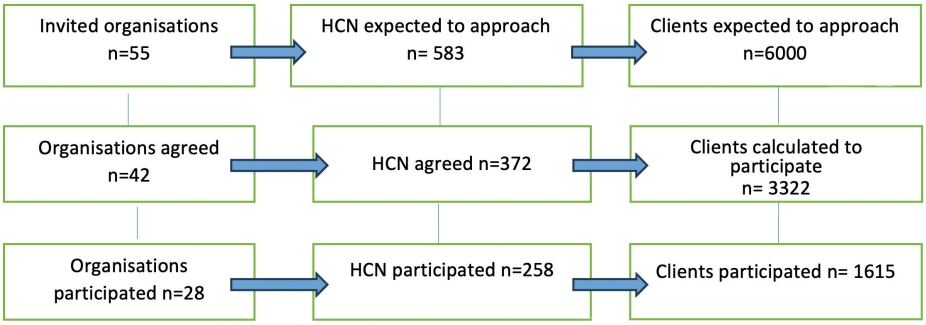

Figure 1. Flowchart of invited, agreed and participated organisations, home care nurses (HCN), and clients

Recruitment of organisations

From June 2021 to December 2022, organisations were recruited by researchers using the networks from six universities across different parts of the Association of Care Organisations, the Dutch Association of Nurses and other relevant associations. Social media, advertisements, mailings and events were used several times throughout the recruitment period to engage organisations.

Recruitment of home care nurses

After obtaining consent from the CEOs of organisations, the researchers recruited home care nurses from these organisations. Information about the study was provided to interested nurses during online gatherings and through information folders. Depending on the organisation's size, we randomly included 20–25 nurses from large organisations (with revenues exceeding 10 million Euros) and 1–10 nurses from small and medium-sized organisations (with revenues up to 1 million and 1–10 million Euros). Random number generator software was used to select nurses randomly. Organisation representatives, typically policy or quality employees knowledgeable about home care nursing, provided email addresses and acted as contact persons. A second round of random selection was conducted if home care nurses declined to participate, resulting in fewer than the predetermined number of home care nurses joining.

Recruitment of clients

The participating home care nurses were asked to inform and include at least five (preferably ten) clients for whom they had recently assessed needs (within the last six months). The organisations facilitated client recruitment, supported by the researchers. An information folder, including the informed consent form, was developed to obtain permission to collect and use data from the clients' Electronic Health Records (EHR). Additionally, an explanatory document was created to inform clients about the study and assist home care nurses in discussing research participation with their clients.

Data collection

Data were obtained from three sources: a) clients' EHRs, b) home care nurses and c) representatives of the organisations. Data from organisations and home care nurses were collected using online questionnaires implemented in Qualtrics XM software. All data were collected between August 2021 and January 2023. See the routes and forms off the data collection in Figure 2.

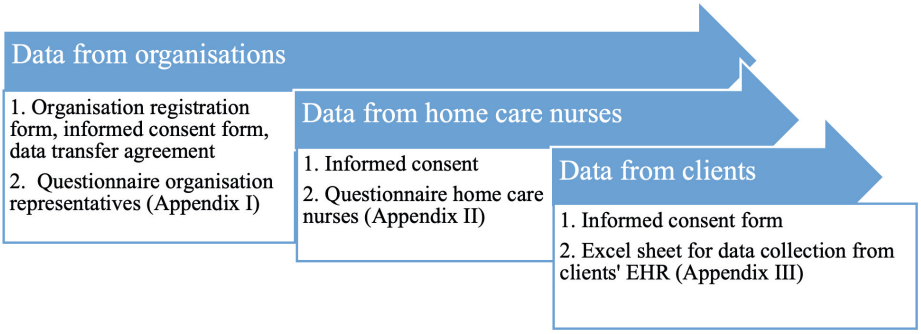

Figure 2. Routes and forms used in this study to collect informed consent and data collection

Data collection from organisations

Data from the organisations were collected in two steps. In step 1, along with obtaining the organisations' agreement through data transfer agreement forms and signed informed consent forms, information about the organisation's size, service coverage region, number of employed home care nurses, number of clients, ICT provider supporting the EHR and the classification system used in the EHRs was collected via email. For step 2, a Qualtrics questionnaire (Appendix I) was emailed to organisation representatives, mostly quality or policy officers, including questions about nurses' context-related factors (i.e. the organisation being money-driven or the insurance companies' influence; see Appendix IV) derived from earlier studies (14). Factors influencing needs assessment were found in a scoping review, an expert meeting and a Delphi study (14, 19).

Data collection from home care nurses

The questionnaire for home care nurses (Appendix II) contained questions regarding personal nurse-related factors, such as years of home care experience and adherence to nursing guidelines (Table 1). Nurses received the Qualtrics questionnaire via email and provided informed consent at the beginning of the questionnaire. They could give the answers in their own time when they preferred. Some questions were based on existing questionnaires (27).

Data collection from clients' EHR

To ensure all relevant data were included in clients' EHRs, try-out sessions involving five organisations were conducted. Following these tests, some variables were omitted from data collection due to a lack of documentation (e.g. the number of complications of a client's disease and the client's financial position). This resulted in an Excel datasheet for collecting data from clients' EHRs (see Appendix III). Five data collectors with a caregiving background (except for one) collected data from EHRs. Before data collection, one of the researchers (MS, EdV or JvD) instructed each data collector to become familiar with the organisation's EHR to enhance

uniform data extraction. organisations provided the researchers and data collectors temporary access to clients' EHRs with their permission.

VARIABLES

Variables were based on a previous study that categorised influencing factors on needs assessment into two categories concerning the client and the client's context (Appendix IV, part A) and two categories concerning the home care nurse and their context (Appendix IV, part B and part C) (14). The researchers constructed the questionnaires, using, when possible, validated tools, such as the GRAS, OCAI, and an instrument to measure clients' ADL functioning, but most variables were single questions created by the researchers (9, 26, 27).

Dependent variables

Two dependent variables derived from the client's EHR were defined to determine whether practice variation in needs assessment exists: 1) the home care nurse's *assessed* minutes of care per client per week, and 2) the home care nurse's *delivered* minutes of care per client per week.

Independent variables on the client level, the home care nurses' level and the organisation level

Appendix IV, parts A, B, and C, details all numeric and categorical variables at the client, home care nurses, and organisation levels.

DATA ANALYSIS

Due to the hierarchical structure of the nested data (clients nested within home care nurses and nurses nested within home care organisations), a three-level linear mixed-effects model was developed. Initially, univariate descriptive statistics were performed on all variables, describing numerical variables using mean and standard deviation and categorical variables using frequencies and percentages, including counts and percentages of missing values. Variables with a 4- or 5-point Likert scale were treated as continuous. Two variables (i.e. 'the number of medical and nursing diagnoses') were documented in various ways in the EHRs and were therefore excluded from the analysis.

Variables with more than 10% missing values were excluded from the analysis. Five client-level variables were excluded, including clients' capacity for self-direction, their ability to self-manage, their wishes and preferences, their living circumstances and other disciplines involved in their care. First, we explored multiple imputations to estimate the effects of these variables. However, in a three-level model of this complexity, multiple imputations were not feasible with the collected

data. Thus, we opted for a 10% cut-off to balance retaining a sufficient sample size for regression analysis while ensuring adequate coverage of influencing factors. A sensitivity analysis was performed for each dependent variable to investigate how organisations with a high average of assessed or delivered minutes of care influenced the size and significance of the independent variables' estimates.

Given the rule of thumb of ten observations per independent variable, the sample size at the organisational level was limited (28 organisations and 18 variables to test). We employed a systematic three-step procedure to determine whether a variable selection for the final model (see Appendix V). We calculated percentages of variations at different levels (clients, home care nurses and organisations). These percentages show how variation in needs assessment is distributed between the different levels. The higher the percentage at a certain level, the more variation can be attributed to that level.

Client and public involvement statement

Clients were actively involved in the development of this study. Specifically, they contributed to identifying and prioritising the important variables to include in the dataset and provided insights that informed the overall study setup. Their input ensured that the research questions and outcomes were relevant and meaningful from a client perspective. Regarding the level of participation, client involvement can be situated at the level of "advisory/consultation.

Ethical considerations

Before participant recruitment, ethical approval was obtained from METC-Z (METCZ20210171). The study was conducted in accordance with the Declaration of Helsinki in 2000 (28). Written informed consent was obtained at three levels: organisation, home care nurses, and client. A data management plan (DMP) was developed (Figure 2) to provide information on data handling and secure storage on Maastricht University's save drive. This procedure was documented in the data transfer agreements signed by Maastricht University and the organisation's representatives.

RESULTS

Figure 1 shows the three levels' recruitment, agreed-upon, and included population. The findings are presented based on the assessed and delivered minutes of care per client per week. The missing values in delivered minutes of care differ between the study populations (Appendix VI). Percentages of variation are presented at different levels (clients, home care nurses, and organisations). The results of the sensitivity analyses for each outcome measure are reported in the following paragraphs. Analysed factors and missing values of variables are reported in Appendix VI.

Assessed minutes of care per client per week

Appendix VII presents the population characteristics used to analyse variation in assessed minutes of care per client per week. Data from 964 clients, 199 home care nurses, and 25 home care organisations were included in the analysis.

Variation was observed at all three levels. In the unconditional model, 56% of the total variation in assessed minutes of care per client per week was attributed to the client level, while 23% was attributed to the home care nurses' level and 22% to the organisational level. However, after considering influencing client-related factors in the model, the variation changed across all three levels: 83% of the total variation was found at the client level, 7% at the home care nurses' level and 9% at the organisational level.

At the client level, the *client's functional status* and *palliative care needs* were significantly associated with assessed minutes of care per week (alpha = 0.01). A client more dependent on care (on a scale from independent to entirely dependent) received, on average, an additional 392 minutes of care per week for each unit increase in care dependence ($p < 0.001$). Clients with a palliative status received, on average, 2871 more minutes of care per week than clients assessed for less than three months of general care ($p < 0.001$) (see Table 1).

At the home care nurses' level, there were indications of an association (alpha = 0.05) between *knowledge and use of guidelines* and assessed minutes of care. For each unit increase in knowledge of guidelines, an average of 111 minutes less of care per week was assessed ($p = 0.044$). Conversely, clients received, on average, 91 minutes more of care per week for each unit increase in the *use of guidelines* ($p = 0.031$) (see Table 1).

At the organisational level, *working with freelancers* was significantly associated with assessed minutes per week (alpha = 0.01). In organisations that work (partially) with freelancers, an average of 601 more minutes of care per week was assessed ($p < 0.001$). No other significant variations were identified in assessed minutes of care (see Table 1).

Table 1. Analysis of assessed minutes per client per week

Parameter		Est. (SE)	p-value	95% CI
Clients' level				
Intercept		667 (581)	0.252	[-477, 1811]
Age in years		1 (2)	0.577	[-2, 4]
Functional status		392 (51)	**0.000**	[291, 493]
Follow-up assessment		17 (56)	0.760	[-93, 127]
Target care group	Less than three months in need of general care	Reference group		
	More than three months in need of general care	92 (71)	0.195	[-47, 231]
	More than three months in need of geriatric or psychiatric care	58 (92)	0.525	[-122, 238]
	In need of palliative care	2871 (129)	**0.000**	[2619, 3123]
	In need of specialised care	243 (164)	0.139	[-79, 564]
Rural residence		-8 (49)	0.871	[-105, 89]
Network is available		-38 (123)	0.758	[-279, 204]
Home care nurses' level				
Gender		-192 (123)	0.121	[-435, 51]
Age in years		3 (3)	0.318	[-3, 8]
Years of home care nursing experience		0 (3)	0.965	[-7, 6]
Bachelor's degree		-406 (284)	0.154	[-963, 152]
Trainings per year		-8 (6)	0.144	[-19, 3]
Self-reflecting abilities of nurses (GRAS score)		-6 (4)	0.137	[-14, 2]
Specialised training course		-2 (58)	0.972	[-116, 112]
Use of technologies		-83 (43)	0.057	[-168, 3]
Knowledge of guidelines		-111 (55)	**0.044**	[-218, -3]
Use of guidelines		91 (42)	**0.031**	[8, 173]
Felt freedom to assess		21 (44)	0.632	[-66, 109]
Time to assess		66 (33)	0.048	[1, 131]
Being influenced while assessing		-40 (53)	0.448	[-144, 64]
Felt responsibility		-5 (33)	0.875	[-70, 60]
Team competencies		-45 (41)	0.268	[-126, 35]
Experienced workload		-11 (37)	0.763	[-85, 62]
Professional attitude (code of conduct)		-24 (32)	0.447	[-86, 38]
Experienced workload team		80 (47)	0.088	[-12, 172]
Self-regulating team		18 (29)	0.541	[-40, 76]
Continuity in care delivery		-41 (38)	0.287	[-117, 35]
Organisation level				
Working with freelancers to assess care needs		601 (128)	**0.000**	[347, 855]

Note: p-values are based on Wald tests with Satterthwaite approximation for denominator degrees of freedom (SPSS MIXED procedure)

Sensitivity analysis

During the analysis, we noted that one organisation had a higher average of assessed minutes compared to others. Consequently, a sensitivity analysis was performed to examine the influence of that organisation. The results regarding variation related to the client's *functional status* and *palliative care needs* remained consistent ($p < 0.001$). However, the other findings were strongly influenced by that one organisation. The findings regarding *knowledge of guidelines* ($p = 0.099$) and *use of guidelines* ($p = 0.051$) did not hold in the sensitivity analysis. The variable concerning *working with freelancers to assess care needs* was not significantly associated with assessed minutes of care per week after applying a three-step approach to determine whether a variable should be selected in the final model; therefore, it was excluded from the sensitivity analysis. The sensitivity analysis results of assessed minutes are reported in Appendix VIII.

Delivered minutes of care per client per week

Appendix IX shows the characteristics of the population for delivered minutes per week. The analysis included 1,302 clients, 237 home care nurses, and 28 home care organisations.

Variation in delivered minutes per client per week occurred on all three levels. In the unconditional model without explanatory variables, 85% of the total variation was found at the client level, 8% at the home care nurses' level and 8% at the organisational level. After considering influencing client factors in the model, variation changed on all three levels: 88% was found at the client level, 10% at the home care nurses' level and 2% at the organisational level.

At the client level, *the functional status* of a client was significantly associated with delivered minutes of care (alpha = 0.01). For each unit increase in care dependence, a client received, on average, 294 more minutes of care delivered ($p < 0.001$). Additionally, the *palliative status* of a client was significantly associated with delivered minutes per week. On average, 931 additional minutes of care per week for clients with a palliative status were delivered. These results indicated (alpha = 0.05) an association between receiving *more than three months of general care* (vs less than three months) and delivered minutes of care. Those clients received, on average, 67 more minutes per week than clients who received less than three months of general care ($p = 0.035$).

At the home care nurses' level, the *age of home care nurses* was related to the minutes delivered. For each additional year of age, a client receives, on average, 3 minutes of extra care delivered ($p = 0.041$). At the organisation level, there appeared to be an indication of an association between *the perceived collaboration with other care providers in the region* and delivered care (alpha = 0.05). For each unit increase

in perceived collaboration, a client received, on average, 74 minutes less care per week delivered (p = 0.020). Furthermore, there were signs (alpha = 0.05) for an association between the *availability of home care nurses* and delivered minutes of care. For each unit increase in the *availability of home care nurses* within an organisation, a client received, on average, 74 minutes less care per week delivered (p = 0.012). Additionally, there were indications (alpha = 0.05) for an association between *the availability of care from municipalities* and delivered care. If *care from municipalities is available*, a client receives, on average, 89 minutes less care delivered (p = 0.035). Table 2 presents the analysis of delivered minutes of care.

Table 2. Analysis of delivered minutes per client per week

Parameter		Est. (SE)	p-value	95% CI
Clients' level				
Intercept		722 (324)	0.027	[84, 1361]
Age in years		0 (1)	0.761	[-2, 2]
Functional status		294 (27)	**0.000**	[241, 347]
Follow-up assessment		10 (27)	0.695	[-42, 62]
Target care group	Less than three months in need of general care	Reference group		
	More than three months in need of general care	67 (32)	**0.035**	[5, 130]
	More than three months in need of geriatric or psychiatric care	46 (43)	0.288	[-39, 131]
	In need of palliative care	931 (70)	**0.000**	[793, 1068]
	In need of specialised care	187 (83)	0.024	[24, 349]
Rural residence		-17 (27)	0.535	[-69, 36]
Network is available		-28 (68)	0.677	[-161, 105]
Home care nurses' level				
Gender		-37 (58)	0.518	[-151, 76]
Age in years		3 (1)	**0.041**	[0, 6]
Years of home care nursing experience		-3 (2)	0.088	[-7, 0]
Bachelor's degree		-209 (114)	0.068	[-434, 15]
Trainings per year		1 (3)	0.833	[-6, 7]
Self-reflecting abilities of nurses (GRAS-score)		-4 (2)	0.057	[-8, 0]
Specialised training course		-10 (34)	0.758	[-77, 56]
Use of technologies		-34 (24)	0.154	[-81, 13]
Knowledge of guidelines		24 (29)	0.410	[-34, 82]
Use of guidelines		10 (22)	0.631	[-33, 54]
Felt freedom to assess		29 (26)	0.256	[-21, 80]

Time to assess	-2 (19)	0.925	[-38, 35]
Being influenced while assessing	-35 (29)	0.234	[-93, 23]
Felt responsibility	18 (18)	0.313	[-17, 52]
Team competencies	-16 (22)	0.481	[-60, 28]
Experienced workload	-29 (21)	0.158	[-70, 11]
Professional attitude (code of conduct)	22 (17)	0.186	[-11, 54]
Experienced workload team	-33 (25)	0.196	[-83, 17]
Self-regulating team	26 (17)	0.121	[-7, 58]
Continuity in care delivery	-14 (22)	0.512	[-57, 28]
Organisation level			
Perceived collaboration with other care providers in the region.	-74 (31)	**0.020**	[-136, -12]
Availability of home care nurses	-49 (19)	**0.012**	[-87, -11]
Care from municipalities is available	-89.242 (40.571)	**0.035**	[-172, 7]

Note: p-values are based on Wald tests with Satterthwaite approximation for denominator degrees of freedom (SPSS MIXED procedure)

Sensitivity analysis

During the analysis of variation in delivered care minutes per week, two home care organisations had higher averages of delivered minutes compared to other organisations. Hence, a sensitivity analysis was performed without these two organisations. The only findings that remained robust were at the client level: *functional status* ($p < 0.001$) and the *need for palliative care* ($p < 0.001$). The other findings were significantly influenced by the two organisations. The variables *target group more than three months in need of general care* ($p = 0.053$) and *age* of home care nurses ($p = 0.070$) did not remain significantly associated with delivered minutes of care. The variables at the organisation level (*perceived collaboration with other care providers in the region* ($p = 0.020$)*, availability of home care nurses* ($p = 0.012$) and *care from municipalities is available* ($p = 0.035$)) were not significantly (alpha = 0.01) associated with delivered minutes of care per week after a three-step approach for variable selection (Appendix V) and therefore, were excluded from the analysis. The sensitivity analysis of delivered minutes is documented in Appendix X.

DISCUSSION

This study found variation in assessed and delivered minutes per client per week across the client, home care nurse and organisational levels in the unconditional model. However, significant variation was identified at the client level after incorporating potential influencing factors related to the client into the multi-level analysis. At the home care nurses' level, there were indications that the specific

nurse assessing the care may influence the outcomes. At the organisational level, variation decreased, which could be attributed to the diverse client populations served by those organisations.

Variation was observed in more care-dependent clients and those with a palliative status, who received more minutes of care per week than less care-dependent clients. This variation was considered warranted, as it reflects differences in client needs. In a previous study, we defined warranted variation as variation caused by clients' characteristics, context and preferences concerning achieving goals that are taken into account by the home care nurse in a professional, substantiated decision-making process (14). Variation can also be unwarranted when not caused by clients' characteristics, context and preferences (29) and should therefore be prevented. In this study, only warranted variation was found, which reflects that client-centred care is provided based on the uniqueness of clients and their contexts. However, as clients' needs become more complex, it is increasingly important to identify health issues promptly and ensure that clients' health concerns are recognised on time. Proper nursing documentation is therefore essential to organising client-centred care. In addition, it might be expected that a rising population of clients with multimorbidity and chronic conditions, which are conditions lasting three months or longer, would likely lead to a decrease in short-term home care needs and an increase in the number of clients requiring longer-term home care. As Holmboe et al. (30) stated, warranted variation should ideally contribute to achieving the best possible care outcomes. In this regard, it is a favourable outcome that the only significant variation lies at the client level in variables that logically influence minutes of care. The results also indicate possible variations caused by the home care nurses, which could not be evidenced, but are still a concern for the quality of home care clients receive. This study is part of a bigger program, so follow-up studies on this level are needed.

Furthermore, only two factors were found to influence the needs assessment. However, based on a previous study (14), we expected to identify more factors that may warrant or unwarranted influence the needs assessment, such as the number of nursing diagnoses, self-direction and self-management, health literacy, the wishes and preferences of a client and other disciplines involved and adjusted living circumstances (Appendix IV, part A). For instance, we expected self-direction and self-management to influence variation in needs assessments, as a high level of self-management is associated with a lower dependence on the healthcare system and reduced burden of chronic conditions (31). However, we could not test these factors due to many missing values in nursing documentation. We concluded that the documentation variation was unexpectedly inconsistent with the standards framework of the Dutch Association of Nurses (12). The researchers initiated

quantitative follow-up research because they recognised the importance of missing information on these essential client factors (Van Dorst et al., under review).

At the organisational level, we observed that more available home care nurses correlate with less care per week delivered. However, this trend was inconsistent after removing two organisations (not contracted by insurers) with extremely high averages in delivered care. A possible explanation is that organisations without insurer contracts face fewer obligations to prioritise efficiency in home care nursing. Additionally, non-contracted organisations receive only 75% of the standard hourly pay from insurers, which could affect the total hours they provide weekly. Conversely, contracted organisations are directed by insurers to limit the average number of hours per week to their clients overall. The finding that, when care from municipalities is available, a client receives, on average, less care; this can be explained by the fact that municipalities provide social care and therefore might decrease the need for personal or nursing care covered by the Health Insurance Act and receive less provision of nursing care".

The present study has some strengths. A significant strength is the inclusion of various types of home care organisations and home care nurses nationwide, which minimised the risk of systematic bias by reducing the influence of any specific organisation or region. Additionally, we used a three-level model to account for the nested nature of the data, and sensitivity analyses were conducted to test the robustness of the results. Nevertheless, the study also has limitations. Due to the recruitment procedure during the COVID-19 pandemic, many home care organisations and nurses could not participate because of staff shortages and high workloads. On the other hand, it is questionable whether including more home care organisations would have led to robust results, given the high number of missing values in nursing documentation. Due to the treatment of variables at the organisational level, we are cautious about concluding significance at this level. Furthermore, we found variation in nursing documentation in client EHRs. In addition, a myriad of information regarding client-related factors was included in the model, which had many missing values. Consequently, we could not incorporate these variables into the statistical analysis. Additionally, the documentation was not in line with the nursing process. However, this is difficult to interpret, as the absence of documentation does not necessarily indicate that the phases have not been followed. One reason for variation in documentation could be that adherence to the nursing process presents inherent challenges, as it often does not form a fundamental part of electronic nursing documentation and is not always traceable in clients' EHRs (32). Another explanation could be that in the Netherlands, home care organisations utilise different classification systems (primarily NANDA-NIC-NOC and the Omaha System) and various EHR providers (32). In conclusion, the high number of missing values complicates determining whether there is variation

in needs assessments or if the variation in documentation leads to the assumption of variation in care.

Further research

Further research should focus on the possible factors that influence client-related factors absent in nursing documentation, such as the client's ability for self-direction and self-management, their culture and living circumstances, and their wishes and preferences. This should also include exploring nurses' clinical reasoning in the nursing process. Additionally, it might be beneficial to examine the needs of home care nurses to conduct a solid needs assessment. Moreover, it might also be valuable to investigate the influence of home care organisations on the needs assessment.

CONCLUSIONS

This is the first study to investigate practice variation in assessed and delivered care time in needs assessments in home care nursing. It shows variation related to client-related factors and a lack of nursing documentation. The latter complicates determining whether variation in needs assessments is genuine or arises due to inconsistent documentation, giving the impression of variation in care. Thus, further research on possible influencing factors is essential. In clinical practice, greater emphasis should be placed on complete nursing documentation.

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APPENDICES

I. Organisation representative questionnaire
II. Home care nurse's questionnaire
III. Excel sheet for data collection from clients' Electronic Health Records
IV. Table 1 Variables on client, home care nurse and organisation level
V. Procedure for variable selection at the organisational level (three-step approach)
VI. Characteristics of the entire population and missings
VII. Characteristics of the population assessed minutes of care
VIII. Sensitivity analysis of assessed minutes
IX. Characteristics of the population delivered minutes of care
X. Sensitivity analysis of delivered minutes

Appendix I: Organisation representative questionnaire

Dear Organisation Representative, The following questionnaire contains questions about your organisation. Completing this questionnaire will take approximately 10 minutes. If you have any questions and/or comments about completing this questionnaire or the research in general, please contact the research team via Marit Schwenke (email address) or José van Dorst (email address).Thank you in advance for your contribution!	
Q1 Are there guidelines and standards available for home care nurses within your organisation? (e.g. PubMed, subscriptions to scientific journals, internal library, knowledge portal, etc.)	- Yes (1) - No (2)
Q2 To what extent does your organisation facilitate access for home care nurses to scientific evidence?	- Completely (1) - To a large extent (2) - Somewhat (3) - To a small extent (4) - Not (5)
Q3 Has your organisation described/ recorded how home care nurses are given space for their professional decision-making in its policy?	- Yes (1) - No (2)
Q4 To what extent does your organisation encourage home care nurses to use this space for professional decision-making? For example: intervision, peer review, department, nurse governance, participation in policy, different organisational structure that allow for more participation)	- Completely (1) - To a large extent (2) - Somewhat (3) - To a small extent (4) - Not (5)
Q5 Are there training opportunities for home care nurses?	- Yes (1) - No (2)
Q6 Do home care nurses receive separate training for needs assessments?	- Yes (1) - No (2)
Q7 Are further training courses regarding needs assessments mandatory?	- Yes (1) - No (2) - Not applicable (3)
Q8 Do the home care nurses have access to a training budget within the organisation?	- Yes (1) - No (2)
Q9 Are they allowed to freely spend this budget on the training of their choice?	- Yes (1) - No (2)

Appendix I: Organisation representative questionnaire (continued)

Q10 To what extent are technological tools available within your organisation? (for example: digital sign-off of medication, video calling with clients, iPad with EHR accessibility, mobile telephone with EHR accessibility, medicine dispenser, online consultation options, e-learning options)	- Completely (1) - To a large extent (2) - Somewhat (3) - To a small extent (4) - Not (5)
Q11 Is there sufficient provision of Wmo care in your area? (Consider daytime activities, short-term stays, home adjustments, etc.)	- Yes (1) - No (2)
Q12 Is there sufficient provision of mental healthcare (GGZ) in your area?	- Yes (1) - No (2)
Q13 Is there sufficient provision of WLZ care in your area? (Consider institutions, e.g. nursing or care homes, specific treatments, daytime activities, medical care, etc.)	- Yes (1) - No (2)
Q14 How do you experience the collaboration between your organisation and other parties (Wmo, GGZ, WLZ providers)?	- Very good (1) - Good (2) - Reasonable (3) - Bad (4) - Very bad (5)
Q15 To what extent does your organisation have home care nurses available to provide care?	- Completely (1) - To a large extent (2) - Somewhat (3) - To a small extent (4) - Not (5)
Q16 Have you implemented a cessation of care or (temporary) reduction in care deployment in your organisation in 2021 due to insufficient available staff?	- Yes (1) - No (2)
Q17 To what extent is your organisation focused on adapting to the needs of healthcare?	- Completely (1) - To a large extent (2) - Somewhat (3) - To a small extent (4) - Not (5)
Q18 To what extent is your organisation prepared to change?	- Completely (1) - To a large extent (2) - Somewhat (3) - To a small extent (4) - Not (5)

Appendix I: Organisation representative questionnaire (continued)

Q19 Below are six topics about organisational culture. Four statements are described for each topic. Distribute 100 points among the four statements depending on how well they describe the organisation. Do not use decimals.	
Q19a Dominant characteristics of the organisation (Distribute 100 points):	a. The organisation has a very personal character. It is a lot like a big family. The people seem to have a lot in common: _____ (1) b. The organisation is very dynamic and there is a real entrepreneurial spirit. People are willing to take risks: _____ (2) c. The organisation is strongly results-oriented. Getting the work done is the biggest concern. The people are very competitive and focused on achieving results: _____ (3) d. The organisation is tightly managed and structured. Formal procedures generally determine what people do: _____ (4)
Q19b The leadership of the organisation (Distribute 100 points):	a. The management of the organisation generally acts as a mentor, facilitating and encouraging: _____ (1) b. The management of the organisation generally displays an entrepreneurial spirit, as well as a willingness to innovate and take risks _____ (2) c. The management of the organisation generally demonstrates a no-nonsense attitude, aggressiveness and a focus on results: _____ (3) d. The organisation's leadership generally demonstrates coordinating and organising behaviour and gives the impression of a smoothly running, efficient machine: _____ (4)

Appendix I: Organisation representative questionnaire (continued)

Q19c Personnel management (Distribute 100 points):	a. The organisation's management style is characterised by teamwork, consensus and participation: _____ (1) b. The management style of the organisation is characterised by personal risk appetite, innovation, freedom and uniqueness: _____ (2) c. The organisation's management style is characterised by ruthless competence, high demands and performance orientation: _____ (3) d. The organisation's management style is characterised by job security, regulations, predictability and performance orientation: _____ (4)
Q19d The binding agent of the organisation (Distribute 100 points):	a. The glue that holds the organisation together consists of loyalty and mutual trust. Involvement in the organisation is of paramount importance: _____ (1) b. The glue that holds the organisation together is commitment to innovation and development. The emphasis is on striving to be at the forefront of the industry: _____ (2) c. The glue that holds the organisation together is an emphasis on performance and achieving objectives. Aggressiveness and winning are common themes: _____ (3) d. The glue that holds the organisation together consists of formal rules and policies. Maintaining a smoothly running organisation is important: _____ (4)

Appendix I: Organisation representative questionnaire (continued)

Q19e Strategic accents (Distribute 100 points):	a. The organisation emphasises human development. A high degree of trust, openness and participation are indispensable: _____ (1) b. The organisation emphasises tapping new sources and creating new challenges. Trying new things and looking for opportunities is appreciated: _____ (2) c. The organisation emphasises competitive behaviour and performance. Achieving ambitious goals and winning in the market play a leading role: _____ (3) d. The organisation emphasises survival and stability. Efficiency, manageability and smooth execution play a leading role: _____ (4)
Q19f Success Criteria (Distribute 100 points):	a. The organisation defines success based on human resource development, teamwork, staff involvement and care for its people: _____ (1) b. The organisation defines success as having the most unique or latest products possible. It can be considered innovative and leading when it comes to its products. : _____ (2) c. The organisation defines success as winning in the market and outperforming the competition. Competitive market leadership is central: _____ (3) d. The organisation defines success within the framework of efficiency. Reliable delivery, smooth schedules and low-cost production are critical. : _____ (4)
Q20 To what extent do you sometimes provide care even if it is not yet clear whether there is/will be an indication for care within your organisation?	- Completely (1) - To a large extent (2) - Somewhat (3) - To a small extent (4) - Not (5)
Q21 To what extent is your organisation supply-driven?	- Completely (1) - To a large extent (2) - Somewhat (3) - To a small extent (4) - Not (5)

Appendix I: Organisation representative questionnaire (continued)

Q22 To what extent does your organisation also provide care that is not mentioned in your offer?	- Completely (1) - To a large extent (2) - Somewhat (3) - To a small extent (4) - Not (5)
Q23 Does your organisation work with self-employed home care nurses for the needs assessment?	- Yes, only (1) - Yes, occasionally (2) - No (3)
Q24 To what extent are home care nurses employed in your organisation? (There are organisational forms conceivable where there is no salaried employment, for example: cooperative form, partnership of self-employed persons, mediation agency)	- All home care nurses (1) - The majority of home care nurses (2) - Half of the home care nurses (3) - The smallest part of home care nurses (4) - None of the home care nurses (5)
Q25 Are there several healthcare providers of home care nursing in your region?	- Yes (1) - No (2)
Q26 How many providers are there?	- 0–5 (1) - 6-10 (2)
Q27 To what extent is your home care organisation centrally organised?	- Completely (1) - To a large extent (2) - Somewhat (3) - To a small extent (4) - Not (5)
Q28 Are internal audits carried out in your organisation?	- Yes (1) - No (2)
Q29 What is done with the results of these audits?	- Very much (improvement measures are identified and implemented) (1) - Quite a lot (a plan is made with improvement measures) (2) - Somewhat followed up (in teams, someone is responsible for follow-up) (3) - Followed up to some extent (discussed in team meetings) (4) - Nothing at all (5)
Q30 Are external audits carried out in your organisation?	- Yes (1) - No (2)

Appendix I: Organisation representative questionnaire (continued)

Q31 What is done with the results of these audits?	- Very much (improvement measures are identified and implemented) (1) - Quite a lot (a plan is made with improvement measures) (2) - Somewhat followed up (in teams, someone is responsible for follow-up) (3) - Followed up to some extent (discussed in team meetings) (4) - Nothing at all (5)
Q32 Is peer review carried out in your organisation to improve the needs assessment?	- Yes (1) - No (2)
Q33 Does intervision take place in your organisation to improve the needs assessment?	- Yes (1) - No (2)
Q34 Is peer consultation carried out in your organisation to improve the needs assessment?	- Yes (1) - No (2)
Q35 Do you have any comments about this survey?	open

Appendix II: Home care nurses' questionnaire

Dear home care nurse, The following questionnaire contains questions about factors that may influence practice variation in the indication. We are pleased to present this to you. Completing this questionnaire will take approximately 10 minutes. If you have any questions and/or comments regarding the completion of this questionnaire or the research in general, please contact the research team via Marit Schwenke (email address) or José van Dorst (email address).Thank you in advance for your contribution!	
Q1 I declare that I am voluntarily participating in the research into practice variation indication for community nursing and I hereby agree to the use of the answers to the questions for the purpose of the research.	- Yes (1) - No (2)
Q2 What is your age?	Open
Q3 What is your gender?	- Female (1) - Male (2) - Other (3)
Q4 How many years of experience do you have in nursing?	Open
Q5 How many years of experience do you have in home care nursing?	Open
Q6 In what year did you complete your nursing training?	- Completed in... (1) - Completion planned in... (2)
Q7 What training have you completed? (Multiple answers possible)	- HBO-v completed before 2016 with MGZ exit variant (1) - HBO-v completed before 2016, other exit variant (2) - In-service training supplemented with MGZ training (3) - HBO-v completed after 2016 (4) - Completed HBO-V and supplemented with post-HBO district nursing (5) - Mbo-v (6) - Other, namely (7) - (Still in) training HBO-v (8)
Q8 I keep up with my profession and regularly attend training and/or further education.	- No (1) - Yes (2)
Q9 How many training sessions on average per year?	Open
Q10 I have followed additional education/ training to learn how to indicate. If additional training or education has been completed, please note which one was provided and by which agency.	- No (1) - Yes, namely (2)

Appendix II: Home care nurses' questionnaire (continued)

Q11 To what extent do you use the latest technologies and tools?	- Complete (1) - To a large extent (2) - Somewhat (3) - To a small extent (4) - Not (5)
Q12 To what extent are you familiar with the latest nursing guidelines and standards?	- Very familiar (1) - Familiar (2) - Neutral (3) - Unfamiliar (4) - Not familiar at all (5)
Q13 Do you use these guidelines and standards in your work?	- Always (1) - Usually (2) - Neutral (3) - Sometimes (4) - Never (5)
Q14 To what extent do you feel competent in assessing care needs in home care nursing?	- Very competent (1) - To a large extent (2) - Somewhat competent (3) - To a small extent (4) - Not competent (5)
Q15 To what extent do you feel competent in assessing PGB care needs in home care nursing?	- Very competent (1) - To a large extent (2) - Somewhat competent (3) - To a small extent (4) - Not competent (5)
Q16 To what extent do you feel free to assess the care you think clients need?	- Very free (1) - To a large extent (2) - Somewhat free (3) - To a small extent (4) - Not free (5)
Q17 Do you experience sufficient time for assessing care needs?	- Very sufficient (1) - To a large extent (2) - Somewhat (3) - To a small extent (4) - Not sufficient (5)
Q18 Do you notice that you are sometimes influenced by others when assessing care needs?	- Yes (1) - No (2)
Q19 Please indicate below who influences you when giving indications. (Multiple answers are correct)	- By clients (1) - By informal caregivers (2) - By colleagues from my team (3) - By my employer (4) - By health insurers (5) - By others, namely (6)

Appendix II: Home care nurses' questionnaire (continued)

Q20 There are now 23 statements about yourself. For each statement, indicate the extent to which you agree or disagree with the statement (GRAS): 1) I want to know why I do what I do. 2) I have insight into the emotions that influence my actions. 3) I don't like to question my own views. 4) I respond cautiously to comments about my personal performance. 5) I examine my own thinking habits. 6) I can view my own behaviour from a distance. 7) I test my judgments against those of others. 8) Others sometimes say that I overestimate myself. 9) I think it is important to know what certain rules and guidelines are based on. 10) I can empathise with people from a different cultural/religious background. 11) I take responsibility for my statements. 12) I reject thinking differently. 13) I can view an experience from different points of view. 14) I take responsibility for the statements I make. 15) I can question my own views. 16) I am aware of my limits. 17) I sometimes find myself having difficulty explaining an ethical position. 18) I am aware of cultural influences on my views. 19) I want to understand myself. 20) I am aware of the emotional charge that information can have for others. 21) I sometimes find myself having difficulty coming up with alternative solutions. 22) I can empathise with someone else's situation. 23) I have insight into the emotions that influence my thinking.	- Completely agree (1) - Agree (2) - Neutral (3) - Disagree (4) - Completely disagree (5)

Appendix II: Home care nurses' questionnaire (continued)

Q21 How do you experience the responsibility you have as a home care nurse?	- Very burdensome (1) - Highly burdensome (2) - Somewhat burdensome (3) - Low burden (4) - Not burdensome (5)
Q22 How skilled or competent do you experience the team you work with?	- Very competent (1) - Highly competent (2) - Somewhat competent (3) - Low level of competence (4) - Not competent (5)
Q23 To what extent do you experience work pressure in your work (related to the needs assessment)?	- Very high work pressure (1) - High work pressure (2) - Somewhat (3) - To a small extent (4) - No work pressure (5)
Q24 To what extent do you ever consider looking for other work due to the perceived workload?	- Very often (1) - Often (2) - Sometimes (3) - Just once (4) - Never (5)
Q25 To what extent are you familiar with the content of the Professional Code of Nurses and Caregivers (Guideline for professional conduct)?	- Very familiar (1) - To a large extent (2) - Somewhat familiar (3) - Unfamiliar (4) - Not familiar at all (5)
Q26 Do you use the contents of the Professional Code of Nurses and Caregivers document when assessing care needs?	- Always (1) - Usually (2) - Neutral (3) - Sometimes (4) - Never (5)
Q27 To what extent do you find the content of the Professional Code of Nurses and Caregivers helpful when assessing care needs?	- Very helpful (1) - Helpful (2) - Somewhat helpful (3) - Not helpful (4) - Not helpful at all (5)
Q28 Does the content of the Professional Code of Nurses and Caregivers provide you with sufficient guidance regarding professional attitudes,, attitudes and beliefs when assessing care needs?	- Very much guidance (1) - Much guidance (2) - Some guidance (3) - Low degree of guidance (4) - No guidance (5)
Q29 Complete this sentence: The perceived workload in my team is...	- Very high (1) - High (2) - Present to some extent (3) - Low (4) - Very low (5)

Appendix II: Home care nurses' questionnaire (continued)

Q30 To what extent is the team you work in self-managing?	- Completely self-managing (1) - To a large extent (2) - Somewhat self-managing (3) - To a small extent (4) - Not self-managing (5)
Q31 To what extent can you and your team provide continuity of care to clients? (Consider care at the same times, hours per week always the same, the same professionals helping a client as much as possible)	- Completely (1) - To a large extent (2) - Somewhat (3) - To a small extent (4) - Not (5)
These were the questions we wanted to ask you. If you have any additional comments, please note them below. Thank you for your cooperation in completing this questionnaire.	

