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Pelvic floor disorders and health-related quality of life in older women: Results from the Women's Gynaecological Health study in Lieto, Finland

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Abstract: Objective: The aim of this study was to analyse the prevalence of pelvic floor disorders and to describe health-related quality of life(HRQoL)among older women. We also compared participants' HRQoL with the age-matched general female population and analysed factors associated with HRQoL.Study design: This is a population-based study of a cohort of women born in 1948 and in 1950 (n = 143) which is also part of the Women's Gynaecological Health study in Lieto, Finland. Methods: The data were collected by questionnaires which pertained to socio-demographics, health-related variables, pelvic floor disorders and HRQoL (15D). Linear model was conducted to estimate a model of factors that associated with HRQoL. Results: The prevalence of urinary incontinence, faecal incontinence and pelvic organ prolapse was 50%, 13% and 12%, respectively. The overall HRQoL score of the study cohort is broadly similar to that of the agematched general Finnish female population (mean±SD15D scores 0.905±0.084 vs 0.912±0.077). Higher number of medications was the most important explanatory factor for lower HRQoL.
Conclusion: Urinary incontinence was common; however, the impact on HRQoL was minor. The overall HRQoL score of the study cohort was broadly similar to that of age-matched general female population. Women who used a higher number of medications had lower HRQoL compared to women who used fewer medications.

Keywords: older women, pelvic floor disorders, health-related quality of life

1. Introduction

In most developed countries, an increase in the number and proportion of people over 65 years is expected in the coming decades. Older women make up a significant proportion of the world's population and their numbers are growing. (WHO 2015.) This demographic trend is associated with a higher incidence of pelvic floor disorders (PFDs), i.e., urinary incontinence (UI), faecal incontinence (FI) and pelvic organ prolapse (POP) (Nygaard & Barber 2008; Wu et al. 2014; Costa

et al. 2018). Despite their growing prevalence, PFDs remain undertreated and are not well understood by ageing women (Hobdy et al. 2018).

Previous studies have identified that PFDs reduce older women's health-related quality of life (HRQoL), with physical, psychological, sexual and social implications (Milsom et al. 2017, Bardsley 2018, Knut et al. 2018). A recent study by Knut and colleagues (2018) demonstrated that even mild urinary leakage reduces the quality of life significantly whereas a subsequent increase in the degree of incontinence has only minimal additional effect. It is important to gain more understanding of how PFDs affect the HRQoL of older women.

PFDs are common and affect at least one in every four women (Dieter et al. 2015). In a review of 30 studies comprising a total of 83,000 women from 15 countries, the mean prevalence of UI was 30% (range 5–71%), that of POP 20% (range 3–56%), and that of FI 7% (range 5–41%) (Walker & Gunasekera 2010). The prevalence of one or more PFDs has been reported to be 46%, and many women have a combination of the conditions (Milsom et al. 2017).

UI is the most common PFD (Nygaard & Barber 2008; Costa et al. 2018, Milsom et al. 2018). UI is a common condition worldwide and across different cultures, often increasing as women age (Sung & Hampton 2009; Kwon et al. 2010). Markland and colleagues (2008) reported that in community-dwelling older women (aged 65 and over), the prevalence of UI was 27%. UI, defined by the International Continence Society as any involuntary loss of urine, can be classified into stress incontinence, urge incontinence and mixed incontinence (Haylen et al. 2010). In older women, urge and mixed incontinence is more common than stress incontinence (Sung & Hampton 2009).

PFDs remain hidden because of the "culture of silence" surrounding women's lives (Susila & Roy 2014, Hobdy et al. 2018). Most women with these symptoms will never seek support and care for these debilitating symptoms (Basu & Duckett 2009, Sung & Hampton 2009). However, PFDs are often treatable. There are behavioural and pharmacologic treatments, devices and surgical interventions which can help ageing women as well. A systematic Cochrane review shows, for example, that high-quality evidence was found favouring the use of pelvic floor muscle training among women with urinary incontinence (Costa et al. 2018). In clinical practice, it is therefore important to recognise PFDs that may impact older women's HRQoL (Hobdy et al. 2018). HRQoL denotes an individual's perception of the impact of changes in their physical and emotional health status on their functioning and well-being (Sintonen 2001).

The aim of this study was to analyse the prevalence of pelvic floor disorders and to describe health-related quality of life (HRQoL) among older women born in 1948 and 1950. We also compared participants' HRQoL with that of a representative sample of the age-matched general Finnish female population and analysed the association of socio-demographic, health-related variables and PDFs with HRQoL.

