Project INContinence care

- Research focussing on Austrian nursing homes -

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Declaration

I hereby declare that this thesis is my own original work and that I have fully acknowledged by name all of those individuals and organisations that have contributed to the research of this thesis. Due acknowledgement has been made in the text to all other material used. Throughout this thesis and in all related publications I followed the guidelines of „Good Scientific Practice“.

Graz, 23.07.2018 Manuela Hödl, eh

Bildnachweis: https://www.pexels.com/de/foto/wasser-welle-nass-wasser-tropfen-34228/; 02.02.2017; CC0-Lizenz

Disclosures

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All co-authors have explicitely agreed to the use of their data in this thesis.

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Contents

LIST OF ABBRIVATIONS

ADLs	Activities of daily living
AGREE II	Appraisal of clinical guidelines for research and evaluation II instrument
BMI	Body mass index
CAPGO	Clinician's assessment of practice guidelines in oncology study
CaRT	Classification and regression tree
CDS	Care dependency scale
CG	Control group
CI	Confidence interval
CONSORT	Consolidated standards of reporting trials
CONT	Continent residents/patients
DI	Double incontinence
FI	Faecal incontinence
GEE	Generalized estimating equation model
ICD-10	International statistical classification of diseases and related health problems - 10th revision
ICS	International Continence Society
IG	Intervention group
IOM	Institute of Medicine
N	Number
NH(s)	Nursing homes
NICE	National Institute for Health and Care Excellence

NR	Nursing recommendations
OAB	Overactive bladder
OR	Odds ratio
p	p-value
P-INC	Project INContinence
PIPOH-scheme	Population, interventions, professionals, outcomes, health care setting - scheme
QIC	Quasi-likelihood under Independence Model Criterion
RCT	Randomized controlled trial
RCN	Royal College of Nursing
RNAO	Registered Nurses' Association of Ontario
SD	Standard deviation
SIGN	Scottish Intercollegiate Guidelines Network
UI	Urinary incontinence
WHO	World Health Organisation

Chapter 1

General Introduction

“Angry with myself. I thought this problem could be solved somehow.
One can do something about everything, right?
Only about incontinence one can do nothing.”(1 p.374)

“I just felt it was normal every day, an age thing you know,
something that I‘d got to tolerate and put up with.” (2 p.1065)

General Introduction

This first chapter provides general background information and presents the theoretical framework for this doctoral thesis, called P-INC (**P**roject **INC**ontinence). Subsequently, the research problems, aims and research questions will be presented and described.

Introduction

Incontinence is a highly prevalent problem among members of the aging population (3), especially urinary incontinence (UI). UI prevalence rates up to 20 % are reported in all health care settings, including the community and the hospital setting (4, 5). In nursing homes, UI rates of about 65 % have been found (6). Due to the worldwide increase of UI in people aged 65 or older (7), it has been assumed that the prevalence of UI will become higher in the near future (8).

UI is highly inconvenient for the person due to the negative association between UI and quality of life (QoL) (9-13). Bedretdinova et al. showed that UI is associated with impaired health related QoL, measured with the “Nottingham Health Profile”, mainly in the dimensions of energy, social isolation, and physical mobility (14). Yip et al. revealed a self-reported decrease in the overall health of nursing home residents with UI (15). Other authors have reported consequences such as more sleep/energy disturbances and performance limitations (10), frequent micturition (16), incontinence-associated dermatitis (17), restricted fluid intake, falls when going to the toilet and avoidance of coughing (18). Incontinence also leads to psychological/emotional consequences such as feelings of shame, e.g., in intimate relationships/sexual life (16, 18).

Beside the burden of UI placed on the patients/residents themselves, UI also increases the workload of nurses and informal caregivers, because they need to regularly change the absorbent products, such as pads, pants and slips or involve incontinent persons in prompted voiding programs (3, 19).

Besides the workload, UI also increases the health care costs. As an example, the total health care expenditures in Germany for UI are stated to be about € 396 million per year (20).

In summary, UI is highly prevalent and burdensome for the affected patients/residents, informal/formal care givers and contributes to rising health care costs.

(Urinary) Incontinence

Urinary incontinence (UI) in this study is defined as *involuntary loss of urine* (3 p. 500). UI can be specified as different types (see table 1.1), such as stress UI, urge UI, mixed UI (3). Other forms of incontinence are faecal incontinence (FI) and double incontinence (DI). Faecal incontinence (FI) is defined as *any involuntary loss of solid or liquid faecal material* (3 p. 74). Double incontinence (DI) is defined as an *involuntary loss of both urine and faecal material* (21 p. 5).

Table 1.1 Different types and definitions of UI

	Definition
Stress UI	Any involuntary loss of urine on effort or physical exertion or on sneezing or coughing (3 p. 17)
Urgency UI	Any involuntary loss of urine associated with urgency (3 p. 17)
Mixed UI	Any involuntary loss of urine associated with urgency and also with effort or physical exertion or on sneezing or coughing (3 p. 17)
Functional UI	Functional incontinence is urinary leakage associated with inability to access the toilet because of impairment of cognitive and/or physical functioning or an environmental barrier (3 p. 17, 22)
Overflow incontinence	Any involuntary loss of urine associated with bladder over-distention (22 p. 16)
Total incontinence	Total incontinence is a continuous and unpredictable loss of urine (22 p. 16)

Older persons are especially at high risk of receiving a catheter (3), even though it is internationally accepted that catheters, as they can cause urinary tract infections, should not be used as a continence intervention unless all other conservative as well as pharmacological interventions have been tried (3). By definition, persons who are not losing urine involuntarily and have a catheter, e.g., in the intensive care units, are not seen as suffering from UI. Therefore, the focus of this dissertation is on UI nursing home residents, excluding those with a catheter.

Prevalence rates

International prevalence rates for incontinence differ largely according to the types and settings. A study conducted in the Netherlands as well as a study of older people in nursing home facilities in New Zealand reported FI prevalence rates of up to 26 % (23, 24). Prevalence rates of DI have been described to be about 23 % (23). With regard to FI and DI in Austrian hospitals, prevalence rates are stated for FI as 8 % and for DI, 5 % (25). However, the focus of this thesis is placed on UI due to the fact that UI is a highly prevalent problem facing members of the aging population.

A study conducted in the Midwestern United States of acutely ill, adult, hospitalized patients revealed a prevalence rate for UI of 20 % (4). With regard to the hospital setting, prevalence rates of UI in the Netherlands have been reported to reach up to 10 % (26). In the Austrian hospitals prevalence rates of 16 % have been stated for UI (25).

A recent literature review described that UI is common among older people, with high prevalence rates reported in the nursing home setting (27). Another study from the Netherlands reported UI prevalence rates in nursing homes of up to 48 % (23). In comparison to the formerly mentioned prevalence rates, the highest prevalence rates were reported by Carver et al. (24). They described that 57 % of older people in nursing home facilities in New Zealand suffer from UI (24). A national nursing quality survey conducted in Austrian nursing homes described prevalence rates of UI of up to 71 % (25). A Swiss study conducted in nursing homes also reported that more than half of the female residents suffered from UI (28).

With regard to the different subtypes of UI in the Austrian and Dutch nursing home settings, the most prevalent diagnosed subtype is total incontinence (28 % vs 17 %), followed by functional incontinence (19 % vs. 17 %) (23, 29). However, in 27 % of the Austrian UI residents, there is no diagnosis, and the subtype is not specified in 15 % of those who have a diagnoses (23, 29). This is in line with findings from the Netherlands where 30 % had no diagnosis and 18 % of the diagnoses were not specified (23, 29).

These differences in the prevalence rates between hospitals and nursing homes might be due to the fact that hospitalized patients might be less care dependent and younger than nursing home residents or because different data collection methods or definitions were used (3, 8).

According to the operationalization from Sandberg et al. (p.183), an Austrian nursing home is "*a facility that provides 24-hour functional support for people who require assistance with ADLs and have identified health needs, is staffed with nurses and nurse aids, and can provide palliative and/or hospice care at end of life*"(30).

Various international studies have been conducted to investigate the most important influencing factors on incontinence (3, 5). Pregnancy and childbirth are well-known influencing factors (16, 31). This can be explained by the decrease in the pelvic floor muscular functions (32).

Another well-known influencing factor on incontinence is a high body-mass index (33, 34). The elevated higher abdominal pressure has been stated as reason for pelvic floor disorders in obese people (3).

Another influencing factor for incontinence is higher age (3). Pathophysiological changes, such as a decline in detrusor function and efficiency, are associated with higher age (35). Overall, there are several studies that have described ageing as an influencing factor for UI (36-41). In addition to the different subtypes, the "International Continence Society" also distinguishes reversible UI. They conclude (p.440) that "*a significant proportion of nursing home residents" suffer from reversible UI (3), which is defined as "UI that arises suddenly, lasts less than six month and results from reversible causes*" (42, p.63). Possible causes for reversible UI can be delirium, infections, pharmaceuticals, or reduced mobility (3 p. 440).

Female sex is also a well-known influencing factor of UI (3). Studies have reported higher prevalence rates for women than for men (5, 9, 25, 43).

The summarized pathophysiological causes for UI include a decreased capacity to handle the afferent signals in the brain due to factors, such as spinal cord lesions, cerebral infarction, dementia, Parkinson's disease, or abnormally increased afferent signals from the bladder and/or the urethra, through myogenic changes, as well as microbiota, chronic inflammation and pelvic organ prolapse (3).

Prevalence rates for UI, FI and DI are higher in the nursing home setting than in the hospital settings, having the highest prevalence rates for UI. Older female nursing home residents are a high-risk group for suffering from incon-

tinence, especially UI. Therefore, this population was the primary focus of this dissertation.

Nursing care and UI management

Various health care professionals working in the health care system deal with UI, such as medical doctors, physiotherapists and nurses. In the nursing home setting, nurses are the primary contact person for residents and relatives and, therefore, play major roles in UI management (44).

Nursing care is delivered by following the nursing process including the assessment, diagnosing, planning, implementation and evaluation (45). Within that process, UI management is integrated in each step; UI is diagnosed if present and the subtype is identified, nursing interventions such as support with absorbent products or bladder training are performed, and the set goals as well as quality of care are evaluated.

The management of UI is closely linked to the quality of care. The Institute of Medicine (IOM) defines quality of care as *"the degree to which health care services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge"* (46 p. 21). Such knowledge can be summarized in documents such as evidence-based guidelines (47). With regard to the management of UI, the conservative management of UI is defined as the use of any interventions that do not involve surgical or pharmacological treatments (32), and is generally accepted as the first step in the initial management of UI (3). Conservative interventions are rarely used in the nursing home setting, although they are described as successful interventions for long-term management (27, 48-50).

Quality of health care is generally closely linked to the model for health care organizations described by Donabedian (51), which is the most common evaluation framework (52). Based on his model, conclusions can be drawn regarding the quality of care and distinguish among three levels: structure, process and outcome (51).

Structural level of incontinence care

Structure of care is defined as "the attributes of the setting in which care occurs including material resources (e.g. equipment, money), human resources (e.g. number and qualification of staff) and organization of health care staff (e.g. methods of reimbursement)" (51 p. 1745).

The structural level regarding incontinence, refers to the availability of continence nurses or multidisciplinary teams, evidence-based guidelines, voiding records, as well as food and fluid records. Training sessions and the and the availability of information brochures are also incorporated under relevant structural indicators. Such structural indicators are internationally recommended for the management of UI (53, 54) and can have a considerable effect on process (nursing practice) and outcome level (55) (figure 1.1).

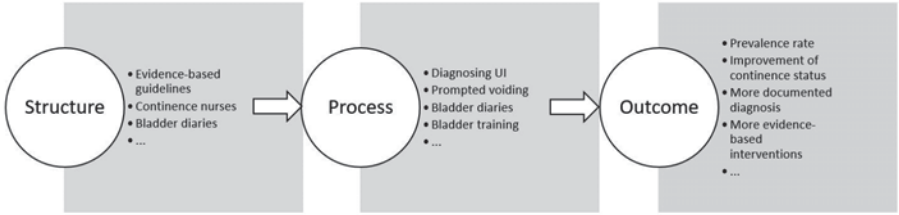

Figure 1.1 Model of Donabedian (51) regarding incontinence care

Process level of incontinence care

The process level in this model is characterized by *"what is actually done in giving and receiving care"* (51 p. 1745).

The process level of incontinence care includes, for example, diagnosing UI and establishing evidence-based nursing interventions. International guidelines recommend a detailed incontinence assessment as a first step for nursing care planning (3, 56). Within a nursing care plan, international experts endorse the diagnosis of UI, as well as establishing appropriate and evidence-based nursing interventions, such as monitoring diet and bowel habits or conservative interventions such as beginning bladder/pelvic floor muscle/ toilet training (22, 57).

Outcome level of incontinence care

The outcome level describes the *"effects of care on the health status of patients and populations. Improvement in the patient's knowledge and salutary changes in the patient's behaviour are included under a broad definition of health status, and so is the degree of patient's satisfaction with care"* (51 p. 1745).

The outcome level of incontinence care describes the effects of care on the health status of patients or residents (51 p. 1745), which includes measuring outcomes such as the continence status (prevalence of UI), frequency of UI (daily, weekly), or well-known UI-severity measures like the Sandvik-score (56).

Relation of structure-process-outcome to incontinence care

Within Donabedian's model structure, process and outcome are related to each other. The findings of Egnatios et al. showed that the implementation of an evidence-based guideline (structural level) in older people can reduce UI (outcome level) by more than 50 % (58). Tallye et al., as a result of their literature review, concluded that nursing interventions, such as bladder training which is anchored in Donabedian's model at the process level, showed the strongest evidence for reducing UI in frail older adults (59). Additionally, exercises and prompted voiding (process level) were shown to improve the frequency of UI and FI (outcome level) in nursing home residents (60). The combination of staff education (structural level) and group exercise (process level) also resulted in a decrease of UI in nursing home residents (61). The association among structure, process and outcome with regard to DI (outcome level), were reported by Morgan et al. (55). Their findings confirmed that the implementation of a bowel and bladder incontinence assessment tool (structural), including an individualised toileting schedule (process level), can decrease the rate of DI (outcome level) (55).

Research problems

With regard to Donabedian's model for health care organizations, the following research roblems were identified.

On the outcome level, few studies are available that measure all types of incontinence, including UI, FI and DI in hospitals and nursing homes. Addi-

tionally, no profiles of patients/residents at risk of developing incontinence are currently available.

Although several studies based on Donabedian's model are available (62-65), none are focused on the quality of incontinence care in nursing homes.

With regard to the structural level of Donabedian's model, many evidence-based guidelines are available internationally. However, the evidence-based recommendations included, such as the use of an assessment tool, are often not applied in (nursing) care (66) due to linguistic differences or differences in staff responsibilities (6). Therefore, evidence-based recommendations have to be adapted to fit to the national/regional working context to increase acceptance and applicability and to meet different staff requirements (6).

Above all, various recent studies have focused on the effects of the urinary incontinence guideline recommendations (58, 67-70). Nevertheless, most of those that focused on the adherence of health care professionals (67, 68) were tested in settings other than nursing homes (58) or focused on surgical/pharmacological management (70).

Rsearch aims and questions

The detailed aims and research questions for each conducted study included this doctoral thesis are stated below. The overall aims of this doctoral thesis were to (1) describe influencing factors as well as the quality of care in the Austrian health care setting and to (2) adapt evidence-based nursing recommendations for the conservative management of urinary incontinence in nursing homes and to test their introduction.

The aim of study 1 – part A (chapter 3) was to identify associations between well-known factors and profiles of incontinent nursing home residents and hospital patients.

- Which interactions among well-known factors can be identified for urinary, faecal, and double incontinence in nursing homes and hospitals?
- Which profiles can be developed for urinary, faecal, and double incontinent nursing home residents and hospital patients?

The aim of study 1 – part B (chapter 4) was to describe the quality of incontinence care in nursing homes.

- Which structural indicators regarding incontinence care are available at ward and institutional levels?
- On process level, which nursing interventions are used for the management of incontinence?
- What is the prevalence of incontinence?

The aim of study 2 (chapter 5) was to describe the adaptation of international clinical guideline recommendations regarding UI to the national nursing home context by following the ADAPTE-process and to ask the following research questions:

- Which international guidelines for incontinence are available?
- What is the quality of these guidelines?
- Are the included recommendations applicable for the Austrian nursing home context?

The aim of study 3 (chapter 6) was to examine the effectiveness of introducing guideline recommendations regarding the conservative management of UI in Austrian nursing homes and to test three hypotheses.

1. Female residents in the intervention group (IG) are less likely to experience daily UI events than residents in the control group (CG).
2. Residents in the IG have a higher chance to have a UI diagnosis than residents in the CG.
3. Residents in the IG have a higher chance to receive a recommended nursing interventions (e.g., bladder training) than residents in the CG.

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Chapter 2

Methods

Methods

In this chapter an overview of the methodologic aspects of the studies with regard to their design, sampling method, setting, data collection and analysis method is presented. For more details, please refer to chapters 3 to 6.

Table 2.1 Overview of methodologic aspects of the studies

	Study 1 – part A	Study 1 – part B
Topic	Interactions of factors and profiles of incontinent residents and patients	Structural, process and outcome indicators for incontinence care
Design	Multi-centre, cross sectional study	
Setting & sample	36 Austrian hospitals with 3,303 patients and 16 nursing homes with 1,302 residents	16 Austrian nursing homes with 1,302 residents
Data collection	Assessment of influencing factors on patient/resident level by two nurses with a standardized questionnaire in 2013	Assessment of institutional indicators by nurse directors, ward indicators by ward nurses and residents by two nurses with a standardized questionnaire in 2013
Data analysis	Descriptive statistics, inductive statistics, Classification and regression trees	Descriptive statistics

Table 2.2 Overview of methodologic aspects of the studies

	Study 2	Study 3
Topic	Adaptation of international nursing recommendations for the management of UI in Austrian nursing homes	Effectiveness of the introduction of conservative management recommendations in nursing homes
Design	Methodological study following the ADAPTE-process	Cluster-randomized controlled trial
Setting & sample	5 reviewers for external validity 6 experts via a Delphi round	6 nursing homes in the intervention group and 6 in the control group with 3 measurement times and 381 participating residents
Data collection	Assessment of applicability of the recommendations for Austrian nursing home setting	Assessment of each resident every 6 weeks by the first author and a nurse using a standardized questionnaire
Data analysis	Descriptive and inductive statistics	Descriptive and inductive statistics, general equation estimates model

Chapter 3

Interactions of factors and profiles of incontinent nursing home residents and hospital patients

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ABSTRACT

PURPOSE: To investigate the interactions among well-known influencing factors for urinary incontinence (UI), fecal incontinence (FI), and double urinary and fecal incontinence (DI) in the nursing home and hospital setting and to identify profiles of UI, FI, and DI residents and patients.

SUBJECTS AND SETTING: Data from more than 4200 residents and patients from 16 nursing homes and 36 hospitals were collected.

DESIGN: This was a cross-sectional study.

METHODS: A cross-sectional study was used for data collection. The Austrian version of the International Prevalence Measurement of Care Problems survey was used to collect data about different nursing care problems (e.g. pressure ulcer and incontinence). To improve objectivity, 2 nurses assessed each resident/patient. The Care Dependency Scale (CDS) was used to measure the degree of care dependency regarding different needs such as mobility, with lower scores indicating a higher level of care dependency. A classification and regression tree analysis was used to determine the interactions among factors and develop profiles of incontinent residents and patients.

RESULTS: Interactions between the CDS-items of states of Dress/Undress, Hygiene, Mobility, and Eat/Drink and age based on incontinence were found in nursing home residents. In contrast, interactions between the CDS-items Hygiene and Eat/Drink, as well as age and gender based on incontinence, were identified in hospitalized patients. Residents with UI were care dependent with reference to the CDS-item Dress/Undress. Patients with UI were older than 77.5 years and completely, or to a great extent, care dependent with reference to the CDS-item Hygiene. Nursing home residents with DI were completely, or to a great extent, care dependent with regard to the CDS-item Hygiene and completely care dependent with reference to the CDS-item Dress/Undress. In comparison, hospitalized DI patients were completely, or to a great extent, care dependent with regard to the CDS-item Hygiene.

CONCLUSIONS: The results of this study show that independently associated factors for incontinence also influence each other. Furthermore, these interactions increase the prevalence for incontinence and differ with regard to the type of incontinence and setting.

