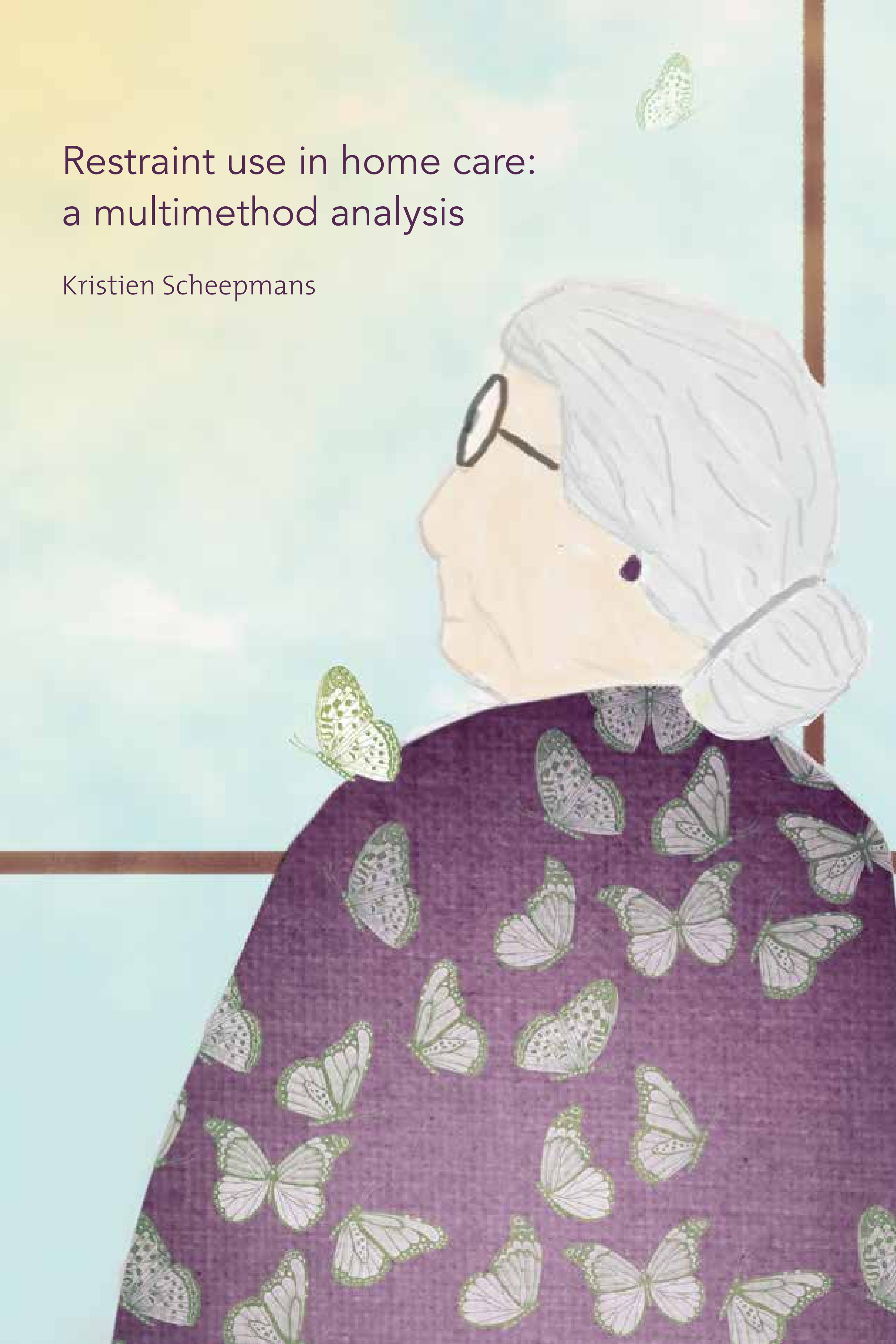
Restraint use in home care: a multimethod analysis

Kristien Scheepmans



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RESTRAINT USE IN HOME CARE: A MULTIMETHOD ANALYSIS

Kristien Scheepmans

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Chair:	Prof. dr. Geert Verbeke
Jury members:	Prof. dr. Bert Aertgeerts
	Prof. dr. Johan Flamaing
	Prof. dr. Jan Hamers
	Prof. dr. Peter Van Bogaert

Dissertation presented in partial fulfilment of the requirements for the degree of Doctor in Biomedical Sciences.

March 2018

ISBN: 9789082823004
Lay-out & design: Yellow Beans, www.yellowbeans.be
Printed by: ACCO, Leuven Belgium

DANKWOORD

Dit dankwoord is het hoofdstuk dat ik het meest herschreven heb ... in mijn hoofd. Na een constructieve vergadering, een goede presentatie, boeiende of enthousiaste reacties, een positief gesprek, een efficiënte werkdag, waardoor ik er weer voluit in geloofde, een ingediend of uiteindelijk gepubliceerd artikel en vele andere kleine of grote succesmomenten, voegde ik er een stukje aan toe of herschreef het in de auto.

En hoewel ik nooit de intentie heb gehad om te doctoreren, ben ik dankbaar voor dit avontuur. Eerlijkheidshalve moet ik toegeven dat het maken van dit doctoraat geen evidentie was. Het was een uitdaging om U tegen te zeggen. Een confrontatie met mijn eigen zwaktes en sterktes en een heel proces om hiermee om te gaan en deels dit te aanvaarden. Maar koppig als ik ben, het is de aanhouder die wint. Samenvattend zou ik het doctoraat omschrijven als een ervaring om nooit te vergeten en als een ongelofelijk leer- en groeiproces waar ik zowel professioneel als persoonlijk sterker ben uitgekomen.

Vrij zijn, bevrijd zijn, persoonlijke vrijheid, de zoektocht ernaar en het respect hiervoor zowel bij mezelf als bij anderen… het zijn allemaal aspecten die mij zeer nauw aan het hart liggen. Een doctoraat over vrijheidsbeperkende maatregelen waar dit gedachtegoed zo in vervat zit, was voor mij dan ook het perfecte onderwerp om mij met hart en ziel in te verdiepen.

Ik had dit doctoraat nooit tot een goed einde kunnen brengen zonder de hulp en steun van een aantal mensen. Graag wil ik de tijd en ruimte nemen om deze mensen oprecht te bedanken.

Allereerst wil ik Professor Koen Milisen bedanken. Koen, jij was een van de voornaamste bakens tijdens dit doctoraat. Het was een hele geruststelling om onder jouw veilige vleugels aan dit traject te beginnen, geleidelijk aan te (mogen) groeien en het uiteindelijk tot een goed einde te brengen. Je had al snel door wie ik echt ben. Jouw eerlijkheid en constructieve feedback maar ook je menselijke en respectvolle aanpak, heb ik enorm gewaardeerd. Dank je wel voor het vertrouwen dat je me steeds weer gaf en voor de vele kansen waardoor ik heel wat grenzen heb verlegd, denk nog maar aan het GSA congres in Washington, wat een overwinning! Ook straalde je rust uit en was je er steeds op momenten dat het echt nodig was of als de vertwijfeling toesloeg, ongeacht jouw hectische agenda. Ik heb veel geleerd van je professionalisme, je uitgebreide expertise waar ik steeds beroep op kon doen, jouw geduld, je realistische kijk op haalbare doelen en tegelijkertijd je enthousiasme en gebetenheid met betrekking tot fixatie en het streven naar kwalitatief goede zorg. Het klinkt cliché, maar het is echt gemeend: mezelf zeer goed kennende, was jij voor mij de promotor die het best bij mij paste! Dank je wel!!

Graag wil ik ook mijn co-promotor, professor Bernadette Dierckx de Casterlé bedanken. Bernadette, 17 jaar geleden was je mijn promotor voor mijn master thesis. En ook nu was het een eer, een plezier en een waar genoegen om jou als co-promoter voor mijn doctoraat te hebben. Je kent me als geen ander. En ik wil je ook meteen gerust stellen: 'het gaat goed met mij en thuis ook, wat druk en het is (was) niet altijd evident om alles te combineren'. Dank je wel om hier steeds weer met oprechte interesse naar te informeren, om het te doorprikken wanneer dit niet zo was en om dan steeds klaar te staan met een luisterend oor en advies. Hierdoor blijkt ook meteen de toon van de begeleiding die ik van jou heb gekregen: warm, respectvol, met veel aandacht voor mijn persoonlijk welzijn en welbevinden en met een betrokkenheid die verder reikte dan alleen maar het onderwerp van dit doctoraat. Ik heb ontzettend veel van je geleerd. Ik heb je kritische ingesteldheid, de grondigheid en nauwgezetheid waarmee je zaken aanpakt, de constructieve feedback, en het creëren van structuur steeds gewaardeerd. Maar ook om te leren genieten van kleine successen en om de juiste prioriteiten te stellen. Dank je wel hiervoor!

Een woord van dank aan de leden van mijn begeleidingscommissie en de jury. Professor Johan Flamaing, professor Bert Aertgeerts, professor Jan Hamers en professor Peter Van Bogaert: dank je wel voor het nalezen en het kritisch beoordelen van mijn doctoraatsthesis en jullie positieve feedback. Ook dank aan de voorzitter van mijn openbare verdediging, professor Geert Verbeke.

Uiteraard is er geen sprake van een doctoraat als er geen project is. Ik ben het Wit-Gele Kruis zeer dankbaar dat zij openstonden voor dit onderwerp. Een oprechte dank aan de toenmalige voorzitters en huidige voorzitter Piet Vanthemsche, de Raad van Bestuur en de directies van het Wit-Gele Kruis voor deze unieke kans. Een speciaal woord van dank aan Hendrik Van Gansbeke, algemeen coördinator van het Wit-Gele Kruis van Vlaanderen. Hendrik, vanaf het begin was je overtuigd van het belang van dit project voor het Wit-Gele Kruis, voor de patiënt en de mantelzorger en voor de thuiszorg. Je hebt hier steeds met veel enthousiasme stevig je schouders onder gezet en mij altijd gesteund. Dank je wel voor deze kans, het vertrouwen, je begrip en motiverende woorden. Ook een 'dank je wel' aan de collega's van het Wit-Gele Kruis van Vlaanderen. Ik kon altijd wel ergens terecht voor allerlei advies, een Engelse helpdesk of een aanmoediging. Een speciaal woord van dank aan twee bijzondere collega's Louis Paquay en Hilde De Groef. Louis, dank je wel om een van mijn vaste en betrouwbare begeleiders te zijn tijdens dit project, voor je motiverende en tegelijkertijd ook geruststellende woorden en je eindeloze geduld. Ik bewonder je wijsheid en je uitgebreide (statistische) kennis, waar ik vaak beroep op kon doen. Hilde, jij bent zonder twijfel een 'collega uit de duizend'. Jij hebt mijn brede waaier van emoties steeds van dichtbij meegemaakt. Vaak was je mijn steun en toeverlaat: je leefde mee, was bezorgd, eerlijk en kordaat maar je was ook fier op de vooruitgang en de successen die ik boekte en waar ik je steeds weer deelgenoot van maakte. Een zeer oprechte dank je wel. Ook wil ik alle thuisverpleegkundigen die hebben meegewerkt aan de verschillende studies van harte bedanken. Dank aan alle organisaties en betrokkenen die hebben meegewerkt aan de ontwikkeling van de praktijkrichtlijn.

Dank aan Vanbreda voor de financiële ondersteuning van het vooronderzoek, de ontwikkeling van de richtlijn en de verdere verspreiding ervan.

Met plezier denk ik terug aan de leuke en boeiende 'ontmoetingen' met de collega's van het AccentVV-team! Een welgemeende dank voor de talrijke leermomenten, de grote bereidheid om steeds te helpen, de bemoedigende woorden, voor de kritische maar steeds opbouwende feedback en de aangename lunchpauzes. Het resultaat van al deze 'ontmoetingen', heeft op een of andere manier bijgedragen aan het versterken van dit doctoraatsonderzoek, van mijn academische skills en persoonlijkheid. Dank je wel aan Ellen, voor de vele leuke en motiverende gesprekken en al je hulp; Pieter voor de 'rust' en relativering; Theo voor de bemoedigende woorden en de belangrijke levenslessen; Fabienne, Mieke, Elke, Nathalie, Eva, Bastiaan, Jasper, Els, Liesbeth, Fouke, Philip, Marc, Alexandra, Caroline, Heidi, Anja en nog zo vele anderen voor alle advies.

Annick, we hebben elkaar leren kennen tijdens de EANS Summerschool. Ik heb genoten van onze 'ventilatie'-avonden die een aangename afwisseling waren tussen het harde werken.

Ilse en Dorien van Yellow Beans, jullie creatieve brein slaagde er perfect in om mijn woorden en gedachten mooi in beeld te brengen. Zoals altijd was het een leuke samenwerking!! Super dank je wel!

Kristel en Susan, het was geen evidentie om elkaar te zien maar ik keek altijd uit naar onze schaarse maar gezellige avonden. Zo zie je maar dat kwaliteit belangrijker is dan kwantiteit. De toekomst belooft wellicht meer regelmaat. Kristel, hartsvriendinnen zijn schaars en moet je koesteren! Dank je wel dat ik steeds voor alles bij jou terecht kon. Je bent een parel van een hartsvriendin!! Laten we nog lang en gezellig verder fietsen op onze stevige tandem.

Fredo et Claire, milles fois merci pour tous ces nombreux moments superbes! N'importe que ce soit une soirée, un weekend ou des vacances, chaque fois c'est une fête plein d'amusement, d'amour et de joie. Tous les ingrédients nécessaires pour me détendre et me recharger à bloc pour continuer. Merci beaucoup!

Dank aan mijn ouders voor de kansen die jullie me steeds hebben gegeven om te kunnen studeren en jullie soms terechte bezorgdheid. Dank aan Lieve en José voor alle steun, aanmoediging en jullie hartelijkheid.

Een enorme dank je wel aan mijn grootste, eerlijkste en liefste supporters: Elissa en Amélie!! Dank je wel voor jullie eindeloze geduld en begrip als ik weer eens aan het werk was, voor de aanmoedigende knuffels, jullie eerlijkheid en om tijdig aan de bel te trekken, jullie enthousiasme en voor jullie onuitputtelijke steun! Jullie zijn heel bijzonder, twee moedige, sterke en toffe dochters. Ik zie jullie ontzettend graag!

Olivier, ik weet niet goed waar ik moet beginnen aan mijn lijstje om je te bedanken… Daarom kort, krachtig en rechtuit, zoals je het graag hebt: dank je wel voor je onvoorwaardelijke steun, hulp en advies, je eindeloze geduld en je luisterend oor, je vertrouwen, liefde en vriendschap. Dank je wel om zo een geweldige papa te zijn voor onze dochters. Met jou aan mijn zijde kan ik bergen verzetten. Een heel oprechte dank je wel!!!!

Kristien

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CHAPTER 1:

GENERAL INTRODUCTION

This manuscript reports about the use of restraints in home care. The introductory chapter will provide the rationale for studying this subject in home care, starting with the growing importance of home care and the use of restraints as a challenge for this setting. The overall research approach combined with the different chapters provides the framework of this PhD research.

GROWING IMPORTANCE OF HOME CARE

Traditional patterns of care are changing due to the demographic, epidemiological, social and cultural trends in Europe. These trends affect the demand and supply of home care (De Vliegher, 2015; Tarricone & Tsouros, 2008). The combination of increased life expectancy, resulting in increased longevity, and the falling fertility rates, influence the demographic aging of the population (Eurostat, 2012). In 2010, the share of persons of 65 years and older in the European-27's population is 17.4% (in Belgium it is 17.1%), of whom 4.7% are older than 80 years of age. The 65-plus figure is expected to increase to 29.5% by 2060 (Paulus, Van den Heede, & Mertens, 2012). By 2060 the median age of the whole population of these European countries is projected to stabilize at 47.6 years (versus 40.9 in 2010) (Eurostat, 2012). A consequence of the increased share of persons older than 65 is the growing number of care-dependent older persons and of persons with chronic diseases (Genet et al., 2011; Paulus et al., 2012; Van den Bosch et al., 2011). Indeed, the dependency coefficient of older persons (67+) in Belgium is expected to increase from 25.3% in 2016 to 38% in 2040 and 39% in 2060 (Federaal Planbureau, 2017, p. 25). The aging population has and will have an increasing impact on healthcare systems (De Vliegher, 2015; Van den Bosch et al., 2011) and has resulted in an increased interest in home care (Genet et al., 2011). In many European countries home care is one of the fastest-growing segments in the health care industry (Carpenter et al., 2004). This is because the balance of long-term care tends to shift towards home-based care, due to the fact that home care, as opposed to institutionalization, is the mode of care preferred by most older people (Boerma et al., 2013; Carpenter et al., 2004; Genet et al., 2011). It is also more cost-effective than institutional care (Carpenter et al., 2004; Genet et al., 2011). As reported by the World Health Organization, "home is the place of emotional and physical associations, memories and comfort" (Genet et al., 2011). Home care can be defined as any care provided within clients' own homes by professional caregivers for both long-term and short-term care (Boerma et al., 2013). Changes in epidemiology (e.g. mental illness, changing patterns of diseases like dementia, diabetes and cancer) combined with the aging population and the technological innovation and evolution result in new challenges in home care.

RESTRAINT USE AS A CHALLENGE IN HOME CARE

One of these challenges in home care is the use of restraints. Indeed, due to the aforementioned demographic, economic and technological evolutions and because patients prefer to stay at home as long as possible, there are an increasing number of frail older persons living at home despite major cognitive disturbances and functional disabilities (Hoeck et al., 2011), conditions known to be associated with an increased use of restraints (Hofmann and Hahn, 2014). As a consequence, healthcare workers in home care are getting increasingly confronted with situations where restraints are requested or already in place. Despite the indications that restraints are used in home care, research about the prevalence of restraints, the types being used, the ways they are used and the associated factors in their use in home care is scarce (Beerens et al., 2014; de Veer et al., 2009; Hamers et al., 2016), and most insights in restraint use are related to the acute and chronic residential setting.

RESTRAINT USE AS A COMPLEX PROBLEM IN THE RESIDENTIAL SETTING

Restraint use is a well-known and complex problem affecting older adults in many countries, with a prevalence varying from 3.5% to 11.8% in acute hospitals (Hofmann et al., 2015; Krüger et al., 2013; Raguan et al., 2015) and from 26.3% to 56% in nursing homes (Feng et al., 2009; Huizing et al., 2007; Hofmann et al., 2015). Evidence from the acute and chronic residential setting shows that restraint use has many negative consequences. Patients experience physical (e.g. incontinence, decubitus ulcers, loss of muscle strength, problems with balance, falls), psychological (e.g. depression, anger, agitation) and social (e.g. social isolation) negative consequences (Gastmans & Milisen, 2006; Hamers & Huizing, 2005; Hofmann & Hahn, 2014). In addition, the use of restraints also has an important impact on the family (e.g. idea of finality, denial, anger, worry) and on the healthcare workers (e.g. inner conflicts and mixed emotions such as frustration, guilt, ambivalence resulting in moral distress) (de Veer et al., 2013; Gastmans & Milisen, 2006; Saarnio & Isola, 2010).

Furthermore, the decision to use restraints is a complex trajectory that depends on patient characteristics (e.g. cognitive decline, increased dependency in activities of daily living, poor mobility, challenging behaviour, falls and perceived risk of falling), nonpatient-related factors; and by the requirement of balancing safety, ethical and legal aspects (Gastmans & Milisen, 2006; Goethals et al., 2012; Hofmann & Hahn, 2014). Examples of nonpatient-related factors are staff characteristics such as nursing skill mix, staffing levels, the attitude of the nurses (e.g., nurses' perception of patient behaviour), job characteristics (e.g. job autonomy) and legislation. The presence of the family, insufficient time to discuss use of restraints with other staff members or a lack of staff are examples of context-related factors (Heeren et al., 2014; Huizing et al., 2007; Meyer et al., 2009; Möhler et al., 2014).

URGENT NEED FOR RESEARCH ABOUT RESTRAINT USE IN HOME CARE

Because of the specific context of home care, the insights of the residential setting may not be translated to the home care setting. In this setting, healthcare workers enter into the living and personal environment of the patients. They see their patients during short visits and often work alone. Home care is organized differently from care in residential settings and it is difficult to ensure the 24-hour cover and increased supervision required when restraints are used. Relatives of the patients play a crucial role as well and may even take the lead in the decision-making process (de Veer et al., 2009; Hamers et al., 2016). These factors point up the need for research on restraint use in the home care setting in order better to understand how to support home care providers dealing with situations where restraints are requested or already used.

Therefore, the overall objectives of this explorative dissertation are twofold: 1) to gain in-depth insight into the use of restraints in the home care setting and 2) to use and integrate these insights to develop a clinical, evidence-based practice guideline for supporting healthcare providers in decreasing the use of restraints in home care.

The following specific aims fall within the first research objective:

- To describe nurses' experiences about restraint use in Flemish home care.
- To describe the prevalence, types, frequency and duration of restraint use with older persons receiving home care in Flanders, and ways that restraints are used (e.g. reasons, decision-making and application process, permission, etc.).
- To describe the risk factors for restraint use with older persons in home care in Flanders.
- To describe, by means of a systematic literature review, the definitions, prevalence, types, persons involved and reasons for using restraints with older persons in home care.

METHODS AND STRUCTURE: GENERAL OVERVIEW (FIGURE 1)

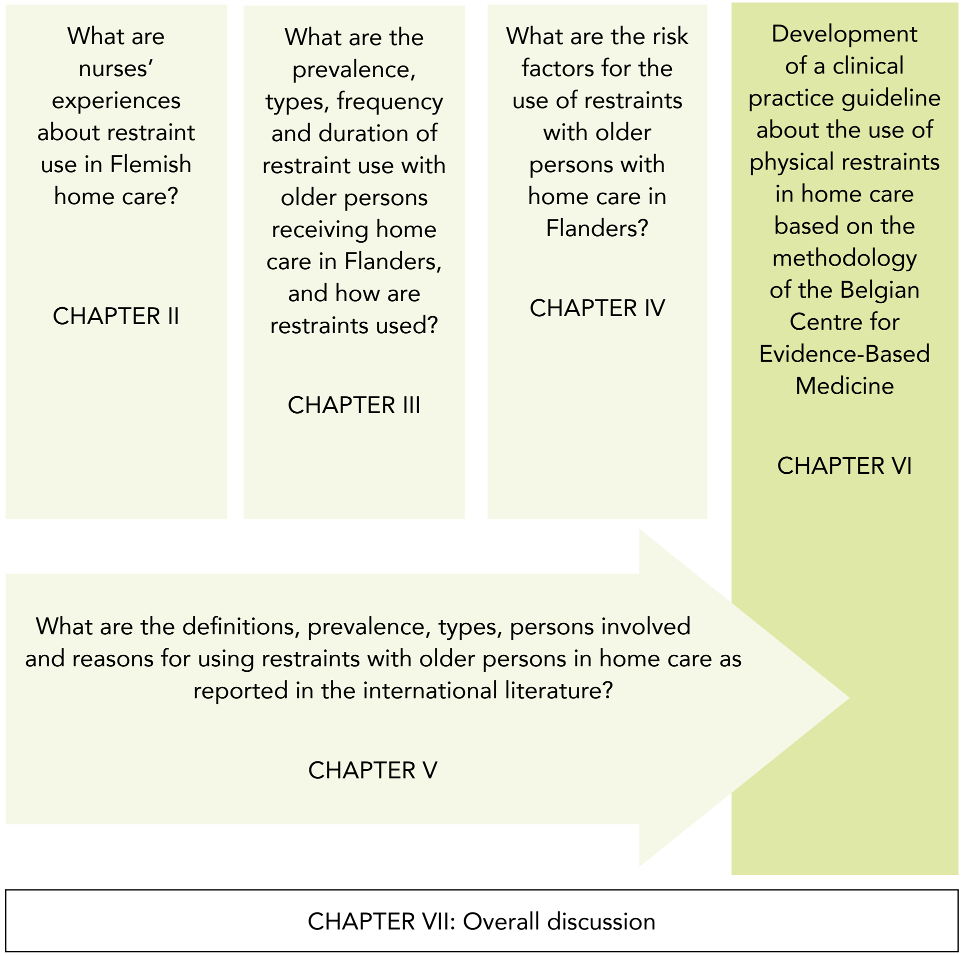
Because of the complexity of restraint use and the limited available research in home care, we chose to use a multimethod approach to explore restraint use in home care thoroughly. A multimethod approach (Tashakkori & Teddlie, 2003, Chapter 7; Polit & Beck, 2012) was appropriate to explore restraint use in home care because of the complexity of the phenomenon, the broad scope of the research and the limited available evidence about this topic in home care. The multiple aims of the PhD project (i.e. description of restraint use in home care, understanding its characteristics and the underlying relationships, and the development of a well-founded strategy to reduce restraint use in home care) require different levels of data and insights; and consequently require different studies and designs resulting in a more comprehensive picture of restraint use in home care.

To get in touch with the subject and to understand the concept better, we started with a qualitative study to explore the perspectives of home care nurses about restraint use (Chapter II). This study provided a first insight into restraint use and – combined with insights of additional literature – helped us to develop a questionnaire and to prepare our survey study (Chapter III). The aim of this study was to obtain a general idea of the extent of restraint use in home care and, more specifically, about the prevalence, types, frequency, duration and ways that restraints are used at home. We further used the data of the survey to determine the associated factors of restraint use in home care (Chapter IV). By using a binary logistic regression model, we aimed to gain insight into patient-related and nonpatient-related factors of restraint use in the home care setting.

Finally, we searched the literature systematically from inception to the end of April 2017 (Chapter V). We started this PhD project with a literature review to prepare our qualitative study thoroughly. The scarcity of empirical research in home care led us to consult and update the literature continuously during this PhD research. The systematic review examined the definitions, prevalence, types, persons involved and reasons for using restraints with older persons in home care within a national and international home care context. The results of the different studies were used to develop the practice guideline (Chapter VI). For that task we worked with a multidisciplinary group with representatives of healthcare professionals (e.g. home nurses, general practitioners, domestic aid) and representatives of patient and informal caregivers.

The combination of different research designs (i.e. qualitative explorative study, large survey study, systematic review, methods for guideline development) and corresponding analysis techniques resulted in a thorough insight into the use of restraints at home. A general overview of the PhD research, reflections on the main findings, discussion of the methodological issues and recommendations for clinical practice and future research are presented in Chapter VII.

Figure 1: Overview of PhD dissertation



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CHAPTER 2:

RESTRAINT USE IN HOME CARE: A QUALITATIVE STUDY FROM A NURSING PERSPECTIVE

This chapter is published and reproduced with the kind permission of the editor: Scheepmans, K., Dierckx de Casterlé, B., Paquay, L., Van Gansbeke, B., Boonen, S., Milisen, K. (2014). Restraint use in home care: A qualitative study from a nursing perspective. *BMC Geriatr., 14,* 17.

ABSTRACT

Background: Despite the growing demand for home care and preliminary evidence suggesting that the use of restraint is common practice in home care, research about restraint use in this setting is scarce.

Methods: To gain insight into the use of restraints in home care from the perspective of nurses, we conducted a qualitative explorative study. We conducted semi-structured face-to-face interviews of 14 nurses from Wit-Gele Kruis, a home-care organization in Flanders, Belgium. Interview transcripts were analyzed using the Qualitative Analysis Guide of Leuven.

Results: Our findings revealed a lack of clarity among nurses about the concept of restraint in home care. Nurses reported that cognitively impaired older persons, who sometimes lived alone, were restrained or locked up without continuous follow-up. The interviews indicated that the patient's family played a dominant role in the decision to use restraints. Reasons for using restraints included "providing relief to the family" and "keeping the patient at home as long as possible to avoid admission to a nursing home." The nurses stated that general practitioners had no clear role in deciding whether to use restraints.

Conclusions: These findings suggest that the issue of restraint use in home care is even more complex than in long-term residential care settings and acute hospital settings. They raise questions about the ethical and legal responsibilities of home-care providers, nurses, and general practitioners. There is an urgent need for further research to carefully document the use of restraints in home care and to better understand it so that appropriate guidance can be provided to healthcare workers.

BACKGROUND

Despite increasing evidence of negative consequences (Castle and Engberg, 2009; Evans et al., 2003; Gallinagh et al., 2001; Gastmans and Milisen, 2006), the use of physical restraints is still common practice in many countries. The prevalence ranges between 4% and 85% in nursing homes (Gastmans and MIlisen, 2006) and between 8% and 68% in hospitals (Hamers and Huizing, 2005). This wide range partly reflects varying definitions for what constitutes restraint, different populations studied, and different countries with differences in legislation and practice.

Due to shifting demographic, economic, and technological trends and the desire of patients to live at home as long as possible, home care is growing in demand. With these trends, an increasing number of frail older persons are living at home despite major cognitive disturbances and functional disabilities (Hamers, 2005; Hellwig, 2000), conditions known to be associated with an increased use of restraints (Gastmans and MIlisen, 2006; Hamers and Huizing, 2005). As a consequence, healthcare workers are increasingly confronted with restraint use, even in home care. Research on this topic in home care is scarce. One study conducted in the Netherlands suggested that restraint use in home care is common practice (de Veer et al., 2009).

The use of restraints has a large impact on patients (e.g., physical and psychological consequences); family (e.g., anger, worry); and healthcare workers (e.g., mixed emotions such as anger, reassurance) (Evans et al., 2003; Gastmans and Milisen, 2006; Hamers and Huizing, 2005; Saarnio and Isola, 2010). Furthermore, the decision process to use restraints lies along a complex trajectory that depends on patient characteristics and on the attitude of nurses (e.g., nurses' perception of patient behavior, their willingness to take risks, or their own comfort). It also depends on context-related factors such as family involvement, which can have a positive or negative impact on nurses' decision making; insufficient time to discuss restraint use with other staff members like physicians; lack of staff; and the requirement of balancing safety, and ethical and legal aspects (Gastmans and Milisen, 2006; Saarnio and Isola, 2010; Goethals et al., 2012).

Current understanding about restraint use derives mostly from acute and long-term residential settings. Knowledge about restraint use obtained from residential settings does not easily generalize to the home-care setting, because of the uniqueness of the home-care setting. Moreover, it is unclear how the little research that has been done in home-care settings relates to that done in long-term residential care settings. In the home-care setting, healthcare professionals work in the patient's personal living environment rather than in a healthcare facility, where they have more control over decisions. Moreover, they see their patients for short visits; thus, they have no opportunity to continuously supervise restrained persons. Also, home-care nurses typically work alone, often leaving them in an unsupported professional position when confronted with decisions about restraints. Patients' relatives also play a crucial role and may even take the lead in the decision-making process (Haut et al., 2010; Ludwick et al., 2008). These factors emphasize the need for research on restraint use in home-care settings.