2. Material and methods

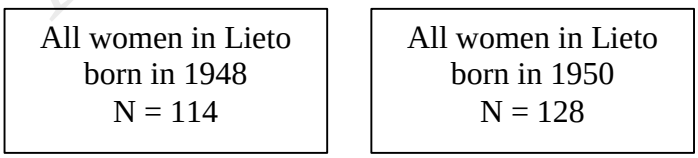
2.1 Design

A population-based study of the cohort of women born in the years 1948 and 1950. This study is part of the Women's Gynaecological Health study in Lieto, Finland. This study started in 2016 with the aim to evaluate gynaecological health and health-related factors in older women living in the community in Lieto, Finland. In the future, the aim is to follow up these cohorts as they age.

2.2.Participants and data collection

All the home-dwelling women in the Lieto area in Southwest Finland born in 1948 (N = 114, n = 67) and in 1950 (N = 128, n = 76) were originally considered eligible for the study. Lieto is a rural district in southwestern Finland. It has a population of about 20,000. All samples were systematically obtained, based on year of birth, from the Finnish Population register.

The data were collected in 2016 using questionnaires and clinical examinations. First, we sent an informed consent to the participants (N = 242) by post, which they signed and returned to the researchers. After this, the participants were sent questionnaires and an invitation for an appointment at the gynaecology clinic. The non-respondents were sent a reminder letter. 143 (59%) returned the postal questionnaires and participated in the clinical examinations (Figure 1). The clinical examinations by the study nurse and gynaecologist were conducted at the University Hospital in Turku, Finland. The study nurse went through the questionnaires with the participants, making some additional notes, if necessary. In this study, we report data from the questionnaires.



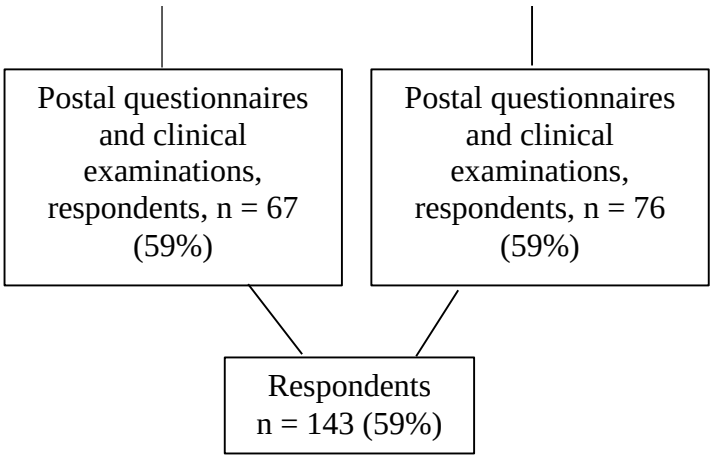


Figure 1. Study population of Women's Gynaecological Health study in Lieto, Finland.

2.3.Questionnaires and data analysis

Explanatory variables

The socio-demographic factors used as explanatory variables were living status and educational and occupational background. Education was categorized according to whether secondary school or more had been attended or not.

The health-related factors that were addressed in this analysis included parity, gynaecological surgery, BMI and the number of regular medications. Body mass index (BMI) was classified as <24 kg/m2 (underweight), 24–29 kg/m2 (normal weight) and >29 kg/m2 (overweight) (Duodecim 2015).

PFDs as explanatory variables were measured by urinary incontinence (UI) (yes/no), type of UI, impact of UI, faecal incontinence (yes/no) and pelvic organ prolapse (yes/no). Type of UI was evaluated with Urogenital Distress Inventory (UDI-6, short version) and the impact of UI was evaluated with visual analogue scale (VAS 0–10) (Kauppila et al. 1982; Uebersax et al. 1995; Stach-Lempinen et al. 2001).