Appendix III: Excel sheet for data collection from clients' Electronic Health Records

No.	Question	Answer
1	Re-assessment/initial assessment	1 = Re-assessment 2 = Initial assessment
2	Target group care	1 = < 3 months somatic 2 = > 3 months somatic 3 = > 3 months psycho-geriatric 4 = Palliative terminal 5 = Specialist care
3	How many minutes are assessed per week? (only if regular funding is relevant)	Number
4	How many minutes per week are delivered?	Number
5	How many minutes per week are planned? (during pilot new funding)	number 4 = The client is not on medication. 999 = n/a
6	What is the client's year of birth?	Number
7	How many medical diagnoses does the client have?	Number 999 = Unknown
8	How many complications from these conditions does the client have?	number 999 = Unknown
9	How many nursing diagnoses does the client have?	number 999 = Unknown
10	How many nursing diagnoses are included in the client's care plan?	number 999 = Unknown
11.1	Preparing a meal	1 = The client is independent in preparing the meal. 2 = The client requires partial assistance from third parties (e.g. encouragement, supervision or physical support) in preparing meal(s). 3 = The preparation of all meals must be fully taken over by third parties. 999 = Not described
11.2	Nutrition	1 = The client can eat and drink independently. 2 = The client requires partial assistance from third parties (e.g. encouragement, supervision or physical support) with eating and drinking. 3 = The client requires full assistance from third parties with eating and drinking. 999 = Not stated

Appendix III: Excel sheet for data collection from clients' Electronic Health Records (continued)

No.	Question	Answer
11.3	Continence	1 = The client is entirely continent, both urine and stool. 2 = The client is incontinent of urine and/or uses aids for this. 3 = The client is incontinent of defecation and/or uses aids for this. 4 = The client is incontinent of urine and faeces and/or uses aids for this. 999 = Not stated
11.4	Toilet visits	1 = The client can use the toilet, bedpan or urinal independently. 2 = The client requires partial assistance from third parties (e.g. encouragement, supervision or physical support) to use the toilet, bedpan or urinal. 3 = The client must be fully assisted by third parties to use the toilet, bedpan or urinal. 999 = Not stated
11.5	Mobility	1 = The client can stand up independently and move around without assistance. 2 = The client uses mechanical aids to get up and/or move. 3 = The client requires (possibly in addition to mechanical aids) assistance from third parties (e.g. encouragement, supervision or physical support) to get up and/or move. 999 = Not stated
11.6	Dressing	1 = The client can dress and undress independently. 2 = The client requires partial assistance from third parties (e.g. encouragement, supervision or physical support) to dress and/or undress. 3 = The client must be fully assisted by third parties to dress and undress. 999 = Not stated
11.7	Washing/showering	1 = The client washes/showers independently. 2 = The client requires partial assistance from third parties (e.g. encouragement, supervision or physical support) to wash/shower. 3 = The client must be fully assisted by third parties to wash/shower. 999 = not stated

Appendix III: Excel sheet for data collection from clients' Electronic Health Records (continued)

No.	Question	Answer
11.8	Medication use	1 = The client takes medication independently. 2 = The client requires partial assistance from third parties (e.g. preparation of medication, encouragement or supervision) when taking medication. 3 = The administration of medication must be completely taken over by third parties. 4 = The client is not on medication. 999 = Not stated
12	Are the goals aimed at encouraging self-management and self-reliance of the client and/or client system?	0 = No, 1 = Yes, 999 = Unknown
13	Does the client have the ability to manage their own health?	0 = No, 1 = Yes, 999 = Unknown
14	Does the client have preferences, wishes, and/or needs that are considered?	0 = No, 1 = Yes, 999 = Unknown
15	Does the client have a social network (think of family, friends, volunteers, acquaintances, possibly school and employer)?	0 = No, 1 = Yes, 999 = Unknown
16	Does the client's social network participate in the care plan of the EHR?	0 = No, 1 = Yes, 999 = Unknown
17	Does the social network (informal caregiver) have expectations regarding the care the client needs?	0 = No, 1 = Yes, 999 = Unknown
18	Are there other disciplines involved in the care of the client? (think of domestic help, physiotherapist, occupational therapist, supervisor, etc.)	0 = No, 1 = Yes, 999 = Unknown
19	Has the client needed care before?	0 = No, 1 = Yes, 999 = Unknown
20	Does the client have a stable financial situation?	0 = No, 1 = Yes, 999 = Unknown
21	Does the client's ethnicity or cultural background influence the care plan?	0 = No, 1 = Yes

Appendix III: Excel sheet for data collection from clients' Electronic Health Records (continued)

No.	Question	Answer
22	Has the client's living situation been adjusted?	0 = No, 1 = Yes, 999 = Unknown
23	In which region does the client live?	0 = No, 1 = Yes, 999 = Unknown
24	Did the intake take place at the client's home?	0 = No, 1 = Yes, 999 = Unknown
25	Was the intake carried out by a HBO-V trained home care nurse?	0 = No, 1 = Yes, 999 = Unknown
26	Have eHealth technologies/ tools been used by the client?	0 = No, 1 = Yes, 999 = Unknown
27	Is the capacity/burden of the client and their network monitored?	0 = No, 1 = Yes, 999 = Unknown
28	Has ANAMNESIS been applied?	0 = No, 1 = Yes, 999 = Unknown
28.1	Has DIAGNOSIS applied?	0 = No, 1 = Yes, 999 = Unknown
28.2	Have GOALS applied?	0 = No, 1 = Yes, 999 = Unknown
28.3	Have INTERVENTIONS applied?	0 = No, 1 = Yes, 999 = Unknown
28.4	Have EVALUATIONS applied?	0 = No, 1 = Yes, 999 = Unknown
28.5	Has the methodology of the nursing process been applied? TOTAL SCORE (anamnesis, diagnosis, goals, interventions, evaluations)	0 = None 1 = 1 step 2 = 2 steps 3 = 3 steps 4 = 4 steps 5 = 5 steps 999 = Not known
29	Has a PROBLEM been formulated?	0 = No, 1 = Yes, 999 = Unknown
29.1	Has ETIOLOGY formulated?	0 = No, 1 = Yes, 999 = Unknown
29.2	Have SYMPTOMS formulated?	0 = No, 1 = Yes, 999 = Unknown
29.3	Are the nursing diagnoses formulated in a PES? TOTAL SCORE	0 = No 1 = 1 letter 2 = 2 letters 3 = 3 letters 999 = Unknown
30	Has a goal been formulated?	0 = no (if no, continue with question 36) 1 = yes

Appendix III: Excel sheet for data collection from clients' Electronic Health Records (continued)

No.	Question	Answer
30.1	Is the goal **S**pecific?	0 = No, 1 = Yes, 999 = Unknown
30.2	Is the goal **M**easurable?	0 = No, 1 = Yes, 999 = Unknown
30.3	Is the goal **A**cceptable?	0 = No, 1 = Yes, 999 = Unknown
30.4	Is the goal **R**ealistic?	0 = No, 1 = Yes, 999 = Unknown
30.5	Is the goal **T**ime-bound?	0 = No, 1 = Yes, 999 = Unknown
30.6	Are the goals formulated as SMART in the file? TOTAL SCORE	0 = No SMART 1 = 1 item 2 = 2 items 3 = 3 items 4 = 4 items 5 = 5 items 999 = unknown
31	Is it clearly described in the care plan who does what, when and, if necessary, how?	0 = No, 1 = Yes, 999 = Unknown
32	Is the reporting aimed at achieving goals?	0 = No, 1 = Yes, 999 = Unknown
33	Is the care regularly evaluated?	0 = No, 1 = Yes, 999 = Unknown
34	Is more frequent evaluation planned for unstable care?	0 = No, 1 = Yes, 999 = Unknown
35	Have the goals been evaluated in the assessment with the client?	0 = No, 1 = Yes, 999 = Unknown
36	Will the care plan be modified based on the outcome of the evaluation?	0 = No, 1 = Yes, 999 = Unknown
37	Is there information from (previously) involved healthcare professionals in the EHR?	0 = No, 1 = Yes, 999 = Unknown
38	Has the client (and/or their network) permitted the request for data from other healthcare providers?	0 = No, 1 = Yes, 999 = Unknown
39	Is there a transfer form available in the EHR for the client to use if necessary?	0 = No, 1 = Yes, 999 = Unknown

Appendix IV: Variables on client, home care nurse and organisation level

Part A. Client level	Variable name	Answering options in Excel sheet for clients' Electronic Health Record
What is the year of birth?	Age in years	Number
What is the client's functional status?	Functional status (9)	For items 1–7: Four answering options: Self-supportive, partly in need of support, fully depending on support, unknown
	1. Meal preparing abilities	
	2. Eating and drinking abilities	
	3. Visiting bathroom	
	4. Mobility	
	5. Dressing	
	6. Washing	
	7. Medication-use	
	8. Continence of urine and/ or faeces	For Item 8: Five answering options: Fully continent, incontinent of urine, incontinent of faeces, incontinent of urine and faeces, unknown
Kind of assessment?	Kind of assessment	First assessment
		Follow-up assessment
What target care group does the client belong to?	Target care group	Less than three months in need of general care
		More than three months in need of general care
		More than three months in need of geriatric or psychiatric care
		In need of palliative care
		In need of specialised care
What is the client's region of living?	Living region	Non-rural
		Rural
Is there a network available?	Network is available	No
		Yes
		Unknown

Appendix IV: Variables on client, home care nurse and organisation level (continued)

Is the capacity of clients' self-direction accounted for?	Capacity for self-direction is present	No
		Yes
		Unknown
Is the client's capability to take care of his/her health accounted for?	Ability for self-management	No
		Yes
		Unknown
Are wishes and preferences accounted for?	Wishes and preferences are described in the EHR	No
		Yes
		Unknown
Are living circumstances accounted for?	Living circumstances are described in the EHR	No
		Yes
		Unknown
Are other disciplines accounted for?	Other disciplines are involved in care	No
		Yes
		Unknown

* Average functional status was calculated from seven out of eight questions about meal preparation, eating and drinking, bathroom visits, mobility, dressing, washing and medication use (Verhoeven et al., 2022). Continence-related functional status was not included due to its lack of an ordinal measurement level. Before averaging, a reliability analysis confirmed consistency (Cronbach's alpha: 0.84), allowing the combination of separate questions into a single functional status score. If six or seven questions contained missing values, the average functional status score was deemed missing

Appendix IV: Variables on client, home care nurse and organisation level (continued)

Part B. Level of the home care nurse	Variable name	Answering options in Qualtrics questionnaire for home care nurses
What is your gender?	Gender	Women
		Men
		Prefer not to say
What is your age?	Age in years	Number
How many years of home care nursing experience do you have?	Years of home care nursing experience	Number
Do you have a Bachelor's degree?	Bachelor's degree	No Yes
*Do you keep up with the nursing profession?	Trainings per year	Number
Groningen reflective ability scale questionnaire	Self-reflecting abilities of nurses (GRAS score)	Number
Did you follow a specialised training course for assessing clients' needs?	Specialised training course	No Yes
*While assessing, do you make use of technological care support tools?	Use of technologies	Not
		To a small extent
		Somewhat
		To a great extent
		Fully
Do you know the guidelines concerning needs assessment?	Knowledge of guidelines	No knowledge
		Little knowledge
		Somewhat
		Knowledge
		Fully knowledgeable
Do you make use of guidelines while assessing the needs of clients?	Use of guidelines	Not
		To a small extent
		Somewhat
		To a great extent
		Fully

Appendix IV: Variables on client, home care nurse and organisation level (continued)

*Do you feel free to assess whatever clients need?	Felt freedom to assess	Not
		To a small extent
		Somewhat
		To a great extent
		Fully
*Do you have enough time to assess clients' needs properly?	Time to assess	Not
		To a small extent
		Somewhat
		To a great extent
		Fully
Do you feel influenced by others while assessing the needs of clients?	Being influenced while assessing	No
		Yes
How would you describe your felt responsibility towards assessing the needs of clients?	Felt responsibility	Not
		To a small extent
		Somewhat
		To a great extent
		Fully
How do you experience the competencies of the team workers?	Team competencies	Not
		To a small extent
		Somewhat
		To a great extent
		Fully competent
How do you experience your workload?	Experienced workload	Not
		To a small extent
		Somewhat
		To a great extent
		Fully
Do you use the code of conduct while assessing clients' needs?	Professional attitude (code of conduct use)	Not
		To a small extent
		Somewhat
		To a great extent
		Fully

Appendix IV: Variables on client, home care nurse and organisation level (continued)

How would you rate the workload experienced by the team you work with?	Experienced workload team	Very low
		Low
		To some extent
		High
		Very high
*Is your team self-regulating in caring for clients?	Self-regulating team	Not
		To a small extent
		Somewhat
		To a great extent
		Fully
*Was there a client waiting list necessary during 2021?	Continuity in care delivery	Not
		To a small extent
		Somewhat
		To a great extent
		Fully

*Several questions were asked in the questionnaires of home care nurses and organisation representatives. For the analysis, we left out the variables on the organisational level to retain a sufficient sample size for the regression analysis and have sufficient coverage of influencing factors.

Appendix IV: Variables on client, home care nurse and organisation level (continued)

Part C. Level of the organisation	Home care organisations variable name	Answering options in Qualtrics questionnaire for organisation representatives
What is the size of the organisation?	Size of the organisation	Up to 1 million Euro revenues yearly
		1–10 million revenues
		10 million and more revenues
In what part of the country are you working?	Working region of the Netherlands	North
		Mid
		South
		More than one region
What classification system is used in the EHR?	Classification system	Omaha
		Nanda-Nic-Noc
		Other or more than one system
Do you work with freelancers to assess the needs of clients?	Working with freelancers to assess care needs	No
		Yes/yes, partially
*Do you provide space for professionals to decide on the needs of clients?	Space for professional decision-making	No
		Yes
In what way is decision-making supported in the organisation?		Intervision
		Peer review
		Intercollegial consultation
Are there more home care organisations working in the region?	Number of home care organisations in the region	0–5 organisations
		6–10 organisations
Do municipalities in the region provide another kind of care?	Care from municipalities is available	No
		Yes
Is psychiatric care provided for in the region?	Psychiatric care is available	No
		Yes

Appendix IV: Variables on client, home care nurse and organisation level (continued)

Are nursing homes present in the region?	Nursing care home is available	No
		Yes
How would you rate the collaboration with providers of different kinds of care?	Perceived collaboration with other care providers in the region.	Very bad
		Bad
		Somewhat
		Good
		Very good
Do you have enough home care nurses available?	Availability of home care nurses	Not
		To a small extent
		Somewhat
		To a great extent
		Fully
Was there a client waiting list necessary during 2021?	Had a waiting list for client care delivery in 2021	No
		Yes
To what extent is the organisation prepared to deliver care that is not mentioned in what you usually offer?	Supply-driven organisation	Not
		To a small extent
		Somewhat
		To a great extent
		Fully
To what extent is your organisation prepared to deliver care that the home care nurse has not yet accounted for?	Delivering care without legitimisation	Not
		To a small extent
		Somewhat
		To a great extent
		Fully

Variables. Part A: Questions concerning the client- and client context-related factors are displayed, the variable name is in the second column, and answering options are in the third column. Part B: Questions about home care nurse-related factors, the variable names and answering options in the questionnaire. Part C: Questions, variable names and answering options in the organisation-representative questionnaire

Appendix V: Procedure for variable selection at the organisational level (three-step approach)

For each dependent variable, we followed a three-step approach:

1. Initial screening: For each variable at the organisational level, a three-level linear mixed-effects model was executed. This model incorporated all independent variables at the client and nurse levels and the single variable at the organisational level under consideration. Using an alpha of 0.1, organisational-level variables significantly associated with the dependent variable were identified. The researchers opted for a higher alpha to minimise the risk of overlooking relevant variables (false negatives).
2. Secondary screening: All variables at the client and nurse levels, along with all significant variables from step 1, were again included. Each remaining variable at the organisational level was reintroduced one at a time to that model. Using an alpha of 0.05, significant variables were identified after adjusting for confounders, even if they were not significant in the initial screening.
3. Final model: The final three-level model was constructed with all client and nurse variables and selected organisational-level variables deemed significant in both previous steps. An alpha of 0.01 was used to determine conclusive findings. p-values between 0.01 and 0.05 were reported as potential, albeit uncertain, associations.

Appendix VI: Characteristics of the entire population and missings

Clients' level (N = 1615)			
Parameter		n (%) / mean (± sd)	Missing values n (%)
Age in years		77.9 (±13.1)	8 (0.5)
Functional status		1.7 (± 0.5)	40 (2.5)
Follow-up assessment		1208 (74.8)	11 (0.7)
Target care group	Less than three months in need of general care	226 (14.0)	21 (1.3)
	More than three months in need of general care	1122 (69.5)	
	More than three months in need of geriatric or psychiatric care	153 (9.5)	
	In need of palliative care	57 (3.5)	
	In need of specialised care	36 (2.2)	
Rural residence		669 (41.4)	0
Network is available		1573 (97.4)	89 (5.5)
Capacity for self-direction is present		948 (58.7)	**231 (14.3)**
Health literacy is present		1113 (68.9)	**723 (44.8)**
Wishes and preferences are described in EHR		1324 (82)	**483 (29.9)**
Living circumstances are described in EHR		984 (60.9)	**412 (25.5)**
Other disciplines are involved in care		1335 (91)	148 (9.2)
Home care nurses' level (N = 258)			
Parameter		n (%) / mean (± sd)	Missing values n (%)
Gender	Women	245 (95)	4 (1.5)
	Men	13 (5)	
Age in years		39.6 (±12.6)	4 (1.5)
Years of home care nursing experience		10.6 (±9.1)	4 (1.5)
Bachelor's degree		254 (98.8)	5 (1.9)
Trainings per year		4.82 (±4.06)	15 (5.7)
Self-reflecting abilities of nurses (GRAS-score)		93 (±6.8)	8 (3.1)
Specialised training course		198 (77)	6 (2.3)

Appendix VI: Characteristics of the entire population and missings (continued)

Use of technologies	Not	0	6 (2.3)
	To a small extent	11 (4.3)	
	Somewhat	127 (49.6)	
	To a great extent	106 (41.4)	
	fully	12 (4.7)	
Knowledge of guidelines	No knowledge	0	6 (2.3)
	Little knowledge	4 (1.6)	
	Somewhat	53 (20.7)	
	Knowledge	184 (71.5)	
	Fully knowledgeable	16 (6.3)	
Use of guidelines	Not	0	6 (2.3)
	To a small extent	15 (5.9)	
	Somewhat	47 (18.4)	
	To a great extent	161 (62.5)	
	Fully	34 (13.3)	
Felt freedom to assess	Not	0	7 (2.7)
	To a small extent	2 (0.8)	
	Somewhat	17 (6.7)	
	To a great extent	132 (51.8)	
	Fully	105 (40.8)	
Time to assess	Not	1 (0.4)	7 (2.7)
	To a small extent	10 (3.9)	
	Somewhat	66 (25.5)	
	To a great extent	117 (45.5)	
	Fully	64 (24.7)	
Being influenced while assessing		164 (63.5)	7 (2.7)
Felt responsibility	Not burdensome	12 (4.7)	9 (3.4)
	To a small extent burdensome	45 (17.4)	
	Somewhat	121 (47)	
	To a great extent burdensome	75 (28.9)	
	Fully burdensome	5 (2)	
Team competencies	Not competent	0	9 (3.4)
	To a small extent competent	8 (3.2)	
	Somewhat	89 (34.4)	
	To a great extent competent	145 (56.1)	
	Fully competent	16 (6.3)	

Appendix VI: Characteristics of the entire population and missings (continued)

Experienced workload	No experienced workload	4 (1.6)	9 (3.4)
	Small experienced workload	27 (10.3)	
	Somewhat	110 (42.7)	
	Heavy experienced workload	97 (37.5)	
	Very heavy experienced workload	20 (7.9)	
Professional attitude (code of conduct use)	Not	14 (5.5)	9 (3.4)
	To a small extent	25 (9.5)	
	Somewhat	130 (50.2)	
	To a great extent	85 (32.8)	
	Fully	5 (2)	
Experienced workload team	Very low	0	9 (3.4)
	Low	5 (2)	
	To some extent	75 (28.9)	
	High	153 (59.3)	
	Very high	26 (9.9)	
Self-regulating team	Not	5 (2)	9 (3.4)
	To a small extent	36 (13.8)	
	Somewhat	85 (32.8)	
	To a great extent	108 (41.9)	
	Fully	25 (9.5)	
Continuity in care delivery	Not	2 (0.8)	9 (3.4)
	To a small extent	31 (11.9)	
	Somewhat	116 (45.1)	
	To a great extent	104 (40.3)	
	Fully	5 (2)	
Organisation level (N=28)			
Parameter		n (%) / mean (±sd)	
Large organisations		18 (64.3)	
Working in the province of The Netherlands	North	9 (32.1)	
	Midlands	7 (25)	
	South	10 (35.7)	
	More than one province	2 (7.1)	
Classification system	Omaha	18 (64.3)	
	Nanda-NIC-NOC	6 (21.4)	
	Other or more than one system	4 (14.3)	

Appendix VI: Characteristics of the entire population and missings (continued)

Working with freelancers to assess care needs	No	24 (85.7)
	Yes/ yes, partially	4 (14.3)
Number of home care organisations in region	0–5	4 (14.3)
	6–10	24 (85.7)
Space for professional decision-making	Yes	17 (60.7)
	No	11 (39.3)
	Intervision	14 (50)
	Peer review	23 (82.1)
	Intercollegial consultation	17 (60.7)
Care from municipalities is available		23 (82.1)
Psychiatric care is available		17 (60.7)
Nursing care home is available		24 (85.7)
Perceived collaboration with other care providers in the region.	Very bad	0
	Bad	1 (3.6)
	Somewhat	12 (42.9)
	Good	14 (50)
	Very good	1 (3.6)
Availability of home care nurses	Not	1 (3.6)
	To a small extent	0
	Somewhat	8 (28.6)
	To a great extent	12 (42.9)
	Fully	7 (25)
Had a waiting list for client care delivery in 2021		19 (67.9)
Supply-driven organisation	Not	1 (3.6)
	To a small extent	5 (17.9)
	Somewhat	17 (60.7)
	To a great extent	4 (14.3)
	Fully	1 (3.6)
Delivering care without legitimisation	Not	0
	To a small extent	11 (39.3)
	Somewhat	8 (28.6)
	To a great extent	8 (28.6)
	Fully	1 (3.6)

Appendix VII: Characteristics of the population assessed minutes of care

Parameter		**n (%) / mean (± sd)**
Clients' level (N = 964)		
Age in years		77.9 (±13.8)
Functional status		1.7 (±0.4)
Follow-up assessment		778 (80.7)
Target care group	Less than three months in need of general care	96 (9.9)
	More than three months in need of general care	711 (73.8)
	More than three months in need of geriatric or psychiatric care	92 (9.5)
	In need of palliative care	42 (4.4)
	In need of specialised care	23 (2.4)
Rural residence (yes)		936 (97.1)
Network is available (yes)		467 (48.4)
Capacity for self-direction is present (yes)		556 (57.7)
Health literacy is described in EHR (yes)		660 (68.5)
Wishes and preferences are described in EHR (yes)		796 (82.6)
Living circumstances are described in EHR (yes)		594 (61.6)
Other disciplines are involved in care (yes)		893 (92.6)
Home care nurses' level (N=199)		
Gender	Women	189 (95.0)
	Men	10 (5.0)
Age in years		38.5 (±12.3)
Years of home care nursing experience		10.3 (± 9.1)
Bachelor's degree (yes)		197 (99)
Trainings per year		5 (±4.3)
Self-reflecting abilities of nurses (GRAS score)		93 (± 6.8)
Specialised training course		146 (73.4)
Use of technologies	Not	0
	To a small extent	9 (4.5)
	Somewhat	101 (50.8)
	To a great extent	83 (41.7)
	Fully	6 (3)

Appendix VII: Characteristics of the population assessed minutes of care (continued)

Parameter		**n (%) / mean (± sd)**
Knowledge of guidelines	No knowledge	0
	Little knowledge	2 (1)
	Somewhat	38 (19.1)
	Knowledge	144 (72.4)
	Fully knowledge	15 (7.5)
Use of guidelines	Not	0
	To a small extent	13 (6.5)
	Somewhat	32 (16.1)
	To a great extent	131 (65.8)
	Fully	23 (11.6)
Felt freedom to assess	Not	0
	To a small extent	2 (1)
	Somewhat	14 (7)
	To a great extent	109 (54.8)
	Fully	74 (37.2)
Time to assess	Not	1 (0.5)
	To a small extent	8 (4.0)
	Somewhat	50 (25.1)
	To a great extent	93 (46.7)
	Fully	47 (23.6)
Being influenced while assessing (yes)		127 (63.7)
Felt responsibility	Not	9 (4.5)
	To a small extent	36 (18.1)
	Somewhat	92 (46.2)
	To a great extent	58 (29.1)
	Fully	4 (2)
Team competencies	Not competent	0
	To a small extent	7 (3.5)
	Somewhat	68 (34.2)
	To a great extent	113 (56.8)
	Fully	11 (5.5)

Appendix VII: Characteristics of the population assessed minutes of care (continued)

Parameter		**n (%) / mean (± sd)**
Experienced workload	Not	4 (2)
	To a small extent	22 (11.1)
	Somewhat	86 (43.2)
	To a great extent	70 (35.2)
	Fully extent	17 (8.5)
Professional attitude (code of conduct use)	Not	11 (5.5)
	To a small extent	16 (8)
	Somewhat	103 (51.8)
	To a great extent	64 (32.2)
	Fully	5 (2.5)
Experienced workload team	Very low	0
	Low	4 (2.0)
	To some extent	56 (28.1)
	High	120 (60.3)
	Very high	19 (9.5)
Self-regulating team	Not	5 (2.5)
	To a small extent	32 (16.1)
	Somewhat	64 (32.2)
	To a great extent	80 (40.2)
	Fully	18 (9)
Continuity in care delivery	Not	2 (1)
	To a small extent	23 (11.6)
	Somewhat	87 (43.7)
	To a great extent	84 (42.2)
	Fully	3 (1.5)
Organisation level (N = 26)		
Large organisations		16 (61.5)
Working region of The Netherlands	North	9 (34.6)
	Mid	6 (23.1)
	South	9 (34.6)
	More than one region	2 (7.7)
Classification system	Omaha	18 (69.2)
	Nanda-Nic-Noc	4 (15.4)
	Other or more than one system	4 (15.4)

Appendix VII: Characteristics of the population assessed minutes of care (continued)

Parameter		**n (%) / mean (± sd)**
Working with freelancers to assess care needs	No	23 (88.5)
	Yes/ yes, partially	3 (11.5)
Space for professional decision-making	Yes	17 (60.7)
	No	11 (39.3)
	Intervision	13 (50)
	Peer review	21 (80.8)
	Intercollegial consultation	15 (57.7)
Number of home care organisations in the region	0–5	3 (11.5)
	6–10	23 (88.5)
Care from municipalities is available		22 (84.6)
Psychiatric care is available		16 (61.5)
Nursing care home is available		23 (88.5)
Perceived collaboration with other care providers in the region	Very bad	0
	Bad	1 (3.8)
	Somewhat	12 (46.2)
	Good	12 (46.2)
	Very good	1 (3.8)
Availability of home care nurses	Not	1 (3.8)
	To a small extent	0
	Somewhat	7 (26.9)
	To a great extent	12 (46.2)
	Fully	6 (23.1)
Had a waiting list for client care delivery in 2021 (yes)		17 (65.4)
Supply-driven organisation	Not	1 (3.8)
	To a small extent	5 (19.2)
	Somewhat	15 (57.7)
	To a great extent	4 (15.4)
	Fully	1 (3.8)
Delivering care without legitimisation	Not	0
	To a small extent	10 (38.5)
	Somewhat	7 (26.9)
	To a great extent	8 (30.8)
	Fully	1 (3.8)

Appendix VIII: Sensitivity analysis of assessed minutes

Clients' level				
Parameter		**Est. (SE)**	**p-value**	**95% CI**
Intercept		125 (562)	0.824	[-980, 1231]
Age in years		0 (2)	0.963	[-3, 3]
Functional status		369 (51)	**0.000**	[270, 469]
Follow-up assessment		26 (55)	0.636	[-82, 134]
Target care group	less than three months in need of general care	Reference group		
	More than three months in need of general care	78 (69)	0.263	[-58, 214]
	More than three months in need of geriatric or psychiatric care	36 (90)	0.692	[-141, 212]
	In need of palliative care	2521 (136)	**0.000**	[2255, 2787]
	In need of specialised care	308 (161)	0.056	[-8, 624]
Rural residence		-22 (47)	0.641	[-115, 71]
Network is available		-26 (129)	0.843	[-279, 228]
Home care nurses' level				
Gender		-144 (115)	0.213	[-371, 83]
Age in years		2 (2)	0.329	[-2, 7]
Years of home care nursing experience		1 (3)	0.778	[-5, 7]
Bachelor's degree		-418 (266)	0.118	[-942, 106]
Trainings per year		-4 (5)	0.452	[-14, 6]
Self-reflecting abilities of nurses (GRAS score)		-5 (4)	0.151	[-13, 2]
Specialised training course		4 (53)	0.935	[-100, 109]
Use of technologies		-32 (41)	0.440	[-113, 49]
Knowledge of guidelines		-86 (52)	0.099	[-188, 16]
Use of guidelines		77 (39)	0.051	[0, 155]
Felt freedom to assess		38 (42)	0.360	[-44, 121]
Time to assess		72 (32)	**0.025**	[9, 136]
Being influenced while assessing		-43 (50)	0.392	[-140, 55]
Felt responsibility		21 (30)	0.478	[-38, 81]
Team competencies		-22 (39)	0.573	[-98, 54]
Experienced workload		-6 (35)	0.860	[-76, 63]
Professional attitude (code of conduct)		-10 (30)	0.741	[-69, 49]
Experienced workload team		66 (44)	0.139	[-21, 153]
Self-regulating team		24 (27)	0.381	[-30, 78]
Continuity in care delivery		-38 (36)	0.295	[-109, 33]
Organisation level				
Intervision in organisation		91 (53)	0.096	[-17, 198]

Note: p-values are based on Wald tests with Satterthwaite approximation for denominator degrees of freedom (SPSS MIXED procedure)

Appendix IX: Characteristics of the population delivered minutes of care

Parameter		n (%) / mean (± sd)
Clients' level (N = 1302)		
Age in years		78.3 (± 13.1)
Functional status		1.6 (± 0.4)
Follow-up assessment		988 (75.9)
Target care group	Less than three months in need of general care	199 (13.6)
	More than three months in need of general care	910 (69.9)
	More than three months in need of geriatric or psychiatric care	134 (10.3)
	In need of palliative care	51 (3.9)
	In need of specialised care	30 (2.3)
Rural residence		1271 (97.6)
Network is available		586 (45.0)
Capacity for self-direction is present		755 (58.0)
Self-management is present		887 (68.1)
Wishes and preferences are described in EHR		1104 (84.8)
Living circumstances are described in EHR		833 (64.0)
Other disciplines are involved in care		1199 (92.1)
Home care nurses' level (N = 237)		
Gender	Women	224 (94.5)
	Men	13 (5.5)
Age in years		39.5 (± 12.6)
Years of home care nursing experience		10.1 (± 9.3)
Bachelor's degree		236 (99.7)
Trainings per year		4.8 (± 4.1)
Self-reflecting abilities of nurses (GRAS score)		93.2 (± 6.9)
Specialised training course		184 (77.6)
Use of technologies	Not	0
	To a small extent	10 (4.2)
	Somewhat	114 (48.1)
	To a great extent	102 (43.0)
	Fully	11 (4.6)
Knowledge of guidelines	No knowledge	0
	Little knowledge	2 (0.8)
	Somewhat	48 (20.3)
	Knowledge	171 (72.2)
	Fully knowledgeable	16 (6.8)

Appendix IX: Characteristics of the population delivered minutes of care (continued)

Parameter		n (%) / mean (± sd)
Use of guidelines	Not	0
	To a small extent	13 (5.5)
	Somewhat	42 (17.1)
	To a great extent	151 (63.7)
	Fully	31 (13.1)
Felt freedom to assess	Not	0
	To a small extent	2 (0.8)
	Somewhat	15 (6.3)
	To a great extent	124 (52.3)
	Fully	96 (40.5)
Time to assess	Not	1 (0.4)
	To a small extent	10 (4.2)
	Somewhat	59 (24.9)
	To a great extent	110 (46.4)
	Fully	57 (24.1)
Being influenced while assessing		151 (63.7)
Felt responsibility	Not	12 (5.1)
	To a small extent	42 (17.7)
	Somewhat	111 (46.8)
	To a great extent	68 (28.7)
	Fully	4 (1.7)
Team competencies	Not competent	0
	To a small extent	7 (3.0)
	Somewhat	82 (34.6)
	To a great extent	133 (56.1)
	Fully	15 (6.3)
Experienced workload	Not	4 (1.7)
	To a small extent	24 (10.1)
	Somewhat	102 (43.0)
	To a great extent	87 (36.7)
	Fully extent	20 (8.4)
Professional attitude (code of conduct use)	Not	14 (5.9)
	To a small extent	22 (9.3)
	Somewhat	118 (49.8)
	To a great extent	78 (32.9)
	Fully	5 (2.1)

Appendix IX: Characteristics of the population delivered minutes of care (continued)

Parameter		n (%) / mean (± sd)
Experienced workload team	Very low	0
	Low	5 (2.1)
	To some extent	67 (28.3)
	High	143 (60.3)
	Very high	22 (9.3)
Self-regulating team	Not	5 (2.1)
	To a small extent	33 (13.9)
	Somewhat	75 (31.6)
	To a great extent	101 (42.6)
	Fully	23 (9.7)
Continuity in care delivery	Not	2 (0.8)
	To a small extent	25 (10.5)
	Somewhat	107 (45.1)
	To a great extent	98 (41.4)
	Fully	5 (2.1)
Organisation level (N = 28)		
Large organisations		18 (64.3)
Working region of the Netherlands	North	9 (32.1)
	Mid	7 (25.0)
	South	10 (35.7)
	More than one region	2 (7.1)
Classification system	Omaha	18 (64.3)
	Nanda-Nic-Noc	6 (21.4)
	Other or more than one system	4 (14.3)
Working with freelancers to assess care needs	No	24 (85.7)
	Yes/ yes, partially	4 (14.3)
Space for professional decision-making	Yes	17 (60.7)
	No	11 (39.3)
	Intervision	14 (50.0)
	Peer review	23 (82.1)
	Intercollegial consultation	17 (60.7)
Number of home care organisations in the region	0–5	4 (14.3)
	6–10	24 (85.7)
Care from municipalities is available (yes)		23 (82.1)
Psychiatric care is available (yes)		17 (60.7)

Appendix IX: Characteristics of the population delivered minutes of care (continued)