Because of their pivotal role in home care and their intensive interactions with family and other healthcare workers, home-care nurses are in an excellent position to provide relevant information about the use of restraints in home care. The aim of this study was to gain initial insights into the use of restraints in home care in Flanders, Belgium, from the perspective of home nurses. The overarching research question was, "What are nurses' experiences about restraint use in Flemish home care?"

METHODS

Design

A qualitative explorative study was performed to gain more insight into the experiences nurses have with restraint use in the home-care setting (Strauss and Corbin, 1990; Holloway and Wheeler, 1996). Physical restraint is defined as using "any device, material or equipment attached to or near a person's body and which cannot be controlled or easily removed by the person and which deliberately prevents or is deliberately intended to prevent a person's free body movement to a position of choice and/or a person's normal access to their body" (Retsas, 1998). We extended this definition to include other forms of restraint; e.g., chemical and environmental restraints and any other action applied by someone that restricts another person's freedom in some way.

Setting

The study was conducted in the Wit-Gele Kruis, an umbrella organization that provides home nursing in Flanders, Belgium. In Belgium, professional home nursing is provided by a private organization, an agency, or by self-employed nurses. Organizations, such as the Wit-Gele Kruis, have a similar organizational structure to a hospital: nursing director, management head, and nurses. All nurses working at Wit-Gele Kruis are employees and provide care for patients living at home. Professional home nursing is part of the social security system and is financed by the National Institute for Health and Disability Insurance (NIHDI). This institution reimburses patients who are insured, which is mandatory in Belgium. Furthermore, the NIHDI reimburses for a limited set of nursing activities listed in the nomenclature for home nursing. This list of home nursing activities has codes that correspond to an honorarium or reimbursement fee (De

Vliegher et al., 2010). Most nursing care activities must be prescribed by a physician to be reimbursable. However, no prescription is required for the use of restraints in this nomenclature, which refers to a nursing activity as "measures to prevent injury" and "includes restraint devices, insulation, security, and surveillance." In short, this means that nurses can perform these kinds of actions under certain conditions and that they bear responsibility for its implementation.

Wit-Gele Kruis consists of five autonomous home nursing agencies, each of which is located in one of the five Flemish provinces and is spread over 100 divisions. In 2012, 153,199 patients received at-home nursing care from Wit-Gele Kruis. The mean age of these patients was 72.9 years, with 80.3% being older than 60 years.

Participants

The head nurses of nine randomly selected divisions were contacted and informed about the aim of our study. They were asked to select home-care nurses who met the following criteria: (i) delivered direct patient care at home, (ii) had experience with the use of restraints at home, and (iii) were willing to talk about their experiences. The researcher contacted potential candidates to confirm their voluntary participation and to set a date for in-depth-interviews. All participants gave written informed consent.
The purposive sample consisted of 14 nurses (13 females) who had an average age of 39 years (range: 23-57 years) and an average of 11.4 years (range: 11 months - 24 years) of professional experience as a home-care nurse. Eight of them worked full time.

To become a nurse in Belgium, one can chose from two types of training or educational programs: baccalaureate-level or associate-level nursing programs. Nurses with baccalaureate degrees graduated from a nursing program at a college for higher education. Nurses with an associate degree received polytechnical nurse training in their fourth year of secondary school. Of the 14 participants, 6 were nurses with a baccalaureate degree and 8 were nurses with an associate degree.

Procedure

Data were collected from April to June 2009, using semi-structured in-depth interviews. Each interview took approximately 1-1½ hours and was conducted at the division where the participant was employed. All interviews were digitally recorded. The first author (KS) conducted all interviews and had no professional relationship with the participants.

The interview guide consisted of open-ended questions and was refined throughout the research project (Table 1). We started the interview by asking the respondents to describe the concept of "restraints" in their own words. Next, we asked the nurses to provide a specific example of a situation in which they had used restraints in home care. The questions listed in Table 1 helped us to gather more information about their experiences. The interview guide was adapted and refined according to insights made from the first interviews. The research team also added some questions to gather more information about the general practitioner's role, nurses' knowledge of available alternatives, and the organization of team meetings. The goal of this was to better understand the decision-making process, and whether restraints were used acutely or chronically. The order of the questions was adapted according to the answers of each nurse during his/her interview. After discussing the first example of restraint use, we asked the nurses to provide another example of restraint use and to explain how this differed from the previous situation. We also asked about other kinds of restraints used in the home-care setting. Finally, we asked them to describe an ethically irresponsible situation they experienced and how they dealt with that situation.

Table 1: Interview guide

- Please give an example of a situation in which you were faced with the use of restraints?
- What types of restraints did you use in this situation?
- What was the reason for using these restraints?
- Were these restraints used in an acute or chronic way?*
- Can you explain how the decision about restraint use was made (e.g., during team meetings)?*
- How did you experience the use of restraints?
- Can you describe your emotions when using restraints?
- What difficulties did you experience by using restraints?
- Can you describe how you dealt with this situation and why?
- Who supported you in this situation?
- Can you explain the role of the general practitioner in using restraints?*
- What were available alternatives in this situation?*
- In your opinion, what would be the best care for this patient?
- As a nurse, how did you experience your responsibility in this situation?

* Additional questions after the initial interviews.

Ethical approval

The Medical Ethics Committee of the Leuven University Hospitals approved the study.

Data Analysis

The data were analyzed using the method described in the Qualitative Analysis Guide of Leuven (Quagol) (Dierckx de Casterlé et al., 2012). Data collection and thematic analyses occurred in parallel, with continuous interaction between the two. Much time was devoted to analyzing and understanding the data and thoroughly preparing the coding process.

Each tape-recorded interview was transcribed verbatim and read several times in order to obtain a general picture of restraint use in home care and to make sense of the material provided by the nurses. Significant statements were extracted and codes/concepts were formulated that conveyed the essential meaning of the nurses' experiences. Statement fragments with similar codes were ordered and organized into categories per interview. These categories were then compared with what was said in the original interviews. After analyzing each interview separately, the research team determined common categories produced across the different interviews. This resulted in a master list of concepts/codes, which served as the data that was entered into the qualitative software program Nvivo 7.0.

All interviews were analyzed by the interviewer. In addition, the first interviews were read and analyzed by all members of the research team and discussed in a group. The remaining interviews were divided among three members of the research team, so that each interview was read, significant statements were indicated and coded by two members and the interviewer. All findings were discussed by the team and always verified with the interviews.

The research team consisted of four members. The members had a mixture of expertise in the field of home care, restraints, qualitative research, and ethics. Analysis started immediately after the first interview and continued until saturation was reached. Several strategies (researcher triangulation, context triangulation, audit-trail, peer-debriefing) were used to optimize the methodological quality of the study (Mays and Pope, 2000).

RESULTS

The present study confirmed that restraints are used in home care, but at the same time, revealed a lack of clarity about this concept among nurse participants. Furthermore, the study showed that the use of restraints was associated with specific features unique to this type of setting, including types of restraints used, patient characteristics, reasons for restraining, and persons involved in the decision-making process.

Restraints in home care: an ambiguous concept

The participating nurses had difficulty in defining the use of restraints. The interviews revealed a variety of interpretations of this concept related to particular personal and professional experiences of the nurses. Some nurses even considered home modifications, like moving the bed downstairs, to be a form of restraint. Other nurses had a very restricted interpretation of restraint use, more in line with the notion of abuse or neglect of older individuals. Between these two extremes, activities like turning off the gas for cooking, the use of sheets, bedrails, a geriatric chair, etc., were interpreted by some nurses to be a use of restraints.
There was also confusion between the concepts of "restraints" and "safety measures." Many measures like the use of bedrails or a geriatric chair - even without the patient's approval - were considered to be safety measures, not restraints.

During the interviews, we noted that the participating home-care nurses became increasingly aware of the meaning of "restraints" and its use in daily clinical practice.

"The questions stimulate you to think; normally you don't realize it. When the question is asked, you start thinking and then you see the concept a lot larger. I thought that I could not tell a lot because I had not been confronted with restraints, but suddenly I realized I could give many examples." (Interview 2)

Characteristics of restraint use in home care

Types of restraints

Commonly used restraints, like geriatric chairs, belts, bedrails, and other types of restraints were used. Nurses reported limiting patients' freedom of movement by restricting access to stairs, by reorganizing areas in the house, by putting away medication, by turning off the gas, and by locking the front door. They also reported systematically locking the patient in a separate room. These were typical examples of the use of restraints in home care. According to the nurses, medication to control behavior (chemical restraint) was often administered by the family.

Patient characteristics

In home care, restraints were most frequently used for older persons experiencing cognitive decline (e.g., patients with dementia). Often these patients lived alone and had no family nearby or other forms of supervision.

"I have a patient who is demented, according to the family. In my opinion she is slightly demented. After each care I must lock her up, put the key away and leave. The patient sits by the window, watches me, and rattles the door. This is really difficult." (Interview 8)

Reasons for using restraints

In addition to ensuring the safety of a patient at home, "keeping the patient at home as long as possible" was a common reason nurses gave for using restraints in this setting. Often for financial reasons, restraints were used as a tool to avoid admitting the patient to a nursing home.

"Without restraints, it is not possible to keep her at home, and she will have to go to a nursing home. Because of the distance and her husband's bad health, this would make it impossible for him to visit her." (Interview 1)

"Because people have no other choice. I think that when this patient goes to a nursing home, the same will happen. Besides, they will give the patient more medication to calm him than when he lived at home." (Interview 5)

"We have a key to the patient's home. After the care, we lay her in bed with bedrails and lock the front door. This is for her safety. Otherwise, she would need to go to a nursing home, which scared her a lot." (Interview 11)

Another specific reason for using restraints at home was to relieve the informal caregiver. Nurses emphasized that caring for a cognitively impaired older person is exhausting. Restraints allowed patients' family to do other things like shopping and provided some respite, since with restraints they wouldn't have to look constantly after their relatives.

"I often see that restraints are used to protect their informal caregiver/neighbor, to limit their stress. They apply restraints not for the safety of the patient but to relieve relatives and themselves." (Interview 2)

Persons involved in the decision-making process

The family appeared to play an important role in the decision-making process on whether to use restraint, either facilitating or complicating the process. In most cases, family members and nurses worked together to find the best solutions. Sometimes family played a dominant role and made their own decision, thereby putting some nurses in a difficult situation, especially when the demands of the family were in conflict with the patient's well-being. Because nurses were considered to be "visitors" in the home of the patient and their family, they often felt obliged to accept the dominant role of the patient's family.

"Often it is the family who takes the initiative to [use] restraints, when they can no longer deal with the situation. For example, I knew a family who used a sheet as a belt to protect the patient from falling." (Interview 3)

"When the family asks for something, you cannot refuse it. When the children ask to restrain a patient, we typically comply with their request, because this is home care and we depend on the family." (Interview 8)

An unexpected finding that emerged from the interviews was that nurses did not mention the patient's general practitioner, unless they were asked to do so. When specifically asked, the nurses implied that the general practitioner had no role in the decision to use restraints, except when asked to prescribe medication to control the patient's behavior. Nurses reported that they would prefer the general practitioner to play a more active role because of his/her prominent and respected position.

"I see the general practitioner as someone having more influence on the family." (Interview 6)

DISCUSSION

To the best of our knowledge, this is the first study to show from the perspective of home-care nurses that restraint use in home care is definitely an important issue. During the interviews, we noticed that the nurses became increasingly aware of the full meaning of the "restraints" concept and the consequences of restraint use. Discussing restraint use helped us to better understand the concept and its implementation in the home-care setting. The absence of a clear policy on restraint use within our organization, as confirmed by the participating nurses, typically contributed to ignorance or confusion at the beginning of the interview.

In line with our findings, de Veer et al. (2009) also emphasized the importance of a documented policy in home-care organizations that offer educational programs for nurses and other healthcare workers. Such documentation provides guidance for everyone involved on how to ensure safety and use appropriate surveillance. Furthermore, it helps direct solutions when family members have different opinions.

Our findings also underscore the need to initiate careful study on the prevalence of restraint use in home care. Taking into consideration the expressed ambiguity around the concept, a clear operationalization of the concept of restraint use in home care will be required in future studies.
The results of the current study can serve as an important basis for developing a new questionnaire to study the prevalence of restraint use, one adapted to the unique features of the home-care setting.

Results of our study also prompt ethical and legal questions because of the documented absence of continuous follow-up, the dominant role of family, and the specific reasons for using restraints in home care. Our interviewees reported that patients were restrained or locked up and left alone, which is at variance with best practice guidelines and underscores the need for supervision when patients are restrained (Milisen et al., 2006). Medication to control a patient's behavior (i.e., neuroleptic drugs, benzodiazepines, etc.) was often given by the family with no or minimal professional follow-up. This disturbing finding raises questions about the ethical and legal responsibilities of home-care providers, nurses, and general practitioners. The absence of a clear role of the general practitioner in restraint use, as reported by the nurses, should be further explored. In Belgium, like in most European countries, general practitioners are supposed to play a central role in primary home care.

The dominant role of the family in home care may pose major challenges to care providers. For example, at times, relatives insist on the use of restraints or certain types of restraints, which, according to the nurses, do not contribute to "good" care. Providing care that does not promote the overall feeling that the patient is a human being in all dimensions (physical, relational, social, psychological, moral, and spiritual) is considered by nurses to be a morally distressing situation (Austin et al., 2005). Employers of agencies should provide a clear policy or guidance to staff on the use of restraints, focusing on a multi-disciplinary approach to individual care planning that includes risk assessment procedures and appropriate education, among other training and guidance. This will help nurses and other staff to make appropriate decisions about the use of restraints (Royal College of Nursing, 2008).

One of the reasons reported for using restraints was to keep the patient at home as long as possible and to avoid admission to a nursing home. Respite for informal caregivers was another specific reason given for restraining a patient at home. Regardless of the reason, it is important that healthcare workers discuss the patient's values with him or her. It is a challenge to choose and implement the best option that helps the patient feel like a human being.

The decision to use restraints should not be the sole responsibility of the family, but should be discussed by the whole team, including the patient and his or her family. In addition to focusing on the person being or not being restrained, it is essential to support the family in this decision-making process. Our interviews revealed that nurses are confronted with extremely difficult situations in which their opinions differ with those of the family. For example, they might question the motives of the family to use restraints, or they might disagree with the context in which restraints should be used, which types of restraints and materials are used, or how they are applied. Managers of home-care organizations need to be aware that nurses have to make difficult choices between organizational values, family demands, and what they personally consider to be morally right. Not being able to act according to personal ethical values ultimately causes nurses to experience moral distress (de Veer et al., 2013). These situations raise questions about the role, position, and responsibility of home-care organizations. A clear organizational policy serving as a firm basis for decision making is necessary.

This study presents the first qualitative research about restraint use from a home-care nursing perspective. The strengths of this study are the data analysis methods, which were characterized by a strong team approach (intensive analyses carried out by the entire research team), a case-oriented approach, and a forward-backward dynamics using a constant comparative method (Mays and Pope, 2000). Sample heterogeneity (in terms of age and experiences of the nurses, who come from different divisions) contributed to saturation, except for data regarding the role of general practitioners.

This study also has limitations. The first limitation concerns the sampling strategy. We asked the head nurses of nine randomly selected districts to select home-care nurses who met the recruitment criteria. Voluntary participation of the home-care nurses may be questionable, because of perceived differences in professional power held by the in-home nurses and the head nurses. Nevertheless, we asked the nurses twice (during the first call and before starting the interview) whether their participation was voluntary, and emphasized that the interview and data analysis would remain anonymous and would not influence their professional activities. We also emphasized that the researcher had no hierarchical relationship with the management of the organization.

Another limitation of the study is the lack of depth in data collection, which resulted in data saturation after only 14 interviews. Initially, we planned to interview about 20 home-care nurses, depending on the point of saturation. Unfamiliarity with the concept of "restraint" (describing the concept took up a lot of time) and difficulty in discussing such a complex, ethically laden subject could have contributed to the lack of depth in the data.

A third limitation is that our analysis resulted in the identification of several major categories, rather than themes that would normally be expected on the basis of the current analysis process. Although the data did not allow a more in-depth analysis, nevertheless it revealed important information about the use of restraints in home care, in accordance with the purpose of the study.

This study focused only on the experiences of home-care nurses with regard to the use of restraints. However, the nurses' perspectives on restraint use should be supplemented with the viewpoints and experiences of others involved. Further research on restraint use from the perspective of the patients' family and physicians is needed to better understand the prominent role of the family and the expected role of general practitioners. Also, there is lack of information about the experiences of home-care patients themselves. This information is needed in order to develop an evidence-based practice guideline for proper management of restraint use in home care.

CONCLUSIONS

This study provides insights into the use of restraints in home care from nurses' perspective. Our results indicate that restraint use is an important issue and is frequently used in home care. It is possibly even more complex than in long-term residential care settings and acute hospital settings. There is an urgent need for further research to carefully document and understand the use of restraints in home care and the experiences of all persons and organizations involved.

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CHAPTER 3:

RESTRAINT USE IN OLDER ADULTS RECEIVING HOME CARE

This chapter is published and reproduced with the kind permission of the editor: Scheepmans, K., Dierckx de Casterlé, B., Paquay, L., Van Gansbeke, H., & Milisen, K. (2017). Restraint Use in Older Adults Receiving Home Care. *Journal of the American Geriatrics Society, 65(8)*,1769-1776.

ABSTRACT

Objectives: To determine the prevalence, types, frequency, and duration of restraint use in older adults receiving home nursing care and to determine factors involved in the decision-making process for restraint use and application.

Design: Cross-sectional survey of restraint use in older adults receiving home care completed by primary care nurses.

Setting: Homes of older adults receiving care from a home nursing organization in Belgium.

Participants: Randomized sample of older adults receiving home care (N=6,397; mean age 80.6 years; 66.8% female).

Measurements: For each participant, nurses completed an investigator-constructed and -validated questionnaire collecting information about demographic, clinical, and behavioral characteristics and aspects of restraint use. A broad definition of restraint was used that includes a range of restrictive actions.

Results: Restraints were used in 24.7% of the participants, mostly on a daily basis (85%) and often for a long period (54.5%, 24 h/d). The most common reason for restraint use was safety (50.2%). Other reasons were that the individual wanted to remain at home longer, which necessitated the use of restraints (18,2%) and to provide respite for the informal caregiver (8.6%). The latter played an important role in the decision and application process. The physician was less involved in the process. In 64.5% of the cases, there was no evaluation after restraint use was initiated.

Conclusion: Use of restraints is common in older adults receiving home care nursing in Belgium. These results contribute to a better understanding of the complexity of use of restraints in home care, a situation that may be even more complex than in nursing homes and acute hospital settings.

INTRODUCTION

Restraint use in older adults is complex. Evidence from acute and chronic residential settings shows that restraint use has many negative consequences. Patients experience physical (e.g., incontinence, decubitus ulcers, falls), psychological (e.g., depression, anger), and social (e.g., social isolation) consequences (Hofmann and Hahn, 2014; Evans et al., 2003). The use of restraints also affects the family (e.g., idea of finality, denial) and healthcare workers (e.g., inner conflicts and mixed emotions such as frustration, guilt) (Gastmans and Milisen, 2006). Restraints are still frequently used in many countries in hospitals (Raguan et al., 2015; Heinze et al., 2011; Krüger et al., 2013) and nursing homes (Hofmann et al., 2015; Huizing et al., 2007; Feng et al., 2009). In Belgian hospitals, 35% of nurses indicated that fewer than 10% of patients had been restrained during the previous week; 25% that 10% to 19% had been restrained, and 15% that 20% to 69% had been restrained (Lodewijck, 2014). In Belgian nursing homes, physical restraints are used at least once in 47.5% of the residents, with prevalence rates at the unit level varying from 5% to 90% (Heeren et al., 2014).

Research on restraint use in home care is scarce. In two studies on community-dwelling older persons with cognitive impairment, the prevalence of physical restraint use was 9.9% (ranging 3.4% - 19.8% across several countries assessed) (Beerens et al., 2014) and 7% (Hamers et al., 2016). Another study used a self-report survey of home-care nurses and found that almost 80% of these nurses had used physical restraints at least once (de Veer et al., 2009). In Belgium, there are no prevalence studies on restraint use in home care; only one qualitative study is available (Scheepmans et al., 2014). That study not only provided evidence of the use of restraints, but also suggested that the subject of restraint use in home care may be more complex than in nursing homes and hospitals. Their findings revealed that nurses are unclear about the concept of restraint use in home care and that there are many unanswered questions about related ethical and legal responsibilities.

In Belgium, there is no specific legislation regulating the use of (physical) restraints in any setting, but restraining or isolating an individual is considered deprivation of freedom and is forbidden. Belgian law clearly defines who may deprive a person's freedom. A judge can decide about a forced admission to a healthcare facility. In the context of providing healthcare, only nurses and medical doctors may apply restraints.

Because of the global demographic shift toward an aging population, an increasing percentage of frail older people will receive in-home care. Healthcare workers will increasingly be confronted with the possibility of restraint use in home care and will have to assess the associated implications.

Understanding of the use of restraints in home care will enhance support of healthcare workers. When using the term “restraint”, a range of restrictive actions that limit an individual’s freedom is included.

The main objective of this study was to acquire more detailed data on restraint use in home care, which will aid in the development of an evidence-based practice guideline that will inform healthcare professionals on how to avoid or reduce restraint use in home care. More specifically, the goal was to answer the following research questions: What are the prevalence, types, frequency, and duration of restraint use in older adults receiving home care? What factors underlie the decision-making process and application of restraints in home care (e.g., reasons, involved persons, permission, documentation in the record and evaluation of restraint outcomes)?

METHODS

Design

A cross-sectional survey was conducted with home-care nurses caring for individuals aged 60 and older in Wit-Gele Kruis. The nurses assessed restraint use of their patients.

Study Setting and Sample

Study Setting

The Wit-Gele Kruis is a nonprofit organization that provides person-centered nursing care at home in Flanders (Belgium). Professional home care nursing is part of the social security system in Belgium and is financed by the National Institute for Health and Disability Insurance. In Belgium, health insurance is mandatory and guarantees reimbursement for individuals who need home care nursing (Scheepmans et al., 2014). The Wit-Gele Kruis comprises five autonomous provincial organizations and is spread over 102 divisions. Of these, all but one contributed older adult to the study.

Sample

To select the study subjects, each provincial organization created a database of all adults aged 60 years and older receiving home care from the Wit-Gele Kruis during the month of March 2013. No other inclusion or exclusion criteria were specified. Eight thousand subjects (17.5%) were randomly selected from 45,700 older adults in the database using a randomization algorithm.

Questionnaire

Development

A new questionnaire for use by clinical home care nurses was developed based on findings in published literature (de Veer et al., 2009) and insights from a previous qualitative study on restraint use in home care (Scheepmans et al., 2014). That study suggested relevant items to be included, for example, a list of the types of restraints used, the reasons for using restraints in home care, and the persons involved in the decision-making process. The source of the data derives from a combination of information retrieved from electronic health records and the questionnaire that the nurses completed, based on their knowledge of individuals under their care.

Experts iteratively assessed content validity of the questionnaire until consensus was reached. First, the questionnaire was presented to the nursing directors of the five provincial organizations. Based on their recommendations, the questionnaire was adapted by the research team and evaluated again by the nursing directors and two international researchers with expertise in restraint use in the elderly. Finally, clinical nurses of one division assessed the clarity, completeness, and comprehensiveness of the questionnaire, as well as the procedure for data collection and the cover letter with instructions, and adjusted accordingly.

Variables

The questionnaire consisted of items sampling participant demographic and clinical variables and variables concerning use of restraints.

Demographic and Clinical Variables. For the demographic and clinical variables, existing validated scales from the Resident Assessment Instrument (RAI) (e.g., Cognitive Performance Scale for home care) were used in the questionnaire (Morris et al., 1994; Landi et al., 2000; Wellens et al., 2013). Data related to age, sex, and care dependency (based on Belgian Activities of Daily Living Evaluation Scale - Katz Index scores) (Arnaert and Delesie (1999)) were extracted from the participants' records. The degree of an individual's dependence on care is subdivided into four categories (0, A, B, C), and reimbursement is based on his or her indicated category. This ranges from physically independent (0) to physically dependent for all daily activities (C) (Table 1) (Steeman et al., 2006).

Other variables measured were the individual's living situation (alone vs with another), hospitalization in the past 3 months; polypharmacy (taking ≥ 5 different medications), number of falls during the six previous months, and fall risk (estimation of the risk of falling by nurse's clinical judgment) (Milisen et al., 2012). Cognitive function was assessed by the Cognitive Performance Scale for home care (Morris et al., 1994; Landi et al., 2000; Wellens et al., 2013). A score of 2 or more on this scale indicates cognitive impairment (Hartmaier et al., 1995). Behavioral symptoms (Table 1) were measured using a 4-point scale of the RAI (Morris et al., 2010), and divided into three categories: no behavioral problems, one or more behavioral problems less than daily, and one or more behavioral problems daily. Finally, the presence of informal care (yes/no) was evaluated, and the well-being and perceived support of the informal caregiver were assessed using six questions adapted from the RAI (Table 1) (Morris et al., 2010).

Restraint Variables. No consistent definition of restraint use can be found in the available literature. For the present study, therefore, restraint use was defined broadly to include not only devices, but also other restrictive actions, as described below. This definition was based on the results of a qualitative study of restraint use in home care in Belgium (Scheepmans et al., 2014) and on the definition from another study (Retsas, 1998). To ensure that all types of restraints were sampled, any other actions that healthcare workers or informal caregivers performed that restrict the individual's freedom in some way (e.g., adaptation of the house, removal of aids like a walker) were included in the definition (Table 2). In the context of this liberal definition of restraint use, nurses were asked (in the questionnaire) how many times they had observed or used each type of restraint during the past month.

For the assessment, the frequency of restraint use in the past month was categorized as once a month, more than once a month, but not daily, or daily. The duration of restraint use was estimated using six categories ranging from less than 30 minutes a day to 24 hours a day (Table 2).

The various categories of person(s) involved included the initiator (person requesting restraints), the person involved in the decision-making process (those making the final decision), and the person executing the restraints. Examples of the various categories of involved persons are informal caregiver, nurse, nurses' aid, the domestic aid, physician (general practitioner), and the multidisciplinary team. The nine reasons for using restraints were requested by the individual, requested by the informal caregiver; ensuring the safety of the individual; protecting the environment from damage or disruption by the individual; respite for informal caregivers; absence of the informal caregiver; absence of professional help; the individual wanted to remain at home longer, which necessitates the use of restraints; and desire to delay admission to a nursing home. Multiple types of answers were acceptable for the variables "frequency," "reasons," and "persons involved."

Participant permission to use restraints: oral and written permission, oral permission, no permission requested regardless of ability to do so, cognitively or physically unable to give permission. Permission of the family: individual written permission given, oral permission given, no permission requested, and refused to grant permission.

A 4-point Likert item was used to assess the frequency of restraints documented in the medical record (never, sometimes, regularly, always) and to assess restraint outcomes (never, daily, weekly, monthly).

Table 1: Demographic and Clinical Characteristics of Sample (N = 6397)

Characteristic	Value
Age, mean ± (SD) (n = 6375)	80.6 ± 7.8
Female, n (%) (n = 6388)	4268 (66.8)
Care dependence category, n (%) (n = 6368)[a]	
0	3341 (52.5)
A	1669 (26.2)
B	1094 (17.2)
C	264 (4.1)
Living Alone, n (%) (n = 6285)	2917 (46.4)
Informal caregiver, n (%) (n = 5978)[b]	4186 (70.0)
Well-being and perceived support of the informal caregiver, n (%)	
Is able to care for the patient in the future (n = 4062)	3469 (85.4)
Express feeling of sadness, anger, depression (n = 3636)	643 (17.7)
Is upset by disease or condition of the patient (n = 3580)	471 (13.2)
Is dissatisfied with the support of family/friends (n = 3576)	245 (6.9)
Is dissatisfied about the professional support (n = 3557)	106 (3.0)
≥ 5 medication, n (%) (n = 5750)	3190 (55.5)
Participant hospitalized within previous 3 months, n (%) (n = 6057)	1121 (18.5)
Cognitive impairment, n (%) (n = 5867)	1730 (29.5)
Behavioral symptoms, n (%) (n = 6397)	
Wandering	441 (6.9)
Verbal violence	377 (5.9)
Physical violence	144 (2.3)
Socially inappropriate or disruptive behavior	220 (3.4)
Public undressing or inappropriate sexual behavior	66 (1)
Resisting care	477 (7.5)
Behavioral problems, n (%) (n = 5711)	
No	5342 (93.5)
< Daily	179 (3.1)
Daily	190 (3.3)
Falls, n (%)	
Fall within past 6 months (n = 6067)	1841 (30.3)
Estimated risk of falling by nurse (n = 6282)	3670 (58.4)

N differs for each variable depending on how many nurses completed the answer for that variable.

[a] Defined according to Steeman et al. (2006): Category 0, physically independent; Category A, physically dependent on help for bathing, dressing, transferring, and/or using the toilet; Category B, physically dependent on help for bathing, dressing, transferring, using the toilet, maintaining continence, and/or feeding; Category C, physically dependent on help for bathing, dressing, transferring, using the toilet, maintaining continence, and feeding.

[b] Informal care is described as "the mutual, self-evident, unpaid, non-organized help within families and a social network" (Ter Meulen and Wright, 2012).

Data Collection

Each questionnaire was identified using a unique label containing basic patient information (patient number, name, and address) and the name of the primary nurse. This primary nurse completed the questionnaire with input from colleagues during weekly patient discussions. The nurses had 2 weeks to complete the questionnaire. There were no incentives (financial or otherwise) for nurses to participate. Nurses and head nurses received a cover letter containing a description of the study objectives and detailed instructions on how to complete the questionnaire. All questionnaires were scanned using automatic data extraction, and the data were anonymized.

Analysis

The database was assessed for missing data, correct database coding, and extreme values (outliers). Data were analyzed using descriptive statistics using SAS version 9.3 (SAS Institute, Inc., Cary, NC). Categorical data were expressed as number of cases and percentages. Continuous data were expressed as means with standard deviations. Percentages were calculated based on the actual number of answers.

Ethical Approval

The Medical Ethics Committee of the Leuven University Hospitals approved the study and procedures (No. B322201317586). According to Belgium law and the Declaration of Helsinki, no informed consent of the participants or family members was necessary because the study used anonymous data and did not influence the daily care that the participants received.