Dependent variables

HRQoL was the dependent variable and it was measured with a generic HRQoL instrument (15D). The 15D is a 15-dimensional, standardized HRQoL instrument that can be used both as a profile and single index score measure. The 15D instrument includes the following dimensions: mobility,

vision, hearing, breathing, sleeping, eating, speech, excretion, usual activities, mental function, discomfort and symptoms, depression, distress, vitality and sexual activity, each of them with 5 possible levels. The single index score (15D score), representing the overall HRQoL on a 0-1 scale (1=full health, 0=being dead) and the dimension level values, reflecting the goodness of the levels relative to no problems on the dimension (=1) and to being dead (=0), are calculated from the questionnaire by using a set of population-based preference or utility weights. Mean dimension level values are used to draw 15D profiles for groups. The 15D has shown good psychometric properties in a number of earlier studies. (Sintonen 2001.) The minimum clinically important change or difference in the 15D score has been estimated to be ±0.015 on the basis that people can on average feel such a difference. (Alanne et al. 2015)

The 15D data for the general population came from the National Health 2011 Survey representing the Finnish population aged 18 and over. For this analysis those women were selected, who were of the same age as the cohorts (n=125). (Koskinen S, Lundqvist A, Ristiluoma N (eds.) Health, functional capacity and welfare in Finland in 2011. National Institute for Health and Welfare (THL), Report 68/2012. Helsinki 2012. (http://urn.fi/URN:ISBN:978-952-245-769-1.)

Data were described with frequencies (percentages), means (standard deviations) and medians, when appropriate. Independent samples t-test was used to test the statistical significance of the mean differences in the HRQoL and its dimensions between the study cohort and controls from the general population. The univariate associations of factors with HRQoL were analysed using Mann-Whitney U-test (factors with two categories) or Kruskal-Wallis test (factors with more than two categories). , and further pairwise comparisons were done using Steel-Dwass method. The factors significantly associated with HRQoL in univariate analysis were included in multivariable linear model to examine the explanatory variables independently associated with HRQoL. The residuals in linear model were normally distributed. All statistical analyses were performed with SAS System for Windows, version 9.4 (SAS Institute Inc., Cary, NC, USA). P-values <0.05 were considered as statistically significant.

2.4. Ethical considerations

The study was approved by the Ethics Committee of the Hospital District of Southwest Finland (ETMK 133/1801/2014 or 18.11.2014§394, ClinicalTrials.gov registration ID: NCT02338726). In

accordance with the World Medical Association's Declaration of Helsinki, this research followed commonly accepted ethical principles. Informed consent was obtained from all the participants, who were given assurances that their data would be treated confidentially.

3. Results

3.1. Participant characteristics

Out of 242 women, 143 participated in this study. Most of them were retired (96%). More than half of the participants had secondary education or higher. 62% of participants had previous gynaecological surgery. Twenty per cent of the participants reported that they used five or more medications per day. The socio-demographic and health-related factors of the participants are shown in more details in Table 2.

3.2.Prevalence of pelvic floor disorders

These cohorts included 72 (50%) incontinent women; 46 (64%) of them had genuine stress incontinence, 16 (22%) had urge incontinence and 10 (14%) had a mixed condition. The mean of impact of UI was 3.08 (SD 2.57, VAS scale). Faecal incontinence was reported by 13% of the participants and pelvic organ prolapse by 12%. The PFDs of the participants are shown in more details in Table 2.

3.3. Health-related quality of life in study cohorts compared with the general population

There was no statistically significant and clinically important difference in the mean 15D score between the study cohorts and age-matched general Finnish female population. When single dimensions were compared, study cohorts had significantly impaired HRQoL on four dimensions, i.e., sleeping ($p = 0.012$), depression ($p = 0.011$), distress ($p = 0.001$), and discomfort and symptoms ($p = 0.035$). The study cohorts reported a better score in mental function ($p = 0.001$). (Table 1, Figure 2)

Table 1. Mean (SD) health-related quality of life (15D) scores and profiles of the cohorts of this study (n = 143) and age-matched general Finnish female population control cohort (n = 125).

	Cohorts Mean (SD) n = 143	**General population** Mean (SD) n = 125	**p-value**	**Mean Difference (95% CI)**
15D score	.905 (.084)	.912 (.077)	.469	0.007 (0.012–0.027)
Mobility	.938 (.144)	.928 (.142)	.588	0.009 (0.044-0.025)
Vision	.959 (.118)	.948 (.173)	.521	0.012 (0.047-0.024)
Hearing	.948 (.126)	.964 (.088)	.224	0.016 (0.009-0.042)
Breathing	.908 (.170)	.910 (.160)	.947	0.013 (0.038-0.041)
Sleeping	.776 (.183)	.830 (.1510)	**.012**	0.053 (0.012-0.095)
Eating	.991 (.063)	1.000 (.00)	.098	0.009 (0.001-0.020)
Speech	.985 (.064)	.982 (.088)	.719	0.003 (0.021-0.016)
Excretion	.822 (.209)	.863 (.197)	.101	0.041 (0.008-0.089)
Usual activities	.941 (.149)	.926 (.146)	.423	0.014 (0.050-0.021)
Mental function	.929 (.151)	.861 (.178)	**.001**	0.068 (0.108-0.028)
Discomfort and symptoms	.754 (.205)	.806 (.193)	**.035**	0.051 (0.004-0.099)
Depression	.899 (.139)	.939 (.116)	**.011**	0.040 (0.009-0.070)
Distress	.894 (.155)	.948 (.117)	**.001**	0.054 (0.021 – 0.087)
Vitality	.885 (.146)	.910 (.121)	.135	0.024 (0.008-0.057)
Sexual activity	.888 (.202)	.927 (.166)	.079	0.040 (0.004-0,084)