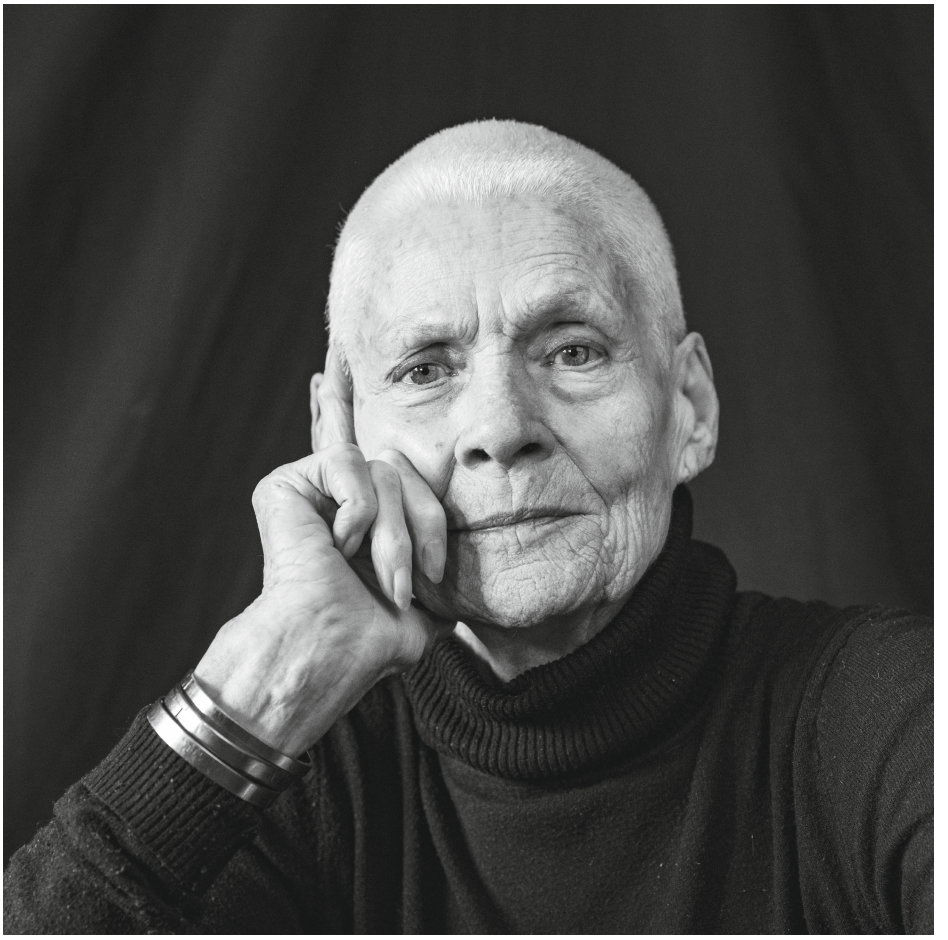
Parameter		n (%) / mean (± sd)
Nursing care home is available (yes)		24 (85.7)
Perceived collaboration with other care providers in the region.	Very bad	0
	Bad	1 (3.6)
	Somewhat	12 (42.9)
	Good	14 (50.0)
	Very good	1 (3.6)
Availability of home care nurses	Not	1 (3.6)
	To a small extent	0
	Somewhat	8 (28.6)
	To a great extent	12 (42.9)
	Fully	7 (25.0)
Had a waiting list for client care delivery in 2021		19 (67.9)
Supply-driven organisation	Not	1 (3.6)
	To a small extent	5 (17.9)
	Somewhat	17 (60.7)
	To a great extent	4 (14.3)
	Fully	1 (3.6)
Delivering care without legitimisation	Not	0
	To a small extent	11 (39.3)
	Somewhat	8 (28.6)
	To a great extent	8 (28.6)
	Fully	1 (3.6)

Appendix X: Sensitivity analysis of delivered minutes

Parameter		Est. (SE)	p-value	95% CI
Clients' level				
Intercept		197 (306)	0.521	[-405, 798]
Age in years		0 (1)	0.954	[-2, 2]
Functional status		290 (27)	**0.000**	[237, 343]
Follow-up assessment		4 (27)	0.893	[-49, 56]
Target care group	Less than three months in need of general care	Reference group		
	More than three months in need of general care	62 (32)	0.053	[-1, 125]
	More than three months in need of geriatric or psychiatric care	47 (43)	0.280	[-38, 132]
	In need of palliative care	921 (70)	**0.000**	[784, 1059]
	In need of specialised care	232 (82)	**0.004**	[72, 392]
Rural residence		-31 (27)	0.245	[-84, 21]
Network is available		-3 (68)	0.970	[-136, 131]
Home care nurses' level				
Gender		-48 (58)	0.408	[-163, 67]
Age in years		3 (1)	0.070	[0, 5]
Years of home care nursing experience		-3 (2)	0.135	[-7, 1]
Bachelor's degree		-259 (115)	**0.025**	[-485, -32]
Trainings per year		1 (3)	0.710	[-5, 8]
Self-reflecting abilities of nurses (GRAS score)		-3 (2)	0.135	[-8, 1]
Specialised training course		-10 (36)	0.779	[-80, 60]
Use of technologies		-36 (24)	0.128	[-83, 11]
Knowledge of guidelines		18 (30)	0.535	[-40, 77]
Use of guidelines		10 (22)	0.659	[-34, 53]
Felt freedom to assess		26 (26)	0.307	[-24, 77]
Time to assess		4 (19)	0.840	[-33, 40]
Being influenced while assessing		-31 (29)	0.300	[-89, 27]
Felt responsibility		16 (18)	0.356	[-19, 52]
Team competencies		-4 (22)	0.865	[-48, 40]
Experienced workload		-25 (21)	0.224	[-66, 16]
Professional attitude (code of conduct)		12 (17)	0.459	[-20, 45]
Experienced workload team		-36 (25)	0.159	[-86, 14]
Self-regulating team		5 (16)	0.765	[-27, 37]
Continuity in care delivery		0 (21)	0.997	[-42, 42]

Organisation level			
Classification system 2 (Nanda-NIC-NOC)	13 (33)	0.704	[-54, 79]
Classification system 6 (other or more than one system)	207 (61)	**0.001**	[86, 328]

Note: p-values are based on Wald tests with Satterthwaite approximation for denominator degrees of freedom (SPSS MIXED procedure)



5

VARIATION IN CLINICAL JUDGMENTS ABOUT CLIENTS' NEEDS:

A Think-Aloud Study Among Home Care Nurses

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ABSTRACT

Background: This study aims to determine whether home care nurses adhere to the nursing process when assessing clients' needs. It examines their clinical reasoning skills and the time dedicated to each skill and phase involved in making clinical judgments regarding the amount, type, and duration of home care. Additionally, it investigates the factors that influence their clinical judgments.

Design: A qualitative exploratory design was employed using the think-aloud interview method.

Method: Twelve home care nurses from nine Dutch organisations were invited to assess clients' needs while expressing their thoughts. The case was presented through a video featuring an actress depicting a client with Parkinson's disease, based on a real scenario. Nurses were asked to apply clinical reasoning to determine the amount, type, and duration of care needed. Interview transcripts were coded deductively using a scheme based on a conceptual framework that includes three components: the five phases of the nursing process, 17 clinical reasoning skills, and factors influencing clinical judgment.

Results: After conducting 12 interviews, saturation was reached. All but one home care nurse mentioned the five phases of the nursing process (i.e., assessment, diagnosis, goal-setting, intervention, and evaluation). Not all nurses utilised all 17 skills. Promoting health and identifying patterns were used the least, while intervention planning was the most frequently employed skill. The recommended duration for needed home care varied from three weeks to an indefinite period. The suggested hours ranged from one hour to over nine hours weekly for the same client. Home care nurses primarily focused on planning interventions and paid less attention to the diagnosing and goal-setting phases when applying clinical reasoning skills in the nursing process. They highly valued clients' wishes and preferences in their clinical judgments.

Conclusion: Clinical judgments made by home care nurses varied, possibly due to inadequate clinical reasoning within the nursing process.

BACKGROUND

Home care nurses play a critical role in assessing clients' needs, planning interventions, and ensuring high-quality care. The nursing process provides a structured framework consisting of five key phases: assessment, diagnosis, goal-setting, intervention planning, and evaluation (1, 2). Effective clinical reasoning is essential in applying this framework, ensuring accurate decision-making and appropriate care delivery/interventions in line with the client's goals. (3, 4). Clinical reasoning is a cognitive process that integrates knowledge, critical thinking, and reflection to guide nurses in making well-founded clinical judgments about client care (5). Connor et al. (2023) described clinical judgment as 'a reflective and reasoning process that draws upon all available data, is informed by an extensive knowledge base and results in forming a clinical conclusion' (6). In addition, research by Laukvik et al. (2023) revealed that nurses engage in all five phases of the nursing process, operating cyclically rather than linearly (7). For education on clinical reasoning, Alfaro-LeFèvre identified 17 skills that nurses employ to proceed professionally through the different phases of the nursing process (4). These skills interact and depend on each other; for example, when inconsistency is recognised in how the client responds to the provided care, this care might be based on an assumption, and reflection on this assumption is needed to draw valid conclusions and adjust the interventions (4). This makes clinical reasoning a dynamic process.

Home care nurses face significant challenges with an ageing population and increasing numbers of clients presenting complex, multimorbidity care needs (8). Variability in clinical reasoning skills may result in inconsistent clinical judgments, leading to over- or under-provision of services that do not align with client needs and preferences (9). Studies by Mahmoud & Bayoumy (2014) and Miskir & Emishaw (2018) highlighted how deficiencies in clinical reasoning contribute to unsafe or inadequate care (10, 11). More recent studies suggest that developing clinical reasoning skills in nursing students is complex and requires a multilayered approach that addresses knowledge acquisition and complex thinking processes (5, 12, 13). Furthermore, the need for uniform education and training in clinical reasoning is becoming more apparent (14).

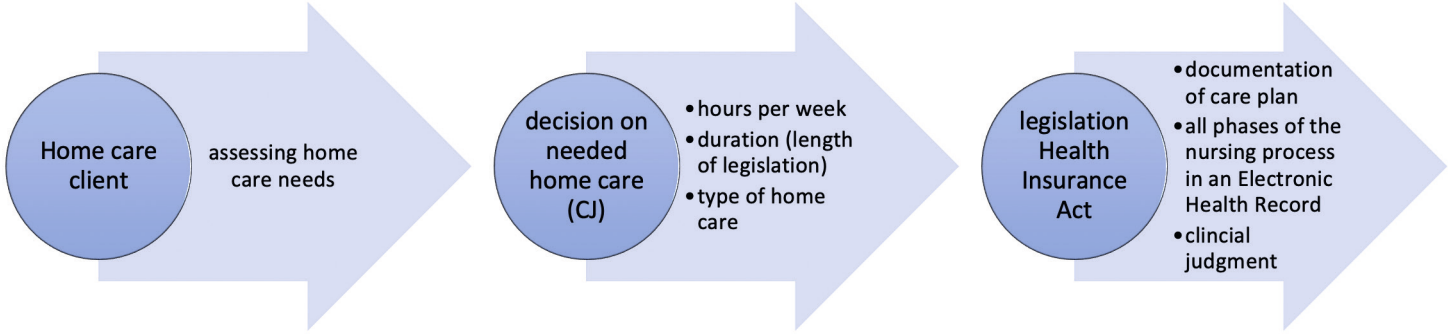


Figure 1. Process of admission to the Health Insurance Act by Dutch home care nurses

In the Dutch home care context, which is the study's setting, home care encompasses integrated nursing, personal care, and technical care provided in clients' homes (15). Home care nurses assess clients' needs using clinical reasoning skills in the nursing process and, with their clinical judgment, grant formal access to home care under the Health Insurance Act (16). Only nurses with a bachelor's or master's degree hold this responsibility (2). Their clinical judgment of what home care is needed is the foundation for determining the amount, type, and duration of care, effectively adding clinical judgment as an extra phase to the nursing process (17). Hence, home care nurses' clinical judgment is the starting point for ensuring high-quality care (see Figure 1. Process of admission to the Health Insurance Act by Dutch home care nurses).

Given the increasing demand for home care, which is becoming more complex, combined with ongoing workforce shortages, understanding how home care nurses make decisions and substantiate their clinical judgments is crucial (8). While research has established the importance of clinical reasoning in accurate care planning and documentation, studies investigating the reasoning skills that home care nurses apply during the nursing process while assessing clients' needs are lacking (7, 18). In addition, gaining insight into how much attention (measured by time) individuals allocate to the various phases and skills may provide insight into their reasoning abilities and their level of attention for the different stages of the nursing process to ultimately substantiate their clinical judgments. The study seeks to identify areas for improvement, e.g., education and training, ultimately enhancing the quality of home care provision (9).

METHODS

Aim

This study investigates the extent to which home care nurses adhere to the nursing process in assessing clients' needs and explores their clinical reasoning skills, decision-making processes, and influencing factors.

Study design

This study employed qualitative exploratory research via think-aloud interviews (19). Ericsson and Simon developed think-aloud interviews (20). It is used for collecting data through participants' dialogue of thoughts with minimal interruption or influence from an interviewer (19). The quantitative approach followed the qualitative interviewing method (21). The data were quantified to provide insight into how much time and attention home care nurses needed to make clinical judgments about the client's care needs. Additionally, it helps assess the time and focus dedicated to each phase and skill involved in the nursing process. This approach was based

on Creswell and Plano Clark, and a study by Lee et al. on clinical reasoning skills applied by registered nurses (18, 22).

Conceptual Framework

Data collection was based on a conceptual framework that integrates three concepts: 1) the nursing process, 2) clinical reasoning skills in the nursing process, and 3) clinical judgment.

Figure 1 illustrates the three concepts together. The nursing process is depicted in the centre as a cycle. The clinical reasoning skills are described per phase in the outer circle. After goal-setting, the blue box in Figure 1 indicates the additional moment in the nursing process where the clinical judgment is formulated. Based on this conceptual framework, a hypothesis was formulated: home care nurses use the nursing process to guide their clinical reasoning, thoughts, and skills to determine clients' home care needs for clinical judgment.

Setting and Participants

The target population consisted of Dutch bachelor-educated home care nurses responsible for assessing clients' needs. The nurses worked for home care organisations of varying sizes situated in different parts of the Netherlands, employing different classification systems implemented in the Electronic Health Records (i.e., NANDA-International classification or Omaha-system classification) (23, 24). We approached contacts in home organisations that participated in our previous study (25) Schwenke et al., submitted). Initially, purposive theoretical sampling was used to include a mixed group of home care organisations based on the aforementioned inclusion criteria (26). Convenience sampling was subsequently applied to invite eligible home care nurses within these organisations. We aimed to include 10–12 home care nurses (26). The saturation of information extracted from the interviews determined the final sample size.

Data collection

All organisations' home care nurses were approached through an invitation email containing information about the study's objective, the assessment task, the online interviewing method, and how data would be collected. This email was shared via the members on the organisation contact list, whom we had approached earlier (Schwenke & Van Dorst et al., submitted). Interested nurses could apply to participate by sharing their contact information with the researcher to schedule the interview.

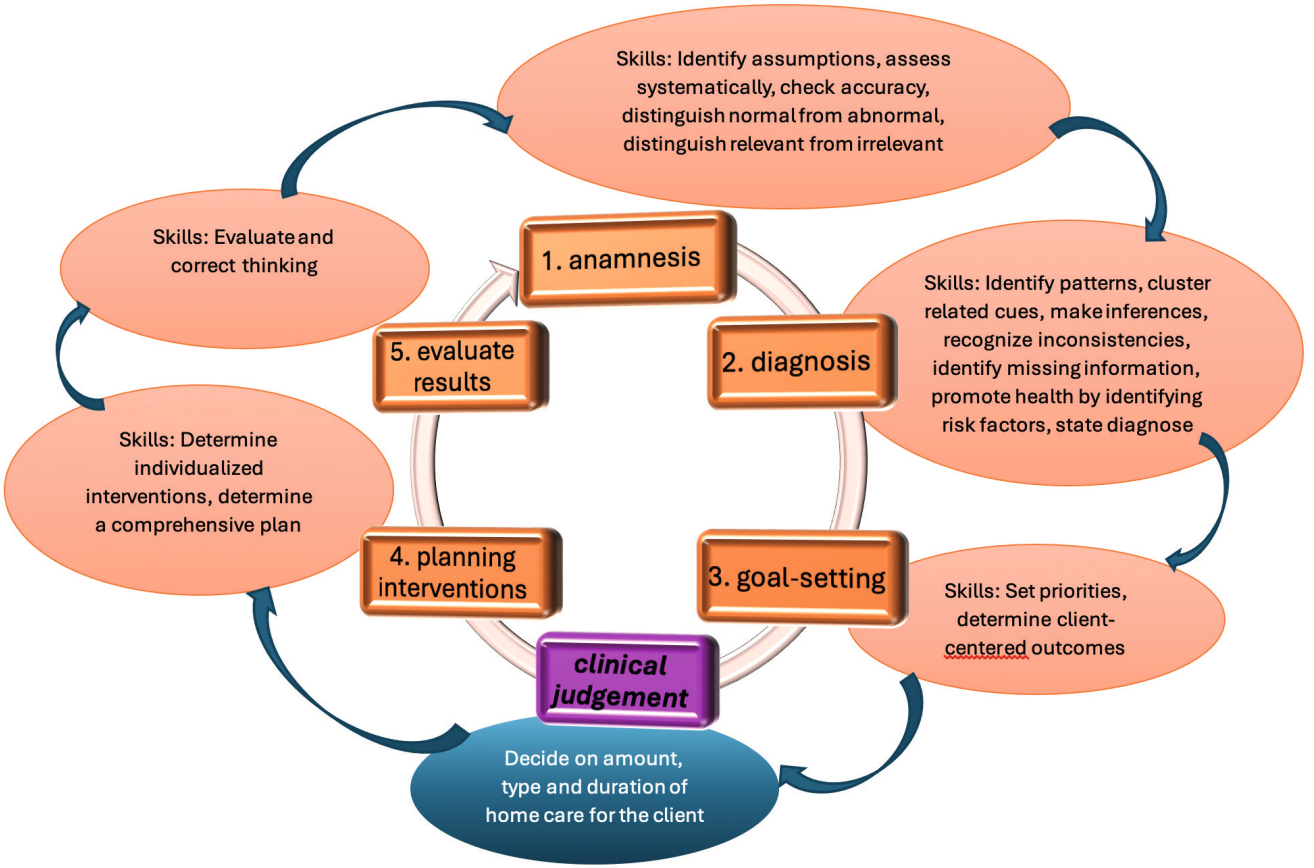


Figure 2. Conceptual framework, including the nursing process (17) with clinical reasoning skills (4) per phase and clinical judgment (3)

Think-aloud interviews

Johnson's guidelines for preparing and conducting think-aloud interviews and ensuring validity and reliability indicate that, first, a one-client-case (presented in a 10-minute video) task was selected to provide all nurses with the same information upfront. Second, concurrent verbalisation was chosen to closely mimic the work environment of the home care nurse and capture a real-time scenario in which the home care nurses assess the client's needs and decide in a clinical judgment. Concurrent verbalisation refers to the verbalisation of thoughts active in working memory simultaneously during task completion (19). Third, the participants were prepared in a standardised manner, following the interview guide (see Appendix 1 Interview Guide), and fourth, verbal data collection commenced after the instructions in the interview guide (see Appendix 1 Interview guide) were provided (19). When the recording began, verbal data were collected, and the task completion time was measured.

Task Selection

A videotaped actress portraying a client with Parkinson's disease, named Nicole Alders, was used as the case in this study with the permission of the actress and Nursing (a congress organisation, part of Bohn, Stafleu and Van Loghum (BSL), and the owner of the video). Playing a client, this actress was filmed during a Masterclass for Assessing Home Care Needs during the COVID-19 period of 2020 to support an online variant of the Masterclass for Assessing Needs. Using a video vignette allowed us to compare the clinical judgments on one client case based on a real-life situation.

Nicole is filmed in her home as she attempts to start a telephone conversation. After two unsuccessful tries, she is unexpectedly delighted to reconnect with a friend she hasn't seen in 30 years. The conversation reveals her struggle with Parkinson's disease, along with various health issues. It becomes evident that she ***neglects her well-being****, often indulging in* ***unhealthy habits*** *such as* ***consuming (a lot of) alcohol*** *and* ***only eating fast food*** *and* ***mismanaging her medications****—taking them all at once in the evenings* ***instead of as prescribed.***

When she discusses her past as an international truck driver, delivering flowers across Europe, a ***sense of nostalgia washes over her****. She* ***longs for the freedom*** *she once enjoyed and* ***expresses deep regret for no longer contributing*** *to society. Due to her illness, Nicole was forced to sell her truck, a decision that plunged her into* ***significant financial trouble****. This loss not only* ***stripped her of her livelihood*** *but also deepened her* ***sense of isolation and despair****, compounding the* ***challenges she faces daily****.*

Nicole ***reflects on the joy of cycling*** *with her younger brother, who passed away,* ***marking the significant time that has elapsed since his death****. Her* ***loneliness*** *is palpable throughout the video.*

As she speaks, ***signs of her suffering*** *are apparent:* ***bottles of wine, an ashtray filled*** *with discarded cigarettes,* ***and empty pizza boxes*** *resting on* ***her walker*** *serve as stark reminders of her struggles. She confesses to* ***not having showered in a long time*** *and reveals that she* ***has not seen a specialist in years****,* ***convinced that there is little anyone can do*** *for her chronic condition. Her* ***husband left her for her neighbour*** *some years ago and is the* ***only one who attends to her with a little bit of social support****, taking care of her grocery needs like coffee and tobacco.*

Nicole has endured ***considerable loss*** *since becoming ill—****her health, her job, her brother, who was also her best friend, her independence, her future aspirations, and her marriage****. Each* ***loss weighs heavily*** *on her, painting a poignant picture of her current reality.*

Text Box 1. The case of Nicole Alders was used as a video vignette. Cues for nursing diagnoses incorporated in this case are marked in bold.

To increase comparability in the study, the home care nurses who participated were required to perform under the same circumstances. They were all presented with the same case, which was based on an actual client situation, and the same information

upfront to enhance the reliability of the study, rather than using different clients in actual practice. For the case description, see Text Box 1 (the video is available upon request by emailing the corresponding author).

Verbal Data Collection

The online interviews were planned individually and conducted using Microsoft Teams software (MS Teams 365, 2023). Before the interview, the participants were offered to practice speaking their thoughts aloud to familiarise themselves with the process by asking what they thought about being invited to join this study for a few minutes. The interviewer (JvD) introduced the video: Your home care organisation received a phone call from Nicole's ex-husband requesting help. The ex-husband mentioned that Nicole had agreed to this phone call. The video of Nicole was then shown. After viewing the video, the participants were invited to begin assessing the needs of Nicole Alders in the same manner they were accustomed to while simultaneously verbalising their thoughts. To capture these thoughts, all interviews were recorded using a Game Bar system recorder for secure data storage. The recording of the task started immediately after the video was presented and ended after the participants pointed out their clinical judgment. The home care nurses assessed the client's needs in their usual work environment, as they would in their daily practice. For example, they worked in the room with team members present or took the necessary time to complete the task. Data were collected between February and May 2023. Field notes were made during all interviews by the researcher (JvD). A second researcher (CS or AvdB) was present during the first four interviews to take notes and ensure that the interviews proceeded as planned. Data on age, years of working experience, and education of the participating home care nurses were collected by asking them before or after the interview.

Data analysis

According to Johnson's think-aloud guide, four separate steps were distinguished in the data analysis described below (19).

Task Analysis

During analysis, a predefined coding scheme was created based on the anticipated thought process while completing the task. The task analysis assumes that all participants perform in all phases of the nursing process, employing their clinical reasoning skills to determine the amount of hours, type of care, and duration of care in a clinical judgment.

Anticipating Coding Scheme

The coding scheme (see Appendix 2) for the deductive analysis of the Think-Aloud Interviews is threefold and a priori determined: (1) codes based on home care nurses using the five phases of the nursing process, including clinical judgment

as a sixth phase; (2) codes based on home care nurses employing the 17 clinical reasoning skills from Alfaro-LeFèvre (2013); and (3) codes based on factors considered by the home care nurses while assessing the client's needs, as vocalised by the participants (4). For the latter, the factors identified in a Delphi study were divided into four categories of influencing factors for assessing clients' needs: two categories concerning the clients and their contexts and two concerning the home care nurses and their contexts (9).

Vocalisation segmentation

The interviews were transcribed verbatim using Amberscript software (amberscript.com). The participants were allowed to read and respond to the transcriptions before the analysis. After transcription, the researcher (JvD) segmented the vocalisation transcripts into phrases. Each phrase has a self-contained meaning and contains only the participant's expression (27). Segments without meaning or expressions from the interviewer were excluded from the analysis. The vocalisations, including time stamps, were retained chronologically.

Vocalisation Coding

Two researchers (CS and Jvd) coded in three rounds, individually, using the anticipated coding schemes: the phases of the nursing process and the 17 clinical reasoning skills (see Appendix 2). Each segment was assigned a code from the nursing process and, in the next round, a code from the coding scheme with 17 clinical reasoning skills. In the third round, segments matching an influencing factor were coded. NVivo14 software (lumivero.com) was used for coding by the researchers and for comparing the coding of the two researchers (CS and Jvd). Based on the number of segments coded per phase of the nursing process and coded according to the clinical reasoning skills, the researchers discussed the differences. Forty per cent of the segments that were coded differently were discussed. Most differences were found in the coding of the various reasoning skills, and the definitions of the skills were used to examine the different coding methods used by the researchers. When in doubt, a third researcher (AvdB) was consulted.

Based on these segmentations, which included time stamps, NVivo14 was used to analyse the following aspects: for clinical judgment, analyses were performed for the type of care, frequency, and total hours per week of indicated care, followed by the duration of care. For the phases of the nursing process and the clinical reasoning skills, analyses were performed on time spent in each phase of the nursing process (average in minutes, range in minutes, and percentage of the total time of relevantly coded segments); time spent per clinical reasoning skill (range in minutes, total time in minutes, and percentage of total time of relevantly coded segments); and the number of times a respondent switched between phases of the nursing process (frequency and average). Finally, for the influencing factors, an

analysis was performed on the number of respondents who mentioned a particular factor when deciding on the client's needs. During the interviews, the time spent on the different phases and skills was measured to explore home care nurses' attention to the various phases and skills (18, 21). All minutes and percentages were rounded to whole numbers, and only relevant text segments were measured.

Ethical considerations

This study is part of a more extensive study in which ethical approval was granted by the ethical committee METC-Z from Zuyderland Medical Center, the Netherlands (METCZ20210171). The study was conducted under the Helsinki 2024 declaration (28). The researchers ensured that all participants were informed about the study's purpose and methodology before participating and that they could withdraw at any time. They signed an informed consent form and provided verbal consent for the interview to be recorded and the recorded data to be used. The participants' names were coded and pseudonymised, making them traceable only by the researchers. After transcription, the recordings were deleted. The data were stored securely on Maastricht University's secure drive, accessible only to the research team.

Rigour and reflexivity

During data collection, the researcher interfered as little as possible while the home care nurses fulfilled their tasks, which may have disturbed their thinking processes. Moreover, employing the think-aloud interviewing method, which minimises interviewer interference, allowed her to restrain her expertise and personal opinions (19).

To minimise bias during the interviews, the interviewer introduced herself exclusively as a researcher to ensure that her professional identity did not influence the participants' responses. In the analysis phase, she reflected on how her prior experience using NANDA-International, particularly in her training for home care nurses, might shape her data interpretation. Half of the participants used the Omaha System instead of NANDA-International to determine clients' needs (23, 24). This reflexive approach underscores the importance of recognising personal and professional influences to enhance the rigour and credibility of the research findings. A second researcher (CS or AvdB) was included to mitigate potential confirmation bias. Furthermore, she had no personal relationships with the participants and was conscious of potential biases stemming from her knowledge of the research topic. After these interviews, the field notes helped to reflect on what had occurred. During data analysis, the definitions of the reasoning skills (see Appendix 2 Coding scheme) were used to continuously reflect on the codes applied to segments of the interviews by both researchers (CS and JvD); JvD had a background in nursing, whereas CS did not. The fact that CS had no nursing background helped to reflect on the definitions leading to the coding. By consistently reflecting on the process of interviewing and

the data analysis with an awareness of the researchers' backgrounds, we increased the rigour and reflexivity of the study (29).

RESULTS

Participants

All 12 home care nurses who responded to the invitation participated in the interviews. Table 1 presents the ages, sex, years of experience, size of the organisation they work in, the part of the country where the organisation operates, and the classification system they use. Eleven bachelor-educated nurses and one vocationally educated nurse from nine organisations participated in this think-aloud study. Note: While regulations stipulate that only bachelor-educated nurses should make clinical judgments, management allows vocationally educated nurses to assume this responsibility in some organisations. Two home care nurses from three organisations participated in the study, whereas one home care nurse from six organisations participated. After 12 interviews, no new information emerged from the data; thus, data saturation was reached. The average age of the participants was 36.2 years, ranging from 23 to 60 years. All but one participant was female, and the participants' average experience in home care nursing was 8.2 years, ranging from 1.5 to 21 years. Eight of the 12 home care nurses had completed an extra course to assess client needs.

Table 1. Participant characteristics

Home care nurse with organisation number and interview number	Age	Sex (female (f) male (m))	Years of experience in nursing	Years of experience in home care nursing	Educational level	Size of the organisation (< €10 m revenues = Small > €10 m revenues = Large) and part of the country active	Classification used Omaha (24) or Nanda (23)
1 A	26	f	9	2	Bachelor's degree	Small (middle)	Omaha System
2 B	48	f	15	9	Vocationally educated	Large (north)	Omaha System
3 C	31	f	6	4	Bachelor's degree	Large (south)	Nanda-International
4 D	24	f	5	2.5	Bachelor's degree	Large (north)	Omaha System
5 E	60	f	43	8	Bachelor's degree	Small (middle)	Omaha System
6 F	23	f	2.5	1.5	Bachelor's degree	Small (north)	Nanda-International
7 G	40	f	15	9	Bachelor's degree	Large (south)	Nanda-International
8 C	49	f	20	8	Bachelor's degree	Large (south)	Nanda-International
9 H	42	f	23	21	Bachelor's degree	Large (south)	Omaha System
10 H	25	f	7	4	Bachelor's degree	Large (south)	Omaha System
11 I	35	m	16	11	Bachelor's degree	Large (middle)	Nanda-International
12 F	32	f	15	9	Bachelor's degree	Small (middle)	Nanda-International

Using the nursing process

All the participants engaged in every phase of the nursing process, except for one participant who did not establish goals while completing the assessment task. Table 2 outlines all phases of the nursing process, including the clinical judgment phase, the time required to complete the assessment task, and the time spent in each phase of the nursing process. The total interview time for all participants was 353 minutes, with 14% of this time attributed to small talk or irrelevant content. The average time to complete the assessment task was 30 minutes, ranging from 6 to 59 minutes. However, the relevant and coded time varied among the interviews. In the shortest interview, which lasted six minutes, 94% of the time was relevant and coded, whereas in the interview lasting 28 minutes, 72% was relevant and coded.

The average time spent on the assessment phase was one hour and 25 minutes (24% of the total interview time), while the diagnosis phase took 39 minutes (11%), and the goal-setting phase required 14 minutes (4%) of the total interview time. In planning interventions and evaluations, participants allocated one hour per phase (17%) of the total interview time to the assessment task. The average time spent making clinical judgments was 46 minutes (13%) of the total interview time, with the time needed to determine the client's needs in clinical judgment varying from 6 to 59 minutes.

Table 2. The range, average time in minutes, percentages and number of times participants spent per phase completing the assessment task

	Total time of the interview to complete the task (minutes relevant and coded)	**Assessment % of total time**	**Diagnosis % of total time**	**Goal-setting % of total time**	**Clinical judgment % of total time**	**Interventions % of total time**	**Evaluation % of total time**
Range of time a participant spent on a phase (%)	6 – 59 min.	10% - 38%	2% - 34%	0% - 8%	5% - 27%	9% - 30%	10% - 26%
Average time spent per phase (minutes (%))	30 min. spent on assessing needs	85 min. (24%)	39 min. (11%)	14 min. (4%)	46 min. (13%)	60 min. (17%)	60 min. (17%)
The range of the number of times respondents switch between phases*		5 – 25 times	1 – 18 times	0 – 10 times	4 – 13 times	5 – 29 times	4 – 31 times
The average number of times respondents use a specific phase*		13 times	8 times	5 times	8 times	14 times	13 times

* See Appendix 3 for more details, including the order in which home care nurses progress through the different phases of the nursing process and the frequency of phase transitions.

Using clinical reasoning skills

Table 3 presents the 17 clinical reasoning skills, their definitions, the number of home care nurses who employed each skill, and the range of time spent on each skill. The final column indicates the total time and percentage allocated to each skill. Twelve home care nurses dedicated the majority of their total interview time (n = 353 minutes, nearly six hours) to 'determining a comprehensive plan and evaluating and updating the plan' (i.e., 54 minutes (15%)) and 'evaluating and correcting thinking' (i.e., 29 minutes (7%)). Conversely, skills such as 'distinguishing relevant from irrelevant' (four minutes by four nurses), 'identifying patterns' (four minutes by nine nurses), 'promoting health by identifying and managing risk factors' (three minutes by nine nurses), and 'recognising inconsistencies' (five minutes by seven nurses) were used the least, each accounting for only 1% of the total interviewing time.

Table 3. The number of participants, range, minutes and percentages of time spent on each skill (4)

Clinical reasoning skills	Definition of the skills (4)	Number of nurses using this skill and range of time spent on using the skill	Min. (%)* of the total interview time reasoning skills used (n = 353 minutes)
Determining a comprehensive plan / evaluating and updating the plan	Ensuring that priority problems, corresponding outcomes, and interventions are recorded in the patient record, keeping the plan up-to-date	12 nurses Range: 1 – 14 min	54 min. (15%)
Evaluating and Correcting Thinking (self-regulating)	Reflecting on thinking for safety and improvement—for example, identifying flaws, assessing whether thinking is focused and sufficiently detailed, and making necessary adjustments	12 nurses Range: 0.5 – 4 min	29 min (8%)
Determining Individualised Interventions	Identifying specific nursing actions tailored to the patient's needs, designed to (1) prevent, manage, and eliminate problems and risk factors; (2) reduce the likelihood of undesired outcomes and increase the likelihood of desired outcomes; and (3) promote health and independence	12 nurses Range: 0.3 – 4 min	26 min. (7%)

Table 3. The number of participants, range, minutes and percentages of time spent on each skill (4) (continued)

Clinical reasoning skills	Definition of the skills (4)	Number of nurses using this skill and range of time spent on using the skill	Min. (%)* of the total interview time reasoning skills used (n = 353 minutes)
Making Inferences (Drawing Valid Conclusions)	Making deductions or forming opinions that logically follow based on patient cues (subjective and objective data)	11 nurses Range: 0.3 – 5 min	25 min (7%)
Clustering Related Cues	Grouping data to identify patterns and relationships among the data	11 nurses Range: 0.3 – 6 min	23 min (7%)
Identifying Assumptions	Recognising when something is taken for granted or presented as fact without supporting evidence	12 nurses Range: 0.2 – 5.6 min	21 min (6%)
Identifying Missing Information	Recognising gaps in data collection and seeking information to fill those gaps	10 nurses Range: 0.1 – 5 min	19 min (5%)
Assessing Systematically and compre-hensively	Utilising an organised, systematic approach that enhances the ability to discover all necessary information needed to fully understand a person's health status	12 nurses Range: 0.1 – 4 min	16 min (5%)
Diagnosing Actual and potential problems	Ensuring that the patient's actual and potential problems are accurately identified based on evidence from the health assessment and patient records	11 nurses Range: 0.1 – 6 min	15 min (4%)
Checking Accuracy and reliability	Collecting additional data to verify whether the gathered information you gathered is correct and complete	6 nurses Range: 0.3 – 5 min	13 min (4%)

Table 3. The number of participants, range, minutes and percentages of time spent on each skill (4) (continued)

Clinical reasoning skills	Definition of the skills (4)	Number of nurses using this skill and range of time spent on using the skill	Min. (%)* of the total interview time reasoning skills used (n = 353 minutes)
Setting Priorities	Setting priorities is defined in two ways: 1) differentiating between problems requiring immediate action and those needing subsequent action, and 2) determining which problems must be addressed in the patient record	9 nurses Range: 0.1 – 4 min	12 min (3%)
Distinguishing normal from abnormal	Analysing patient data to determine what falls within the normal range and what lies outside the usual range for normalcy, then deciding whether abnormal data may indicate specific problems	9 nurses Range: 0.1 – 2 min	6 min (2%)
Determining Client-Centred Outcomes	Describing precisely what results will be observed in the patient to demonstrate the expected benefits of care at a specific point in time	9 nurses Range: 0.3 – 1 min	6 min (2%)
Recognising Inconsistencies	Identifying when pieces of information contradict each other	7 nurses Range: 0.1 – 2 min	5 min (1%)
Distinguishing Relevant from irrelevant	Determining what information is pertinent to understanding the situation and what is irrelevant	4 nurses Range: 0.4– 2 min	4 min (1%)
Identifying Patterns	Determining what patterns of health, illness, or function are indicated by patient data	9 nurses Range: 0.1 – 1 min	4 min (1%)

Table 3. The number of participants, range, minutes and percentages of time spent on each skill (4) (continued)

Clinical reasoning skills	Definition of the skills (4)	Number of nurses using this skill and range of time spent on using the skill	Min. (%)* of the total interview time reasoning skills used (n = 353 minutes)
Promoting Health by identifying and managing risk factors	Maximising well-being by detecting and managing factors that evidence suggests contribute to health problems (e.g., sedentary lifestyles contribute to many health issues)	9 nurses Range: 0.1 – 0.8 min	3 min (1%)

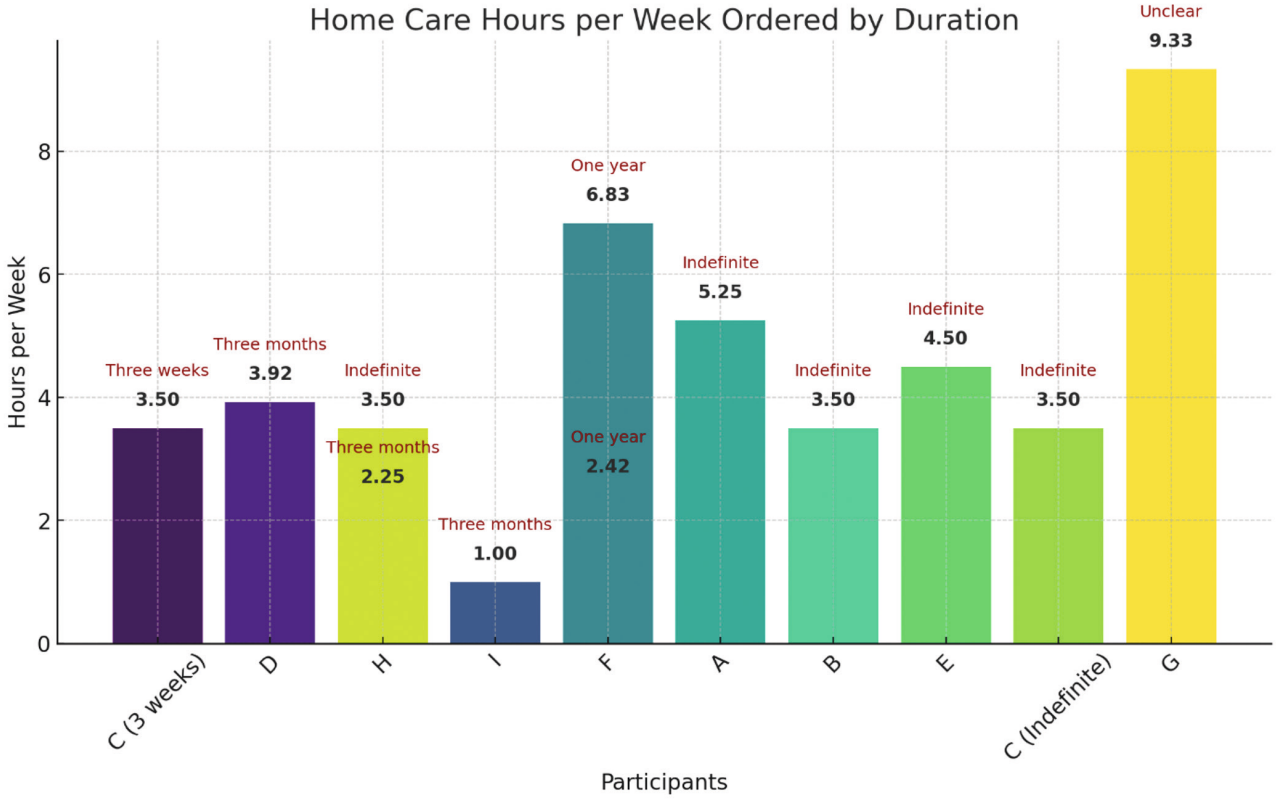
** Percentages do not sum to 100% due to rounding and not all transcript text being coded (e.g., due to small talk or irrelevant passages)*

Clinical judgment on hours, type and duration of home care

The clinical judgments made by the home care nurses revealed variations in the type of care they assessed for the same client. Table 4 shows the type of care that home care nurses indicated for the same client. All but one of the home care nurses decided to initiate weekly bathing for the client. They vary in the number of weekly bathing sessions and visits to support medication intake before the introduction of a medication dispenser. One nurse focused on building a network for the client and introducing supportive care tools, including the medication dispenser, to enhance the client's self-management. The home care nurses within the same home care organisation (C, F and H) also show different types and numbers of visits for this client.