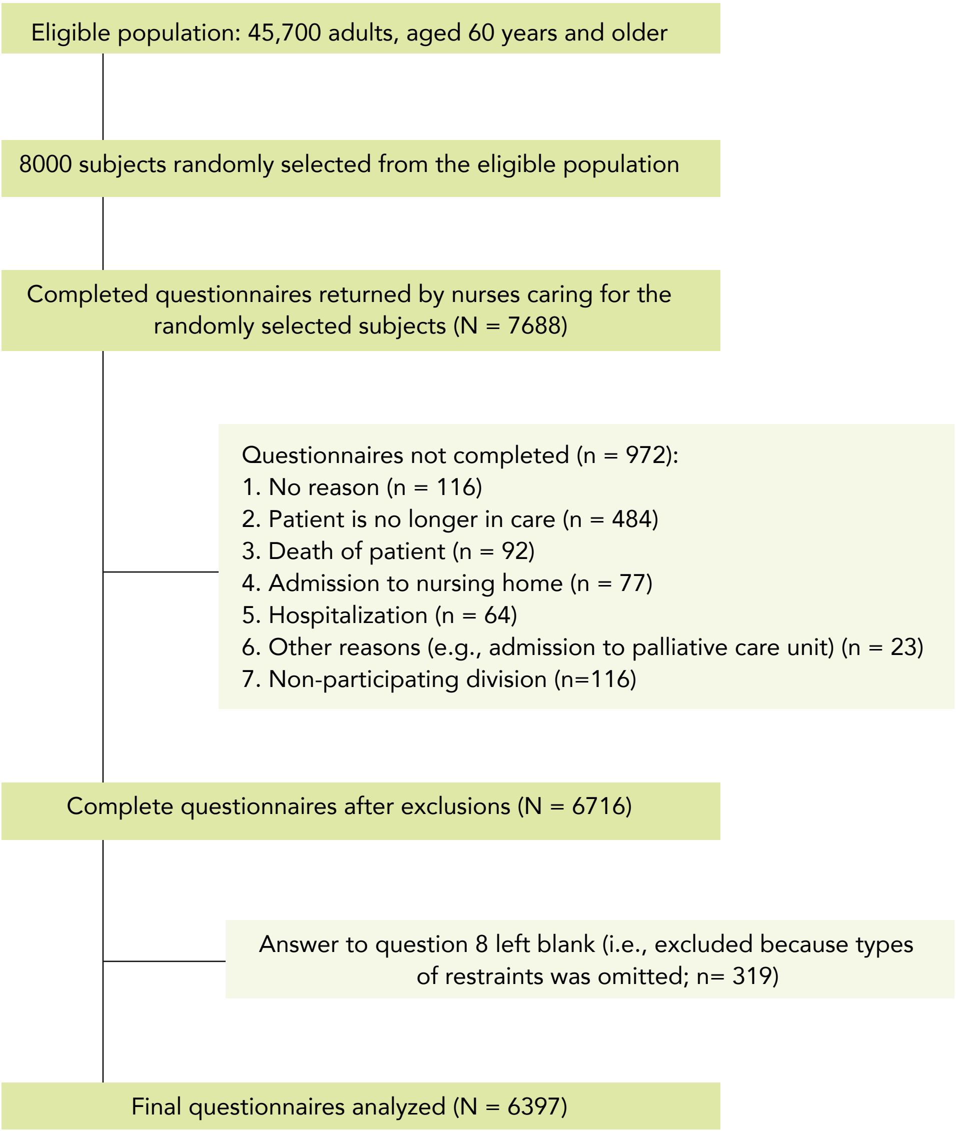
RESULTS

Sample

Of the 8000 questionnaires sent out to nurses, 7688 were returned. Of these, 972 were not completed for various reasons, leaving 6716 questionnaires for analysis (Figure 1). Questions on restraint use start with question 8 of the questionnaire: "Which restraints were used in the past month?" When this question was left blank (n=319), the entire questionnaire was excluded from further analysis because the data were meaningless for study objectives. Thus, of the 8000 questionnaires, 6397 (80%) were available for analysis (Figure 1).

The mean age of these 6397 patients was 80.6 ± 7.8 (Table 1); 66.8% were female, 46.4% lived alone and 47.5% were dependent in some level of care (categories A-C). In 70% of cases, there was an informal caregiver involved. More than half of the patients (55.5%) were taking more than five different medications (polypharmacy), and 18.5% had been hospitalized during the past 3 months. Almost one-third (29.5%) had cognitive impairment, and 6.4% had behavioral problems. One-third had fallen during the past 6 months, and 58.4% had a high fall risk, as estimated by the nurses.

Figure 1: Study flowchart



Prevalence and Types of Restraints

Using a broad definition of restraint, it was determined that restraints were used in 1577 participants (24.7%; 95% confidence interval (CI) = 23.6-25.7%). The most common types of restraints were bed against the wall (39%) and adaptation of the house (25.8%). The least common types of restraints were the nursing blanket (0.2%) and the ankle and wrist ties and the sleeping bag (both 0.7%) (Table 2).

Frequency and Duration of Use

Most restraints were used daily (87.9%). More than half of the patients (54.5%) were restrained for 24 hours per 7 days per week and 27% for more than 7 hours a day (Table 2).

Reasons for Use

The main reasons reported for using restraints were the safety of the participant (50.2%); request of the informal caregiver (31.9%); participant request (18.7%); participant wanted to remain at home longer, which necessitated the use of restraints (18.2%); and to give the informal caregiver respite (8.6%) (Table 2).

Table 2. Types, Reasons, Frequency, and Duration of Restraint Use

Characteristics of restraints	n (%)	95% Confidence Interval
Types of Restraint (n = 1577)		
Bed against wall	615 (39.0)	36.6-41.5
Adaptation of house	406 (25.8)	23.6-28.0
Bedrails	380 (24.1)	22.0-26.3
Tilted chair or geriatric chair	255 (16.2)	14.4-18.1
Brakes on wheelchair	220 (14.0)	12.3-15.8
Locking house	208 (13.2)	11.6-15.0
Electronic supervision	178 (11.3)	9.8-12.9
Removal of aids (e.g., walker)	169 (10.7)	9.2-12.9
Chair against table	150 (9.5)	8.1-11.1
Gloves	110 (7.0)	5.8-8.3
Appropriate clothing	83 (5.3)	4.2-6.5
Over-chair table	75 (4.8)	3.8-5.9
Forced or camouflaged medication administration	73 (4.6)	3.6-5.9
Belts	41 (2.6)	1.9-3.5
Separation in a room without locking the door	40 (2.5)	1.8-3.4
Locking the room	37 (2.4)	1.7-3.2
Restraints during activities of daily living	38 (2.4)	1.7-3.3
Restraint vest	13 (0.8)	0.4-1.4
Sleeping bag	11 (0.7)	0.3-1.2
Ankle and wrist ties	11 (0.7)	0.3-1.2
Nursing blanket [a]	3 (0.2)	0.04 - 0.6
Other	47 (3.0)	2.2-3.9
Reason for restraint (n= 1577)		
Safety of patient	791 (50.2)	47.7-52.7
Request of informal caregiver	503 (31.9)	29.6-34.3
Request of patient	295 (18.7)	16.8-20.7
Patient wanted to remain at home longer, which necessitated use of restraint	287 (18.2)	16.3-20.2
Respite for the informal caregiver	136 (8.6)	7.3-10.1
Protecting environment from damage or disruption by patient	125 (7.9)	6.6-9.4
Desire to delay an admission to nursing home	120 (7.6)	6.3-9.0
Absence of the informal caregiver	105 (6.7)	5.5-8.0
Absence of professional help	34 (2.2)	1.5-3.0
Other	43 (2.7)	2.0-3.7
Frequency of restraint (n= 1285)		
Once a month	77 (6.0)	4.8-7.4
> Once a month but not daily	78 (6.1)	4.8-7.5
Daily	1130 (87.9)	86.0-89.7

Table 2 continued

Characteristics of restraints	n (%)	95% Confidence Interval
Duration of restraint (n= 1157)		
< 30 minutes	123 (10.6)	8.9-12.5
< 30-59 minutes	24 (2.1)	1.3-3.1
1-2 hours	30 (2.6)	1.8-3.7
3-6 hours	38 (3.3)	2.3-4.5
> 7 hours	312 (27.0)	24.4-29.6
24 hours per day	630 (54.5)	51.5-57.3

[a] A nursing blanket is blanket used to tightly cover someone to restrict his or her movements.

Persons Involved with Restraint Use

The informal caregiver (55.3%), nurse (37.2%), and the older adult (24.9%) most frequently asked for use of restraints. In 11.9% of the cases, the physician was the initiator. The informal caregiver (62%), older adult (42.9%), and nurse (39.2%) were most commonly involved in the decision to use restraints. Again, the physician was less frequently involved in the decision (16.2%) (Table 3).

The informal caregivers (60.7%) and the nurses (42.2%) most often executed the restraints. Nursing aids (7.9%) and physicians (4.1%) did so less frequently (Table 3).

Permission

For most of the participants, the families (86.6%) or the participants (67%) themselves gave permission to use restraints (Table 4).

Documentation and Evaluation of Restraint Use

Use of restraints was always (19.4%), regularly (10.3%), or sometimes (20%) documented in the medical record. In 50.3% of the cases, there was no documentation. In 64.5% restraint use was not evaluated (Table 4).

Table 3: Persons Involved with Initiating, Decision-Making, and Execution of Restraints

	Initiator		**Decision-Maker**		**Execution**	
Person	n (%)	95% CI	n (%)	95% CI	n (%)	95% CI
Patient	393 (24.9)	22.8-27.1	677 (42.9)	40.5- 45.4	n/a	n/a
Informal caregiver	872 (55.3)	52.8-57.8	977 (62.0)	59.5-64.4	957 (60.7)	58.2-63.1
Nurse	587 (37.2)	34.8-39.7	618 (39.2)	36.8-41.6	666 (42.2)	39.8-44.7
Nursing aid	45 (2.9)	2.11-3.8	51 (3.2)	2.4-4.2	125 (7.9)	6.6-9.4
Domestic aid	27 (1.7)	1.1-2.5	29 (1.8)	1.2-2.6	65 (4.1)	3.2-5.2
Physician	187 (11.9)	10.3-13.6	255 (16.2)	14.4-18.1	65 (4.1)	3.2-5.2
Multidisciplinary team	88 (5.6)	4.5-6.8	85 (5.4)	4.3-6.6	62 (3.9)	3.0-5.0
Other	32 (2.0)	1.4-2.8	25 (1.6)	1.0-2.3	61 (3.9)	3.0-4.9

CI = Confidence interval

Table 4. Permission, Documentation, and Evaluation of Restraint Use

Restraint use	**n (%)**
Permission	
Patient (n = 1209)	
Oral and written permission	47 (3.9)
Oral permission	763 (63.1)
No permission requested, regardless of ability to do so	134 (11.1)
Cognitively or physically unable to give permission	265 (21.9)
Family (n= 958)	
Written permission	62 (6.5)
Oral permission	767 (80.1)
No permission requested	127 (13.3)
Refusal	2 (0.2)
Documentation (n= 1193)	
Never	600 (50.3)
Sometimes	239 (20.0)
Regular	123 (10.3)
Always	231 (19.4)

Table 4 continued

Restraint use	n (%)
Evaluation of restraint outcome (n= 1179)	
Never	760 (64.5)
Daily	74 (6.3)
Weekly	72 (6.1)
Monthly	273 (23.2)

DISCUSSION

In the present study, one in four older persons receiving home care was being restrained to some degree, mostly on a daily basis and often for a long time. Comparing these results with those reported in the literature is difficult because of differences across studies in the definition of what constitutes restraint (Beerens et al., 2014; Hamers et al., 2016; Bleijlevens, 2014), study population (Beerens et al., 2014; Hamers et al., 2016); and methodology (de Veer et al., 2009). The broad definition of restraints used might partly explain the high prevalence of restraint use observed. At the start of the study, there was a lack of clarity about the definition of restraints in the literature. Based on the results of a qualitative study (Scheepmans et al., 2014), a less-conservative definition of restraints was chosen, one that includes not only physical devices to control behavior but also other restrictive actions intended to limit the free movement of older persons being cared for at home (e.g., adaptation of the house, removal of aids). Finding an appropriate definition for restraints is a challenge for researchers in this field. International consensus was recently reached on a research definition of physical restraint in older persons in clinical care settings (Bleijlevens et al., 2016). The phrase "involuntary treatment," which includes three categories (physical restraints, psychotropic medication, non-consensual care) was subsequently introduced (Hamers et al., 2016). Further research is necessary to determine whether this classification is more suitable for research on restraints in home care.

Another reason for the high prevalence of restraint use in the current study may be related to informal caregivers. Informal caregivers affect prevalence through their role as initiator, their implicit involvement in the decision-making and application processes, and their reasons for applying restraints. Using restraints specifically at the request of the informal caregiver and to give the informal caregiver respite—two reasons also mentioned in the previous study to explain why restraints are used in home care (Scheepmans et al., 2014) —strongly suggest that burden placed on the informal caregiver plays a role in deciding whether restraints should be used. The prominent role of informal caregivers in home care may pose some challenges. Research indicates that informal caregivers have less knowledge about the negative consequences of restraint use than professional home-care workers (Kurata and Ojima, 2014) and a more positive perception of its use (Scheepmans et al., 2014; Haut et al., 2010). Their role could also explain why most informal caregivers of older adults who are not cognitively impaired also give permission to use restraints. Consistent with previous studies, the current study findings demonstrated that physicians play a rather limited role in the decision-making and application processes for restraint use (de Veer et al., 2009; Scheepmans et al., 2014).

Consistent with similar studies performed in other settings (Hofmann and Hahn, 2014; Hamers and Huizing, 2005; Evans and FitzGerald, 2002) safety was the most common reason for using restraints in home care. Given the evidence that restraint use is associated with many negative consequences (Hofmann and Hahn, 2014), it is doubtful to what extent using restraints guarantees the safety of older adults. Other important reasons for restraint use were to help the individual to remain at home longer, which necessitates the use of restraints, and the desire to delay admission to a nursing home. Nurses must be alert to these possibilities and always confirm the desire of the older adults in their care and determine that the decision represents a well-conducted, informed decision-making process that includes identifying other less-restrictive ways of achieving the goal.

In half of the cases, there was no documentation of restraint use in the medical record. Moreover, in more than six of 10 cases, no evaluation of restraint use or its outcome was documented. The important role of informal caregivers could have contributed to these results. Nevertheless, it is ultimately the nurse's responsibility to evaluate the individual's situation and whether the use of restraints is warranted, to look for less-restrictive measures; and to strive to prevent or decrease restraint use. Moreover, all relevant data about this process need to be documented carefully in the medical record. The lack of a clear definition of restraints and of a restraint policy in the home care organization may have prevented nurses from assuming their responsibility in this process (Scheepmans et al., 2014). Moreover, the lack of knowledge and the insufficient awareness of the nurses about restraint use and its negative consequences (Scheepmans et al., 2014) could have influenced the whole process (e.g., prevalence, kind of initiators, involvement in the decision-making process, execution of restraints).

Study strengths are the large randomized sample, the carefully developed and validated questionnaire for data collection, the high response rate, and the broad demographic nature of the older population under study. In contrast to existing studies of restraints in home care, the current study included subjects aged 60 years and older regardless of their cognitive functioning (Beerens et aL, 2014; Hamers et al., 2016; de Veer et al., 2009). This broadens the representativeness of the study in generalizing its findings to the population of older adults receiving professional home care. This study has also limitations. The use of a broad definition of restraints may have influenced the results and should be considered before generalizing them. Because of this less-conservative definition, overall restraint use may have been overestimated. For example, results related to inclusion of bed against the wall as a restraint should be interpreted with caution. Of the 1577 restrained individuals, 615 were restrained this way; 401 one of these (65.2%) were restrained in combination with another type of restraint. As a consequence, and because, in the previous study (Scheepmans et al., 2014) nurses perceived this measure as a type of restraint, it is unlikely that this led to a large overestimation. For example, with a hemiplegic individual, a bed against the wall is often used as a restraint when positioning so he or she will not fall out of bed. Furthermore, several measures (e.g., close follow-up, clear instructions to the (head) nurses) were put in place to minimize over- or underreporting.

Another limitation relates to the newly developed questionnaire. Although it was carefully developed, only its content validity was established. Some of the items were based on validated instruments, whereas others were based on a previous study (Scheepmans et al., 2014) and insights gleaned from the literature (de Veer et al., 2009). Further evaluation of the questionnaire is necessary, and a choice of refusal should be added to the patient decision item.

Twenty percent of the randomized sample was unavailable for data collection (Figure 1), which may have introduced a selection bias, but given the characteristics of the population, most of the reasons for nonparticipation (e.g., death, hospitalization, discharge) were to be expected. Thus, it is likely that there was a low risk of selection bias in the study.

Further research is needed to gain more insight into the experiences of all persons involved in restraints in the home-care setting (e.g., older adults, informal caregivers, nurses, physicians). These insights may contribute to development of guidelines to support all involved, including professionals, with the goal of reducing restraint use.

In conclusion, these results show a relatively high prevalence of restraint use and a range of restraints in home care. Other reasons are given for this practice in the home care than in long-term care. Moreover, restraint use in the home-care setting seems to have produced another effect, for example, on the role of informal caregivers and the way permission is granted. Because restraint use has negative consequences, it should be discouraged. Nevertheless, if a change in use of restraints in home care is to occur, the process could benefit from better education for caregivers, nurses and other healthcare providers; a clear policy; interdisciplinary collaboration that includes formal and informal care; and more support for informal caregivers.

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CHAPTER 4:

FACTORS ASSOCIATED WITH USE OF HOME CARE: A CROSS SECTIONAL STUDY

This chapter is submitted as:
Scheepmans, K., Milisen, K., Vanbrabant, K., Paquay, L., Van Gansbeke, H., Dierckx de Casterlé, B. (2017). Factors associated with use of restraints on older adults with home care: A cross sectional study. *International Journal of Nursing Studies*.

ABSTRACT

Background: The objective of this study is to gain insight into the factors associated with restraint use on older adults receiving home care.

Methods: A cross-sectional survey of restraint use on older adults receiving home care from a nursing organisation in Belgium, was completed by the patients' primary care nurses. A binary logistic regression model with generalised estimating equations was used to evaluate factors associated with restraint use. Eight thousand subjects were randomly selected from a total of 45,700 older adults. Data from 6397 participants were analysed in detail. The mean age of the sample was 80.6 years, 66.8% were women and 46.4% lived alone.

Results: 24.7% of the patients were subject to restraint. Multivariate logistic regression indicated that restraint use was associated with supervision [OR=2.433, 95% CI=1.948-3.038]; dependency in ADL-activities (i.e. eating [OR=2.181, 95% CI=1.212-3.925], difficulties in transfer [OR=2.131, 95% CI=1.191-3.812] and continence [OR=1.436, 95% CI=0.925-2.231]; perceived risk of falling in the nurses' clinical judgement [OR=1.994, 95% CI=1.710-2.324], daily behavioural problems [OR=1.935, 95% CI=1.316-2.846] and less than daily behavioural problems [OR=1.446, 95% CI=1.048-1.995]; decreased well-being of the informal caregiver [OR=1.472, 95% CI=1.126-1.925], the informal caregiver's dissatisfaction with family support [OR=1.339, 95% CI=1.003-1.788]; patient's cognitive impairment [OR=1.398, 95% CI=1.290-1.515]; polypharmacy [OR=1.415, 95% CI=1.219-1.641].

Conclusion: The study results provide insight into new and context specific factors associated with restraint use in home care (e.g. supervision, informal caregiver's decreased well-being and dissatisfaction with family support). These insights could support the development of interventions to reduce restraint use in home care.

INTRODUCTION

Recent research indicates that restraint use is common in home care (Beerens et al., 2014; de Veer et al., 2009; Hamers et al., 2016; Kurata & Ojima, 2014; Scheepmans et al., 2014, 2017). The prevalence of restraint use varies from 7% (Hamers et al., 2016) and 9.9% (Beerens et al., 2014) to 24.7% (Scheepmans et al., 2017). In Japan 40.5% of providers of home care have observed use of physical restraint in older patients' homes (Kurata and Ojima, 2014) and 80% of nursing staff members have physically restrained a person at some time (de Veer et al., 2009). Various types of restraint (e.g. bedrails, deep/overturned chair, belts, locked (front)door) (de Veer et al., 2009; Kurata and Ojima, 2014; Scheepmans et al., 2017) are used and the family seems to play an important role in restraining patients (de Veer et al., 2009; Hamers et al., 2016; Kurata and Ojima, 2014; Scheepmans et al., 2014; 2017). A growing number of older people living at home are frail, which is associated with increased risk of restraint use (e.g. due to increased dependence, cognitive impairment and poor mobility). Health-care professionals are confronted with increased demand for restraint use in home care. The frequent negative consequences of restraints (e.g. incontinence, decubitus ulcers, depression, social isolation) (Hofmann and Hahn, 2014) make the prevention of restraint use an important target in home care.

Research on long-term residential care has revealed that cognitive decline, poor mobility and dependence in activities of daily living are the characteristics most commonly associated with use of physical restraint (Heeren et al., 2014; Hofmann and Hahn, 2014; Meyer et al., 2009). Other important characteristics are challenging behaviour (i.e. wandering, aggression, verbal and physical agitation), falls and the perceived risk of falling, age, gender, and continence (Hamers et al., 2004; Hamers and Huizing, 2005; Heinze et al., 2011; Hoffman and Hahn, 2014; Meyer et al., 2009). In hospitals similar characteristics are associated with restraint use, as well as other patient factors (e.g. polypharmacy, confinement to bed) (Heinze et al., 2011; Krüger et al., 2013; Raguan et al., 2015). There are also a number of nonpatient-related factors (e.g. characteristics of job or types of nursing home wards; staffing levels; routine behaviour; legislation, use of medical devices) that may affect use of physical restraint (Heeren et al., 2014; Huizing et al., 2007; Meyer et al., 2009; Möhler and Meyer, 2014).

Research on the factors associated with use of restraint in home care is scarce. To our knowledge, there has been only one study (Hamers et al., 2016) of factors associated with involuntary treatment, including the use of physical restraints, psychotropic medication and non-consensual care. This study identified some factors that were specific to the home care setting (e.g. living alone, perceived caregiver burden) (Hamers et al., 2016). The evidence about the prevalence of restraint use in home care and the specificity of this setting highlight the need for more research to improve understanding of the factors associated with use of restraint in home care, as a first step towards to reduce restraint use in home care. The aim of this study was, therefore, to gain insight into the factors associated with restraints of older adults receiving home care.

METHODS

To determine the factors associated with use of restraints in home care we analysed data from a cross-sectional survey that has been described elsewhere (Scheepmans et al., 2017). We summarise the survey methodology below.

Design

A cross-sectional survey was conducted in June 2013. Home-care nurses completed a questionnaire and assessed the use of restraint on patients aged 60 years or older who were under their care. The Medical Ethics Committee of the Leuven University Hospitals approved the study (No. B322201317586).

Study Setting and Sample

The study was carried out in collaboration with Wit-Gele Kruis, a non-profit organisation for home nursing in Belgium. One hundred and one out of 102 divisions participated in the study. A random sample of 8000 older adults was selected from the database of all adults aged 60 years and older who were receiving home nursing care from Wit-Gele Kruis during March 2013 (N = 45700).

Variables

A questionnaire was developed based on insights from a previous qualitative study of restraint use in home care (Scheepmans et al., 2014) and findings in additional literature (de Veer et al., 2009). The questionnaire included previously validated scales. During development of the questionnaire its content validity was assessed iteratively by experts until consensus was reached (Scheepmans et al., 2017). Nurses were asked to record any occasions during the past month on which they had observed use of restraints or had used restraint themselves.

Primary outcome

Restraint use (absent; present) was the primary outcome in this study. Based on the results of a qualitative study of restraint use in home care (Scheepmans et al., 2014) and Retsas's (1998) definition we defined restraint use as any actions performed by healthcare workers and/or relatives that restricted the patient's freedom to some extent (e.g. adaptation of the house, removal of aids such as a walker, forced or camouflaged administration of medication).

Associated factors

From the literature, we identified patient and nonpatient-related factors associated with use of restraints. Patient-related factors include age, gender, dependency in activities of daily living (Arnaert and Delesie, 1999), living situation (living alone versus living with others), a fall in the past six months, perceived risk of falling (Milisen et al., 2012) and cognitive decline (according to a nurse's clinical judgement), cognitive functioning, hospitalisation in the past three months, polypharmacy (i.e. taking five or more different medicines) and the presence of behavioural problems. Nonpatient-related factors are the presence of supervision (e.g. by a professional or informal caregiver, electronic supervision, others), the presence of an informal caregiver and the informal caregiver's well-being and perceived support.

Cognitive function was assessed with the Cognitive Performance Scale (CPS) for home care from the Resident Assessment Instrument (RAI) (Landi et al., 2000; Hartmaier et al., 1995; Morris et al., 1994; Wellens et al; 2013). This scale covers five domains: short-term memory, procedural memory, skills for daily decision-making, making self-understood and eating dependency. Cognitive status scores range from 0 (intact) to 6 (very severe impairment). Behavioural problems were measured on the basis of 6 behavioural symptoms (wandering, verbal violence, physical violence, socially inappropriate or disruptive behaviour, public undressing or inappropriate sexual behaviour and resisting care) using a four-point scale taken from the RAI (Morris et al., 2010). Scores were used to assign patients to three groups: "no behavioural problems"; "less than daily behavioural problems"; "daily behavioural problems". The informal caregiver's well-being and perceived support were assessed using six items adapted from the RAI (covering informal caregiver's ability to care for the patient in the future, feelings of sadness, anger or depression, the extent to which the informal caregiver is upset by the patient's disease or condition and his or her dissatisfaction with family support and professional support (Morris et al., 2010). The Belgian Activities of Daily Living (ADL) Evaluation Scale – KATZ index was used to assess the patients' dependence in six activities (i.e. bathing, dressing, transfer, toilet, continence, eating) using a four-point ordinal scale ranging from 1 (no assistance) to 4 (total dependence) (Arnaert and Delesie, 1999).

Procedure

The data were derived from a combination of information retrieved from electronic patient records (i.e. age, gender, and the six-item ADL) and nurses' knowledge of patients under their care. The primary nurse completed the questionnaires with input from colleagues during weekly patient discussions. Nurses were given two weeks to complete the questionnaires and were not offered any incentives (financial or otherwise) to do so. The nurses and head nurses received a covering letter containing detailed instructions on how to complete the questionnaires together with a description of the study objectives. An automatic data extraction procedure was applied to questionnaires and the data were anonymised.

Analysis

The database was assessed for missing data, correct database coding and outliers. All analyses were performed using SAS software (SAS version 9.4). Categorical data were expressed as numbers of cases and percentages. Continuous data were expressed as means with standard deviations. Percentages were calculated based on the actual number of answers.

A binary logistic regression model with generalised estimating equations (GEE) was used to evaluate associations with restraint. Use of GEE was necessary to account for the unknown correlations between the data of patients within a single nursing division. An unstructured covariance matrix was used, and the variance components were estimated using a sandwich estimator.

Use of restraints was treated as an outcome in univariable and multivariable GEE models. In the univariable case, all predictors were individually regressed on restraint use. Indicators of well-being and the informal caregiver's perceived support were included as predictors in a univariable GEE that was tested on a subset of patients where an informal caregiver was present. In the multivariable case, all factors potentially associated with use of restraint were included in the model as independent variables. No interactions were considered. Inspect of the variance inflation factor (VIF) suggested that the potential predictors were not affected by multicollinearity.

Because the majority of the independent variables had missing values, only 4472 out of 6397 patients (about two thirds of the sample) would have been included if the analysis had been restricted to complete cases. Excluding these cases would have resulted in biased estimates if the missing variables were not random (Rubin, 1976), so we performed multivariate imputation using the fully conditional specification (FCS) approach (Van Buuren, 2007). This involves specifying, for all variables with any missing values, a regression model using all the other potential predictors and outcome variables as covariates. We used linear regression, binary logistic or nominal logistic regression model, depending on the variable.

The process is iterative (one iteration consists of one cycle through all variables) and continues until convergence to the multivariate distribution is obtained. Ten complete datasets were created. The multivariate analyses were performed on each of the ten imputed datasets. In a pooling phase, the estimates for the ten datasets were integrated into one estimate for each effect using Rubin's rule (Rubin, 1987). The multivariate model for restraint use was also calculated without age and gender as covariates; these estimates did not differ from the model including age and gender as a covariates and so we report only the latter. All reported confidence intervals (CI) are 95% CI.

RESULTS

Sample

Of the 8000 questionnaires, 6716 were completed and 6397 patient subjects were analysed. Details about the response rate are reported elsewhere (Scheepmans et al., 2017). The mean age of the patients was 80.6 years (SD= 7.8). Most (66.8%) were female and 46.4% lived alone. One third of the patients (33.3%) were perceived to be at risk of cognitive decline and 60% were perceived to be at risk of falling. One third of the subjects (30.3%) had a fall-related incident in the previous six months. More than 50% were taking five or more different medicines (55.5%). More than 40% were completely dependent on help for bathing (42.4%) or dressing (40.1%). In addition 6.4% of the older adults showed behavioural problems.

In 70% of cases, there was an informal caregiver (70.0%); 17.7% of informal caregivers expressed feelings of sadness, anger or depression and 13.2% were upset by the patient's disease or condition. The majority of the patients (76.3%) were supervised (Table 1).

One out of four patients was subject to restraints (24.7%; n= 1577; CI= 95% 0.2360-0.2573). More details of the characteristics of restrained and non-restrained patients are presented in Table 1.

Associated Factors

The univariate analyses showed that most investigated factors were significantly associated with restraint use. Only sex, the informal caregiver's ability to care for the patient in the future and the informal caregiver's dissatisfaction with professional support, had no statistically significant association with restraint use. Living alone was significantly associated with lower odds for restraint use (Table 2).

