

Indwelling catheter use in home care—elderly, aged 65+ in 11 different countries in Europe

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Abstract

Objective: to describe possible differences/patterns in the use of indwelling urinary catheters (IUC) in Europe.

Design: a prospective, population-based, assessment study.

Setting: the target population was 4,455 (random sample of 405 from each of 11 countries) aged 65+ receiving home care.

Methods: the clients were assessed by using the Resident Assessment Instrument MDS-HC; epidemiological and medical characteristics of clients and service utilisation were recorded.

Measurements: the frequency of use of IUC related to the patients' activities of daily living (ADL) and cognitive functioning.

Results: the sample consisted of 4,010 informants: 74% female, with mean age 82.3 ± 7.3 years; men 80.9 ± 7.5 years and female 82.8 ± 7.3 years. A total of 216 (5.4%) clients were using IUC. In Italy 23% were using a catheter compared with 0% in The Netherlands. Catheter use was more common in men than in women (11.5% versus 3.3%). Use of IUC was significantly correlated to certain diseases and symptoms and increase in care burden and formal services. Twenty-six per cent of the informants with indwelling catheters scored three or more on a hierarchical ADL scale (0–6). The clients using IUC in the Nordic countries were less dependent on care than in the other European countries. Models built on multivariate analysis explained 37% of the use of IUC. Tradition and attitudes may explain the differences between the sites.

Conclusions: catheter use is associated with formal or family care burden. The need for nursing home placement ought to be considered in some cases. A stricter criterion for using IUC may be considered in the southern European countries.

Keywords: elderly, home care, indwelling urinary catheter, quality of care, care burden, RAI-HC, elderly

Introduction

Urinary incontinence (UI) is a significant cause of disability and dependency; it is distressing and disproportionately affects older people [1–3]. The frequency in different samples varies from 15 to 30% depending on the study [4, 5]. About 50% of those who live at home and receive formal services are incontinent [6, 7].

However, only few studies document the prevalence rates for indwelling urinary catheters (IUC) in home care. In a population study of urinary incontinence in the age group 70–97 years, Molander *et al.* [8] stated that IUC were not often used. Smith concluded in a review that the prevalence of IUC was 4% [9], whereas a prevalence rate of 10% was found in Japan by Gotoh *et al.* [10]. The complications associated with IUC cause significant morbidity and mortality [11, 12].

Objective

To find out among the clients receiving home care in 11 European sites: (i) the characteristics of the population that has an indwelling catheter compared with those that have not; (ii) the differences in practices between the sites; (iii) the predictors for indwelling catheters for clients in home care.

Methods

Population

The study was performed in 11 European countries: Czech Republic, Denmark, Finland, France, Germany, Iceland, Italy, The Netherlands, Norway, Sweden and the UK.

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Home care agencies providing home care services to older persons living in a defined geographical urban area were chosen by the partners to represent as well as possible the practices of each of the countries. In each of the sites, the randomly selected study population comprised 405 persons, aged 65 years or over, and of those all together 4,010 subjects were finally enrolled in the study. The mean age of the participants was 82 years and 74% were female [13].

Data collection

In the present study, we used the data collection performed by using Minimum Data Set version 2.0 for home care (MDS-HC 2,0) at the baseline. The MDS assessment consists of more than 300 internationally validated variables or scales and has good inter-observer reliability [13–15]. Service utilisation, physical capacity, cognitive skills and psychosocial characteristics of the clients were assessed and recorded by specially trained nurses. Indwelling catheter was defined as any catheter inserted to ensure urinary drainage, including catheters inserted suprapubically or via the urinary tract. Use of an indwelling catheter was assessed as 'yes' or 'no'. Missing values were interpreted as no use of IUC.