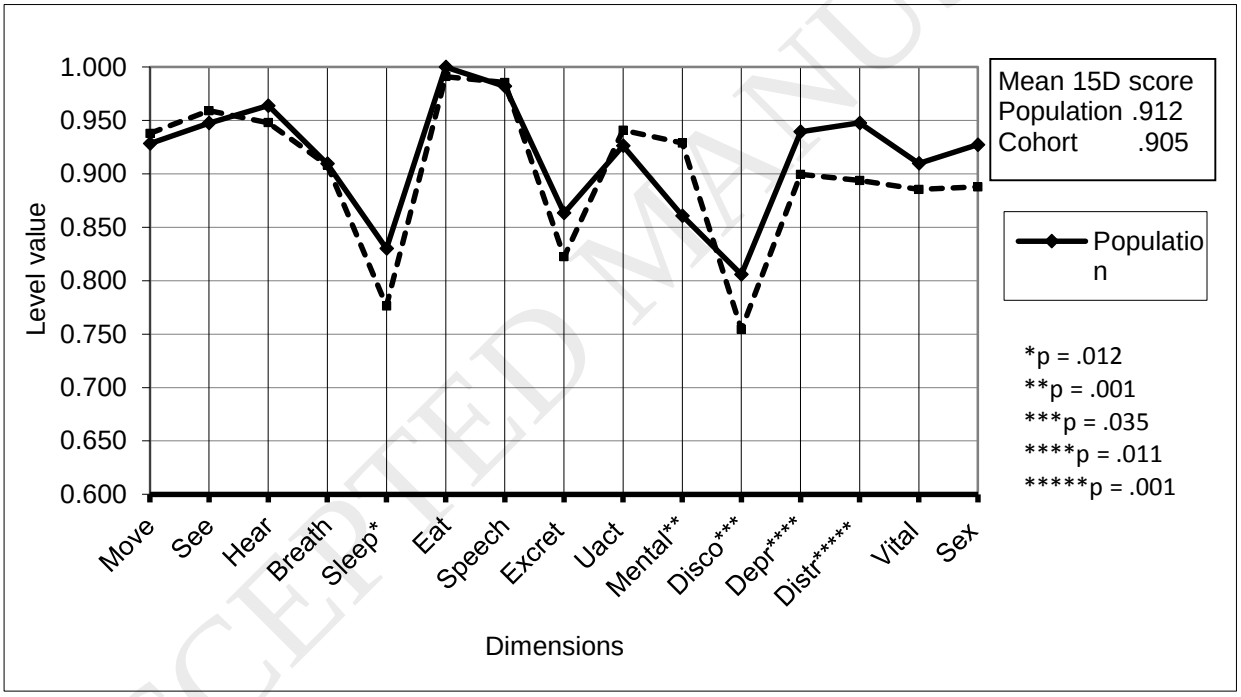


Figure 2. Mean health-related quality of life (15D) scores and profiles of the cohorts of this study (n = 143) and age-matched general Finnish female population control cohort (n = 125).

3.4.Factors associated with health-related quality of life (15D)

In univariate analysis, the factors that were significantly associated with HRQoL were BMI, number of medications and faecal incontinence. The median 15D score was significantly lower in women who were overweight (BMI >29 kg/m2) compared to those who were normal weight (24–29 kg/m2) (p = 0.039) or underweight (<24 kg/m2) (p = 0.009). The median 15D score was significantly lower in women who used 5 or more medications compared to those who used 1–4

medications (p = 0.012) and non-medication users (p < 0.001), and also between women who used 1-4 medications and non-medication users (p < 0.001). The median 15D score was significantly lower in women who suffered from faecal incontinence compared to those who did not (p = 0.014). (Table 2)

Table 2. Associations of explanatory variables with HRQoL in study cohorts.