KEYWORDS: factors, hospital, nursing homes,incontinence, tree analysis

INTRODUCTION

Incontinence is a common health issue and increases with aging (1-3). It can lead to serious consequences, such as a reduction in self-reported overall health (4). Furthermore, incontinence leads to increasing health care costs and a higher workload for health care professionals (5-7). Urinary incontinence (UI) is defined as any involuntary loss of urine and fecal incontinence (FI) is defined as any involuntary loss of fecal material (8). Double incontinence (DI) is defined as any involuntary loss of both urine and fecal material (9).

National nursing quality indicator surveys conducted in Austria described prevalence rates of UI in the years 2013 and 2014 in nursing homes of up to 64.5 %. The prevalence rate of FI in the nursing homes was up to 58.2 %, and it was 38.2 % for DI (10, 11). These findings are consistent with prevalence rates reported in international studies in nursing homes for UI, which range from 30 % to 65 %. Prevalence rates in international studied for FI varied from 22.4 % to 55.5 %, and rated for DI ranged from 20.5 % to 64 % (12). In contrast, national and international prevalence rates for UI, FI, and DI in the hospital setting are reported to be up to 20 %, 10 %, and 3 %, respectively (10, 11, 13). However, most of these studies focused on one type of incontinence.

Multiple international studies have been conducted to investigate the most important factors independently associated with incontinence such as age, gender, and dementia (14-17). Other studies have found that incontinence can be affected by comorbid conditions such as diabetes mellitus, stroke, and obesity (18-20), as well as decreased mobility and impairments in eating and drinking (5).

A recent study investigated characteristics (e.g. age, gender, cognitive impairment, and diabetes) of nursing home residents that predispose them to continence. Saga and colleagues (21) found that UI was related to a reduced likelihood of diabetes and some dependencies in activities of daily living (ADL) such as grooming and bathing. FI was related to lower levels of cognitive impairment and ADL independence in feeding and grooming. Double incontinence was significantly related to cognitive impairment, stroke and ADL dependencies in feeding, grooming, toileting, and mobility. This study used descriptive statistics (χ 2 or Fisher exact test) to explore the associations between various factors and different types of incontinence. Nevertheless, the interactions among these factors were not the focus of this study.

Studies investigating the interactions among factors in different types of incontinence and settings are still lacking. Identifying interactions among factors can give more information about possible profiles and allow the identification of groups of residents and patients at risk of each type of incontinence.

Classification and Regression Trees

Classification and regression trees (CaRT) are an exploratory statistical method that can be used to investigate how complex interactions such as how 2 or more factors jointly operate in the development of incontinence (22, 23). This method enables data to be split and the development of a hierarchical order among items. Therefore, we deemed it suitable for describing interactions among factors in incontinent nursing home residents or hospitalized patients (22). Abdollah and colleagues (24) used CaRT to investigate factors for UI after radical prostatectomy, and they developed a risk classification tool that split patients into risk groups for UI after this surgery. Kuhn and associates (25) recommend the use of CaRT when large datasets were available because of its easily interpretable graphics.

They highlighted its applicability to nursing because it can be used to gain a deeper understanding of multiple and hierarchical interactions.

Up to now, evidence concerning the interactions among factors for each type of incontinence in different settings is limited. For this reason, a tree analysis was chosen as a data analysis method with the following goals: (1) to identify interactions among well-known factors and (2) to develop profiles of incontinent nursing home residents and hospital patients for each type of incontinence. We posed the following research questions: (1) Which interactions among well-known factors can be identified for urinary, fecal, and double incontinence in the nursing homes and hospitals; and (2) which profiles can be developed for urinary, fecal, and double incontinent nursing home residents and hospital patients?

METHODS

In 2013, the Austrian version of the *International Prevalence Measurement of Care Problems survey*, which is a cross-sectional multicenter study, was conducted (11, 26). The Institute of Nursing Science at the Medical University Graz invited (via e-mail and leaflets) all hospitals and nursing homes in Austria

with more than 50 beds, registered at a national database, to participate voluntarily in the survey (27). All residents/patients who were living/staying in the nursing home/hospital on the day of data collection were invited to participate. These persons or their legal representatives had to sign a written informed consent form. Approval was given by the ethical committee of the Medical University of Graz, Austria. Sixteen nursing homes and 36 Austrian hospitals with a total of 4700 residents and patients participated.

Variables and Measurement

As part of the Austrian version of the *International Prevalence Measurement of Care Problems survey*, data about care problems suffered by residents/patients including prevalence of pressure ulcers, rates of incontinence, tendencies toward malnutrition, occurrences of intertrigo, falls, and use of restraints were collected (13). This analysis focuses specifically on data related to incontinence.

Two nurses, one working on the resident's/patient's ward and one, an independent nurse from another ward, assessed each resident/patient to increase objectivity. Discussion was used in the case of disagreement to arrive at a uniform assessment. The assessment was based on both inspection of the resident/patient and available documentation.

UI and FI were measured by asking questions that could be answered with a yes or no. These questions were: did the patient suffered from UI or FI? To define mutually exclusive categories, in this study, residents/patients with UI were defined as losing only urine involuntarily, without any involuntary loss of fecal material. FI residents/patients were defined as residents/patients who suffered any involuntary loss of fecal material, but not urine. If residents/patients lost both urine and fecal material, they were categorized as DI. Residents/patients using catheters were excluded to delineate the prevalence of incontinence without use of a catheter as an outcome indicator.

In addition to the outcome indicators, demographic data (e.g. age and gender) and medical diagnoses according to *International Classification of Diseases, Tenth Revision (ICD-10)* were assessed (28). Obesity was defined as a risk factor for residents/patients whose body mass index was more than 30 kg/m^2 (29). The German version of the Care Dependency Scale (CDS) was used to measure the degree of care dependency with reference to different

needs such as mobility, where lower scores indicated a higher level of care dependency (30, 31). The CDS is a validated 15-item instrument designed to assess care dependency of patients with dementia or learning disabilities. The cumulative score of the CDS ranges from completely care dependent (15-24 points), to a great extent care dependent (25-44 points), partially care dependent (45-59 points), and to a limited extent care independent (60-69 points), up to almost care independent (70-75 points) (32). Training materials and training were provided with regard to the measurements, the use of the questionnaires, and the web-based data entry program, and were conducted for all participating institutions (26).

Data Analysis

The SPSS 22.0 statistical software was used for analyses (Statistical Packae for the Social Sciences Chicago, Illinois) (33). For categorical variables, a descriptive data analysis method was used. The mean with standard deviation was used to describe age. Median values and percentiles (25 %; 75 %) were calculated to describe continuous variables that were not normally distributed. The χ 2 and t tests were conducted to compare the significance of differences identified between independent groups. A P value of ≤.01 was considered to indicate statistical significance.

The CaRT analysis uses standardized algorithms to allow differentiations to be made, for example, between UI and continent (CONT) residents/patients (33). Within SPSS we used the CaRT algorithm for this analysis (33). The variable that produced the most highly significantly split between 2 groups (e.g. UI and CONT) was chosen in the tree analysis as the split variable (33). Splits were not performed when no significant difference was identified between the groups, or if the number of residents/patients was below 100 at the parent node and 50 at the child node (33). For FI, due to the small sample size of fecal incontinent residents/patients (9 FI residents vs 32 FI patients), the parent node size cut-off was decreased to 50 and the child node was decreased to 10.

Validation of our analysis was necessary to determine whether the identified tree structure could be universally applied to a larger group of residents/patients (33). Version 22.0 of the SPSS software allows use of 2 validation methods. We chose split-sample validation because of its suitability for very large datasets. The split-sample validation technique randomly assigned 50 % of

the data to a training sample and 50 % to a test sample. A split-sample validation could not be conducted for FI because of the small sample size.

RESULTS

Response rates to the survey of 80.8 % from the nursing homes and 76.1 % from the hospitals were achieved. We analyzed findings from 4237 residents and patients. Data from 406 residents/patients were excluded because they had indwelling urinary catheters, and an additional 57 residents/patients were eliminated because incontinence-related data were missing. Residents of nursing homes were significantly older than patients in hospitals. The most prevalent diseases reported in both settings were cardiovascular diseases (73.0 % vs 44.5 % in nursing homes and hospitals), followed by dementia in the nursing homes (53.6 %) and motor disorders in the hospitals (29.0 %). Resident/patient characteristics are summarized in the table 3.1.

Table 3.1 Sample Characteristics

	Residents	Patients
Response rate N (%)	1397 (80.8 %)	3303 (76.1 %)
Final Sample Size N	1290	2947
Mean Age (SD), Years[a]	83.8 (9.6)	64.9 (17.5)
Female %[a]	79.1	57.1
Most Prevalent Diseases[a b] N (%)		
Cardio-vascular Disease	942 (73.0)	1312 (44.5)
Motor Disorder/Disease	854 (29.0)	854 (29.0)
Disorder/Disease of the Digestive Tract	331 (25.7)	617 (20.9)
Dementia	691 (53.6)	70 (2.4)
Median CDS Sum Score (Percentile)[a]	47 (29;66)	75 (67;75)
Degree of Care Dependency N (%)[a]		
Completely Care Dependent	256 (19.8)	32 (1.1)
To a Great Extent Care Dependent	338 (26.2)	99 (3.4)
Partially Care Dependent	251 (19.5)	228 (7.7)
To a Limited Extent Care Dependent	216 (16.7)	503 (17.1)
Almost Care Independent	229 (17.8)	2080 (70.7)
Prevalence UI %	27.8	13.0
Prevalence FI %	0.7	1.1
Prevalence DI %	41.0	3.4

[a]$p \leq 0.01$ significant difference between nursing home residents and hospital patients;
[b]four most prevalent diseases, ranking oriented by total, multiple answers poss ble.

The median CDS cumulative score assessed in the nursing home was 47 points, which indicated that residents generally fell into the category of partially care dependent. In contrast, the median CDS sum score in the hospitals was 75 points, which indicated that patients were almost care independent. Significant differences between nursing home residents and hospital patients could be found with reference to their age, gender, most prevalent diseases, and the degree of care dependency. The prevalence rates of incontinence in the nursing homes were 27.8 % (UI), 0.7 % (FI), and 41.0 % (DI).

Interactions of Factors and Validation of Analyses

We identified the same tree structures for UI in the nursing home setting and for UI/DI in the hospital setting as those found using split-sample validation. The CaRT analysis revealed the following interactions among well-known factors for incontinence: (1) an association between the CDS-item Dress/Undress and the CDS-item Mobility was found in nursing home residents and (2) a significant interaction between age, the CDS-item Hygiene, and gender for UI was identified in hospitalized patients (figures 3.1 and 3.2).

Profiles of Residents/Patients With UI, FI, and DI

Residents with UI were care dependent for the CDS-item Dress/Undress (figure 3.1, node 2). Hospitalized patients with UI were older than 77.5 years and completely or to a great extent care dependent for the CDS-item Hygiene (figure 3.2, node 5). In contrast, an age of 77.5 years or less was correlated with a lower prevalence of UI among hospital patients (7.8 %) (figure 3.2, node 1). The highest prevalence rates that could be identified were similar in the nursing home setting (64.2 %) and in the hospital setting (64.9 %).

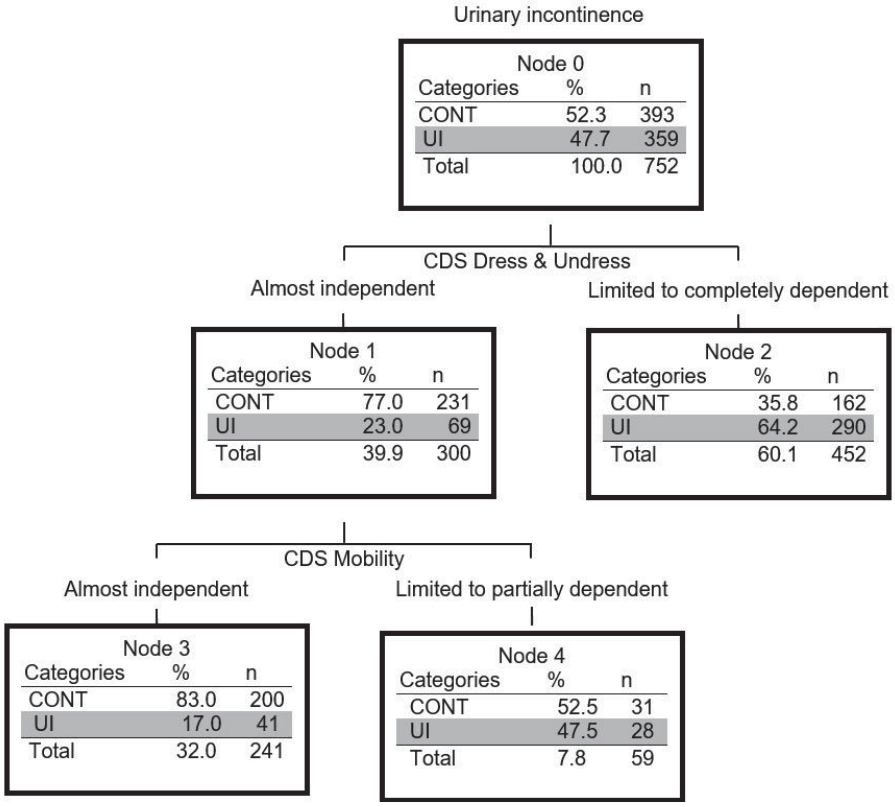

Figure 3.1 Classification Tree Analysis with factors as predictors of continence (CONT) and urinary incontinence (UI) in nursing home residents

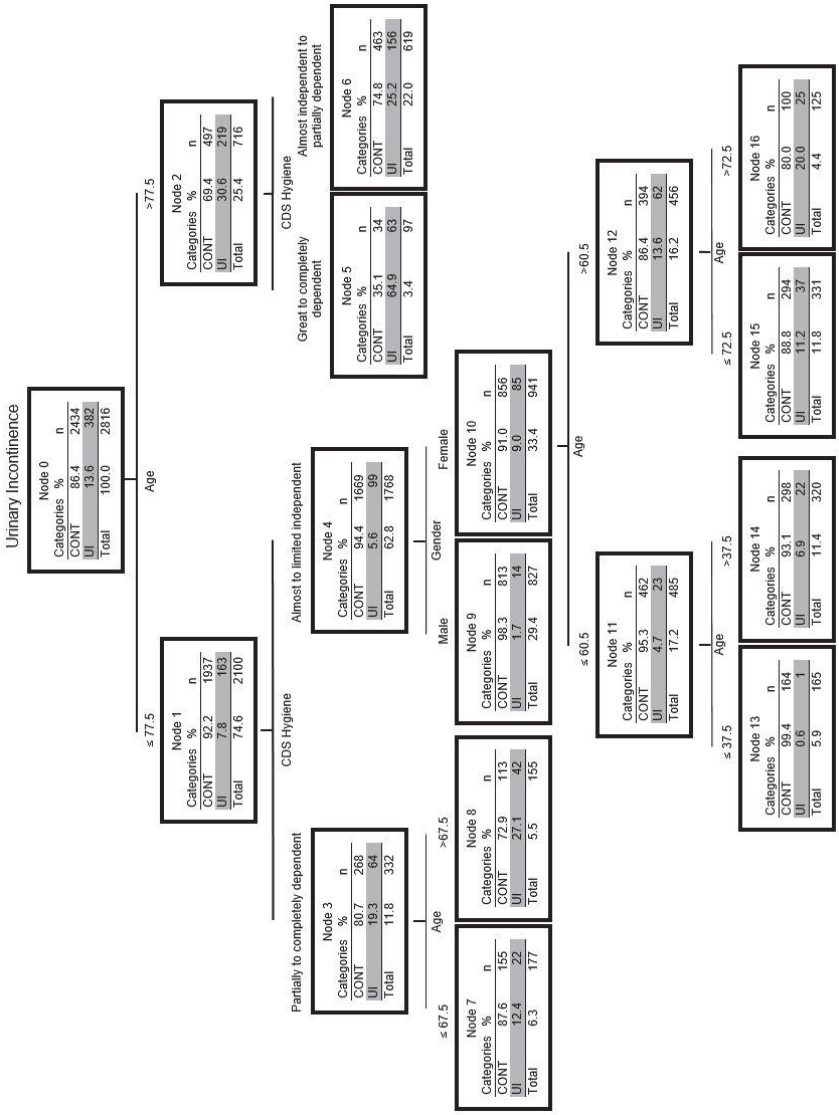

Figure 3.2 Classification Tree Analysis with factors as predictors of continence (CONT) and urinary incontinence (UI) in hospital patients

Nursing home residents with FI were completely or to a great extent care dependent with regard to the CDS-item Eat/ Drink (figure 3.3, node 1). In contrast, the prevalence for FI was 1.3 % among when residents who were to a great extent/ almost care independent, or even partially dependent with reference to the CDS-item Eat/Drink (figure 3.3, node 2). The highest prevalence rate for FI was about assessed for nearly a quarter of the residents (22.2 %).

In contrast, the typical FI patient was completely care dependent with reference to the CDS-item Hygiene (figure 3.4, node 2).

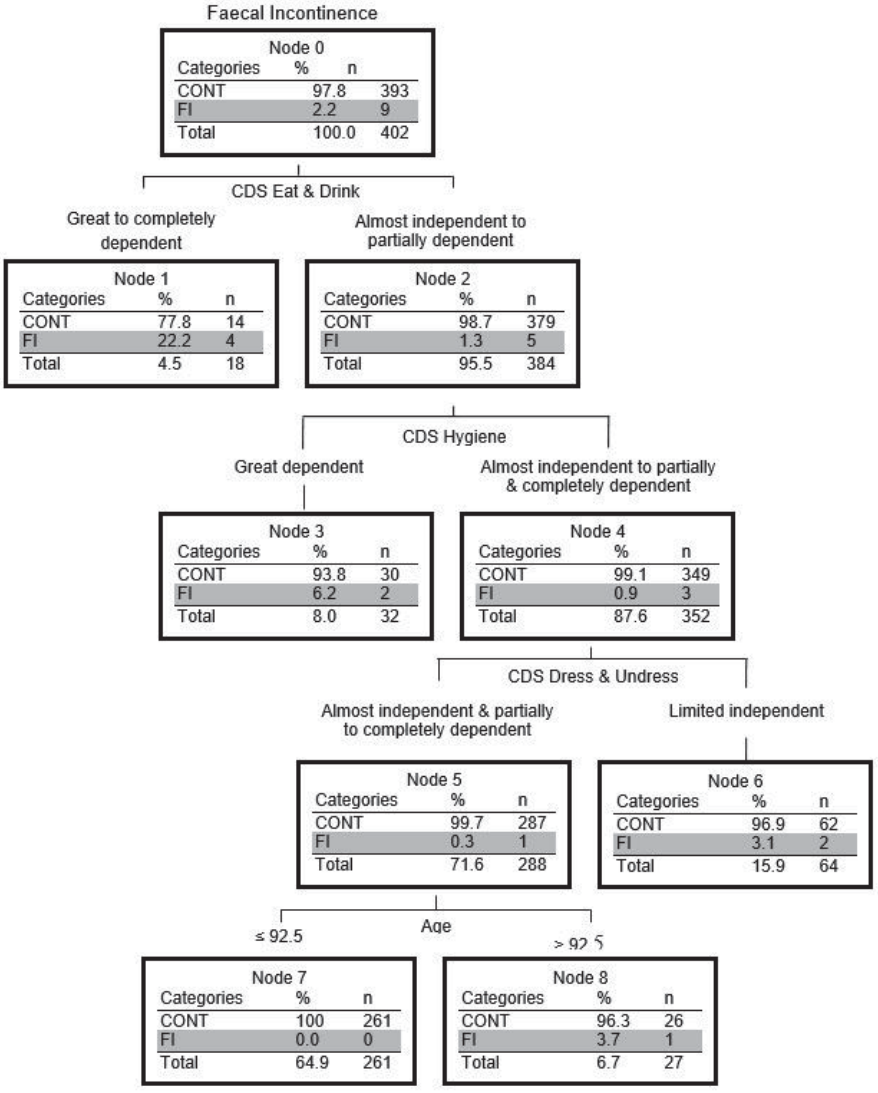

Figure 3.3 Classification Tree Analysis with factors as predictors of continence (CONT) and faecal incontinence (FI) in nursing home residents

