Factors Predictor and Self-care Behavior for Urinary Incontinence among the Elderly Females in Khon Kaen Province, Thailand: Cross-sectional Study

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Abstract

The purposes of this research were to study the factors predicting Urinary Incontinence (UI) and self-care behavior in caring for UI among elderly females. Explained using Orem's Self-Care Theory. The sample group consisted of 288 elderly female living in Daeng Yai Sub-district, Mueang District, Khon Kaen Province. Multistage sampling was conducted using a demographic interview form, screening form, factors that cause UI form, and self-care behavior in caring for UI in elderly females' form. Also, reliability by Kuder-Richardson20 (K-R20) equals 0.89 and Cronbach's alpha coefficient equal to 0.90 and 0.87 respectively. Data were analyzed using chi-square (Z^2), Pearson product-moment correlation coefficient, and stepwise multiple regression.

The results showed that factors predicting UI in elderly females include pelvic muscle exercise, exercise, constipation, environmental barriers, water intake, and activities. The overall self-care behavior of caring for UI among elderly females was at a moderate level. When considering each dimension, UI self-care behavior was moderate for overall prediction, behavioral changes, and self-care performance. This factor predicted the occurrence of UI in elderly females by 56.1% (R^2=0.561, F= 4.053, p=0.05). Health policymakers should develop and implement strategic plans for UI in health setting services to screening and establish a more effective and efficient model of care.

Keywords: Self-care behavior, Urinary incontinence, Elderly female, Predictor

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Introduction

UI is commonly found in the elderly or also known as "Giant geriatric syndrome" (Morley, 2017) affects physical, mental, social and economic cystitis, social activity limitation, daily routine limitation, low self-valued (World Health Organization, 2017), low quality of life, the risk for an accident, abnormal sleep behavior and depression (Eshkoor, Hamid, Shahar & Mun, 2017).

For Thailand, especially regarding the health of Thai people the 6th time found that Thai population aged 60 years and over seen to have UI 24.4 % (Ekphakorn, 2021) found in elderly females in the Ban Phru community, Songkhla Province 21.3-30% (Fumaneechote & Phakthongsuk, 2017) found in the elderly Na Siew Subdistrict, Mueang District, Chaiyaphum Province 20.8% (Chompoowisate, Laokhompruttajarn & Laokhompruttajarn, 2022) found Natan Subdistrict, Tha Khan Tho District, Kalasin Province 44.4% (Rattanawisai, Srichaikul & Songkhasri, 2017).

Factors related to UI that can be modified include overweight, environmental barriers, alcohol and caffeine intake, smoking, exercise (Padungkul & Mantangkul, 2017), pelvic floor weakness (Chaisri, Sarit-apirak, Udomsubpayakul & Monomai, 2017; Radziminska, Rajek, Straczynska, Podhorecka, Kozakiewlcz & Kormatowska, 2018; Torres-Lacoma, Navarro-Brazalez, Yuste-Sanchez, Sanchez-Sanchez, Prieto-Gomez & Vergara-Perez, 2022; Zhang, Wang, Gao, Jia, Sun & Wang, 2022), and constipation (Condon, Mannion, Molloy & O'Caoimh, 2019). And factors related to UI that cannot modify include: diabetes, high blood pressure, dependence, (Padungkul & Mantangkul, 2017), Alzheimer's disease, depression (Padungkul & Mantangkul, 2017; Zhang, Wang, Gao, Jia, Sun & Wang, 2022), activity limitation (Shuo, Zhao, Shi, Wei, Xiao-long, Guan-qun et al, 2023; Zhang, Wang, Gao, Jia, Sun & Wang, 2022). However, UI in elderly females is completely different, based on the context of the population, geography, environment, society, culture, and personal traits. UI is mostly found among elderly females (Kim, Shin, Choi, Park & Lee, 2018; Saboia, Firmiano, Bezerra, Vasconcelos, Oria & Vasconcelos, 2017), and increases with advancing age (Shi, Zhao, Cui, Wang, Liu, Si et al, 2022).