Table 1: Characteristics of the overall sample and restrained and unrestrained groups

Variable	Sample	Not subject to restraint	Subject to restraint
	n (%)	n/N (%) 4820/6397 (75.3)	n/N (%) 1577/6397 (24.7)
Sex			
Female	4268 (66.8)	3186/4814 (66.2)	1082/1574 (68.7)
Age		4804	1571
Mean (SD)	80.6 (7.8)	80.4 (7.8)	81.2 (7.8)
Supervision			
Yes	4599 (76.3)	3198/4517 (70.8)	1401/1512 (92.7)
Informal caregiver			
Yes	4186 (70.0)	2960/4512 (65.6)	1226/1466 (83.6)
Estimated cognitive impairment			
Yes	2095 (33.3)	1221/4741 (25.8)	874/1551 (56.4)
Cognition: CPS		4424	1443
Mean	1.1	0.8	2.2
Previous Hospitalisation			
Yes	1121 (18.5)	782/4551 (17.2)	339/1506 (22.5)
Polypharmacy			
Yes	3190 (55.5)	2190/4311 (50.8)	1000/1439 (69.5)
Behavioural problems			
No behavioural problems	5342 (93.5)	4161/4308 (96.6)	1181/1403 (84.2)
Behavioural problems less than once a day	179 (3.1)	81/4308 (1.9)	98/1403 (7.0)
Daily behavioural problems	190 (3.3)	66/4308 (1.5)	124/1403 (8.8)
ADL – KATZ*			
Bathing			
Score 1	1138 (17.9)	984/4800 (20.5)	154/1568 (9.8)
Score 2	631 (9.9)	523/4800 (10.9)	108/1568 (7.0)
Score 3	1902 (29.9)	1502/4800 (31.3)	400/1568 (25.5)
Score 4	2697(42.4)	1791/4800 (37.3)	906/1568 (57.8)
Dressing			
Score 1	1339 (21.0)	1160/4800 (24.2)	179/1568 (11.4)
Score 2	828 (13.0)	670/4800 (14.0)	158/1568 (10.1)
Score 3	1647 (25.9)	1289/4800 (26.9)	358/1568 (22.8)
Score 4	2554 (40.1)	1681/4800 (35.0)	873/1568 (55.7)

Table 1 continued

Variable	**Sample**	**Not subject to restraint**	**Subject to restraint**
	n (%)	**n/N (%)** **4820/6397 (75.3)**	**n/N (%)** **1577/6397 (24.7)**
Transfer			
Score 1	2093 (32.9)	1774/4800 (37.0)	319/1568 (20.3)
Score 2	2202 (34.6)	1719/4800 (35.8)	483/1568 (30.8)
Score 3	1669 (26.2)	1137/4800 (23.7)	532/1568 (33.9)
Score 4	404 (6.3)	170/4800 (3.5)	234/1568 (14.9)
Toilet			
Score 1	2536 (39.8)	2126/4800 (44.3)	410/1568 (26.2)
Score 2	1208 (19.0)	944/4800 (19.7)	264/1568 (16.8)
Score 3	2177 (34.2)	1526/4800 (31.8)	651/1568 (41.5)
Score 4	447 (7.0)	204/4800 (4.3)	243/1568 (15.5)
Continence			
Score 1	2235 (35.1)	1861/4800 (38.8)	374/1568 (23.9)
Score 2	2301 (36.1)	1778/4800 (37.0)	523/1568 (33.4)
Score 3	1486 (23.3)	1015/4800 (21.2)	471/1568 (30.0)
Score 4	346 (5.4)	146/4800 (3.0)	200/1568 (12.8)
Eating			
Score 1	2936 (46.1)	2443/4800 (50.9)	493/1568 (31.4)
Score 2	2799 (44.0)	2025/4800 (42.2)	774/1568 (49.4)
Score 3	505 (7.9)	296/4800 (6.2)	209/1568 (13.3)
Score 4	128 (2.0)	36/4800 (0.8)	92/1568 (5.9)
Fall within last 6 months?			
Yes	1841 (30.3)	1209/4564 (26.5)	632/1503 (42.1)
Nurses' estimate of risk of falling			
At risk	3670 (58.4)	2436/4736 (51.4)	1234/1546 (79.8)
Living situation			
With other(s)	3368 (53.6)	2430/4735 (51.3)	938/1550 (60.5)
Alone	2917 (46.4)	2305/4735 (48.7)	612/1550 (39.5)
Informal caregiver			
Able to care for the patient in the future?			
Yes	3469 (85.4)	2480/2885 (86.0)	989/1177 (84.0)

Table 1 continued

Variable	**Sample**	**Not subject to restraint**	**Subject to restraint**
	n (%)	**n/N (%)** **4820/6397 (75.3)**	**n/N (%)** **1577/6397 (24.7)**
Expresses feeling of sadness, anger, depression?			
Yes	643 (17.7)	341/2566 (13.3)	302/1070 (28.2)
Upset by patient's disease or condition?			
Yes	471 (13.2)	243/2523 (9.6)	228/1057 (21.6)
Dissatisfied with support from family/friends?			
Yes	245 (6.9)	120/2526 (4.8)	125/1050 (11.9)
Dissatisfied with professional support?			
Yes	106 (3.0)	63/2515 (2.5)	43/1042 (4.1)

*All items of the Belgian Activities of Daily Living [ADL] Evaluation Scale - Katz Index are scored using a four-point scale: 1=no assistance; 2=with assistive device or minimal assistance; 3=with assistance; 4=totally dependent.

Table 2: Univariate Analyses and Multivariate Model

			Univariate analyses		**Multivariate model after multiple imputation**	
	N obs		**Odds Ratio (95% CI)**	**P-value**	**Odds Ratio (95% CI)**	**P-value**
Sex	6388			.		.
		Female	1.116 (0.988;1.260)	0.0776	0.873 (0.742;1.026)	0.0995
		Men	#	.	#	.
Age	6375		1.013 (1.004;1.022)	0.0039	1.003 (0.993;1.012)	0.5947
Supervision	6029			.		.
		Yes	5.067 (4.140;6.200)	<.0001	2.433 (1.948;3.038)	<.0001
		No	#	.	#	.
Informal Caregiver	5978			.		.
		Yes	2.609 (2.229;3.054)	<.0001	1.080 (0.834;1.399)	0.5595
		No	#	.	#	.
Estimated cognitive impairment	6292			.		.
		Yes	3.653 (3.239;4.122)	<.0001	0.919 (0.715;1.182)	0.5116
		No	#	.	#	.
Cognition: CPS	5867		1.627 (1.560;1.697)	<.0001	1.398 (1.290;1.515)	<.0001

Table 2 continued

			Univariate analyses		Multivariate model after multiple imputation	
	N obs		Odds Ratio (95% CI)	P-value	Odds Ratio (95% CI)	P-value
Previous hospitalisation	6057			.		.
		Yes	1.403 (1.211;1.627)	<.0001	1.151 (0.959;1.381)	0.1300
		No	#	.	#	.
Polypharmacy	5750			.		.
		Yes	2.198 (1.915;2.523)	<.0001	1.415 (1.219;1.641)	<.0001
		No	#	.	#	.
Behavioural problems	5711			<.0001		0.0004
		Daily, behavioural problems	6.531 (4.424;9.642)	<.0001	1.935 (1.316;2.846)	0.0009
		Behavioural problems less than once a day	4.169 (3.098;5.610)	<.0001	1.446 (1.048;1.995)	0.0248
		No behavioural problems	#	.	#	.
ADL – KATZ*						
Bathing	6368			<.0001		0.6615
		Score 2	1.349 (1.012;1.799)	0.0412	0.770 (0.495;1.198)	0.2465
		Score 3	1.679 (1.298;2.171)	<.0001	0.867 (0.528;1.423)	0.5720
		Score 4	3.227 (2.396;4.346)	<.0001	0.837 (0.478;1.466)	0.5337
		Score 1	#	.	#	.
Dressing	6368			<.0001		0.1194
		Score 2	1.525 (1.202;1.935)	0.0005	1.567 (1.068;2.299)	0.0216
		Score 3	1.779 (1.396;2.268)	<.0001	1.527 (0.967;2.412)	0.0694
		Score 4	3.356 (2.484;4.534)	<.0001	1.822 (1.038;3.198)	0.0367
		Score 1	#	.	#	.
Transfer	6368			<.0001		0.0202
		Score 2	1.566 (1.269;1.931)	<.0001	1.101 (0.849;1.427)	0.4678
		Score 3	2.587 (1.977;3.384)	<.0001	1.404 (1.029;1.915)	0.0323
		Score 4	7.519 (4.901;11.536)	<.0001	2.131 (1.191;3.812)	0.0108
		Score 1	#	.	#	.
Toilet	6368			<.0001		0.2784
		Score 2	1.435 (1.178;1.749)	0.0003	0.855 (0.694;1.053)	0.1403
		Score 3	2.215 (1.757;2.792)	<.0001	0.966 (0.760;1.226)	0.7738
		Score 4	6.088 (4.074;9.098)	<.0001	0.785 (0.460;1.340)	0.3754
		Score 1	#	.	#	.

Table 2 continued

			Univariate analyses		Multivariate model after multiple imputation	
	N obs		Odds Ratio (95% CI)	P-value	Odds Ratio (95% CI)	P-value
Continence	6368			<.0001		0.0149
		Score 2	1.449 (1.209;1.737)	<.0001	0.849 (0.687;1.050)	0.1304
		Score 3	2.254 (1.731;2.936)	<.0001	0.806 (0.613;1.061)	0.1237
		Score 4	6.642 (4.334;10.179)	<.0001	1.436 (0.925;2.231)	0.1070
		Score 1	#	.	#	.
Eating	6368			<.0001		0.0183
		Score 2	1.869 (1.519;2.299)	<.0001	1.041 (0.854;1.269)	0.6917
		Score 3	3.477 (2.514;4.809)	<.0001	0.982 (0.702;1.372)	0.9139
		Score 4	12.357 (7.191;21.233)	<.0001	2.181 (1.212;3.925)	0.0093
		Score 1	#	.	#	.
Fall within last 6 months?	6067			.		.
		Yes	1.984 (1.747;2.253)	<.0001	1.079 (0.905;1.285)	0.3977
		No	#	.	#	.
Estimated risk of falling	6282			.		.
		At risks	3.648 (3.210;4.146)	<.0001	1.994 (1.710;2.324)	<.0001
		Not at risk	#	.	#	.
Living situation	6285			.		.
		Alone	0.695 (0.621;0.779)	<.0001	1.097 (0.941;1.278)	0.2388
		With other(s)	#	.	#	.
Informal caregiver:						
Able to care for the patient in the future?	4062			.		.
		Yes	0.895 (0.689;1.162)	0.4033	1.021 (0.806;1.293)	0.8636
		No	#	.	#	.
Expresses feeling of sadness, anger, depression?	3636			.		.
		Yes	2.842 (2.300;3.511)	<.0001	1.472 (1.126;1.925)	0.0050
		No	#	.	#	.
Upset by patient's disease or condition?	3580			.		.
		Yes	3.096 (2.488;3.853)	<.0001	0.962 (0.724;1.278)	0.7873
		No	#	.	#	.

Table 2 continued

			Univariate analyses		Multivariate model after multiple imputation	
	N obs		Odds Ratio (95% CI)	P-value	Odds Ratio (95% CI)	P-value
Dissatisfied with the support of family/friends?	3576			.		.
		Yes	3.083 (2.337;4.066)	<.0001	1.339 (1.003;1.788)	0.0474
		No	#	.	#	.
Dissatisfied with professional support?	3557			.		.
		Yes	1.589 (0.969;2.606)	0.0667	1.179 (0.724;1.920)	0.5091
		No	#	.	#	.

Results from univariate logistic regression models based on generalised estimating equations (GEE) using a compound symmetric working correlation matrix.
\# reference category

*All items of the Belgian Activities of Daily Living [ADL] Evaluation Scale - Katz Index are scored using a four-point scale: 1=no assistance; 2=with assistive device or minimal assistance; 3=with assistance; 4=totally dependent.

Results from a multivariate generalised estimation equations analysis based on multiple imputations (10 datasets) with use of restraint as a dependent variable.
\# reference category

The multivariate regression indicated that use of restraints was positively associated with supervision (OR= 2.433, 95% CI= 1.948 – 3.038), ADL-activities eating (OR= 2.181, 95% CI= 1.212 – 3.925), transfer (OR= 2.131, 95% CI= 1.191 – 3.812) and continence (OR= 1.436, 95% CI= 0.925 – 2.231); perceived risk of falling in the nurses' clinical judgement (OR= 1.994, 95% CI= 1.710 – 2.324), daily behavioural problems (OR= 1.446, 95% CI= 1.048 – 1.995) and less than daily behavioural problems (OR= 1.446, 95% CI= 1.04 – 1.995); informal caregiver's well-being and more specifically his or her feelings of sadness, anger, depression (OR= 1.472, 95% CI= 1.126 – 1.925) and the informal caregiver's dissatisfaction with family support (OR= 1.339, 95% CI= 1.003 – 1.788), cognitive impairment (as measured by CPS) (OR= 1.398, 95% CI= 1.290 – 1.515) and polypharmacy (OR= 1.415, 95% CI= 1.219 – 1.641) (Table 2).

DISCUSSION

The results indicate that both patient and nonpatient-related factors are associated with use of restraint in home care. Many of these factors (dependence in ADL (Heeren et al., 2014; Hofmann and Hahn, 2014; Meyer et al., 2009; Hamers et al., 2004; Heinze et al., 2011; Raguan et al., 2015), cognitive impairment (Hamers et al., 2016; Huizing et al., 2007; Meyer et al., 2009), behavioural problems (Hofmann and Hahn, 2014), poor mobility and fall history/risk of falling (Hamers et al., 2004; Heeren et al., 2014; Huizing et al., 2007), age (Heinze et al., 2011; Krüger et al., 2013), gender (Raguan et al., 2015) and polypharmacy (Heinze et al., 2011)) are also associated with use of restraints in hospitals and nursing homes. In contrast with some studies in residential care settings (Huizing et al., 2007; Krüger et al., 2013; Raguan et al., 2015) the multivariate model indicated that gender and age were not associated with use of restraints during home care.

The nonpatient-related factors that were positively associated with restraint use in home care were supervision, the informal caregiver's well-being and more specifically his or her feelings of sadness, anger, depression and his or her dissatisfaction with support from family or friends. The association between supervision and restraint might be due to the characteristics of patients in home care (e.g. patients with ADL-dependency, poor mobility and cognitive impairment), this would emphasise the patients' vulnerability and highlight the important role of informal caregivers in restraint use, which is confirmed in literature (Scheepmans et al., 2017). The association between restraint use and the informal caregiver's well-being suggests that the burden placed on informal caregivers may contribute to their use of restraints. Our results are in line with those of Hamers et al. (2016) and confirm the assumption that informal caregiver burden is associated with use of restraints in home-based care. They raise concerns because of the increased frailty of the older adults receiving home care.

In accordance with research in residential care settings, cognitive impairment (Hamers et al., 2016; Huizing et al., 2007; Meyer et al., 2009) was also positively associated with use of restraints in home care. It is notable that in the multivariate model use of restraints was associated with the objective measure of patients' cognitive functioning, but not with nurses' clinical judgement of patients' cognitive decline. A potential untested explanation of this finding is that the short visits that are typical in home care may not be sufficient for nurses to collect enough information to assess cognitive function accurately.

Also in accordance with studies in residential care settings (Hamers et al., 2004; Heeren et al., 2014; Huizing et al., 2007; Möhler et al., 2014), nurses' perceptions of risk of falling was positively associated with use of restraints in home care. The finding that perception of the risk of falling has more impact on restraint than a previous fall is worrisome, given that restraint use is not a good way of preventing falls (Gastmans and Milisen, 2006).

Both our study and that of Hamers et al. (2016) point that living alone was associated with restraint use during home care. Unlike Hamers et al. (2016), we found that this association disappeared when the multivariate model corrected for the effect of other variables; nevertheless our previous qualitative study (Scheepmans et al., 2014) indicated that subjecting frail older people who are living alone to restraint use creates dangerous situations. When restraints are used in the absence of any form of supervision it is more likely to result in damage to the physical, social and mental well-being of the older adult.

The strengths of the study were the large randomised sample, the carefully developed questionnaire, high response rate and the demographically varied nature of the older adult sample (Scheepmans et al., 2017). Our study also has several limitations. One is the limited number of non-patient-related factors included in the questionnaire. It might be worth investigating the relationship between contextual factors (e.g. nurse staffing levels, skill mix and education) and the prevalence of restraint use. Another limitation is that the study only indicates which variables are associated with restraint use; no conclusions can be drawn about possible explanations or causality. The data were based on nurses' observations and although they were given clear instructions, their observations may have been biased.

In conclusion, the study indicates that use of restraints in home care is associated with both patient-related and nonpatient-related factors, a finding which warrants further research. It also showed that the patient-related factors associated with restraint use (e.g. cognitive decline, ADL dependency, poor mobility) are characteristic of frail, older adults living at home. Supervision and the well-being of the informal caregiver and the dissatisfaction with family support were non-patient factors associated with restraint use. These factors are specific to the home care setting. This led us to conclude that knowledge about use of restraint in the residential care context cannot be directly translated to the home care context. The results of the study provide insight into the factors associated with use of restraint in home care and could support the development of interventions to reduce it.

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CHAPTER 5:

RESTRAINT USE IN OLDER ADULTS IN HOME CARE: A SYSTEMATIC REVIEW

This chapter is published and reproduced with the kind permission of the editor:
Scheepmans, K., Dierckx de Casterlé, B., Paquay, L., Milisen, K. (2017). Restraint use in older adults in home care: a systematic review. *International Journal of Nursing Studies, 23*;79:122-136. doi: 10.1016/j.ijnurstu.2017.11.008

ABSTRACT

Objectives: To get insight into restraint use in older adults receiving home care and, more specifically, into the definition, prevalence and types of restraint, as well as the reasons for restraint use and the people involved in the decision-making process.

Design: Systematic review.

Data sources: Four databases (i.e. Pubmed, CINAHL, Embase, Cochrane Library) were systematically searched from inception to end of April 2017.

Review methods: The study encompassed qualitative and quantitative research on restraint use in older adults receiving home care that reported definitions of restraint, prevalence of use, types of restraint, reasons for use or the people involved. We considered publications written in English, French, Dutch and German. One reviewer performed the search and made the initial selection based on titles and abstracts. The final selection was made by two reviewers working independently; they also assessed study quality. We used an integrated design to synthesise the findings.

Results: Eight studies were reviewed (one qualitative, seven quantitative) ranging in quality from moderate to high. The review indicated there was no single, clear definition of restraint. The prevalence of restraint use ranged from 5% to 24.7%, with various types of restraint being used. Families played an important role in the decision-making process and application of restraints; general practitioners were less involved. Specific reasons, other than safety for using restraints in home care were noted (e.g. delay to nursing home admission; to provide respite for an informal caregiver).

Conclusions: Contrary to the current socio demographical evolutions resulting in an increasing demand of restraint use in home care, research on this subject is still scarce and recent. The limited evidence however points to the challenging complexity and specificity of home care regarding restraint use. Given these serious challenges for clinical practice, more research about restraint use in home care is urgently needed.

INTRODUCTION

Restraint use is a well-known and common problem in acute and chronic residential settings and has a significant impact on patients, their families and healthcare providers (Scheepmans et al., 2017). Until recently there was no internationally accepted research definition of restraint (Bleijlevens et al., 2016). The negative consequences of restraint for the patient are physical (e.g., decubitus ulcers, incontinence), psychological (e.g. anger, depression) and social (e.g. social isolation). Restraint use affects the family (e.g. anger, worry) and healthcare providers (e.g. emotions such as guilt) (Evans et al., 2003, Hamers and Huizing, 2005, Hofmann and Hahn, 2014, Newbern and Lindsey, 1994, Saarnio and Isola, 2009 and 2010, Gastmans and Milisen, 2006). Whilst there is a considerable body of research on restraint use in residential settings, research on restraint use in home care is scarce.

Research on restraint in residential settings indicates that resident characteristics are important determinants of restraint use. Impaired cognition, impaired mobility, increased dependency, challenging behaviour, a history of falls and a high perceived fall risk are all strongly positively associated with restraint use (Hofmann and Hahn, 2014). In addition, non-patient-related factors such as staff characteristics (e.g. nursing skill mix, staffing level), job characteristics (e.g. job autonomy) and legislation are also associated with restraint use (Heeren et al., 2014; Huizing et al., 2007). As the number of dependent older people with cognitive problems living at home increases (Hoeck et al., 2012) home healthcare workers will increasing find themselves confronted with decisions about restraint use (Hellwig, 2000; Scheepmans et al., 2014).

Most insights into restraint use have been derived from research in acute and chronic residential settings (Möhler et al., 2011; Hamers and Huizing, 2005) and cannot simply be translated to the specific context of home care. The family has a different role and more influence over care in the home than in institutional settings (Scheepmans et al., 2017). The family is often present, plays a crucial role (e.g. supporting a patient to stay at home), may disagree with professional caregivers about what is best for the patient and may take the lead in many decisions (Scheepmans et al., 2014). Healthcare professionals providing home care enter in the patient's personal environment and territory, see their patients only during short visits and often work alone. Home care is organised differently from care in residential settings (e.g. the organization of and working with interdisciplinary team) and it is difficult to ensure the 24-h cover and increased supervision required when restraint is used. All these reasons may influence the extent to which restraint is used in home care, the decision-making process, the reasons for using restraints and the methods chosen.

In order to prepare for future changes in home care it is important to gain insight into restraint use in this setting. The aim of this review is to answer the following research questions:

- How is restraint defined in research about restraint use in older adults receiving home care?
- How prevalent is use of restraint on older adults receiving home care and what methods are used?
- What are the reasons given for restraining older adults receiving home care and who is involved in the decision-making process?

METHOD

The method used for this systematic review has been registered in PROSPERO (CRD42016036745) and the review was conducted according to the PRISMA guidelines for reporting systematic reviews and meta-analyses (Shamseer et al., 2015).

Search strategy

Four databases (Pubmed, CINAHL, Embase, Cochrane Library) were systematically searched from inception (1976) to end of April 2017. The search string was created by combining Medical Subject Headings (Mesh terms) (e.g. 'Restraint, Physical', 'Home Care Services', 'Aged') and "free" search terms (e.g. restraints, home care, elderly) using Boolean operators (AND, OR). The search string was reviewed by an expert librarian and adapted for each database (see Figure 1). The reference lists of the included articles were screened to identify additional potentially relevant references. Whenever more information was needed or an article was not available, (co)authors were contacted.

Figure 1: Search strategy used for MEDLINE (OVID) and adapted for Cinahl, Embase and Cochrane Library

Search Query

((((((((((("oldest old") OR "older persons") OR "older person") OR "older people") OR "Frail Elderly"[Mesh]) OR "frail elderly") OR ("Aged, 80 and over"[Mesh])) OR (("aged, 80 and over"))) OR "Aged"[Mesh]) OR "aged")) AND ((((((((((((((((((((((("home care services") OR "home care service") OR "Home Care Services, Hospital-Based"[Mesh]) OR "Home Care Services, Hospital-Based") OR "Home Care Agencies") OR "Home Care Agency") OR "Home Care Agencies"[Mesh]) OR "Home Nursing"[Mesh]) OR "Home Nursing") OR "Home care") OR "Home Care Services"[Mesh]) OR "domiciliary care") OR "Primary Health Care"[Mesh]) OR "primary health care") OR "Primary Care Nursing"[Mesh]) OR "Primary Care Nursing") OR "community care") OR "Community Health Services") OR "Community Health Services"[Mesh]) OR "nurses, community health") OR "Nurses, Community Health"[Mesh]) OR "home health services")) AND (((("Restraint, Physical"[Mesh]) OR "physical restraint") OR "physical restraints") OR "restraint")

Inclusion and exclusion criteria

Studies were considered for this review if they met the following criteria: (1) empirical research on restraint use (any design), (2) subjects included older adults receiving home care, (3) reported a definition of restraint and data on prevalence, types of restraint used, reasons for use or people involved and (4) written in English, French, Dutch or German. Studies about restraint use in daycare centres and service flats, studies restricted to use of chemical restraint, systematic reviews, meta-analyses, non-peer reviewed research, letters and editorials were excluded.

Study selection

The search strategy was developed jointly by all authors (KS, BDdC, LP, KM). The first author (KS) performed the search, removed duplicate publications and made the first selection of articles based on the titles and abstracts of all studies retrieved during the database search. Two authors (KS, LP) reviewed the full texts of the selected articles independently to decide whether they should be included. Where they disagreed, the whole team reviewed and discussed the article in order to reach a consensus.

Data extraction

The research team decided which data would be extracted: general information (authors; year), study characteristics (e.g. aim; study design; methods; characteristics of the setting and participants; data analysis) and the main variables of interest (definition of restraint; prevalence; types of restraint; people involved; reasons for use). Data were extracted by KS and verified by LP. The final data extraction was discussed with KM.

Quality assessment

Two authors (KS, LP) assessed the methodological quality of all studies independently. Disagreements between the reviewers were resolved through discussion amongst the research team (BDdC, KM).

The decision to include original empirical research of any design resulted in a mixed studies review and so the Mixed Methods Appraisal Tool (MMAT) was used (Pluye et al., 2009). This tool can be used to describe the methodological quality of qualitative, quantitative and mixed method studies. The quantitative studies were classified as randomised controlled studies, non-randomised studies and descriptive studies. The questions used to assess methodological quality were adjusted according to the type of study, although two questions were common to all types (Were there clear research questions? Do the data collected allow one to address the research question?). The answer options for all items were 'yes', 'no', 'unclear' and 'not applicable'. The studies were organised into three categories based on methodological quality (Vlaeyen et al., 2017): low (yes < 3), moderate (yes: 3-5) or high quality (yes = 6).

Data synthesis

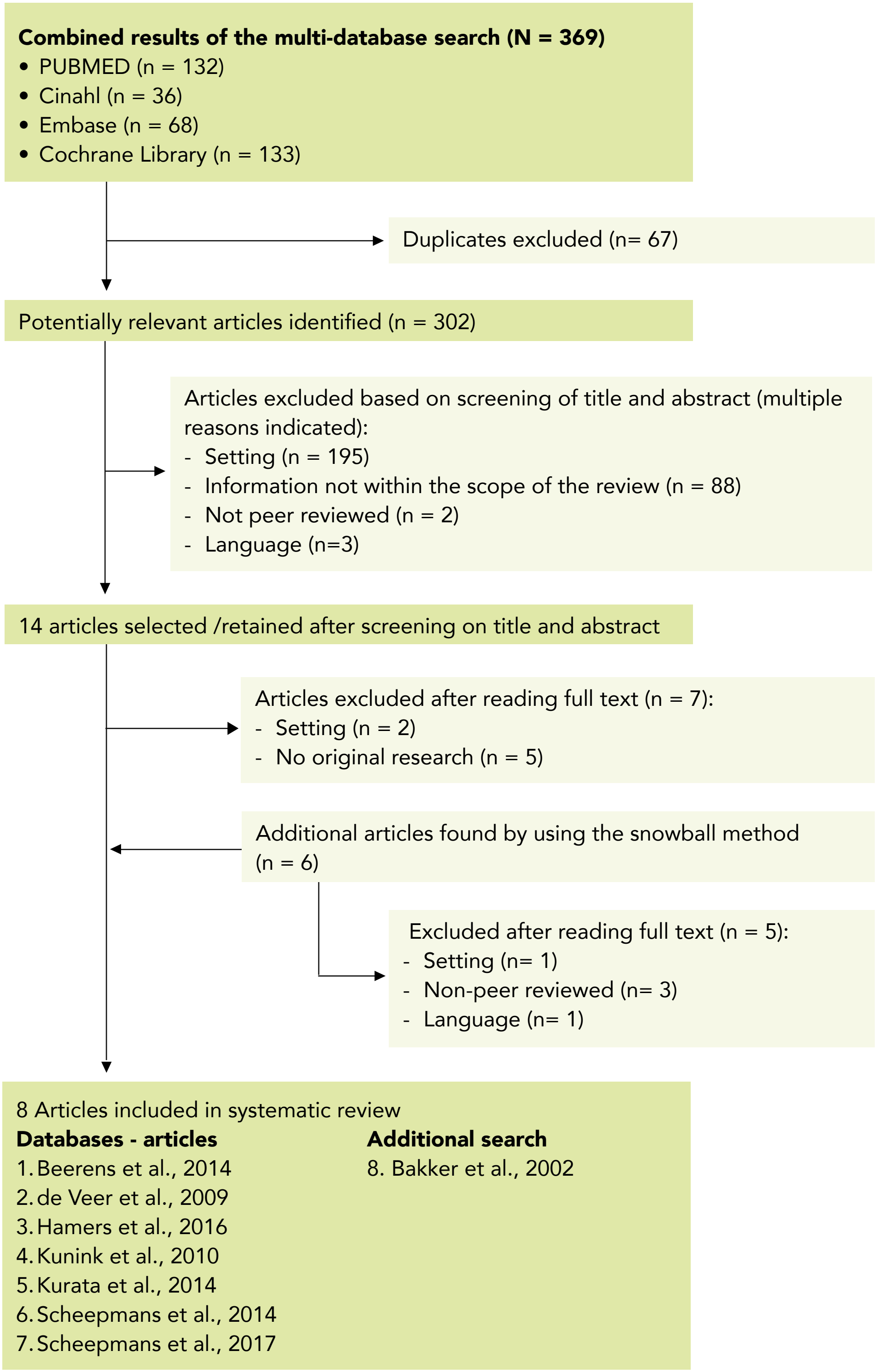
The results of individual studies were summarised in narratives and tables (Tables 1 and 2). Due to the small samples of manuscripts for the different variables of interest meta-analysis was not feasible. Because the quantitative and qualitative findings addressed the same research questions we used an integrated approach to synthesise the findings (Polit and Beck, 2017). The selection included only one qualitative study (Scheepmans et al., 2014).

RESULTS

Search strategy

The electronic search retrieved a total of 369 articles from the databases included. After removal of the duplicates, the titles and abstracts of 302 articles were screened to determine relevance. In total 288 studies were excluded because they did not meet the inclusion criteria: no homecare setting (n = 195); information not within the scope of the review study (n = 88); published in non-peer reviewed journal (n = 2); language (n = 3). After reading the full text of the 14 retained articles we concluded that 7 articles met the predefined inclusion criteria (Beerens et al., 2014; de Veer et al., 2009; Hamers et al., 2016; Kunik et al., 2010; Kurata and Ojima, 2014; Scheepmans et al., 2014; Scheepmans et al., 2017). Six additional articles were found through the snowball method, of which only one (Bakker et al., 2002) met the inclusion criteria (Figure 2). The authors of two of the included articles (Beerens et al., 2014; Kunik et al., 2010) were contacted to ask for additional information about the definition of restraint used and for more specific data on prevalence.

Figure 2: Flow diagram of the selected studies



Study characteristics

The selected articles, published between 2002 and 2017, report studies conducted in the Netherlands (n= 3) (de Veer et al., 2009; Hamers et al., 2016; Bakker et al., 2002), Belgium (n= 2) (Scheepmans et al., 2014, 2017), Japan (n= 1) (Kurata and Ojima, 2014), USA (n=1) (Kunik et al., 2010); one was a European multi-country study covering eight countries (UK; Estonia; Finland; France; Germany; the Netherlands; Spain; Sweden) (Beerens et al., 2014) (Table 1).