Explanatory variables	*Description of variable*	*N (%)*	*Mean (SD)/ Median 15D score*	*p-value**
Socio-demographic factors				
Living status	Alone	30 (21)	.901(.081)/ .923	
	Living together	113 (79	.906 (.086)/ .929	0.704*
Educational status	Primary or less	58 (40)	.900 (.077)/ .910	0.247*
	Secondary or more	85 (60)	.908 (.089)/ .936	
Occupational status	Employed	6 (4)	.905 (.086)/ .929	0.478*
	Retired	137 (96)	.906 (.037)/ .902	
Health-related factors				
Parity	0-1	35 (25)	.930 (.059)/ .945	0.118#
	2-3	99 (69)	.896 (.091)/ .923	
	4-5	9 (6)	.904 (.085)/ .929	
Gynaecological surgery	No	55 (38)	.909 (.070)/ .926	0.992*
	Yes	88 (62)	.902 (.093)/ .929	
BMI	<24 kg/m^2	47 (33)	.926 (.059)/ .940	**0.009#**
	24–29 kg/m^2	60 (42)	.913 (.076)/ .932	
	>29 kg/m^2	36 (25)	.863 (.110)/ .889	
Number of regular medications	0	39 (25)	.955 (.041)/ .962	
	1-4	79 (55)	.903 (.067)/ .912	**<0.001#**
	5 or more	25 (20)	.830 (.122)/ .851	
Pelvic floor disorders				
Urinary incontinence	No	71 (50)	.913 (.079)/ .936	0.193
	Yes	72 (50)	.896 (.089)/ .923	
Faecal incontinence	No	125 (87)	.910 (.084)/ .936	**0.014***
	Yes	18 (13)	.870 (.081)/ .881	
Pelvic organ prolapse	No	126 (88)	.906 (.085)/ .932	0.396*
	Yes	17 (12)	.894 (.077)/ .896	

*Mann-Whitney U-test

#Kruskal-Wallis test; pairwise comparisons with Steel-Dwass method for BMI >29 kg/m^2 vs 24-29 kg/m^2 (p=0.039) and >29 kg/m^2 vs <24 kg/m^2 (p=0.009) and for number of regular medicine 0 vs 1-4 (p<0.001), 0 vs 5 or more (p<0.001) and 1-4 vs 5 or more (p=0.012).

In multivariable analysis, BMI, number of medications and faecal incontinence were included as explanatory variables in linear model. The number of regular medications (p < 0.001) remained as a statistically significant explanatory factor for lower HRQoL, whereas BMI (p = 0.414) and FI (p = 0.140) did not remain significant (p = 0.140). A higher number of medications was a statistically significant explanatory factors for lower HRQoL. (Table 3)

Table 3. Associations of explanatory variables with HRQoL at study cohorts in multivariable linear model.

	Adjusted mean (SE)	p-value
BMI		
<24	0.894 (0.014)	0.414
24-29	0.889 (0.013)	
>29	0.871 (0.015)	
Use of medication		
0	0.936 (0.016)	<0.001*
1-4	0.893 (0.011)	
5 or more	0.825 (0.017)	
Faecal incontinence		
No	0.899 (0.007)	0.140
Yes	0.870 (0.018)	

* Pairwise comparisons with Tukey's method: 0 vs 1-4 (p=0.015), 0 vs 5+ (p<0.001) and 1-4 vs 5+ (p<0.001).

4. Discussion

4.1. Findings

In this study, we analysed the prevalence of PFDs and described HRQoL among older women born in 1948 and 1950. We also compared participants' HRQoL with general Finnish female population and analysed the association of socio-demographics, health-related variables and PDFs with HRQoL. This study is part of the population-based cohort study Women's Gynaecological Health in Lieto, Finland. A similar study charting gynaecological problems in older women has not previously been conducted in the Finnish population.

This study indicates that UI was common among older women, with a prevalence of 50%. However, the impact of UI was quite minor, VAS mean 3.08, SD 2.57 (see Stach-Lempinen et al. 2001). Of the participants, 13% reported faecal incontinence and 12% pelvic organ prolapse. Previous studies suggesting that the prevalence of urinary incontinence in community-dwelling older women was 27% (Markland et al. 2008). The prevalence of urinary incontinence varies a lot between studies. The factors contributing to this may include how incontinence has been investigated in different studies. The incontinence symptoms may also fluctuate, and spontaneous recovery occurs as well. It is stated that most women with these symptoms will never seek support and care for these symptoms (Basu & Duckett 2009, Sung & Hampton 2009). It has been found that PFDs remain hidden because of the "culture of silence" surrounding women's lives (Susila & Roy 2014, Hobdy et al. 2018). In health care, assessment of older women's overall health status is important, as PFDs are relatively common and there are various methods to prevent and treat them

(Krhut et al. 2017). In general, it is important to bear in mind that in older people, good functional ability also promotes continence and maintenance of good pelvic muscle tone (Gibson & Wagg 2014, Jung et al. 2015).