Table 4. The type of home care, number of visits and hours

Participant	Type of care per week assessed for Nicole Alders	Number of times per week	Number of hours per week indicated
1 A	* Bathing * Medication intake support * Coordination time is 15 minutes	Two days a week Two times a day Weekly 15 minutes	5 hours and 15 minutes
2 B	* Bathing * Medication intake support * Having interdisciplinary contacts	Two days a week Daily 5 minutes Weekly one hour	3 hours and 30 minutes
3 C	* Collecting more information combined with bathing * Building a network * Introducing supportive care tools such as medication dispensers.	Once a week Once a week for three weeks Once a week for three weeks	3 hours and 30 minutes
4 D	* Bathing twice weekly * Medication intake support * Installing medication dispenser * Evaluating and having a supportive conversation.	Two days a week Twice a day Once every two weeks	3 hours and 55 minutes
5 E	* Bathing * Medication intake support * Introducing medication dispenser.	Seven days a week Seven days a week	4 hours and 30 minutes
6 F	* Bathing * Medication support daily, * Introducing medication dispenser.	Two days a week Daily	2 hours and 25 minutes
7 G	* Bathing * Medication intake support * Introducing medication dispenser.	Seven days a week Four times a day	9 hours and 20 minutes
8 C	* Bathing three times a week, * Coordination on consulting multi-disciplines * Introducing medication dispensers.	Three days a week	3 hours and 30 minutes
9 H	* Bathing * Introducing medication dispensers	Once a week	3 hours and 30 minutes
10 H	* Bathing * Evaluation conversation.	Three days a week Once every two weeks	2 hours and 15 minutes
11 I	* Supportive conversation * Introducing medication dispenser.	Once every two weeks	1 hour
12 F	* Bathing * Medication intake support * Introducing medication dispenser * Coordination and consulting other disciplines	Two days a week Four times a day, seven days a week	6 hours and 50 minutes



Graph 1. The variation in the amount and duration of home care per week
Legend: The X-axis displays participants, with columns H and F representing two home care nurses from the same organisation, each with varying durations and hours of home care assigned. The Y-axis indicates the weekly home care hours determined.

Graph 1 illustrates the variation in the number of hours per week and the duration of home care determined by home care nurses for the same client. The hours range from 1 hour per week for three months to 9 hours and 20 minutes per week of home care for an unspecified duration, as shown in Graph 1. Five nurses chose to provide home care indefinitely (as long as the client resides at home), whereas three nurses felt that three months of home care were necessary for the client to achieve self-management. The clinical judgments of home care nurses within the same organisations (C, F, and H) also varied in the amount and duration of care they assessed for the same client.

Factors considered in making clinical judgments about the client's care

As shown in Table 5, home care nurses identified 16 factors that were considered before determining the client's needs in clinical judgment (see Table 5). The 'client's wishes and preferences' and 'self-direction and self-management' factors were most frequently mentioned when assessing the client's needs. All the nurses indicated the necessity of understanding what Nicole desired before determining her needs. Some nurses noted that they were compelled to decide on more hours of care per week when a client resides in a rural area with fewer care providers than in an urban region, where there are more options for supportive care, such as specialised facilities for day care for clients with Parkinson's disease.

Participant 5 said, "Yes, I have much information about that in the back of my mind, as we have day centres in the region for people with Parkinson's disease."

Participant 5 said, "This woman is often alone for many hours, and we have excellent experience with a company called ... that delivers nutritious meals at home. We have helped over a hundred people in the area with this, so they receive a healthy, warm meal between five and six. You can also leave it for two hours; if you are not hungry, you can eat at seven or half past seven, but you will have a delicious meal ready."

These two factors, 'living region' and 'availability of different types of care providers,' influence the type of home care that the home care nurse may arrange for the client. *Participant 11 said, "I work in two different areas, a small village and a city. There is not much I can organise for this client in the smaller village. Certainly, it is even worse; I know there are regions in the Netherlands where healthcare has become so scarce that people sometimes do not get the care they need. For me, that is not the case now."*

Participant 11 appears to have made different decisions in two compelling areas because of the differences in care provision when providing client care.

Participant 12 said, "I would like to cooperate with volunteer organisations; in my region, there are 24 volunteer organisations available. Sometimes, there is a shortage of volunteers. The local authority coordinating this type of support normally decides which organisation is most adequate for the situation, which may take up to six weeks or more. […] It influences which organisation I decide to contact, and that is not always the one with the best support when it is not available. Therefore, it affects the care I want to organise for this client."

One participant mentioned her 'knowledge of guidelines.' *Participant 10 said, "It was a long time ago that I nursed a client with Parkinson's disease, so I would like to look at the guidelines to make sure I would not miss something. I think that is very important."*

Several nurses noted that they had to deal with what was available or not in their working regions, such as other involved disciplines or personnel shortages, which sometimes resulted in fewer or more hours of home care. *Participant 11 said, "It is partly determined regionally. It is interesting to see whether you decide on what is needed or only decide on what is required and what is available to organise for this client." Participant 12: "In this case, I can offer her the possibilities within my working area. We have an outstanding network for client support."*

Alternatively, the type of care they wish to provide may not suit the client. *Participant 12: "They do not make it very difficult, but … it is aimed at people aged 65 and over. I would have to advocate strongly to include this lady, under 60."*

Most home care nurses preferred to 'involve other disciplines' in Nicole's care, which resulted in fewer hours of care per week, except for one nurse who mentioned that involving additional disciplines would require more time for coordination. *Participant 2: "To involve other disciplines would lead to more hours per week because of the needed coordination time."*

Furthermore, 'technological tools' are not always accessible or supported within organisations for home care nurses, which can impact the number of care hours they determine in their clinical judgments. *Participant 2 said, "We prefer using Baxter rolls for medication support and telephone calls to remind her of her intake above medication dispensers because, within our team, we cannot assure the alarm response."*

Table 5. Influencing factors on clinical judgment mentioned by home care nurses

Factors mentioned influencing needs assessment.	The number of home care nurses who identified this factor when determining the client's needs
The client's wishes and preferences	10
The presence of different types of care providers in the region	9
The client's capacity for self-reliance and self-direction	10
Other disciplines involved in the client care	10
The availability of technological tools in an organisation	7
The nurses' attitudes and beliefs	6
The availability of the client's network	7
The nurses' years of experience	4
The client's ability to learn	4
The region where the client is living	3
The client's number of nursing diagnoses	1
The presence of multiple home care providers in the region	2
The client's living circumstances	2
The client's culture	1
The capacity of personnel available	2
The home care nurse's knowledge of guidelines, standards, and scientific evidence	1

DISCUSSION

Through think-aloud interviews, we gained valuable insight into how home care nurses decide on clinical judgments of the client's needs and apply clinical reasoning skills across the different phases of the nursing process. Our findings reveal substantial variation in clinical judgments among participating nurses, particularly in determining weekly care hours, types of care, and intervention durations. Notably, the diagnostic and goal-setting phases received limited attention, whereas planning interventions was emphasised the most. In a previous study, we noted that the diagnostic and goal-setting phases were poorly documented in electronic health records (EHRs) (Schwenke & Van Dorst et al., submitted). The current study confirms the lack of attention reflected in the time spent in each phase and highlights their inadequate utilisation. Poor documentation of the phases of the nursing process and the quality of nursing diagnoses were also reported in institutional long-term care (30). De Groot et al. studied the inadequate documentation of care plans. They argued that electronic health records (EHRs) often do not support home care nurses

in adequately documenting the nursing process. The insufficient implementation of standardised terminologies such as NANDA or Omaha in the Netherlands is frequently cited as a cause (31). Consequently, the poor user-friendliness of these systems has burdened nursing staff, who feel unsupported in documenting care plans via EHRs (31). However, this study demonstrates that inadequate software support is not the sole cause of poor documentation; instead, the diminished attention given to the diagnostic and goal-setting phases plays an important role.

Secondly, the findings regarding the use of clinical reasoning skills indicate that skills such as 'distinguishing relevant from irrelevant,' 'identifying patterns,' 'distinguishing normal from abnormal,' 'promoting health by identifying and managing risk factors,' and 'recognising inconsistencies' received notably less attention, corroborating Lee's findings (18). These skills are essential for the preparation and execution of the diagnostic phase. When goals are neither formulated nor documented based on sound diagnoses, the planned interventions are likely to differ, resulting in varying amounts of home care hours (32). Although the results demonstrate a lack of substantiation for the planned interventions and hours of home care needed to organise and provide these interventions, this study does not provide evidence for the relationship between variations in clinical judgment and poor diagnostic reasoning competencies. Hence, further research is necessary to substantiate this relationship. Nevertheless, the study results concerning the inadequate use of specific skills for appropriate diagnoses suggest that education focused on diagnostic reasoning and goal-setting skills is advisable and could enhance the quality of clinical reasoning in the nursing process and, consequently, improve home care nurses' clinical judgments. Moreover, minimal engagement with the skills needed in the diagnostic and goal-setting phases, and subsequently, the omission or misinterpretation of critical information regarding the client's issues, poses significant risks. Several studies indicate that this may result in incorrect and unsafe care (32-34). To enhance the clinical reasoning skills of home care nurses, the results of this study follow Fossum et al.'s suggestion of employing supportive tools for decision-making in the nursing process (35).

'Determining a comprehensive plan and evaluating and correcting thinking' was the most frequently utilised skill by the home care nurses in our study, rather than 'checking accuracy and reliability' as determined by Lee and colleagues (18). Only half of the nurses in our study employed 'checking accuracy and reliability.' A primary focus on determining a comprehensive plan poses the risk of jumping to conclusions. This may lead to intervention on symptoms rather than linking interventions to the causes of nursing diagnoses, resulting in unnecessary or missed care. The nature of the questions posed may explain this difference in findings. In Lee's study, nurses were asked: 'What do you think the patient's problem is?'—directly prompting the identification of nursing diagnoses—whereas in our study,

home care nurses were asked to determine the client's needs and formulate a clinical judgment regarding the number of hours, type, and duration of home care. This may have led to the home care nurses' direct focus on interventions and plans in our study more than in Lee's. However, this aligns with the conclusions drawn by Fossum et al. (2010); registered nurses also tended to move directly into interventions after being presented with written scenarios and formulating their thoughts about them (35).

Thirdly, the study revealed that home care nurses consider several contextual factors, including the client's wishes and preferences, geographic region, and the availability of care providers for different kinds of care, when determining the client's needs. The participants predominantly discussed their work environments, including whether their organisation provides support through technological tools to facilitate home care and the availability of interdisciplinary collaboration, which can reduce home care hours. Our findings suggest that context-related factors may influence home care nurses' ability to organise care and their decisions regarding clients' care needs. This is a relevant addition to a study where it was not traceable from the EHRs and organisational information whether these factors influenced variations in clinical judgments (Schwenke & Van Dorst et al., submitted). Moreover, it aligns with results from a focus group study by Schwenke et al. (submitted), which revealed variability among home care nurses in determining the necessary hours of care for clients influenced by the organisation's policy (Schwenke et al., submitted). For example, one nurse required additional time to coordinate the involvement of other disciplines, whereas others reported needing fewer hours when interdisciplinary collaboration was established. This finding illustrates that contextual factors may influence the number of hours home care nurses determine in their clinical judgments. The results imply that home care nurses should be able to act more autonomously and make decisions based solely on professionally substantiated clinical judgments regarding clients' needs, irrespective of the organisation's policies.

Strengths and Limitations

A key strength of this study was the use of a standardised video presentation of a client case, which ensured consistency across participants. In contrast to an international survey by Fan et al. (2020) on employing think-aloud protocols, this study involved minimal interaction during interviews (36). However, participants identified the lack of real-time client interaction as a barrier to thoroughly assessing client needs. Nevertheless, home care nurses were briefed in advance about the think-aloud practices, and all nurses received uniform instructions before the interviews to mitigate any potential impact on their performance (36).

Furthermore, while conducting the think-aloud interviews and analysing the data, we closely followed Johnson's guidelines, with one exception. We did not code the

level of thinking separately since we used a preselected coding scheme (19). This scheme has three categories, making it unnecessary to code the interviews more than three times. Although this may present a limitation, it is important to note that protocol analysis, as described by Ericsson and Simon (1993), is based on linear thought processes. The complex thought processes observed in this study are not always linear and may not be fully captured by the protocol analysis they proposed (20).

Another critical consideration is measuring the time spent on the different phases. The participants varied in age and years of experience from novice to experienced home care nurses, which reflects actual practice in home care nursing in the Netherlands. This may have impacted the findings, although a recent study showed that the factor of home care nurses' years of experience did not influence the variation in hours decided on by home care nurses (Schwenke & Van Dorst et al., submitted). Quantifying time spent on the different phases and skills made looking at the attention they applied per phase or skill possible. Home care nurses varied in spending between six minutes and almost one hour on the assessment task. However, spending more time on a phase or skill does not necessarily indicate better quality in applying clinical reasoning skills in the nursing process.

CONCLUSION

This study reveals practice variation in the nursing process and the application of clinical reasoning skills by the home care nurses who participated in this think-aloud interview study. This variation suggests that the differences found in their clinical judgment regarding the amount of hours, type, and duration of home care admission are attributable to the inadequate use of critical clinical reasoning skills in the diagnostic and goal-setting phases of the nursing process. Additionally, several contextual factors were considered in the clinical judgment of the home care nurses, resulting in variation. Additional research, such as participatory action research or a realist evaluation study (on peer review meetings), would be valuable in uncovering whether home care nurses are influenced in their clinical judgment by the context-related factors they mentioned. Engaging in discussions about client cases and identifying these influences could increase nurses' autonomy and strengthen their position within the organisation regarding their responsibilities to clients and policymakers. Furthermore, a study on the quality of the nursing process documentation, focusing on the alignment between diagnoses, nursing goals, and nursing interventions, could provide more insight into the quality of the home care provided to clients (32, 37).

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APPENDICES

I: Interview guide
II: Coding Scheme for the Deductive Analysis of the Think-Aloud Interviews
III: The order in which the home care nurses progress through the different phases of the nursing process and the frequency of phase transitions.

Appendix I: Interview guide
The home care nurse is invited to participate in the interview via an online link in an Outlook appointment. The participant selects the date for the appointment through an invitation via a date picker.

Script:
Prepare the video
Open Teams
Getting to know the participant
- "Hello, may we introduce ourselves to one another?"
- "Thank you again for participating in this interview."

Ask again permission to record the interview and use the data for research.
- "Do you agree to record this interview and use the data for this study?"

Check whether turning off cameras is desirable for the interviewee.
- "Participation in this interview is anonymous."
- "I have checked the working conditions form in advance; can you join this interview without disturbing anyone? Are there any questions or additions that may be important to your situation?"
- "Are there any other questions?"
- "Would you like to practice thinking out loud?"
- "What signal do we agree on when there are breaks, and you are silent for too long?" Shall I ask you to speak your thoughts out loud at such a moment?"
- "I will disturb your thoughts/work as little as possible and only then when you silently think for too long."
- "If I have any questions, I will ask them at the end of the interview."
- "If you want to take notes while watching the video, just do so."
- "Are you ready to start and watch the video?"
- "You will watch a recording of Nicole Alders made at her home. Her ex-husband has asked your organisation to send a home care nurse to visit and arrange care for her. He mentioned that she agrees to this and is expecting your visit. He expresses concern about her; she is mishandling her medication, drinking excessively, and has Parkinson's disease."
- "Feel free to take notes if you normally do."

Start the video:Do not interrupt the participant while watching the video unless the participant has been silent for a few seconds.
- "What are you thinking at the moment? Can you think aloud, please?"

Continued script after watching the film:
- "Can I start the recording?"

Start recording: You have now activated a shortcut to capture a screen recording when you press the Windows and G keys on your keyboard simultaneously. The Xbox Game Bar will now launch. Click the dot in the top left panel to start recording. A timer will become visible on the right side of the screen.
Allow recording to continue until the final conversation.
When you have finished recording, click the blue stop button next to the timer on the right.

Your recording will now be saved to the Captures folder in your profile folder:
C:\Users\YOURUSERNAME\Videos\Captures

- "The recording has started."
- The question/assignment is: "You have now watched this film with the client. May I ask you to start assessing the needs as always? If you want to use pen and paper or enter things into the computer, do that as you are used to doing. I would like you to express everything you do or want to do, or think about everything that comes to your mind, speak out loud, and share it with me. We want to get insight into your thoughts while you assess the needs of Nicole and how you decide on her needs. Do not hesitate to say everything during your assessment process because there is no right or wrong."

Follow-up after completing the task:
Any in-depth questions that may be asked may start with, "Can you tell me more about… You indicated at…., can you explain what you mean by that?"
If there are no in-depth questions, the recording can be stopped.

Stop recording.

Question: Have you already completed the online questionnaire? Are you not done yet? I will send you a link with a request to complete it.

After the interview, it is announced that the research results will be shared after analysis and that the participants will be contacted personally to receive the results and to attend the symposium.

Request address details to send a gift voucher.

- Close interview: "Thanks for participating!"

Appendix II: Coding Scheme for the Deductive Analysis of the Think-Aloud Interviews

Name	Description
Nursing Process (17)	Six phases in the nursing process, including the clinical judgment
1. Assessment	Anamnesis
2. Diagnosis	Nursing problems
3. Goal Setting	Defining goals
4. Planning Interventions	Defining interventions
5. Evaluation	Evaluating results
6. Clinical Judgment (3)	Decision on the amount, type, and duration of home care
Clinical Reasoning Skills (4)	A complex cognitive process that employs formal and informal thinking strategies to gather and analyse patient information, evaluate its significance, and weigh alternative actions
Assessing systematically and comprehensively	Utilising an organised, systematic approach that enhances one's ability to discover all the information to fully understand a person's health status
Checking accuracy and reliability	Collecting additional data to verify whether the information is correct and complete
Clustering related cues	Grouping data to identify patterns and relationships among the data
Determining a comprehensive plan or evaluating and updating the plan	Ensuring that priority problems, corresponding outcomes, and interventions are recorded in the patient record, keeping the plan up-to-date
Determining client-centred outcomes	Describing precisely what results will be observed in the patient to demonstrate the expected benefits of care at a specific point in time
Determining individualised interventions	Identifying specific nursing actions tailored to the patient's needs, designed to (1) prevent, manage, and eliminate problems and risk factors; (2) reduce the likelihood of undesired outcomes and increase the likelihood of desired outcomes; and (3) promote health and independence.
Diagnosing actual and potential problems	Ensuring that the patient's actual and potential problems are accurately identified based on evidence from the health assessment and patient records.
Distinguishing relevant from irrelevant	Determining what information is pertinent for understanding the situation at hand and what information is irrelevant.
Distinguishing normal from abnormal and identifying signs and Symptoms	Analysing patient data to determine what falls within the normal range and what is outside it, then deciding whether abnormal data may indicate specific problems

Appendix II: Coding Scheme for the Deductive Analysis of the Think-Aloud Interviews (continued)

Name	Description
Evaluating and correcting thinking	Reflecting on thinking for safety and improvement—for example, identifying flaws, assessing whether thinking is focused and sufficiently detailed, and making necessary adjustments
Identifying assumptions	Recognising when something is taken for granted or presented as fact without supporting evidence
Identifying missing information	Recognising gaps in data collection and seeking information to fill those gaps
Identifying patterns	Determining what patterns of health, illness, or function are indicated by patient data
Making inferences (drawing valid conclusions)	Making deductions or forming opinions that logically follow based on patient cues (subjective and objective data)
Promoting health by Identifying and managing risk factors	Maximising well-being by detecting and managing factors that evidence suggests contribute to health problems (e.g., sedentary lifestyles contribute to many health issues)
Recognising inconsistencies	Identifying when pieces of information contradict each other
Setting priorities	Setting priorities is defined in two ways: (1) differentiating between problems requiring immediate action and those needing subsequent action, and (2) determining which problems must be addressed in the patient record.
Influencing Factors (9)	
The client's wishes and preferences	
The presence of different types of care providers in the region	
The client's capacity for self-reliance and self-direction	
Other disciplines involved in the client's care	
The availability of technological tools in an organisation	
The nurses' attitudes and beliefs	
The availability of the client's network	
The nurses' years of experience	
The client's ability to learn	
The region where the client is living	
The client's number of nursing diagnoses	
The presence of multiple home care providers in the region	
The client's living circumstances	

Appendix II: Coding Scheme for the Deductive Analysis of the Think-Aloud Interviews (continued)

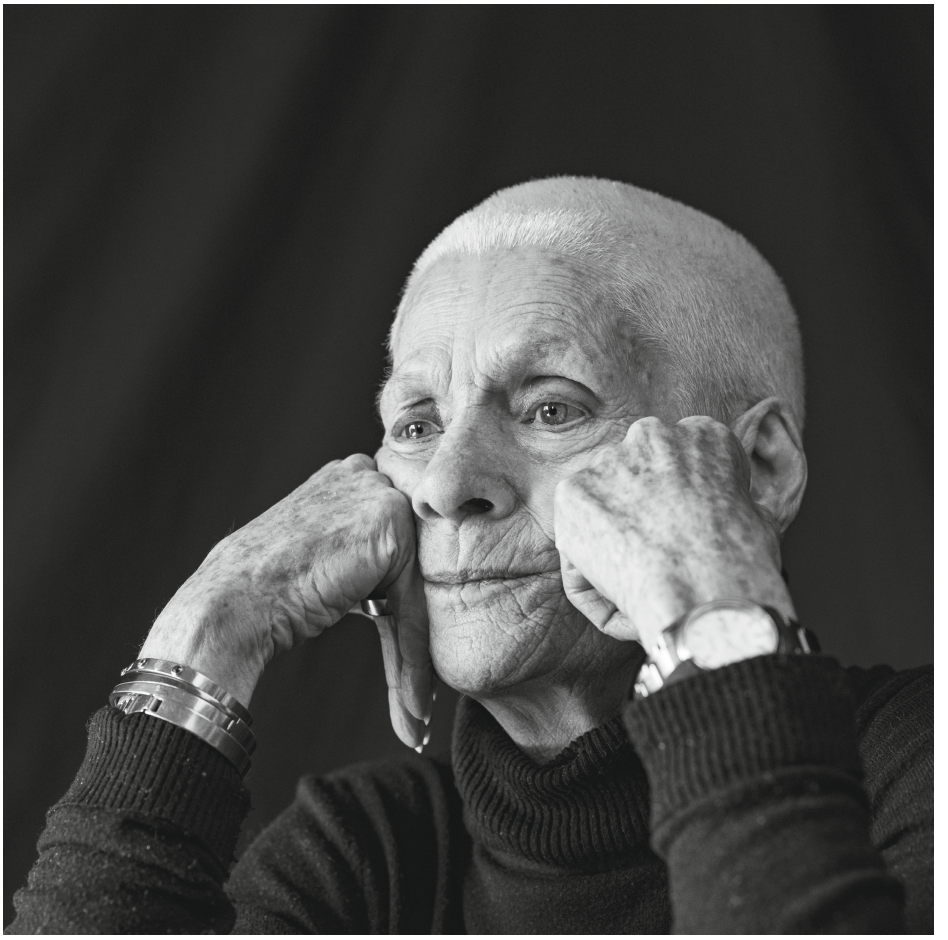
Name	Description
The client's culture or ethnicity	
The capacity of personnel available	
The home care nurse's knowledge of guidelines, standards, and scientific evidence	

Appendix III: The order in which the home care nurses progress through the different phases of the nursing process and the frequency of phase transitions.

Participant	Follow-up of Phases	1. Assessment	2. Diagnosis	3. Goal-Setting	6. Clinical Judgment	4. Interventions	5. Evaluation
1 A	1-2-1-4-2-1-4-2-4-6-4-1-6-5-6-5-4-6-5-2-6-5-1	5 times	4 times	0 times	5 times	5 times	4 times
2 B	1-3-4-1-4-3-1-4-1-4-1-4-1-4-3-1-2-4-1-4-1-2-1-2-4-2-1-2-1-4-1-3-1--6-4-1-6-3-6-4-6-4-6-5-1-5-6-5-6-5-1-5-1-4-5-4-5-4-1-6-4-5-4-5-4-3-4-5-6-5-6-4-5-6-1-5-4-5-4	20 times	5 times	6 times	11 times	22 times	14 times
3 C	1-2-1-2-4-3-1-2-3-1-4-1-4-1-4-5-3-4-6-3-4-2-5-4-5-6-5-6-5-1-5-3-4-3-2-1-5-2-4-5-6-3	8 times	6 times	7 times	4 times	9 times	8 times
4 D	1-4-1-4-1-5-4-5-1-4-5-1-5-1-4-6-4-3-1-5-1-3-4-6-5-1-4-5-6-5-1-5-6-4-1-5-4-5-4-1-5-1-4-1-5-6-5-1-6-5-6-5-5-2	15 times	1 times	2 times	7 times	12 times	17 times
5 E	1-4-1-4-6-5-1-5-6-4-1-5-6-1-2-1-4-1-4-2-5-4-2 -4-5-4-1-4-1-4-5-6-5-3-4-3-1-4-1-4-2-1-2-1-4-1-5-1-5-2-4-1-2-5-4-1-6-5-6-5-1-6-5-4-1-4-6-1-5-6-5-1-5-1-5-4-1-	23 times	7 times	2 times	9 times	19 times	17 times
6 F	1-2-1-4-1-6-1-5-4-2-1-5-1-4-5-1-4-3-5-2-4-6-2-4-2-5-4-1-4-5-6-4-6-4-6-4-2-5-6-5-4-2-1-5-4-5-6-5-4-5-4-2-3-1-2-5-6	10 times	9 times	2 times	8 times	15 times	13 times
7 G	1-4-1-2-4-1-4-1-4-5-2-5-2-4-2-5-2-4-2-5-2-3-2-3-2-1-2-1-2-1-2-4-3-2-4-1-2-4-2-1-2-4-5-1-2-4-2-6-4-6-4-5-6-1-5-6-5-4-3-5-5-3-5-1-5-6-4-5-1-	13 times	18 times	5 times	5 times	15 times	13 times

Appendix III: The order in which the home care nurses progress through the different phases of the nursing process and the frequency of phase transitions. (continued)

Participant	Follow-up of Phases	1. Assessment	2. Diagnosis	3. Goal-Setting	6. Clinical Judgment	4. Interventions	5. Evaluation
8 C	1-2-1-2-1-2-1-2-1-4-6-5-4-2-4-5-4-6-5-6-5-4-5-6-5-4-5-2-6-5-4-3-6-2-5-3-5-	5 times	7 times	2 times	6 times	7 times	10 times
9 H	1-2-1-2-6-5-4-6-5-4-6-1-4-1-4-2-4-2-1-6-4-5-4-3-5-3-5-6-2-5-2-1-5-3-4-3-2-5-4-3-1-4-3-6-3-6-1-4-3-1-2-6-5-6-5-6-5-3-5-2-1-5-2-4-2-5-4-6-2-6-1-4-6-1-4-5	12 times	12 times	9 times	13 times	15 times	15 times
10 H	2-1-4-5-1-4-1-4-1-3-5-4-2-5-6-3-4-6-2-3-5-4-1-4-2-1-5-6-5-4-5-3-2-4-6-5-2-1	7 times	6 times	4 times	4 times	9 times	8 times
11 I	1-5-1-2-1-3-4-1-4-3-6-3-4-3-5-3-4-5-3-1-2-5-4-6-4-3-1-6-4-6-5-6-4-6-4-6-4-6-5-6-3-1-1-5-1-3-1-4-1-5-6-5-6-6-3-6-5	11 times	2 times	10 times	13 times	11 times	10 times
12 F	1-2-1-4-2-5-3-1-5-2-1-4-3-1-4-2-4-5-4-5-1-5-4-5-4-1-5-1-5-4-1-4-1-4-3-1-5-1-5-2-1-3-5-1-6-5-2-5-3-2-1-5-4-1-4-1-4-5-4-1-5-2-4-5-4-2-4-5-4-1-4-2-1-4-5-3-6-6-4-1-6-1-4-6-5-6-5-4-5-6-5-6-1-4-6-5-5-4-1-5-6-4-5-4-6-2-4-5-6-5-3-1-3-5-2-4-2-5	25 times	13 times	8 times	12 times	29 times	31 times
*Range of times they switch phases**		*5 – 25 times*	*1 – 18 times*	*0 - 10 times*	*4 – 13 times*	*5 – 29 times*	*4 – 31 times*
*Average of phases used**		*13 times*	*8 times*	*5 times*	*8 times*	*14 times*	*13 times*



6

EXPLORING PRACTICE VARIATION IN DIAGNOSES, OUTCOMES AND INTERVENTIONS AND CLINICAL JUDGMENTS BY HOME CARE NURSES:

A survey study

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ABSTRACT

Background: Based on clinical reasoning, nurses follow the nursing process to develop client care plans. In many healthcare systems, including home care settings, nurses are crucial in assessing the amount, type, and duration of care needed. In some countries, such as the Netherlands, these needs assessments also serve as a formal basis for accessing care services, regulated by national health policies. A recent study revealed limited application of skills in accurate diagnosis and goal-setting alongside wide variability in the recommended hours, types, and duration of home care.

Objective: The current study explored variations in the needs assessments for weekly home care nursing hours for one specific client case, along with the nursing diagnoses, predicted outcomes, and interventions underlying these decisions.

Method: A cross-sectional quantitative vignette survey was designed and conducted among home care nurses in the Netherlands. Participants were shown a videotaped client (vignette) and were invited to diagnose, predict outcomes, plan interventions, and decide on the number of weekly home care hours needed. The vignette was based on a real-life case and provided cues, allowing home care nurses to determine four nursing diagnoses. Data were analysed using descriptive analyses.

Results: One hundred fifty-six complete surveys were analysed. The recommended home care hours ranged from zero to over 15 hours. Variation was also found in the diagnoses, interventions, and outcomes. When assessing clients' needs, home care nurses pay minimal attention to the impact of psychosocial problems on physical nursing problems. Home care nurses primarily focus on supporting medication management and bathing.

Conclusion: The weekly hours, diagnoses, interventions, and outcomes recommended for one client case varied widely among home care nurses. Their focus was predominantly on physical nursing diagnoses and less on psychosocial nursing diagnoses.

BACKGROUND

Home care nursing is becoming increasingly important across many European countries, primarily due to demographic shifts characterised by an ageing population (1). An increasing number of individuals opt for home care services, motivated by the desire for independence and to receive care in familiar surroundings (2). This trend is also stimulated by the cost-effectiveness of home care nursing compared to institutional care (3). As home care nursing is taking on an increasingly important role in healthcare, the role that home care nurses have or can play is also becoming more critical. In the Netherlands, being the focus of this study, for example, a policy shift in 2015 aimed to strengthen the home care setting by repositioning home care nurses in a central role. From that moment on, home care nurses regained the responsibility to assess home care clients' needs, giving them formal authority to allocate home care nursing funded under the Health Insurance Act (in Dutch: Zorgverzekeringswet) (4).

Worldwide, nurses are educated to systematically assess clients' needs by utilising the nursing process during clinical reasoning (5). They holistically gather information about the client and his or her context to state what nursing problems exist before setting goals and choosing appropriate interventions (6). The holistic approach considers the client's physical needs interconnected and interactive with their emotional, spiritual, and intellectual needs. Looking at people holistically forms the basis of most nursing theories (7). This holistic perspective ensures that care is deeply attuned to people's needs. Assessing the client's needs for granting access to home care nursing is not always a nurse's responsibility in other countries. For example, in Norway, service allocators from municipalities decide on needs with questions not necessarily based on classification systems utilised in the nursing process (8). Also, the client's medical diagnoses and condition steer the nursing interventions provided to clients in home care nursing (9). In Germany, a special agency assesses clients' needs (10); in France, social workers decide on the clients' needs (11), and in the United Kingdom, the municipalities decide on the care individuals receive (12). It is unclear whether they use any validated or evidence-based instruments.

The policy shift in 2015 in the Netherlands has created challenges and opportunities for bachelor-educated home care nurses to assess clients' needs. A key challenge lies in the relatively recent return of responsibility to home care nurses, who had not handled client needs assessments for nearly 18 years. From 1997 until 2015, this task was managed and centralised by external, independent organisations (13, 14). Placing the responsibility back with the home care nurse offers an excellent opportunity for them to enhance their professional autonomy (6). Moreover, it

empowers home care nurses to tailor care plans more closely to the unique needs of their clients, fostering a more personalised approach to care delivery and paying more attention to prevention (15, 16). In addition to assessing explicit home care needs, Dutch home care nurses play a pivotal role as healthcare promoters by addressing individual client care and broader community health initiatives (7, 10). Together with the general physician, they act as gatekeepers to prevent clients from becoming ill, developing complications, or requiring avoidable hospital or nursing home admissions (11, 12).

Research shows that care plans based on accurate nursing diagnoses, with logical connections to outcomes and interventions, ensure safer and more effective care (17-22). The diagnosis phase can, therefore, be seen as one of the most crucial parts of the nursing process, as it involves selecting the proper interventions for clients and addressing prevention. Each diagnosis's PES (problem-aetiology-symptoms) concept provides elements that point to possible outcomes with interventions connected to these elements (19). However, a recent study shows practice variation in recommended hours, type and duration of care (Van Dorst et al., submitted). Practice variation in needs assessment is defined as how home care nurses differ in the amount, type and duration of home care they decide on in similar client situations (23). Studying client files, it remained rather complex to fully grasp whether this variation was due to a variation that was found in the nursing documentation in general or due to influencing factors that could not be investigated because of missing in documentation (Schwenke & Van Dorst submitted; Van Dorst et al., submitted). Moreover, nurses appeared to place limited emphasis on diagnosis, goal-setting, and core reasoning skills (such as pattern recognition and risk management) when conducting their needs assessments (Van Dorst et al., submitted). While practice variations were observed in recommended hours, type, and duration of home care, knowledge about the underlying nursing diagnoses is lacking. Assuming that the weekly hours of home care decided on will vary when the stated nursing diagnoses vary, requiring different interventions and outcomes.

Aim

This study explores the variation in home care nurses' decisions after needs assessment regarding recommended home care hours, nursing diagnoses, planned interventions, and predicted nursing outcomes.

METHOD

Design

A cross-sectional quantitative video vignette (24) survey study with an open-answer-question design was chosen for this study to collect data from Dutch home care nurses about the home care needs assessment in a single client case.