All the selected studies were quantitative in design, except the qualitative study of Scheepmans et al. (2014). Six of the quantitative studies were cross-sectional and one had a prospective design (24 months) (Kunik et al., 2010).

Six studies dealt only with the home care setting (de Veer et al., 2009; Hamers et al., 2016; Scheepmans et al., 2014, 2017; Kurata and Ojima, 2014; Kunik et al., 2010). Two studies reported on home care and institutional care (Beerens et al., 2016; Bakker et al., 2002). Bakker et al. (2002) distinguished between standard home care and home psychiatric care.
In five studies all the respondents were professional care providers: home nurses (de Veer et al., 2009; Scheepmans et al., 2014, 2017), dementia case managers (mostly registered district nurses) (Hamers et al., 2016) and professionals directly involved in patient care (Bakker et al., 2002). The respondents of the other three studies were dyads consisting of the patient and an informal caregiver (Beerens et al., 2016; Kunik et al., 2010) or an informal caregiver and a professional provider of home care (i.e. home helper, visiting nurse, visiting physician, care manager) (Kurata, 2014).

The patients involved in the studies were older people receiving home care (de Veer et al., 2009; Scheepmans et al., 2017; Kurata and Ojima,

2014) and people with cognitive impairments (Hamers et al., 2016; Beerens et al., 2016; Kunik et al., 2010). The patients in the study by Kunik et al. (2010) were veterans.

In six studies the primary goal was to gain insight into restraint use (de Veer et al., 2009; Bakker et al., 2002; Kurata and Ojima, 2014; Scheepmans et al., 2014, 2017; Hamers et al., 2016). Hamers et al. (2016) also explored the factors associated with involuntary treatment (including use of physical restraint). Physical restraint use was a secondary outcome in two studies (Beerens et al., 2016; Kunik et al., 2010), the former was part of a larger study (Verbeek et al., 2012) exploring quality of life and quality of care indicators, including physical restraint use, in people with dementia whereas the latter examined aggression as a predictor of number of outcomes, including restraint use.

Table 1: Study Characteristics of the Included Articles

Author / Year	**Study Design**	**Study Methods**	**Setting and participants**	**Data analysis**
de Veer et al., 2009	- Quantitative - Self-report survey	- Postal survey - Structured questionnaire - Forced-choice items	Home care, the Netherlands <u>Characteristics:</u> - Home care nursing staff of elders living at home - 157 respondents (70 Certified nursing assistants, 87 Registered nurses): response rate: 71.7% - Average age: 45.7 years	- Descriptive analysis - Because there were no differences between two groups, only the combined results are presented
Kurata & Ojima, 2014	- Quantitative - Cross-sectional study	- 3 self-administered questionnaires o Knowledge of 11 physical restraint procedures prohibited by long-term care insurance facilities and 10 harmful effects of physical restraints o Perceptions of 17 reasons for using physical restraint o Experiences involving physical restraint use	Family caregivers and professional carers providing for frail older people living at home in Japan <u>Characteristics:</u> - Family caregivers: n = 494, response rate unknown - 1062 home care providers (n = 568) o 449 home helpers (n = 201, 44.8%) o 123 visiting nurses (n = 78, 63.4%) o 294 visiting physicians (n = 131, 44.6%) - 196 care managers (n = 158, 80.6%)	- Descriptive and comparative analyses
Hamers et al., 2016	- Quantitative - Cross-sectional survey	- Developed questionnaire to assess involuntary treatment, based on a adapted version of a tool designed to assess physical restraint use in institutional settings - 2 subscales from the RAI-MDS: ADL Hierarchy and the cognitive performance scale - Self-Perceived pressure from Informal Care Scale - 30 dementia case managers completed questionnaires for every person in their caseload (at home + professional care)	Professional home care, the Netherlands <u>Characteristics:</u> - Dementia case managers recorded data - Persons with cognitive impairment receiving professional home care (n = 827) - Women: 60% - Mean age: 81.6 years	- Descriptive analysis - Comparative analysis (persons who did and did not receive involuntary treatment) - Multivariate logistic regression model: backward stepwise procedure

Table 1 continued

Author / Year	Study Design	Study Methods	Setting and participants	Data analysis
Beerens et al., 2014	- Quantitative - Cross-sectional survey - Part of the Right-TimePlace-Care study	- Face to face interviews - Quality of Life (QoL) - Quality of Care (QoC): o Subjective judgement of informal caregiver o Evaluation of 8 QoC indicators	Long-term institutional care and home care in 8 European countries (England, Estonia, Finland, France, Germany, the Netherlands, Spain and Sweden)* <u>Characteristics:</u> - Persons with dementia receiving formal home care but at risk for admission to an institutional long term nursing care within 6 months; their informal caregivers (n = 1123) - Mean age: 82.2 years - Women: 63%	Descriptive and multivariate regression techniques and cross-country comparisons
Scheep-mans et al., 2014	- Qualitative - Exploratory study	- In-depth interviews - Interview guide: open-ended questions, semi-structured - Strategies used to optimize methodological quality (e.g. audit trail, peer-debriefing, triangulation)	Home nursing care, Belgium <u>Characteristics:</u> - 14 home care nurses (13 women) - Mean age: 39 years (range: 23-57 years) - Average duration of professional experience as home care nurse: 11.4 years (range: 11 months - 24 years)	- According to the Qualitative Analysis Guide of Leuven (Quagol, Dierckx de Casterlé et al., 2012) - Within research team - Using software program Nvivo 7.0
Scheep-mans et al., 2017	- Quantitative - Cross-sectional survey	- Investigator-constructed and validated questionnaire - Primary nurse completed questionnaires with input from colleagues during weekly discussions	Home nursing care, Belgium <u>Characteristics:</u> - 6397 questionnaires on older adults receiving home care - Mean age: 80.6 years - Women: 66.8%	- Descriptive analysis
Kunik et al., 2010	- Quantitative - Prospective study	- Home visits at baseline and every 4 months - Telephone interviews/ assessments - Questionnaire: Cohen-Mansfield Agitation Inventory	People newly diagnosed with dementia and living in the community (veterans elders), USA <u>Characteristics:</u> - 215 newly diagnosed dementia patients and no aggression/caregivers dyads - Mean age: 76 years - Sex: 95% men	- Descriptive and comparative analyses
Bakker et al., 2002	- Quantitative - Cross-sectional survey	- Developed questionnaire - Randomized response technique	Health care settings and institutions who do not fall under the BOPZ law (special admissions into psychiatric hospitals), the Netherlands* <u>Characteristics:</u>* - Home care: 36% (n = 244) - Psychiatric home care: 59% (n = 105)	- Descriptive analysis (frequency and means)

* only information about home care is given in the table

Study quality

The methodological quality of the selected studies ranged from moderate (n = 3) to high (n = 5) (see Table 2). All studies had clear research questions that were addressed by the data collected.

Table 2: Methodological quality

Types of mixed-methods study components or primary studies	**Methodological quality criteria**	Bakker et al., 2002	Beerens et al., 2014	de Veer et al., 2009	Hamers et al., 2016	Kunik et al., 2010	Kurata et al., 2014	Scheepmans et al., 2014	Scheepmans et al., 2017
Screening questions	Are there clear qualitative and quantitative research questions (or objectives), or a clear mixed-methods question (or objective)?	YES	YES	YES	YES	YES	YES	YES	YES
	Do the collected data allow address the research question (objective) e.g., consider whether the follow-up period is long enough for the outcome to occur (for longitudinal studies or study components)?	YES	YES	YES	YES	YES	YES	YES	YES
1. Qualitative	1.1 Are the sources of qualitative data (archives, documents, informants, observations) relevant to address the research question (objective)?	NA	NA	NA	NA	NA	NA	YES	NA
	1.2 Is the process for analyzing qualitative data relevant to address the research question (objective)?	NA	NA	NA	NA	NA	NA	YES	NA
	1.3 Is appropriate consideration given to how findings relate to the context, e.g., the setting, in which the data were collected?	NA	NA	NA	NA	NA	NA	YES	NA
	1.4 Is appropriate consideration given to how findings relate to researchers' influence, e.g., through their interactions with participants?	NA	NA	NA	NA	NA	NA	YES	NA
2. Quantitative (non- randomized)	2.1 Are participants (organizations) recruited in a way that minimizes selection bias?	NA	YES	NA	NA	NA	YES	NA	NA
	2.2 Are measurements appropriate (clear origin, or validity known, or standard instrument; and absence of contamination between groups when appropriate) regarding the exposure/intervention and outcomes?	NA	YES	NA	NA	NA	YES	NA	NA
	2.3 In the groups being compared (exposed vs. non-exposed; with intervention vs without; cases vs. controls), are the participants comparable, or do researchers take into account (control for) the difference between these groups	NA	NO	NA	NA	NA	YES	NA	NA
	2.4 Are there complete outcome data (80% or above), and when applicable, an acceptable response rate (60% or above), or an acceptable follow-up rate for cohort studies (depending on the duration of follow-up)?	NA	NO	NA	NA	NA	NO	NA	NA

Table 2 continued

Types of mixed-methods study components or primary studies	Methodological quality criteria	Bakker et al., 2002	Beerens et al., 2014	de Veer et al., 2009	Hamers et al., 2016	Kunik et al., 2010	Kurata et al., 2014	Scheepmans et al., 2014	Scheepmans et al., 2017
3. Quantitative (descriptive)	3.1 Is the sampling strategy relevant to address the quantitative research question (quantitative aspect of the mixed-methods question)?	YES	NA	YES	YES	YES	NA	NA	YES
	3.2 Is the sample representative of the population understudy?	YES	NA	YES	YES	YES	NA	NA	YES
	3.3 Are measurements appropriate (clear origin, or validity known, or standard instrument)?	NO	NA	YES	YES	YES	NA	NA	YES
	3.4. Is there an acceptable response rate (60% or above)?	NO	NA	YES	YES	YES	NA	NA	YES
Total		4/6	4/6	6/6	6/6	6/6	5/6	6/6	6/6

NA: not applicable

RESULTS

Definition

Two concepts (i.e. physical restraint and restraint) were used in the selected articles. Only three articles gave a clear definition of either term (de Veer et al., 2009; Scheepmans et al., 2014, 2017). de Veer et al. (2009, p 1882) described physical restraint as "measures used by nursing staff to keep a patient away from a (potentially) dangerous situation". Scheepmans et al. (2014, 2017) described restraint as "any devices and all actions that healthcare workers or informal caregivers performed that restricted the individual's freedom in some way." The qualitative study indicated that nurses had difficulty in giving a clear definition of restraint and that awareness of the meaning of 'restraints' increased during the interviews (Scheepmans et al., 2014).

Five studies did not define restraint formally. Four of them operationalised the concept by using examples (see Table 3); the number of examples given ranged from 4 (Beerens et al., 2016) to 10 (Bakker et al., 2002; Hamers et al., 2016) or 11 (Kurata and Ojima, 2014). Bakker et al. (2002) based their examples partly on Dutch legislation and consultations with inspectors of various health sectors. The examples used by Beerens et al. (2016) were drawn from the literature and those used by Kurata and Ojima (2014) were based on government policy documents (Table 3). One study used two questions to operationalise the concept of physical restraint (Has the physical or verbal aggression of [patient's name] necessitated the use of a physical restraining mechanism? and In the past month have you used the following to decrease the chance of injury: Vest restraint? Bedrails? Tie restraint? Geriatric chair with lap bar? Other physical restraint?) (Kunik et al., 2010, p 42).

Hamers et al. (2016) included use of physical restraint in their definition of involuntary treatment: "a treatment that professional and family caregivers provide without the consent of the person receiving the treatment" (Hamers et al., 2016, p.354). The authors assessed use of involuntary treatment with an adaptation of a tool originally designed for use in residential settings (Hamers et al., 2016); they tested their adaptation to ensure that it was clear and appropriate for use in home care settings.

Table 3: Table of evidence

Author / Year	Aim	Sampling	Definition	Prevalence of restraint use; Type(s) of restraint	People involved; Reasons for use	Study Quality*

de Veer et al., 2009	To gain more knowledge about the **physical restraint** of elderly people living at home (how often, why, application, existing guidelines)	157 nursing staff in home care (registered nurses and certified nursing assistants) from a randomly selected and nationally representative panel	*"Measures used by nursing staff to keep a patient away from a (potentially) dangerous situation"*	Prevalence: NA
				Types:
				- Devices (belts, special sheets, wrist straps): 1.9%
				- Isolation (putting someone in a special room): NA
				- Bed rails: 71.8%
				- Preventing clients from leaving their chairs: 18.1%
				- Locking room or home: 37.7%
				- Seclusion (putting someone in a separate room without locking the door): NA
					People involved:
					- Decision:
					  - Family / informal carer
					  - Nursing staff member
					  - Less involvement of general practitioner
					  - Other: client
					- Permission generally granted by:
					  - Both client and family member
					  - Client
					Reasons:
					- Protection of client
					- Requested by the client or his / her representative
						6/6

Hamers et al., 2016	To explore the prevalence of involuntary treatment of people with cognitive impairment receiving home care and the associated factors in order to gain knowledge about the rationale and people involved	Convenience sample (827 persons with cognitive impairment)	Physical restraint was part of the primary outcome, 'involuntary treatment', which was not formally defined, but operationalised via examples (see next column)	Prevalence: Physical restraints: 7% Types: - Waist belt in (wheel)chair: <1% - Waist belt in bed: 0% - Wrist or ankle ties: 0% - Chair with fixed tray table: 2% - Deep, over-turned or reclined chair: 4% - Chair on a board: 0% - Locked (wheel)chair: 0% - Bilateral full-enclosure bedrails: 2% - Special sheet: 0% - Sleep suit: < 1%	Persons involved: Request by family caregivers Reasons: No information	6/6

Table 3 continued

Author / Year	Aim	Sampling	Definition	Prevalence of restraint use; Type(s) of restraint	People involved; Reasons for use	Study Quality*
Kurata & Ojima, 2014	To assess family caregivers' and home care providers' knowledge and perceptions of use of **physical restraint** in order to determine whether the potential for abusive use of physical restraint by family caregivers should be investigated in detail.	- Multistage sampling: - 494 family caregivers of frail elders living at home with family - 201 home helpers - 78 visiting nurses - 158 care managers - Convenience sample: -131 visiting -physicians	Operationalisation based on a list of 11 physical restraint procedures prohibited in long-term care insurance facilities (see next column).	Prevalence: / Types: 11 prohibited physical restraint procedures: range from family caregivers to case managers - Tying a person to a wheelchair/ bed to prevent wandering: 50.2% - 98.7% - Tying a person to a bed to prevent falls: 44.5% - 93% - Using side rails to keep a person in bed: 31.3% - 73.4% - Restraining limbs to prevent a person from pulling out IV/feeding tubes: 29.8% - 66.9% - Applying mittens to prevent a person from pulling out IV/feeding tubes or tearing skin: 19% - 43.9% - Restraining a person with belts or tray tables to prevent sliding or rising from a (wheel)chair: 24% - 64.6% - Using a chair to prevent someone standing up: 40.7% - 82.9% - Using overalls over clothing to impede removal of clothes/ incontinence pads: 24.5% - 66.2% - Tying someone to a bed to prevent him/her from causing trouble for others: 44.8% - 89.9% - Giving an overdose of psychotropic drugs to reduce excitement: 37.6% - 75.9% - Locking someone in a room: 45.4% - 86.1%	People involved: - Home care providers: Advice on restraint or use of restraint (n = 82; 16.7%): - home helper 11.2% - visiting nurse 32.1% - visiting physician 10.1% - care manager 21.3% - Family caregivers: 20.1% wavered over using physical restraints Reasons: - Perception of 17 reasons for requiring physical restraints - Protecting an older person from falling out of bed (1), out of a chair (2) or due to unsafe ambulation (3) - Preventing an older person from wandering (4), taking things from others (5), getting into dangerous places or getting access to supplies (6) - Keeping a confused older person from bothering others (7) - Preventing an older person from pulling out a catheter (8), a feeding tube (9) or an intravenous tube (10), or tearing sutures (11) - Preventing an older person from removing a dressing (12) - Providing quiet time or rest for an overactive older person (13) - To ensure safety for an older person with impaired judgement (14) - Insufficient staff to observe patients (15) - Protecting staff or other patients from physical abuse/combative behaviour (16) - Management of agitation (17)	5/6

Table 3 continued

Author / Year	**Aim**	**Sampling**	**Definition**	**Prevalence of restraint use; Type(s) of restraint**	**People involved; Reasons for use**	**Study Quality***
Scheepmans et al., 2014	To gain insight into home nurses' perspective on use of restraint in home care	Purposive sample (14 home care nurses)	The definition of physical restraint (*"using any device, material or equipment attached to or near a person's body and which cannot be controlled or easily removed by the person and which deliberately prevents or is deliberately intended to prevent a person's free body movement to a position of choice and/or a person's normal access to their body"*) was extended to include other forms of restraint and any action by another person that restricts someone's freedom in some way.	<u>Prevalence:</u> / <u>Types:</u> bedrails, belts, locking the door to the house or to a particular room, geriatric chairs, locking away medication, restricting access to stairs, reorganising areas in the house, turning off the gas	<u>Involved people:</u> Family plays an important role in decision-making process, with nurses taking a secondary role; general practitioners are less involved <u>Reasons:</u> - To ensure the patient's safety at home - To keep the patient at home as long as possible - To avoid the need for admission to a nursing home - To relieve informal caregiver	6/6
Scheepmans et al., 2017	To gain more detailed knowledge of restraint use in home care (data on prevalence, types, frequency, duration, decision-making process)	Randomised sample (6397 patients, 60 years or older)	Restraint use: "*devices + all actions that healthcare workers or informal caregivers performed that restricted the individual's freedom in some way*"	<u>Prevalence:</u> 24.7% <u>Types:</u> - Bed against the wall: 39% - Adaptation of house: 25.8% - Bedrails: 24.1% - Titled chair or geriatric chair: 16.2% - Brakes on wheelchair: 14% - Locking house: 13.2% - Electronic supervision: 11.3% - Removal of aids: 10.7% - Chair against table: 9.5% - Gloves: 7% - Appropriate clothing: 5.3% - Over-chair table: 4.8% - Forced or camouflaged administration of medication: 4.6% - Belts: 2.6% - Seclusion in an unlocked room: 2.5% - Locking the room: 2.4% - Restraints during activities of daily living: 2.4% - Restraint vest: 0.8% - Sleeping bag: 0.7% - Ankle and wrist ties: 0.7% - Nursing blanket: 0.2% - Other: 3%	<u>People involved:</u> - Request + decision: informal caregiver, nurse and older person - Execution: informal caregivers and nurses <u>Reasons:</u> safety of patient (1), requested by informal caregiver (2) or patient (3), patient wanted to remain at home longer, which necessitated use of restraints (4), to provide respite for informal caregiver (5), to protect environment from damage or disruption by patient (6), desire to delay an admission to nursing home (7), absence of informal caregiver (8), absence of professional help (9)	6/6

Table 3 continued

Author / Year	Aim	Sampling	Definition	Prevalence of restraint use; Type(s) of restraint	People involved; Reasons for use	Study Quality*
Beerens et al., 2014	Exploring the quality of life and quality of care indicators of people with dementia who are at a 'breaking-point' when home care may become insufficient / inadequate and admission to residential nursing care might be needed (8 countries)	Purposive sample (1223 persons with dementia and their caregivers)	No definition Physical restraint used as an indicator of quality of care	Prevalence: 9.9% (3.4% - 19.8%) Types: - Belts: NA - Locked chair/table: NA - Deep/overturned chair: NA - Bedrails: NA	Persons involved: no information Reasons: No information	4/6

Bakker et al., 2002	To classify the extent and conditions of restraint use in healthcare settings and institutions that do not fall under the BOPZ law (special admission into psychiatric hospitals)	Convenience sample (home care (n= 244), psychiatric home care (n=105)	Operationalisation of restraints based on examples:
			forced administration of medication, food or fluid; separation; isolation; fixation; restriction of freedom of movement, bedrails, belts, camouflaged administration of medication; ignoring requests for help/action.
				Prevalence: NA
				Types: standard / psychiatric home care
				- Bedrails: 53% / 2%
				- Belt: 16% / 4%
				- Forced medication: 29% / 18%
				- Forced food intake: 13% / 6%
				- Forced fluid intake: 16% / 4%
				- Camouflaged administration of medication: 47% / 12%
				- Removing the bell: 5% / 0%
				- Deliberately ignoring request: 10% / 10%
				- Fixation: 23% / 2%
				- Seclusion (open space): 0% / 2%
				- Seclusion (closed space): 3% / 2%
				- Restriction of freedom of movement: 23% / 10%
					People involved:
					- Initiative and decision:
					  - Home care: family, nurse, nursing aid, general practitioner
					  - Home psychiatric care: family, nurse, nursing aid
					- Applying:
					  - Home care: family and nurse, general practitioner and nursing aid
					  - Home psychiatric care: nurse, family and nursing aid
					Reasons:
					- Protection of the client
						4/6

Table 3 continued

Author / Year	**Aim**	**Sampling**	**Definition**	**Prevalence of restraint use; Type(s) of restraint**	**People involved; Reasons for use**	**Study Quality***
Kunik et al., 2010	Comparing the rates of nursing home placement, injuries, restraint use, use of health services for community-dwelling dementia patients who develop aggression and those who do not.	Purposive sample (215 newly diagnosed dementia patients)	Operationalised using the following questions: - "Has the physical or verbal aggression of patient necessitated the use of a physical restraining mechanism? - In the past month, have you used the following to decrease the chance of injury (vest restraint, bed rails, tie restraint, geriatric chair with lap bar, other)"? This information was used to create a dichotomous physical restraint use variable	Prevalence: about 5% Types: - Vest restraint: / - Bedrails: / - Tie restraint: / - Geriatric chair with lap bar: / - Other: /	People involved: no information Reasons: no information	6/6

Prevalence = overall prevalence of (physical) restraint use

Types = prevalence of the various types of restraint mentioned in the different studies

NA= no figures available

*Methodological quality according to the Mixed Methods Appraisal Tool (MMAT) (Pluye et al., 2009). See table 2 for more details. The methodological quality was divided in three categories according to Vlaeyen et al., 2017 [low (yes < 3), moderate (yes: 3-5) or high quality (yes = 6)].

Prevalence

Only four studies reported the prevalence of restraint use; the figures ranged from about 5% (Kunik et al., 2010), to 7% (Hamers et al., 2016), 9.9% (Beerens et al., 2016) and 24.7% (Scheepmans et al., 2017). Three studies did not report prevalence rates but confirmed use of restraints in home care. Kurata and Ojima (2014) reported that 40.5% of the home care providers observed that physical restraint was used in older patients' homes. The majority (80%) of nursing staff in the study by de Veer et al. (2009) said they had physically restrained a person at some point. The qualitative study of home care nurses' experiences of restraint use indicates that these measures are used in home care (Scheepmans et al., 2014).

Type of restraints

Various types of restraints are used in home care, the number of different types of restraint measured in the studies ranged from 6 (de Veer et al., 2009), to 10 (Hamers et al., 2016), 12 (Bakker et al., 2002), 17 (Kurata and Ojima, 2014) and 24 (Scheepmans et al., 2017) (Table 3).

Persons involved

Six studies provided information about the people involved in restraint use in home care (de Veer et al., 2009; Bakker et al., 2002; Kurata and Ojima, 2014; Scheepmans et al., 2014, 2017; Hamers et al., 2016), indicating that people in a range of roles are involved: informal caregivers, family, nurses, the general practitioner and the patient.

A common factor in all the studies was the importance of the role of family or informal caregivers. They often request or initiate the use of restraint (de Veer et al., 2009; Scheepmans et al., 2017; Bakker et al., 2002; Hamers et al., 2016) and are mostly involved in the decision-making process and application of restraints (de Veer et al., 2009; Scheepmans et al., 2017; Bakker et al., 2002). Twenty percent of family caregivers indicated that they had wavered about whether or not to use restraint and that they would consult a care manager, visiting physician, other family members, daycare centre staff, visiting nurses or home helpers about the decision when they were uncertain about its use (Kurata and Ojima, 2014). The qualitative study confirmed that family have an important role in the decision-making process (Scheepmans et al., 2014).

Nurses are the second group of people that often initiates restraint use (Scheepmans et al., 2017; Bakker et al., 2002), is involved in the decision (de Veer et al., 2009; Scheepmans et al., 2017; Bakker et al., 2002), gives advice about use of restraints (Kurata and Ojima, 2014) or uses restraint (Scheepmans et al., 2017; Bakker et al., 2002). The qualitative study also described nurses' involvement in use of restraint use and how (in most cases) they collaborated with the family to find the best solution for the patient (Scheepmans et al., 2014).

Three out of the four studies describing the role of the general practitioner in use of restraint indicated that compared to people in other roles as the nurses, the general practitioner is less involved in the decision (de Veer et al., 2009; Scheepmans et al., 2017), the application (Scheepmans et al., 2017; Bakker et al., 2002; Kurata and Ojima, 2014) and less likely to request to restraint use (Scheepmans et al., 2017). The nurses involved in the qualitative study did not mention the general practitioner as someone involved in decisions about restraint use or actual use of restraint except when they were explicitly asked about this by the interviewer. The general practitioner's role appeared to be largely limited to the prescription of medication to control the patient's behaviour, although some home care nurses preferred them to take a more active role in the decision process

(Scheepmans et al., 2014). In contrast, Bakker et al. (2002) reported that general practitioners did request restraint use and were involved in the decision-making process, especially with regard to home-based psychiatric care (Bakker et al., 2002).

One study reported that in 24.9% of the cases the patient initiated use of restraint and that the patient was involved in the decision in 42.9% of cases (Scheepmans et al., 2017). In this study permission to use restraint was sought from the patient in 67% of cases (Scheepmans et al., 2017). In the study by de Veer et al. (2009) patients granted permission for use of various forms of restraint: bed rails (16.1%); geriatric chair or deep chair (14.3%); locking room or home (18.6%).

Reasons

In the five studies reporting information about the reasons for using restraint, patient safety was the most commonly reported reason (Table 3) (de Veer et al., 2009; Bakker et al., 2002; Scheepmans et al., 2014, 2017; Kurata and Ojima, 2014) although it was expressed in various ways e.g. protection of the client (Bakker et al., 2002; de Veer et al., 2009) and safety of the patient (Scheepmans et al., 2014, 2017). Nine of the 17 reasons mentioned in the study by Kurata and Ojima (2014) were safety-related (e.g. protecting an older person from falling out of bed; preventing a patient from pulling out a catheter).

The second and third most commonly mentioned reasons were, respectively requests from an informal caregiver or representative of the patient, or a request from the patient him or herself (de Veer et al., 2009; Scheepmans et al., 2017). Other reasons cited were behaviour-related, e.g. to prevent an older person from taking things from others or from removing a dressing (Kurata and Ojima, 2014), to protect the environment

from damage or disruption by a patient (Scheepmans et al., 2017; Kurata and Ojima, 2014) and lack of staff (Kurata and Ojima, 2014). Specific reasons mentioned in the qualitative study (Scheepmans et al., 2014) and confirmed in a survey (Scheepmans et al., 2017) were that the patients wanted to remain at home for as long as possible which necessitated use of restraints, the desire to delay admission to a nursing home and to provide respite for the informal caregiver.

DISCUSSION

To the best of our knowledge this is the first systematic review of research on use of restraint on older adults receiving home care. Due to the lack of evidence on this topic we decided to address several research questions in the review, to include studies of all types of designs and not to limit our search by date of publication. This produced a mix of eight, recently published (between 2002 and 2017) studies (Bakker et al., 2002, Beerens et al., 2014, de Veer et al., 2009; Hamers et al., 2016, Kurata and Ojima, 2014, Kunik et al., 2010, Scheepmans et al., 2014, 2017). The review has demonstrated that, contrary to the residential settings, research about restraint use in home care is scarce.

The methodological quality of the selected studies ranged from moderate to high. Some of them were not designed to answer our research questions and as a consequence gave us indirect answers (Beerens et al.,2014; Kunik et al., 2010). Other limitations of the review are the lack of a clear definition of restraint and the lack of consensus on how to operationalise the concept (Kunik et al., 2010, Hamers et al., 2016, Kurata and Ojima, 2014, Bakker et al., 2002), as well as the limited reporting (de Veer et al., 2009, Beerens et al., 2014, Kunik et al., 2010) and differences in methodology of the studies included in it. Although some studies did define restraint, there were inconsistencies in the definitions used (de veer et al., 2009, Scheepmans et al., 2014, 2017). Various examples were used to operationalise the concept of restraint use, with belts and bedrails being the most commonly mentioned restraints (de Veer et al., 2009, Hamers et al., 2016, Scheepmans et al., 2017, Bakker et al., 2002). In some studies descriptions of examples were vague, making comparison difficult (e.g. restriction of freedom and locked chair/table or deep/overturned chair) (Bakker et al., 2002). This lack of a clear definition and the variety of examples used in home care; mirrors the conceptual difficulties noted in the residential setting. The search for a clear definition is also reflected in the different reports of the annual performed National Prevalence Measurement of Care Problems in the Netherlands and evolves over the years (Halfens et al., 2007 – 2016). An internationally accepted research definition of physical restraints was published recently in recognition of this problem (Bleijlevens et al., 2016). This new consensus definition should make it easier to understand and compare the results of future studies. Physical restraint as defined by Retsas (1998) and recently by Bleijlevens et al., (2016) focuses more on the physical measures (such as belts, wrist or ankle ties) attached or adjacent to a person's body aimed to restrict the mobility of a person. Restraints is a broader concept and implies any devices and actions that healthcare providers or informal caregivers perform that restrict the individual's freedom in some way (e.g. adaptation of the house) (Scheepmans et al., 2017). Understanding the negative consequences of restraint use starts by having a clear understanding of what 'restraints' means or includes. A clear definition of the concept is a first step to increase awareness among healthcare providers. Other elements to increase awareness are a clear policy, education of healthcare providers, and available alternatives.

Despite these limitations our review provides some valuable insights into restraint use in the home care setting. The reported prevalence of restraint use in home care varied widely, from about 5% (Kunik et al., 2010) to 24.7% (Scheepmans et al., 2017) and these figures indicate clearly that restraints are used in home care. The variance in reported prevalence could be explained by the above-mentioned differences in conceptualisation and operationalisation. There is also large variation in the reported prevalence of (physical) restraint use in long-term residential care; the figures are typically higher than for home care, ranging from 26.8% (Hofmann et al., 2015) to 84.9% (Esérez-Guerra, 2017).