Self-care for UI in elderly females was 99% to avoid smoking, 96.6% giving genital parts a proper clean, and 93% urinating before traveling or outside. Moreover, the research found that only a few elderly females who experienced the condition received appropriate treatment. Research from the Muang Ban Pru community in Hat Yai District, Songkhla Province, found that only 8% of patients received adequate consideration from doctors (Padungkul & Mantangkul, 2017).

Providing appropriate care for UI in elderly females can help prevent complications and improve the quality of life. Furthermore, the results may lead to the development of intervention programs for elderly Thai females. Policymakers should consider modifying UI preventive recommendations for this population after identifying the obstacles they experience. Thailand has become a completely ageing society (Hachanda, 2022; Watakit, 2024; Zangphukieo, 2020). This research utilized the World Health Organization (World Health Organization, 2017) and the International Continence Society (ICS) (Sultan, Monga, Lee, Emmanuel, Norton, & Santoro, 2017) adaptation of the definition concept of UI as a research tool incorporated with Orem's self-care deficit theory (Orem, 2001), which focuses on patients' ability to care for themselves as a research concept.

Utilizing Orem's self-care deficit theory to investigate the influence of self-care agency and self-care deficits, a crucial aspect of Orem's theory, on UI administration in elderly females. This may involve examining how individuals' perceptions of their ability to perform self-care behaviors impact their management strategies and adherence to treatment.

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Objectives

Current research indicates a scarcity of studies on UI in elderly females. Consequently, the main goal of this study was to investigate the factors that predict UI. The secondary objective was to study self-care behavior in caring for UI among elderly females in the Dang Yai sub-district, Muang district, Khon Kaen province.

Material and Method

Study Sample

The population comprised elderly females aged 60 years or older who were Thai nationals and registered in the Dang Yai sub-district of Muang district, Khon Kaen province. The sample consisted of 288 elderly females, who were selected by qualification participate in the study by Daniel (Daniel & Cross, 2017). The sample size was calculated to be 261 individuals, with 10% added to prevent missing or incomplete data. Therefore, the population size of this study was 288.

The sampling process involved multiple steps, beginning with dividing the population into three groups based on village size. A representative sample from each group was selected using random cluster sampling, with a ratio of 4:1. The selection process involved randomizing two villages and one town. As a result, Nong Loob Moo 4 with 86 samplings and Nong Loob Moo 10 with 78 samplings were chosen from the two villages, while Nong Loob Moo 7 was selected from the town, with a total of 124 samplings (288 samplings in total).

Inclusion criteria

Females aged 60 or above, holding Thai nationality, and residing in Dang Yai sub-district, Muang district, Khon Kaen province, were eligible for this study if they were capable of verbal communication and comprehension and provided their consent.

Exclusion criteria

Individuals who had been diagnosed with or had undergone treatment for neurological conditions such as stroke, Parkinson's disease, Alzheimer's disease, spinal cord injury, acute confusional state, depression, or had been assessed for any of these conditions, including those related to the brain or nervous system, and attended less than 80% of the research participants.

Conceptual framework

This cross-sectional descriptive research was conducted in a community context using semi-structured interviews as data collection methods. All data were included as demographic and socioeconomic factors by age, educational level, body mass index (BMI), number of normal deliveries, past career, urinate leakage, activities, environment barriers, caffeine and alcohol intake, constipation, daily water intake, urination frequency from day to night, underlying disease, pelvic muscle exercise, the amount of urine and the frequency in UI conditions and self-care behavior: Prediction, behavioral change and self-care performance by using the definition "UI" of WHO (World Health Organization, 2017) and ICS (Sultan, Monga, Lee, Emmanuel, Norton & Santoro, 2017) along with Orem self-care theory (Orem, 2001) as the concept of research tool.

Orem's self-care deficit theory (Orem, 2001) focuses on patients' abilities to care for themselves, a concept widely acknowledged in nursing. Orem elaborated on the idea of care, defining "self-care" as "the activity that a person initiates and performs in order to benefit themselves to maintain living, health and livelihood." This theoretical framework underscores the significance of individuals' ability to undertake actions that enhance their own well-being and maintain their health and quality of life.

Utilizing Orem's self-care deficit theory to explore the impact of self-care agency and self-care deficit, fundamental aspects of Orem's model, on UI management among elderly females. This approach encompasses examining how individuals' self-assessed abilities to perform self-care activities influence their UI management approaches and treatment compliance, while also developing

personalized interventions for elderly females affected by UI.