Statistical analyses

Variables previously known to associate with the use of indwelling catheters were extracted from the database for the current analyses, which were then performed using SAS statistical software (Gary Inc., www.statsoftinc.com). First, the associates of indwelling catheter use were identified (chi-square analysis for dichotomised variables and Student's tests for continuous variables). Then the associates of catheter use were entered one by one into multivariate models in clinically meaningful groups. The strongest predictors for indwelling catheters were entered into the final model to combine the sites with the clinical factors.

Results

Of the 4,010 persons in the study, IUC was found in 216 persons (5.4%) and the variation between sites was 0–23%.

Table 1 shows that IUC was used more often in males than in females (11.5% versus 3.3%, $P < 0.0001$). Use of catheters followed different patterns in males compared with females with advancing age (Figure 1).

Table 2 presents comparisons of clients with and without IUC as to the tested clinical features; it also shows the type of dependency on services as to the clients with IUC compared with those without it.

The explanatory value for the first model consisting of only the sites was 17%, when all the other sites were compared with the samples collected from The Netherlands and Sweden. The explanatory value for the model consisting of diagnoses was 7%, for cognitive and physical functional capacity 23% and for the symptoms 14%. The combined results are presented in Table 3.

Table 1. Use of IUC by gender and by site among the home care clients in 11 European countries

Site	Number	IUC in males (%)	IUC in females (%)	Overall %
Czech Republic	428	7.8	0.6	2.1
Denmark	469	5.0	0.3	1.3
Finland	187	2.9	2.0	2.1
France	381	15.0	6.2	8.7
Germany	607	15.7	3.1	6.2
Iceland	405	2.9	1.0	1.5
Italy	412	30.7	18.5	23.1
The Netherlands	198	0	0	0.0
Norway	388	6.4	1.4	2.8
Sweden	246	3.0	0.6	1.2
UK	289	9.5	1.9	3.8
Overall n (%)	4,010 (100)	119 (11.5)	97 (3.3)	216 (5.4)

$n = 4,010$.

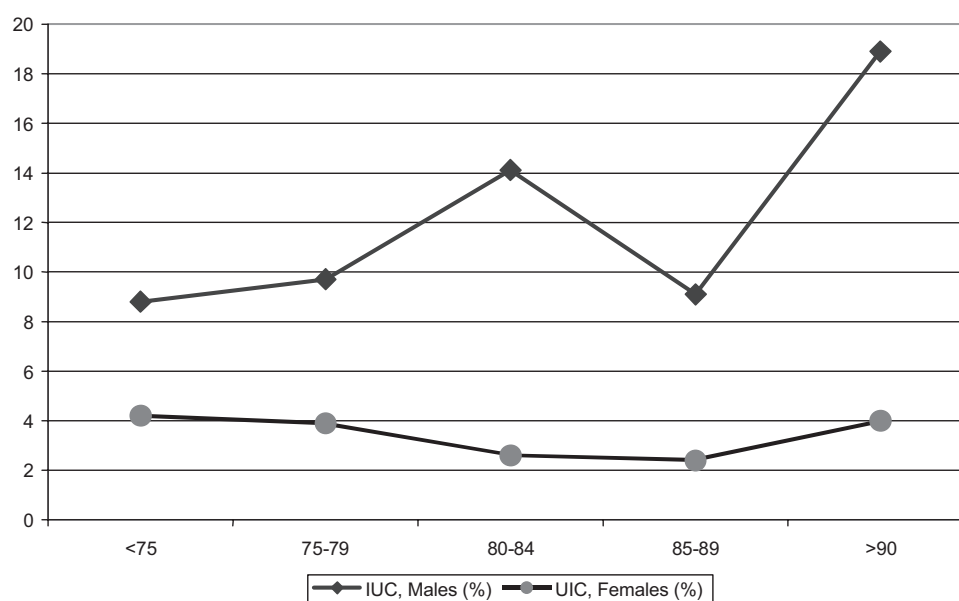


Figure 1. Urinary indwelling catheters by gender and age among the home care clients in 11 European countries ($n = 4,010$).