Participants

Home care nurses with a bachelor's degree who were responsible for assessing clients' home care needs (i.e. European Qualification Framework (EQF) level 6) were invited to participate in the survey (25). The link to the survey was shared across the country via social media, LinkedIn, the Living Lab of Ageing and Long-Term Care Limburg, and colleagues' networks. The target population concerned approximately 7.560 Dutch registered home care nurses responsible for granting paid home care nursing client access under the Health Insurance Act (Zorgverzekeringswet, ZVW) (26). Convenience sampling was employed, aiming for a maximum response rate.

Development of the video vignette and survey

The video vignette introduced a real-life client case with anonymised information. An actress presented a client called Nicole, who lives at home and struggles with the consequences of Parkinson's disease. The video depicts Nicole discussing her life, sitting in her home, conversing by phone with a friend, and providing cues such as signs and symptoms and probable causes of nursing diagnoses (see Text Box 1). The client's cues in the video would lead to recognising specific nursing diagnoses. The video vignette holds four diagnoses related in a cause-and-effect pattern (see Appendix A). The connections between the diagnoses show that the nursing diagnoses of *Ineffective health self-management* combined with *Maladaptive grieving* and/ or *Situational inadequate self-esteem* lead to *Excessive loneliness* and eventually to a *Decreased self-care ability syndrome* (19). The total video vignette lasted ten minutes. Three nursing lecturers tested the video on usability and credibility.

The first part of the survey inquired about whether participants worked as home care nurses responsible for assessing the needs of home care clients, followed by the informed consent procedure. In addition, some questions were included about the participants' background, i.e., whether participants were self-employed or employed by a home care organisation, their educational level, and whether they had completed a specialised course in assessing clients' home care needs. The video vignette was introduced after the first part. The survey questions in Part 2 were based on three phases of the nursing process: diagnosis, predicted outcomes, and interventions. After viewing the video, participants answered what, according to them, were 1) the nursing diagnoses, 2) the predicted nursing outcomes, 3) the nursing interventions, and 4) the number of hours of home care per week the home care nurse would recommend for the first three months to achieve the predicted outcomes.

Nicole is filmed in her home as she attempts to start a telephone conversation. After two unsuccessful tries, she is delighted to reconnect with a friend she hasn't seen in 30 years. The conversation reveals her struggle with Parkinson's disease, along with various health issues. It becomes evident that she ***neglects her well-being****, often indulging in* ***unhealthy habits*** *such as* ***consuming (a lot of) alcohol*** *and* ***only eating fast food*** *and* ***mismanaging her medications****—taking them all at once in the evenings* ***instead of as prescribed.***

A sense of nostalgia washes over her *when she discusses her past as an international truck driver, delivering flowers across Europe. She* ***longs for the freedom she once enjoyed*** *and* ***expresses deep regret for no longer contributing*** *to society. Due to her illness, Nicole was* ***forced to sell her truck****, a decision that plunged her into* ***significant financial trouble****. This loss not only* ***stripped her of her livelihood*** *but also deepened her* ***sense of isolation and despair****, compounding the* ***challenges she faces daily****.*

Nicole ***reflects on the joy of cycling*** *with her younger brother, who passed away,* ***marking the significant time that has elapsed since his death****. Her* ***loneliness*** *is palpable throughout the video.*

As she speaks, ***signs of her suffering*** *are apparent:* ***bottles of wine, an ashtray filled*** *with discarded cigarettes,* ***and empty pizza boxes*** *resting on* ***her walker*** *serve as stark reminders of her struggles. She confesses to* ***not having showered in a long time*** *and reveals that she* ***has not seen a specialist in years****,* ***convinced that there's little anyone can do*** *for her chronic condition. Her* ***husband left her for her neighbour*** *some years ago and is the* ***only one who attends to her with a little bit of social support****, taking care of her grocery needs like food, wine and tobacco.*

Nicole has endured ***considerable loss*** *since becoming ill—****her health, her job, her brother, who was also her best friend, her independence, her future aspirations, and her marriage****. Each* ***loss weighs heavily*** *on her, painting a poignant picture of her current reality.*

Text Box 1. Nicole Alders's vignette was used in the survey. The bold parts in the text are the incorporated cues for the diagnosis in the case.

Data collection

Data was collected using the survey software Qualtrics XM. The link to the data collection form was shared and reposted multiple times between June 2023 and October 2024. Additionally, data were gathered during two conference workshops for home care nurses in June and November 2023 using the same survey link.

Data analyses

Data were extracted from the online survey supported by Qualtrics software into an Excel sheet, where data cleaning occurred (Qualtrics XM, MS Office 365). Only fully completed surveys (regarding nursing problems, nursing outcomes, nursing interventions, and the number of hours of home care per week) were included in the analysis. As the survey questions were open-ended, the next step in the analysis involved coding the nursing diagnoses, interventions, and outcomes. The Nanda-International Classification of Nursing Diagnoses 2024-2026, the Nursing Intervention Classification (NIC), and the Nursing Outcome Classification (NOC) provided a standardised framework for coding, ensuring consistency and comparability in the analysis (19, 27, 28). Two researchers, CS and JvD, separately categorised the data using the three classification systems and compared the results before uploading the data to SPSS. Because home care nurses might use older versions before the 2024 edition of Nanda-I, where some diagnoses are removed, adjusted, or were not yet classified -diagnoses (such as Risk for Excessive Loneliness and Excessive Loneliness and Risk for Decreased Self-Care Ability Syndrome and Decreased Self-Care Ability Syndrome) were combined into one column (Excessive Loneliness and Decreased Self-Care Ability Syndrome). Diagnoses removed from the Nanda-I 2024-2026 were marked with an asterisk (*). Terms for diagnoses, interventions, or outcomes that could not be mapped because they did not align with existing classification terminology were annotated accordingly. If answers appeared in a different question (e.g., an intervention was mentioned in the diagnosis question), this was coded under the corresponding heading (e.g., the intervention was coded as such) through an iterative process between the two researchers, CS and JvD. SPSS was used for descriptive data analyses to investigate the data distribution, the median, and the interquartile range.

Ethical considerations

METC-Z (METCZ20210171) was commissioned for ethical approval on November 10th, 2021. The study was conducted in accordance with the Declaration of Helsinki in 2024 (29). At the start of the survey, home care nurses provided written informed consent after being informed about the study's purpose, duration, and the option to withdraw at any time. The anonymous survey link ensured no personally identifiable information was collected from participants. The data were stored safely on Maastricht University's secure drive.

RESULTS

Participants

The survey was completed by 162 participants (133 via the online survey and 29 via the survey link used in the workshops). Six participants submitted unusable text and were thus removed from the dataset. After excluding incomplete responses, 156 participants completed the survey and were included in the analysis.

Of all home care nurses, 140 held a bachelor's degree (90%), 15 had a master's degree (10%), and one did not report the level of education. Most home care nurses worked in an employed situation with the organisation (N = 148, 95%); seven were self-employed (4%), and one worked in a combined situation of being self-employed and employed by an organisation. About three-quarters of the home care nurses (N = 116, 74%) completed a specialised course for assessing clients' needs.

Diagnoses

Table 1 shows all the nursing diagnoses the participants stated for the client. In total, 28 different diagnoses were mentioned. Nurses stated that, on average, they had 3.8 diagnoses, ranging from 1 to 12. The three most frequently mentioned diagnoses based on Nanda-I (13) were: *Ineffective health self-management* (N = 145, 92.9%), followed *by Decreased self-care ability syndrome* (or Risk for) (N = 116, 74.4%), and *Excessive Loneliness* (or Risk for) (N = 60, 38.5%). These diagnoses had explicit cues in the video; the other cued diagnoses. *Maladaptive grieving* was diagnosed by 20 nurses (12.8%); no one identified the diagnosis of *Situational inadequate self-esteem* (which could have been used as an alternative or combined with *Maladaptive grieving*). *Ineffective health maintenance behaviours* were diagnosed by 31.4% of the home care nurses, and the *Risk for falls* by 19.9% of the home care nurses. There were some cues for the last two diagnoses, but fewer cues than those intertwined in the video vignette. Seventeen of all home care nurses identified the four upfront intertwined diagnoses.

Table 1. Nursing diagnoses stated by the home care nurses (19)

Diagnoses (n=28)	Number / Percentage of nurses	
Ineffective health self-management*	145	92.9%
(Risk for) Decreased self-care ability syndrome*	116	74.4%
(Risk for) Excessive loneliness*	60	38.5%
Ineffective health maintenance behaviours	49	31.4%
Risk for falls	31	19.9%
Impaired physical mobility	29	18.6%
Social isolation	26	16.7%
(Risk for) decreased activity tolerance	23	14.7%
Maladaptive grieving*	20	12.8%
Ineffective home maintenance behaviours	14	9%
Inadequate health knowledge	13	8.3%
Ineffective planning of activities	13	8.3%
Ineffective overweight self-management	11	7.1%
Impaired memory	10	6.4%
Pain	10	6.4%
Impaired physical comfort	9	5.8%
Ineffective Health maintenance behaviour	8	5.1%
(Risk for) Excessive fluid volume	7	4.5%
Impaired sensory perception**	7	4.5%
Coping (unspecified)	7	4.5%
(Risk for) skin integrity	7	4.5%
Readiness for enhanced self-care abilities	4	2.6%
Inadequate nutritional intake	4	2.6%
Powerlessness**	3	1.9%
Excessive anxiety	3	1.9%
Ineffective role performance	3	1.9%
Decreased diversional activity engagement	3	1.9%
Situational inadequate self-esteem*	0	0

* These diagnoses had specific cues to be identified from the video
** Diagnoses that were included in an older version of the Nanda-International (19)

Interventions

The home care nurses selected 19 interventions, with an average of 3.5 and a range of one to eight interventions per home care nurse. As shown in Table 2, 76.9% of home care nurses selected *medication management*, followed by 64.1% of all home care nurses who plan *self-care assistance*. 40.3% selected a *multidisciplinary care conference*, followed by *activity therapy* by 26.2% of the home care nurses. 8.3% chose *grief work facilitation* as an intervention.

Table 2. The selected interventions by home care nurses

Interventions (n=19)	Number / Percentage of nurses	
Medication management (dispenser-use)	121	76.9%
Self-care assistance (IADL)	100	64.1%
Multi-disciplinary care conference	63	40.3%
Activity therapy	41	26.2%
Health literacy enhancement	40	25.6%
Nutritional counselling	35	22.4%
Support system enhancement	34	21.7%
Healthcare information exchange	23	14.1%
Disease process	21	13.5%
Medication administration	19	12.1%
Exercise promotion	19	12.1%
Grief work facilitation	13	8.3%
Fall prevention	12	7.6%
Home maintenance assistance	12	7.6%
Pain management	6	3.8%
Dressing	6	3.8%
Fiscal resource management	5	3.2%
Weight management	3	1.9%
Sensory perception management*	3	1.9%

*Interventions not classified in NIC (28)

Predicted Outcomes

Table 3 shows all 22 predicted outcomes by home care nurses. They mentioned an average of three outcomes per home care nurse, ranging from one to eight per home care nurse. *Compliance behaviour in prescribed medication* is the most selected predicted outcome among 61 (38.5%) of the home care nurses, followed by *health-seeking behaviour* by 54 (34.6%) of all home care nurses. *Compliance behaviour* is selected by 51 (32.7%) of the home care nurses, and 48 (30.8%) aim to

improve the clients' *self-care hygiene*. *Loneliness severity* is a selected outcome by 18.6% of the home care nurses.

Table 3. The predicted outcomes by home care nurses

Outcomes (n=22)	Number / Percentage of nurses	
Compliance behaviour: Prescribed medication	60	38.5%
Health-seeking behaviour	54	34.6%
Compliance behaviour	51	32.7%
Self-care hygiene	48	30.8%
Self-management: Chronic disease	33	21.2%
Loneliness severity	29	18.6%
Energy conservation	28	17.9%
Acceptance: Health status	28	17.9%
Nutritional status	20	12.8%
Appropriate care*	20	12.8%
Decline of symptoms*	19	12.2%
Lifestyle balance	19	12.2%
Personal well-being	19	12.2%
Mobility	16	10.2%
Body-positioning self-initiated	15	9.6%
Social support	14	9%
Retrieving more information*	13	8.3%
Fall prevention	9	5.8%
Comfort	8	5.1%
Weight loss	7	4.5%
Comfort status environment	6	3.8%
Pain level	5	3.2%

*Outcomes not classified in NOC (27)

The number of hours decided on by home care nurses

The data on the weekly hours recommended by home care nurses varied considerably, between 0 and 945 minutes being recommended. The data were positively right-skewed, with a skewness of 1.718 due to four outliers. The median was 165, and the interquartile range was 180 (90 – 270).

DISCUSSION

Based on a single client case (video vignette), this study reveals variation in home care nurses' decisions regarding the required hours, ranging from zero to over 15 hours per week. Variation was also observed in the identified diagnoses, interventions and predicted outcomes.

The findings suggest that home care nurses prioritise physical diagnoses over psychosocial ones, as also found in the study of Naess et al. (9). Several studies on home care needs assessment and nursing interventions show a dominant medical logic in nursing (8, 9). Still, nurses think home care nursing is exceptional because of the holistic view (30). Hospital nurses act on nursing problems that arise after treatment or when a medical issue occurs. Still, in home care nursing, next to these nursing problems, medical issues arise caused by psychosocial problems. In the video vignette, at least five cues for detecting the clients' grieving are presented, and only a few home care nurses define this nursing diagnosis. In addition, the existing pattern between physical and psychosocial nursing diagnoses is hardly identified. Addressing the symptoms and consequences of ineffective health self-management—rather than its underlying causes—may result in inadequate and inappropriate care that fails to resolve the issue. This can prolong or even worsen nursing problems (27).

This dominant focus on physical diagnoses and interventions may be explained by the fact that home care nurses continue to act (or are influenced by the context) as before the system change in 2015, focusing on intervening immediately. While home care nurses are expected to work autonomously and adjust their focus as needed, they are part of large organisations that prioritise interventions to secure home care hour declarations, which is essential for financial sustainability (31). Influencing factors, such as the influence of insurance companies and the organisation being money-driven, influence the needs assessment of home care nurses in an unwarranted manner (23). Although funding models evolve and emphasise prevention and lifestyle changes, current funding remains tied to planned interventions rather than the actual outcomes achieved in home care nursing (32). As a result, there may be a disconnection or even a contradiction between the priorities of organisational management and those of the home care nurses (Schwenke et al., submitted). Simply changing the position and responsibilities of home care nurses is insufficient to alter the behaviour of other organisational actors and factors, creating a context where conflicting responsibilities may collide. The working context, as the social environment surrounding the home care nurse, is known to influence variations in practice (33, 34).

Additionally, addressing psychosocial issues often requires collaboration with other disciplines. The World Health Organisation emphasises multi-professional team collaboration as a crucial change in skill mix, essential for effectively organising and coordinating health and care services in the future (35). Approximately one-third of the home care nurses selected multi-disciplinary care conferences as an intervention, indicating that working together in situations involving psychosocial problems is not evident to them. It is unclear whether they do not know how to act, believe it is not their area of responsibility, or are unable to act. Home care nurses should approach client cases more holistically, considering factors beyond the care provided by their organisations. Adopting a multi-disciplinary approach enables nurses to fulfil their responsibilities and collaborate with other disciplines. Working together towards nurse-sensitive outcomes, such as reducing the severity of loneliness, achieving lifestyle balance, or improving comfort through interventions like grief facilitation and support system enhancement, helps clients like Nicole achieve personal well-being and a more positive self-image. As Nicole feels better about herself, she may be more likely to adopt a healthier lifestyle, including adhering to her medication regimen as part of managing her chronic condition. Home care nurses can only serve as gatekeepers by organising appropriate care to address the psychosocial aspects of the diagnoses presented in this video vignette. To collaborate in a multidisciplinary setting, they will face challenges in using disparate electronic health records, which often serve as barriers rather than facilitators of effective teamwork (36, 37). Organisations frequently have separate documentation systems, primarily due to differing financing structures and ICT providers, making multidisciplinary collaboration more challenging.

A broad spectrum of reasons and factors likely influences the variation in practice. Some of these factors fall within nurses' influence, such as the need for continuous professional development in clinical reasoning and varying levels of competencies in clinical reasoning among nurses. Research on European nursing curricula indicates that clinical reasoning receives limited attention, and additional education, requiring sustained effort, is essential to effectively assess and address clients' complex care needs (5). Similarly, a recent study on Dutch bachelor nursing programs revealed inconsistencies in the teaching hours and methods dedicated to clinical reasoning and the nursing process (38). This calls for organisations to act on stimulating the improvement of clinical reasoning skills. At the meso- and macro-level, structural and organisational factors may play a crucial role. Clear guidelines and educational programs for (home care) nursing, stimulated by their organisations, are necessary to enable and facilitate home care nurses in their needs assessments and interventions. Nursing associations and professional bodies could play a pivotal role in advocating for curriculum enhancements, developing decision-support tools, and providing ongoing support for nurses working in home care settings. Additionally, some factors contributing to practice variation may be beyond the direct control

of nurses. Regional differences, including social and nursing services availability, influence how home care nursing is delivered (Van Dorst et al., submitted). Variability in local policies, healthcare funding structures, and interprofessional collaboration may further shape nursing practices in different areas. Even in more standardised medical contexts, where single-diagnosis approaches are often present, practice variation is well-documented (39). This variation becomes even more pronounced in nursing, where diagnoses are inherently complex, interdependent, and dynamic, as illustrated in the case vignette. Multiple nursing diagnoses frequently interact and influence one another, requiring a nuanced approach to assessment and intervention, which leads to practice variation caused by client-specific factors. This further highlights the complexity of nursing and the need for ongoing efforts to refine and optimise clinical reasoning to improve client care quality and safety in the home care setting (5, 40).

Strengths and limitations

This study has both strengths and limitations. One limitation is that the anonymous survey provided participants with the benefit of anonymity. However, we received some defensive reactions via LinkedIn. Most of these comments expressed concerns about not adequately engaging with the client to assess their needs, as they are supposed to do due to the video format. Nonetheless, multiple nurses considered a video vignette the most appropriate method for assessing the same client, as it is not feasible to visit one client with many participants to conduct a needs assessment. Therefore, we acknowledged that nurses could not interact with the client as they were accustomed to; we invited them to assess this client based on precisely the same information, which is a strength. Data were collected through different routes. Data gathered through workshops were less anonymous, as the researcher was present. To mitigate potential bias, workshop participants were asked to complete the survey forms individually before any discussion. The two different routes showed no differences in variations.

This study used the NANDA-NIC-NOC classification systems to code the nurses' responses to nursing diagnoses, interventions, and outcomes (19, 27, 28). During this process, it became evident that many nurses used varying terminology, particularly concerning nursing outcomes (NOC) (27). While some outcomes mentioned were traceable to the standardised NOC system, others, such as "appropriate care" or "retrieving more information" as desired outcomes, were not. This variability illustrates a lack of unified terminology within nursing classifications. A consistent, standardised language is essential, as it supports the transparent sharing and utilisation of nursing information across professionals and organisations (36, 41). Without alignment in terminology, differences may emerge in the goals set for clients and, in turn, in the care hours allocated or types of care indicated. The absence of shared language can, therefore, affect the consistency, quality, and

evaluability of care planning and decision-making, especially in home care nursing, where decisions on the needs assessment (e.g. access to care) are based on the professional judgment of nurses (36).

Finally, we must consider that these study results do not represent all home care nurses in the Netherlands because the sample size is too small. Nevertheless, they show considerable variation, which requires further research.

CONCLUSION

Variation in weekly hours, diagnoses, interventions, and predicted outcomes exists when assessing a single client case. Home care nurses primarily focus on physical diagnoses and interventions rather than psychosocial diagnoses and related outcomes. More research is needed to understand why they struggle to identify or intervene in psychosocial diagnoses and what context-related factors may affect home care nurses' clinical judgment. Our study results suggest that enhancing education, supporting systems, and decision support in clinical reasoning, particularly for psychosocial diagnoses, is essential for improving the quality and safety of client care, especially in the home care setting.

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7

ENHANCING HOME CARE NURSING IN THE NETHERLANDS:

How can Organisations Facilitate the Improvement of Needs Assessments in Home Care Nursing? A Focus Group Study

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ABSTRACT

Background: Home care nursing plays an essential role in the current and future societal challenges. In the Netherlands, home care nurses autonomously determine the type, cost and duration of nursing care at home. There are no guidelines for performing this needs assessment and organisations can implement the needs assessment according to their preferences. Recent research indicates variation in the assessed care of comparable clients. Also, there are various problems in the needs assessment process, mostly on organisational level. Organisations play a crucial role in the improvement of the needs assessment. However, it remains unclear how organizations address the challenges encountered during the needs assessment process and what specific difficulties they face. The aim of this study is to explore the challenges that organisations encounter in the process of the needs assessment and what approaches they handle to optimise the process of the needs assessment.

Methods: This study had a qualitative explorative design. Four focus group interviews were conducted with professionals including managers, policy- and quality officers, and home care nurses from different organisations who are involved in improvement processes regarding the needs assessment in Dutch home care organisations. The focus group interviews were audio-recorded and transcribed. Data were analysed using a thematic approach.

Results: 38 participants from 22 different home care organisations participated in the study. Three main themes emerged: 1) Problems in the process of the needs assessment, 2) Best practices in organisations, and 3) Professionals' improvement ideas. Organisations experience challenges especially due to a lack of a shared vision and different perspectives on the needs assessment. Many different approaches were seen between organisations that could influence practice variation, e.g. short-term assessments, intake routes or various roles and functions, such as senior home care nurses, ambassadors, or dual management.

Conclusions: To optimise the needs assessment process, a clear and shared vision is needed among all involved organisations, health care professional and health insurers. Furthermore, more scientific evidence on interventions and strategic approaches in home care nursing are essential to provide organisations with guidance in improvement processes towards a better needs assessment. Third, home care organisations, other health care professionals, and health insurers must collaborate to create a more uniform process of the needs assessment.

Keywords: Home care nursing, community nursing, needs assessment, organisational change management, process improvement

List of abbreviations

COREQ = Consolidated criteria for Reporting Qualitative research
ECO-GD = Ethical Committee Research of HU University of Applied Sciences Utrecht (Ethische Commissie Onderzoek- Gezond en Duurzaam leven)
EHRs = Electronic Health Records
PES = Problem-Etiology-Symptoms
SMART = Specific, Measurable, Achievable, Relevant, Time-bound
V&VN = Verpleegkundigen & Verzorgenden Nederland (Dutch professional nurses Association)

*In the published article, the word 'patient' is used. In this and other Chapters, this term has been changed to 'client' for the purpose of this thesis.

BACKGROUND

Due to worldwide staff shortages in healthcare and aging populations, care for older people with complex care needs is increasingly shifting from institutional care towards care at people's homes (1). Home care nursing, which in this study is defined as professional assistance with personal care and skilled-based nursing care delivered in the clients' homes (2), plays an essential role in these developments. In many European countries, e.g. in the Netherlands, a needs assessment is required to authorise clients access to reimbursed home care nursing, though the way these assessments are organised differs. For example, in Germany, an independent consultancy and assessment service carries out the needs assessments to assist statutory health and care insurance providers (3). In France, a social worker or nurse is responsible for evaluating client needs (4), whereas in England, local authorities oversee the assessment process for clients (5).

In the Netherlands, being the focus of this study, home care nurses who are educated on at least bachelor-level (EQF level 6), are providing access to home care nursing. They are employed by home care organisations. Through performing needs assessments, they autonomously determine the type, cost and duration of nursing care that a client receives at home. A clear and adequate needs assessment is an essential starting point for high-quality nursing care (6). The needs assessment is embedded in the nursing process. Home care nurses need solid clinical reasoning skills to perform a needs assessment (7). Through a comprehensive history, home care nurses establish nursing diagnoses and, in collaboration with the client, set care goals and interventions. This process constitutes the actual needs assessment, during which the type, amount, and cost of home care nursing are determined [6]. Subsequently, the identified care is provided, typically by nursing assistants or nurses with vocational training, depending on the specific care requirements. This care is delivered to mainly people aged 75 plus, who has frequent general practitioner consultation aid devices, pharmaceutical care, ambulance transportation and occupational therapy (8). Home care nurses continually monitor and assess the care process, adjusting the care plan when necessary (7). As mentioned, the needs assessment is an integral part of the broader nursing process and cannot be viewed in isolation from the other stages, as the initial steps influence the final outcome (7). In the Netherlands, there are no guidelines or instruments for performing a needs assessment and organisations can implement the process of the needs assessment according to their preferences. However, the Dutch professional nursing association V&VN requires home care nurses and organisations to take six standards into account for a solid needs assessment, namely: Home care nurses educated at least to the bachelor level are assessing needs (1), while their professional autonomy is being ensured (2). The nursing process is being followed (3) and the clients' self-

direction is aimed to be strengthened (4). Last, nursing documentation (5) and transfer (6) must be done according to the guidelines of V&VN (9).

Recent research indicates variation in needs assessments in the Netherlands, which is defined as 'the way home care nurses differ in the nature, amount and duration of care they indicate for clients in similar situations' (10, p. 3432). A recent think-aloud interview study among twelve Dutch home care nurses found a large variation in the assessed care for the same client, which varied from 3:30hrs of care per week for 3 weeks to 9:20hrs of care per week for unlimited time. Also, the diagnoses and goal-setting phases were taken less into account (11). Furthermore, several issues related to the process of the needs assessment have emerged from prior research (12,13). First, nursing documentation, which is essential for the traceability and justification of the needs assessment, is often incomplete. Broad background information about the client (e.g. the financial situation or living situation) is often not described in the Electronic Health Records (EHRs). Also, it is often not traceable whether the nursing process was followed while assessing needs, goals are not formulated SMART (Specific, Measurable, Achievable, Relevant, Time-bound), and diagnoses do not follow a Problem, Etiology, Symptoms-structure (12). Second, there is often a guiding policy in organisations related to the autonomous process of the needs assessment. Home care nurses experience not being involved in (new) policies and decisions concerning the needs assessment within their organisations (13). Third, home care nurses lack the basic knowledge on clinical reasoning, laws and regulations that is required for a solid needs assessment. Necessary guidelines and documents are not always known, and activities for further professional development (e.g. training or peer review) are not mandatory (13). This can have various reasons: it is not being facilitated by the organisation, there is no budget available, or home care nurses do not have enough time or are not interested (13). Therefore, based on these previous studies, the role of organisations and how they facilitate nurses seems crucial to enhance the process of the needs assessment.

Home care organisations constantly need to change to improve processes due to internal and external triggers, like societal, political, or technological developments (14, 15). Organisations need to involve health care professionals in change processes, clearly communicate and prepare professionals for changes, and acknowledge the changes' value for the health care services to achieve successful changes (16). However, it is not clear how home care organisations address these problems in the process of the needs assessment, and what challenges they experience related to the needs assessment. Therefore, this study aims to 1) explore what challenges organisations encounter in the process of the needs assessment, and 2) what approaches organisations handle to optimise the process of the needs assessment. The findings of this study can be useful for healthcare organisations

worldwide that deliver home care nursing when improving needs assessments to enhance client-tailored care.

METHODS

Design

This study had a qualitative explorative design, using four focus group interviews to promote interaction and discussion among participants, encouraging them to share and discuss their experiences and perspectives (17). These different perspectives and experiences offered valuable insights into the challenges and approaches of the process of the needs assessment. The reporting follows the Consolidated criteria for Reporting Qualitative research (COREQ) checklist (18) (Appendix II). For enhancing the clarity and accuracy of the author's original writing, the AI language model ChatGPT, developed by OpenAI, was used in the preparation of this manuscript by providing feedback on specific sentences. This study was part of a nationwide research project on practice variation in needs assessments in home care nursing in the Netherlands (10-13,19] commissioned by the Dutch Ministry of Health, Welfare and Sport.

Setting

The study took place in the setting of home care nursing in the Netherlands, where home care nurses at bachelor level autonomously give access to home care nursing by determine the type, duration and cost of nursing care at home by performing a needs assessment. The needs assessment is part of the nursing process. These nurses are employed by home care organisations. The Netherlands has a total of 1,400 home care organisations (19). These organisations can operate in various structures, including salaried employment models, cooperatives, or partnerships of self-employed professionals. Additionally, home care nursing may be provided through mediation agencies or by self-employed home care nurses. Thus, the size of home care organisations varies from small (with revenues up to 1 million euros) and medium-sized organisations (with revenues between 1 and 10 million euros) to large organisations with revenues exceeding 10 million euros. They either operate in the whole country, or specific regions or cities. In 2023, a total of 579,500 clients in the Netherlands received home care nursing, amounting to a total cost of 3.2 billion euros, at an average cost of 5,525 euros per client (20). Especially older people receive home care nursing in the Netherlands; 80% of them are older than 66, with an average age of 75 years. But also middle-aged people and children receive home care nursing (19). Home care nursing can be either contracted or non-contracted by health insurers. In the Dutch healthcare system, insurers are responsible for securing sufficient and high-quality care for their policyholders by establishing agreements with healthcare providers, including home care organisations—this is referred to as contracted care (21). However, some home care organisations opt not

to enter into contracts with insurers, often due to concerns about restrictive budget caps or limitations imposed on their professional autonomy. This non-contracted care model allows clients greater freedom in choosing their healthcare provider. However, it is not always fully reimbursed by health insurers, meaning clients may have to cover the remaining costs themselves. Furthermore, research has shown that the costs per client for non-contracted care providers are 87% higher than those for contracted care providers (22).

Participant selection and recruitment

Managers, policy- and quality officers of home care organisations in the Netherlands, as well as home care nurses who are involved in improvement processes regarding the needs assessment in the organisation they work for, were included in the study (see Table 1). Policy- and quality officers in Dutch home care organisations are responsible for developing products and services in home care nursing, such as (scientific) guidelines and work processes, supporting their implementation, and improve quality improvement processes. They were recruited systematically via their organisation (16). In total, 27 organisations that already participated in other studies of our research group regarding needs assessments in home care nursing (10-13,19) were approached. These organisations differed in the size (large, medium-sized and small organisations) and area they operated in the country (countrywide and regional). We aimed to include at least one participant per organisation, i.e. 27 in total, to gain as much as possible information about experienced challenges and solution approaches. Managers, policy- and quality officers, who were already contact persons for the other studies of our research group, were invited via email and asked to share the invitation with colleagues who met the inclusion criteria. The invitation email also included an informed consent form and the date for the focus group. Participants could register for the study by returning the signed informed consent form via email.

Table 1. In- and exclusion criteria of participants

Inclusion criteria	Exclusion criteria
Managers, policy- and quality officers, home care nurses	Home care nurses who only perform needs assessments or provide care (and who are not involved in policy, quality or training activities in their organisations), since the focus is on strategies at organisational level
Actively involved in processes regarding the improvement of the needs assessment within the organisation	Vocational nurses
Knowledge of the policy regarding needs assessments within the organisation	Managers, policy- and quality officers who do not have knowledge of quality improvement regarding needs assessments within the organisation
Knowledge of training regarding needs assessment and peer review within the organisation	
Knowledge of nursing documentation within the organisation	

Data collection

Four focus group interviews were conducted. Due to the nationwide spread of participants, the interviews were held online via Microsoft Teams. They were moderated by a researcher of the research project (MS, PhD candidate), and supported by a research assistant, who took field notes and kept track of the time. The focus group interviews were conducted in November and December 2023. The average duration of the focus groups was 92 minutes (range 84-98 minutes), and the mean number of participants per focus group was 10 (range 6-15 participants). All interviews were audio-recorded, anonymised, and transcribed verbatim with written and verbal consent of participants.

The focus groups had two aims: 1) Identifying challenges that organisations face in implementing and enhancing the process of the needs assessment, and 2) exploring approaches that organisations already use to enhance the process of the needs assessment. All interviews were guided by the same interview guide that was discussed a priori in the research group (see Appendix I).

The interview guide consisted of three parts. In the first part, participants were informed about the aims and duration of the interviews. Furthermore, they were informed about data processing and privacy, and again, asked for consent for the audio recording. The first part concluded with an introductory round. In the second

part, we shared the findings of our prior research regarding the needs assessment with the participants and allowed questions, comments and discussions. In the third part, we shared three main problems that occurred in the process of the needs assessment based on our prior research (12,13): 1) A guiding policy within organisations that hinders the autonomy of home care nurses, 2) Lack of basic knowledge of home care nurses regarding clinical reasoning, law and regulations needed for the needs assessment, and 3) Incomplete nursing documentation. Each problem has been presented in more detail, followed by the following questions per problem: To what extent does this apply to your organisation? What are you currently doing to tackle this problem? Afterwards, participants were asked what does or does not help them in enhancing the needs assessment to further explore the challenges they experience.

Data analysis

Data were analysed in ATLAS.ti (Version 23.4.0.29360 for Windows) (23) and Microsoft® Excel® for Microsoft 365 MSO (Version 2408 Build 16.0.17928.20114). The analysis followed a thematic approach, as detailed by Braun & Clarke (24). Two researchers, a PhD-candidate (MS) and a postdoctoral researcher read the transcripts thoroughly several times to become acquainted with the data, and independently assigned initial codes. Then, the researchers compared their codes, and merged or renamed them, if needed. The definite codes were organised into themes, and a thematic map was developed. The themes were discussed and defined by both researchers. Afterwards, themes were grouped into categories, and the findings were linked to the research questions. The final analysis has been discussed in the whole research group.

Ethical considerations

In this study, ethical principles were adhered to as described in the Declaration of Helsinki (25). An informed consent procedure was followed by sending written information to the participants before the focus group interviews. This information contained general information about the study, confidential data processing and publication, voluntary participation and the option to withdraw from the study at any time. Participants were requested to return the (digitally) signed form to the researcher via email before the focus groups. Each focus group interview was started with a verbal repetition of the given information, asking participants again to consent to audio recording. Data were handled in line with the data management plan of the broader research project. This data management plan follows the EU General Data Protection Regulation. During the transcription of the interviews, all details that could identify participants were removed. Participants and home care organisations were allocated a random number. Data were saved on a secured cloud data storage service provided by the University of Applied Sciences Utrecht, which only researchers of this study employed at this university had access to. This study

was confirmed by the Ethical Committee Research (ECO-GD) of HU University of Applied Sciences Utrecht (280-000-2024) to not fall under the description of medical scientific research in humans and does not fall within the scope of the Dutch Medical Research Involving Human Subjects Act (WMO).

RESULTS

In total, 38 participants from 22 different home care organisations participated in the study: 35 (92%) were female, and 3 (8%) were male. They had various roles in their organisations in the field of management (n=4), quality and policy (n=16), or as home care nurses (n=18) who are involved in policy or quality improvement processes regarding needs assessments (Table 2). The home care organisations they worked for were 15 large organisations, 2 medium-sized organisations and 5 small organisations, operating in the whole country as well as only in specific regions.

Table 2. Characteristics of the participants

Characteristics of the participants (N=38)	
Gender	n (%)
Female	35 (92)
Male	3 (8)
Role	
Home care nurse	18 (47)
Management	4 (11)
Quality- or policy officer	16 (42)
Home care organisations	22

Figure 1 shows the themes and sub-themes that emerged from the analysis. There were three main themes: 1) *Problems in the process of the needs assessment*, 2) *Best practices in organisations,* with two sub-categories: *Uniformity and professional development* and *Organisational structure and policy*, and 3) *Professionals' improvement ideas*.

Figure 1: Themes and sub-themes that emerged from the analysis

1 PROBLEMS IN THE PROCESS OF THE NEEDS ASSESSMENT

General barriers

Participants experience that the process of the needs assessment gets increasingly unclear due to different perspectives on the needs assessment in education, training and organisations. They think that organisations that let home care nurses assess needs without appropriate training is also a barrier for a uniform process of the needs assessment. Participants perceive also barriers and dilemmas on the level of the home care nurses: Time pressure and high workloads leading to less time for a high-quality needs assessment, the dependence on their organisations and other domains (e.g. municipalities) that do not collaborate in the process of the needs assessment, and conflicting expectations of health insurers and clients. Participants mentioned that the collaboration within and between organisations should be improved to learn from each other and come to a better and uniform needs assessment.

> *"You depend on other domains, that may or may not support your needs assessment. Look, if the municipality does not collaborate, and you as a home care nurse decide to go along and accept that, you have a totally different outcome [in the needs assessment] than confronting the municipality. And some managers say 'Then do it [the needs assessment] by yourself, it cost too much time to discuss with the municipality.'" – Home care nurse, focus group 4*

Challenges in organisations

Participants perceive various challenges in their organisations regarding the improvement of the process of the needs assessment. First, organisations must

constantly adapt to societal challenges, especially in a future with more multimorbid clients with complex care needs, and staff shortages in home care nursing. They experience this as a lot of pressure.

> *"Organisations constantly must anticipate a future where hell will break loose." – Manager, focus group 3*

Second, participants mentioned to perceive the production-driven approach and the challenging financial situation in organisations as a barrier to improve the needs assessment. They experience the actual funding of home care nursing as hindering for a high-quality needs assessment, because it leads to a lot of pressure on direct minutes of care (i.e. direct client care), whereas indirect minutes of care (i.e. planning and organising care, nursing documentation, training and education, etc.) would improve the needs assessment. According to the participants, this funding situation makes it also difficult to implement improvement measures for the needs assessment, because it leads to high workloads and time pressure for home care nurses.

> *"There is also pressure on direct minutes instead of indirect minutes. So, it is the everyday pressure that hinders you to go for the gold standard, and to be satisfied with the bronze standard." – Director, focus group 4*

Third, participants experience that there is insufficient scientifically justified information and guidelines in home care nursing to make choices in organisations to improve the needs assessment, and organisations do not know what the best approach is and what really improves the needs assessment. In the participants' view, this is the reason why each organisation is searching separately for their own solutions and making their own choices in working approaches, which leads to differences in the process of the needs assessment between organisations.