Research tools

For this research, a questionnaire with 65 questions was created and administered to the participants in an interview format. Prior to creating the questionnaire, Previous studies on UI were examined by the researchers across four databases - PubMed, SciELO, Web of Science, and Thaijo - with the keywords "UI," "underreported," "self-care behavior," and "elderly females." Utilizing the WHO (World Health Organization, 2017) and ICS (Sultan, Monga, Lee, Emmanuel, Norton & Santoro, 2017) definition of "UI" in conjunction with Orem's self-care theory (Orem, 2001) as the research concept tool. The survey was distributed across four domains as follows:

1. Demographic interview form is the initial domain involved gathering demographic information through a population-based survey to understand the general characteristics of elderly females with UI. The survey consisted of eight inquiries, including age, education, previous job, health condition, BMI, and total number of childbirths.

2. Screening UI form is the second domain that performs an initial screening for elderly females with UI, where she answered affirmatively to the initial screening queries, showing the existence of UI. Interviews were conducted in a specific order, beginning with demographic information, followed by factors-related questions, and concluding with self-care behavior inquiries. Three questions were used to adapt the definition of UI by WHO (World Health Organization, 2017) and ICS (Sultan, Monga, Lee, Emmanuel, Norton & Santoro, 2017): "Do you experience urine leakage?" "Do you have a high temperature, cloudy, or painful urine?" and "Have you encountered any urine leakage on the day of the interview?"

3. Factors associated with the UI form are the third category dealt with UI questions, focusing on factors associated with the occurrence and severity of UI in elderly females. For 27 questions from the literature review, different factors were linked with the origins of UI, such as activities, environmental barriers, caffeine and alcohol consumption, water intake, pelvic muscle exercises, diabetes, constipation, frequency of urination, and physical activity. Inquiries regarding the seriousness and regularity of UI have also been incorporated.

4. The self-care behavior form is a question of the fourth domain that specifically looks at self-care behaviors for UI among elderly females within the last 6 months or up to the present time. A modified version of Orem's self-care deficit theory (Orem, 2001) was used with 27 questions: six questions focused on prediction, four questions on changing behavior, and 17 questions on self-care performance. Participants were asked to rank their responses from "highest" to "lowest" using a 5-point Likert scale.

Data collection

The initial phase of data collection involved training three healthcare providers to conduct interviews with the elderly females. The training covered standard procedures, questionnaire content, and interview skills, until the providers were confident. The interviewers underwent an evaluation to determine their suitability for conducting the field interviews. The elderly females who were selected were interviewed in person at their residences by a researcher or experienced interviewers. All participants were selected using random cluster sampling and there was no invitation to join the sample group. If an individual is unable to read or write, their fingerprints will be imprinted on the consent form. While conducting the interviews, the interviewers discussed the study's goals and the questionnaire with elderly females. Furthermore, elderly females needed to comprehend the objectives of the research, as they were required to respond personally to the survey. Participants were only included in the study if they responded "Yes" to the initial screening question, "Do you experience urine leakage?" If the respondent did not respond affirmatively, the question was not considered.

After saying "yes" to the question mentioned earlier, participants were required to fill out three forms relating to UI: demographic characteristics, factors related to UI, and self-care behavior questionnaires.

Reliability

To ensure consistency of content, interviews were conducted with five experts to verify content consistency, evaluate the consistency index, and choose questions with a consistency index of 0.6 or higher to be included in the questionnaire. This study determined the conviction rate by surveying 30 elderly females who matched the same criteria as the samples in the Sila Sub-district. The Kuder-Richardson20 (K-R20) showed a screen conviction rate of 0.89, with a Cronbach's alpha coefficient of 0.90 for UI-related questionnaire factors and 0.87 for elderly females' UI self-care behavior questionnaires.

Data analysis

This research utilized the IBM SPSS Software trial version 22 was used to analyze the data. It included distributing frequency, percentage, standard deviation, measures of association for categorical variables with chi-square (Z^2), measures of association for continuous variables with Pearson product-moment correlation coefficient, and prediction testing with stepwise multiple regression analysis at 0.05.