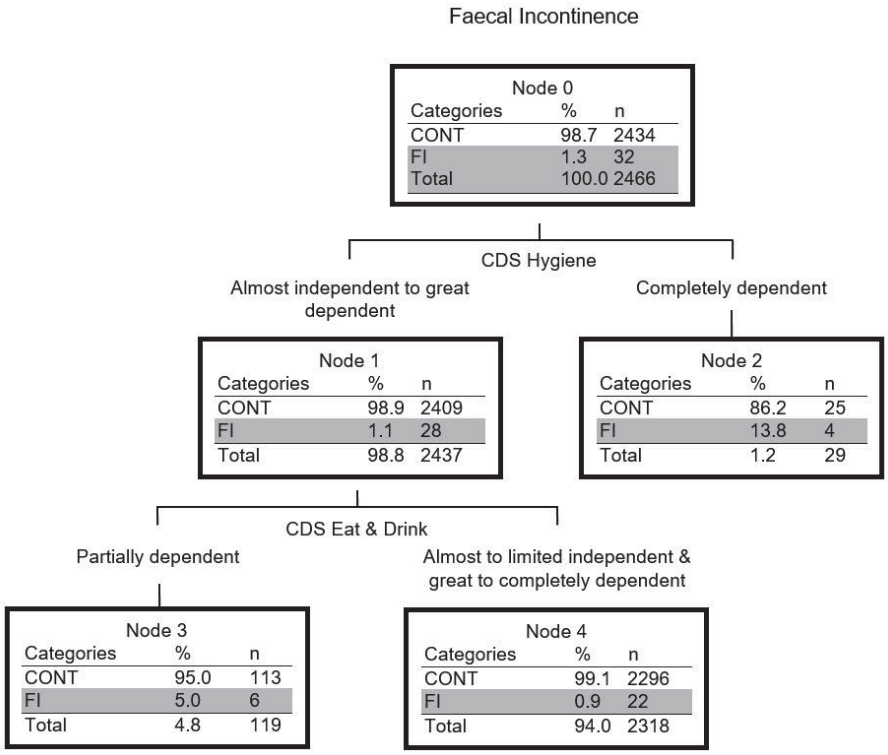

Figure 3.4 Classification Tree Analysis with factors as predictors of continence (CONT) and faecal incontinence (FI) in hospital patient

The vast majority of nursing home residents with DI (97.4 %) were completely or to a great extent care dependent with regard to the CDS-item Hygiene and completely care dependent for the CDS-item Dress/Undress (figure 3.5, node 3). In contrast, residents who were almost independent to partially dependent for the CDS-item Hygiene as well as almost or partly independent with reference to the CDS-item Dress/Undress had a lower risk of being DI (4.2 %) (figure 3.5, node 6). Fewer hospitalized patients with DI (40.2 %) were completely or to a great extent care dependent with regard to the CDS-item Hygiene (figure 3.6, node 2)

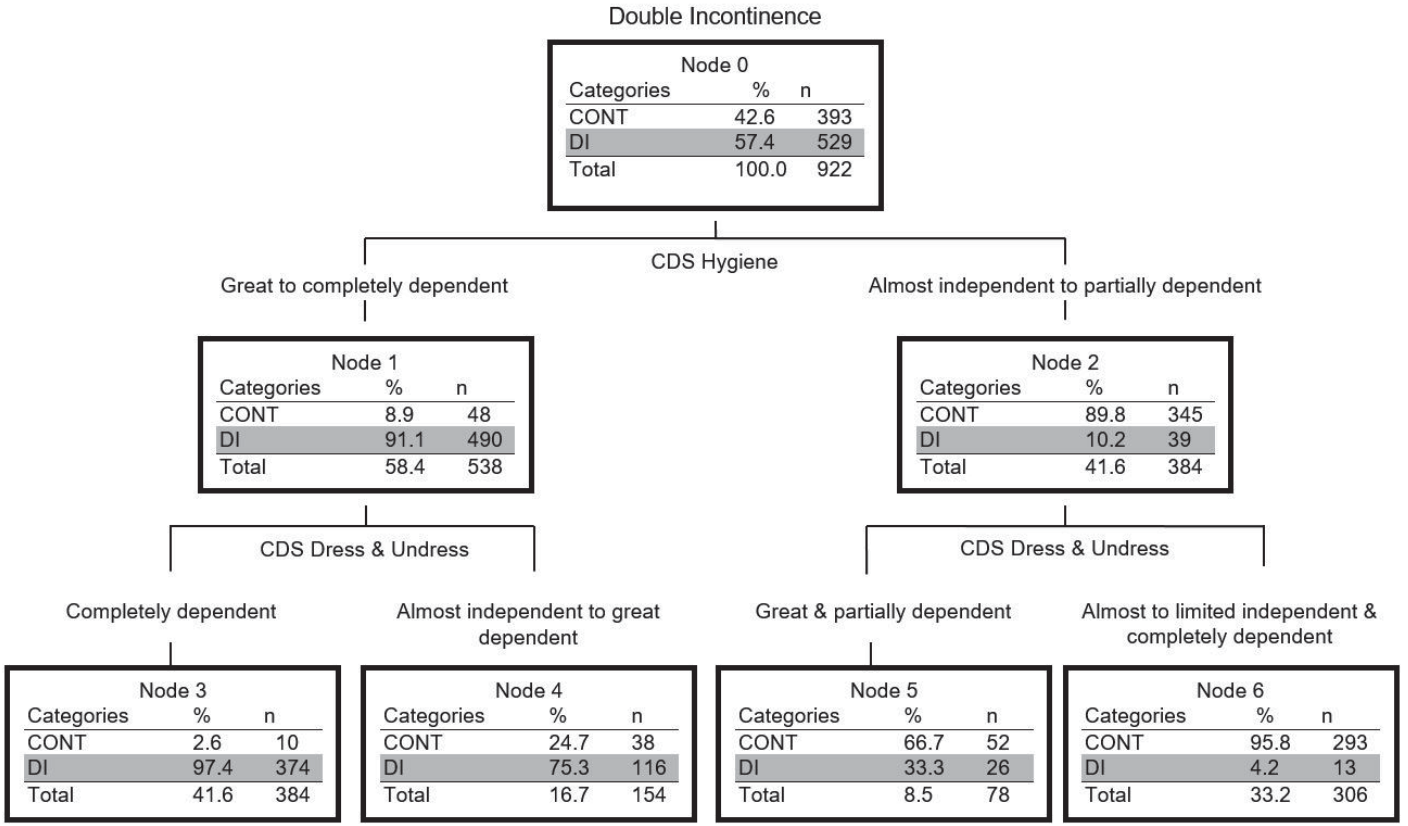

Figure 3.5 Classification Tree Analysis with factors as predictors of continence (CONT) and double incontinence (DI) in nursing home resident

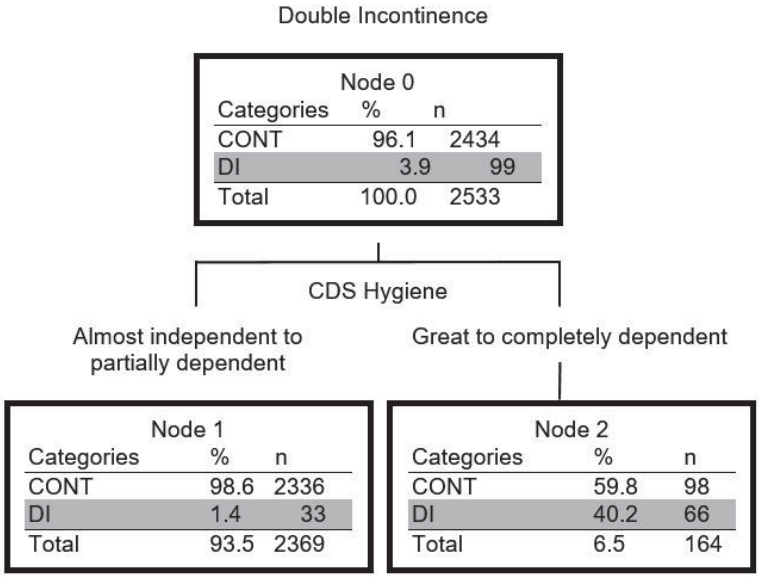

Figure 3.6 Classification Tree Analysis with factors as predictors of continence (CONT) and double incontinence (DI) in hospital patients

DISCUSSION

Our results indicated that, in the nursing home setting, the level of dependence with reference to the CDS-item Dress/Undress is an indicator for prevalence of UI and DI. In the hospital setting, however, CDS sum scores, and especially those ranging from 15 to 44 for the CDS-item Hygiene, were indicators for the higher prevalence of all types of incontinence. The developed profiles of UI, FI, and DI residents and patients, therefore, differed from one another with regard to the setting.

Various well-known factors described in the primary literature were chosen to be included in the CaRT analysis, such as dementia, age, and gender (14-16). Two research groups found that cognitive impairments were associated with an increased risk for UI (34, 35). These results could not be confirmed in our study, but this could be explained by the use of different definitions within the studies. In our study, dementia was defined as a medical diagnosis according to the *ICD-10* system promulgated by the World Health Organization. In contrast, another study asked questions that were formulated to test the resident's awareness of time, place, and situation to assess cognitive impairment (21).

We found that age and gender were interacting factors for UI in the hospital setting. These findings support those of 2 previous studies (34, 35). Furthermore, decreased mobility was found to be an interacting factor in the nursing home setting for UI. This was also found in another study, where limitations in physical function were found to increase the risk of UI (34). Limitations in mobility were also linked to DI in older people (21, 36). Impairments in "eating and drinking" were identified as factors that predisposed residents/patients to all types of incontinence (21). Digestion-related health complaints in older people were also reported as related to all types of incontinence (36). Our study, however, only supported this interaction for FI.

The CDS-item Hygiene was the most frequently identified interacting factor in this study, with exception of UI in the nursing homes. In another study, the level of "grooming," as measured by the Barthel Index, was a significant factor associated with all types of incontinence in nursing home residents (21). Nevertheless, it has to be kept in mind that incontinence is also a factor associated with being care dependent for the CDS-items Hygiene as well as Dress/Undress and vice versa.

Two aspects related to validation of the model are particularly important. In the nursing home setting, the CDS-item Dress/Undress was not identified as an interacting factor with DI in the validation of the model. This may have occurred because split-sample validation requires random division of the total sample size into 2 subsamples (n = 468 and n = 454). Following this initial split through the CDS-item Hygiene, the small size of child nodes could be the reason that no additional significant split was possible. Nevertheless, all other trees indicated the same interactions in the split-sample validation as in the final trees. The second aspect addresses FI. Nine residents and 32 hospital patients had FI and, therefore, no validation could be conducted. A validation of our model including a larger sample size of residents/patients from different countries would be required to provide additional support for our results.

LIMITATIONS

Although our results are in line with other findings in the literature, our study was not without limitations. The first limitation was that participation was voluntary, which might have led to the introduction of selection bias. For example, this could have led to a situation in which only those residents/patients with a good health status participated.

We found lower prevalence rates for UI and FI for both settings relative to previous international studies (10-13). This difference may be attributable to use of mutually exclusive incontinence categories in our study. This disparity may influence the generalizability of our findings. When using a definition without mutually exclusive categories for the nursing home setting and the hospital setting, our UI prevalence rates (68.8 % and 16.4 %, respectively) and FI prevalence rates (41.7 % and 4.5 %, respectively) are again in line with the international literature (10-13). Selection of well-known factors was chosen from the literature as variables for the CaRT analysis may have acted as an additional limitation. Other possible influencing factors such as medication or smoking could not be included in the tree analysis (16, 37, 38). The reason for this was that they are not included in the *International Prevalence Measurement of Care Problems survey*, although they might have a huge influence on types of incontinence. Nevertheless, this was not the focus of this study and, therefore, not initially planned as subject to analysis. Nevertheless, further research including other possible influencing factors is needed.

CONCLUSION

Findings from this study provide additional insights into factors influencing UI, FI and DI in nursing home residents and hospitalized patients. Although previous research has identified that various factors are independently associated with the risk for incontinence, results of this study demonstrate that these factors influence one another and have the potential to increase the prevalence of incontinence. We have also shown that, according to the type of incontinence and the setting, different factors interact with each other. This information allowed us to develop profiles of incontinent residents and patients. By examining different interactions and profiles for each type of incontinence in each setting, researchers can develop specific prevention and management

programs to reduce the prevalence of incontinence and positively influence the health status of residents/patients.

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Chapter 4

Incontinence care in nursing homes: a cross-sectional study

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ABSTRACT

AIMS: To describe the quality of incontinence care in nursing homes. Main outcome measures were: (1) availability of structural quality indicators on ward and institutional levels; (2) use of nursing interventions as quality indicators on a process level; (3) prevalence of incontinence as an outcome indicator.

BACKGROUND: Incontinence in older people is a major problem in nursing care that presents a high workload for nurses, increases costs and places a high burden on affected individuals. The availability of structural indicators, and the use of nursing interventions, is recommended to improve the quality of care. Only limited amounts of reliable and valid data are available regarding the quality of incontinence care in nursing homes.

DESIGN: A cross-sectional multicentre study in 16 nursing homes (N = 1302) in 2013.

METHODS: A standardized and validated questionnaire was used for data collection. Each resident was assessed by two trained nurses.

RESULTS/FINDINGS: The primary outcome of the study indicated that structural indicators, such as the availability of information brochures, are limited in nursing homes. On a process level, the provision of body worn pads or underlay pads to protect beds or chairs were most frequently used and training interventions were only delivered to a small proportion of residents with incontinence. The prevalence of all types of incontinence, particularly double incontinence, was high (69.2 %).

CONCLUSION: Due to the high prevalence of double incontinence and low rate of training interventions regarding this type of incontinence, ongoing efforts to improve the quality of incontinence care are warranted.

KEYWORDS: continence, long-term care, practice nursing, quality of care

Why is this research or review needed?

- Incontinence increases the workload for nurses, costs to the care facility and places a high burden on affected individuals.
- Knowledge about nursing care regarding incontinence on structure, process and outcome level needs to be improved.

What are the key findings?

- Structural indicators, such as the availability of specialized continence nurses or information brochures, are limited in availability in nursing homes.
- On a process level, nursing interventions such as body worn pads were the most frequently used.
- The prevalence of all types of incontinence was high.

How should the findings be used to influence policy/practice/research/education?

- Nursing homes should provide structural indicators such as guidelines and information brochures about incontinence.
- Nursing homes should improve the knowledge of their employees on this topic by providing specialized education and/or continence nurses.
- Researchers should investigate the effectiveness and implementation of nursing interventions with regard to incontinence.

INTRODUCTION

Incontinence is a major health issue that affects women and men during any stage of life; its prevalence increases with ageing (1-3). Although its prevalence increases with ageing, incontinence is not a normal consequence of ageing (4-6). Incontinence has significant psychological and social impacts, places major limitations on the quality of life (1, 7-9) and increases the risk of admission into a nursing home (1, 10, 11). Incontinence can be described as an involuntary loss of urine or faeces or a combination of both. Urinary incontinence (UI) is defined as 'any involuntary loss of urine' and faecal incontinence (FI) is defined as 'any involuntary loss of faecal material' (12 p. 213-214). Consequently, a combination of UI and FI, also known as double incontinence (DI), is 'any involuntary loss of urine and faecal material' (13 p. 16). In the nursing home setting, nurses are the first in-house point of contact for residents and relatives. Therefore, nurses play a major role in the treatment and care of people with incontinence (14).

Background

A systematic review reported international prevalence rates of UI in nursing homes from 30-65 %, FI from 22.4-55.5 % and DI from 20.5-64 % (15). Annual prevalence measurements about different care problems, including incontinence, in the Netherlands reported UI prevalence rates in nursing homes up to 60 % and FI and DI prevalence rates at about 30 % (16). International prevalence rates for European countries, Japan and USA were reported between 42.9-65.2 % (17).

High rates of reported international prevalence for all types of incontinence have serious consequences such as increased anxiety (18), a self-reported decrease in the overall health of nursing home residents (19), represent an increased workload for the nurses (20) and contribute to rising costs for the health system (21, 22). Furthermore, Bürge et al. (2013) described incontinence as one risk factor in nursing home residents, which leads to a decline in the performance of the 'Activities of Daily Living' (ADLs) (23).

The most commonly mentioned risk factors for UI in the literature are age, gender and dementia (20, 24, 25). Furthermore, incontinence can be affected by multiple factors including diabetes, stroke and can be related to decreasing mobility and impairments in eating and drinking (25-27).

Not only individual characteristics, but also structural and process level indicators (as described by Donabedian) influence the health outcomes of residents (28). Donabedian described three categories (structure, process and outcome), within which conclusions with regard to the quality of care can be drawn (29). Structure includes material resources (equipment), human resources (staffing) and organisational aspects; process includes, for example, nursing diagnoses and nursing interventions; the outcome category shows the effect of care on the health status, such as an improvement in resident's knowledge (29).

The application of such structural indicators, such as keeping voiding records or food and fluid diaries, is recommended in the international literature to improve the process of incontinence care (12, 30).

On a process level, international guidelines recommend nursing interventions such as monitoring of diet, bowel habits or toilet training, and the revision and adaption of incontinence affecting medication (13, 31).

A relationship between structural, process level and outcome indicators, as proposed by Donabedian, has been confirmed by some studies (23, 32). A multi-professional team approach (structural) is considered crucial for optimal continence care (31, 32), while Sackley et al. (2008) showed that staff education (structural) and group exercise (process level) improved the outcomes of residents by decreasing urinary incontinence (outcome) (33).

In addition, specific behavioural interventions like exercise and prompted voiding (process level) have been reported to improve continence outcomes for nursing home residents (outcome) (34). Morgan et al. (2008) also confirmed the relationship between structural, process level and outcome indicators (35). They showed a decrease in the rate of incontinence (outcome) after implementation of a bowel and bladder incontinence assessment tool (structural), which included an individualized toileting schedule (process level).

However, Roe et al. (2013) concluded that studies on incontinence are necessary due to the fact that most descriptive studies on the management of urinary incontinence in nursing homes have been conducted in the USA (30). This is especially relevant because of the fact that the applicability of their results may not be transferrable to the European setting, where structural indicators (e.g. organizational structure, staff mix) and delivery of care (process

level indicators) could differ. Furthermore, Roe et al. (2011) reported that most research methods may have limited reliability and validity, due to the use of patient files (15).

THE STUDY

Aims

The overall aim of this study was to describe the quality of incontinence care in nursing homes. The main aims of this study were: (1) to describe the availability of structural indicators on ward and institutional levels; (2) to describe the use of nursing interventions as a level indicators; as process level indicators; and (3) to assess the prevalence of incontinence as an outcome indicator in various risk groups.

Design

The International Prevalence Measurement of Care Problems is an internationally conducted, cross-sectional, multicenter study, which is annually conducted on one specific day in healthcare settings such as hospitals and nursing homes. This study scrutinizes the prevalence, prevention and intervention measures and quality indicators with regard to incontinence, pressure ulcers, restraints, malnutrition, intertrigo and falls (16). This article concentrates only on the incontinence data. Data are collected using a comprehensive and standardized questionnaire that asks questions on three levels: institutional, ward and patient/resident (16). This study was conducted in 2013 in 16 Austrian nursing homes as the Austrian version of the International Prevalence Measurement of Care Problems (36, 37).

Participants

All nursing homes in Austria with more than 50 beds, which are registered in a national database (38), were invited via email and leaflets to take part in the study. Residents were eligible for participation if they were living in the nursing home on the day of data collection. Training on conducting the measurement was offered by staff members of the Institute of Nursing Science at the Medical University of Graz using the questionnaires and the web-based data entry program. Standardized training materials were made available (37).