> *"I recognise that it's difficult to find each other when you want to further develop processes. And how do you do that then? We're also looking for frameworks or guidelines for that, so this research is helpful for organisations."- Quality and policy officer, focus group 1*

Professional development of home care nurses

According to the participants, there are increasing demands placed on home care nurses, resulting from societal challenges. They mentioned that these increased demands make it even more important for home care nurses to gain more confidence in their professional autonomy. However, participants observe a lack of basic knowledge about laws and regulations and clinical reasoning skills of home care nurses in general regarding the needs assessment. In their opinion, a post-

bachelor education is necessary, as well as keeping home care nurses' knowledge up to date.

> *"I don't think that you can expect a recently graduated nurse to function as a home care nurse. You need a separate post-graduate programme, where you focus on all the things that are so specific for home care nursing. I think you become more skilled in how to perform a needs assessment; what aspects you need to consider."- Home care nurse, focus group 2*

Conversely, participants stated that attending conferences and training is often difficult and only possible by using vacation days and personal funding.

Intake

Participants had different opinions about the intake procedure of a client and the documentation of the broader clients' situation. The majority sees a holistic view on a clients' situation for the care planning as an important starting point for high quality care, and as essential information for the traceability of the needs assessment in the nursing documentation. Others see the collection and documentation of a broad situation of a client during the intake as unnecessary, because it takes too much time and includes information that might not be relevant for the care (e.g. the financial situation of a client is not in each case applicable).

> *"I know for sure that the broad clients' situation is not being documented. Ideally, this information should be in the EHR, but you see that home care nurses quickly document an anamnesis that is focussed on disfunction and care, and then you mis broad information about a clients' situation." – Quality and policy officer, focus group 1*

> *"Do you really need to document every-, every-, everything? It is the profession of the home care nurse to have an eye for what's relevant. We want to get rid of all the documentation. GP's also don't document everything, that's almost impossible." – Home care nurse, focus group 2*

Participants also observe barriers to getting a broad perspective on a clients' situation: In the EHR's, that are linked to classification systems like OMAHA or NANDA, there is no adequate space to document a client's background information. Furthermore, some home care nurses find it difficult to inquire about certain information of a client. In some organisations, there are efforts to standardise the intake to decrease the administrative burden. However, some participants see standardisation as not client-centred, leading to disagreement within organisations.

Documentation, classification systems and EHRs

Participants of all organisations experienced that the nursing documentation in EHRs is incomplete. Some participants think that this is due to high workloads. They trust home care nurses to only document information that is relevant for the care of a client, and that missing information is therefore irrelevant. Others observe that care goals are not adequately documented, and that home care nurses experience difficulties with the formulation of SMART goals. According to the participants, the administrative burden must not increase to improve nursing documentation. Organisations are searching for solutions to decrease the administrative burden without losing quality. Some participants think that (intended) care outcomes should be the focus of documentation, instead of the actual care situation of a client. Other participants indicated that their organisations started to implement checklists for documentation to remind them what information should be documented. In the Netherlands, several classification systems are used, mostly OMAHA and NANDA. Participants experience that the classification systems and EHRs are not supporting the documentation, because they do not align with each other.

> *"The most important part of our profession is the needs assessment. And if this is not working well digitally, that is bizarre. And we accept this for eight years already with each other" – Home care nurse, focus group 1*

According to the participants, organisations should adhere to a single classification system for an objective and uniform needs assessment, because in their opinion, using different systems leads to variation.

> *"I think we should figure out the best classification system. In my opinion, we shouldn't want to work with two different classification systems [in the Netherlands]." – Home care nurse, focus group 1*

Role of the home care nursing profession

According to the participants, the home care nursing profession should regain its leading role in the community, which is not the case now according to participants in a management or policy role. Also, home care nurses are less represented in regional forums and committees according to them. Participants perceive that there is no uniform and commonly shared vision on the needs assessment from the professional group.

> *"The process of the needs assessment is getting more and more unclear due to different perspectives on the needs assessment in education, training and organisations." – Policy and quality officer, focus group 4*

Especially participants who work as home care nurses mentioned that the role of home care nursing is not clear for clients and society. This is reinforced by the media that portrays a skewed perspective of home care nursing, leading to less appreciation by politics and society.

> *"It starts with the image. I think that everyone knows what a physiotherapist is and what they do, and in home care nursing people don't even know the different professions."- Home care nurse, focus group 4*

2 BEST PRACTICES IN ORGANISATIONS

2.1 Uniformity and professional development

Peer review

Most organisations implemented peer review for home care nurses regularly to improve the process of the needs assessment. Peer review is a systematic, structured, critical examination within a team of the conduct of health services, such as performing a needs assessment, with the aim of aligning it with a pre-formulated standard [18]. Participants mentioned having positive experiences with peer review, because it creates more awareness for using documents and guidelines that are essential for the needs assessment, to gain a broader perspective on a clients' situation, and it helps home care nurses to reflect on their decision-making, which is a solid basis for assessing clients' needs.

> *"I think that peer review is a nice tool to get the basics in order. You often get caught up in the madness of the day; you keep running around. But, it is good to stand still and reflect on what we are doing." – Home care nurse, focus group 1*

Most organisations of the participants implemented peer review with a frequency of three to six times a year with mandatory participation. However, some participants emphasize home care nurses' responsibility for participation. If participation is not mandatory, participants observe that peer review gets the lowest priority of home care nurses in times of time pressure. If home care nurses do not participate in peer review, organisations of the participants handle various consequences: Some require a conversation with the manager, others require participation in another group, and in some organisations, it does not have any consequences. Peer review is not implemented in all organisations of the participants. Participants, mostly home care nurses, of organisations that did not implement peer review mentioned that their management does not see the importance of peer review for the quality of the needs assessment.

Peer group supervision

Besides peer review, some organisations implemented regular peer group supervision for home care nurses to improve the process of the needs assessment. supervision, or professional peer meetings, is a structured form of support where colleagues collaboratively provide advice on specific work-related problems, with a focus on addressing individual challenges [26]. In those organisations, supervisionis part of an internal audit system and takes place three to six times a year. Some organisations require all home care nurses to participate in supervision, whereas others see participation as the home care nurses' responsibility.

Training

In the Netherlands, there are several commercial providers offering training on needs assessments in home care nursing. In most organisations, home care nurses must complete training to be allowed to assess needs, whereas some of the participants mentioned that participation in such training is not mandatory. Participants agree that there should be the same nationwide training on needs assessments for home care nurses and that organisations should facilitate this. Now, training often takes place in home care nurses' private time and personal funding.

> *"We also sent some of our new home care nurses to a training about the needs assessment. They found it very helpful, but I think nationwide training would be just a good training for home care nurses. That appeals to people!" – Quality and policy officer, focus group 3*

Checking EHRs

Some participants mentioned that their organisations implemented a regular check of nursing documentation in the EHRs to improve the process of the needs assessment. Home care nursing consultants are checking once or twice per year whether documentation is clear, complete and uniform. Based on these checks, the consultants create a development plan for each home care nurse. Participants reported that this takes a lot of time, but that it increases the quality of EHRs and nursing documentation.

> *"In our organisation, consultants are checking all EHR's to see if the nursing process is being followed and if SMART goals are described, for example. Based on that a development plan is made together with the home care nurse. Now, in the third year of doing this, we see that the quality of documentation increased enormously." – Quality and policy officer, focus group 3*

Onboarding process for starting home care nurses

Participants see a structured and supportive onboarding for starting home care nurses as essential for a high-quality needs assessment and retention of home

care nurses. They report different onboarding processes in their organisations. In most organisations, a junior home care nurse is linked to a senior home care nurse. For some organisations, this is not enough. They have a structured onboarding programme and intensive guidance for starting home care nurses. Besides, starting home care nurses must participate in a training for the needs assessment or perform a knowledge test before they are allowed to assess needs. Some organisations reported having good experiences with traineeships, in which starting home care nurses receive a structured onboarding programme and have less responsibility in the beginning.

> *"We also have traineeships. In the first year as a home care nurse, they get coaching and are linked to a senior home care nurse. This is to prevent fluctuation in the first year because they are facing a lot!" – Manager, focus group 3*

2.2 Organisational structure and policy

Home care nurses' involvement in policy

Participants mentioned that organisations want all home care nurses to feel involved in the organisations' policies and new developments. However, participants of large organisations indicated that it is challenging to ensure everyone's full involvement in their organisations. Home care nurses in smaller, but also larger organisations, are mostly involved through working groups, committees, or bodies. Smaller initiatives that all participants reported are involvement through organisation-wide surveys, (pilot) projects, regular meetings with the management and all home care nurses, and announcements for involvement via intranet.

> *"What I observe in our organisation, that is a large organisation with more than 90 teams, it is very complicated to involve all home care nurses. You often try a lot via intranet. And we have a Nurse Advisory Council. So, in this way we try to involve home care nurses. But it is a huge challenge, I must admit."- Quality and policy officer, focus group 3*

Roles and functions

Participants reported various roles and functions they implemented in their organisations to improve the process of the needs assessment. Some organisations work with home care nurses as care coordinators or senior home care nurses, who delegate tasks to decrease the administrative burden and free up time for the basic tasks of home care nurses. Other organisations implemented home care nurse ambassadors, who lead the peer review sessions and act as representatives of all home care nurses in the organisation. A few organisations work with dual management, in which the care manager takes over the administrative work, and home care nurses focus only on their original tasks. Participants from organisations

using dual management emphasised that it is essential for these organisations to trust in the professionalism of home care nurses.

> *"The organisation really needs to believe in the home care nursing profession. So that you don't need to be busy with handling sick leaves, rosters, planning, and all of that. If the organisation believes in the profession, you can really focus on the essentials of home care nursing, and then that is your focus to do that good!" – Quality and policy officer, focus group 1*

Approach of the needs assessment process

Participants shared different approaches they use in their organisations to improve the process of the needs assessment. Some organisations work with short-term assessments, where an initial care period of six weeks is standardly assessed, and further decisions on care are made based on that. This has the aim of financial control according to the participants.

> *"Short-term assessments are a new policy in our organisation, that every home care nurse needs to do: First, you assess care for six weeks, and from there you decide further. There are a lot of discussions about it among home care nurses. There are nurses who think this is reasonable. But there are also nurses who think: 'This influences my professional autonomy to perform a needs assessment'. The aim of that is financial control." – Home care nurse – focus group 4*

Other participants mentioned that their organisations work with intake routes, in which the intake of a client is done by two home care nurses, followed by a discussion about the clients' situation with the entire team. Another approach that was mentioned by participants is the methodical cycle. They mentioned that organisations established the needs assessment as part of a methodical cycle and methodical work. This means that it is determined who has which role in the organisation in the process of the needs assessment. Many participants mentioned working increasingly with an intake in the hospital in the process of the needs assessment to promote knowledge transfer and to prevent misinformation about the role, tasks and limits of home care nursing.

> *"We started to do a 'home visit' in the hospital or revalidation centre already and do the intake there to increase the knowledge transfer." – Home care nurse, focus group 2*

3 PROFESSIONALS' IMPROVEMENT IDEAS

Small initiatives regarding professional development

Participants mentioned different small initiatives taken in their organisations for the professional development of home care nurses to improve the needs assessment process. Initiatives were monthly workshops for home care nurses about a specific topic related to the needs assessments process, e.g. time management to gain enough time for assessing needs, or networking skills for better collaboration with other health care professionals involved in the needs assessment process, case discussions about needs assessments, webinars about the nursing process, and leadership programs. One participant of a larger organisation mentioned that they let home care nurses work in multiple changing locations to improve the needs assessment process.

> *"We now have a whole new trajectory for home care nurses; everyone can participate: Personal or professional leadership, several workshops and meetings. They are for example about time management or networking." – Quality and policy officer, focus group 3*

Ideas to enhance the intake

Some participants reported improving the intake during the needs assessment in their organisation by prioritising visits to the clients' home instead of doing the intake on the phone. Other participants reported that home care nurses in their organisations need to write the anamnesis from the client's perspective. It has also been reported that working on changing the mindset of home care nurses to invest time for a proper intake helps to ensure a high-quality needs assessment.

> *"I think it comes down to taking the time for assessing needs. The real issue is that many colleagues don't prioritize making enough time for the needs assessment. Their mindset needs to shift in that regard."- Home care nurse, focus group 1*

Ideas to enhance the nursing documentation

Participants mentioned smaller initiatives to improve the nursing documentation. Some use SOAP notes (Subjective, Objective, Assessment, Plan) to support clear and uniform reporting. This method is a structured and systematic approach to document [27]. Other organisations have an EHR of a fictional client that is used as an example for home care nurses to give and receive feedback on the documentation. The use of "superusers" was also mentioned. These individuals serve as key contacts for home care nurses seeking guidance on documentation-related

queries and manage an intranet page that provides updates on documentation developments and frequently asked questions.

> *"We call that 'superusers'. These are people who are contact points for everything that concerns EHR's. They also keep all developments up-to-date, and they have an intranet site where they answer all questions [from home care nurses]." – Manager, focus group 3*

Organisational culture

Participants mentioned some improvement ideas for the organisational culture that need to change to improve the needs assessment. First, organisations need to facilitate nursing and personal leadership for a high-quality needs assessment. Second, organisations must enable collaboration and discussions about the needs assessment between home care nurses. They need to provide support to home care nurses to address each other in the manner of performing the needs assessment. Third, organisations have to trust more in home care nurses as care professionals, according to participants.

> *"You need to trust in the professional autonomy of home care nurses and trust in them doing their work well. I think that you can facilitate that as an organisation, for example by offering more training on nursing or personal leadership, so that a home care nurse also gains more self-confidence and feels more safe in doing the needs assessment." – Director, focus group 3*

DISCUSSION

This study aimed to explore what challenges organisations encounter in the implementation of the process of the needs assessment, and what working methods organisations handle to optimise the process of the needs assessment. Organisations experience challenges especially due to a lack of a clear vision and different perspectives on the needs assessment. They already apply several approaches and have concrete ideas on how organisations can optimise the process of the needs assessment, e.g. short-term assessments or intake routes, peer review or supervision, and various roles and functions, such as senior home care nurses, ambassadors, or dual management. However, many different approaches and solutions are seen between organisations.

Undergraduate education programmes, training providers and organisations all seem to have different perspectives on the needs assessment. But also, health insurers and other domains related to home care nursing, like municipalities, may have their own interests and priorities, which can lead to differing perspectives on the needs assessment (28). An explanation for these different perspectives and

visions could be, that in the Netherlands, the performance of needs assessments is a relatively new responsibility for home care nurses. Since 2015 it has been reassigned to home care nurses through changes to the Dutch Health Insurance Act (29). Before, external agencies were giving access to home care nursing. However, before 1997, the needs assessment was a central task of the home care nursing profession (30). Given these developments, it is unsurprising that a multitude of perspectives exists and that a cohesive vision is perceived to be lacking. However, it is essential for the improvement of practice that all involved health care professionals and stakeholders share a common vision. There are various models describing that the development of an explicit and common vision is crucial in the early phase of change (31). A vision also needs to be accepted and known by all professionals and stakeholders for successful change (32). Research indicates that a lacking explicit vision, limited engagement of people involved, and ineffective communication are key contributors for failure in change processes (33, 34). Moreover, these barriers, as well as lack of understanding and support from management are also described by Clarke et al (2024) in a rapid systematic review reporting barriers and facilitators on evidence-informed decision making in various care settings (35). Therefore, it is essential for the improvement of the process of the needs assessment that all home care nurses, organisations, health insurers and municipalities share and adhere to a common vision and perspective on the needs assessment. A recent study from Norway demonstrated how three guiding principles supported priority setting and informed how service allocators reasoned and justified their decisions when allocating long-term care services to older adults (28). The findings showed that these are in line with "ageing in pace", a political trends and discourse, indicating that there guiding principles and vision can support service allocators in decision making.

Organisations in this study are making separate choices in working approaches, decreasing administrative burden, and improving nursing documentation. None of them are evaluated on the improvement of the needs assessment, and organisations struggle to find suitable evidence-based solutions (36-38). Fjørtoft et al (2021) highlighted that a distinctive role of the home care nurse is the assessment of health needs (15). The assessment and the skills that are needed enables these nurses to act as gatekeepers (15, 39). However, there is little evidence how the quality of the assessment can be optimized (39). This is concerning, especially given the growing societal importance of home care nursing, which highlights the need for increased focus in this research area (15, 39, 40). For creating best practices in home care nursing, as well as demonstrating the effectiveness and value of it, it is necessary to gather more evidence (15, 40, 41). Therefore, research should focus more on supervision and strategic approaches in home care nursing to provide organisations with guidance for improving internal processes and health care services.

Moreover, the siloed solutions implemented by organisations may result in even greater variation in the needs assessments. In the Netherlands, home care nursing is a joint responsibility between the government, municipalities, and health insurers due to several funding types (42). Most of the care provided at home is funded through the Health Insurance Act, which was revised in 2006 to establish market competition among health insurers and providers (43). But home care nursing can also be funded through the Chronic Care Act for long-term care needs, or through the Social Support Act for home-based social care (42). Together with around 1,400 home care organisations (20), this circumstance has caused fragmentation in home care nursing, making it challenging for all parties involved to collaborate successfully (43). Still, collaboration between all health care professionals, providers and stakeholders in primary care is crucial for the best possible and future-proof care at home (44). Consequently, instead of searching for and implementing siloed solutions, organisations must collaborate and learn from each other, to create a more uniform process of the needs assessment, and to strengthen the position of home care nursing in primary care.

This study has several strengths and limitations. First, the study consisted of a heterogeneous sample of participants in various functions related to the improvement of the needs assessments. The choice of a heterogeneous sample was made to gain more extensive information through different perspectives. However, this might have limited the participants' ability to freely express their views, as they could have felt constrained by the professions of the other participants. Nevertheless, all participants participated in their role as being involved in improvement processes regarding the needs assessment, regardless of their function as manager, policy- or quality officer or home care nurse. Also, this study included an adequate number of participants. However, one of the focus groups consisted of 15 participants. Although this was a large group, all 15 participants were invited due to their availability on the scheduled date, as well as the fact that we did not wish to exclude those eager to share their perspectives. While this large group size presented limitations, as not all participants actively engaged in the discussions, it also offered advantages, such as a broader range of perspectives, which enhanced the depth and diversity of the insights gathered. Moreover, as there are around 1,400 home care organisations in the Netherlands (18), the participation of representatives from only 22 different organisations could be a limitation on the range of perspectives and approaches. Nevertheless, participants worked in small, large and medium-sized organisations from all over the country, which provided extensive insights. Furthermore, this study used a deductive approach by sharing three main problems from prior research with the participants. This may have unintentionally narrowed the scope of their responses, potentially overlooking other relevant challenges they might have raised. This approach could also have led to confirmation bias, where the authors might have been more inclined to focus on responses that align with our

existing understanding of these problems, rather than exploring new or unexpected perspectives.

Furthermore, this study aimed to explore working methods in organisations that improve the process of the needs assessment. On the one hand, none of these collected working methods are scientifically proven, which makes it challenging to make them transferable for a broader target group. On the other hand, these approaches could be inspirational for other organisations and health care providers. Furthermore, in other contexts or settings, the results of this study, such as the importance of a shared vision, evidence-based approaches, and collaboration among different stakeholders in specific processes, can be valuable for further improvement.

CONCLUSIONS

This study shows the challenges that home care organisations encounter in the implementation of the process of the needs assessment, as well as working methods they use to optimise this process. Perceived challenges were due to the different perspectives on the needs assessment and a shared vision that is not known or shared by those who are involved. Many different approaches were seen between organisations to enhance the process of the needs assessment, e.g. short-term assessments, intake routes or various roles and functions, such as senior home care nurses, ambassadors, or dual management. However, there are many siloed approaches in organisations.

To optimise the process of the needs assessment, several conclusions can be drawn from this study. First, a clear vision and guiding principles on the needs assessment is essential, that is accepted and shared by all organisations, healthcare professionals and stakeholders who are involved in the needs assessment. Second, scientific evidence on effective interventions and strategic approaches in home care nursing is needed to guide organizations in optimizing their internal processes and healthcare services. This findings of this study can help home care organizations refine how they assess clients' needs and tailor care plans accordingly and what is needed to enhance uniformity.

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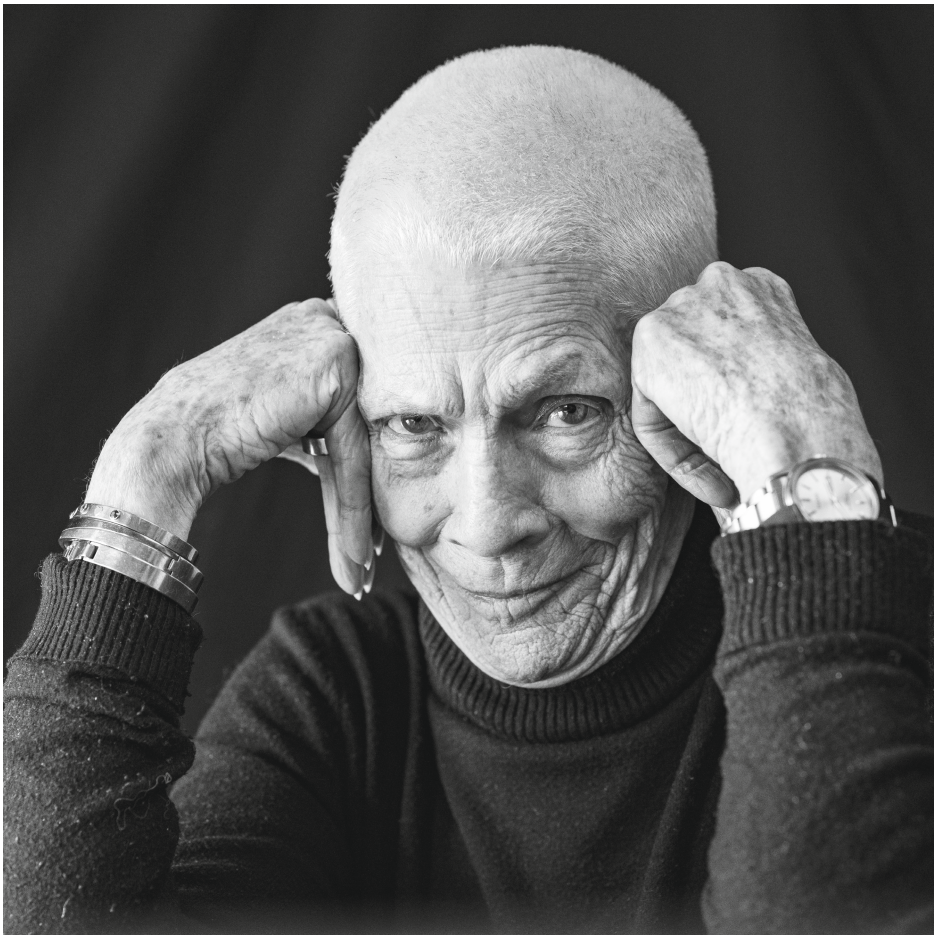

8

GENERAL DISCUSSION

This chapter will first outline the main findings of this thesis's aims. Next, it will outline the theoretical and methodological considerations that underpin this thesis. Lastly, it will present policy, practice, education, and research recommendations.

This thesis had the following aims:

- Firstly, this thesis examined how home care nurses are prepared to conduct needs assessments during their bachelor's education.
- Secondly, this thesis defined practice variation in needs assessment within home care nursing and identified the factors that influence this assessment.
- Thirdly, it examined practice variation in needs assessment in the home care nursing practice and the influencing factors.

Main findings

Educating home care nurses on performing needs assessment

Drawing on survey data from 72 professionals across 18 Universities of Applied Sciences (Chapter 2), this thesis highlights structural patterns and misalignments in nursing education related to home care. The curriculum in bachelor-level nursing programmes remains predominantly broad in scope, focusing on the basics of nursing and offering limited specialised pathways into home care nursing despite growing demands in this setting. Although some institutions incorporate home care nursing through elective minors, the prevailing trajectory directs graduates toward hospital-based roles, with only a marginal proportion (approximately 10%) entering home care nursing directly after graduation (1). A notable disjunction emerges between the nursing classification systems taught and those used in clinical practice: while educational instruction frequently relies on the NANDA-NIC-NOC taxonomy, home care organisations predominantly utilise the Omaha System, reflecting a systemic gap in curricular alignment with field-specific requirements (2, 3). The Proactive Nursing model is widely adopted for fostering clinical reasoning skills; however, broad variation exists in how clinical reasoning and the nursing process are emphasised across institutions. These findings suggest a need to critically reassess the alignment between nursing education and evolving professional practice contexts, particularly concerning the home care nursing readiness of newly graduated nurses.

Defining practice variation in home care nursing needs assessment and its influencing factors

Through a Delphi study (Chapter 3) involving 32 experts representing a broad spectrum of stakeholders in home care nursing – home care nurses, client representatives, insurers, government bodies, and professional nursing associations – three interrelated definitions of practice variation in needs assessment were

established based on a high level of consensus. Practice variation in needs assessment in home care nursing refers to how home care nurses differ in the amount, type, and duration of home care nursing that home care nurses indicate for clients in similar situations. Practice variation is only considered warranted if caused by clients' characteristics, context and preferences concerning achieving goals taken into account by the home care nurse in a professional, substantiated decision-making process. The expert panel identified 59 influencing factors, organised into four domains: client-related, client context-related, nurse-related, and nurse context-related. Client-related factors, such as personal preferences and cognitive capacity, were predominantly considered legitimate grounds (warranted) for variation. Conversely, the experts often classified organisational and systemic influences, such as financially driven agendas or insurer directives, as contributing to unwarranted variation. These findings highlight a tension between professional autonomy in needs assessment and external pressures, underscoring the structural and systemic conditions that may compromise equitable and appropriate care in home care nursing organisations.

Examining the degree of practice variation in home care nursing needs assessment

Across three complementary studies, described in Chapters 4, 5, and 6, considerable variation in needs assessment was observed in home care nursing practice and documentation.

Based on a large, nested dataset comprising 25 home care nursing organisations, 199 home care nurses, and 964 client files (Chapter 4), a cross-sectional, quantitative, retrospective study assessed the indicated and delivered minutes of weekly home care. Most of the variation was associated with client-related factors (83%-88 %), primarily revealing warranted variation. We did find the indication for unwarranted variation in the organisation and home care nurses' level, which did not remain significant during the sensitivity analysis. However, the study also showed serious omissions in the completeness of nursing documentation within Electronic Health Records (EHRs).

The subsequent studies (Chapters 5 and 6) presented variation between home care nurses within and between home care organisations, which was unwarranted compared to the mostly warranted variation identified in Chapter 4. The two studies revealed substantial variation in home care nurses' assessments and care planning for the same client case (video vignette). There were wide discrepancies in the proposed duration and weekly hours of care and the types of diagnoses, interventions, and outcomes identified. While nurses applied the nursing process, they predominantly focused on interventions, often bypassing diagnosis and goal-setting phases. A narrow set of reasoning skills, primarily related to intervention planning, was commonly employed, with limited consideration of psychosocial

aspects. Clinical decisions were strongly influenced by clients' preferences and regional care availability, suggesting that contextual factors weighed on the professional nurses' reasoning. Overall, findings highlight inconsistent approaches and a tendency to prioritise immediate action over comprehensive needs assessment, raising concerns about the uniformity and depth of care planning in home care nursing.

Building on the findings from Chapter 5 regarding the influence of context on practice variation, the focus group study involving 38 participants from 22 home care organisations further confirmed the significant role of the context of home care nurses in shaping needs assessment practices. Home care nurses, policy- and quality officers, and managers highlighted several challenges in implementing the needs assessment process. Key themes that emerged included a lack of shared vision, differences in implementing the Six Standards Framework and organisational variation in setting up the needs assessment process. Various approaches were noted among organisations that could influence practice variation, such as short-term assessments, intake routes, or multiple roles and functions (including senior home care nurses, ambassadors, or dual management). To address these challenges, participants proposed mandatory additional education for home care nurses on conducting needs assessments and mandatory peer review sessions as potential strategies to enhance consistency and quality in needs assessment practices.

Theoretical considerations

Fragmentation in education and practice undermines the realisation of holistic needs assessment

The fragmented implementation of the Six Standards Framework (Chapter 7) and various institutional and contextual influences, such as regional care availability differences and inconsistencies in client documentation (Chapters 2, 5, and 6), contribute to ongoing variation in the needs assessment. As demonstrated throughout this thesis, variation occurs not only at the client level but also at the professional level, within the organisation, and across the educational system. Despite formal training in the nursing process at nursing schools and the use of classification systems such as NANDA-NIC-NOC and Gordon's health patterns (primarily used as a concept in the initial assessment phase of the nursing process), nurses appear inadequately prepared to translate a more comprehensive holistic understanding of health and well-being into practice (Chapters 4, 5, and 6). These findings pose a critical question: to what extent are nurses equipped to conduct needs assessments that align with this broader conception of health? The observed

misalignment between policy ambitions and actual practice indicates that current educational and organisational structures inadequately support this.

To enable home care nurses to embrace the paradigm shift and broader holistic conception of health, they must effectively apply the nursing process for clinical reasoning in assessing clients' needs. This reasoning should emphasise psychosocial nursing issues and address these appropriately, as outlined in Chapter 6, which relates to a broader holistic conception of health. Their training does not adequately provide the proper methods, often leaning more towards medical rather than social approaches (Chapter 2). While relying primarily on Gordon and NANDA-NIC-NOC classifications can assist in the nursing process, home care nurses are mainly expected to implement the Omaha Systems in practice (2-4). Consequently, home care nurses face a gap between what they learn in school and practice. Furthermore, organisational management expects new graduates to be equipped to assess and evaluate clients' needs, as norm 2 of the Standards Framework suggests that a bachelor's degree in nursing is sufficient and highlights the importance of using the nursing process in norm 4 (5). A disconnect persists between what they learn in school and what they practice, with misaligned expectations between care organisations that employ newly graduated home care nurses and educational institutions. This disparity impacts the already complex landscape of home care nursing, as described in Chapter 5, where clients' living environments influence needs assessments. Additionally, the social context in which emerging professionals begin their careers may affect their approach to needs assessments. Research by De Jong (2015) supports this notion, highlighting that differences in medical practices exist and that professionals in similar contexts frequently make identical decisions about interventions or treatments (6). This may also apply to home care nursing, potentially illuminating why home care nurses often follow institutional protocols, such as utilising the Omaha system in EHRs instead of the NANDA-NIC-NOC taxonomies, and why organisations adopt diverse methods for the needs assessment process, resulting in a fragmented environment for home care nurses (Chapter 7) (2). For example, organisations have EHRs that do not adequately support the nursing process. Occasionally, the assessment phase cannot be comprehensively documented, and there appears to be a shared perception that conducting a broad and holistic needs assessment is time-consuming. This may contribute to the view that such assessments are primarily an administrative task (Chapter 7).

Home care nurses should remain responsible for the needs assessment (or not?)

Another question arises regarding whether home care nurses should continue to be responsible for the needs assessment. With a professional specialised education enabling a holistic understanding of client needs and more attention for the first two crucial phases of the nursing process, the answer to the question raised is

absolutely yes; home care nurses should still be responsible for conducting needs assessment. Although in most European countries, this is carried out either by a central authority, like in Germany, or by social workers, as seen in France, while in the UK, local authorities assess clients' needs (7-9), evidence indicates that varying who conducts the needs assessments does not eliminate practice discrepancies (10). Replacing the home care nurse with another professional or a central organ affects home care nurses' advantages in building trusting relationships with clients. They can initiate and engage throughout the entire nursing process. Above all, this approach does not solve the problem of practice variation.

Examining how the needs assessment process is organised is worthwhile. Best practices advocate for delaying decisions about clients' needs. Nursing consultations instead of intake conversations and special intake routes yield promising outcomes (11, 12). A key example is delayed decision-making through intake routes within the needs assessment procedure, representing an extended moment of in-depth problem analysis. This delay enables a more nuanced understanding of the client's situation and a more comprehensive mapping of possibilities and needs. Despite the postponed timing, the core function of this analysis —identifying needs and assessing the required level of support —remains consistent with the current routing. This convergence underscores the robustness of the assessment framework and highlights the importance of maintaining standardised criteria across intake routes. A recent somewhat comparable example was undertaken in the assessment of household support (11). Initially, a formal decision on household needs was made following an official conversation with a local authority representative; however, this decision is now based on six weeks of household support, informed by observed results. Consequently, the decision is better informed, often resulting in reduced support needs or more appropriate assistance (11). Home care nurses could consider this method of conducting the needs assessment process, as mentioned in the focus group by one of the participating members who had a successful experience with it, as described in Chapter 7. A short-term decision on care provision is made, followed by an extended period during which a small team of home care nurses (EQF 6) visits the new client to gather data and observe their situation. After this extended observation phase, they make a formal decision regarding the client's needs, supported by a thorough assessment and diagnosis. By reorganising the needs assessment process, decisions become more informed, allowing home care nurses sufficient time to effectively engage in the initial two phases of the nursing process (i.e. assessment and diagnoses).

More action is needed for the intended paradigm shift to occur as policy dictates.

The findings of this thesis indicate that the change intended by government policy in 2010 has not yet been reflected in the decisions made by home care nurses regarding needs assessment (Chapters 5 and 6). Therefore, a focus on preventing

health problems by influencing individual lifestyles has not yet been achieved. (13, 14). Government policy has positioned home care nurses as responsible for deciding on home care nursing needs, expecting them to manage this broader perspective on health, while proper education is lacking (15). As Kotter explains in his Eight-Step Model of Change, all stakeholders must engage and develop a vision to make a paradigm shift work (16). Change will not occur when stakeholders continue to act as they did before the policy change. Home care nurses would, therefore, need additional specialised education for needs assessment and handling a broader, holistic conception of health. Above all, they need a less diffuse field with supportive stakeholders who share the same vision. As the Bachelor of Nursing 2020 already contains more components for home care nurses, as findings in Chapter 2 show, nursing students are still provided with a more functional and disability perspective rather than a psychosocial and ability perspective for education to clinical reasoning, which may seem justifiable from a market perspective (17-19). Support from stakeholders for a shared vision of home care nursing, particularly regarding a broader holistic conception of health, like the First-Line partnership intents, includes investing in the education of home care nurses to strengthen the home care nursing sector and support individuals ageing in place (20). Furthermore, it would enhance the autonomy of home care nurses and influence stakeholders in the home care nursing sector by articulating and nurturing the necessary conditions to facilitate a paradigm shift. When insurers and home care organisations recognise that functional health problems often relate to psychosocial issues, it becomes evident that organising and financing mandatory additional specialised education for conducting needs assessments is necessary.

Practice variation in needs assessment will always exist in actual practice

Although a shared vision, adjusting the needs assessment process, and specialised education are necessary for home care nurses, this will not completely prevent practice variation from appearing due to systemic, contextual, and interpersonal dynamics (Chapters 2, 3, 4, 5, 6, and 7). As the population of individuals with complex care needs grows (7), the urgency for enhanced education in clinical reasoning within European curricula is increasingly emphasised (21). Documents like the Home Care Nurses' Area of Expertise and the Standards Framework promote a holistic approach to addressing clients' needs (5, 22). Although the nursing process is widely accepted as a fundamental concept in teaching nurses to approach clients' needs and is an essential part of the Bachelor of Nursing 2030 (11), not all phases of the process are appropriately utilised (Chapters 5 and 6), and the documentation practices of home care nurses often fall short (Chapter 4) (23). Crucial client background information is frequently absent from EHRs (Chapter 4), and it is evident that the EHRs do not support the nursing process, but that is not the sole cause of improper documentation (24). Factors at the home care nurse and organisational levels contribute to the fact that the phases of the nursing process

are not always clearly traceable in the documentation, as described in Chapters 4 to 7 (25). Diagnoses are not consistently structured using the PES (Problem, Aetiology, Symptoms), and when goals are documented, they are seldom articulated in SMART (Specific, Measurable, Achievable, Relevant, Time-bound) terms (25). Moreover, home care nurses report limited awareness of relevant guidelines and key documents, and they frequently do not participate in available training sessions or peer review meetings (Schwenke et al., submitted). These findings illustrate the need for improvement at the micro (individual and team) and meso (organisational) levels. Specialised education, such as post-bachelor or even master's education, is mentioned by home care nurses (Chapter 7) and must address these improvement needs at all levels. Moreover, it seems strange that mandatory nursing education is required for oncology, childcare, and dementia nurses, so why not for home care nurses, as was needed before the home care nursing system changed in 1997 (26, 27)?

At the macro level, regional differences further complicate the landscape of a uniform needs assessment. For instance, urban municipalities may collaborate with home care nursing organisations to offer specialised facilities for clients with conditions such as Parkinson's disease. In contrast, rural regions often lack such facilities, and fewer different kinds of care are available, contributing to practice variation in needs assessments (Chapter 5). As discussed in Chapter 3, such variation is deemed unwarranted when not based on individual client needs. Nevertheless, even when home care nurses adopt a holistic and person-centred perspective incorporating regional context, such practice variation can be explained and justified. Regional reinforcement of collaboration platforms, subsidised by the government, may provide a context to discuss these shortages in what is provided and developed for a more client-need-fitting landscape in home care nursing, such as in the PlusWIJken in the country's south (28, 29). A needs assessment should begin by identifying client needs based on accurate assessment data and thorough diagnoses, followed by consideration of the resources available in the region to set feasible goals. This two-step approach, in which the assessing and organising parts of the process are separately attended to, is required: first, to determine client needs autonomously and professionally, and second, to arrange home care nursing by involving what is available in the client's living area rather than vice versa. This approach underscores the inherent complexity of the needs assessment. It affirms that practice variation between home care nurses and home care organisations could never be entirely ruled out, even with shared visions, additional education, and standardised procedures in place, because there is no one-size-fits-all client.

Methodological considerations

Understanding the complexity of needs assessment in home care nursing

This thesis utilised various methodological approaches to examine the variation in needs assessment practices. By synthesising the findings of multiple studies that have explored practice variation, it becomes evident that conducting needs assessments in home care nursing is a complex intervention (30). This paragraph reflects on the complexity of the needs assessment and the methodological approaches and discusses the theoretical model of practice variation. It ends with a reflection on the researcher's role.