Ethics Statement

This study was certified by the National Ethics Committee Accreditation System of Thailand (NECAST) of Northeastern University on December 15, 2023, Number of COA 018/2566, Project No. 023/66. Moreover, this study worked according to Helsinki's ethical principles only when the samplings verbally volunteered and signed the study contract before participating in the research.

Results

The population-related data of the samplings in the community shows the data of 94 elderly females who had UI which found the average age at 72.48 years (standard deviation (S.D.) =7.71, Min.=62, Max.=89): 61.7% of elderly females aged between 60 and 69 years and 21.3% of elderly females aged 70–79 years. These elderly females mostly had the highest education at 95.7% of primary school and 97.9% who did a lot of heavy lifting, minority had underlying disease (31.9%) such as hypertension (18.1%), diabetes (13.8%), and mostly having between 25.0 kg/m2 and 29.9 kg/m2 of BMI (91.5%), 2.54 times in average of elderly females who experienced more than two times of normal delivery (S.D.=1.22, Min.=0, Max.=8), and almost half of the samples had experienced 2 times of normal delivery twice (46.8%) (Table 1).

Table 1 Demographic profile of the respondents (n=94) (Source: Original Research Data)

Demographic profile of the respondents	Number (Percentage)
Age (Mean=72.48, S.D.=7.71, Min.=62, Max.=89)	
60–69 Years	58 (61.7%)
70-79 Years	20 (21.3%)
80-89 Years	16 (17.0%)
Education level	
Primary school	90 (95.7%)
High school	4 (4.3%)
Past career	
Labor	92 (97.9%)
No	2 (2.1%)

Demographic profile of the respondents	Number (Percentage)
Underlying disease	
Hypertension	17 (18.1%)
Diabetes Mellitus	13 (13.8%)
No	64 (68.1%)
Body mass index	
23–24.9 kg/m2 (overweight)	8 (8.5%)
25–29.9 kg/m2 (obesity class 1)	86 (91.5%)
Number of normal deliveries	
(Mean=2.54, S.D.=1.22, Min.=0, Max.=8)	
2 times	44 (46.8%)
3 times	26 (27.7%)

Factors related to UI in elderly females

Table 2 shows the factors related to UI in elderly females as follows: pelvic muscle exercise (r=0.676, p<0.001), exercise (r=0.587, p<0.001), constipation (r=0.566, p<0.001), environmental barriers (r=0.518, p<0.001), water intake (r=0.421, p<0.001), and activities (r=0.311, p=0.002) at a significance level of 0.05. The model explained that the overall prediction success rate was 56.1%.

Table 2 Factors related to UI in elderly females (n=94) (Source: Original Research Data)

Variables	Unstandardized Coefficients		Standardized Coefficients	t	p-value
	B	Std. Error	Beta		
Pelvic muscle exercise	0.123	0.052	0.564	9.464	<0.001*
Exercise	0.438	0.092	0.353	7.752	<0.001*
Constipation	0.231	0.066	0.357	6.492	<0.001*
Environmental barriers	0.176	0.042	0.096	1.906	<0.001*
Water intake	-0.147	0.039	0.348	7.577	<0.001*
Activities	0.137	0.034	0.157	3.088	0.002*

Constant=1.398, R=0.583, R^2=0.561, p-value<0.05

Self-care behavior for UI among elderly females

Table 3 shows self-care behaviors for UI among elderly females. Overall, it was moderate (mean=2.96, S.D.=0.14). Specifically, the overall prediction was moderate (mean=3.38, S.D.=0.32), and found that the top four self-care prediction behaviors were as follows: the highest was not in a place with cigarette smoke at 98.9% (mean=4.99, S.D.=0.10) followed by avoidance of constipation (89.4%; mean=3.90, S.D.=0.33), control body weight of 88.3% (mean=2.99, S.D.=0.34), and no water intake for 2 hours before sleep was 63.8% (mean=2.31, S.D.=0.61).

The overall behavioral change was moderate (mean=2.68, S.D.=0.37). The highest was checking the nearest route to the restroom, 75.5% (mean=2.83, S.D.=0.45), checking the location of the nearest restroom before going was 74.5% (mean=2.82, S.D.=0.51), trying to stay close to the restroom at 71.1% (mean=2.71, S.D.=0.45), and did not go out at 51.1% (mean=1.67, S.D.=0.87).