Data collection

For data collection purposes, the Austrian version of the *International Prevalence Measurement of Care Problems* was used (37). This questionnaire was based on Donabedian's structure, process and outcome model for health care organisations (29). With reference to incontinence, the structural and process level indicators were developed and regularly updated by consulting experts. These were based on guidelines, e.g. the EAU Guideline in Urinary Incontinence 2010 (39) and those appearing in the primary literature (40, 41). Specific details for the development of these indicators can be found in Van Nie-Visser et al. (2013) (37). The focus of this study was to directly assess the incontinence data. Therefore, the first step was to question the nursing home residents. If this was not possible, patient files or caregivers could be used to collect relevant information. The last course taken was to ask the relatives. The reason for this was that most of the relatives have been observed to have little insight into the nursing practices, care and intervention measures with regard to care problems such as incontinence and, therefore, were not expected to be able to answer the questions. Seven structural indicators on the institutional level were specified that could be answered with a simple 'yes' or 'no', for example, whether guidelines or information brochures were available. On the ward level, seven structural indicators with dichotomous (yes/no) answers were assessed (e.g. multidisciplinary meetings on incontinence, availability of incontinence experts). The process level indicators were conceptualized as the use of nursing interventions for UI (e.g. individual schedules for fixed-time bathroom visits, bladder training), where multiple answers were possible. The prevalence of incontinence without a catheter was delineated as an outcome indicator. To ensure a clear distinction between types of incontinence, the previously mentioned International Continence Society (ICS) definitions (12) for UI and FI were used and elaborated on. A resident experiencing UI was defined as involuntarily losing urine, without any involuntary loss of faecal material. Residents were defined as experiencing FI when they suffered from any involuntary loss of faecal material, without any involuntary loss of urine. If a resident lost both urine and faecal material, they were identified as experiencing DI. In addition to these indicators, demographic data (e.g. age, gender) and medical diagnoses according to ICD 10 (42) were measured. Decreased mobility or impairment in eating and drinking were measured with the German version of the Care Dependency Scale-CDS, where lower scores referred to higher levels of care dependency (43, 44). The CDS sum score of the residents could range from completely care dependent (15-24 points), to

a great extent care dependent (25-44 points), partially care dependent (45-59 points), to a limited extent care independent (60-69 points) and up to almost care independent (70-75 points) (45).

Ethical considerations

Written informed consent was given by the participating nursing home resident or their legal representative. The study was approved by the ethical committee of a university.

Data analysis

Statistical analyses were performed using the SPSS 20.0 statistical software for Windows (46). The data file was checked for discordant values and contradictions. Descriptive data analysis was used for nominal variables and ordinal variables. Age was described as the mean with standard deviation. Metric variables that were not normally distributed were revealed as the median and percentile (25 %; 75 %).

Validity and reliability

For data collection purposes, the *International Prevalence Measurement of Care Problems*, a standardized and psychometrically tested questionnaire, was used (37). The development process, and reliability and validity of the whole questionnaire and included instruments, has already been described in detail (37). The Austrian version was professionally translated and language changes were discussed with members of an international, fluent, German-speaking research team (47-49). In 2008, a pilot measurement was conducted in 11 Austrian hospitals to assess the comprehensibility and applicability of the Austrian version. Feedback, with minor linguistic changes suggested by staff at the 11 pilot hospitals, was included into the questionnaire (47-49). To increase the objectivity of the assessment, each resident was assessed by one nurse from the ward and one independent nurse from another ward. Disagreements were resolved through discussion. No independent researcher was involved in the data collection process.

RESULTS

Characteristics of sample

16 Austrian nursing homes including 43 wards with 1397 nursing home residents (response 80.1 %) participated in the study. Additional exclusion criteria included the use of a catheter (N = 74) and whether data for incontinence were missing (N = 21). The mean age of participants in the final sample was 83.7 years (standard deviation: 9.6) and more than three quarters were female (78.8 %). The three most prevalent diagnoses were cardiovascular diseases (73.2 %), dementia (53.3 %) and motor disorders (46.3 %). The median sum score of the CDS was 47.5 (percentiles: 29.0; 65.0). Nearly half of the residents were completely or to a great extend care dependent (46.0 %) and more than one-third (36.3 %) were completely care dependent with regard to their 'continence'. Table 4.1 illustrates structural indicators on both institutional and ward levels.

Table 4.1 Availability of structural indicators on institutional (N=16) and ward (N=43) levels

	Number	Percentage
Availability of structural indicators on the institutional level		
Guidelines for incontinence treatment	10	62.5 %
Expert to update guidelines	10	62.5 %
Availability of incontinence expert	8	50.0 %
Protocol for management of incontinence products	15	93.8 %
Refresher course for caregivers	9	56.3 %
Information brochure	3	18.8 %
Standard policy for handover	4	25.0 %
Availability of structural indicators on the ward level		
Availability of incontinence expert	16	37.2 %
Multi-disciplinary incontinence team meetings	9	20.9 %
Control of compliance with guidelines	30	69.8 %
Care file includes nursing interventions for incontinence	41	95.3 %
Standardized availability of incontinence products	42	97.7 %
Information brochure	7	16.3 %
Standard policy for handover	42	97.7 %

Structural level

The most frequent incontinence-related structural quality indicator on the institutional level was the availability of a management protocol for incontinence products at the institutional level (15 out of 16 nursing homes). A continence nurse was available in half of the nursing homes. The least used structural quality indicator on the institutional level was the availability of an informational brochure about incontinence for residents and/or caregivers (3 out of 16 nursing homes). The average number of structural quality indicators available on the institutional level was 4.3 (range: 1 to all = 7). The most frequent quality indicators on the ward level were the review of continence status during admission/discharge, the documentation of nursing interventions for incontinence in the care file and the availability of incontinence products in the ward (42 out of 43 wards). An incontinence specialist was available on the ward for 16 of 43 wards. The least frequently used structural quality indicator on a ward level was again the availability of informational brochures about incontinence for residents and/or caregivers (7 out of 43 wards). The average number of structural quality indicators available on the ward level was 4.9 (range: 3 to all = 7).

Process level

Table 4.2 shows diverse incontinence-related interventions for the management of UI that were offered to the nursing home residents.

Table 4.2 Application of UI nursing interventions for UI, DI and incontinence in %

Application of UI nursing interventions*	UI residents (N=359)	DI residents (N=529)	INC residents (N=888)
Body worn disposable or washable pads	85.2 %	84.7 %	84.9%
Disposable or washable underlay pads	68.8 %	69.0 %	68.9%
Adapted and comfortable clothing	51.8 %	58.2 %	55.6%
Individual schedule for fixed time bathroom visits	51.5 %	38.6 %	43.8%
Adaptation of the environment	44.3 %	42.3 %	43.1%
Evaluation of medication	27.9 %	26.8 %	27.3%
Disposable (under) pants	15.9 %	19.7 %	18.1%
Ward schedule for fixed time bathroom visits	9.7 %	18.5 %	15.0%
Bladder training/pelvic muscle/relaxation exercise	5.0 %	5.5 %	5.3%
Medication	6.7 %	2.8 %	4.4%
Others	1.9 %	0.9 %	1.4%
No actions (e.g., use of catheter)	1.1 %	0.6 %	0.8%

*Multiple answers poss ble.
UI, urinary incontinence; DI, double incontinence; INC, incontinence.

Disposable or washable absorbent bodyworn pads (84.9 %) or pads/mats for placing under the participant (68.9 %) were the interventions most frequently used for all types of incontinence. Adapted and comfortable clothing was offered for approximately 50 % of the residents with incontinence (55.6 %). Individual schedules for fixed bathroom visits were chosen as interventions for about a third of the residents with DI (38.6 %) and an adaptation of the environment was made for 42.3 % of the residents with DI. An evaluation of medication given was performed for about one quarter of the residents with incontinence (27.3 %). In contrast, medication was used as an intervention for 4.4 % of the residents with incontinence. Departmental scheduling at a fixed time for bathroom use was made for 15.0 % of the residents. Training interventions such as bladder training/pelvic muscle exercise/relaxation exercise were used only for a small number of residents with incontinence (5.3 %).

Outcome level

The overall prevalence of incontinence (UI, FI, or DI) in Austrian nursing homes was 69.2 % (N = 1302; 95 % CI: 66.7-71.7 %) and UI was prevalent in 27.6 % (95 % CI 25.6-29.6 %) of the residents. Most of the residents with UI had experienced this condition for more than a year (58.5 %) and had experienced UI every day of the month before the assessment (74.4 %). The prevalence of FI was 1.0 % and 46.2 % of these FI residents had been suffering from FI for more than a year. Most of the residents experienced FI twice a week (38.5 %). The prevalence rate of DI was 40.6 % (95 % CI 38.6-42.6 %). Most of the DI residents had been suffering from UI (62.0 %) and FI (59.0 %) for more than a year. In addition, most of the DI residents experienced UI (96.6 %) and FI (44.6 %) every day. In table 4.3, the prevalence rates for incontinence, UI, FI and DI are shown in different risk groups.

Table 4.3 Prevalence of UI, FI, DI and incontinence in various at risk-groups

	UI prevalence	N	FI prevalence	N	DI prevalence	N	INC prevalence	N
Age								
≤ 80 years	34.8 %	201	3.7 %	136	52.9 %	278	62.9 %	353
≥ 81 years	51.7 %	559	2.9 %	278	58.6 %	652	71.5 %	949
Female (%)	53.0 %	581	3.2 %	282	61.5 %	709	73.4 %	1026
Male (%)	28.5 %	179	3.0 %	132	42.1 %	221	53.6 %	276
Diabetes Mellitus (%)	53.9 %	152	4.1 %	73	62.2 %	187	74.3 %	272
Stroke (%)	43.8 %	89	5.7 %	53	67.9 %	156	74.7 %	198
Dementia (%)	58.0 %	314	4.3 %	138	73.9 %	506	81.0 %	694
CDS Mobility								
Completely care dependent	77.1 %	35	38.5 %	13	97.1 %	277	97.4 %	309
Great extent care dependent	80.0 %	70	12.5 %	16	89.6 %	135	92.7 %	193
Partially care dependent	64.9 %	74	4.8 %	42	60.8 %	102	77.5 %	178
Limited extent care dependent	58.5 %	183	1.3 %	77	40.2 %	127	67.7 %	235
Almost care independent	26.5 %	358	1.1 %	266	9.0 %	289	32.0 %	387
CDS Eating & Drinking								
Completely care dependent	52.9 %	17	20.0 %	10	96.2 %	208	96.3 %	219
Great extent care dependent	81.1 %	37	30.0 %	10	95.3 %	149	96.2 %	182
Partially care dependent	63.7 %	128	2.7 %	75	61.4 %	189	77.1 %	319
Limited extent care dependent	49.1 %	224	3.4 %	118	28.3 %	159	58.2 %	273
Almost care independent	29.2 %	281	1.0 %	201	11.6 %	225	35.6 %	309

UI, urinary incontinence; FI, faecal incontinence; DI, double incontinence; INC, incontinence.

Nearly three quarters of residents older than 81 years were incontinent. The exception here is FI, whereby residents younger than 81 years suffered more often from FI than older residents. With regard to gender, the results show that female residents experienced incontinence more often than male residents. Between 43.8 % and 73.9 % of the residents with diabetes, stroke and dementia suffered from UI or DI. Of the residents that were completely care dependent in the sub-item 'mobility' as well in the 'eating and drinking' categories, nearly 100 % (97.1 %; 96.2 %) had DI. Of the residents that were to a great extent care dependent for these two sub-items, more than three-quarters had UI (80.0 %; 81.1 %).

DISCUSSION

Until now, little data have been collected in Europe with regard to incontinence care in nursing homes and most existing studies have been conducted in the USA (30). The result of this study provides an initial insight into the quality of incontinence care with respect to structural, process level and outcome indicators in Austrian nursing homes. The primary outcome of the study indicated that structural indicators, such as the availability of specialized continence nurses or information brochures, are still limited in Austrian nursing homes. On a process level, nursing interventions such as the provision of body worn pads or underlay pads to protect beds or chairs were most frequently used. In contrast, training interventions (e.g. bladder training, relaxation techniques) were delivered to only a small proportion of residents with incontinence. Nevertheless, the prevalence of all types of incontinence measured was still high, especially DI, which underlines the urgent need for improvements in incontinence care in Austrian nursing homes. The most commonly applied structural indicator in Austrian nursing homes was the availability of management protocols for incontinence products. This could be explained by the fact that, for management/financial reasons, incontinence products have to be organized and documented. Furthermore, protocols/guidelines on the prevention and treatment of incontinence were commonly available. With regard to this, Dugan et al. (2001) found an improvement in incontinence care through the implementation of clinical guidelines for women, but not for men, because the latter were less likely to be asked about incontinence (50). Furthermore, we stress that the availability of these protocols and/or guidelines does not necessarily indicate their appropriate application and use. The reasons for

this could be a lack of knowledge, IT-resources, or specific language requirements. These could impede the implementation of evidence based recommendations as described by Harvey et al. (2012) (51). Nine out of 16 nursing homes had offered a minimum two hour refresher course on incontinence at some point during the 2 years prior to the study. This is noteworthy because every 5 years all nurses in Austria are legally required to have 40 hours of training regardless of the topic (52). This was in accordance to Sackley et al. (2008) who described staff education as an obligatory precursor for beneficial outcomes for residents (33). Nurse education and the cooperation of the nurses with advanced geriatric nurses can help increase overall knowledge on incontinence assessment and can positively influence the attitudes of the nurses (53). The least-used structural quality indicator on the institutional and ward levels was the availability of informational brochures about incontinence. A possible explanation could be that, on one hand incontinence might still be considered a taboo subject (18) and on the other hand, a societal misconception that incontinence is a normal consequence of aging may still exist (4-6). The infrequent use of informational brochures is consistent with the findings of studies with regard to other care problems and the use of informational brochures as structural indicators (47, 48). The results of this study with regard to structural indicators confirm other findings published in international literature (33, 47, 48). Protocols and guidelines are commonly available, but this does not imply that they are used in practice. For this reason, ongoing efforts about the development/adoption of guidelines, focusing on their usability for nursing practice, is warranted. At a process level, international guidelines recommend, for example, prompted voiding and keeping diet, food and fluid diaries and voiding records (13, 26, 31). In contrast, in the Austrian nursing homes the most commonly applied nursing intervention was the use of disposable or washable body worn pads or underlay pads. This is consistent with the results of Rodriguez et al. (2007) where 50 % of the nursing homes used absorbent products to manage incontinence (54). Wagg et al. (2008) also reported that 63 % of care home residents received such absorbent products (55). Our results are also in agreement with the results from Sgadari et al. (1997), where 71.6-92.9 % of incontinent residents received pads or absorbent diapers (17). With regard to this, Hägglund (2010) ranked the use of incontinence aids, such as absorbent products, on the lowest level of evidence in a systematic review about incontinence in nursing home residents with dementia, which is the clinical experience (7). In addition, the author recommended the use

of absorbent products only while waiting for or during an investigation or as supplements to other interventions (7). An explanation for the frequent use of absorbent products in Austrian nursing homes might be the high workload of the nurses. Bliss et al. (2004) explained that only a few nursing homes might be able to achieve a staff ratio that allows for high quality incontinence intervention (56). Another explanation could be that the nursing labour costs of implementing behavioural therapies were higher than the laundry costs (57). There is evidence that active management of incontinence (bladder training or pelvic floor muscle training) is seen as an successful intervention for long-term management (58-60), in contrast to the results of this study, where only about 5 % of the residents with incontinence were offered such programs. This result is in agreement with the result of Wagg et al. (2008), who found that between 3-16 % of the care home residents received pelvic floor muscle or bladder training (55). This can be explained by the fact that a high number of residents with dementia might not be able or willing to participate in such active training programs. Another explanation could be that Austrian nurses are not aware that active training programs could be an effective intervention for older people. On an outcome level, the prevalence rates for UI differ from the international and European prevalence rates reported. On the other hand, rates for FI seem much lower in the Austrian nursing home context as compared with international rates. These differences could be explained by the definition of the mutually exclusive incontinence categories, which we used in our study. When comparing the international and national prevalence rates without mutual exclusive categories, Austrian prevalence rates for UI (68.2 %) and FI (41.6 %) were higher than prevalence rates reported from other European countries (16), however, they are consistent with international prevalence rates reported by Roe et al. (2011)(15). Our observations and data collected indicate that nurses, in general, perceive incontinence as a normal consequence of aging and, therefore, the nurses do not deem it necessary to actively prevent it in the nursing practice. This general observation was also noted by Roe et al. (2011) (15), who recommended that studies regarding the maintenance/promotion of continence were warranted.

LIMITATIONS

In this study, certain limitations might have influenced the data quality. The first limitation was that only 16 Austrian nursing homes participated in this

study, which represented only 3.4 % of all Austrian nursing homes. On this basis, a comprehensive overview of the Austrian nursing home situation could not be achieved. A second possible limitation was a potential selection bias. Participation was voluntary and may be only nursing homes that already focussed on the quality of care participated, leading to the potential for bias in the results. The residents had to give their written informed consent, which could have led to the event that only residents with a 'good health status' participated and residents with a 'poorer health status' refused to participate, although those with a 'poorer health status' would have been of great interest for inclusion. This study provided a brief insight into the quality of nursing incontinence care in Austrian nursing homes. Nevertheless, the study design does not allow for an evaluation of causalities between the structural, process and outcome levels.

IMPLICATIONS FOR PRACTICE AND RESEARCH

Based on our results, we recommend the further development and provision of guidelines and informational brochures about incontinence in Austria. In addition, knowledge about incontinence could be improved by educating nurses in the nursing homes and/or through implementation of specialized continence nurses. With regard to the research aspect, one major recommendation would be to investigate the effectiveness and implementation of nursing interventions related to incontinence in nursing homes. Overall, the results of the data analysed indicate that it is necessary to overcome societal misconceptions regarding incontinence and ageing in nursing practice, research and education.

CONCLUSION

In Austrian nursing homes, structural indicators, such as the availability of specialized continence nurses or informational brochures, remain limited. Furthermore, on a process level, active training interventions (e.g. bladder training, relaxation techniques) are only delivered to a small proportion of residents with incontinence. In contrast, nursing interventions such as the provision of body worn pads or underlay pads are most frequently used. Overall, the prevalence of all types of incontinence was still high, especially in the case of DI. This study aimed to increase the knowledge base about incontinence

and exemplifies the urgent need for improvements in the structural and process level indicators of incontinence care in Austrian nursing homes.

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Chapter 5

Adaptation of evidence-based guideline recommendations to address urinary incontinence in nursing home residents according to the ADAPTE-process

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ABSTRACT

AIMS AND OBJECTIVES: To adapt international guideline recommendations for the conservative management of urinary incontinence (UI), defined as any involuntary loss of urine, in Austrian nursing home residents following the ADAPTE-process.

BACKGROUND: Many international guidelines for managing UI are available. Nevertheless, the international recommendations have not yet been adapted to address the Austrian nursing home context. This crucial adaptation process will enhance the acceptance and applicability of the recommendations as well as encourage adherence among Austrian nurses and nursing home residents.

DESIGN: This study is a methodological study based on the ADAPTE-process, including a systematic search, quality appraisal of the guidelines using the Appraisal of Clinical Guidelines for REsearch & Evaluation II (AGREE II) instrument as well as an external review by means of a Delphi technique. The guidelines had to be topic relevant, published within the last 3 years and achieve a rigor of development score of 80 % using the AGREE II instrument.

METHODS: We searched international guideline databases to identify adequate guidelines. Two raters assessed the quality of each guideline, ascertaining that it fulfilled the inclusion criteria using the AGREE II instrument. We translated the identified recommendations into German and externally reviewed for their applicability in the Austrian context.

RESULTS: We identified 1,612 hits in 10 databases. After applying inclusion and exclusion criteria, we assessed five international clinical guidelines for quality using the AGREE II instrument. One clinical guideline fulfilled the inclusion criteria. This clinical guideline contains 116 recommendations, of which 29 were applicable in the Austrian nursing home setting.

CONCLUSION: We identified only one suitable guideline, possibly due to the stringent nature of the inclusion criteria. However, following low-quality guidelines may result in the use of recommendations that are not based on evidence and, therefore, may lead to suboptimal nursing care and outcomes.

KEYWORDS: clinical guidelines, development, evidence-based practice, incontinence nursing home care

What does this paper contribute to the wider global clinical community?

- Describing the search for international clinical guidelines, we used their quality assessment and the appraisal of applicability of international guideline recommendations for other international researchers when adapting recommendations from international clinical guidelines to their regional contexts.
- This study shows that although a high number of guidelines are available, we used only a few recommendations for the specific regional practice. This also emphasizes the need for systematic adaptation of international clinical guidelines to identify recommendations applicable for the regional context.
- The quality of most guidelines identified in our study was low. Further research on guideline reporting standards and methodological quality is warranted. It is also necessary to evaluate the effectiveness of these NR in Austrian nursing home settings.