The review indicates that a wide variety of restraints are used in home care (the number of form of restraint mentioned ranged from 6 to 24 in the selected studies). In residential settings the range of restraints used tends to be more limited (e.g. bedrails, geriatric chair, belts, chair with attached table) (Estévez-Guerra, 2017; Hofmann and Hahn, 2014) and this may be because in the home environment restraint is imposed using equipment already available in the patient's home environment (e.g. placing chair against table, deep chair) instead of or in combination with professional equipment. The differences in operationalisation and reporting of restraint use make it difficult to get a clear overview of the common types and is also seen in the reports of Halfens et al. (2007 – 2010); however the review revealed use of types of restraint that appear to be specific to home care such as adaptation of the house, locking the house, and seclusion.

Some of the reasons given for using restraint in home care are the same as those given in other settings, e.g. safety- and behaviour-related reasons. Others, such as a patient's wish to remain at home as long as possible, the desire to delay admission to a nursing home and provision of respite for the informal caregiver appear to be specific to the home care setting.

Hellwig (2000) focuses on behavioural reasons (such as hunger, pain, infection) to use restraints and mentioned 'modifying the environment as an alternative to restraint use' in contrary to the studies of Scheepmans et al., (2014 and 2017) where adaptation of the house is perceived as a restraint.

As in the residential setting, nurses play an important role in the decision-making process surrounding use of restraint in home care. The limited evidence we reviewed indicates that the informal caregiver has an important role in the use of restraint and, in contrast, the general practitioner's role is more limited; however, none of the studies we reviewed provided in-depth analysis of the roles of either. These findings seem to be in contrast with the reports of Halfens, indicating that healthcare providers most take the initiative to use restraints, followed by the informal caregiver (Halfens et al., 2009, 2010). Given that restraint use is a complex and challenging intervention these findings really should not be ignored. For legal reasons (e.g. an informal caregiver may not apply restraints without instruction of the general practitioner of the nurse) and the pivotal role of general practitioners in home care the latter must be more involved in the decision-making surrounding restraint use. Nurses, general practitioners and other healthcare providers should pay more attention to the burden on informal caregivers and, where necessary, take action to support them. Further research is, however, needed to better understand the roles of each of these professions in restraint use and their experiences. Literature suggests that multicomponent interventions, that combine different strategies such as (psycho)education and role training interventions can reduce the burden of the informal caregiver (Fänge et al., 2017, Pinquart and Sörensen, 2006, Gitlin et al., 2003). It is recommended to explore how those interventions could be integrated in a multicomponent program to successfully reduce restraint use in home care (Gulpers et al., 2011, Köpke et al., 2012).

The findings of the review raise some ethical questions and important concerns. First, the review indicates that the use of restraints in home care is not evidence based; and as a consequence the findings suggest that patients do not receive good care. Indeed, patient safety has been mentioned in the review as the most common reason for using restraints. But, evidence from literature shows that restraint use has many negative consequences for the patient and that using restraints actually increases the chances of patient harm and can increase disorganized behavior (Evans et al., 2003, Hamers and Huizing, 2005, Hofmann and Hahn, 2014, Saarnio and Isola, 2009, Gastmans and Milisen, 2006). Secondly, the results raise also ethical concerns about the decision making process. The considerations of context-related factors (such as a shortage in staff, relieve of the informal caregiver) rather than patient-related factors may result in decisions about restraint use mainly determined by convenience instead of what is really needed or suitable for the older person. The findings of the review strongly suggest a lack of awareness, knowledge and ethical reflection related to the use of restraints in home care, all of which are essential to realize a dignified and person focused practice. As a consequence, there is an urgent need to educate and to enhance the awareness of healthcare providers and stakeholders about the dangers of restraint use and to improve their competency to critically and thoroughly consider values (e.g. respect for dignity for the older person, autonomy, self-reliance) in view of a human care.

Implications for further research

Research on restraint use in home care is limited and recent. However, there is sufficient evidence to be certain that restraint is used in the home. Some differences between use of restraints in the home and in residential settings such as the prominent role of the informal caregiver, the lack of continuous supervision and the various types of restraints used, underline the importance of further research on the use of restraint in home care. In contrast with the residential setting, there is as yet no research providing insight into the patient's perspective on use of restraint in the home. Further research into the impact of being restrained at home is needed given that we know that older people, who are often frail, are restrained in their homes. Research from the family's perspective would also increase our understanding of restraint use in home care as the family plays a prominent role in this. Understanding why families use restraint may help professional healthcare workers to support them in other ways. Additional research is also necessary to determine how restraint should be defined in the context of home care (just physical forms of restraint, restraints in general or any form of involuntary treatment?) and how it can be operationalised, taking into account the experiences of the patients, family, general practitioners and other involved health care providers.

Home care nurses have a pivotal role in home care. Given that the trajectory to use restraint is complex, that context and nurse-related factors can hinder nurses' decision-making (Goethals et al., 2012) and that there are specific factors that must be taken into account in the home care setting, further research is needed to explore how nurses can be empowered to deal more effectively and insightfully with this complex care issue. Future research is necessary to investigate the perspectives and attitudes of other healthcare professionals about restraint use and to explore the knowledge about alternatives for restraint use. Taking into account the complexity of restraint use in home care, its prevalence and its implications for the older persons and its implications for home care, guidelines to reduce restraint use in home care are urgently needed as well as a clear policy about this topic. Subsequently to this, further research is needed about how these guidelines can be implemented and restraints in home care can be reduced; for instance by implementing a multicomponent intervention program; as has already been successfully demonstrated in the residential setting (Gulpers et al., 2011; Köpke et al., 2012).

CONCLUSION

Contrary to the current socio demographical evolutions resulting in an increasing demand of restraint use in home care, research on this subject is still scarce and recent. The limited evidence however points to the challenging complexity and specificity of home care regarding restraint use. Given these serious challenges for clinical practice, more research about restraint use in home care is urgently needed.

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CHAPTER 6:

REDUCING PHYSICAL RESTRAINTS IN HOME CARE: DEVELOPMENT OF AN EVIDENCE-BASED GUIDELINE

This chapter is submitted as: Scheepmans, K., Dierckx de Casterlé, B., Paquay, P., Van Gansbeke, H. Milisen, K. (2018). Reducing physical restraints in home care: Development of an evidence-based guideline. *Journal of Advanced Nursing*.

ABSTRACT

Objectives: To develop a practice guideline for the use of physical restraints in home care in order to support caregivers in reducing restraint use in home care.

Background: Restraint use is a complex and challenging issue. Home healthcare workers are faced with an increasing demand for restraint use, resulting in the use of various types of restraints in home care.

Method: The practice guideline was developed according to the framework of the Belgian Centre for Evidence-Based Medicine and AGREE II. The development of the guideline consisted of several stages: (1) determination of the target population and scope, (2) literature search, (3) drafting and (4) validation of the guideline. A multidisciplinary working group developed the guideline by using the consensus procedure and by consulting experts.

Design: Developmental research for practice guidelines.

Implications for nursing: The guideline gives an answer to six clinical questions and contains ten key recommendations based on the classification of GRADE. Furthermore, the guideline supports healthcare providers in reducing restraint use in home care by increasing awareness and knowledge about the use of restraints, its implications and ethical challenges in home care; and by providing a flowchart for dealing with complex situations where the use of restraints is requested, already present or considered.

Conclusions: The guideline was validated by the Belgian Centre for Evidence-Based Medicine. Increasing competence, awareness and knowledge related to restraint use are key objectives of the guideline for reducing use of restraints in home care.

INTRODUCTION

Depending on the definition used, the prevalence of restraint use in home care varies from 7% (Hamers et al., 2016), over 9.9% (Beerens et al., 2014) to 24.7% (Scheepmans et al., 2017). Various types of (physical) restraints are used in home care (e.g. bedrails, use of a deep or a geriatric chair with table, waist belts on chairs or beds, wrist or ankle ties, locked (wheel)chair, house or room doors) (Beerens et al., 2014; de Veer, 2009; Hamers et al., 2016; Scheepmans et al., 2017). The most commonly indicated reason for using (physical) restraints is the safety of the patient (Scheepmans et al., 2017), and risk factors include need for supervision, dependency in ADL activities, perceived risk of falls by nurses' clinical judgement, behavioural problems, cognitive impairment, polypharmacy and decreased wellbeing of the informal caregiver (Scheepmans et al., 2017). The use of restraints has many negative consequences for the patient (e.g. decubitus, falls, isolation, aggression) (Evans, Wood, & Lambert, 2003; Hofmann & Hahn, 2014), the family (anger, worry) and the healthcare provider (e.g. frustration, guilt) (Gastmans & Milisen, 2006).

Decisions about the use of restraints are complex, and the process is influenced by patient-, nurse- and context-related factors (Goethals et al., 2012). The family and, in the second place, the nurses play an important role in the decision-making process of restraint use at home (de Veer et al., 2009; Hamers et al., 2016; Scheepmans, 2014, 2017). Family caregivers are less aware of the many negative consequences of restraints and the regulations surrounding physical restraint procedures as compared to professional home care providers (Kurata & Ojima, 2014). The majority of home nurses are not aware of alternatives to restraint use (de Veer et al., 2009). Healthcare providers need to be supported when they are confronted with situations where restraints are used or requested at home. A clear policy within home care organizations and guidelines to deal with restraint use in home care are lacking (de Veer et al., 2009; Halfens et al. 2010; Scheepmans et al., 2014). The aim of this research has been to develop a practice guideline to support healthcare workers to reduce the use of physical restraints in home care.

METHOD

The practice guideline was developed according to the framework of the Belgian Centre for Evidence-Based Medicine (CEBAM) and AGREE II (Agree Next Steps Consortium, 2009). The development of the guideline existed of different stages: (1) determination of the target population and scope, (2) literature search, (3) drafting and (4) validation of the guideline.

Stage 1: Determination of target population and scope of the guideline

Experiences from daily practice and the scarce literature about restraint use in home care indicate a lack of awareness about the concept, the consequences, legislation, responsibilities and alternatives of restraint use (Hellwig et al., 2000; Scheepmans et al., 2014). Based on this information, six clinical questions were formulated: (1) What is meant by physical restraints in home care? (2) What factors increase the risk of physical restraints in home care? (3) What are the consequences and the impact of the use of physical restraints in home care? (4) What ethical and legal framework can support healthcare providers in decisions about the use of physical restraint in home care? (5) How can healthcare workers reduce restraints in home care? And, (6) what steps and which persons need to be involved in the decision-making process and the application of physical restraints in home care? A multidisciplinary working group with representatives of home nurses, domestic aids, general practitioners, patients and informal caregivers was installed and completed with the research team, consisting of persons with expertise in home care, physical restraints, delirium, falls and care ethics.

The target population was determined as home-dwelling persons, aged 60 and older, with home care and at increased risk for physical restraint use. Target users of the guideline were healthcare providers in home care (e.g. home nurses, nursing aids, domestic aids, general practitioners, occupational therapists and physiotherapists).

Stage 2: Literature search

The availability of existing national and international guidelines on physical restraint use in home care was explored by conducting a literature search. Because of the absence of available guidelines in this setting, the search was expanded to include research involving residential settings. Publications were considered if they met the following criteria: (1) reporting about older persons, restraint use, chronic care and (practice) guidelines and (2) written in English, French or Dutch. Guidelines about restraint use related to children, schools, psychiatry, seclusion, acute, emergency or intensive care and dentistry were excluded. Five databases (i.e. Pubmed, Embases, Psych Info, Cinahl and Invert) and online (inter) national guideline databases (including New Zealand Guidelines Groups, National Clearinghouse, Guideline Finder UK, SING, NICE, WHO guidelines, Canadian Medical Association InfoBase Clinical Practice Guidelines, Haut Autorité de Santé, Agency for Healthcare Research and Quality, KCE [Federaal kenniscentrum voor Gezondheidszorg], Domus Medica and Société Scientifique de Médecine Générale) were searched from their inception through March 2013. Five guidelines (Milisen et al., 2006; JBI, pt. 1 & 2, 2002; ANAES, 2000; Royal College of Nursing, 2008; Irish Nurses Organisation, 2003) were found and assessed using AGREE II (Table 1). Based on the AGREE II results, two of them were retained (Milisen et al., 2006; Anaes, 2000).

Table 1: Quality Appraisal of existing guidelines according to Agree II

	JBI (2002) (Pt 1 & 2)	**Irish Nurses Organisation (2003)**	**Anaes (2000)**	**Royal College of Nursing, (2008)**	**Milisen et al., (2006)**
Domain 1: Scope and Purpose					
1.The overall objective(s) of the guideline is (are) specifically described.	5	7	7	7	7
2. The health question(s) covered by the guideline is (are) specifically described.	4	2	6	5	4
3.The population (patients, public, etc.) to whom the guideline is meant to apply is specifically described.	3	3	6	7	7
Subtotal	12	12	19	19	18
Domain 2: Stakeholder Involvement					
4. The guideline development group includes individuals from all the relevant professional groups.	4	2	6	6	6
5. The views and preferences of the target population (patients, public, etc.) have been sought.	2	1	4	3	3
6. The target users of the guideline are clearly defined.	2	4	5	5	4
Subtotal	8	7	15	14	13

Table 1 continued

	JBI (2002) (Pt 1 & 2)	Irish Nurses Organi-sation (2003)	Anaes (2000)	Royal College of Nursing, (2008)	Milisen et al., (2006)
Domain 3: Methodology					
7. Systematic methods were used to search for evidence.	1	1	5	1	1
8. The criteria for selecting the evidence are clearly described.	1	1	1	1	1
9. The strengths and limitations of the body of evidence are clearly described	1	1	2	1	1
10. The methods for formulating the recommendations are clearly described.	1	1	1	1	1
11. The health benefits, side effects and risks have been considered in formulating the recommendations.	3	2	2	2	2
12. There is an explicit link between the recommendations and the supporting evidence.	2	3	5	3	3
13. The guideline has been externally reviewed by experts prior to its publication.	5	1	6	3	2
14. A procedure for updating the guideline is provided.	1	1	1	1	1
Subtotal	15	11	23	13	12
Domain 4: Clarity of Presentation					
15. The recommendations are specific and unambiguous.	6	6	6	5	7

Table 1 continued

	JBI (2002) (Pt 1 & 2)	Irish Nurses Organi-sation (2003)	Anaes (2000)	Royal College of Nursing, (2008)	Milisen et al., (2006)
16. The different options for management of the condition or health issue are clearly presented.	4	3	3	4	4
17. Key recommendations are easily identifiable.	5	3	3	5	6
18. The guideline describes facilitators and barriers to its application.	1	1	1	1	1
Subtotal	16	13	13	15	18
Domain 5: Applicability					
19. The guideline provides advice and/ or tools on how the recommendations can be put into practice.	3	5	6	3	4
20. The potential resource implications of applying the recommendations have been considered.	1	1	1	1	1
21. The guideline presents monitoring and/ or auditing criteria.	1	1	1	1	1
Subtotal	5	7	8	5	6
Domain 6: Editorial Independence					
22. The views of the funding body have not influenced the content of the guideline.	3	1	1	1	1
23. Competing interests of guideline development group members have been recorded and addressed.	2	1	1	1	1
Subtotal	5	2	2	2	2

Table 1 continued

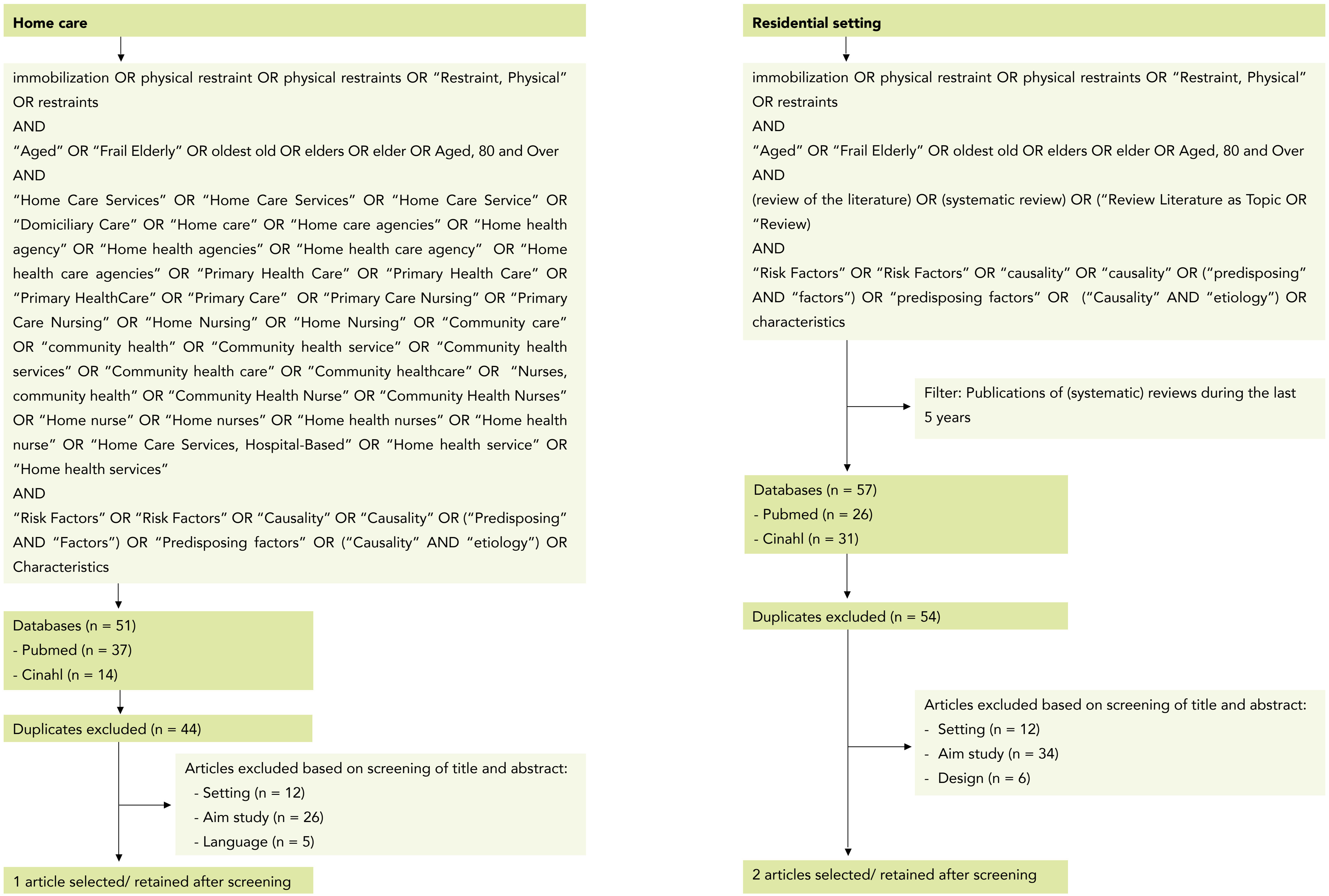
	JBI (2002) (Pt 1 & 2)	Irish Nurses Organisation (2003)	Anaes (2000)	Royal College of Nursing, (2008)	Milisen et al., (2006)
Overall guideline assessment:					
- Rate the overall quality of this guideline: 1 (lowest possible quality) – 7 (highest possible quality)	3	4	5	4	5
- I would recommend this guideline for use: o Yes o Yes, with modifications o No	x	x	x	x	x
Notes		Implementation schedule	Overview by behaviour and scores of alternatives	Lesgislation of UK (-) Examples for clarifications Employers involved (+) Ethical aspects (+)	Belgian context flowchart
Total	61	52	80	68	69

Next, a systematic literature search focused on the aforementioned six predetermined clinical questions. For each question, the literature search existed of two phases. First, evidence was checked for home care, and articles of any designs written in English, Dutch or French were eligible for inclusion. Second, this review was supplemented by a search of (systematic) review articles related to the residential setting published in the last five years, with the same language criteria as for the home care.

Pubmed and Cinahl were the databases consulted for both searches. For only the first clinical question in the home care setting, an additional database (i.e. Embase) was consulted. To build up the search string, medical subject headings were combined with free search terms using Boolean operators (AND / OR). The same groups of search terms (i.e. restraints and aged) were used for both searches and combined with search terms in function of the subject of the clinical question and setting. The search string of the home care setting was completed with variations on the term 'home care'. For the residential setting, combinations of key words for review were added (see figure 1 for an example of research question 2).

One author (KS) performed the search for the existing guidelines and the literature search, removed duplicated publications and did the first selection of articles on titles and abstracts. Different tools were used to assess the quality of the articles according to the study design: VAKS (qualitative research) (Schou et al., 2011), MINORS (quantitative research) (Slim et al., 2003) and AMSTAR (systematic reviews) (Shea et al., 2007; Sequeira-Byron et al., 2011). Table 2 gives an overview of the retained articles and the quality assessment by clinical question and setting. Using the snowball method, reference lists were checked, which resulted in inclusion of three additional articles (Evans et al., 2002, 2003; Gastmans & Milisen, 2006). Four articles (Evans & Cotter, 2008; Hamers & Huizing, 2005; Hellwig, 2000; Gastmans & Milisen, 2006) and one chapter from the book of Gastmans and Vanlaere (2005) contained important background information drawing upon expert opinion while not reporting about primary research. As a consequence, there was no quality assessment for those items.

Figure 1: Example of overview literature search of second clinical question: What factors increase the risk of physical restraints in home care?



Home care

immobilization OR physical restraint OR physical restraints OR "Restraint, Physical" OR restraints
AND
"Aged" OR "Frail Elderly" OR oldest old OR elders OR elder OR Aged, 80 and Over
AND
"Home Care Services" OR "Home Care Services" OR "Home Care Service" OR "Domiciliary Care" OR "Home care" OR "Home care agencies" OR "Home health agency" OR "Home health agencies" OR "Home health care agency" OR "Home health care agencies" OR "Primary Health Care" OR "Primary Health Care" OR "Primary HealthCare" OR "Primary Care" OR "Primary Care Nursing" OR "Primary Care Nursing" OR "Home Nursing" OR "Home Nursing" OR "Community care" OR "community health" OR "Community health service" OR "Community health services" OR "Community health care" OR "Community healthcare" OR "Nurses, community health" OR "Community Health Nurse" OR "Community Health Nurses" OR "Home nurse" OR "Home nurses" OR "Home health nurses" OR "Home health nurse" OR "Home Care Services, Hospital-Based" OR "Home health service" OR "Home health services"
AND
"Risk Factors" OR "Risk Factors" OR "Causality" OR "Causality" OR ("Predisposing" AND "Factors") OR "Predisposing factors" OR ("Causality" AND "etiology") OR Characteristics

Databases (n = 51)
- Pubmed (n = 37)
- Cinahl (n = 14)

Duplicates excluded (n = 44)

Articles excluded based on screening of title and abstract:
- Setting (n = 12)
- Aim study (n = 26)
- Language (n = 5)

1 article selected/ retained after screening

Residential setting

immobilization OR physical restraint OR physical restraints OR "Restraint, Physical" OR restraints
AND
"Aged" OR "Frail Elderly" OR oldest old OR elders OR elder OR Aged, 80 and Over
AND
(review of the literature) OR (systematic review) OR ("Review Literature as Topic OR "Review)
AND
"Risk Factors" OR "Risk Factors" OR "causality" OR "causality" OR ("predisposing" AND "factors") OR "predisposing factors" OR ("Causality" AND "etiology") OR characteristics

Filter: Publications of (systematic) reviews during the last 5 years

Databases (n = 57)
- Pubmed (n = 26)
- Cinahl (n = 31)

Duplicates excluded (n = 54)

Articles excluded based on screening of title and abstract:
- Setting (n = 12)
- Aim study (n = 34)
- Design (n = 6)

2 articles selected/ retained after screening

Table 2: Overview of articles by clinical question, setting and quality appraisal

Author	**Setting**	**Type**	**Answer by clinical question**	**Quality appraisal**		
				AMSTAR *	VAKS**	MINORS***
Beerens et al., 2014	HC	Survey	1			10/10
de Veer et al., 2009	HC	Survey	1			9/10
Evans and Fitz-Gerald, 2002	Res	Review	2	6/10		
Evans and Cotter, 2008	HC	Paper	5, 6	NA	NA	NA
Evans et al., 2003	Res	Review	3	4.5/10		
Gastmans and Milisen, 2006	Res	Paper	1,2, 4-6	NA	NA	NA
Gastmans and Vanlaere, 2005	Res	Book	2-4	NA	NA	NA
Goethals et al., 2012	Res	Review	2-4	6/10		
Goethals et al., 2013	Res	Qualitative study	4		14.6	
Hamers and Huizing, 2005	HC, Res	Paper	1-3	NA	NA	NA
Hellwig, 2000	HC	Paper	1, 3, 5, 6	NA	NA	NA
Hofmann and Hahn, 2014	Res	Review	1-3	6/10		
Köpke et al., 2012 ****	Res	RCT	5, 6			
Kurata and Ojima, 2014	HC	Survey	1			9/10
Lane and Harrington, 2011	Res	Review	1	5/10		
Möhler et al., 2012	Residential, HC	Review	1, 5, 6	7/10		
Möhler et al., 2014	Res	Review	1, 3, 4	7/10		
Scheepmans et al., 2014	HC	Qualitative study	1		15	

*Shea et al., 2007. AMSTAR is a validated instrument and consists of 11 items with 4 answer possibilities (Shea et al., 2007)

** The assessment tool VAKS consists of 30 questions related to 5 criteria (i.e. formal requirements, credibility, transferability, dependability and confirmability). Based on the total score an article is 'recommended' (≥ 15), 'recommended with reservations' (≥ 10 < 15) or 'not recommended' (< 10) (Schou et al., 2011).

*** The MINORS consists of 12 items, the first 8 items are for non-comparable studies. The scores for the individual items can be 0 (not reported), 1 (reported but inadequate) or 2 (reported and adequate) (Slim et al., 2003).

**** For the quality appraisal of the RCT, the authors refer to Scheepmans and Paquay, 2014.

NA: not applicable; HC: home care; Res: residential

Stage 3: Development of the practice guideline

The literature search indicated that no guidelines about restraint use in home care were available and that research about restraint use in the home care setting was scarce. For this reason, the multidisciplinary working group decided to develop the practice guideline according to the consensus procedure (Smets & Peremans, 2011; Chevalier et al., 2007). A thorough answer for the six predefined clinical questions was searched based on the limited available research from the home care setting, supplemented with research from the residential setting and combined with the expertise of the multidisciplinary working group and experts. Therefore, the research team prepared the answers, which were then discussed with the working group. The development of the practice guideline has resulted in ten recommendations in response to the six clinical questions and a flowchart to support the decision-making process when use of physical restraints is requested. To indicate the quality of evidence and strength of the recommendations, we used the system of GRADE (Van Royen et al., 2008).

A preliminary version of the guideline was tested within the organizations of the members of the multidisciplinary working group and adapted based on their experience and feedback. Further, a second version of the guideline was discussed within the multidisciplinary working group by using clinical cases. A third and final version was again discussed with clinical practitioners (i.e. nurses, occupational therapists, general practitioners, physiotherapists) and adapted as needed.

Table 3: Overview of the six clinical questions, ten recommendations and the quality of the evidence and strength of the recommendations according to GRADE

Clinical question	No.	Recommendations	GRADE
1. What is meant by physical restraints in home care?	1.	Definition of physical restraint (Retsas, 1998): 'any device, material or equipment, attached to or near a person's body and which cannot be controlled or easily removed by the person and which (is) deliberately (intended to) prevent(s) a person's free body movement to a position of choice and\or a person's normal access to their body'	1 C
	2.	Healthcare providers must be aware that the application of any measure, regardless of its purpose, that limits free movement of the patient is a form of restraints.	1 C
2. What factors affect the probability of physical restraints in home care?	3.	A complex set of factors affects the probability that physical restraint will be used in home care: - Personal (e.g. poor mobility) and contextual factors (e.g. request of the family) - Knowledge and attitudes of healthcare providers - Culture of home care organization - Legislation	1 B
3. What are the consequences and the impact of the use of physical restraint in home care?	4.	The use of physical restraints should be avoided as much as possible due to the negative physical and psychosocial consequences for the patient.	1 A
	5.	Healthcare providers must be aware of the negative impact of physical restraints on the informal caregiver and should pay attention to support them.	1 C
	6.	Healthcare organizations must be aware of the impact of using physical restraints on the involved healthcare providers.	1 B

Table 3 continued

Clinical question	No.	Recommendations	GRADE
4. What ethical and legal framework can support healthcare providers in decisions about the use of physical restraint in home care?	7.	Consider carefully the different values, norms and reasons in the context of humane care.	1 C
	8.	Physical restraints may only be used as a last resort and exception. A clear reporting of the careful decision-making process in the patient record is necessary. * No strength of evidence because it is based on legal texts	1 *
5. How can healthcare workers reduce restraints in home care?	9.	Reducing restraint use in home care indicates the following: 1. Gaining insight into personal and contextual factors: thorough assessment. 2. Interdisciplinary collaboration (including patient and family) and taking their own responsibility. 3. Proactive and transparent communication with all involved persons. 4. Develop with the involved persons (formal and informal caregivers) a care plan to determine the aims and preventive actions.	1 B
6. What steps and which persons need to be involved in the decision-making process and the application of physical restraints in home care? (see flowchart)		- Reducing restraints requires: - Carefully and consciously dealing with situations where means of physical restraints are considered, requested or already used. - Taking into account the wishes of the patient. - Involvement of the patient and the family from the beginning of the process and all other involved healthcare providers. - Physical restraint should be used: - Only as a last resort. - Only after first considering alternatives. - Only over a short period of time, with careful supervision and with materials that are in proportion to the patient's behaviour.	1 C

GRADE: The strength of the recommendation is expressed in a number (1 = strong; 2= weak). The quality of the evidence is classified into high (A), moderate (B) or low (C) (Van Royen et al., 2008).

Stage 4: Validation of the practice guideline

The practice guideline was presented to the Belgian Centre for Evidence-Based Medicine (CEBAM) for validation. The aim of this independent validation was to guarantee its methodological quality. A validation committee was formed consisting of one methodological expert, one content expert, the chair (president of CEBAM and a general practitioner) and three experienced clinicians representing the disciplines for which the guideline was developed (one home care nurse, one occupational therapist, one general practitioner). The validators assessed the guideline using the AGREE II instrument (Agree Next Steps Consortium, 2009) and discussed afterwards all their remarks with the researchers (KS, KM) to reach consensus. The guideline was revised in response to the comments of the validation commission and finally approved by CEBAM on 15 December 2015.

RESULTS

The current article describes only a summary of the results; a full version of the guideline can be consulted elsewhere (Scheepmans et al., 2016). The practice guideline provides an answer to six clinical questions and resulted in 10 recommendations (table 3) and a flowchart that illustrates the steps to be taken and the persons to be involved in the decision-making process for the application of physical restraints in home care (sixth question).