Furthermore, overall self-care performance was moderate (mean=3.02, S.D.=0.11). The highest is hurry to the restroom, at 98.9% (mean=4.42, S.D.=0.15), urinate in advance 97.9%

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(mean=4.30, S.D.=0.46), change to new clothes when wet with urine at 96.8% (mean=4.04, S.D.=0.15), and meditating at 68.1% (mean=4.01, S.D.=0.47).

Table 3 Self-care behavior for UI among elderly females on prediction, behavioral change and self-care performance (n=94) (Source: Original Research Data)

Self-care behavior	Level Number (Percentage)					Mean	S.D.
	Lowest	Low	Moderate	High	Highest		
Prediction (Mean=3.38, S.D.=0.32)							
1. Not in a place with cigarette smoke	0	0	0	1 (1.1)	93 (98.9)	4.99	0.10
2. Avoiding constipation	0	0	10 (10.6)	84 (89.4)	0	3.90	0.33
3. Controlling body weight	0	6 (6.4)	83 (88.3)	5 (5.3)	0	2.99	0.34
4. No water consuming for 2 hours before sleep	4 (4.3)	60 (63.8)	27 (28.7)	3 (3.2)	0	2.31	0.61
Behavioral change (Mean=2.68, S.D.=0.37)							
1. Checking the nearest route to the restroom	0	23 (24.5)	71 (75.5)	0	0	2.83	0.45
2. Checking the location of the nearest restroom before going out	1 (1.1)	19 (20.2)	70 (74.5)	4 (4.3)	0	2.82	0.51
Behavioral change 3. Trying to stay close to the restroom	0	27 (28.7)	67 (71.1)	0	0	2.71	0.45
4. Do not going out	48 (51.1)	37 (39.4)	1 (1.1)	8 (8.5)	0	1.67	0.87
Self-care performance (Mean = 3.02, SD = 0.11)							
1. Hurry to the restroom	0	0	0	93 (98.9)	1 (1.1)	4.42	0.15
2. Urinate in advance time	0	0	0	92 (97.9)	2 (2.1)	4.30	0.46
3. Change into new clothes when wet with urine	0	0	1 (1.1)	91 (1.1)	2 (2.1)	4.04	0.15
4. Meditating	0	0	0	64 (68.1)	30 (31.9)	4.01	0.47

Discussion

A study on the predictive factors and self-care behavior for UI among elderly females in Khon Kean province, Thailand, discussed the results as follows:

1. The study found factors related to UI in elderly females as follows: Pelvic muscle exercise, exercise, constipation, environmental barriers, water intake, and activities, which is related to pelvic muscle exercise (Chaisri, Sarit-apirak, Udomsubpayakul & Monomai, 2017; Radziminska, Rajek, Straczynska, Podhorecka, Kozakiewlcz & Kormatowska, 2018; Torres-Lacoma, Navarro-Brazalez, Yuste-Sanchez, Sanchez-Sanchez, Prieto-Gomez & Vergara-Perez, 2022; Zhang, Wang, Gao, Jia, Sun & Wang, 2022), activities limitation (Chompoowisate, Laokhompruttajarn, Laokhompruttajarn, 2022; Shuo, Zhao, Shi, Wei, Xiao-long, Guan-qun et al, 2023; Zhang, Wang, Gao, Jia, Sun & Wang, 2022), water intake, environmental barriers (Padungkul & Mantangkul, 2017), constipation (Condon, Mannion, Molloy & O'Caoimh, 2019), and exercise (Padungkul & Mantangkul, 2017; Zhang, Wang, Gao, Jia, Sun & Wang, 2022), limitation of some activities that obstruct the elderly from walking to the restroom and urinating on their clothes unintentionally, and inappropriate environment (Chompoowisate, Laokhompruttajarn, Laokhompruttajarn, 2022; Padungkul & Mantangkul, 2017).