INTRODUCTION

The International Continence Society defines urinary incontinence (UI) as "any involuntary loss of urine" (1 p. 27). Urinary incontinence increases with age (1) with prevalence rates in nursing homes reaching up to 75.8 % (2, 3). It results in high costs particularly in nursing homes than in other settings, such as community (4) and places a high burden on the affected individuals (5) and nursing staff (6). Therefore, effective strategies to manage UI in nursing homes are needed. Managing UI using effective interventions based on evidence-based knowledge from clinical guidelines implies integrating evidence-based knowledge into nursing practice (7). Nurses play crucial roles in UI management in nursing homes because they often recognise the problem first (8). In Austria, nurses are legally bound to practice according to specialised, scientific knowledge and experiences (9). Referring to high-quality evidence is a prerequisite to offering quality health care. Valid guidelines are important tools used to create evidence-based clinical practices (10).

BACKGROUND

Guidelines development versus adaptation

The development of clinical guidelines is a costly and time-intensive challenge (8), and may even be unnecessary, as many international clinical guidelines for different conditions, healthcare providers and settings already exist (2, 11). Numerous international clinical guidelines have been published on the same topic and population that offer varied or even contradictory recommendations, leading to confusion among members of the health profession (12). Although many clinical guidelines are available, these evidence-based recommendations are often not used in (nursing) care (13) due to cultural or linguistic differences. Recommendations must be adapted to the regional nursing practices to increase the acceptance and applicability, the adherence to the recommendations and to overcome different staff responsibilities (3). In Austria, there are two main levels of nursing staff including nurses and nursing assistants. Nurses carry the main responsibility for patients' nursing care and may delegate tasks to nursing assistants who are mainly responsible for basic care tasks. Contrary to healthcare regulations in other countries, nurses in Austria do not perform healthcare measures such as the prescription of medication or placing a catheter in men. On the other hand, nurses are responsible for wound

management including dressing changes, with the decision of dressing type being taken by physicians.

Such strictly regulated responsibilities are very important within the Austrian nursing home setting where no doctors are directly employed in the nursing homes like they are in other countries. Generally, Austrian nurses' ability to read basic English scientific articles/reports varies, as basic principles to read English nursing literature were not included in their basic education (14). So, translating and adapting recommendations into native language may improve the use of evidence-based nursing recommendations. The advantage of translating and adapting guidelines rather than developing them de novo is to minimise investments (e.g., money, staff time) (10, 11, 15). Guideline adaptation is a "systematic approach that can be used, where clinical guidelines currently exist or for customising (an) existing guideline to suit local context" (16 p. 9). At this moment, no current guidelines are available to guide nursing practice for the care of people with UI in Austrian nursing homes. Therefore, we decided to translate and adapt evidence-based recommendations for Austrian nursing homes. The regional context is defined as "Austrian nursing homes, including nursing staff and their responsibilities." Austrian nursing homes might differ from those in other countries on a structural level (e.g., organizational structure, staff mix), as well as in the delivery of care (e.g., prescription of medication) (17). Nursing homes in Austria might be defined as geriatric long-term care facilities that provide skilled nursing care services for inpatients on a daily basis.

This study provides a detailed description of how we used the ADAPTE-process in nursing research. We found several studies that used the ADAPTE-process (18-20) but did not describe the steps in detail. This study can be regarded as an example on how international clinical guidelines can be tailored to regional contexts.

Therefore, following steps of the ADAPTE-process, we aimed to describe (a) the search for international clinical guidelines, (b) the quality assessment of international guidelines, and (c) the appraisal of applicability of international guideline recommendations with regard to UI to the Austrian nursing home context.

METHODS

The ADAPTE-process

The ADAPTE-process was chosen because it is well known and frequently used as a framework to adapt clinical guidelines to regional contexts (18-20). The ADAPTE-process has the following major strengths: (a) It ensures the validity of the final recommendations, (b) it ensures that these recommendations address-specific health question (UI) and the local context (Austrian nursing homes), and (c) it ensures that the needs and priorities of the target group (nurses) and legislation (work field of nurses in Austria) as well as resources in the local context (patient– staff ratio) are considered. The ADAPTE-process has three phases (figure 5.1).

Figure 5.1 ADAPTE-process (16)

Phase 1: Set-up

During the set-up phase, we: (a) established an organising committee, (b) chose a topic, (c) checked whether adaptation is feasible, and (d) planned further steps. The organising committee consisted of three persons (MH, DS and CL) with expertise in nursing research, especially guideline development, systematic literature research and appraisal of clinical guidelines, and familiarity with UI in nursing homes. The committee choose conservative management of UI (21 p. 7) as the guideline topic, with reference to “therapies such as lifestyle interventions and physical, behavioural and non-therapeutic interventions” in nursing homes. To get a broad overview of the topic, we also conducted an exploratory search (22) in 79 databases using “continence” as a search term. Ten databases, a detailed list can be provided by the main

author, for example, National Guideline Clearinghouse (23), for clinical guidelines were initially identified during this phase that contained references to UI. During this exploratory search, no guideline was identified that focused on the nursing practice in the Austrian nursing home context.

Phase 2: Adaptation

Figure 5.1 describes the detailed steps of phase 2. Following the PIPOH-scheme (Population, Interventions, Professionals, Outcomes, Healthcare setting) (16), the research question was addressed as follows: Which conservative management strategies can be recommended that nursing staff can use to prevent or treat UI in residents living in Austrian nursing homes?

Search and screen for guidelines

We searched for guidelines, limiting our search to guidelines published in English or German. Because the prescription of medication is not a task allocated to nurses in Austria, we excluded clinical guidelines that focused on pharmacological treatment. We still included clinical guidelines including both the nonpharmacological and the pharmacological treatments. We also excluded guidelines older than 3 years (24) or guidelines synthesising other guidelines. We collected additional information regarding the development of the guideline (e.g., factsheets, methodological papers and audit instruments such as clinical audit standards and reports).

Quality assessment of guidelines

Two raters assessed the clinical guidelines using the AGREE II instrument (Appraisal of clinical Guidelines for REsearch & Evaluation II) (25).

The AGREE II instrument contains 23 key items in six domains plus two global rating items: scope and purpose, stakeholder involvement, rigor of development, clarity of presentation, applicability and editorial independence (25). All AGREE II items are rated on a 7-point Likert scale (1 for “strongly disagree” to 7 for “strongly agree”), and domain scores were calculated using the formula from the AGREE II manual (25). 100 % mean scores indicated that the raters strongly agreed that all items of the domain were fulfilled. The raters only included clinical guidelines if their scores for the domain “methodological rigor” and overall quality score were >80 %. Low “rigor of development” domain scores indicated that the recommendations were not based on evidence and, therefore, their use could result in suboptimal nursing care and outcomes

(26). Each appraisal was discussed until a consensus was reached. In a case of doubt, we chose the rating with the lower score.

Phase 3: Finalisation

During the finalisation phase, we conducted an external review by experts, further planning steps and the production of a final report according to the ADAPTE-process.

Appraisal for applicability: Step 1

We extracted all recommendations from the valid guideline identified. To meet national requirements, we asked three reviewers to independently categorise the recommendations as: (a) not a task performed by Austrian nurses, (b) a task performed in part by Austrian nurses, and (c) an independent task performed by Austrian nurses. We included recommendations in this first review process if all reviewers assessed it as (c), or two reviewers assessed it as (c) and one assessed it as (b). We chose researchers with a nursing background as reviewers because the ability of most Austrian nurses to read basic English scientific articles/reports varies. We translated recommendations from English into German independently by the first author and a professional translator. We checked the translated version for linguistic differences which were resolved by the first author.

Appraisal for applicability: Step 2

We used a questionnaire developed for the "Clinician's Assessment of Practice Guidelines in Oncology study" (CAPGO) (27) to gather information on applicability. We excluded items in the CAPGO-survey that deal with recommendation reliability or validity (n = 4 items) and the implementation process (n = 4 items), as the aim of the external review process was to identify applicability in the Austrian nursing home context. Question one asked whether the experts are currently responsible for persons for whom the recommendations are relevant (options: yes, no, unsure). Two other questions could be rated from 0–5, and the other 12, from 1–5 (0 = not applicable and 1 = strongly disagree to 5 = strongly agree). We used following questions from the CAPGO-survey (27) to gather information on applicability:

- Is there a need for guideline recommendations on this topic?
- The draft recommendations in this report are clear.
- I agree with the draft recommendations as stated.

- The draft recommendations are suitable for the patients for whom they are intended.
- When applied, the draft recommendations will produce more benefits for the patients than harms.
- The draft recommendations present options that will be acceptable to patients.
- The draft recommendations are likely to be supported by a majority of my colleagues.
- If I follow the draft recommendations, the expected effects on patient outcomes will be obvious.
- The draft recommendations are too rigid to apply to individual patients.
- To apply the draft recommendations will require reorganisation of services/care in my practice setting.
- To apply the draft recommendations will be technically challenging.
- The draft recommendations are too expensive to apply.
- The draft recommendations reflect a more effective approach for improving patient outcomes than is current usual practice.
- When applied, the draft recommendations will result in better use of resources than current usual practice.

In addition, we provided one field for comments and remarks. We asked two independent nursing researchers to review the CAPGOsurvey for its reasonableness and the accuracy of the translation. During the last step, we conducted an external review using a Delphi technique. We invited six experts via email and telephone to complete the CAPGO-survey and give feedback on the applicability of the recommendations in the Austrian nursing home setting. Experts were defined as nursing home staff who had either experience with UI or nurses who were specialised in continence and ostomy issues. We invited general nurses, specialised nurses and nursing home staff (managers, master students in nursing science) to gain a broad overview. The experts could choose to fill out the CAPGO-survey either manually or online.

We used SPSS 23(IBM, 2015) to calculate Kendall's-W, the degree of agreement among the raters (28, 29) and median score among the six experts. Kendall's-W can be used for ordinal data with more than two raters (29). A statistically significant Kendall's-W, which was calculated in this study among all items together, indicates that there is a significant agreement between

the raters ranging from 0 (no agreement between the raters) to 1 (complete agreement between the raters) (28, 29).

RESULTS

The results are structured according to the steps of the ADAPTE-process, which is to describe (a) the search for international clinical guidelines, (b) the quality assessment of international guidelines, and (c) the appraisal of applicability of international guideline recommendations with regard to UI to the Austrian nursing home context.

Aim 1: Search for international clinical guidelines

Figure 5.2 presents a summary of the search strategy and exclusion criteria.

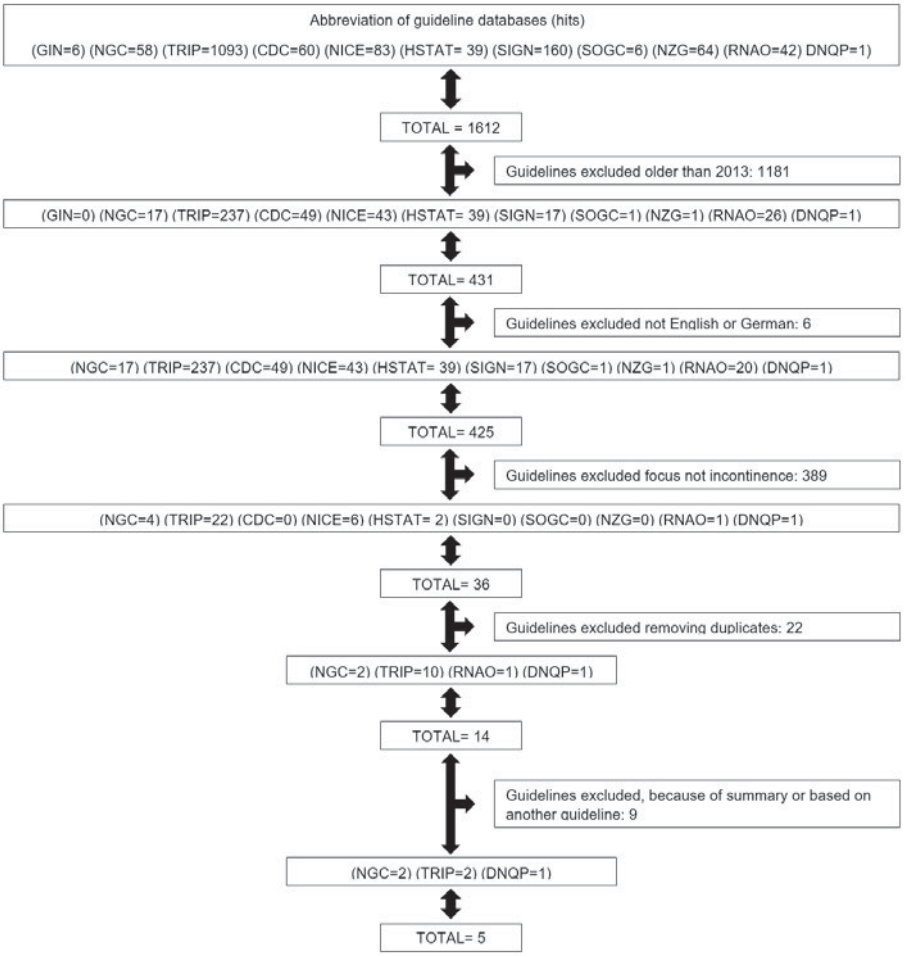

Figure 5.2 Search strategy flowchart

We found 1612 clinical guidelines in the ten different databases. This high number is due to two facts: (a) The use of the term “continence” as a search term resulted in the identification of many clinical guidelines that focused other diseases that influence continence status, and (b) in most databases searched, it was not possible to filter the results (e.g., by publication year). After limiting the search to guidelines newer than 2013 which were published in English or German, 425 clinical guidelines remained. The reviewers (MH, DS) agreed in 96.7 % of the cases that 36 of these 425 clinical guidelines addressed the research question. Both reviewers removed the same duplicates

(N = 22) and retained the remaining 14 clinical guidelines for full-text appraisals. Nine of these clinical guidelines were identified as being either based on another guideline (N=1) or summaries based on clinical guidelines published before 2013 (N = 8).

Aim 2: Quality assessment of international guidelines

The remaining five clinical guidelines for UI were as follows: (a) "Expert's standard to improve urinary incontinence in nursing care" (30) from Germany, (b) "Clinical guidelines on urinary incontinence from the European Association of Urology" (31) from Europe, (c) "Urinary incontinence: The management of urinary incontinence in women from NICE" (32) from United Kingdom, and (d) "Diagnosis and treatment of overactive bladder (non-neurogenic) in adults: American Urological Association (AUA)/Society of Urodynamics, Female Pelvic Medicine & Urogenital Reconstruction (SUFU) guideline"(33); as well as (e) "Nonsurgical management of urinary incontinence in women: a clinical practice guideline from the American College of Physicians" (34) from the USA.

We critically appraised and scaled these five guidelines, and domain scores were assessed using the AGREE II instrument (figure 5.3).

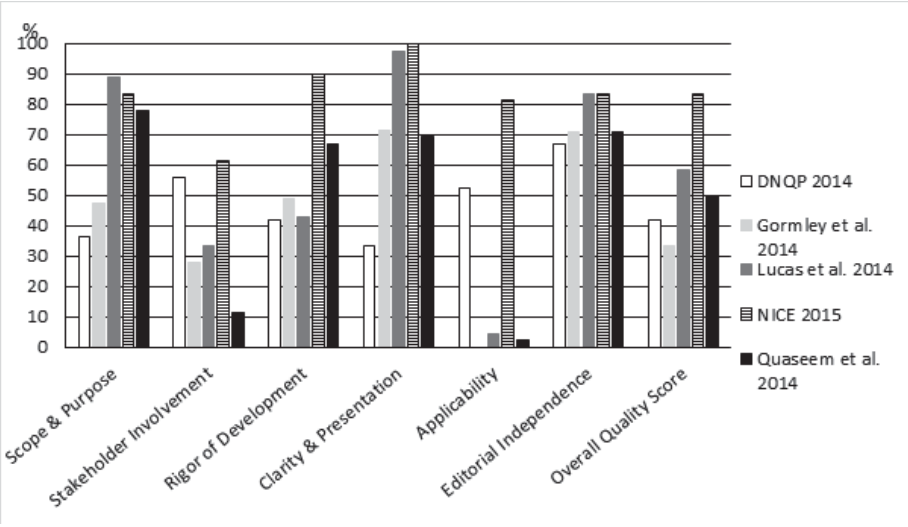

Figure 5.3 Domain scores (percent out of 100) of the guidelines assessed using the AGREE II instrument

The overall quality score for these guidelines ranged from 33.3 % (33) to 83.3 % (32). The NICE guideline (32) scored highest in every domain with the exception of "scope and purpose," whereby Lucas et al. (2014) (31) scored higher (i.e., nearly 90 %). The guideline "Urinary incontinence: The management of urinary incontinence in women from NICE" (32) was the only one that achieved a score of 80 % for "rigor of development; and overall quality." Therefore, we adapted these guideline recommendations for use in the Austrian nursing home setting. Here, it has to be mentioned that the NICE guideline (32) is focusing on women. However, we could not identify a guideline with high quality for both (women and men) or only for men.

Aim 3: Appraisal of applicability step 1

We then extracted the recommendations (N = 116) from the NICE guideline (32). Of these 116 recommendations, we excluded 87 (e.g., those addressing surgical approaches/invasive procedures). We deemed the 29 remaining recommendations (table 5.1) eligible for the Austrian nursing home context by the three reviewers.

Table 5.1 Examples for the 29 recommendations from NICE (32) that are applicable to Austrian nursing practice

Assessment and investigation	
1	Use bladder diaries during the initial assessment of female residents with UI or OAB. Encourage female residents to write in the diary for at least 3 days, describing their usual activities during working and free days.
Lifestyle interventions	
2	Consider advising women with UI or OAB to increase or lower their intake of fluids.
3	Advise women with UI or OAB who have a BMI >30 to lose weight.
Behavioural therapies	
4	Offer bladder training (period at least 6 weeks) as first-line treatment to women with urgency or mixed UI.
The multidisciplinary team (MDT)	
5	When recommending optimal management, the MDT should be taken into account: the female resident's preferences; past management; comorbidities and treatment options (including further conservative management such as OAB drug therapy).
Physical therapies	
6	Offer a supervised pelvic floor muscle training trial (period at least 3 months) as first-line treatment to women with stress or mixed UI.

7	Pelvic floor muscle training programs should include at least 8 contractions performed 3 times per day.
8	Do not routinely use electrical stimulation in the treatment of women with OAB.
9	Do not routinely use electrical stimulation in combination with pelvic floor muscle training.
10	Electrical stimulation and/or biofeedback should be considered for women who cannot actively contract pelvic floor muscles in order to support motivation and adherence to therapy.
Alternative conservative management options	
11	Absorbent products, hand-held urinals and toileting aids should not be considered as a treatment for UI but used only as coping strategies pending definitive treatment, or adjuncts to ongoing therapy and long-term management of UI only after other treatment options have been explored.

Aim 3: Appraisal of applicability step 2

We externally reviewed the 29 nursing recommendations by six experts (five women and one man), including three nurses specialized in continence and ostomy issues, two nursing master's students with experience working in nursing homes and one nursing home manager. The experts were 42 years old and had worked as nurses for 21 years on average. In their current job, five of six experts are responsible for persons for whom these recommendations might be useful. While all experts recommended to include all 29 nursing recommendations in the first round, a second round was not necessary. Figure 5.4 shows the median score among (dis)agreement of the six experts with regard to the applicability of the nursing recommendations (NR) in Austrian nursing homes.