1. *What is meant by physical restraints in home care?*

Given the absence of a clear consensus on the definition of physical restraints at the time of the development of the guideline, the definition of Retsas (1998) was retained [recommendation 1]. This comprehensive definition is widely used in the residential setting and seems also to be useful for home care. Chemical restraints, electronic supervision or prescribed orthopaedic devices that are part of a treatment process are not considered physical restraints. Examples of physical restraints in home care are bed-against-the-wall (positioned in a way that the person will not fall out of bed), locked doors or house, deep chair, and restrictive clothing and belts. Physical restraints were often considered to be safety measures instead of physical restraints (Scheepmans et al., 2014). For this reason the guideline emphasized in the second recommendation that healthcare providers must be aware that the application of any measure that limits free movement of the patient – regardless of its purpose – is a form of restraint because of the possible negative impact of its use and the lived experience of the patient (see question 3) [recommendation 2].

2. *What factors affect the probability of physical restraints in home care?*

A combination of different factors influences the use of physical restraints. Person-related factors (e.g. cognitive impairment, poor mobility, dependency in activities of daily living, challenging behaviour) are the main predictive factors. In addition, context-related factors (e.g. the family frequently asking for using restraints, the wellbeing of the informal caregiver, dissatisfaction with family support) (Scheepmans et al., 2017), factors related to healthcare providers and their organization (e.g. lack of awareness and knowledge about the negative impact of restraint use by healthcare providers, lack of a clear policy about restraint use within the organization) and legislation (e.g. who is allowed to use physical restraints, regulation about informed consent) influence restraint use [recommendation 3].

3. *What are the consequences and the impact of the use of physical restraints in home care?*

The use of physical restraints has an important impact on the patient, the family and the healthcare provider. Patients can experience physical consequences such as decubitus ulcers, urinary incontinence, constipation, increased risk for falls, increased dependence in activities of daily living and decreased muscle strength and mobility (Evans et al., 2003; Gastmans & Milisen, 2006; Hamers & Huizing, 2005; Hellwig, 2000; JBI Pt1, 2002). Besides the negative physical consequences, restraint use has an important impact on the patient's psychosocial wellbeing (e.g. depression, social isolation, discomfort, indifference, fear, anger, humiliation) (Gastmans & Milisen, 2006; Gastmans & Vanlaere, 2005; Hamers & Huizing, 2005; JBI Pt1, 2002).

Informal caregivers (e.g. family members, relatives) are important for the continuity of home care and play an important role in the use of restraints. Depending on the home care situation and the level of involvement, the impact of physical restraints use on the experiences and psycho-social wellbeing of informal caregivers may differ (positively or negatively) (Scheepmans et al., 2014). The limited research indicates that some family members associate the use of physical restraints with the idea of finality and with emotions such as anger and disillusionment (Gastmans & Milisen, 2006).

Restraint use may also affect the involved healthcare workers. Indeed, physical restraint use is a complex decision-making process that is influenced by patient-, nurse- and context-related factors (Goethals et al., 2012). The specificity of the home care setting (e.g. important influencing role of the informal caregiver in the process of caregiving, the difficulties of providing increased supervision when restraints are used) implies that healthcare providers are often faced with difficult home care situations and decisions that affect their experiences and emotional wellbeing (e.g. the mixed emotions of feeling anger and guilt over having to do it and enjoying relief from the benefits of having exercised the restraint) (Gastmans & Milisen, 2006; Möhler & Meyer, 2014; Scheepmans et al., 2014).

The important impact of restraint use on all involved persons has resulted in the recommendations that the use of physical restraint be avoided as much as possible [recommendation 4] and that healthcare providers [recommendation 5] and healthcare organizations [recommendation 6] be aware of the consequences of their use.

4. *What ethical and legal framework can support healthcare providers in decisions about the use of physical restraint in home care?*

Reduction of physical restraints requires a critical and thoroughly consideration of values and norms (e.g. respect for dignity for older person, autonomy, self-reliance, promoting overall wellbeing) and reasons in view of humane care (Gastmans & Milisen, 2006; Gastmans & Vanlaere, 2005; Goethals et al., 2012, 2013) [recommendation 7].

In Belgium there is no specific legislation about physical restraint use. A number of legal texts contain some considerations that may be useful (e.g. only nurses and physicians are allowed to use physical restraints and this only in exceptional circumstances), but they don't always provide a clear answer to all home care situations. The guideline integrates the patient's rights and specifies some items (e.g. informed consent for persons who are competent to make decisions and proxy consent for persons who are incapable to do) (Federale Overheidsdienst Volksgezondheid, Veiligheid van de Voedselketen en Leefmilieu, 2007; Nys, 2013). The guideline emphasizes the need for the utmost care when the use of physical restraints is considered, requested or already present. Important aspects include discussion of the underlying causes that lead to the use of physical restraints, comprehensive reporting with the relevant documentation of the decision-making, application and evaluation processes; informing all healthcare providers who are involved about the decision made; and careful and correct application and follow-up of measures being taken. Based on the legal principles, the guideline prescribes that physical restraints may only be used as a last resort [recommendation 8].

5. *How can healthcare workers reduce restraints in home care?*

All involved healthcare workers, together with the older person and his or her informal caregiver, need to be involved in the decision-making process with regard to restraint use, with the goal of keeping the use of restraints as low as possible. This requires making a critical analysis of the reasons leading to restraint use and, at the same time, searching for preventive actions and alternatives.

A comprehensive assessment of the person- and context-related factors will lead to a better understanding of the patient and the home environment. These insights are the basis for developing an individual care plan for the patient, together with all involved clinicians, the patient and the informal caregiver. Other key elements include proactive and transparent communication and the commitment that each involved person has toward his or her responsibilities (e.g. in accordance with the agreements made) (ANEAS, 2000; Evans & Cotter, 2008; Hellwig, 2000; JBI, 2002) [recommendation 9].

6. *What steps and which persons need to be involved in the decision-making process and the application of physical restraints in home care? (Figure 2)*

The complexity of restraint use in home care requires a careful and deliberate way of dealing with situations in which restraints are considered, requested or already in use. The involvement of the patient and the family in the decision-making process from the beginning is an absolute requirement. Alternatives need to be considered first before using restraints, which is always a means of last resort. If physical restraints are still necessary, materials should be used that are in proportion to the patient's behaviour, increased supervision should be installed and restraints should be stopped as soon as possible [recommendation 10].

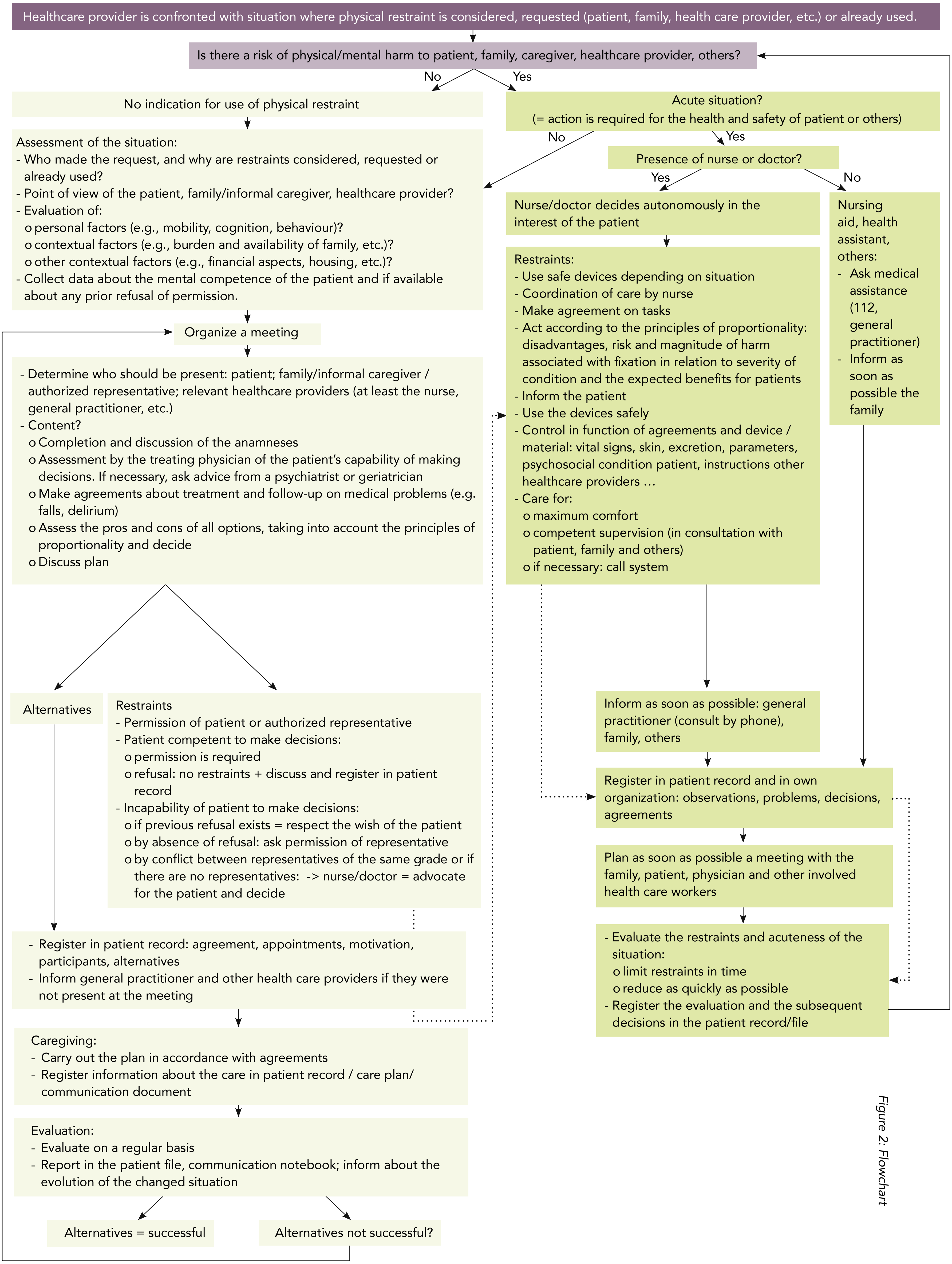
A flowchart has been developed (Figure 2) to support healthcare providers in minimizing the use of physical restraint. This flowchart clarifies the steps and persons involved in the decision-making process and the possible application of physical restraints at home.

The first step consists of an evaluation of the individual patient situation; i.e. whether the behaviour of the patient involves a risk of physical and/or mental harm to self or others. If there is no risk of harm, physical restraints may not be used. If there is a risk for harm, a distinction should be made between urgent and non-urgent situations.

Urgent situations suppose immediate action in the interests of the patients' health and safety and that of others. The nurse and/or physician act autonomously and can decide to use physical restraints. Other healthcare providers (e.g. those not legally authorized to use physical restraints according to the Belgian law) ask for medical assistance (e.g. by using an emergency call) and immediately inform the patients' general practitioner and the family. A team meeting must be planned with the patient, the family, the general practitioner and other healthcare workers involved to re-assess the urgency of the patient situation and the necessity of the restraint use, in order to limit the use of restraints over time and to reduce their use as quickly as possible.

In a non-urgent situation, information about patient- and context-related factors needs to be collected and discussed with all involved persons. The general practitioner needs to assess the capability of the patient to make decisions, consulting with the multidisciplinary team on this point as needed. The pros and cons of all options to deal with the home care situation need to be assessed and discussed. Taking into account that the use of restraints is almost never the first choice, the team decides together with the patient and the informal caregiver which option (use of restraints, alternatives, combination of restraints and alternatives) is most suitable. If physical restraint use is considered, the team must always ensure that the benefits of the restraints outweigh its associated negative risks, that physical restraint is stopped as soon as possible and used solely for the interest and wellbeing of the patient. The permission of the patient, or his/her representative in the case of a person who is incapable of making decisions, is required before applying physical restraints.

The decision-making process, the caregiving and regular evaluations must always be reported in the patient record, and all involved persons must be informed.



Healthcare provider is confronted with situation where physical restraint is considered, requested (patient, family, health care provider, etc.) or already used.

Is there a risk of physical/mental harm to patient, family, caregiver, healthcare provider, others?

No indication for use of physical restraint

Assessment of the situation:
- Who made the request, and why are restraints considered, requested or already used?
- Point of view of the patient, family/informal caregiver, healthcare provider?
- Evaluation of:
  - o personal factors (e.g., mobility, cognition, behaviour)?
  - o contextual factors (e.g., burden and availability of family, etc.)?
  - o other contextual factors (e.g., financial aspects, housing, etc.)?
- Collect data about the mental competence of the patient and if available about any prior refusal of permission.

Organize a meeting

- Determine who should be present: patient; family/informal caregiver / authorized representative; relevant healthcare providers (at least the nurse, general practitioner, etc.)
- Content?
  - o Completion and discussion of the anamneses
  - o Assessment by the treating physician of the patient's capability of making decisions. If necessary, ask advice from a psychiatrist or geriatrician
  - o Make agreements about treatment and follow-up on medical problems (e.g. falls, delirium)
  - o Assess the pros and cons of all options, taking into account the principles of proportionality and decide
  - o Discuss plan

Alternatives

Restraints
- Permission of patient or authorized representative
- Patient competent to make decisions:
  - o permission is required
  - o refusal: no restraints + discuss and register in patient record
- Incapability of patient to make decisions:
  - o if previous refusal exists = respect the wish of the patient
  - o by absence of refusal: ask permission of representative
  - o by conflict between representatives of the same grade or if there are no representatives: -> nurse/doctor = advocate for the patient and decide

- Register in patient record: agreement, appointments, motivation, participants, alternatives
- Inform general practitioner and other health care providers if they were not present at the meeting

Caregiving:
- Carry out the plan in accordance with agreements
- Register information about the care in patient record / care plan/ communication document

Evaluation:
- Evaluate on a regular basis
- Report in the patient file, communication notebook; inform about the evolution of the changed situation

Alternatives = successful

Alternatives not successful?

Acute situation?
(= action is required for the health and safety of patient or others)

Presence of nurse or doctor?

Nurse/doctor decides autonomously in the interest of the patient

Restraints:
- Use safe devices depending on situation
- Coordination of care by nurse
- Make agreement on tasks
- Act according to the principles of proportionality: disadvantages, risk and magnitude of harm associated with fixation in relation to severity of condition and the expected benefits for patients
- Inform the patient
- Use the devices safely
- Control in function of agreements and device / material: vital signs, skin, excretion, parameters, psychosocial condition patient, instructions other healthcare providers …
- Care for:
  - o maximum comfort
  - o competent supervision (in consultation with patient, family and others)
  - o if necessary: call system

Nursing aid, health assistant, others:
- Ask medical assistance (112, general practitioner)
- Inform as soon as possible the family

Inform as soon as possible: general practitioner (consult by phone), family, others

Register in patient record and in own organization: observations, problems, decisions, agreements

Plan as soon as possible a meeting with the family, patient, physician and other involved health care workers

- Evaluate the restraints and acuteness of the situation:
  - o limit restraints in time
  - o reduce as quickly as possible
- Register the evaluation and the subsequent decisions in the patient record/file

Figure 2: Flowchart

DISCUSSION

To the best knowledge of the authors, this is the first validated Evidence Based Practice Guideline about physical restraint use in home care developed by a multidisciplinary working group. The current guideline aims to support healthcare workers to reduce the use of physical restraints and to optimize the quality of care for the older adult receiving home care.

When using this guideline, the following remarks should be taken into account. The guideline is not a protocol or standing order but a tool to support professional healthcare providers dealing with situations where restraints are requested or already in place. This guideline explicitly aims to support healthcare providers in reducing restraint use in community aged care. The guideline intends to increase the competence, awareness and knowledge of home healthcare providers about restraint use by clarifying the concept, negative impact and consequences of restraint use in home care and by developing a flowchart to support a careful and well-considered decision-making process. The guideline also aims to increase the patients' safety when the use of physical restraints in exceptional situations is inevitable. Evidence about restraint use in home care is scarce. For this reason, the multidisciplinary working group translated and adapted knowledge from the residential setting into the home care setting. Despite the strong evidence about restraint use in the residential setting, the recommendations of the current guideline were achieved through consensus; more research is necessary about specific issues such as the experiences of the patient, family and other involved healthcare providers in home care and in alternatives for restraint use in home care. Finally, the development of the practice guideline focused only on the use of 'physical' restraints. Previous research shows that restraint use in home care can involve more than just physical restraints (e.g. adaptation of house, forced or camouflaged medication administration, locking the house) (Scheepmans et al., 2014, 2017).

PRACTICAL IMPLICATIONS

Evidence from the residential setting shows that a guideline alone is insufficient to reduce restraints at home and that the success of reducing physical restraint use in the long term depends on a multi-component approach such as policy change, leadership, education, expert consultation and awareness of available of alternatives to restraint use (Gulpers et al., 2011; Köpke et al., 2012). Indeed, to reduce the use of physical restraints, it is important, among other things, that healthcare providers be sensitized to the impact and consequences for the patients and that the organization facilitate the implementation of the guideline. This requires additional investments on different levels (e.g. availability of alternatives, a clear policy about restraint use, organization of regular multidisciplinary meetings).

CONCLUSION

The current guideline is the first validated evidence-based guideline for reducing the use of physical restraints at home. Updates based on new evidence and investments in its implementation will indicate the potential of the guideline.

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CHAPTER 7: OVERALL DISCUSSION

Restraint use is a complex intervention. Evidence from acute and chronic residential settings shows that restraint use has many negative consequences. Patients experience physical (e.g. incontinence, decubitus ulcers), psychological (e.g. depression, anger, agitation) and social (e.g. social isolation) consequences (Evans et al., 2003; Hamers & Huizing, 2005; Hofmann & Hahn, 2014). In addition, the family and healthcare workers are also affected by the use of restraints, as family members are likely to suffer inner conflicts and mixed emotions such as frustration and guilt (Newbern and Lindsey, 1994; Saarnio and Isola, 2009; Gastmans and Milisen, 2006) while denial, anger and worry may afflict the healthcare workers who are involved with such procedures (Saarnio and Isola, 2010). Due to current demographic evolutions, there is a growing demand for home care, resulting in an increasing number of frail older persons living at home (Hoeck et al., 2011). Despite the fact that healthcare workers are faced with an increasing demand for restraint use in home care, research about restraint use in home care is scarce.

The current explorative dissertation encompasses two overall goals: 1) gaining in-depth insight into the use of restraints in the home care setting; and 2) developing a clinical practice guideline with regard to the use of physical restraints in home care, to help homecare providers to reduce the use of restraints. Four research questions are addressed to achieve the first general objective. These results are integrated into the development of the clinical practice guideline (second objective).
First, a qualitative study was conducted to gain insight in the nurses' experiences about restraint use in Flemish home care. Because of the pivotal role of nurses in home care and their intensive interactions with patients, family members and other healthcare workers, home care nurses are in an excellent position to provide relevant information about restraint use in home care. We performed in-depth interviews by using a semi-structured questionnaire and conducted a thematic analysis using the Qualitative Analysis Guide of Leuven (Dierckx de Casterlé et al., 2012). The results suggest that restraint use in home care is even more complex than in the residential setting. According to the participants, restraints are regularly used in home care, mostly with older persons with cognitive impairment, who sometimes live alone and without continuous supervision. The family seems to play an important role in the decision-making process and in the reasons why restraints are used. During the interviews, we noted a lack of clarity about the concept but, at the same time, an increasing awareness among the nurses about the use of restraints in home care and its impact (Scheepmans et al., 2014).

Second, the results of the qualitative study and additional literature contributed to the development of a questionnaire consisting of 18 items on demographic, clinical and context variables, used for a large survey study (n = 6,397). The aim of this survey was to acquire more detailed information about restraint use in home care. Overall, restraints were used in 1 out of 4 patients with home care, mostly on a daily basis and often for a long period. The most common reason for restraint use was safety. Specific reasons were the patient's wish to remain at home as long as possible, the desire to delay an admission in a nursing home and respite for the informal caregiver. The family in the first place and the nurses in the second place play an important role in the decision and application process. The physician was less involved. In most of the cases, there was no (systematic) evaluation and registration after restraint use was initiated (Scheepmans et al., 2017).

Third, we used the data of the survey study to determine the associated factors of restraint use in home care. Using a binary logistic regression model with generalized estimating equations, we identified patient-related (e.g. dependence in ADL, cognitive impairment, behavioral problems, poor mobility and fall history/risk of falling) and non-patient-related factors (e.g. presence and wellbeing of informal caregiver, supervision). The analysis revealed that the patient-related factors associated with restraint use are characteristic for frail, older adults living at home (e.g. cognitive decline, ADL dependency, poor mobility). The positive association of non-patient-related factors, more specifically the feelings of sadness, anger and depression of the informal caregiver and his/her dissatisfaction with family support, underlines the important role of the informal caregivers and the need to adequately support them.

We searched the literature systematically from inception to the end of April 2017. We started this PhD project with a literature review to prepare the above-mentioned qualitative study thoroughly. During the course of the different studies, the literature was continuously consulted and updated. The review showed that, unlike current evolutions in home care, research about restraint use in home care is still scarce and relatively new. The lack of a clear definition and operationalization of restraint use in home care complicated a clear overview of the empirical evidence. Nonetheless, the review clearly confirmed the use of restraints in home care and the specificity of the home care setting regarding restraint use. Specific types (e.g. locking and adaptation of the house) and reasons (e.g. patient's wish to remain at home as long as possible, delay of nursing home admission and need to provide respite for an informal caregiver) occur in home care. In contrast to the family, which plays an important role in home care, the general practitioner is less involved. The results of the review indicated that the wealth of insights from research in the residential setting cannot be simply transferred to the home care setting and that specific research in home care with regard to this subject is necessary.

Based on all these results and insights, we developed a clinical practice guideline for the use of physical restraints in home care in order to support healthcare providers in reducing its incidence. A multidisciplinary working group with representatives of healthcare professionals (e.g. home nurses, general practitioners, domestic aids) and representatives of patients and informal caregivers was put together. This working group was actively involved in determining the purpose and the target group of the guideline and the six clinical questions to be answered by the guideline. Existing guidelines about the use of physical restraints were identified and a literature search was performed according to the clinical questions. The knowledge about restraint use available from the residential setting was translated to the home care setting in cooperation with the researchers and the working group. The guideline was developed using the consensus procedure, following the AGREE II guidelines (Agree Next Steps Consortium, 2009) and by consulting external experts. This resulted in a practice guideline including 10 key recommendations based on the classification of GRADE (Van Royen, 2008) and a flowchart to deal with situations where restraint use is requested, considered or already present (Scheepmans et al., 2016). The guideline was validated (15/10/2015) by the Belgian Centre for Evidence-Based Medicine, Belgian Branch of the Dutch Cochrane Centre (http://www.cebam.be).

REFLECTIONS ON THE MAIN FINDINGS

This PhD research reflects the **complexity of restraint use in home care**. Not only are restraints regularly used with vulnerable older persons at home; in addition, healthcare providers seem to be insufficiently aware of the concept of restraints and, as a consequence, about their frequent use in clinical practice and negative impact on the patient. At the same time, the results of the different studies suggest that nurses often find themselves in complex situations because of their position between opposing needs and the various interests of the different actors involved (e.g. between the nurse and informal caregiver, patient and informal caregiver, nurse and the home care organization they are working for). This may explain nurses' experience of moral distress when confronted with restraint demands or use (de Veer et al., 2013). This doctoral research revealed a number of ethical dilemmas contributing to the complexity of restraint use in home care. The use of restraints to relieve the family or to keep a patient at home longer and the lack of consensus about good care between the family and the nurses (involving the risk of lower quality of care) are examples that underline the ethical challenges of restraint use in home care. Moreover, the use of restraints and how to deal with them properly is insufficiently embedded within a clearly defined policy.

The current legal framework seems to be inadequate to provide clear guidance for clinical practice in home care. In Belgium there is no specific legislation regulating the use of (physical) restraints. However, isolation or restraining a patient is a deprivation of freedom and is prohibited. Certain articles (i.e. article 12 of the Belgium Constitution , article 5 of the European Convention for the protection of Human Rights (2010)) are related to the use of restraints. Together with the Patient Right's law in Belgium (2002) they form the basic principles and need to be taken into account when dealing with restraints. In Belgium only nurses and physicians may apply restraints.

A limited search in literature suggests that legislation and/or diverse regulations may limit the use of restraints (i.e. Omnibus Reconciliation Act

of 1987 (USA); Adults with incapacity Act 2000, Regulation of Care Act 2001 (Scotland); Joint Commission on Accreditation of Healthcare organizations (USA), Human Rights Act 1998 (Scotland, UK)) but that it's difficult to get an overall overview about its full impact; moreover, legislation seems to be mainly focused on the residential setting (i.e. nursing homes, hospitals and psychiatry) (Hamers & Huizing, 2005, Royal College of Nursing, 2008; Mental Welfare Commission for Scotland, 2013). For instance, restraint use in Norway is forbidden but caregivers are allowed to secure patients from danger; according to Kirkevold et al. (2004) restraints are widely used in Norway because of the absence of a special health and social legislation to regulate its use. Besides legislation, there are also international nursing guidelines (i.e. Köpke et al., 2012; Joanna Briggs Institute, 2002; Royal College of Nursing, 2008) dealing with restraint use, also mostly for the residential setting. Common between those different legislations and guidelines seems to be the impact of the European Convention on Human Rights (2010) as an important principle for dealing with restraint use (i.e. informed and voluntary consent).

Although the literature suggests that legislation can have an impact on restraint use in clinical practice (Hamers et al., 2005, Kirkevold et al., 2004), recent studies have indicated that legislation alone is insufficient to reduce or avoid restraint use (Köpke et al., 2012; Gulpers et al., 2011) and that research about this topic is lacking in home care.
Taking into account the current evolutions in home care and the negative consequences of the use of restraints (Evans et al., 2003; Hamers and Huizing, 2005; Hofmann and Hahn, 2014; Newbern and Lindsey, 1994; Saarnio and Isola, 2009, 2010; Gastmans and Milisen, 2006), these findings pose serious challenges for home care.

Restraints are regularly used in home care (i.e. in 1 out of 4 patients), mostly on a daily basis and often for a long period. This daily and prolonged use of restraints is also seen in residential settings (Saarnio and Isola, 2009; Hamers et al., 2004). A broad variety of types of restraints are used (Scheepmans et al., 2014, 2017). Besides the classic devices which are also used in hospitals and residential settings (e.g. bedrails, belts) (Hoffman and Hahn, 2014), specific measures such as locking the front door of the house or adaptation of the house also occur. Invasive measures such as the use of a restraint vest and ankle and wrist ties also exist but are less commonly used. Our results suggests that, besides professional devices, also nonprofessional materials (e.g. rope, trousers belt) and techniques (e.g. removing the door handle on the inside) are used to limit the freedom of a person at home. The use of these nonprofessional devices and techniques in combination with the lack of knowledge and awareness of the family about restraints and their negative consequences (Kurata and Ojima, 2014) is a worrisome finding.

Furthermore, our studies found characteristics indicating that restraint use at home is mainly applied to **vulnerable older persons**. In addition to the classic risk factors found in residential settings (e.g. poor mobility, cognitive impairment, increased dependency, polypharmacy) (Hofmann and Hahn, 2014; Meyer et al., 2009), the current studies indicate specific risk factors addressing this vulnerability, referring to the patient's social network (e.g. a decreased wellbeing of the informal caregiver or burden of these persons).

The **prominent role of informal caregivers** in the use of restraints at home is another important point raised in this PhD dissertation. Informal caregivers are the ones who most often apply restraint measures or give permission for their use. These findings raise some concerns, first because research indicates that informal caregivers have less knowledge about the negative consequences of restraint use than professional home care workers (Kurata and Ojima, 2014; Kanski et al., 1996) and also have a more positive perception of its use (Haut et al., 2010). Second, our findings suggest the burden of the informal caregiver as one of the reasons that restraints are at home. Indeed, they are also most involved in the decision-making process. Taking these concerns into account, it is important that nurses and other healthcare providers pay attention to the well-being of the informal caregivers and involve them from the beginning in the multidisciplinary decision-making process. Third, until very recently in Belgium, only nurses and physicians were allowed to use restraints, and this only in exceptional circumstances. As a consequence, in most cases restraint use by informal caregivers was illegal. Since the revision of the Belgian health law in 2015 ('Wet betreffende de uitoefening van de gezondheidszorgberoepen, gecoördineerd op 10/5/2015, art 124, 1°'), the nurse or the physician may delegate a nursing activity such as the use of physical restraints to an informal caregiver, but only under certain conditions. This adjustment offers opportunities to provide better quality of care and prevents informal caregivers from illegally practicing nursing activities. However, it is the nurses' and physicians' responsibility to estimate if they can delegate physical restraint use and to support the informal caregivers to deal with it in a proper way.

Nurses play a **pivotal role** in the use of restraints in the residential setting (Hantikainen and Käppeli, 2000; Möhler and Meyer, 2014) and the current results confirm this in the home care setting. At the same time, our results suggest that nurses are not always aware of restraint use and their impact (Scheepmans et al., 2014). There is also a **lack of a clear policy** about restraint use in the home care organization, which may explain the lack of systematic documentation and evaluation of its use (Scheepmans et al., 2017). Moreover, home care nurses typically act alone, the team not being present in the patient's home. All these aspects underline the importance of sensitizing, educating and supporting healthcare providers with a clear policy about (the reduction of) restraint use. These results further underline the need for a validated practice guideline (Scheepmans et al., 2016) and the need to implement and evaluate this guideline.

METHODOLOGICAL ISSUES

We used a multimethod approach (Tashakkori & Teddlie, 2003) which encompasses the combination of different research designs (i.e. qualitative explorative study, large survey study, systematic review, methods for guideline development) and corresponding analysis techniques. This approach allowed for investigating restraint use in home care thoroughly and in depth (i.e. qualitative study) and in general (i.e. descriptive survey, regression analysis of the associated factors, systematic review). The added value of the multimethod approach was the phased progress of this PhD research which implies that the gained insights from each study were gradually used in the following studies; and ultimately also in de development of the guideline. Furthermore, we focused on older persons aged 60 and older receiving professional home care, regardless of their cognitive functioning. The multimethod approach revealed the complexity of restraint use in home care and exposed some specific concerns. The scientific evidence of the different studies supplemented by the experts and the multidisciplinary working group were of high relevance for the development of the evidence-based practice guideline. Besides a better understanding of restraint use in the Flemish home care, this multimethod approach should enrich the limited international literature about restraint use in home care.