Indwelling catheter use in home care in Europe

Table 2. Comparison of clinical features and need for help among the home care clients with and without an indwelling catheter in 11 European countries

	Indwelling catheter inserted <i>n</i> (%)	No indwelling catheter inserted <i>n</i> (%)	<i>P</i> > 0.005
Diseases			
Stroke with hemiplegia <i>n</i> = 247	19 (8)	228 (92)	0.0975
Any type of diagnosed dementia <i>n</i> = 514	46 (10)	468 (91)	0.0001
Multiple sclerosis <i>n</i> = 032	7 (22)	25 (78)	0.0001
Parkinsonism <i>n</i> = 200	23 (12)	177 (89)	0.0001
Any cancer <i>n</i> = 321	34 (11)	287 (89)	0.0001
Urinary tract infection <i>n</i> = 201	38 (19)	163 (81)	0.0001
Renal failure <i>n</i> = 129	10 (8)	119 (92)	0.2264
Symptoms and signs			
Difficulties in urinating or urinating three or more times during the night <i>n</i> = 525	9 (2)	516 (98)	0.0001
Worsening of bladder incontinence within past 90 days <i>n</i> = 409	41 (10)	368 (90)	0.0001
Fever <i>n</i> = 70	14 (20)	56 (80)	0.0001
Grade 1–4 pressure ulcers <i>n</i> = 296	77 (26)	219 (74)	0.0001
Terminal prognosis <i>n</i> = 32	6 (19)	26 (81)	0.0008
Decline in mood within past 90 days <i>n</i> = 470	37 (9)	433 (92)	0.0111
Functional capacity			
ADL > 3 (scale = 0–6) <i>n</i> = 515	134 (26)	381 (74)	0.0001
CPS > 3 (scale = 0–6) <i>n</i> = 419	88 (21)	331 (79)	0.0001
Issues related to quality of life and care-giver burden and use of formal services			
Client is alone most of the day <i>n</i> = 1154	13 (1)	1141 (99)	0.0001
Does not go out of her/his home <i>n</i> = 1421	160 (11)	1261 (89)	0.0001
Informal care-giver feels distressed <i>n</i> = 259	48 (19)	211 (81)	0.0001
Informal care-giver is dissatisfied with provided support <i>n</i> = 112	18 (16)	94 (84)	0.0001
Informal care-giver unable to continue <i>n</i> = 184	22 (12)	162 (88)	0.0001
Use of formal services			
No referral of the medications within past 180 days <i>n</i> = 669	16 (2)	653 (98)	0.0002
Hospital admission within past 90 days <i>n</i> = 698	83 (12)	615 (88)	0.0001
Visit to emergency room (without hospital admission) <i>n</i> = 246	16 (7)	230 (94)	0.4229
Unscheduled emergent care <i>n</i> = 324	24 (7)	300 (93)	0.0928
Visits of home carer within past 7 days <i>n</i> = 1629	68 (4)	1561 (95,83)	0.0049
Visits of nurse within past 7 days <i>n</i> = 1295	101 (9)	1194 (92)	0.0001
Visits of home-help within past 7 days <i>n</i> = 1635	33 (2)	1602 (98)	0.0001

n = 4,010.

Table 3. Predictors for IUC among home care clients in 11 European countries

	Odds ratio	95% CI
Urinary tract infections	6.51	3.91–10.8
Multiple sclerosis	5.89	2.08–16.7
ADL > 3	4.64	3.10–6.92
Male gender	3.53	2.56–4.87
Any type of cancer	2.23	1.39–3.57
CPS > 3	1.87	1.26–2.77
Grade 1–4 pressure ulcers	1.82	1.22–2.72
Czech Republic	2.48	0.64–9.61
Denmark	2.58	0.64–9.67
Finland	2.95	0.63–10.6
France	6.08	1.75–21.1
Germany	5.60	1.65–19.0
Iceland	2.58	0.63–10.6
Italy	14.0	4.12–47.1
The Netherlands	1.00	1.00–1.00
Norway	3.67	0.99–13.7
Sweden	1.00	1.00–1.00
UK	4.90	1.30–18.5

n = 4,010. $r^2 = 0.3663$.