At a clinical level, incontinence may cause embarrassment and reluctance to leave the home, leading to social isolation and decreased activity levels among older women. It has been found that compared with younger people, older adults are less likely to mention incontinence to their health care providers, reflecting a societal view that incontinence is a normal part of ageing (Smith & Shah 2018). Many individuals do not seek help due to the taboo and stigmatizing nature of the condition (Bardsley 2018). With age, the prevalence of gynaecological problems increases (Bardsley 2018), but help and treatment is available. Healthcare professionals should take every opportunity to ask about PFDs so that symptomatic relief and treatment interventions can be initiated (Bardsley 2018). It is important to identify women who would benefit from different interventions (Smith & Shah 2018). Even minor interventions or guidance can significantly affect women's gynaecological health in the upcoming years.

In the present study, we found that there was no statistically significant difference in the mean (SD) 15D score between the study cohorts and an age-matched general female population. When comparing single dimensions, study cohorts had a better score in mental function than the general population. On the other hand, the study cohorts had significantly impaired HRQoL in sleeping, depression, distress and discomfort and symptoms. HRQoL is a key aspect of aging (Avis et al. 2018). In older women, efforts aimed at supporting quality of life should focus on the factors identified in this study: problems with sleep, depression and distress, and discomfort and symptoms.

Our univariate analyses showed that faecal incontinence, overweight (>29 kg/m^2) and a higher number of medications were statistically significant explanatory factors for lower HRQoL. Previous studies have stated that PFDs reduce older women's HRQoL (Stach-Lempinen et al. 2004, Milsom et al. 2017, Bardsley 2018, Knut et al. 2018). In this study, faecal incontinence was the only PFD that impaired respondents' quality of life. As is known, faecal incontinence affects the ability to live a normal life and has huge emotional impact on people. It may also lead to social isolation and decreased activity levels among older women. (e.g. Smith & Shah 2018.) Health care professionals should be more aware of faecal incontinence and its detrimental effects on the quality of life. They should encourage women to discuss their problems because women who suffer from faecal incontinence should be identified and offered help in a timely manner.

In multivariable analyses, we found that a higher number of medications was a statistically significant explanatory factors for lower HRQoL. In gerontological studies, it has been shown that medication use among older people has increased in the last few decades (Hovstadius et al. 2010). In this study, one in every four subjects used more than five medications daily. The large number of medications indicates accumulation of health problems in some subjects, which may be reflected in the results of the study. Further studies are needed to clarify this issue. Our results provide new information on where the focus should be in supporting the quality of life of an ageing female population to help them age successfully.

4.2. Strengths and limitations

The study has several limitations. It was conducted in a typical urban region of south-western Finland. The study sample was quite small (n=143), and nonresponse was comparatively high (response rate 59%), as is usually the case in epidemiological studies among older people. It is noteworthy that the respondents who perceived themselves as ill were more likely to withdraw their participation than those who saw themselves as healthy. It is possible that the older women who took part in the study were in better health than those who did not, which would obviously be reflected in the results. We used validated self-reporting questionnaires, which were well completed. The pelvic floor disorder items used in this study have been used earlier (Kauppila et al. 1982; Uebersax et al. 1995; Stach-Lempinen et al. 2001). In addition, the health-related quality of life (15D) instrument used in this report is a standardized generic HRQoL instrument which has been used in earlier studies for a long time (Sintonen 2001). However, any generalizations from the results must be made with caution. Further studies should work with a larger sample and in different cultures to gain a fuller and more in-depth understanding of the issues concerned.

5. Conclusions

In conclusion, we observed that UI was common, but the harm it caused was minor. In old age, the maintenance of overall functional capacity is a key element of good-quality life and has positive effects on gynaecological problems as well. The overall HRQoL score of the study cohort was largely similar to that of general population of older women. Women who used a higher number of medications had lower HRQoL compared to women who used fewer medications.

Conflict of Interest

Harri Sintonen is the developer of the 15D. The other authors declare that they have no conflict of interest.

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