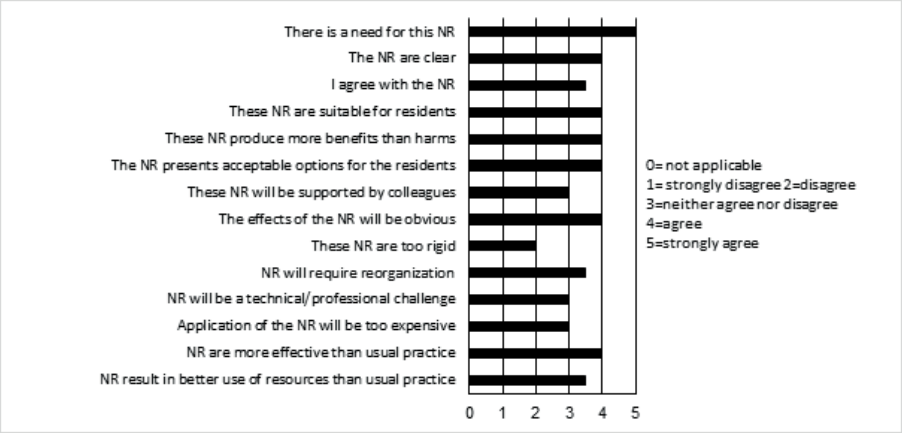

Figure 5.4 Median score among (dis)agreement of six experts with regard to the applicability of the nursing recommendations (NR) in Austrian nursing homes

The experts rated the applicability of the NR for the Austrian nursing home context as suitable for residents with acceptable options, generally agreed with them and felt there was a need for them. They stated that the NR are more effective with regard to resident's outcomes than the usual practices and that the benefits of their applications would outweigh any harm. They did not agree that the NR were too rigid to apply to the residents. A statistically significant medium agreement among the raters was identified (KendallW = 0.48; p = 0.000). The experts could submit comments and remarks. One expert expressed doubts regarding the applicability of these recommendations to nursing home residents with dementia, cognitive impairments or psychiatric illnesses. We provided other comments that addressed the use of catheters, pessaries and electric stimulation. The experts stated that use of these interventions resulted in positive outcomes in daily practice. Experts also stated that bladder training seems to be unclear for nurses and is sometimes confused with toilet training in the Austrian nursing practice. Based on the survey feedback, we then created an adaptation of the international guideline recommendations that included the remaining 29 NR for the conservative management of UI in Austrian nursing home residents by the first author.

DISCUSSION

The development of guidelines is a cost-intensive, time-consuming challenge (10, 11, 15). Therefore, we used the ADAPTE-process for the adaption of international guidelines recommendations. In the "Guidelines International Network-online survey" respondents stated, to refine the Manual and the Resource Toolkit as well to develop additional tools (35). We would specifically recommend the adaption/development of questionnaires for the external review process. A panel of experts identified and accepted one guideline that included 29 NR as applicable to the conservative management of female UI residents in Austrian nursing homes.

Our exploratory search (36, 37) of 79 databases allowed us to identify only 10 databases that contained references to incontinence but many of the other databases (e.g., Cochrane Database for Systematic Reviews) did not include guidelines.

We could identify in the first steps of our search strategy a huge number of guidelines. This is in line with the international literature that describes that many international clinical guidelines for different conditions, healthcare providers and settings are available (2, 11).

However, in our study, we could only include one guideline with 29 NR for the adaptation to the regional context. One explanation is that due to the stringent rigor of the development score that we used for inclusion (>80 %), we identified only one guideline that could be adapted to the Austrian nursing home context. Adequate and rigorous methodology, however, is both the foundation of high quality guidelines and a factor influencing the successful adaptation of the guidelines in practice (38). Internationally, the NICE guidelines achieve high scores according to the AGREE II instrument (39, 40).

In the guideline identified as suitable for adaptation, we found 29 NR that were rated by experts as suitable and applicable for nurses working in the Austrian nursing home setting. This clinical guideline had been developed by and for interdisciplinary use; however, we specifically focused on the conservative management of UI. We referred most of the excluded recommendations to invasive procedures or surgical approaches, tasks that are performed by medical doctors in Austria.

In their comments and remarks, the experts stated that the use of electric stimulation led to positive outcomes in daily practice, which directly contrasts with recommendations 8 and 9. However, evidence exists (recommendation no. 10) that electric stimulation and/or biofeedback are treatment options for women who cannot actively contract pelvic floor muscles to motivate them and promote adherence to therapy. Confusion regarding differentiating bladder training and, for example, timed voiding is also described in the ICS (1). The ICS distinguishes four types of scheduled voiding programs: (a) bladder training, (b) timed voiding, (c) habit training, and (d) prompted voiding (1). The included NICE guideline (32) uses the definition of Wallace, Roe, Williams, and Palmer (41): Bladder training can increase the time interval between voids, using either a fixed or a self-adjustable toileting schedule. In contrast, timed voiding prevents incontinence episodes by providing possibilities for voiding but does not affect bladder functional recovery (37). However, it seems that further education is needed to distinguish among the types of scheduled voiding programs.

Our study had some limitations. One limitation of this study is that, according to Fayers and Machin (42), back translation is recommended, but was not conducted as part of this study. Nevertheless, a professional translator and the first author performed a forward translation, and they found only minor linguistic differences. Another limitation is the purposive sample of experts. However, the aim of this study was to measure applicability to the Austrian nursing homes setting, and all included experts had experience in this specific setting.

CONCLUSION

Summarised, this study gives a detailed insight into how we used the ADAPTE-process in nursing research, which can be used as a model for other international researchers when adapting recommendations from international clinical guidelines to their regional contexts. Besides that, the quality of most guidelines identified in our study was low. Further research on guideline reporting standards and methodological quality is warranted. It is also necessary to evaluate the effectiveness of these NR in Austrian nursing home settings.

RELEVANCE TO CLINICAL PRACTICE

This study shows that although a high number of guidelines are available, we used only a few recommendations for the specific regional practice. This emphasises the need for systematic adaptation of international clinical guidelines to identify recommendations applicable for the regional context.

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CONFLICT OF INTEREST

The authors declare that they have no conflict of interests.

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Chapter 6

Effectiveness of conservative urinary incontinence management among female nursing home residents - a cluster RCT

Manuela Hödl, Ruud J.G. Halfens, Christa Lohrmann

Submitted

ABSTRACT

BACKGROUND: Guideline-compliant conservative management of urinary incontinence (UI) is the first step of the initial management for UI and is recommended for long-term care in older persons. Recent studies have focused on the effects of guideline-compliant UI management. However, most of these studies were tested in another setting than nursing homes and were not focused on conservative management.

AIMS: To measure the effectiveness of 29 evidence-based nursing recommendations regarding the conservative management of UI in Austrian nursing homes.

METHODS: The study is a cluster randomized intervention trial with institution as the unit of randomization. Twelve nursing homes in two Austrian provinces (Styria, Carinthia) were randomly allocated to the intervention group (IG) and control group (CG). Data were collected from participating residents over a three-month period. The intervention consisted of the implementation of recommendations for the conservative management of UI among female nursing home residents. The primary outcome variable was the daily UI experienced by the participating residents.

RESULTS: Residents in the IG (n=216) had a lower risk (OR=0.14, p=0.02) of experiencing daily UI and were less likely to receive absorbent products (OR=0.01, p=0.01) than residents in the CG (n=165). Residents in the IG (OR=5.16, p=0.00) were five times more likely to receive recommended interventions (e.g., bladder training for the management of UI) than residents in the CG.

LINKING EVIDENCE TO ACTION: Introducing guideline-compliant management in nursing practice can increase the use of evidence-based interventions for the conservative management of UI. The intervention in this study is targeted on nurses/nurse managers and can be recommended for the nursing home setting.

KEYWORDS: urinary incontinence, nursing home, long-term care, conservative management, evidence-based nursing, effectiveness

HIGHLIGHTS

- UI guideline adherent management increases the use of evidence-based interventions
- The intervention can be recommended for nurses/nurse managers
- Inclusion of a nurse in recruitment process may increase response rate

INTRODUCTION

In the health care system, urinary incontinence (UI), defined as „any involuntary loss of urine" (1), is a major health issue that has huge psychological and social impacts on affected individuals (2), increases nurses' workloads and health care costs (3). UI should be managed by following evidence-based guidelines to ensure high-quality health care (4). The conservative management of UI is generally accepted to be the first step of the initial management for UI (1) and seen as successful intervention for long-term management in older persons (5, 6). As no guidelines for the conservative management of UI are available in Austria, the current NICE guideline "Urinary incontinence: The management of urinary incontinence in women from NICE" (7) was translated and adapted to the Austrian nursing home context (8). Included recommendations as first-line treatment were e.g., diagnosing UI and the subtype, using a bladder diary, considering modification of fluid intake, advising UI women who have a BMI >30 to lose weight, offering bladder training (8).

Following Donabedian's model for healthcare organizations (9), introducing guideline recommendations for the conservative UI management (structural level) can have effects on process and outcome level (figure 6.1).

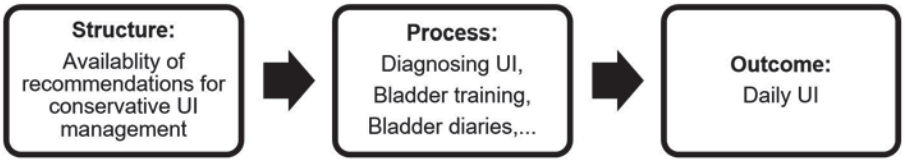

Figure 6.1 Conceptual model of Donabedian adapted to UI care

The availability of recommendations for conservative UI management can increase diagnosing UI or increase the use of bladder diaries (process level), which can influence the outcome level e.g., in terms of a decrease in daily UI.

However, the effectiveness of adapted recommendation for the conservative management for UI among nursing home residents has not yet been sufficiently empirically assessed (10). Recent research has focused on the effects of urinary incontinence guideline recommendations. Most of these have focused on the adherence of health care professionals to guidelines (11, 12), were tested in another setting other than nursing homes (13), and were not focused on conservative management (14).

For this reason, the aim of this study was to examine the effectiveness of the guideline recommendations on the conservative management of UI in Austrian nursing homes by testing three hypotheses:

1. Female residents in the intervention group (IG) are less likely to experience daily UI events than residents in the control group (CG).
2. Residents in the IG have a higher chance of having a UI diagnosis than residents in the CG.
3. Residents in the IG have a higher chance of receiving a recommended nursing interventions (e.g., bladder training) than residents in the CG.

MATERIALS AND METHODS

Design

This study was a two-armed, cluster randomized controlled trial conducted at nursing homes level. The recommendations were implemented within nursing homes (clusters) in the IG. The residents in the CG received nursing care as usual (e.g., daily routine UI management in the institution). After the end of the study, the first author gave the recommendations as well as the supplementary documents to the CG.

Process evaluation

Data were collected at baseline (T1) and during two follow-up measurements after six and twelve weeks (T2, T3). During T3, structured interviews were conducted with either the nurse manager or the person responsible for the project (15).

Ethical considerations

The ethical committees of the Medical University of Graz and the province Carinthia approved the study protocol (Styria: 29-007 ex 16/17; Carinthia: MZ 28/16). Both nursing homes and residents could cancel their participation without justification. The informed written consent of all participating residents or their legal representatives was obtained.

Sample size calculation

We used the „Sample Size Calculator“ (16) to determine the sample size needed to detect a difference between the CG and IG with respect to a 10 % decrease in the number of daily UI events. We assumed a power of 80 %, a significance level of 0.05 and an intraclass correlation coefficient of 0.01 (17, 18), which resulted in a total of 600 residents in twelve nursing homes.

Randomization

Due to the study intervention, blinding was not possible. Twelve nursing homes were included, six in each province and then randomized by the use of computer-generated, random-number tables to either IG or CG, three IG and three CG in each province.

Sampling / Recruitment

All nursing homes in two provinces in Austria (Styria and Carinthia) registered in a national database (19) that had a capacity ≥ 50 beds were invited to participate in the trial. The provinces of Styria and Carinthia were chosen for practicability.

Identified organizations were contacted by telephone and recruited if they met the following criteria (20): (1) The institution’s management agreed to random allocation to the IG or CG; (2) no evidence-based UI guideline was used; (3) no specialized training on UI prevention or management for nursing staff had been offered during the past two years; (4) fewer than five other major nursing care innovation projects had been implemented during the past two years; and (5) no specialized nurse was available for the management of incontinence.

Inclusion criteria for nursing home residents were: They were living in the nursing home at the date of baseline measurement, were female and planned to stay for the whole duration of the study (three months).

Intervention group

The intervention targeted on the nurse manager or person responsible for the study in the IG and consisted of three parts:

1. An one-hour instructional meeting after the baseline measurement with each nurse manager or person responsible in the IG nursing homes.

Detailed information regarding the nursing recommendations were discussed, and printed material was handed out to the IG.
2. The 29 guideline recommendations for the conservative management of UI.
3. Supplementary documents (e.g., posters with abridged versions of the UI management recommendations, bladder diaries (7) and questionnaires about the quality of life regarding UI (7) were provided.

The IG received the recommendations and supplementary documents in both hardcopy and PDF formats.

Data collection

We enrolled twelve nursing homes from January to April 2017. Data were collected at baseline (T1) and during two follow-up measurements after six and twelve weeks (T2, T3) from April to September 2017 by the first author and a nurse in each nursing home.

Instrument

The questionnaire used for data collection was based on the Austrian questionnaire of the "International Prevalence Measurement of Care Problems" research project (21). Residents' characteristics were age, medical diagnoses of dementia or nurses' clinical assessment of cognitive impairment (yes/no) and the Care Dependency Scale (CDS, German version). The CDS was used to measure the degree of care dependency with reference to 15 different needs such as hygiene or continence, whereby lower scores indicated higher levels of care dependency (15-75) (22). Other collected data were participation (yes/no), reason for non-participation (e.g., refusal, cognitive impairment), prevalence of urinary incontinence (yes/double incontinence/no), catheter because of UI (yes/no), start of UI after admission to this institution (yes/no), frequency of UI (3-4 times a month, a few times per week, daily), documented UI diagnosis (no, yes; if yes: stress UI, mixed UI, urge UI) and interventions for the management of UI.

The residents were asked which interventions (multiple answers possible) were conducted for the UI management (e.g., bladder diary, modification of fluid intake). In case of doubts, e.g., due to cognitive impairment, the nurses were asked which interventions were conducted for UI management for the

resident. These nursing interventions were divided into two categories: (1) recommended interventions included modification of fluid intake, pelvic floor muscle training, bladder diary, bladder training, multidisciplinary team, weight reduction and caffeine reduction; and (2) provision with absorbent products such as absorbent inlay pads, slips, pants and bed pads were not considered standard treatment.

Outcomes

We evaluated the effectiveness of the introduction of nursing recommendations into nursing homes (cluster level) by measuring the differences in numbers of daily UI events (primary outcome), number of UI diagnoses and use of nursing interventions between the IG and the CG. Daily UI rates were calculated for residents with "only" UI as well as for residents with double incontinence. Use of nursing interventions was analyzed as yes, when one of the interventions was conducted.

Data analysis

Data analysis was performed using SPSS (Version 24) in consultation with the Institute for Medical Informatics, Statistics and Documentation of the Medical University of Graz, Austria. Calculations were performed to identify differences between baseline and the IG and CG, using the chi-squared test for binary outcomes (participation, dementia) and the Mann–Whitney U test for non-normally distributed variables (age, care dependency sum). We included the province (Styria vs. Carinthia) as a potential confounder in the analysis.

Due to the binary outcomes (daily UI, diagnosis UI, interventions UI), the odds ratios (OR) between the two groups were estimated using a generalized estimating equation (GEE) model. The GEE model was constructed by including all main effects and interactions, omitting interactions that were not statistically significant. We used the GEE model with logit link and an autoregressive order 1 to model the within-nursing homes correlation (missing values were assumed to be completely random).

To construct the GEE model, we used the primary outcome (daily UI) with the resident as the subject and the province, nursing home and time as the inner subject variables. The inner subject variables were all included in the first step of the model and excluded in a step-wise manner. The model was constructed

with the following main effects: group, as well as dementia/cognitive impairment, care dependency and age, because they showed significant differences at the baseline between the intervention and control groups (IG and CG).

We used the autoregressive order 1, because our three measurement points and two observations made at nearer time points were more strongly correlated than two observations made at more distant timepoints (23).

We used a binary logistic model because of the binary outcome (daily UI: yes/no).

The model was chosen based on following criteria:

1. The model had to converge in order to be sure that the “Goodness of Fit” of the model was reliable,
2. the correlations between the time points in the working matrix made sense,
3. a low quasi-likelihood according to the Independence Model Criterion (QIC) was observed, indicating a “better” model, and
4. because the order of the inner subject variables had no influence on the QIC, we chose the order province, nursing home and time.

Analyses were performed based on the intention-to-treat principle and following the CONSORT 2010 statement for analyzing cluster randomized trials (24). The influences of baseline characteristics were evaluated by including age, dementia and care dependency in the model. The intra-cluster correlation coefficient was calculated with R (version 3.4.2) package ‘sjstats’ (25). To overcome the influence of the cluster nature as well as the influence of the outcome variables on the intra-cluster correlation coefficient, we used the formula for binary outcomes of Wu et al. (26). Throughout the analyses, 95 % CIs were reported, and a P-value of ≤0.05 was considered statistically significant.

RESULTS

Process evaluation

To evaluate the process, we followed four steps:

1. Recruitment of the nursing homes clusters: Overall, we had a nursing home response rate of 15.8 % (19.3 % in Styria and 13.3 % in Carinthia).
2. Response of clusters in the IG (n=6): In general, 4 of the nurse managers/persons responsible for this project agreed with the recommendations and regarded them as acceptable and applicable for resident care/treatment. 5 of the interviewed persons thought that the recommendations were helpful for nurses.
3. Experience of the IG's during and response to the intervention (n=6): 2 of the nursing homes had fully implemented the recommendations, and 4 partially implemented the recommendations. More than 50 % used the implemented recommendation during their daily nursing care practice, mainly by providing information material (41.7 %).
4. Unintended consequences in IG (n=6): The interviewed persons reported that 5 institutions met challenges while implementing the recommendations (e.g., residents were unwilling to actively keep a bladder diary).

The twelve nursing homes included a total of 676 female residents, with a response rate of 56.4 %. The main reasons for non-participation were refusal (40.7 %) and cognitive impairment (34.6 %).

Figure 6.2 provides a detailed description of the process of recruitment, allocation and analysis.

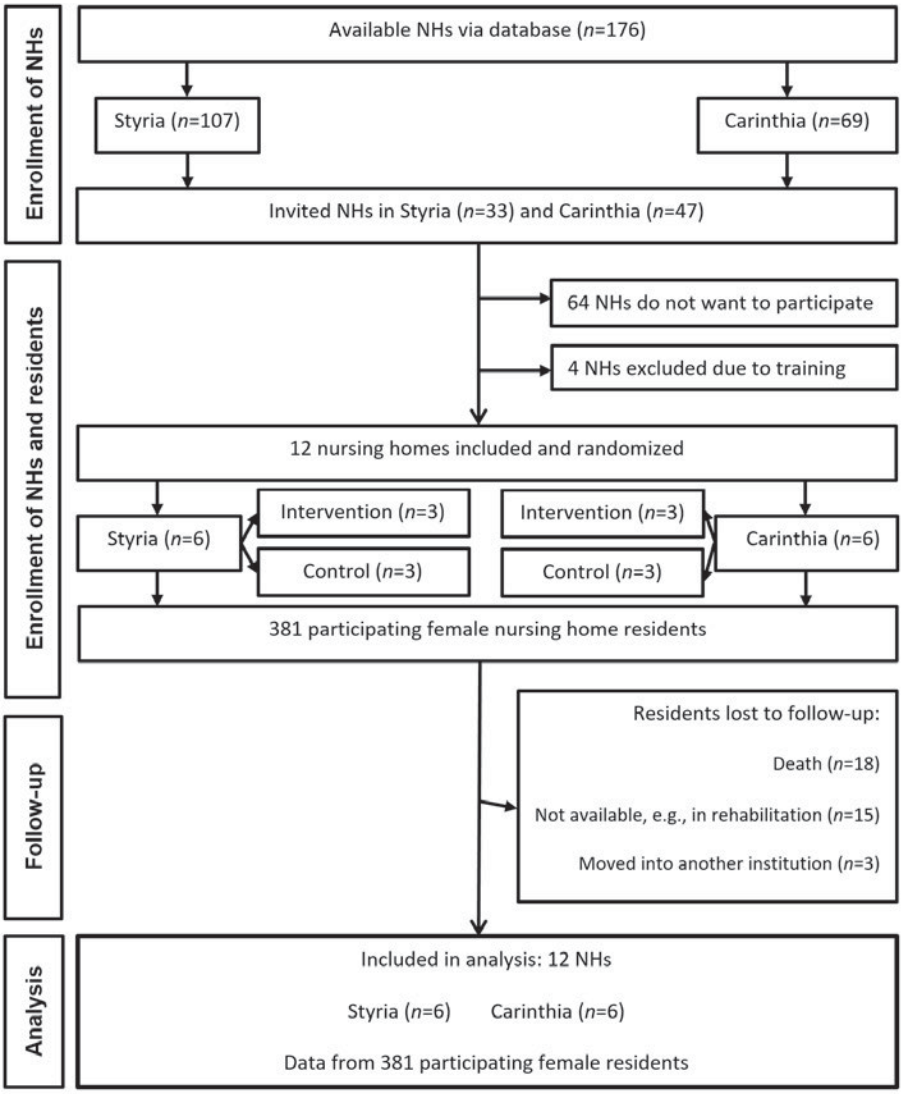

Figure 6.2 Description of the process of recruitment, allocation and analysis

Sample characteristics

We analyzed data from 216 residents in the IG and 165 in the CG. The IG had a statistically significant, higher response rate (65.5 %) than the CG (47.7 %). The IG residents were statistically significantly older (86 years) and suffered more often from dementia/cognitive impairment (54.2 %) than the CG residents respectively (82 years vs. 38.2 %). Residents in the IG were statistically significantly more care dependent (mean CDS sum score: 54.4) compared to the CG (mean CDS sum score: 60.5). The prevalence of UI in the IG (71.3 %) was statistically significant different than in the CG (66.7 %). Most of the IG and CG residents were UI prior to nursing home admission (57.8 % vs. 63.6 %) and displayed daily UI at the baseline measurement (77.9 % vs. 80 %). We found no statistically significant differences between the IG and the CG at baseline regarding daily UI, diagnosis of UI and use of absorbent products. At baseline, a statistically significant difference between the IG (37 %) and CG (17.6 %) existed regarding the use of recommended interventions.