The overall limitation of this PhD dissertation is the lack of a clear conceptualization of restraint use, as expressed in the lack of a consistent definition and operationalization of the concept. This ambiguity was present in every study and complicated the analysis of the different studies. A broad concept of restraints was used in the qualitative study to explore the meaning of restraints in the home care setting fully. The qualitative findings support the hypothesis that an expanded definition is needed to further explore restraint use in home care; its absence resulted in the use of a broad definition in our survey study. Because of the complexity of restraint use in home care, the multidisciplinary working group decided to limit the focus of the guideline to the use of 'physical' restraints. During the course of our research work, a new international consensus definition of physical restraints was published (Bleijlevens et al., 2016). Unfortunately this definition was only available after we finished our studies and the development of the guideline. However, taking into account the results of our qualitative study and the characteristics of the (Flemish) home care setting, it is uncertain whether this definition would have contributed to a better understanding of restraint use in our research population. The new definition focusses on actions and devices that are attached or adjacent to a person's body (i.e. physical aspects) while our current research indicates restraint use in home care as a much broader concept (i.e. limitation of freedom). Involuntary treatment, which is another recent concept described by Hamers et al. (2016), referring to the use of physical restraints, psychotropic medications and non-consensual care (e.g. forced or hidden medications, forced hygiene, restricting communication, confining a person, removing aids) has a broader scope that may be used as a starting point for future research in the home care setting.

In literature there are different definitions and descriptions for defining the concept of 'restraints'. These definitions differ from each other by the included dimensions resulting in a broader or more narrow scope of research with different kinds of generalizations. Common characteristics of the three different concepts referred to in this PhD project ('restraints', 'physical restraints' and 'involuntary treatment') are that they all include the physical restraint aspect, they emphasize the intentional and deliberated aspect within the restriction of a person and refer to the impact of its application on the involved person.

The consensus definition (Bleijlevens et al., 2016) focuses on one dimension, namely the act of physical restraints and primarily on devices that are attached or adjacent to a person's body. However, distinguishing between an environmental or physical restraint is difficult based on this definition; as mentioned by the authors themselves (Bleijlevens et al., 2016).

The concept of involuntary treatment is defined as 'treatment that professional and family caregivers provide without the consent of the person receiving the treatment' and includes the following three dimensions: the use of physical restraints, psychotropic medication, and nonconsensual care, which are all clarified on the basis of a list of examples (Hamers et al., 2016, p. 354). The broad scope of 'restraint measures' in this concept can be an added value in home care. However, looking more into detail on the different listed examples of this concept and its dimensions, a greater clarity about the content of the dimensions and the addition of an environmental dimension could add value to this concept. Surely, some could object that the dimension 'nonconsensual care' wherein removing aids or confining a person is included, is quite similar to the general concept of involuntary treatment. It is our opinion that those two acts are better incorporated in perhaps a fourth dimension (e.g. in the environmental dimension).

The definition of restraints used in this PhD project defines restraints as 'devices and all actions that healthcare workers or informal caregivers performed and restricted the individual's freedom in some way' (Scheepmans et al., 2014, 2017). This definition contains some characteristics that are also present in the concept of involuntary treatment (Hamers et al., 2016); i.e. including the healthcare workers and informal caregivers who provide restraint use. Furthermore, it has also a broad scope of 'restraint measures'. However, a classification in different dimension of the measures is missing.

Regardless the definition used and its dimensions, healthcare providers need to be aware that both, the direct physical interventions and the 'softer methods of limiting freedom' such as not providing someone with a walking aid, can be seen as having a restraining effect on the freedom of a person (Royal College of Nursing, 2008; Mental Welfare commission Scotland 2013).

Another limitation in our empirical research is the lack of perspectives of other stakeholders besides nurses, although such stakeholders were involved in the development of the practice guideline. The findings that the informal caregivers play an important role and that the general practitioners are less involved emphasize the importance of further exploring their perspectives on the use of restraints. Also, the perspective of the persons being restrained is missing in this research; more qualitative research with a more diverse group of persons involved, including the patients, might have resulted in a more refined understanding of restraint use at home.

For clinical practice

The results of this PhD dissertation indicate that healthcare providers need to be supported in dealing with the complex problem of restraint use at home.

A common and clear policy within the home care setting about restraint use needs to be developed. Two cornerstones, evidence- and ethics-based, constitute the basis for the framework of this policy whose aim is to support nurses and other healthcare providers in dealing with an increasing demand for restraint use in clinical practice. Principles of our validated practice guideline such as comprehensive assessment, consultation and communication among all involved persons and multidisciplinary decision making (Scheepmans et al., 2016) need to be integrated within this policy. Given the prominent role of informal caregivers and the difficult circumstances they often have to face, healthcare organizations need to give special attention to the support of informal caregivers.

Moreover, ethical aspects need to be explicitly addressed in this policy. This requires a critical reflection of healthcare organizations about good home care, the limits / boundaries of home care (e.g. situations where use of restraints can cross the line into elder abuse), the role and responsibility of the healthcare providers and the translation of all these considerations into an institutional policy. These ethical considerations will support healthcare providers in dealing with the many ethical dilemmas they are confronted with in considering or using restraint in home care (e.g. wellbeing of the patient versus wellbeing of the informal caregiver, the desire of the patient versus burden on the informal caregiver, request of the informal caregiver versus vision of good care within the organization).

Furthermore, it is the responsibility of home care organizations to translate and implement the guideline into daily clinical practice. Evidence from the residential setting shows that the success of reducing physical restraint use in the long term depends on the combination of different factors of approach such as the implementation of the policy change (e.g. prohibition of certain devices, written and oral communication regarding the changed policy), leadership, education, expert consultation and the availability of alternatives for restraint use (Gulpers et al., 2011; Köpke et al., 2012). Based on the results of this PhD research, sensitizing and educating healthcare providers to increase their awareness and competence and supporting informal caregivers are key elements in a multicomponent approach to reducing physical restraints in home care.

Finally, implementation of evidence based standard care in home care should be emphasized in home care policy. A profound assessment of the patient and his home care situation, with regular follow-up of his cognitive and physical functioning, multidisciplinary meetings with all involved persons taking into account the patients' needs and preferences, the use of evidence based guidelines for topics related to an increased risk of restraint use (i.e. guidelines for delirium management and falls prevention), are all good practice principles that can prevent or contribute to the reduction of restraint use. These standard of care principles are a cornerstone and crucial in each profession and need therefor to be implemented in daily care practice.

For future research

There is an urgent need for more research, taking into account the frequent use of restraints in the home care setting, the specificity of this setting, the scarcity of available empirical findings and the methodological limitations in this field of research.

A clear definition of the concept of restraints is necessary for uniform use in national and international research. Having a clear definition will help to increase awareness of healthcare providers and consequently can be a first step in reducing the use of restraints. In the search for a clear definition, the results of this PhD research suggest a definition that takes into account the specificity of the home care setting (e.g. the important role of the informal caregiver). Furthermore, it seems important to use a broad description of restraint use like the definition used in our own studies (e.g. any actions performed by healthcare workers and/or relatives that restrict the patient's freedom to some extent). If further specification is necessary, it seems enlightening to distinguish, for example, physical restraints (according to the new consensus definition, Bleijlevens et al., 2016) from chemical restraints (Mott et al., 2005), environmental restraints and non-consensual care (Hamers et al., 2016).

A better understanding of restraint use in home care requires further research into the perspectives of restraint use of other involved persons. More insight into the experiences of families who care for frail older persons is necessary to understand their perspective on the use of restraints and how they can be better supported.

A better understanding of the experience of being restrained by exploring the older persons' perspectives can support the decision-making process about restraint use. The perspectives and expectations of other involved healthcare providers about restraint use and on how to work together (as mentioned in the practice guideline) need further exploration, more specifically the perspectives from the general practitioner who appears to be less involved in the decision-making process despite his pivotal role. The use of a qualitative research approach is preferred because it allows an in-depth analysis of this complex field of research.

The effect of the implementation of the practice guideline needs to be evaluated as well. Indeed, further research on intervention and implementation is necessary to develop a program that will support healthcare providers in the use of practice guidelines, with the ultimate goal of reducing restraint use in home care. Furthermore, the practice guideline stipulates that there should be increased supervision when restraints are used. Because of the specificity of the homecare setting and the current evolutions (i.e. possible decrease of available informal caregivers) (Vermeulen and Declercq, 2011), more insights are necessary with regard to which way domotics and other ICT devices can have a supporting role in providing supervision.

Finally, given that restraints should only be used as a last resort, research on alternatives to restraint use in home care is urgently needed.

OVERALL CONCLUSION

This PhD dissertation has explored the use of restraints in home care and developed a practice guideline to reduce its incidence. The results indicate that restraint use in home care is a complex issue with important implications for all involved persons, especially for older patients, who are one of the most vulnerable groups in our society. Taking into account the current evolutions, this group of vulnerable older persons will increase. Respecting the dignity and integrity of older persons, therefore, requires an increasing critical awareness and ethical thoughtfulness on the part of healthcare providers. Therefore, investment in their education is needed, with specific attention for supporting informal caregivers. Taking into account the complexity of the home care setting, there is an urgent need for effective multidisciplinary cooperation and further research in this setting.

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CHAPTER 8:

SUMMARY

SUMMARY

Due to demographic, economic and technological evolutions and the preference of patients to stay at home as long as possible, there is a growing demand for home care. As a result, there are an increasing number of frail older persons living at home despite major cognitive disturbances and functional disabilities, conditions known to be associated with an increased use of restraints. These trends confront healthcare workers with an increased use of restraints in home care. Despite the indications that restraints are used in home care, research about the prevalence, the types being used, the way how restraints are used and the associated factors to use restraints in home care is scarce.

The general aim of this explorative dissertation was to gain in-depth insight into the use of restraints in the home care setting and to use and integrate these insights to develop an evidence based clinical practice guideline to support healthcare providers in decreasing the use of restraints in home care.

We started with a qualitative study, using semi-structured interviews to explore nurses' experiences about restraint use in Flemish home care. The interviews indicated a lack of clarity among nurses about the concept of restraints in home care and the use of lots of different types of restraints. Cognitively impaired older persons, who sometimes lived alone, seemed to be restrained or locked up without continuous follow-up. The patient's family seemed to play a prominent role in the decision making process to use restraints. According to the nurses, safety of the patient was the most common reason to use restraints. Other reasons for using restraints according to the interviewees included "providing relief to the family" and "keeping the patient at home as long as possible to avoid admission to a nursing home." The nurses stated that general practitioners had no clear role in deciding whether to use restraints.

Next, we conducted a cross-sectional survey of restraint use in older adult home care patients (n= 6397). For each patient, nurses completed a new validated questionnaire consisting demographic and clinical/behavioral information and aspects of restraint use. Restraints were used in 1 out of 4 patients with home care, mostly on a daily basis and often for a long period of time. The survey study confirmed what was already indicated in the qualitative study namely that the most common reason for restraint use was safety and that specific reasons were the patient's wish to remain at home as long as possible, the desire to delay an admission in a nursing home and respite for the informal caregiver. The family in the first place and the nurses in second place, played an important role in the decision and application process. The physician was less involved. In most of the cases, there was no (systematic) evaluation and registration after restraint use was initiated.

We used the data of the survey study to determine the associated factors of restraint use in home care. Using a binary logistic regression model with generalized estimating equations, we identified patient and non-patient-related factors. Multivariate logistic regression indicated that restraint use was associated with the following patient related factors: dependency in ADL-activities (i.e. eating, difficulties in transfer and continence), perceived risk of falling in the nurses' clinical judgement, behavioural problems (daily and less than daily), patient's cognitive impairment and polypharmacy. Nonpatient-related factors associated with the use of restraints are supervision, decreased well-being of the informal caregiver, the informal caregiver's dissatisfaction with family support.

Finally, we conducted a systematic review according to the PRISMA guideline. Eight studies were reviewed (one qualitative, seven quantitative) ranging in quality from moderate to high. The review indicated there was no single, clear definition of restraint. The prevalence of restraint use ranged from 5% to 24.7%, with various types of restraints being used. Families played an important role in the decision-making process and the application of restraints; general practitioners were less involved. Specific reasons, other than safety for using restraints in home care were noted (e.g. delay to nursing home admission; to provide respite for an informal caregiver). Contrary to the current socio demographical evolutions resulting in an increasing demand of restraint use in home care, research on this subject is still scarce and recently. The limited evidence however indicates our point to the challenging complexity and specificity of home care regarding restraint use.

The results of the above mentioned studies supported the development of a clinical practice guideline about the use of physical restraints in home care in order to support healthcare providers in reducing restraint use in home care. A multidisciplinary working group with representatives of healthcare professionals and representatives of patients and informal caregivers was organized and was actively involved in the development of the guideline. Existing guidelines about the use of physical restraints were identified and a literature search was performed according to the clinical questions. The guideline was developed using the consensus procedure, following the AGREE II guidelines and by consulting external experts. This resulted in a practice guideline including 10 key recommendations based on the classification of GRADE and a flowchart to support healthcare providers dealing with situations where restraint use is requested, considered or already present. The guideline was validated by the Belgian Centre for Evidence-Based Medicine; Belgian Branch of the Dutch Cochrane Centre.

The results of the PhD dissertation indicate that restraint use in home care is a complex issue with important implications for all persons involved in the care situation, especially for the older patients, who are one of the most vulnerable groups of our society. Taking into account the current evolutions, this group of vulnerable older persons will increase. Respecting the dignity and integrity of the older persons requires an increasing critical awareness and ethical thoughtfulness of healthcare providers. Therefore, investments in their education is needed, with specific attention for supporting informal caregivers. Taking into account the complexity of the home care setting, there is an urgent need for effective multidisciplinary cooperation and further research in this setting.

NEDERLANDSTALIGE SAMENVATTING

Door de demografische, economische en technologische evoluties en doordat steeds meer mensen verkiezen om zo lang mogelijk thuis te blijven, stijgt de vraag naar thuiszorg. Een gevolg hiervan is een toename van het aantal kwetsbare ouderen die ondanks hun cognitieve en of functionele beperkingen, thuis wonen. Hierdoor zullen zorgverleners in toenemende mate geconfronteerd worden met het gebruik van vrijheidsbeperkende maatregelen in de thuiszorg gezien patiënteneigenschappen zoals verminderde cognitie en functionele beperkingen hiermee geassocieerd zijn. Ondanks de indicaties dat vrijheidsbeperkende maatregelen aanwezig zijn in de thuiszorg, is onderzoek in dit domein en meer in het bijzonder over het voorkomen ervan, het soort maatregelen, de wijze waarop zij worden gebruikt alsook de risicofactoren, schaars.

Het algemeen doel van dit verkennend doctoraat is om een diepgaand inzicht te verkrijgen in het gebruik van vrijheidsbeperkende maatregelen in de thuiszorg. Daarnaast wil dit doctoraatsonderzoek de verworven inzichten uit de verschillende studies gebruiken om een evidence-based praktijkrichtlijn te ontwikkelen om zorgverleners te ondersteunen in het verminderen van het gebruik van fysieke fixatie in de thuiszorg.

We startten het doctoraatsonderzoek met een kwalitatieve studie om de ervaringen van Vlaamse thuisverpleegkundigen bij het toepassen van vrijheidsbeperkende maatregelen te onderzoeken met behulp van semi-gestructureerde diepte interviews. De interviews geven aan dat thuisverpleegkundigen geen eenduidige invulling kunnen geven van het begrip en dat er in de thuiszorg veel verschillende soorten maatregelen worden gebruikt. Vrijheidsbeperkende maatregelen blijken vooral te worden toegepast bij oudere personen met cognitieve stoornissen, die soms alleen wonen. Daarnaast blijkt de familie een prominente rol te spelen bij de besluitvorming rond het gebruik van deze maatregelen. Volgens de thuisverpleegkundigen is veiligheid de voornaamste reden om vrijheidsbeperkende maatregelen toe te passen. Andere redenen zijn het ontlasten van de mantelzorger en een persoon zo lang mogelijk thuis laten om een opname in een woonzorgcentrum te voorkomen. Volgens de verpleegkundigen hebben huisartsen een minder uitgesproken rol bij de besluitvorming rond het gebruik van vrijheidsbeperkende maatregelen.

Vervolgens werd een cross-sectionele studie uitgevoerd over het gebruik van vrijheidsbeperkende maatregelen bij oudere patiënten met thuiszorg (n=6397). De verpleegkundigen vulden voor elke patiënt een nieuwe gevalideerde vragenlijst, bestaande uit zowel demografische, klinische en gedragsinformatie en aspecten met betrekking tot het gebruik van vrijheidsbeperkende maatregelen. Eén op vier patiënten wordt thuis in zijn vrijheid beperkt, meestal dagelijks en vaak voor een lange periode. De survey studie bevestigt wat reeds in de kwalitatieve studie werd aangehaald namelijk dat veiligheid de meest voorkomende reden is om vrijheidsbeperkende maatregelen te gebruiken. Het ontlasten van de mantelzorger, de wens van een patiënt om zo lang mogelijk thuis te blijven en als alternatief voor een opname in een woonzorgcentrum, blijken ook uit deze studie specifieke redenen te zijn om vrijheidsbeperkende maatregelen in de thuissetting te gebruiken. De familie in de eerste plaats en vervolgens de verpleegkundigen spelen een belangrijke rol in de besluitvorming en passen deze maatregelen het meeste toe. De huisarts is minder betrokken en in de meeste gevallen is er geen systematische evaluatie en registratie eens deze maatregelen zijn geïnitieerd.

De data van de survey studie werden gebruikt om de risicofactoren te bepalen voor het gebruik van vrijheidsbeperkende maatregelen in de thuiszorg. We gebruikten hiervoor een binaire logistisch regressie model met gegeneraliseerde schattingsvergelijkingen en identificeerden patient- en niet-patiëntgerelateerde factoren. Patiëntgerelateerde factoren voor het gebruik van vrijheidsbeperkende maatregelen verwijzen naar de karakteristieken van kwetsbare thuiswonende ouderen zoals cognitieve problemen, ADL afhankelijkheid, verminderde mobiliteit. Niet-patiëntgerelateerde factoren die geassocieerd zijn met het gebruik van vrijheidsbeperkende maatregelen zijn toezicht, een verminderd welzijn van de mantelzorger en ontevredenheid van de mantelzorger met de steun die hij/zij krijgt van familie en vrienden.

Tenslotte voerden we een systematische review uit volgens de PRISMA richtlijnen. Acht studies (een kwalitatieve, zeven kwantitatieve studies) van gemiddelde tot hoge kwaliteit werden geïncludeerd in de review. De review geeft aan dat er geen eenduidige definitie is van vrijheidsbeperkende maatregelen. De prevalentie varieert van 5 tot 24.7% en verschillende soorten maatregelen worden gebruikt. De familie speelt een belangrijke rol in het besluitvormingsproces en het toepassen van vrijheidsbeperkende maatregelen. Huisartsen zijn minder betrokken. Ook uit de review blijkt dat er, naast veiligheid, specifieke redenen gehanteerd worden om vrijheidsbeperkende maatregelen in de thuissetting te gebruiken (uitstellen van een opname in een woonzorgcentrum, het ontlasten van de mantelzorger). De review toont aan dat in tegenstelling tot de huidige socio-demografische evoluties die resulteren in een stijgende vraag naar vrijheidsbeperkende maatregelen in de thuiszorg, onderzoek over dit onderwerp nog steeds schaars en recent is.

De inzichten van de bovenvermelde studies hebben bijgedragen aan de ontwikkeling van een klinische praktijkrichtlijn over het gebruik van fysieke fixatie in de thuiszorg om zorgverleners te ondersteunen in het streven naar een fixatie-arme thuiszorg. Hiervoor werd een multidisciplinaire werkgroep opgericht bestaande uit vertegenwoordigers van zorgverleners, patiënten en mantelzorgers die actief betrokken was bij de ontwikkeling van de richtlijn. De ontwikkeling gebeurde aan de hand van de consensusprocedure, de AGREE II richtlijn en met behulp van externe experten. De praktijkrichtlijn bestaat uit tien kernaanbevelingen die werden opgesteld aan de hand van de classificatie van GRADE en een stroomdiagram dat hulpverleners ondersteunt om met situaties waar vrijheidsbeperkende maatregelen worden gevraagd, overwogen of reeds aanwezig zijn, om te gaan. De richtlijn werd gevalideerd door het Belgisch Centrum voor Evidence Based Medicine.

De resultaten van deze doctoraatsthesis geven aan dat het gebruik van vrijheidsbeperkende maatregelen in de thuiszorg een complex probleem is met belangrijke implicaties voor alle betrokken personen en vooral voor de kwetsbare ouderen in onze samenleving. Rekening houdend met de huidige evoluties zal deze groep van kwetsbare ouderen nog toenemen. Het respecteren van de waardigheid en integriteit van oudere personen vereist van zorgverleners een toenemend bewustzijn omtrent het gebruik van vrijheidsbeperkende maatregelen en een zorgvuldige, kritische en ethisch gefundeerde omgang met deze problematiek. Daarom zijn investeringen in opleiding van zorgverleners nodig, met specifieke aandacht hierbij voor het ondersteunen van mantelzorgers. De bevindingen van de studie onderstrepen tenslotte de nood aan meer effectieve multidisciplinaire samenwerking in de thuiszorg en aan verder onderzoek over het gebruik van vrijheidsbeperkende maatregelen in deze setting.

CHAPTER 9:

PROFESSIONAL CAREER AND LIST OF PUBLICATIONS

PROFESSIONAL CAREER

Kristien Scheepmans was born on April 13, 1976 in Leuven, Belgium. She achieved her bachelor degree in Nursing at the Katholieke Hogeschool Leuven (1997) and obtained a Master degree in Nursing Science at the KU Leuven in 2001. In 2003 she finished her University Teacher Education (Academische lerarenopleiding) at the KU Leuven.

After graduation, she started working in September 2001 as a home care nurse at 'De Bres', an organization for home nursing at Vilvoorde. In February 2002 she worked fulltime as a nurse in the Europe Hospitals (St-Michel in Etterbeek, Belgium) at the surgical department. Since November 2003 she is a nursing staff member in the nursing department of the Wit-Gele Kruis van Vlaanderen, an organization for home nursing in Flanders, Belgium. She is mainly involved in research activities related to continuity of care. From July 2008 until January 2012, she worked as a research assistant at Lucas – Centre for Care Research and Consultancy at the KU Leuven, focusing on the profile of the professionally active informal caregiver (part of the Flemish Elderly Care Study). In October 2011, she started the PhD training at the Doctoral School of Patient Related and Public Health Research at the Faculty of Medicine of the KU Leuven and started working as a research assistant at the Academic Centre for Nursing and Midwifery (30%). The focus of her PhD was to explore the use of restraints in home care. In 2012, she enrolled the three-year summer school of the European Nursing Academy for Nursing Sciences, which she finalized in 2014. Since then she is a member of the European Academy of Nursing Science. In 2012, Kristien Scheepmans received 'the Best Oral Presentation Prize' of the Belgian Association for Gerontology and Geriatrics. In 2015 she successfully achieved the course of legal expert in nursing. Since June 2017 she is coordinator of a research project to develop and evaluate a multicomponent implementation program for the practice guideline "aiming for a restraint reduction in home care".

LIST OF PUBLICATIONS

International peer reviewed publications

- **Scheepmans, K.**, Dierckx de Casterlé, B., Paquay, L., Milisen, K. Reducing physical restraints in home care: development of an evidence based guideline (Submitted to Journal of Advanced Nursing – January 2018).
- **Scheepmans, K.**, Milisen, K., Vanbrabant, K., Paquay, P., Van Gansbeke, H., Dierckx de Casterlé, B. Factors Associated with Use of Restraints on Older Adults with Home Care: A Cross Sectional Study. (Submitted to International Journal of Nursing Studies -2017).
- **Scheepmans, K.**, Dierckx de Casterlé, B., Paquay, L., Milisen, K. (2017) Restraint use in older adults in home care: a systematic review. International Journal of Nursing Studies, 23;79:122-136. doi: 10.1016/j.ijnurstu.2017.11.008.
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- Cordyn S., Tobing E., **Scheepmans K.**, Van Gansbeke H. Thuisverpleging in België. Kluwer (2009).
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- “Fixatie moet het laatste redmiddel zijn” in Zorgmagazine (April 2017), p 22-23
- “Gefixeerd op vrijheid” in Bodytalk, 115, (Mei 2017), p 20-22.
- “Streven naar fixatiearme thuiszorg” in Artsenkrant – Speciaal Wit-Gele Kruis, nr. 2500 (16 juni 2017), p 5.

Abstracts, posters and presentations

- **Scheepmans K.,** Dierckx de Casterlé B., Paquay L., Van Gansbeke H., Milisen K. (2012). De ervaringen van het toepassen van vrijheidsbeperkende maatregelen: een kwalitatieve studie. Tijdschrift voor Gerontologie en Geriatrie, vol. 43 (1). 35ste Wintermeeting van de Belgische Vereniging voor Gerontologie en Geriatrie (BVGG), Ostend, Belgium, March 2-3, 2012.
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CHAPTER 10:

SCIENTIFIC ACKNOWLEDGEMENTS, PERSONAL CONTRIBUTION AND CONFLICT OF INTEREST STATEMENTS

SCIENTIFIC ACKNOWLEDGEMENTS

This dissertation summarizes research articles published in international, peer-reviewed journals and pre-published manuscripts. In this acknowledgement section, an overview of all contributors of the different manuscripts is given.

Chapter 2: Restraint use in home care: a qualitative study from a nursing perspective

The following authors were involved in this study: Kristien Scheepmans (KS), Bernadette Dierckx de Casterlé (BDdC), Louis Paquay (LP), Hendrik Van Gansbeke (HVG), Steven Boonen (SB), Koen Milisen (KM).

KS was responsible for the study concept and design, acquisition of data, analysis and interpretation of data, and drafting the manuscript. BDdC, LP, KM contributed to the study concept and design, the acquisition of data, the analysis and interpretation of data, and the drafting of the manuscript. HVG contributed to the study concept and design, and the drafting of the manuscript. SB participated in drafting the manuscript. All authors revised the manuscript. All authors, except SB read and approved the final manuscript. Supervision was done by KM.

Chapter 3: Restraint Use in Older Adults Receiving Home Care

The following authors were involved in this study: Kristien Scheepmans (KS), Bernadette Dierckx de Casterlé (BDdC), Louis Paquay (LP), Hendrik Van Gansbeke (HVG), Koen Milisen (KM).

All authors participated in the design of the study. Data collection was carried out by KS and LP. KS, LP, BDdC, KM performed the data analysis and drafted the manuscript. All authors critically reviewed and approved the final manuscript. Supervision was done by BDdC, and KM.

Chapter 4: Factors Associated with Use of Restraints on Older Adults with Home Care: A Cross Sectional Study

The following authors were involved in this study: Kristien Scheepmans (KS), Koen Milisen (KM), Koen Vanbrabant (KV), Louis Paquay (LP), Hendrik Van Gansbeke (HVG), Bernadette Dierckx de Casterlé (BDdC).

KS, LP, BDdC, HVG, KM were responsible for the study design. KS and LP performed the data collection. Data analysis was performed by KS, LP, BDdC, KM and KV. KS, LP, BDdC, KM and KV drafted the manuscript. All authors critically reviewed and approved the final manuscript. Supervision was done by BDdC, KM.

Chapter 5: Restraint use in older adults in home care: a systematic review

The following authors were involved in this study: Kristien Scheepmans, (KS), Bernadette Dierckx de Casterlé (BDdC), Louis Paquay (LP), Koen Milisen (KM).

Author Contributions: The search strategy was developed by all authors (KS, BDdC, LP, KM). KS performed data collection. KS & LP reviewed the full texts of the selected articles. Data were extracted by KS and verified by LP. The final data extraction was discussed with KM. KS & LP assessed the methodological quality. Disagreements between the reviewers were resolved through discussion (BDdC & KM). KS & LP were responsible for the data analysis. The manuscript was drafted by KS. Critical revision of the manuscript, contribution to revisions and approval of the final manuscript was done by all authors. Supervision was done by KM.

Chapter 6: Reducing physical restraints in home care: development of an evidence based guideline

The following authors were involved in this study: Kristien Scheepmans (KS), Bernadette Dierckx de Casterlé (BDdC), Louis Paquay (LP), Hendrik Van Gansbeke (HVG), Koen Milisen (KM).

Author Contributions: KS, LP, BDdC, HVG, KM: study design. KS: data collection. KS, LP, BDdC, KM, KV: data analysis, drafting the manuscript. BDdC, KM: supervision. All authors critically reviewed and approved the final manuscript. KM supervised the study.

PERSONAL CONTRIBUTION

This 'personal contribution' section summarizes the contribution of Kristien Scheepmans to the dissertation.

Chapter 2: Restraint use in home care: a qualitative study from a nursing perspective

Kristien Scheepmans participated in the study concept and design, carried out the data collection and analysis and interpretation of data. She drafted the manuscript and performed the revisions.

Chapter 3: Restraint Use in Older Adults Receiving Home Care

Kristien Scheepmans contributed to the study design and was responsible for the data collection. She contributed to the statistical analysis and interpretation. She was responsible for manuscript drafting and revising.

Chapter 4: Factors Associated with Use of Restraints on Older Adults with Home Care: A Cross Sectional Study

Kristien Scheepmans contributed to the study design, data collection, statistical analysis and interpretation. She was responsible for manuscript drafting and revising.

Chapter 5: Restraint use in older adults in home care: a systematic review

Kristien Scheepmans Wrote the protocol and was involved in the study design, performed data collection, assessed the methodological quality and was responsible for the data analysis. She drafted and revised the manuscript.

Chapter 6: Reducing physical restraints in home care: development of an evidence based guideline

Kristien Scheepmans was involved in the development of the practice guideline and the study design. She performed the data collection, data analysis, drafted and revised the manuscript.

CONFLICT OF INTEREST STATEMENTS

Below, a conflict of interest (COI) statement can be found for each study in this dissertation.

Chapter 2: Restraint use in home care: a qualitative study from a nursing perspective

None of the authors reported any conflicts of interest.

Chapter 3: Restraint Use in Older Adults Receiving Home Care

The authors have no conflict of interest. The funding agency Vanbreda Risk & Benefits had no role in the design, data collection, analysis, or interpretation of the study.

Chapter 4: Factors Associated with Use of Restraints on Older Adults with Home Care: A Cross Sectional Study

The authors have no conflicts of interest in the manuscript. The funding agency Vanbreda Risk & Benefits had no role in the design, data collection, analysis, or interpretation of the study.

Chapter 5: Restraint use in older adults in home care: a systematic review

The authors have no conflicts of interest in the manuscript.

Chapter 6: Reducing physical restraints in home care: development of an evidence based guideline

There were no conflicting interests of interests of the members of the multidisciplinary working group, the participating experts and the authors. The funding agency Vanbreda Risk & Benefits had no role in the design, data collection, analysis, or interpretation of the study.