Recognition of the needs assessment as a complex intervention

According to the Medical Research Council (MRC) framework, an intervention is considered complex when it involves multiple interacting components, operates across different levels of a system, and is highly context-dependent (30). Needs assessment in home care nursing fits this definition (Chapter 4). It requires integrating clinical judgment, client preferences, heterogeneity, professional standards, and the availability of care services. The process involves multiple stakeholders, including clients, informal caregivers, healthcare professionals, insurers, and municipal bodies, each with distinct roles, expectations, and constraints. The assessment is also shaped by factors at the micro level (e.g., nurse-client interaction), meso level (e.g., organisational routines), and macro level (e.g., policy and funding structures (Chapter 3). These layers of variability and interdependence make needs assessment a dynamic, adaptive, and non-linear process, which are core characteristics of a complex intervention as defined by the MRC (30). Recognising this complexity should have important implications for how needs assessments should be supported, evaluated and implemented in nursing practice.

In 2015, when the home care nurses regained responsibility for the needs assessment, it was not recognised or treated as a complex nursing intervention. This thesis may have provided insight into underestimating the systemic, contextual, and interpersonal dynamics involved in its practical application. The implementation focused mainly on minimal standardisation (31) without fully accounting for the diversity of nurses' competencies, clients' needs, regional care infrastructures and broader policy influences. In retrospect, the implementation process could have greatly benefited from a systematic development and evaluation approach, such as recommended by the Medical Research Council (MRC) Framework for Complex Interventions (30). This framework emphasises the importance of iterative development, stakeholder involvement, theoretical modelling, and context-sensitive evaluation (30). Applying the MRC Framework could have enabled policymakers and practitioners to identify, before rollout, the key mechanisms through which needs assessments would operate, the various contextual conditions that shape

outcomes, and the anticipated variations in practice. It would also have supported formative evaluation and refinement before wide-scale implementation.

Recognising needs assessment as a complex intervention entails acknowledging that there is no singular solution to prevent unwarranted practice variation. This perspective also helps contextualise and soften the potentially disheartening findings for home care nurses in Chapters 5 and 6. It illustrates that practice variation is not solely attributable to individual shortcomings of the profession but rather arises from the interplay of many systemic factors, one of the most obvious being the regional availability of care services, as illustrated in Chapter 5. For instance, what is organised and funded by municipalities directly shapes the options available to home care nurses during assessment and care planning.

Reflection on the methodological approach

To strengthen the findings' internal validity and overcome potential sources of bias, this thesis employed a triangulated research design, integrating multiple qualitative and quantitative methods to detect existing practice variations. Recognising that practice variation in home care nursing is a complex and context-sensitive phenomenon, the research drew on distinct but complementary methodological approaches. A Delphi study was employed to achieve expert consensus on the definition and conceptual understanding of practice variation, thereby ensuring that the subsequent phases of the research were grounded in shared professional standards. Client file research provided real-world practice data on how needs assessments are documented and justified in practice. One notable limitation of the file research was the frequent absence of critical information in client records. Many files lacked detailed documentation and information, including underlying reasoning, contextual factors, or client preferences. The large amount of missing data introduces a risk of information bias, as the available records may not be entirely accurate due to the missing data. Moreover, the absence of standardised reporting formats across files complicates consistent interpretation and comparison. As a result, conclusions drawn from the file analysis may underrepresent the clinical judgment exercised by home care nurses and oversimplify the variation observed in practice. Additional methods, such as think-aloud interviews and survey data, were used to mitigate this limitation. These approaches provided a more profound insight into nurses' thought processes, values, and contextual considerations that were often left undocumented, thereby complementing the file research and enhancing the overall validity of the findings. More specifically, think-aloud interviews were conducted to gain insight into home care nurses' cognitive and reasoning processes during assessments, allowing the researchers to capture live reasoning and contextual considerations. These interviews also revealed the time spent on each phase while assessing the client's needs. A survey among a broader sample of nurses using one client case helped to gain perspectives on what

diagnoses, interventions and outcomes underpin the needed hours assessed. This combination of methods yielded a more nuanced understanding of how practice variation emerges and is shaped by both individual and systemic factors. Together, these strategies enhanced the credibility of the conclusions while acknowledging the complexity inherent in the needs assessment.

However, one could discuss whether the chosen methodological approaches are optimal, and other methods may be preferable. A realistic evaluation or focus groups on the needs assessment could have been considered. A realist evaluation is a system of enquiry that provides a framework for evaluating a healthcare intervention (32). While traditional evaluations focus on measures, this approach considers the environment, culture, and emotions involved. The question of what works, for whom and in what circumstances leads to describing and evaluating theory, including context, mechanisms, and outcomes, followed by hypotheses, observations, and programme specification (32). This may have been a more suitable approach for the needs assessment to capture, evaluate, and respect the various elements involved in the needs assessment as a nursing intervention. The mechanisms, for example, may help capture the interactions between the client and the home care nurse as individuals, as well as the influencing factors such as the client's living region and the availability of other care providers. The realist evaluation offers a holistic approach to nursing interventions by incorporating physical and psychosocial health components, making it a natural fit.

The theoretical model on practice variation developed by De Jong et al. offered a valuable lens for interpreting the complexity of needs assessment in home care nursing. The model identifies multiple layers of influence, from individual professional factors to organisational structures and broader systemic conditions. The interplay of components outlined by De Jong et al. (2015), such as available resources (other services available in the surroundings), mirrors the interacting elements and multi-level contextual influences also emphasised by the MRC (6, 30). Additionally, the model explicitly acknowledges the impact of a heterogeneous client population, which adds unpredictability and limits the applicability of uniformity. It highlights the need for flexible, context-sensitive approaches that consider the dynamic realities of home care nursing practice and the multiple systems in which it is embedded. Using the MRC framework instead of De Jong's model could have shed light on the discrepancies in implementing the Six Standards Framework into the EHRs of different organisations at an earlier stage of the research (6, 30). We would have gained insight into the variation in the documentation before exploring the factors that influence the needs assessment. However, this thesis aimed to define practice variation in needs assessment and examine whether practice variation exists in actual practice rather than to evaluate the needs assessment as a complex intervention (33).

Reflection on my role as a home care nurse, educating conduct of needs assessment

This research has always prioritised scientific integrity, a principle discussed by the team from the beginning and throughout each new study. Scientific integrity signifies a commitment to adhering to a moral and ethical code in all project phases and while interacting with participants (34). We commenced this research with a team of professionals well-versed in home care nursing research. My experience as a home care nurse, combined with my vast network in this field and ownership of a company that provides education on needs assessments, presents advantages and challenges. The advantages included access to various organisations and home care nurses to recruit participants for our studies. Throughout the research, the team persistently reviewed these selections to avoid selection bias. Additionally, our familiarity with needs assessment and related classification systems used in practice posed a risk of cognitive bias. Serving as a lecturer on NANDA- NIC- NOC in needs assessment courses while pursuing this PhD created personal challenges, including the potential for cognitive bias and hasty conclusions—often driven by fears that home care nurses could be blamed for discrepancies in the needs assessments observed. To avoid premature conclusions and confirmation bias, discussions with my team were essential for maintaining perspective and ensuring that our findings guided our conclusions. My team actively provided solutions as we reviewed analyses, occasionally adding a researcher to help reduce cognitive bias in our outcomes. During the think-aloud interviews detailed in Chapter 5, I found it challenging not to intervene, and the think-aloud interview method, which respects ongoing thought processes, helped me maintain a professional distance from the home care nurses' decisions, thus preventing interviewer bias (Chapter 5). In the analysis of survey data detailed in Chapter 6, a research assistant without a nursing background played a crucial role in preventing cognitive bias stemming from the researcher's knowledge of NANDA- NIC- NOC and Omaha System taxonomies. This was important for accurately interpreting the terminology used by home care nurses regarding diagnoses, interventions, and outcomes (see Chapter 6) (4, 32-34). Afterwards, it was beneficial that I had no direct involvement in my colleague's focus group study, discussed in Chapter 7, where participants felt that the needs assessment course offered by my company could serve as an exemplary model for mandatory education for home care nurses. While this situation might suggest a conflict of interest, I maintained integrity by being absent during both the focus groups and the subsequent data analysis.

Recommendations for policy and practice

As the findings in this thesis show, all stakeholders must contribute to enhance needs assessment and minimise unwarranted practice variation to make the paradigm shift intended by the new policy (13, 16). The overall recommendation emphasises acknowledging and recognising the complexity of the needs assessment (30). The following recommendations might seem wishful thinking and challenging to

achieve due to educational costs, a shortage of personnel, and the high demands placed on home care nurses. However, when the appropriate professional provides suitable care, it can enhance the quality of care and effectively lower costs. This may still be feasible and necessary when considering the benefits of reorganising interdisciplinary and multidisciplinary collaboration (11, 33). To make things happen, there are recommendations for each stakeholder; however, they are interdependent, as one does not function without the other.

Home care nurses: "You are in the lead, so take the lead!"

Home care nurses must take the initiative in the nursing process, leveraging their clinical reasoning skills and knowledge of their profession's developments (Chapters 4, 5, 6, and 7). First, their responsibility for needs assessment entails actively enhancing needs assessment practices and implementing feasible initiatives in the field (Chapter 7). They should prioritise optimising all stages of the nursing process, particularly in diagnosis and goal-setting (Chapter 5). Strong clinical reasoning abilities are essential for providing appropriate care, preventing worsening situations, supporting individuals in adjusting their lifestyles, and ensuring high-quality home care for clients. To improve needs assessments, nurses must adopt their roles as independent home care professionals, allowing clients' needs to guide their practice, enhance their skills, and contribute to advancing nursing science as described in the Home Care Nurses' Area of Expertise (22). They must feel obligated to stay updated on available nursing knowledge, regulations, existing frameworks, and valuable tools while enhancing EHR documentation to support the nursing process phases outlined in Chapter 4 (23). If home care nurses excel in clinical reasoning, they can provide adequate and appropriate care for clients, becoming strong, exemplary leaders in home care nursing (Chapters 5 and 6).

The Dutch Association of Nurses takes a stand for additional education

Home care nurses must broaden their roles, and the Dutch Association of Nurses must respond accordingly. First, they should advocate for discussions on educational advancements for home care nurses in line with the Home Care Nurses' Area of Expertise and educators. Chapter 2 reveals that home care nurses are insufficiently equipped for their roles despite the expectation that their training corresponds with the Home Care Nurses' Area of Expertise. Additional education is crucial, as a Bachelor of Nursing degree only provides general nursing knowledge (Chapter 2). Secondly, they must elevate educational benchmarks and endorse post-bachelor's training as a requirement for practising home care nursing (Chapter 7). When standards for home care nurses are adjusted, this education provides access to the special quality registration system for home care nursing, 'Nursing and Caring' (V&V: Verpleging en Verzorging), established by the Dutch Association of Nurses (Chapters 5, 6, and 7). Post-baccalaureate education in home care nursing must include a comprehensive needs assessment course with appropriate attention to

physical and psychosocial problems. The Dutch Association of Nurses might also consider lowering barriers for home care nurses by alleviating financial pressures, such as reducing the entrance fee for home care nurses (Chapter 7). This would make the profession of home care nursing more appealing while ensuring it keeps pace with the latest developments in the field.

Health insurers can assist by revising their purchasing requirements

As mentioned in the recommendations, all of them are interconnected; one cannot succeed without the others. The health insurer can ensure that registering in a separate quality register does not become an administrative burden. Instead, it supports home care nurses and demonstrates its purpose in practice, aligning with the revised standards framework (5). They already encourage organisations to have 80% of home care nurses registered in the V&V quality register for nurses. They can easily adjust their purchasing requirements to correspond with this special register for home care nurses, encouraging organisations to improve the educational standards for home care nursing professionals, as home care nurses request, similar to practices in the 1990s (Chapters 1 and 7). By adjusting the purchasing requirements for practising home care nurses, they will support the amendment of norm one related to the professional autonomy of home care nurses to maintain authorisation and competency in home care nursing needs assessments (5).

The Association of Health Insurers can formulate overarching purchasing requirements for all members by incorporating supportive technological tools and other relevant materials into home care nursing practices as usual care (Chapters 5 and 6). Insurers may also support good practices and actively share the available knowledge with organisations, such as by sharing the good practice of nursing advice consultation (11, 12, 36). Lastly, health insurers could engage with various stakeholders, including municipalities, to better understand the different regions (Chapter 5), discuss the benefits of organising care provision in alignment with needs through joint ventures, and initiate funded projects under the reinforcement described in the First Line vision (29, 49). These partnerships should be based on a shared vision of a broader, holistic conception of health that emphasises prevention and client-specific care, ensuring clients have access to the best available services. This strategy can help mitigate inconsistencies in needs assessments since home care nurses cannot deliver unavailable care (Chapter 5).

Organisations are shifting from top-down to bottom-up organising home care

While organisations provided home care nursing based on a CIZ decision before 2015 and had commercialised incentives, they are transforming into entities that support home care nurses as professionals who know what is best for clients. They are shifting towards a broader conception of health and acting upon the vision of the First Line, which includes a more holistic view of health and collaboration (20).

To help home care nurses improve their assessment of needs based on this holistic approach, the first step is acknowledging the necessity of additional education and pursuing financial resources to enhance educational opportunities (Chapters 2, 5, 6, and 7). Funds for education coming from the Headline Agreement (HLO, Hoofdlijnen Akkoord Ouderenzorg) together with the Additional Care and Welfare Agreement (AZWA, Aanvullend Zorg- en Welzijnsakkoord) may be suitable for this purpose (37). Additionally, organisations should take greater responsibility for improving the consistency and quality of nursing documentation based on the nursing process and collaborate more closely with other organisations towards a uniform EHR (Chapter 4). Organisations that provide home care nurses with increased development opportunities should be celebrated as best practices, serving as models for insurance companies to inspire the reorganisation of home care nursing practices as outlined in Chapter 7. Innovating the needs assessment process, as described earlier, can also enhance the interprofessional working climate, and good practices offer promising opportunities for new home care nurses (12, 36). Seeking collaboration with other organisations for care and welfare is a societal obligation for all organisations to help the paradigm shift succeed (20, 29).

Improving educational standards will influence practice in many ways. It affects financial matters and may also create avenues for (re)organising interdisciplinary teams. Team members with EQF levels 3 – 4 are educated to participate in the phases of the nursing process; however, their skills are partly wasted when they have no other distinct role in the client's care besides providing home care. They can assist home care nurses in the nursing process by gathering information, evaluating care, and reporting outcome indicators (Chapter 7). An integrated Electronic Health Record (EHR) aligned with the phases of the nursing process should support interdisciplinary and multidisciplinary collaboration (Chapters 5 and 7). Home care nurses remain responsible for the nursing process but with a greater emphasis on delegated cooperation, where all team members contribute to delivering quality client care and achieving the predicted outcomes agreed upon with their clients.

National policy can help optimise documentation according to the guidelines

The government has begun to establish a broader, holistic conception of health to meet the anticipated demand for home care nursing (13, 14). However, less attention has been paid to the preconditions for success, resulting in inconsistencies in practice and variations at different levels (Chapters 3, 4, 5, 6 and 7). They already focus more on preconditions for the home care nursing field to reduce unnecessary variation and emphasise prevention. It may be helpful when considering legislation for the documentation of client information. Additionally, the government may offer funds for more research, education and collaborative initiatives aimed at prevention. Initiatives based on the First Line Vision 2030 are growing, but need connection, and the government might actively facilitate home care nursing to be part of

this movement (29). The five Academic Living Labs on Home Care Nursing can contribute to enhancing the home care nursing sector as an essential partner in the First Line (38).

Recommendations for education

Is education in front of the bus when competencies of home care nurses are discussed?

This thesis emphasises the need for specialised education to enhance home care nurses' skills in needs assessment and their professional roles (Chapters 2, 6, and 7). The Home Care Nurses' Area of Expertise, created by home care nurses, details all the roles and competencies required for nurses, with an additional section dedicated to the specific competencies needed for home care nurses (22). This occupational profile should form the basis for designing a bachelor's educational framework. Findings in Chapter 2 reveal that a bachelor's education generally prepares students for nursing but does not address the unique aspects of home care nursing. Therefore, specialised education must be designed as part of a post-bachelor pathway. While this approach appears suitable, it is essential to recognise that needs assessment, a fundamental task of home care nurses, is a complex intervention; hence, the needs assessment should be evaluated as such before developing specialised education. For this evaluation, a screening tool called 'Complextool' is available to determine if a bachelor's level of education is adequate or if a master's level may be more appropriate (39).

Chapter 2 also highlights a disconnect between theoretical learning and practical needs. While the Omaha System is used in practice, education primarily relies on NANDA-NIC-NOC and the Proactive Nursing tool to teach clinical reasoning (4, 40-42). Furthermore, there is a need for tools that prioritise psychosocial diagnoses over physical ones (Chapters 2, 5, and 6). The educational curricula are presumed to include the most evidence-based concepts, prompting whether practice or theory requires modification. Evidence-based practice aims to deliver the highest quality of care to clients, composed of three components: 1) scientific research, 2) clinical expertise, and 3) client values and circumstances. Consequently, theory (education) and practice (home care nursing organisations and home care nurses) must cooperate to determine what aligns best with professionals' competencies. The extra financial burden that comes with higher education is evident, but several studies show that higher-educated nurses positively influence the quality and safety of care (43, 44).

Establishing educational initiatives at the post-bachelor's or master's level will require time, money, and clear support from key stakeholders, such as government

agencies, insurers, and relevant organisations. Further research could enhance this dialogue, including insights from the Complextool application (39). At the same time, there is an urgent need for improved education on clinical reasoning using tools that focus more on psychosocial factors than purely physical ones, which could be advantageous (Chapter 6). Such tools can help home care nurses perform needs assessments with a broader, holistic vision focusing on clients' abilities rather than disabilities. By incorporating specialised methods for a broader home care nursing clinical reasoning approach and implementing them into decision-support tools within Electronic Health Records (EHRs), home care nurses can receive enhanced support in the nursing process (Chapters 4 and 6). Given that nursing operates as both an independent and complementary discipline to medical science, this shift may represent a significant progression for nursing science.

Recommendations for research

Based on the findings of this thesis, the following five research recommendations are proposed.

The documentation in the clients' EHRS varied greatly, as previously identified in earlier research, resulting in incomplete information (Chapter 4) (24). While we focused on the quantity of the documentation, we did not assess the quality of what was documented. Investigating the quality of nursing process documentation within Electronic Health Records (EHRs) could be valuable. This research should be done to optimise the needs assessment and documentation of all phases of the nursing process. Employing D-Catch, a tool designed for this purpose that accommodates various classification systems in EHRS, would yield insights into the relationships among diagnoses, interventions, and expected outcomes (45). Testing the psychometric properties of this instrument for the home care nursing field is necessary. Home care nurses who employ different intervention strategies but achieve similar results within the same timeframe could form the basis for a hypothesis. Exploring this before and after a specialised course on conducting needs assessments for home care nurses would be worth considering.

More research on stakeholders' barriers and facilitators seeking to improve needs assessments conducted by home care nurses would be interesting, especially on the different routes they already implemented, such as the intake procedure, where more time is provided for the first two phases of the nursing process (Chapters 5 and 7). Participatory action research could be a fitting method (46, 47). How can the nursing process be (re)organised? What role do other team members play in this new route? Does the new intake procedure have better needs assessment results (11)? These questions may provide results that will yield valuable insights and assist in organising essential preconditions within the field of home care nursing.

In several regions, home care nurses have organised peer review sessions supported by their organisations. These sessions include participants from various home care organisations involved in home care nursing. They discuss the needs assessments in peer review guided by someone leading the process systematically. Research on these peer review sessions yields valuable insights into influencing factors. As discussed in these sessions, context-related factors affecting home care nurses are key indicators. During these gatherings, home care nurses from various organisations learn and exchange ideas on conducting needs assessments and addressing different influences. Participatory action research could be insightful, focusing on what home care nurses need to understand about systemic influences to enhance their professional awareness (46, 47).

There is a lack of understanding of how bachelor's programs address clinical reasoning education. Gathering further information about curriculum studies would be advantageous. Examining clinical reasoning approaches in nursing education, particularly in home care nursing, may involve conducting a focus group study with educators from Universities of Applied Sciences as a subsequent research study based on the findings presented in Chapter 2. Additionally, an analysis is warranted on whether and what decision-support tools exist to support clinical reasoning specific to home care nurses and students.

As mentioned earlier, we recommend a realist evaluation of the needs assessment as a complex intervention. It would be interesting to look at client cases using the context, mechanisms and outcomes theory to investigate what might work, for whom, and in what circumstances (32).

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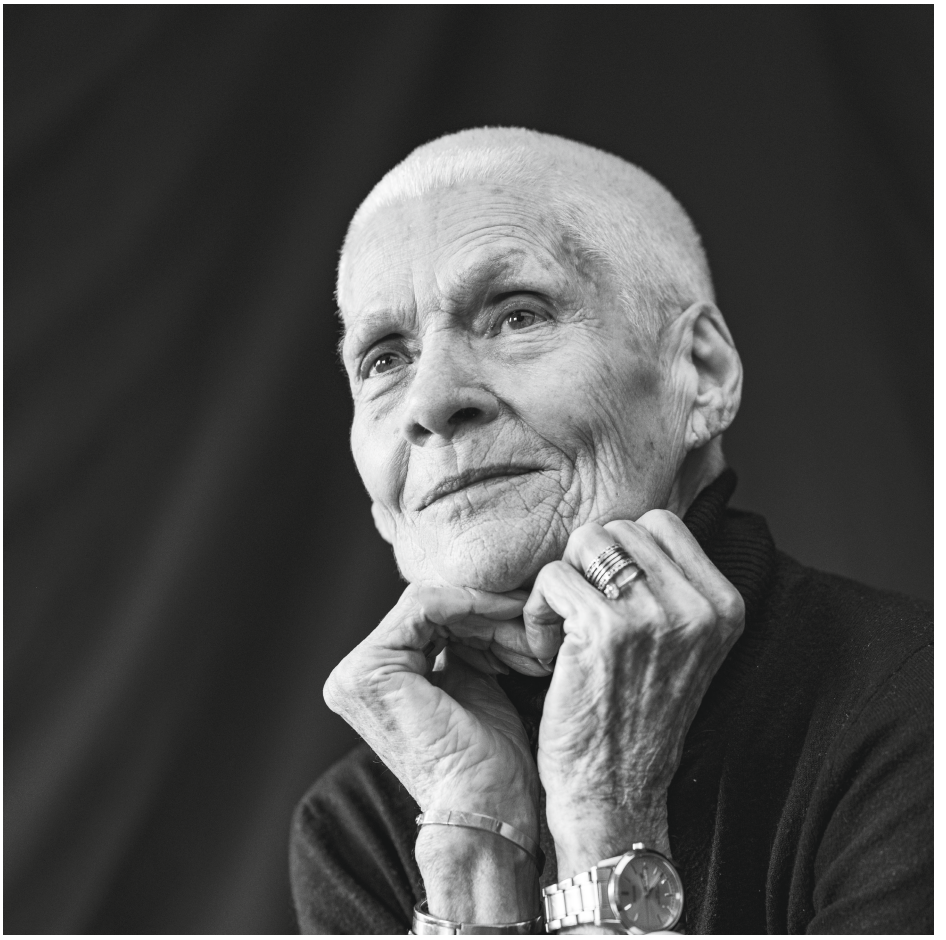

9

IMPACT

This Chapter outlines the impact of the thesis and explains the contribution to the home care nursing profession, client care and research. The research described in this thesis impacts several levels. At the macro level, it informs the government and branch organisations, like Actiz and the Dutch Association of Nurses, as well as ZN (Health Insurers of the Netherlands: Zorgverzekeraars Nederland) and PFN (Dutch Patient Federation: Patiënten Federatie Nederland). At the meso level, it provides input to team members of home care nursing nurses, and home care organisations. At the micro level, home care nurses and clients.

Impact on the macro level

With the needs assessment as an important foundation of high-quality home care nursing, this thesis provides essential input for the ongoing political debate on the future accessibility and organisation of home care nursing. It informs the Minister of Health, Welfare and Sports, who funded the research program Practice Variation in Needs Assessment in Home Care Nursing, of which this thesis is a part (1). The findings will be discussed in the House of Representatives of the States General (Tweede Kamer der Staten-Generaal) on 3 September 2025 (2). This debate is based on three reports, including this research, and is intended to directly support decision-making on the future accessibility and organisation of home care nursing (3).

There were many stakeholders involved in the project, namely representatives of the Dutch Ministry of Health, Welfare and Sport (VWS), the Dutch Association of Insurance Companies (ZN, Zorgverzekeraars Nederland), the Healthcare Institute (Zorginstituut Nederland), the Dutch Association of Organisations (Actiz and Thuisnl), the Dutch Nurses Association (V&VN, Verpleegkundigen en Verzorgenden Nederland) and the Dutch Patient Federation (PFN), Patiënten Federatie Nederland). All national home care nursing stakeholders participated in either a task group or a steering group associated with the research program and were informed regularly, three times a year, throughout the four-year research period. During these meetings, the preliminary results, progress and challenges were discussed. Expectations regarding the findings were sometimes higher than what could be realistically achieved due to the voluntary nature of organisational participation. The interactions in meetings with steering or task group members ultimately fostered a deeper understanding of the complexity of the needs assessment through an iterative process. For example, a discussion with stakeholders about the demand for the legalisation of all needs assessments under the Health Insurance Act, without any change in preconditions, during the first half of 2015, led to the realisation that home care nurses were overburdened at that time. A member of the Task Group, a practising home care nurse in 2015, said: "I realise that what was asked of us was almost impossible to achieve, but we still did our best. It disappoints me that there is so much variation (Chapter 4). I hoped it would be better now that we are seven years ahead, but we were not supported then". This statement underlines the impact

of sharing preliminary results on the variation in documentation (Chapter 4). It also reflects on the poor organisational support for the home care nurses at the start of their renewed responsibility, and the effect of this change, resulting in variation in documentation at that time. This impacted the view of this stakeholder about home care nurses being responsible for the variation and gave the results a different perspective, which may have affected their advice to the government about the future of home care nursing. With the needs assessment as an essential foundation of high-quality home care nursing, this thesis provides vital input for the ongoing political debate on the future accessibility and organisation of home care nursing.

The task force reviewed the research results and released a report (3) that included all the studies that had been performed. Insurance companies quickly recognised the value of the findings. In collaboration with the Dutch Association of Nurses, they initiated an annual conference for home care nurses. Offered free of charge for the first two years, this event created an accessible platform for nurses to share insights and foster dialogue around the research outcomes. The conferences attracted many self-employed home care nurses, aiding in disseminating information regarding variations in needs assessment practices. During the latest conference, several self-employed home care nurses registered to participate in further research, a development welcomed by insurance companies and others. Gaining a comprehensive understanding of the full spectrum of home care nursing by including all parties involved (self-employed and on payroll) is essential, emphasising building trust and fostering a learning culture rather than assigning blame. Sharing findings impacted the self-employed home care nurses' readiness to participate in research, which is progress, because in the study on client files (Chapter 4), only two self-employed home care nursing organisations joined. Home care nurses must be supported in broadening their perspective on clients' needs. All stakeholders play a part in improving the process of conducting needs assessments to ensure the success of the paradigm shift towards a broader, holistic conception of health that focuses on prevention and individual lifestyles. Insurance companies are open to including the research findings in their policies, and members of the research team are invited to discuss their home care nursing vision for 2030. Lastly, all stakeholders start collaborating in good practices in the First-Line Partnership program (4).

The Dutch Association of Nurses has taken decisive actions to incorporate several research findings into their professional practices. They amended the Six Standards Framework, now called the Standards Framework, focusing on the first standard, which guides home care nurses in ensuring their competence in needs assessment (5). Consequently, starting in 2025, new home care nurses will need to engage in a mandatory course on Assessing Client Needs, alongside a requirement for a minimum of 24 accreditation points in the Quality Register of Nurses. Additionally,

the statement mandates that home care nurses engage in inter-collegial peer reviews of needs assessment at least three times annually (6).

Impact on the meso level

Home care organisations that participated in the study and contributed to data collection at three levels (client, home care nurse, and organisation) were all actively engaged with data collection and the results. Nurses working in home care organisations also collected data after training and instruction. The involvement of nurses as data collectors and their experiences were discussed in a focus group session after they completed the data collection. Participation in the data collection increased awareness and reflection among the participating nurses regarding their practices. One of the nurses reacted: "I was unaware of the documentation being so different within my organisation; these are my colleagues! I thought it was all the same; sometimes, I had to think hard to understand where I could find the correct information, and sometimes, it was missed." After the data collection, findings were shared with the organisation to foster learning and improvement. Organisations received tailored feedback on their data, presented approximately 12 times through online or in-person sessions. In addition, participating organisations were provided with a report summarising their specific outcomes.

In many organisations, improvement actions were initiated as a result of the tailored feedback they received. During an online session presenting the organisation's results on data collection, with home care nurses, police officers, and managers present, they reacted with surprise to the finding that goals were often missing in client files. If goals were present, they were frequently not formulated using SMART terminology. Quote of a nurse: "We thought it was unnecessary to develop goals more explicitly when using Omaha Systems classification in our documentation, where 'the stars' explicitly state the progress of results." Others mentioned the limited support of the nursing process in the EHRs, resulting in different ways of documenting client information. Many of these organisations incorporated the findings into their annual planning, focusing on improving internal needs assessment procedures, staff education, and documentation practices to support home care nurses. Several organisations (re)introduced peer review meetings among home care nurses to enhance the quality of needs assessments.

In addition to the organisations involved in the study, other organisations also expressed interest in leveraging its findings. For example, home care nurses in the country's South hosted a workshop and invited home care nurses from five home care providers from the area. This workshop aimed to enhance understanding of the factors impacting needs assessment by analysing real client cases derived from the study's Think-Aloud and the survey study, focusing on decision-making differences. Quote from a home care nurse who participated in one of the studies

and was present at this workshop: "I was not aware of the differences in the manner of conducting a needs assessment. I thought everybody did it the same way I did." Another home care nurse said: "It is strange to hear that some organisations do not provide medication dispensers for home care nursing, which directly influences the hours needed for the client". The workshop's success led to its repetition across various organisations.

These research findings prompted discussions in several committees about the need for a master's or post-bachelor's program requested by home care nurses. Such discussions were triggered by the presentation of findings from the published report on Practice Variation in Needs Assessments in Home Care Nursing, along with a column in a Dutch Scientific Nursing Magazine that sparked the debate (3, 7). The research also informs the development of the Bachelor of Nursing 2030, with one of the central points being prevention, and may directly impact the Bachelor's education of home care nurses (8). A lecture on needs assessment at Zuyd University of Applied Sciences at the end of 2024 will be a first step towards increasing attention to home care nursing needs assessment.

Impact on the micro level

The findings also affected home care nurses and their clients at a personal level. Initially, both parties responded defensively during the onset of the research program, viewing the initiative as a critique of their efforts. Some clients felt compelled to seek additional information while obtaining informed consent about our intentions with the findings. They stood up for their home care nurses. Once we clarified that the research was not meant to criticise the nurses, their concerns began to lessen. Over the four-year study, attitudes of home care nurses evolved. Their attitudes shifted to be more curious, engaged, and reflexive, which was evident in meetings and conferences. In the later stages of this study, meetings with home care nurses shifted to a more collaborative and appreciative approach, with participants becoming increasingly open to accepting the findings, learning from them, and reflecting on their practices. The research's intention was always to support the home care nursing profession with positive inquiry and objective data, and it was not about pointing fingers at what went wrong. Professionalising home care nursing needs constant reflection and critical thinking about how and why clients require home care nursing.

Scientific impact

Initially, the needs assessment proved to be a complex intervention that had been underestimated, but it became clear during the research and prompted additional recommendations for further investigation. Furthermore, this thesis advances home care nursing by outlining warranted and unwarranted practice variations while pinpointing the factors affecting the needs assessment. It also enhances the

understanding of clinical reasoning skills in the nursing process, specifically for home care nurses, and sheds light on their educational requirements. The research was conducted under the Living Lab on Ageing and Long-term Care - Limburg (AWO-L), yet its findings hold significance for the broader community, extending beyond the elderly. Meanwhile, the government has supported the creation of five Academic Living Labs in Home Care Nursing across the nation, setting the stage for future research to expand on the outcomes of this thesis and other topics relevant to home care nursing. These Academic Living Labs collaborate to address the issues identified in the research, such as developing a shared, comprehensive, and holistic perspective on home care nursing to support home care nurses. It contributes to more evidence-based care in home care nursing and promotes continuous improvement in daily practice, in close connection with education, policy, and research. This involves addressing the challenges associated with educational gaps in needs assessment and clinical reasoning skills, inadequacies in foundational support, the creation of decision support tools, and efforts to minimise documentation inconsistencies.

Dissemination of findings

In recent years, preliminary results were shared with home care nursing stakeholders to enhance support and knowledge for home care nurses. Findings were disseminated nationally and internationally through presentations at conferences and webinars for home care nurses, organisation representatives, and insurers. Progress was discussed in regular meetings with the branch organisations ActiZ and Zorgthuisnl, ZN, V&VN, PFN, and VWS. Additionally, results were presented multiple times at the Scientific Table of the Association of Nurses, focusing on the Six Standards Framework adjustment. Two reports informed the government about the research program, and three articles were published in Dutch journals, addressing the Six Standards Framework, curriculum variations in Universities of Applied Sciences, and the Delphi study. At the annual symposia of the Living Lab in Ageing and Long-Term Care (AWO-L), posters and workshops engaged long-term care providers, employees, and clients. Internationally, one workshop and multiple conference presentations occurred, connecting doctoral candidates from Bern University of Applied Sciences, the University of Graz and Maastricht University, joining the European Doctoral Nursing Science group for and by nurses. Chapters 3 and 7 are published in a peer-reviewed open-access jounal, while Chapter 2 is published and peer-reviewed in Dutch. Articles for chapters 4, 5, 6, and 7 are submitted to peer-reviewed open-access journals. Dissemination details are in the Addendum 'Publications'.

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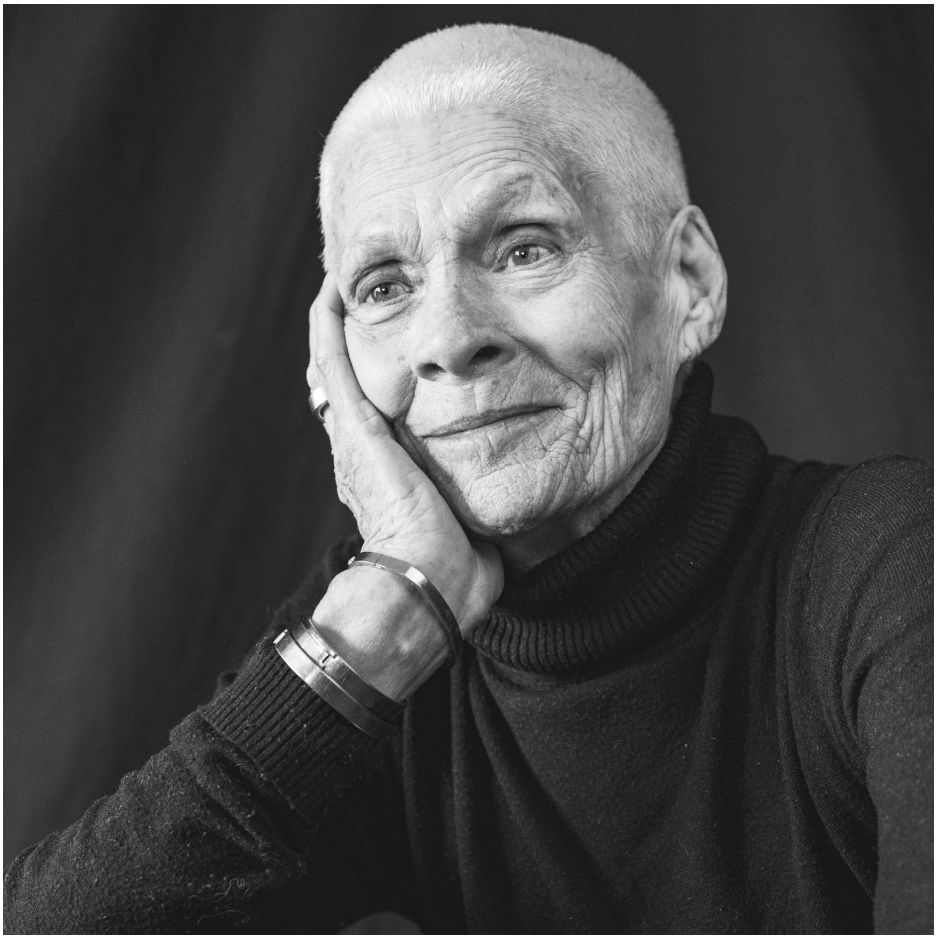

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ADDENDA

SUMMARY

The ageing population, particularly in Europe, is associated with an increase in chronic diseases as people age. Furthermore, the working-age population is decreasing. As a result of these demographic changes, government policies are reassessing healthcare services and concentrate on the home care nursing. To assure access to home care nursing and optimise the quality of the needs assessment and reduce possible unwarranted variation in needs assessment this research was initiated.

Chapter 1 provides an introduction and offers insights into the increasing challenges in healthcare and home care nursing. At the end of the introduction, the needs assessments conducted by home care nursing nurses and the phenomenon of practice variation are explained to highlight the importance of the thesis aims. First, to examine how home care nurses are prepared to conduct needs assessment during their bachelor's education, second to define practice variation in needs assessment, warranted and unwarranted and identify possible influencing factors. Third, to examine practice variation in needs assessment of home care nursing in actual practice.