The intra-cluster correlation coefficient for 381 residents in twelve nursing homes for the primary outcome „daily UI“ was 0.03.

Support for Hypotheses

Hypothesis one was supported by our results (table 6.1).

Table 6.1 Generalized estimating equation model for daily UI

	Odds ratio	p-value	95 % CI
Province			
Carinthia (reference)	1		
Styria	0.80	0.21	0.559-1.138
Group[a]			
CG (reference)	1		
IG	**0.14**	**0.02**	**0.028-0.695**
Time			
T1 (reference)	1		
T2	1.09	0.48	0.852-1.404
T3	1.00	0.98	0.764-1.319
Dementia/Cognitive impairment			
No (reference)	1		
Yes	1.33	0.15	0.906-1.944
CDS-sum score[a]	**0.93**	**0.00**	**0.906-0.946**
Age	1.00	0.76	0.987-1.018
Interaction: Group X CDS-sum score[a]			
CG X CDS-sum score (reference)	1		
IG X CDS-sum score	1.03	0.03	1.003-1.055

CG=Control group; IG=Intervention group; [a]p≤0.05

IG residents had a lower risk (OR=0.14) of experiencing daily UI than CG residents. With each increasing point in the CDS (i.e., decrease in nursing care dependency), the risk of experiencing daily UI events decreased (OR=0.93).

Hypothesis two was not supported by our results (table 6.2).

Table 6.2 Generalized estimating equation model for UI diagnosis

	Odds ratio	p-value	95 % CI
Province[a]			
Carinthia (reference)	1		
Styria	**0.32**	**0.00**	**0.158-0.646**
Group[a]			
CG (reference)	1		
IG	**0.05**	**0.00**	**0.012-0.183**
Time			
T1 (reference)	1		
T2[a]	**2.12**	**0.00**	**1.558-2.887**
T3	0.91	0.53	0.668-1.229
Dementia/Cognitive impairment			
No (reference)	1		
Yes	1.12	0.63	0.716-1.740
CDS- sum score[a]	**0.97**	**0.00**	**0.952-0.989**
Age	0.98	0.06	0.963-1.001
Interaction: Province X group[a]			
Styria X CG (reference)	1		
Carinthia X IG (reference)	1		
Carinthia X CG (reference)	1		
Styria X IG	**5.06**	**0.00**	**2.152-11.894**
Interaction: Group X CDS-sum score[a]			
CG X CDS-sum score (reference)	1		
IG X CDS-sum score	**1.04**	**0.00**	**1.013-1.058**

CG=Control group; IG=Intervention group; [a]p≤0.05

Residents in Styrian nursing homes (OR=0.32) and in the IG (OR=0.05) had a lower chance of receiving a UI diagnosis than residents in Carinthian nursing homes and in the CG. Significantly more UI diagnoses were made at T2 than at T1 (OR=2.12).

Hypothesis three was supported by our results (table 6.3).

Table 6.3 Generalized estimating equation model for the use of recommended nursing interventions and absorbent products

Recommended interventions	Odds ratio	p-value	95 % CI
Province[a]			
Carinthia (reference)	1		
Styria	**5.02**	**0.00**	**3.199-7.872**
Group[a]			
CG (reference)	1		
IG	**5.16**	**0.00**	**3.199-8.322**
Time			
T1 (reference)	1		
T2[a]	**0.68**	**0.01**	**0.500-0.920**
T3[a]	**0.51**	**0.00**	**0.375-0.702**
Dementia/Cognitive impairment			
No (reference)	1		
Yes	0.95	0.84	0.599-1.513
CDS- sum score[a]	**0.99**	**0.01**	**0.973-0.997**
Age	1.00	0.73	0.978-1.016
Absorbent products	Ods ratio	p-value	95 % CI
Province[a]			
Carinthia (reference)	1		
Styria	**0.36**	**0.00**	**0.197-0.647**
Group[a]			
CG (reference)	1		
IG	**0.01**	**0.01**	**9.742E-5 – 0.235**
Time			
T1 (reference)	1		
T2	1.32	0.16	0.898-1.950
T3	1.22	0.36	0.799-1.847
Dementia/Cognitive impairment			
No (reference)	1		

Yes	0.93	0.82	0.507-1.713
CDS- sum score[a]	**1.05**	**0.00**	**1.025-1.071**
Age[a]	**0.94**	**0.00**	**0.909-0.961**
Interaction: Group X age[a]			
CG X age (reference)	1		
IG X age	1.07	0.00	1.025-1.124

CG=Control group; IG=Intervention group; [a]p≤0.05

Residents in Styrian nursing homes (OR=5.02) as well as residents in the IG (OR=5.16) were five times more likely to receive a recommended intervention than residents in Carinthian nursing homes or in the CG.

Residents in Styrian nursing homes (OR=0.36) and in the IG (OR=0.01) were less likely to receive absorbent products than residents in Carinthian nursing homes and in the CG.

DISCUSSION

We included twelve nursing homes with 381 participating residents in this study. We found that residents in the IG had fewer UI diagnoses and received the recommended interventions more frequently. On the other hand, CG residents received more absorbent products (not considered standard treatment) and were at higher risk of experiencing daily UI.

At baseline, 77.9% IG residents and 80% CG residents suffered from daily UI. IG residents had a lower risk (OR=0.14) of suffering from daily UI than CG residents. Similar results were cited in another study using an evidence-based guideline, with an improvement of more than 50% in UI among older people dwelling in a community (13). These results and our study results show that using evidence-based guideline recommendations can effectively reduce UI in older people.

Residents in the IG had a lower chance of receiving a UI diagnosis than residents in the CG, which is in line with the baseline data, where 53.2 % of the IG residents received a diagnosis and 63.6 % of the CG residents. Another study that focused on the use of an incontinence guideline in nursing homes reported that only 15 % of cases had a diagnosis of UI that had been assessed and

recorded by their clinician (27). This indicates that a stronger focus should be placed on the diagnosis of UI in education and nursing practice to provide adequate nursing care.

IG residents were five times more likely of receiving one of the recommended interventions than CG residents. We found a statistically significant difference regarding the use of the recommended interventions at baseline (IG: 37 % and CG: 17.6 %). This baseline group difference with regard to recommended interventions might have influenced our finding that IG residents have a higher chance of receiving recommended interventions. This should be taken into consideration when interpreting the results regarding recommended interventions. Wagg et al. (2011) also stated that older women were less likely to receive guideline-compliant UI management (12). This could be explained by the fact that UI is regarded as a normal part of aging (1). The interviewees also commented that women consider UI to be normal and are not willing to actively address it (e.g., by using a bladder diary or bladder training).

Residents in the CG were also more likely to receive absorbent products than those in the IG. However, both groups used high amounts of absorbent products at baseline, T2 and T3. Other studies have also described high amounts of absorbent product usage (12, 27). During the process evaluation and data collection, residents stated that absorbent products were commonly used during the women's lifespan, and that they also used products like inlay pads for reasons of hygiene and well-being even if they were not incontinent.

At baseline, 77.9 % IG residents and 80 % CG residents suffered from daily UI. IG residents had a lower risk (OR=0.138) of suffering from daily UI than CG residents. Similar results were cited in another study using an evidence-based guideline, with an improvement of more than 50 % in UI among older people dwelling in a community (13). These results and our study results show that using evidence-based guideline recommendations can effectively reduce UI in older people.

The degree of care dependency was also an influencing factor on all three hypotheses e.g. as care dependency increased so did the likelihood of daily UI. A tree analysis, conducted by the first author, also showed similar results for the prevalence of UI and DI in nursing homes (28). In that study, we found a high prevalence of UI in residents that was limited to completely care dependent residents for the item "dress/undress". A high prevalence of DI was also

observed in residents that were either greatly or completely care dependent for the item “hygiene” and completely dependent for the item “dress/undress”. Other studies also highlighted the influence of care dependency, as measured with other instruments (e.g., Barthel index), on incontinence (29).

Limitations

One challenge in cluster randomized trials is the selection bias at cluster level, which can occur when an institution declines to participate, which happened in this study and might influence the generalizability of the results.

We asked all at the baseline measurement available female residents whether they wanted to participate in the study (n=676). This number was much lower than the assumed pool of potential female residents (n=950), based on national database numbers. This may be due to the fact that in two nursing homes only specific wards participated and that some of the nursing homes, especially in Carinthia, were not fully booked during the study period. These aspects may influence the interpretation of our results. At the end, we could include 381 residents in the analysis, which leads to a reduced power.

We had a response rate of 56.4 % residents. This may have been due the fact that one nursing home wanted to participate, but informed consent had to be obtained by the first author alone, resulting in a response rate of 17.9 %.

The data collection for diagnosis of dementia/cognitive impairment was based on the nurses’ clinical assessment. This was not objectively measured with, for example, ICD-10 coding. The process of medically diagnosing dementia is a lengthy process and, therefore, rarely requested by relatives/residents in Austrian nursing homes. To gain a realistic impression of the dementia rates, we included the nurses’ clinical assessment of cognitive impairment.

Implications for future research

In future studies on incontinence, we recommend the inclusion of a nurse who is familiar with the residents during the resident recruitment process. This might increase the response rate. Researchers conducting studies in the nursing home setting must also take into account the fact that the nursing homes might not be fully booked when calculating the sample size in the homes. Also, due to the short study period (three months), the sustainability of our results should be measured in future research.

Overall, the introduction of recommendations from evidence-based guidelines for UI management resulted in positive resident outcomes, a lower risk for daily UI events and an increased use of evidence-based nursing interventions.

CONCLUSIONS

Our findings demonstrate that the introduction of adapted recommendations for the conservative management of UI among female nursing home residents increased the use of recommended interventions. Further research is required to determine the long-term effect of introducing recommendations for the conservative management of UI among female nursing home residents with regard to e.g., cost-effectiveness or resident outcomes such as severity of UI.

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Chapter 7

General discussion

GENERAL DISCUSSION

The overall aims of this doctoral thesis are to (1) describe influencing factors as well as the quality of care in the Austrian health care settings regarding incontinence and to (2) adapt evidence-based nursing recommendations for the conservative management of urinary incontinence among female nursing home residents and test the effectiveness of their introduction.

Summary of the main results

In Study 1–Part A, the interactions among well-known influencing factors for urinary incontinence (UI), faecal incontinence (FI), and double (urinary and faecal) incontinence (DI) in the nursing home and hospital setting were investigated and profiles of UI, FI, and DI residents and patients were identified. In general, interactions between the CDS-items Hygiene and Eat/Drink and the parameters age and gender were identified in hospitalized patients. An interaction between the CDS-items Mobility and Dress/Undress with regard to UI was found in the nursing homes. Typically, urinary-incontinent hospital patients experiencing UI were older than 77.5 years and needed support in the CDS-item Hygiene, whereas UI nursing home residents normally needed nursing support in the CDS-item Dress/Undress.

In Study 1–Part B, the quality of incontinence care in nursing homes was described with regard to structure, process and outcome. Structural indicators, such as the availability of information brochures, are limited in nursing homes. Process indicators, such as the provision of personal absorbent pads or underlay pads to protect mattresses or chairs to manage incontinence were most frequently used. Training interventions were only delivered to a small proportion of residents with UI or DI. The prevalence of all types of incontinence (outcome level) in nursing homes was high, with 69.2 % of the residents being incontinent.

In Study 2, the international guideline recommendations for the conservative management of UI in Austrian nursing home residents were adapted following the ADAPTE process. A systematic search for guidelines in 10 databases yielded a total of 1612 hits. After applying inclusion and exclusion criteria, five international clinical guidelines were assessed regarding their quality using the AGREE II instrument. One of the five fulfilled the inclusion criteria. This clinical guideline contained 116 recommendations, of which 29 were applica-

ble in the Austrian nursing home setting. These recommendations were forward translated and checked by nursing experts for their applicability in the Austrian nursing home setting.

In Study 3, the effectiveness of introducing recommendations for the conservative UI management among female nursing home residents was measured using a cluster-RCT. The results showed that residents in the control group (CG) had a statistically significant higher risk of experiencing daily UI and had a statistically significant higher chance of receiving more absorbent products, compared to residents in the intervention group (IG). In addition, residents in the IG had a statistically significant higher chance of receiving recommended interventions, such as bladder training for the management of UI, more frequently than residents in the CG. Overall, introducing guideline-compliant management recommendations into nursing homes increased the chance of using evidence-based interventions for the conservative management of UI and was effective with regard to the residents' outcomes with respect to daily UI.

Discussion of the main results

The main findings of the studies are discussed below.

Interactions of factors and profiles of incontinent residents and patients

We found that age and sex were interacting factors for UI in the hospital setting, which is in line with the findings from previous studies (1, 2). Focusing on age, pathophysiological changes, such as a decline in detrusor function and efficiency, explain, at least in part, the observed influence of age on UI. On the other hand, a decrease of pelvic floor muscular function as a consequence of pregnancy and birth explains the observed association of sex with UI (3).

Furthermore, decreased mobility was detected as an interacting factor in the nursing home setting for UI. Similar results were also identified in three previous studies, where limitations in physical function/mobility were found to increase the risk of UI and DI (1, 4, 5). The association between mobility and UI in older people can be expressed by the inability to access the toilet in time because of impairment of physical functions or environmental barriers like stairs. This inability to access the bathroom in time is defined as functional incontinence (3, 6).

Incontinence care in nursing homes: A cross-sectional study

Other studies have shown that structural indicators like information brochures are rarely available (7-9), findings which are also supported by the results of our study. Protocols or guidelines on the prevention and treatment of incontinence were more frequently available. These findings are relevant because Dugan et al. reported an improvement in incontinence care through the implementation of clinical guidelines (10).

However, we stress that the availability of these protocols and/or guidelines does not necessarily preclude their appropriate application and use. One reason for inappropriate application and/or use might be that the available protocols and/or guidelines are not available in the native language. Another explanation could be a lack of knowledge as to where to find such protocols/guidelines in the institutions. These aspects could hinder successful implementation of evidence-based recommendations as described by Harvey et al. (11).

The findings of the study also showed that the provision of personal absorbent pads or underlay pads to protect mattresses or chairs were most frequently used for the management of UI. These findings are consistent with the results of other studies, where more than half of the residents experiencing UI received absorbent products for incontinence management (12, 13). The high number of residents receiving these products may be due to unwillingness to participate in active training programs such as bladder training. However, these active training programs were only offered to a small proportion of residents with incontinence. The low number of active training programs offered could also be explained by the fact that a high number of residents have dementia and, therefore, might not be able to participate effectively in such active training programs.

Adaptation of recommendations to address urinary incontinence

In the third study, we included one UI guideline within which 29 nursing recommendations were applicable for the adaptation to the regional context. Only one guideline was included because it achieved the stringent “rigor of the development domain” score in the AGREE II-instrument that we used for inclusion. By including only one guideline, we failed to include FI and DI populations as well as men suffering from UI as target groups. However, adequate

and rigorous methodology is both the foundation of high-quality guidelines and a factor influencing the successful adaptation of a guideline in practice (14).

Out of 116 recommendations from the included guideline, 29 were rated by experts as suitable for and applicable to nurses working in the Austrian nursing home setting. This low number of applicable recommendations might be due to the fact that the included clinical guideline had been developed by and for interdisciplinary use. The conservative management of UI, in contrast, was the focus of our study. Most of the excluded recommendations referred to invasive procedures or surgical approaches, which are all tasks that are performed by medical doctors in Austria.

Effectiveness of conservative UI management

Introducing the recommendations in the nursing homes resulted in a significantly lower risk of being daily UI in the IG compared to the CG. Another study showed similar results, whereby an improvement of more than 50 % regarding UI episodes in older people by use of an evidence-based guideline was observed (15). Our study results can be explained by the fact that residents/nurses described a higher degree of awareness on UI during the study period. This awareness led to preventive bathroom visits and modification of fluid intakes.

An unexpected result was that residents in the IG displayed a lower chance of receiving an UI diagnosis than residents in the CG. Findings of another study focusing on the use of an incontinence guideline in nursing homes reported that only 15 % of cases had a diagnosis of UI that had been assessed and recorded by their clinician (16). The results of this study with regard to the UI diagnosis may be due to the fact that blinding was not possible and, therefore, the CG knew that data were collected on UI and were highly motivated. This might have been especially the fact in the case of one new nursing home manager of the CG, who was highly motivated to update nursing records regarding UI diagnosis. On the other hand, one nursing home in the IG was taken over by a new company after the baseline measurement, an unexpected occurrence at that time. This led the entire nursing staff to place a focus on ongoing organizational issues.

Residents in the IG were more likely to receive a recommended intervention than residents in the CG. These results should be interpreted with caution, as the difference between IG and CG was already statistically significant at the baseline before introducing the evidence-based conservative management recommendations. This statistically significant difference at the baseline indicates a risk of a selection bias.

Residents in the IG were less likely to receive absorbent products than residents in the CG. This result might be due to raised awareness and a critical reflection on the commonly used interventions by the nurses as well as the nursing home residents through the introduction of the evidence-based recommendations as an intervention. However, in general, other studies also described high levels of absorbent product usage (16, 17). Another reason for this result, which was also stated informally on the questionnaire by the residents regarding nursing interventions, is that UI is seen as a normal part of aging and that absorbent products were already used by the residents for reasons of hygiene and well-being before becoming UI.

The degree of care dependency was also an influencing factor on daily UI, on the diagnosis of UI, as well as the use of nursing interventions in the current study. The results of Study 1–Part A (chapter 3) and those of a previous study by Saga et al. highlighted the influence of care dependency on incontinence (4). This could be explained by the included items of the CDS-items Eat/Drink, Dress/Undress, Mobility and Hygiene, which were found to be significantly associated with incontinence in Study 1–Part A.

In summary, introducing evidence-based management recommendations to address UI in the nursing home setting can reduce the risk that residents experience UI and can increase the frequency of using evidence-based nursing interventions.

Methodological reflections

The limitations and strengths of this doctoral thesis are summarized below.

Study 1 - Part A:

In this study, participation on an institutional as well as on a patient/resident level was voluntary. This might have led to a selection bias due to the fact that institutions that were highly interested in continence care were more likely to

participate. Furthermore, because it was necessary to obtain written informed consent, it could be possible that residents/patients with a reduced health status chose not to participate or sign the consent form. On the other hand, a deeper understanding of multiple and hierarchical interactions of UI, FI and DI was gained through the use of the Classification and Regression Tree (CaRT) method.

Study 1 - Part B:

In this study, the use of a cross-sectional design allowed the first comprehensive overview of the quality of incontinence care in Austrian nursing homes to be gained. Nevertheless, only 3.4 % of the Austrian nursing homes participated, which could have led to a selection bias, although all nursing homes were invited by a leaflet and two reminders were sent per e-mail to the nursing home managers.

Study 2:

A limitation of Study 2 was that back translation of the nursing recommendations was not conducted. However, only minor linguistic differences were found upon a comparison of the translation by the professional translator with that of the first author.