Discussion

The AdHOC Study was designed to compare outcomes of different models of community care using a structured comparison of services and a comprehensive standardised assessment instrument across 11 European countries [13].

The use of IUC varied from 0 to 23% from site to site and showed a mean prevalence of 5.5%. These devices were more often found in men than in women in each of the sites. Occurrence of catheter use was not higher with advancing age in females; however, an increase of catheters was seen in ageing males. The diseases with a relationship to catheter use were those previously shown in the literature [11–12]. The tendency to insert catheters in males in high age groups, with advanced dementia, pressure ulcers and poor functional ability, were our main findings. This occurred particularly if the client suffered from cancer, multiple sclerosis, or if he or she resided in one of the following three sites: France, Germany or Italy. The explanatory value for these findings was 37% ($r^2 = 0.37$).

The frequency of catheter use accords well with the few previously estimated figures [9]. The presence of cognitive decline, more serious than moderate dementia, increased the risk of receiving a catheter almost two-fold; at the same time the presence of a diagnosis of dementia ceased being significant in the multivariate model. Thus, not the disease *per se*, but the severity of it, is of importance. At the same time the presence of severe functional decline increased the risk for receiving IUC a little over four-fold. The presence of pressure ulcers almost doubled the risk for catheter use. Multiple sclerosis is not a prevalent disease in this population whereas cancer is seen slightly more often. When present, the risk for receiving a

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catheter increases 6- and 2-fold correspondingly. More frequent use of IUC in males than in females is most certainly explained by prostate problems that increase with advancing age. Unfortunately, questions about urinary retention are not a part of the MDS questionnaire, and this fact makes it somewhat hard to trace the true cause for inserting the catheter.

Variations from country to country in the prevalence of catheter use may still partially be explained by the case-mix of the clients. It is of interest that when adjusting the regression model for dementia and functional capacity in addition to diseases, the differences vanished between Nordic countries, The Netherlands and the UK, representing the northern parts of Europe. The Central European or Southern European region appeared to host different care patterns or culture of care compared with those living in the north. One reason for the difference between the sites in the prevalence of indwelling catheter use could be habit-based instead of evidence-based practice. Some of the European countries really had restricted use of IUC, corresponding to the view of Ouslander [16]. The predictors for the use of indwelling catheters among the home care clients in Europe (Table 3) document a complexity in the problem situation [17].

A study from Switzerland documented that the presence of a urinary catheter was a predictor of unscheduled services [18]. In our sample the users of IUC had a urinary tract infection 6.5 times more often than those without a catheter. Landi *et al.* [12] conclude that an uncritical use of IUC should be considered an indicator of poor quality care. Pilloni *et al.* [19] documented that intermittent catheterisation reduces the urinary tract infection. If one has to use an indwelling catheter, Robinson [20] specifies that fundamental principles have to be followed. Even if the consequences of catheter use are beyond the scope of this cross-sectional/national analysis, the association between catheters and informal carers' care-giver burden is alarming.

Conclusion

The use of indwelling catheters among home care clients in Europe was most frequent in the oldest males with advanced dementia and poor physical function. The risk for receiving catheters was additionally increased if the client suffered from multiple sclerosis, cancer or pressure ulcers and resided in any of the following sites: France, Germany or Italy.

Moreover, use of urinary catheters was associated with increased care-giver burden. More research is warranted to show whether IUC is predicting long-term care placement among the home care clients in Europe, and if so, will there be differences between countries.

Key points

- Use of indwelling catheters was most frequent in the oldest males with advanced dementia and poor physical function.
- The risk for receiving catheters was additionally increased if the client resided in France, Germany or Italy.

- Use of urinary catheters was associated with increased care-giver burden.

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