Chapter 2 addresses the topic of diversity in Bachelor's education. The objective was to investigate how clinical reasoning is integrated into the nursing process within Dutch Bachelor's programs for nurses, particularly concerning conducting a professional needs assessment in home care nursing. A cross-sectional survey study involving 21 Dutch Universities of Applied Sciences (UAS) assessed the incorporation of clinical reasoning in nursing curricula. Feedback from lecturers, researchers, and managers highlighted learning objectives, assessments, and curriculum content. Researchers and managers from 18 different Universities of Applied Sciences participated in this study. Despite a standardised educational profile, this research uncovers discrepancies in UAS curricula, particularly regarding European Credits (ECs) related to clinical reasoning and the nursing process. The findings emphasise the variability in teaching clinical reasoning across different curricula, the misalignment of educational practices with home care nursing requirements, and the urgent need for curriculum updates. Recommendations include revising the curriculum and conducting further studies.

A Delphi study **(Chapter 3)** was conducted to define practice variation and clarify what is meant with warranted and unwarranted variation. Establishing consensus on definitions of practice variation in needs assessment and identifying potential influencing factors enables professionals to discuss and enhance the consistency and quality of their decision-making processes in home care nursing. This could

lead to more equitable care for clients requiring home care nursing. A Delphi questionnaire was developed based on literature research, an expert meeting, and cases provided by insurance companies. An expert panel of home care nursing nurses, client representatives, policymakers, organisational representatives, and insurers participated. After three rounds, thirty-two experts reached consensus on the definition of practice variation and those of warranted and unwarranted variation. Additionally, 59 factors possible influencing needs assessment were identified. These factors are grouped into four categories: 1) related to the client's personal and health-related aspects (n = 14), 2) the client's context-related factors (m = 7), 3) the personal home care nurse-related factors (n = 12), and 4) the home care nurses' context-related factors (n = 26). Thirty-four factors were categorised as warranted influences, with 18 (out of 34) being client-related, such as the client's ability to learn, the number of diagnoses, and network availability. Most unwarranted influences on needs assessment (17 out of 26) were linked to the context of home care nursing nurses, including the impact of insurance companies and profit-driven organisations.

Chapter 4 presents a study focused on exploring the existence of practice variation in needs assessments by home care nurses, along with identifying the influencing factors. The research utilised a cross-sectional, quantitative retrospective design within home care nursing across the Netherlands. In total, 28 organisations and 258 nurses contributed with data from 1,615 client files. The analysis employed a three-level model to reflect the nested nature of the data. Outcome measures included the minutes assessed weekly and the minutes of home care nursing delivered weekly. The pandemic imposed restrictions, resulting in a limited number of organisations available for this study. The observed variation was primarily linked to client-related factors, with 83% of the assessed variation and 88% of the delivered variation attributed to clients, while 8% (assessed) and 10% (delivered) were linked to nursing, and 9% (estimated) and 2% (delivered) to organisational factors. Warranted variation was particularly noted among clients in the palliative category and their functional status. Insufficient documentation in Electronic Health Records (EHR) resulted in numerous missing values, which hindered the testing of various factors. The absence of adequate nursing documentation indicates that unstated elements may have influenced the variations in needs assessments. Additional research was needed to explore client-related factors that were not captured in the nursing documentation. The significant number of missing values complicated the ability to ascertain whether authentic variation in needs assessments existed or if the documentation inconsistencies led to the perception of variation in care.

Chapter 5 presents a think-aloud study that examined whether home care nurses follow the nursing process and investigate the clinical reasoning skills they utilise to assess clients' needs and make clinical judgments regarding care type, amount,

and duration. A qualitative exploratory design was employed, using think-aloud interviews. Convenience sampling was used, involving twelve nurses from nine Dutch home care organisations who assessed a client's needs while voicing their thoughts. The case study included a video vignette of an actress simulating a client with Parkinson's disease based on a real scenario. The vignette included cues to help nurses identify four nursing diagnoses. Nurses assessed the required amount, type, and duration of care. Interview transcripts were coded deductively, guided by a framework encompassing the five phases of the nursing process, 17 clinical reasoning skills, and various factors that influence clinical judgment. Recommended home care duration varied from three weeks to indefinite, with suggested hours ranging from one to over nine per week. Home care nurses prioritised intervention planning more than the diagnosing and goal-setting phases during their clinical reasoning, emphasising clients' preferences in their judgments. This variation indicates that differences in clinical judgment regarding hours, type, and duration of home care admission stem from insufficient application of critical clinical reasoning skills during the diagnostic and goal-setting phases. Additionally, various contextual factors influenced the clinical judgment of home care nurses, adding to the observed variations.

Chapter 6 of this study examined the variations in assessments related to the weekly nursing hours required for a specific client case, along with the associated nursing diagnoses, expected outcomes, and interventions. A cross-sectional quantitative vignette survey was used. Participants viewed a taped vignette of a client and were tasked with diagnosing the client, predicting outcomes, planning interventions, and determining the necessary weekly home care nursing hours. Data analysis employed descriptive methods and evaluated one hundred fifty-six completed surveys. The NANDA-NIC-NOC taxonomies were used to interpret and analyse the collected data. Recommended home care hours ranged from zero to over 15 hours, with observed differences in diagnoses, interventions, and outcomes. In their assessments, home care nurses tended to overlook the impact of psychosocial factors on physical nursing challenges, focusing primarily on medication management and bathing assistance.

Chapter 7 outlines a qualitative study using focus groups. While organisations improve needs assessments, their strategies for tackling challenges remain ambiguous. Four focus group interviews were held with managers and nursing staff from various home care organisations to explore enhancements in needs assessments within Dutch home care. These interviews involved thirty-eight participants from 22 organisations, and they were recorded, transcribed, and analysed thematically. Three key themes emerged: 1) Challenges in the needs assessment process, 2) Effective practices, and 3) Suggestions for improvement. Organisations encounter obstacles due to a lack of a shared vision and differing

perspectives. The practices observed varied, including short-term assessments and multiple staff roles. A unified vision among organisations, professionals, and insurers is vital for optimising the needs assessment process. Collaboration among home care organisations, healthcare professionals, and insurers is crucial for refining the needs assessment process.

Chapter 8 of this thesis reflects on both the theoretical and methodological aspects of the study. It addresses the complexity of the needs assessment, the theoretical framework applied, and potential sources of bias. Improving the quality of needs assessments and reducing practice variation is a shared responsibility, requiring active contributions from all stakeholders involved. Therefore, recommendations are tailored to the various stakeholders involved.

SAMENVATTING

De vergrijzing, met name in Europa, leidt tot een toename van chronische ziekten naarmate de leeftijd vordert. Bovendien neemt het aantal werkenden af. Als gevolg van deze demografische veranderingen heroverweegt het overheidsbeleid de gezondheidszorg en concentreert het zich op wijkverpleging. Om de toegang tot wijkverpleging te waarborgen, de kwaliteit van de indicatiestelling te optimaliseren en mogelijke ongerechtvaardigde variatie in indicatiestelling te verminderen, is dit onderzoek gestart.

Hoofdstuk 1 biedt een inleiding en inzicht in de toenemende uitdagingen in de gezondheidszorg en wijkverpleging. Aan het einde van de inleiding worden de indicatiestelling die wijkverpleegkundigen uitvoeren en het fenomeen praktijkvariatie toegelicht om het belang van de doelstellingen van het proefschrift te benadrukken. Ten eerste onderzoeken we hoe wijkverpleegkundigen worden voorbereid op het uitvoeren van de indicatiestelling tijdens hun bacheloropleiding, ten tweede definiëren we praktijkvariatie in de indicatiestelling, terecht en onterecht, en identificeren we mogelijke beïnvloedende factoren. Ten derde onderzoeken we praktijkvariatie in de indicatiestelling in de wijkverpleging in de praktijk.

Hoofdstuk 2 behandelt het thema diversiteit in de bacheloropleiding. Het doel was te onderzoeken hoe klinisch redeneren is geïntegreerd in het verpleegkundig proces binnen Nederlandse bacheloropleidingen voor verpleegkundigen, met name met betrekking tot het uitvoeren van een professionele indicatiestelling in de wijkverpleging. Een cross-sectionele enquête onder 21 Nederlandse hogescholen (HBO's) beoordeelde de integratie van klinisch redeneren in verpleegkundige curricula. Feedback van docenten, onderzoekers en managers belichtte leerdoelen, beoordelingen en curriculuminhoud. Onderzoekers en managers van 18 verschillende hogescholen namen deel aan deze studie. Ondanks een gestandaardiseerd onderwijsprofiel brengt dit onderzoek discrepanties aan het licht in de HBO-curricula, met name wat betreft European Credits (EC's) gerelateerd aan klinisch redeneren en het verpleegkundig proces. De bevindingen benadrukken de variabiliteit in het onderwijzen van klinisch redeneren tussen verschillende curricula, de discrepantie tussen onderwijspraktijken en de eisen van de wijkverpleging en de dringende behoefte aan curriculumaanpassingen. Aanbevelingen omvatten onder meer het herzien van het curriculum en het uitvoeren van verder onderzoek.

Een Delphi-studie (**hoofdstuk 3**) werd uitgevoerd om praktijkvariatie te definiëren en te verduidelijken wat wordt bedoeld met gerechtvaardigde en ongerechtvaardigde variatie. Het bereiken van consensus over definities van praktijkvariatie in de indicatiestelling van wijkverpleging en het identificeren van mogelijke beïnvloedende

factoren helpt professionals bij het bespreken en verbeteren van de consistentie en kwaliteit van hun besluitvormingsprocessen in de wijkverpleging. Dit kan leiden tot meer gelijkwaardige zorg voor cliënten die wijkverpleging nodig hebben. Een Delphi-vragenlijst werd ontwikkeld op basis van literatuuronderzoek, een expertmeeting en cases aangeleverd door verzekeringsmaatschappijen. Een expertpanel van wijkverpleegkundigen, cliëntvertegenwoordigers, beleidsmakers, vertegenwoordigers van organisaties en verzekeraars nam deel. Na drie ronden bereikten tweeëndertig experts consensus over de definitie van praktijkvariatie en die van gerechtvaardigde en ongerechtvaardigde variatie. Daarnaast werden 59 factoren geïdentificeerd die de indicatiestelling mogelijk beïnvloeden. Deze factoren zijn gegroepeerd in vier categorieën: 1) gerelateerd aan de persoonlijke en gezondheid gerelateerde aspecten van de cliënt (n = 14), 2) de context gerelateerde factoren van de cliënt (m = 7), 3) de persoonlijke, aan de wijkverpleegkundige gerelateerde factoren (n = 12), en 4) de context gerelateerde factoren van de wijkverpleegkundigen (n = 26). Vierendertig factoren werden gecategoriseerd als gerechtvaardigde invloeden, waarvan er 18 (van de 34) cliënt gerelateerd waren, zoals het leervermogen van de cliënt, het aantal diagnoses en de beschikbaarheid van het netwerk. De meeste ongerechtvaardigde invloeden op de indicatiestelling (17 van de 26) hielden verband met de context van wijkverpleegkundigen, inclusief de impact van verzekeringsmaatschappijen en winst gedreven organisaties.

Hoofdstuk 4 presenteert een onderzoek gericht op het onderzoeken van het bestaan van praktijkvariatie in behoeftebeoordelingen door wijkverpleegkundigen, samen met het identificeren van de beïnvloedende factoren. Het onderzoek maakte gebruik van een cross-sectioneel, kwantitatief retrospectief ontwerp binnen de wijkverpleging in heel Nederland. In totaal leverden 28 organisaties en 258 verpleegkundigen gegevens uit 1615 cliëntendossiers. De analyse maakte gebruik van een model met drie niveaus om de geneste aard van de gegevens te weerspiegelen. Uitkomstmaten omvatten de wekelijks gemeten minuten en de wekelijks geleverde minuten van wijkverpleging. De pandemie legde beperkingen op, waardoor er slechts een beperkt aantal organisaties beschikbaar was voor dit onderzoek. De waargenomen variatie was voornamelijk gekoppeld aan cliënt gerelateerde factoren: 83% van de geïndiceerde variatie en 88% van de geleverde variatie werd toegeschreven aan cliënten, terwijl 8% (geïndiceerd) en 10% (geleverd) verband hielden met wijkverpleegkundigen, en 9% (geïndiceerd) en 2% (geleverd) met organisatorische factoren. Gerechtvaardigde variatie werd met name opgemerkt bij cliënten in de palliatieve doelgroep en cliënten met een slechtere functionele status. Onvoldoende documentatie in elektronische cliëntendossiers (ECD's) resulteerde in talrijke ontbrekende waarden, wat het testen van verschillende factoren belemmerde. Het ontbreken van adequate verpleegkundige documentatie wijst erop dat niet-vermelde factoren mogelijk van invloed zijn geweest op de variaties in de indicatiestellingen. Aanvullend onderzoek was nodig om cliënt

gerelateerde factoren te onderzoeken die niet in de verpleegkundige documentatie waren vastgelegd. Het aanzienlijke aantal ontbrekende waarden bemoeilijkte het vaststellen of er daadwerkelijk variatie in indicatiestellingen bestond of dat de inconsistenties in de documentatie leidden tot de perceptie van variatie in zorg.

Hoofdstuk 5 presenteert een think-aloud- (hardop denken) studie waarin werd onderzocht of wijkverpleegkundigen het verpleegkundig proces volgen en de klinische redeneervaardigheden gebruiken om de behoeften van cliënten in te schatten en klinische besluiten te nemen over het type, de hoeveelheid en de duur van de zorg. Er werd een kwalitatief exploratief ontwerp gebruikt met think-aloud-interviews. Er werd gebruikgemaakt van gemaks-steekproeven, waarbij twaalf verpleegkundigen van negen Nederlandse wijkverplegingsorganisaties hardop denkend de behoeften van een cliënt inschatten en tegelijkertijd hun mening gaven. De casestudy omvatte een videofragment van een actrice die een cliënt met de ziekte van Parkinson simuleerde op basis van een echt scenario. Het fragment bevatte aanwijzingen om verpleegkundigen te helpen bij het identificeren van vier verpleegkundige diagnoses. Verpleegkundigen beoordeelden de benodigde hoeveelheid, het type en de duur van de zorg. Interviewtranscripties werden deductief gecodeerd aan de hand van een raamwerk dat de vijf fasen van het verpleegkundig proces, 17 klinische redeneervaardigheden en verschillende factoren die het klinisch oordeel beïnvloeden, omvatte. De aanbevolen duur van de wijkverpleging varieerde van drie weken tot onbepaald, met voorgestelde uren variërend van één tot meer dan negen per week. Wijkverpleegkundigen gaven tijdens hun klinisch redeneren meer prioriteit aan interventieplanning dan aan de diagnose- en doelstellingsfasen, waarbij ze de nadruk legden op de voorkeuren van cliënten in hun besluitvorming. Deze variatie geeft aan dat verschillen in klinisch besluitvormingsproces met betrekking tot uren, type en duur van wijkverpleging voortkomen uit onvoldoende toepassing van kritische klinische redeneervaardigheden tijdens de diagnose- en doelstellingsfasen. Daarnaast beïnvloedden verschillende contextuele factoren het klinisch oordeel van wijkverpleegkundigen, wat bijdroeg aan de waargenomen variaties.

Hoofdstuk 6 van deze studie beschrijft de variaties in beoordelingen met betrekking tot de wekelijkse verpleeguren die nodig zijn voor een specifieke cliëntcasus, naast de bijbehorende verpleegkundige diagnoses, verwachte uitkomsten en interventies. Er werd gebruikgemaakt van een cross-sectionele kwantitatieve vignette-enquête. Deelnemers bekeken de opgenomen vignette van een cliënt en kregen de taak om te diagnosticeren, uitkomsten te voorspellen, interventies te plannen en de benodigde wekelijkse wijkverpleegkundige uren te bepalen. De data-analyse maakte gebruik van beschrijvende methoden en evalueerde honderdzesenvijftig ingevulde enquêtes. De NANDA-NIC-NOC-taxonomieën werden gebruikt voor de interpretatie en analyse van de verzamelde gegevens. Aanbevolen uren wijkverpleging varieerden

van nul tot meer dan 15 uur, met waargenomen verschillen in diagnoses, interventies en uitkomsten. In hun beoordelingen negeerden wijkverpleegkundigen de impact van psychosociale factoren op fysieke verpleegproblemen en richtten ze zich primair op medicatiebeheer en ondersteuning bij het wassen.

Hoofdstuk 7 beschrijft een kwalitatieve studie met focusgroepen. Hoewel organisaties de indicatiestellingen verbeteren, blijven hun strategieën om uitdagingen aan te pakken dubbelzinnig. Er werden vier focusgroep interviews gehouden met managers en verplegend personeel van verschillende wijkverpleging organisaties om verbeteringen in de indicatiestelling binnen de Nederlandse wijkverpleging te onderzoeken. Aan deze interviews namen 38 deelnemers van 22 organisaties deel. Ze werden opgenomen, getranscribeerd en thematisch geanalyseerd. Drie hoofdthema's kwamen naar voren: 1) Uitdagingen in het indicatiestellingsproces, 2) Effectieve werkwijzen, en 3) Suggesties voor verbetering. Organisaties ondervinden obstakels door een gebrek aan een gedeelde visie en verschillende perspectieven. De geobserveerde werkwijzen varieerden, waaronder kortdurende beoordelingen en meerdere wijkverpleegkundige rollen. Een uniforme visie tussen organisaties, professionals en verzekeraars is essentieel voor het optimaliseren van het indicatiestellingsproces. Samenwerking tussen wijkverpleging organisaties, zorgprofessionals en verzekeraars is cruciaal voor het verfijnen van het indicatiestellingsproces.

Hoofdstuk 8 van dit proefschrift reflecteert op zowel de theoretische als de methodologische aspecten van het onderzoek. Het behandelt de complexiteit van de indicatiestelling, het toegepaste theoretische kader en mogelijke bronnen van bias. Het verbeteren van de kwaliteit van de behoeftebepaling en het verminderen van praktijkvariatie is een gedeelde verantwoordelijkheid, die een actieve bijdrage van alle betrokkenen vereist. Daarom worden de aanbevelingen afgestemd op de verschillende betrokken belanghebbenden.

LIST OF PUBLICATIONS AND PRESENTATIONS

International Publications

Scientific articles in International Journals

- Schwenke, M., **van Dorst, J**., Zwakhalen, S.M.G., De Jong, J. D., Brabers, A. E. M., & Bleijenberg, N. (2022). Measures to improve patient needs assessments and reduce practice variation in Dutch home care organisations. Nursing Open, 00, 1– 12. https://doi.org/10.1002/nop2.1552
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- Schwenke. M., **Van Dorst, J.I.E.,** Brabers, A.E.M., Van Den Bulck, A.O.E., De Jong, J.D., Zwakhalen, S.M.G. M.G., Bleijenberg, N. Enhancing Home Care Nursing in the Netherlands: How can Organisations Facilitate the Improvement of Needs Assessments in Home Care Nursing? A Focus Group Study; BMC Health Services Research. 2025. DOI: 10.1186/s12913-025-13622-8.

Submitted Articles in international journals

- Schwenke. M. & **Van Dorst, J.I.E.,** Hameleers, N., Bleijenberg, N., Brabers, A.E.M., De Jong, J.D., De Vries, E., Van Den Bulck, A. &O.E., Zwakhalen, S.M.G. M.G. Is practice variation determined in the needs assessments performed by Dutch home care nurses? A cross-sectional multi-level analysis; submitted for publication.
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- **Van Dorst, J.I.E.**, Van Den Bulck, A.O.E., Spronck, C.M.H.J., Schwenke, M. Bleijenberg, N., Brabers, A.E.M., De Jong, J.D., Zwakhalen, S.M.G. M.G. Exploring practice variation in diagnoses, outcomes and interventions in the needs assessment by home care nurses: A survey study; submitted for publication.

National publications

Reports:

- **Van Dorst, J.I.E.,** Zwakhalen, S.M.G., Schwenke, M**.**, Bleijenberg, N., Brabers, A. & de Jong, J.D. (2020). Praktijkvariatie Indicatiestelling Wijkverpleging. Deelrapportage Expertmeeting en Delphi studie. https://www.rijksoverheid.nl/documenten/rapporten/2020/10/31/praktijkvariatie-indicatiestelling-wijkverpleging.
- Zwakhalen, S.M.G., **Van Dorst, J.I.E.,** Van Den Bulck, A.O.E., Bleijenberg, N., Schwenke, M., De Jong, J.D., Brabers, A.E.M. (2024). Eindrapportage Onderzoek Praktijkvariatie Indicatiestelling Wijkverpleging. https://www.venvn.nl/media/342aff0z/eindverantwoording_2023_praktijkvariatie_29032024_final.pd

Articles:

- **Van Dorst, J.I.E.** Verpleegkundige Theorieën. Dorothea Orem's zelfzorgtheorie. TVZ 01/2024, pag. 21-22.
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- Reijngoudt, J. & **Van Dorst, J.I.E.,** Zwakhalen, S.M.G. Van het klaslokaal naar de wijkverpleging: klinisch redeneren binnen het verpleegkundig proces in het verpleegkundeonderwijs. Een cross-sectionele studie. Verpleegkunde 4, 12/2024, pag. 145-152.
- **Van Dorst, J.I.E.**, Master voor de wijk? TVZ Next, 12/2024. https://www.tvznext.nl/magazine-artikelen/column-jose-van-dorst-master-voor-de-wijk
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Conference contributions

National outreach:

- Schwenke, M, **Van Dorst, J.I.E.,** Zwakhalen, S, Bleijenberg, N. Indiceren en praktijkvariatie [Assessing needs and practice variation] [Workshop]. Presented at: Congress kennis en kunde van indiceren in de wijkverpleging [Congress on knowledge and skills in needs assessments in home care nursing]; 28 Mei 2021; Online.

- Schwenke, M., **Van Dorst, J.I.E.,** Zwakhalen, S.M.G., Bleijenberg, N. Praktijkvariatie indicatiestelling wijkverpleging [Practice variation in needs assessments in home care nursing] [Oral presentation]. Presented at: V&VN Expertkring indiceren en intercollegiale toetsing; 23 Sep 2021; Online.
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- **Van Dorst, J.I.E.,** Schwenke, M., Zwakhalen, S.M.G., De Jong, J.D., Brabers, A.E.M., Bleijenberg, N. Praktijkvariatie indicatiestelling wijkverpleging [Practice variation in needs assessments in home care nursing] [Oral presentation]. Presented at Utrecht; Landelijke werkgroep Wijkverpleging.
- **Van Dorst, J.I.E.,** Schwenke, M., Zwakhalen, S.M.G., De Jong, J.D., Brabers, A.E.M., Bleijenberg, N. Praktijkvariatie indicatiestelling wijkverpleging [Practice variation in needs assessments in home care nursing] [Oral presentation Taakgroep V&VN/Hoofd Lijnen Akkoorden kwaliteit en transparantie [Taskforce Dutch Nurses Association/ Headline Agreement Quality & Transparency], 8th March 2022, Utrecht, The Netherlands.
- **Van Dorst, J.I.E.,** Schwenke, M., Zwakhalen, S.M.G., De Jong, J.D., Brabers, A.E.M., Bleijenberg, N. Praktijkvariatie indicatiestelling wijkverpleging [Practice variation in needs assessments in home care nursing]. [Oral presentation]. Presented at Limburg Living Lab in ageing and long-term care symposium; 9 June 2022, Kerkrade, The Netherlands.

International outreach:

- **Van Dorst, J.I.E.,** Schwenke, M., Zwakhalen, S.M.G., De Jong, J.D., Brabers, A.E.M., Bleijenberg, N. Praktijkvariatie indicatiestelling wijkverpleging [Practice variation in needs assessments in home care nursing]. [Oral presentation]. Presented at the 19th European Doctoral Conference in Nursing Science, 9 Sep 2022, Bern, Switzerland.
- **Van Dorst, J.I.E.,** Bevelander, A., Zwakhalen, S.M.G. Praktijkvariatie indicatiestelling wijkverpleging [Practice variation in needs assessments in home care nursing]. [Oral presentation]. Presented at the workshop European Forum of Primary Care, 27th Sep. 2022, Ghent, Belgium.
- Schwenke M, **Van Dorst, J.I.E.,** Zwakhalen, S, De Jong, J.D., Brabers, A.E.M., Bleijenberg, N. Measures to improve needs assessments and reduce practice variation in Dutch home care organisations [Oral presentation]. Presented at: 6th European Nursing Congress; 6 Oct. 2022, Online.
- **Van Dorst, J.I.E.,** Schwenke, M., Zwakhalen, S.M.G., De Jong, J.D., Brabers, A.E.M., Bleijenberg, N. Praktijkvariatie indicatiestelling wijkverpleging [Practice variation in needs assessments in home care nursing preliminary results]. [Oral

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- **Van Dorst, J.I.E.,** Van den Bulck, A., Zwakhalen, S.M.G., Let's assess:
- A survey study on the clinical judgements in one client case to explore practice variation among home care nurses [Oral presentation]. Presented at European Doctoral Conference of Nursing Science; 20 September, Graz, Austria
- Schwenke, M, Korpershoek, Y., **Van Dorst, J.I.E.**, Brabers, A.E.M., Van Den Bulck, A.O.E., De Jong, J.D., Zwakhalen, S.M.G., Bleijenberg, N. Bachelor-trained nurses assessing home care needs: What needs to change to improve uniformity? [Poster presentation]. Presented at: EANS Summer Conference; 4 Jul 2024; Torino, Italy.
- Schwenke, M, Korpershoek, Y, **Van Dorst, J.I.E.,** Brabers, A.E.M., Van Den Bulck, A.O.E., De Jong, J.D., Zwakhalen, S.M.G., Bleijenberg, N. Enhancing patient needs assessments for accessing home care nursing in the Netherlands: Needs of home care nurses [Oral presentation]. Presented at: Nordic Conference in Nursing Research, 4 Oct 2024, Stockholm, Sweden.
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National outreach:

- **Van Dorst, J.I.E.,** Schwenke, M., Zwakhalen, S.M.G., De Jong, J.D., Brabers, A.E.M., Bleijenberg, N. Praktijkvariatie indicatiestelling wijkverpleging [Practice variation in needs assessments in home care nursing preliminary results]. [Oral presentation]. Presented at several moments to different organisations between October 2022 and April 2023.
- **Van Dorst, J.I.E.,** Schwenke, M., Zwakhalen, S.M.G., De Jong, J.D., Brabers, A.E.M., Bleijenberg, N. Praktijkvariatie indicatiestelling wijkverpleging [Practice variation in needs assessments in home care nursing]. [Oral presentation]. Presented at workshops at Envida symposium, 1 Nov. 2022, Maastricht, The Netherlands.

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- **Van Dorst, J.I.E.,** Schwenke, M., Zwakhalen, S.M.G., De Jong, J.D., Brabers, A.E.M., Bleijenberg, N. Praktijkvariatie indicatiestelling wijkverpleging [Practice variation in needs assessments in home care nursing]. [Oral presentation]. Presented at Masterclasses Vakbekwaam Indiceren Beweging 3.0, 2 and 8 Dec. and 2 March 2022, Amersfoort, The Netherlands.
- Schwenke, M., **Van Dorst, J.I.E.,** Zwakhalen, S.M.G., De Jong, J.D., Van Den Bulck, A.O.E., Brabers, A.E.M., Bleijenberg, N. Praktijkvariatie indicatiestelling wijkverpleging [Practice variation in needs assessments in home care nursing] [Oral presentation]. Presented at: Leernetwerk Wijkzorg [Learning network home care nursing]; 8 June 2023, Utrecht, The Netherlands.
- **Van Dorst, J.I.E.,** Schwenke, M., Zwakhalen, S.M.G., De Jong, J.D., Brabers, A.E.M., Bleijenberg, N. Praktijkvariatie indicatiestelling wijkverpleging [Practice variation in needs assessments in home care nursing] [Oral presentation]. Presented at: Dag van de Wijkverpleging [Day of Home Care Nursing]; 9 June 2023, Ede.
- **Van Dorst, J.I.E.,** Zwakhalen, S.M.G. Klinisch redeneren in het verpleegkundig proces [Clinical Reasoning in the Nursing Process] [Oral presentation]. Presented at a workshop, Nursing Experience, 30 June 2023, Ede.
- **Van Dorst, J.I.E.,** Schwenke, M., Zwakhalen, S.M.G., De Jong, JD, Brabers, AEM, Bleijenberg, N. Praktijkvariatie indicatiestelling wijkverpleging [Practice variation in needs assessments in home care nursing] [Oral presentation]. Presented at Dutch Nurses Association Expert Circle Assessing Needs and Peer review, 5 Sep. 2023; Utrecht, The Netherlands.
- **Van Dorst, J.I.E.**, Schwenke, M., Zwakhalen, S.M.G., De Jong, J.D., Van en Bulck, A.O.E., Brabers, A.E.M., Bleijenberg, N. Praktijkvariatie indicatiestelling wijkverpleging [Practice variation in needs assessments in home care nursing] [Oral presentation]. Presented at: V&VN wijkverpleegkundigen congress [V&VN home care nurses congress]; 20 Nov 2023, Tilburg, The Netherlands.
- **Van Dorst, J.I.E**., Schwenke, M., Zwakhalen, S.M.G., De Jong, J.D., Van Den Bulck, A.O.E., Brabers, A.E.M., Bleijenberg, N. Praktijkvariatie indicatiestelling wijkverpleging [Practice variation in needs assessments in home care nursing] [Workshops]. Presented at: V&VN wijkverpleegkundigen congress [V&VN home care nurses congress]; 20 Nov 2023; Tilburg, The Netherlands.
- **Van Dorst, J.I.E.,** Schwenke, M., Zwakhalen, S.M.G., De Jong, J.D., Van Den Bulck, A.O.E., Brabers, A.E.M., Bleijenberg, N. Praktijkvariatie indicatiestelling wijkverpleging [Practice variation in needs assessments in home care

nursing] [Workshops]. Presented at Zeeland Zorg, 17 Jan. 2024, Renesse, The Netherlands.

- Schwenke, M., Korpershoek, Y., **Van Dorst, J.I.E.,** Brabers, A.E.M., Van Den Bulck, A.O.E., De Jong, J.D., Zwakhalen, S.M.G., Bleijenberg, N. Bachelor-trained nurses assessing home care needs: What needs to change to improve uniformity? [Poster presentation]. Presented at: CAPHRI Research Day; 19 Jun 2024; Maastricht, The Netherlands.
- **Van Dorst, J.I.E.,** Schwenke, M., Zwakhalen, S.M.G., De Jong, J.D., Van Den Bulck, A.O.E., Brabers, A.E.M., Bleijenberg, N. Praktijkvariatie indicatiestelling wijkverpleging [Practice variation in needs assessments in home care nursing] [Webinars]. Online presentation of results to the participating organisations; 23 and 30 Jan. 2024; Online.
- **Van Dorst, J.,** Van Den Bulck, A., Zwakhalen, S.M.G. Do home care nurses think and act similarly in one client case? (poster presentation). Presented at Caphri Day; 19 June 2024, Limbricht, The Netherlands.
- **Van Dorst, J.,** Van Den Bulck, A., Zwakhalen, S.M.G. Intercollegiale toetsing. Gluren bij de Buren [Workshop Peer review among home care nurses] [oral presentation]. Presented at: AWO-L; 20 June 2024; Venlo, The Netherlands.
- **Van Dorst, J.,** Van Den Bulck, A., Zwakhalen, S.M.G. Do home care nurses think and act similarly in one client case? (poster presentation). Presented at: SANO scientific day; 31 Oct 2024; Kerkrade, The Netherlands.
- **Van Dorst, J.,** Van Den Bulck, A., Zwakhalen, S.M.G. The Nursing Process. (oral presentation). Presented at: University of Applied Sciences Zuyd; 26 Nov. 2024; Heerlen, The Netherlands.
- **Van Dorst, J.,** Schwenke, M., Zwakhalen, S.M.G., De Jong, JD, Brabers, AEM, Bleijenberg, N. Praktijkvariatie indicatiestelling wijkverpleging [Practice variation in needs assessments in home care nursing] [Oral presentation]. Presented at: Dutch Nurses Association and VGZ conference; 26 Nov. 2024; Arnhem, The Netherlands.
- **Van Dorst, J.**, Van Den Bulck, A., Zwakhalen, S.M.G. Praktijkvariatie in professionele besluiten in één client casus. [Practice variation in clinical judgments in one client case?] [Work conferences]. Presented at: TWB; 21 Jan, 4 and 19 Feb and 18 March 2025; Roosendaal, The Netherlands.

Education, training and courses

- Blended learning course Statistics Maastricht, The Netherlands, August – October 2021.
- PHD-1 Critical: Critical Writing Skills Online (Introduction) for PhD and Postdoctoral Candidates. Maastricht, The Netherlands, October – December 2021.
- PhD-1 Academic Writing for PhD candidates and Research Master's Students. Maastricht University, The Netherlands. February - 4th April 2023.

- Essentials of effective presentations. Bern, Switzerland, 16th June 2023.
- From theoretical framework to research activities. Bern, Switzerland, 16th June 2023.
- From theory to instrument development. Maastricht The Netherlands, 6th September 2023.
- Joined colloquium meeting program ageing and long-term care on Publication Bias. Maastricht The Netherlands, 7th September 2023.
- Qualitative Research in Healthcare Practice. EpidM, Amsterdam UMC, Amsterdam, The Netherlands I 22nd – 24th November 2023.
- Successful scientific oral presentations - the opening of the presentation. Graz, Austria, 13th December 2023.
- Workshop: Sex and gender. Graz, Austria, 14th December 2023.
- PhD-2 Health: Advanced Scientific Writing for PhD candidates in Health Sciences and Psychology Gamma. Maastricht, The Netherlands, September – November 2023.
- Lessons learned from a rapid ethnographic study in a green nursing home environment. Maastricht, The Netherlands, 29th February 2024.
- From Theory to Practice: Elevating Clinical Reasoning Across Europe.From Theory to Practice: Elevating Clinical Reasoning Across Europe. Leuven Belgium, 4th June 2024.
- Design of posters and poster presentation. Bern, Switzerland, 5-6th June 2024.

Memberships

- European Doctoral Program on Nursing Science (EDCNS)
- ACCENDIO, Making Nursing Visible
- Dutch Association of Nurses

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ABOUT THE AUTHOR

José van Dorst was born on November 11, 1961, in Wouwse Plantage, near the Belgian border. She grew up in Wouw, and after primary school, she started secondary school in Roosendaal. After graduation, she started nursing education in-service at St. Franciscus Hospital in Roosendaal. After a few years working as a nurse in a hospital, she took up elderly care in a nursing home in Zevenbergen as a team leader. Working part-time was not done in those years, so she stopped working briefly when the children came. She came across home care nursing coincidentally, but this felt like coming home. In 1995, working as a part-time home care nurse, she took her chance to get her bachelor's degree in community nursing at Breda University of Applied Sciences. She was a cum laude graduate on the subject of *'Using a classification system and improving the quality of care, work and having a healthy organisation'*. The following years were spent in a manager's job, but she could not reach the quality of care and work she hoped for. By chance, on request of a client with complex care needs, she started her own company and delivered home care for 11 years to clients wanting to age-in-place with complex care needs. Then the Regional Cross Union came by and requested to bring back the community nurse. The company was sold to Surplus, and with funds from the Regional Cross Union and the Visible Chain, she helped community nurses to take back their position in the neighbourhoods. The subsequent study was completed, and a master's degree was reached in 2013 at Erasmus University in Rotterdam.

Being active in the Dutch Association of Nurses and having knowledge about the competencies of home care nurses, she developed specialised education on competently assessing home care needs with her partner in SBW (Stichting Bevordering Wijkverpleegkunde) and launched a post-bachelor education and the special course on assessing home care needs in 2014. Since then, she has trained thousands of home care nurses nationwide.

At the end of 2019, she came across the vacancy for a PhD on practice variation in needs assessment in home care nursing and saw her name written all over this subject. This part-time PhD trajectory was combined with working as owner, teacher, and coach at SBW. In 2025, SBW developed an e-learning course on assessing home care needs competently. She completed her PhD and is a part-time Postdoctoral researcher in the Living Lab on Ageing, Long-Term, and Community Care at Maastricht University.

LIVING LAB IN AGEING AND LONG-TERM CARE

This thesis is part of the Living Lab in Ageing and Long-term Care, a formal and structural multidisciplinary network consisting of Maastricht University, nine long-term care organizations (MeanderGroep Zuid-Limburg, Sevagram, Envida, Cicero Zorggroep, Zuyderland, Vivantes, De Zorggroep, Land van Horne & Proteion), Intermediate Vocational Training Institutes Gilde and VISTA college and Zuyd University of Applied Sciences, all located in the southern part of the Netherlands. In the Living Lab we aim to improve quality of care and life for older people and quality of work for staff employed in long-term care via a structural multidisciplinary collaboration between research, policy, education and practice. Practitioners (such as nurses, physicians, psychologists, physio- and occupational therapists), work together with managers, researchers, students, teachers and older people themselves to develop and test innovations in long-term care.

ACADEMISCHE WERKPLAATS OUDERENZORG LIMBURG

Dit proefschrift is onderdeel van de Academische Werkplaats Ouderenzorg Limburg, een structureel, multidisciplinair samenwerkingsverband tussen de Universiteit Maastricht, negen zorgorganisaties (MeanderGroep Zuid-Limburg, Sevagram, Envida, Cicero Zorggroep, Zuyderland, Vivantes, De Zorggroep, Land van Horne & Proteion), Gilde Zorgcollege, VISTA college en Zuyd Hogeschool. In de werkplaats draait het om het verbeteren van de kwaliteit van leven en zorg voor ouderen en de kwaliteit van werk voor iedereen die in de ouderenzorg werkt. Zorgverleners (zoals verpleegkundigen, verzorgenden, artsen, psychologen, fysio- en ergotherapeuten), beleidsmakers, onderzoekers, studenten en ouderen zelf wisselen kennis en ervaring uit. Daarnaast evalueren we vernieuwingen in de dagelijkse zorg. Praktijk, beleid, onderzoek en onderwijs gaan hierbij hand in hand.

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