One major strength of Study 2 is that the AGREE II instrument, a psychometrically tested and internationally recommended tool, was used when assessing the quality of clinical guidelines. Furthermore, all guidelines were assessed by two independent reviewers as recommended in the literature and showed a high level of internal agreement. In addition a detailed insight on how to use the ADAPTE-process was reported.

Study 3:

A first limitation of study three was the use of Donabedians model for health care organizations, due to the fact of its linear conception of quality of care. However, this linearity can also be seen as a strength, because it simplifies its use and interpretability of the results. Beside that it is a well-known and often used evaluation framework.

A cluster-RCT was conducted as a high-quality design for testing effects in Study 3. The data were collected by the first author, who also implemented

randomization through the use of random number tables in the participating institutions. The lack of blinding could have led to an observer bias (18).

Another limitation that can occur in cluster-RCTs is baseline imbalance (18). This was made transparent as recommended by Higgins and Green (2011) by reporting a baseline comparison of the residents.

Sometimes the loss of clusters or missing outcomes of individuals within the cluster can lead to a bias in cluster-RCTs (18). In this study, I did not lose a nursing home (cluster) during data collection. However, some outcomes of individuals within the cluster were missing due to, for example, the death of an individual. This was taken into consideration when analysing the data, by assuming that missing values were completely random.

Unlike individual RCTs, cluster RCTs require a specific analysis to be carried out in order to analyse clusters of individuals rather than the individuals themselves. If this is not done, a "unit of analysis error" occurs (18). In order to overcome this analysis error, I used generalized estimating equations, which is a valid model for cluster level analysis (19).

I tested the effectiveness of the introduction of conservative management recommendations of UI on a process level (use of nursing interventions) as well as on an outcome level (daily UI) instead of examining the adherence of the health professionals to the guideline recommendations, which is a strength in this study. As several studies have shown that UI is a physical and psychosocial burden for the affected persons (20-27), UI can be designated as a patient-relevant outcome. These kinds of outcomes as well as patient-reported outcomes are warranted for future research (28-30).

General methodological reflections

In order to measure UI, several definitions and instruments are available (3) which have an influence on the estimates of prevalence (31). Throughout this thesis I used the definition of UI given by the International Continence society as an "*involuntary loss of urine*" (3 p.500).

Although there is an extensive summary of the instruments available for assessing UI (3), they were not used. This was due to the fact that these recommended questionnaires were not part of the "International Prevalence Measurement of Care problems". This questionnaire is based on the model

of Donabedian, which is the theoretical framework of this thesis. In future research, including the questions from the highly recommended ICIQ would valorise the results.

In general, I can recommend the ADAPTE-process as an overview tool for adapting guideline recommendations to the regional context. Although the ADAPTE-process is a well-known and frequently used framework (32-34), some criticism is also valid. During the whole ADAPTE-process, it is important to maintain a high standard, including standards for human and financial resources. However, it is also possible to use the ADAPTE-process in the case of limited resources such as within the framework of a doctoral thesis by, for example, not including a whole team as recommended by the ADAPTE-process. I also suggest that it would be important to adapt and develop more tools. As an example, there are no tools currently available to obtain an external review regarding the applicability of the recommendations. This critique is in line with online feedback received regarding the ADAPTE-process, whereby 13 % of the respondents recommended refining the manual and developing additional tools (35). These recommendations was followed in Study 2 by using the CAPGO-survey (36).

In Study 2, one domain in the AGREE II instrument – applicability – received a low score in the quality assessment conducted by the two reviewers. This domain includes questions focusing on organization barriers and tools to support application. As clinical guidelines aim to assist decision-making processes in health care practice (6), this domain should specifically be taken into consideration when developing guidelines. In addition, I only had a purposive sample of experts assessing the applicability of the recommendations to the regional context.

The introduction of guideline recommendations can be designated as a complex intervention, which should be developed and tested with the complex intervention framework of the Medical Research Council. This framework includes four stages: development, feasibility/piloting, evaluation and implementation (37). In Study 3, this framework was not used. However, seen retrospectively, it might be possible to assign the stages. As an example, the evidence base should be identified in the development stage, which was included in Study 2 through a broad systematic search for guidelines. The step feasibility/piloting of the complex intervention framework was included in Study 2 by reviewers

and external experts which were asked to describe the applicability of the nursing recommendations to the Austrian nursing home setting. In addition the evaluation stage including an assessment of the effectiveness and an understanding of the change process can be assigned to the third study.

Recommendations for nursing research

The results of this thesis highlights recommendations for future nursing research.

Use ADAPTE-process and translation principles

I recommend the use of the ADAPTE-process in future studies in nursing research as well as by other researchers when adapting recommendations from international clinical guidelines to their regional contexts. I also suggest that additional instruments should be developed, adapted and tested for their use while evaluating the applicability of guideline recommendations to the regional context, such as the CAPGO-questionnaire.

As mentioned, only back translation was conducted in Study 2. In future studies, I advise using "*The Translation and Cultural Adaptation—Principles*" of the International Society for Pharmacoeconomics and Outcomes Research (ISPOR) (38). These principles provide comprehensive instructions including for preparation, forward translation, reconciliation, back translation, back translation review and harmonization.

Investigate UI in male patients/residents

As UI is also common in male hospital patients and residents (Study 1–Part A) future studies should focus on male patients/residents when studying UI. This was also highlighted in Study 1–Part B for male nursing home residents, of which more than one quarter suffered from UI and more than 42 % suffered from DI. The need for future studies on male UI patient/residents was also emphasized in comments made by the experts in Study 2. In addition, there is currently no guideline available that focuses on male patients/residents with regard to the conservative management of UI, although conservative management is recommended as first step in the management of UI.

Develop high quality UI information material

Provision of information material for patient education was rarely used as an intervention for the conservative management of UI. This might be explained by the lack of available information material. By developing high quality information material, this gap can be addressed. This is especially relevant in the nursing home setting where the information material must be developed to fit to the needs and expectations of residents.

Examine FI

Due to the fact that many patients/residents are DI, which includes FI, further studies on FI are required. Although FI was empirically assessed, for example, by using surgical/pharmacological approaches, conservative management, which is recommended as the first-line treatment, has not been addressed extensively in research. FI is also considered a highly taboo topic in nursing practice (39) and has rarely been empirically assessed in nursing research; for these reasons, recommendations for conservative management are warranted.

One research recommendation that resulted from Study 2 was to investigate the effectiveness and implementation of conservative nursing interventions related to both male and female FI nursing homes residents. This is specifically relevant in the male FI population, as they have not previously been addressed in nursing research, as compared to the female UI population (40-44).

Recommendations for nursing practice

This thesis exposed several main areas of improvement in nursing practice.

Raise awareness

Incontinence is a highly stigmatized topic in society, in health care in general and in nursing practice (39). This stigma might be associated with the societal misconception that incontinence is still seen as a normal consequence of ageing. I recommend focusing on this topic in nursing practice in order to raise awareness in residents/patients, their families, nurses as well as other health care providers.

In order to raise awareness about the topic of incontinence (e.g., associated factors, diagnosing, preventive measures, treatment options) further staff edu-

cation in nursing practice as well as training for nursing students is necessary. This could be achieved by offering trainings/workshops for nursing staff or by employing specialized continence nurses in nursing practice. Incontinence must not only be focused on in further education, it should also be more emphasized in basic nursing education.

Diagnose UI

The first step in UI management in nursing practice, which should also be included in the nursing process, is to diagnose UI. International studies have shown that diagnosing UI is rarely conducted. I recommend making a nursing diagnosis and assessing subtypes as the first step in the management of UI, which can lead to raised awareness and, subsequently, the adequate nursing management of UI.

Use conservative interventions

I recommend the use of conservative management options for the prevention and treatment of UI. Specifically, I recommend improving patient education about UI/FI and investigating the effectiveness of patient education on UI/FI as conservative management strategies that can be employed by nursing staff. In addition, I suggest following the recommendation to use bladder diaries for three days. These bladder diaries can give detailed information that can enable health care provider to plan the subsequent management plan and can be used for the evaluation of the conducted interventions.

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Chapter 8

Summary

SUMMARY

Incontinence is a highly prevalent and burdensome problem in the aging population. The overall aims of this doctoral thesis are to (1) describe influencing factors as well as the quality of care in the Austrian health care setting regarding incontinence and to (2) adapt evidence-based nursing recommendations for the conservative management of urinary incontinence, defined as any involuntary loss of urine, in nursing homes and test the effectiveness of their introduction.

This **first chapter** provides general background information and presents the theoretical framework for this doctoral thesis, called P-INC (**P**roject **INC**ontinence). Subsequently, the research problems, aims and research questions are illustrated and described.

In the **second chapter**, an overview of methodological aspects of the studies with regard to their designs, sampling, settings, data collection methods and analyses is presented.

Chapter three includes a description of interactions among well-known influencing factors and profiles for urinary incontinence (UI), faecal incontinence (FI) and double incontinence (DI) in the nursing home and hospital settings. A cross-sectional study was carried out and data collected from 4,200 residents and patients from 16 nursing homes and 36 hospitals. Data on care dependency, assessed with the Care Dependency Scale (CDS), and different nursing care problems were collected by means of a standardized survey. To ensure objectivity, two nurses assessed each resident/patient. The results indicate that a typical UI resident is care dependent, especially while dressing and undressing. A typical UI patient is older than 77.5 years and completely, or to a great extent, care dependent regarding hygiene. In summary, the revealed interactions affect the prevalence of incontinence and differ according to the type of incontinence and setting.

In **Chapter four**, the structural, process and outcome indicators of incontinence care in Austrian nursing homes are described using data collected as part of a cross-sectional multicentre study carried out in 16 nursing homes (N=1,302). Two nurses assessed each resident using a standardized and validated questionnaire. The results of this study indicated that structural indicators, such as the availability of information brochures, are limited in nursing

homes. On a process level, the provision of personal absorbent pads or underlay pads to protect beds or chairs were used most frequently and training interventions were only delivered to a small proportion of residents with incontinence. The prevalence of all types of incontinence was high. Due to this high prevalence and the low rate of training interventions used, ongoing efforts to improve the quality of incontinence care are warranted.

Chapter five includes an illustration of the adaptation of international guideline recommendations for the conservative management of UI in Austrian nursing home residents following the ADAPTE-process. This study is, therefore, a methodological study, including a systematic guideline search, quality appraisal of the guidelines using the "*Appraisal of Clinical Guidelines for Research & Evaluation II*" (AGREE II) instrument. The guideline recommendations were translated and externally reviewed for their applicability to the Austrian nursing home setting by means of a Delphi technique. The guidelines had to be topic-relevant, published within the past three years and achieve a rigor of development score of >80 % using the AGREE II instrument. 1,612 hits in 10 databases were identified. After applying inclusion and exclusion criteria, five international clinical guidelines were suitable for quality assessment using the AGREE II instrument. One clinical guideline fulfilled the inclusion criteria with a rigor of development score of >80 %. This clinical guideline contained 116 recommendations, of which 29 were applicable in the Austrian nursing home setting according to the external reviewers. However, the introduction of these nursing recommendations in Austrian nursing home settings requires evaluation.

In **Chapter six**, the effectiveness of the introduction of conservative urinary incontinence management recommendations among female nursing home residents is depicted by a cluster RCT, with the institution as the unit of randomization. Twelve nursing homes in two Austrian provinces (Styria, Carinthia) were randomly allocated to the intervention group (IG) or control group (CG). The intervention consisted of the introduction of recommendations for the conservative management of UI among female nursing home residents. The primary outcome variable was the number of residents that experienced daily UI. Data were collected from participating residents over a three-month period. Residents in the IG had a lower risk of experiencing daily UI and were less likely to receive absorbent products than residents in the CG. Residents in the IG were five times more likely to receive recommended interventions (e.g.,

bladder training for the management of UI) than residents in the CG. Based on these results, I conclude that introducing guideline-compliant management recommendations in nursing practice can increase the use of evidence-based interventions for the conservative management of UI.

In **Chapter seven**, a brief summary and discussion of the main findings is provided. The limitations and strengths of the studies conducted are described and a methodological reflection of the whole thesis and the applied methods is performed. Finally, recommendations for nursing research and practice are presented.

Chapter 9

Zusammenfassung

ZUSAMMENFASSUNG

Inkontinenz ist ein häufig auftretendes und belastendes Pflegeproblem in der alternden Bevölkerung. Die Hauptziele dieser Doktorarbeit sind (1) Interaktionen von Einflussfaktoren zur Entstehung von Inkontinenz und die Pflegequalität der Inkontinenzversorgung in österreichischen Gesundheitseinrichtungen zu beschreiben und (2) evidenzbasierte Handlungsempfehlungen für das konservative Management bei Harninkontinenz in Pflegeheimen zu adaptieren und die Effektivität der Implementierung dieser zu testen.

Das **erste Kapitel** beinhaltet generelle Hintergrundinformationen und stellt den theoretischen Rahmen dieser Doktorarbeit, genannt P-INK (**P**rojekt **INK**ontinenz), vor. Danach folgt die Darstellung der Forschungslücken und, davon abgeleitet, die Forschungsziele und Forschungsfragen.

Im **zweiten Kapitel** wird ein Überblick über die methodologischen Aspekte der Studien in Bezug auf Design, Stichprobe, Setting, Datensammlung und Datenanalyse gegeben.

Kapitel drei beschreibt Interaktionen von Einflussfaktoren auf die Entstehung von Inkontinenz und Profile von BewohnerInnen/PatientInnen mit Harninkontinenz (HI), Stuhlinkontinenz (SI) und Doppelinkontinenz (DI) in Pflegeheimen und Krankenhäusern. Es wurde eine Querschnittstudie mit 4200 BewohnerInnen und PatientInnen in 16 Pflegeheimen und 36 Krankenhäusern durchgeführt. Die Daten zu Einflussfaktoren wurden mittels eines standardisierten Fragebogens erhoben, welcher u.a. auch die Pflegeabhängigkeitsskala (PAS) enthält. Um die Objektivität der erhobenen Daten zu sichern, wurden alle BewohnerInnen/PatientInnen von zwei Pflegepersonen befragt. Die Ergebnisse weisen darauf hin, dass ein/e typische/r harninkontinente/r BewohnerIn beim An-/Auskleiden pflegabhängig ist. Wohingegen harninkontinente PatientInnen häufig älter als 77,5 Jahre und in der Körperhygiene völlig oder überwiegend auf pflegerische Unterstützung angewiesen sind. Zusammengefasst zeigt sich, dass die identifizierten Interaktionen das Auftreten von Inkontinenz beeinflussen und sich abhängig von der Art der Inkontinenz und dem Setting unterscheiden.

Kapitel vier beschreibt Struktur-, Prozess- und Ergebnisindikatoren in Bezug auf Inkontinenz in 16 österreichischen Pflegeheimen (n=1302) durch Nutzung der Daten einer multizentrischen Querschnittstudie. Zwei Pflegepersonen be-

fragten alle BewohnerInnen mit einem standardisierten und validierten Fragebogen. Die Ergebnisse dieser Studie deuten darauf hin, dass strukturelle Indikatoren, wie Informationsbroschüren, selten vorhanden sind. Auf Prozessebene werden häufig Einlagen und Unterlagen zum Schutz von Betten oder Sessel genutzt, wohingegen Trainingsmaßnahmen (z.B. Blasentraining) nur bei einem kleinen Anteil an inkontinenten BewohnerInnen durchgeführt werden. Die Prävalenzraten für alle Arten von Inkontinenz waren hoch. Aufgrund der hohen Prävalenzraten und der niedrigen Rate an Trainingsmaßnahmen sind weiterführende Anstrengungen zur Qualitätssteigerung in der Inkontinenzversorgung erforderlich.

Kapitel fünf beschreibt die Adaptierung von internationalen Handlungsempfehlungen aus Leitlinien zum konservativen Management von HI für österreichische PflegeheimbewohnerInnen nach dem ADAPTE-Prozess. Diese methodologische Studie inkludiert eine systematische Suche nach Leitlinien und eine Qualitätsüberprüfung mittels dem „Appraisal of Clinical Guidelines for Research & Evaluation II“ (AGREE II) Instrument. Die Handlungsempfehlungen wurden übersetzt und mittels Delphitechnik hinsichtlich Ihrer Anwendbarkeit für österreichische Pflegeheime von externen GutachterInnen eingeschätzt. Die Leitlinien mussten für das Thema relevant sein, innerhalb der letzten drei Jahre publiziert und einen Wert von 80 % im Bereich „Genauigkeit der Entwicklung“ des AGREE II Instruments aufweisen, um eingeschlossen zu werden. 1612 Leitlinien wurden in 10 Datenbanken herausgefiltert. Nach der Anwendung der Ein-/Ausschlusskriterien blieben fünf Leitlinien übrig, welche anschließend mit dem AGREE II Instrument bewertet wurden. Eine Leitlinie erfüllte alle Einschlusskriterien. Diese Leitlinie beinhaltete 116 Handlungsempfehlungen, von denen insgesamt 29 von den externen GutachterInnen als anwendbar für das österreichische Pflegeheimsetting angesehen wurden. Im Weiteren bedarf es der Evaluierung der Einführung dieser Handlungsempfehlungen für den österreichischen Pflegeheimbereich.

Im **Kapitel sechs** wird die Effektivität der Einführung der Handlungsempfehlungen zum konservativen HI Management bei weiblichen Pflegeheimbewohnerinnen durch eine cluster-randomisierte kontrollierte Studie beschrieben, wobei hier Institutionen randomisiert wurden. Zwölf Pflegeheime in zwei österreichischen Bundesländern (Steiermark, Kärnten) wurden zufällig der Interventionsgruppe (IG) und der Kontrollgruppe (KG) zugeteilt. Bei der Intervention handelte es sich um die Einführung von Handlungsempfehlungen

zum konservativen Management von HI. Die Hauptzielgröße war die Anzahl an Bewohnerinnen, die täglich harn inkontinent waren. Die Datenerhebung bei den teilnehmenden Bewohnerinnen fand über einen Zeitraum von drei Monaten hinweg statt. Bewohnerinnen in der IG hatten ein geringeres Risiko an täglicher HI zu leiden und erhielten weniger häufig absorbierende Produkte als Bewohnerinnen in der KG. Die Bewohnerinnen in der IG hatten eine fünfmal höhere Wahrscheinlichkeit empfohlene Maßnahmen (z.B. Blasentraining zum Management der HI) zu erhalten, als Bewohnerinnen in der KG. Basierend auf diesen Ergebnissen, kann die Schlussfolgerung gezogen werden, dass leitlinien-konformes Management in der Pflegepraxis die Nutzung evidenzbasierter Maßnahmen für das konservative Management von HI fördert.

Im **Kapitel sieben** wird eine kurze Zusammenfassung und Diskussion der Hauptergebnisse dargestellt. Im Weiteren sind die Schwächen und Stärken der durchgeführten Studien beschrieben und eine methodologische Reflexion der gesamten Doktorarbeit und der genutzten Methoden durchgeführt. Abschließend werden Empfehlungen für die Pflegeforschung und Pflegepraxis präsentiert.

Chapter 10

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Chapter 11

Curriculum vitae

CURRICULUM VITAE

Manuela Hödl (formerly Mandl) was born on the 7th of June, 1980, in Graz. From 2005 to 2012, she pursued and obtained her bachelors' and masters' degrees in Nursing Science at the Medical University of Graz, Austria. Between 2010 and 2011 she worked as an external lecturer for the Medical University of Graz.

Since 2012 Manuela Hödl has been a member of the Institute of Nursing Science at the Medical University of Graz, where she works as a nursing researcher and lecturer. Her research focuses specifically on incontinence. She is also a member of the team that annually organizes the *Pflegequalitätserhebung 2.0*. She is a lecturer in the bachelor's and master's programs with regard to transcultural aspects in nursing, quality of health and nursing care as well as quantitative analysis techniques.

Manuela Hödl started her doctoral studies in 2013 while participating in the *Doctoral Programme Nursing Science* of the Medical University of Graz (Austria), the University Maastricht (The Netherlands) and Charité-Universitätsmedizin Berlin (Germany).

In addition, she is a member of the organization committee of the *European Doctoral Conference in Nursing Science* and was also involved in the organization of the *Austrian Pressure Ulcer Symposium* in November 2017.

Chapter 12

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