Factors predictor influence self-care behavior for UI among elderly females on prediction where avoidance of constipation was 89.4% and no water intake for 2 hours before sleep was 63.8%. Regarding behavioral change, checking the nearest route to the restroom was 75.5%, checking the location of the nearest restroom before going was 74.5%, and trying to stay close to the restroom was 71.1%. The self-care performance was hurry to the restroom 98.9% and urinate in advance 97.9%. Self-care behaviors for UI in elderly females were influenced by several factors including constipation, environmental barriers, water intake, and activities. But elderly female often neglects pelvic floor exercises and exercise as part of their self-care regimen.

These results may increase awareness and focus on the perineal area in elderly females. They should not feel embarrassed despite the fact that discussing genitalia is uncommon in Eastern cultures. Moreover, the outcomes of this study suggest improvements in self-care routines and interventions that incorporate exercises for the pelvic floor muscles. These exercises have proven effective in strengthening the muscles of the pelvic floor and in reducing UI.

2. Self-care behavior for UI among elderly females that overall prediction showed a moderate overall prediction. The top four self-care behaviors were as follows: not in a place with cigarette smoke, avoiding constipation, controlling body weight, and not consuming water for 2 hours before sleep. They found that the prevention of UI is related to avoiding smoking and constipation (Padungkul & Mantangkul, 2017). For overall behavioral change at a moderate level, it was found that the top four highest averages of UI self-care behavior for UI among elderly females were as follows: checking the nearest route to the restroom, checking the location of the nearest restroom before going out, trying to stay close to the restroom, and not going out, who stated that the elderly should prepare the nearest route to the restroom (Chompoowisate, Laokhompruttajarn & Laokhompruttajarn, 2022; Padungkul & Mantangkul, 2017). A pelvic floor muscle exercise program tailored to elderly females and supervised by professionals can help improve UI symptoms (Torres-Lacoma, Navarro-Brazalez, Yuste-Sanchez, Sanchez-Sanchez, Prieto-Gomez & Vergara-Perez, 2022).

Moreover, overall self-care performance was at a moderate level, with the top four highest averages of UI self-care behavior for UI among elderly females being as follows: Hurry to the restroom, urinate in advance time, change into new clothes when wet with urine, and meditating, Research had discovered that the most frequent method used

to help people with UI involves quickly going to the restroom when they feel the urge to urinate, promptly cleaning their body if it gets wet with urine, and changing into fresh clothing (Chompoowisate, Laokhompruttajarn, Laokhompruttajarn, 2022; Padungkul & Mantangkul, 2017; Murukesu, Singh & Shahar, 2019).

Results present significant challenges for healthcare providers and policymakers of Khon Kaen Province for decrease prevalence of UI. They also have implications for policymakers responsible for developing early screening protocols for UI risk factors in elderly females and establishing self-care UI, aimed at facilitating early prevention. Healthcare providers in hospitals, medical centers, and community settings must implement UI screening for early detection and provide guidance on self-care behaviors for those experiencing UI.

Research exploitation and recommendation

To improve the quality of healthcare services and provide valuable insights for UI caring, it is important to investigate the UI user interface experience among the elderly females, particularly in the context of rapidly aging populations. Additionally, health policymakers should develop and implement strategic plans for UI in health setting services to establish a more effective and efficient model of care. Lastly, it is essential to examine UI in both men and women across all healthcare facilities, nursing home, and including community settings.

Limitation

The knowledge gained from this study revealed factors related to UI in elderly females and self-care behaviors for UI among elderly female. Factors related to UI in elderly females in six dimensions are pelvic muscle exercise, exercise, constipation, environmental barriers, water intake, and activities. Self-care behavior for UI among elderly females moderate overall in terms of prediction, behavioral change, and self-care performance. However, this study had certain limitations. It only focused on elderly females living in the Dang Yai Sub-district, Muang District, Khon Kaen Province. Therefore, the findings cannot be applied to all of Thailand or other countries. Additionally, the research was cross-sectional, with a majority (61.7%) of participants falling into the young-to-middle-aged category. Most of the elderly experienced vision impairment and hearing difficulties, and the majority (95.7%) attained primary education. This resulted in a bias in the information gathered during data gathering. Nevertheless, the elderly females who were chosen participated in face-to-face interviews and were provided with clear reading assistance by researchers before completing the questionnaire independently.

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