The effect of a urinary incontinence self-management program for older women in South Korea: A pilot study

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\textbf{Abstract}

\textbf{Background:} Although self-management approaches have shown strong evidence of positive outcomes for urinary incontinence prevention and management, few programs have been developed for Korean rural communities.

\textbf{Objectives:} This pilot study aimed to develop, implement, and evaluate a urinary incontinence self-management program for community-dwelling women aged 55 and older with urinary incontinence in rural South Korea.

\textbf{Methods:} This study used a one-group pre- post-test design to measure the effects of the intervention using standardized urinary incontinence symptom, knowledge, and attitude measures. Seventeen community-dwelling older women completed weekly 90-min group sessions for 5 weeks. Descriptive statistics and paired t-tests were used to analyze data.

\textbf{Results:} The mean of the overall interference on daily life from urine leakage (pre-test: $M = 5.76 \pm 2.68$, post-test: $M = 2.29 \pm 1.93$, $t = -4.609, p < 0.001$) and the sum of International Consultation on Incontinence Questionnaire scores (pre-test: $M = 11.59 \pm 3.00$, post-test: $M = 5.29 \pm 3.02$, $t = -5.881, p < 0.001$) indicated significant improvement after the intervention. Improvement was also noted on the mean knowledge (pre-test: $M = 19.07 \pm 3.34$, post-test: $M = 23.15 \pm 2.60$, $t = -5.881, p < 0.001$) and attitude scores (pre-test: $M = 2.64 \pm 0.19$, post-test: $M = 3.08 \pm 0.41$, $t = 5.150, p < 0.001$). Weekly assignments were completed 82.4\% of the time. Participants showed a high satisfaction level ($M = 26.82 \pm 1.74$, range 22–28) with the group program.

\textbf{Conclusions:} Implementation of a urinary incontinence self-management program was accompanied by improved outcomes for Korean older women living in rural communities.
1. Introduction

Urinary incontinence (UI), defined as any involuntary loss of urine [1], is a prevalent geriatric condition regarded as a public health issue with global implications. Hu and colleagues estimated that economic costs for female overactive bladder syndrome, including UI, were comparable to those of osteoporosis and breast cancer [2]. In 2007, South Korea estimated its total economic cost to treat UI at approximately 186 million USD [3]. Studies have also suggested that UI was associated with lower quality of life and social isolation [4], and a greater impact on the quality of life than many other chronic diseases such as hypertension or diabetes [5].

According to a review on UI prevalence in Korean women, 64.2% of community-dwelling women aged 55 years and older suffer from UI [6]. Despite evidence suggesting that UI is significantly associated with low quality of life, relatively few older Korean women with UI seek help to manage or treat their condition due to cultural norms of privacy and feelings of embarrassment [6]. Older women lack knowledge concerning UI while exhibiting fears that they might have to go through painful examination and treatments [6]. Personal, physical, and psychological factors, such as age, income, educational level, presence of comorbidities, depression, and cognitive impairments, were found to be associated with UI [6]. In particular, older women in rural communities may be more vulnerable to UI as they face a different set of challenges compared to urban women. Park and Park [7] found that compared to urban elders, rural elders had lower educational level, more chronic illnesses, poorer nutritional status, higher level of depression, and less time spent outdoors during daytime. Although research has shown positive impact of UI self-management programs for community-dwelling older women in Korea [8], no to little progress has been made on developing such programs for older women over the past decades, partly due to difficulties reaching out to affected populations when they are reluctant to disclose bladder problems [9] or because they consider UI as a normal ageing process [10].

Chronic illness self-management is defined as the individual’s ability to manage the symptoms, treatment, physical and psychosocial consequences, and lifestyle changes inherent in living with a chronic condition [11]. Self-management is seen as a cornerstone of empowering older adults with chronic illnesses [12]. Chronic disease self-management programs have been developed and evaluated for heart disease, diabetes, chronic pain, HIV/AIDS, and arthritis, showing significant improvements in increasing physical exercise, improving communication with physicians, higher self-reported general health, and social activities limitations [13]. Literature on efficacy of UI self-management has also revealed strong evidence that UI prevention and promotion programs can enhance outcomes among community-dwelling older adults. A randomized trial of behavioral management for continence (BMC) group intervention with older rural women (n = 178) in the U.S. revealed a significant difference between the BMC and the control groups in regard to grams of urine loss and quality of life at the 6-, 12-, 18-, and 24-month follow-up [14]. Holroyd-Leduc et al. [15] developed an evidence-based self-management UI risk factor modification tool for older women that has six modifiable behavioral strategies: (1) pelvic floor muscle strength; (2) caffeine intake; (3) excess weight; (4) constipation; (5) vision and hearing impairment; (6) smoking. Using a 6-month prospective cohort study design with 103 Canadian women (≥55 years), the researchers found that 95% of the participants used the tool at some point and that consequently, urinary leakage rates were reduced by an average of 1.4 daily episodes.

In response to the limited access for rural community-dwelling older women to UI self-management programs, we developed and evaluated a self-management program for older women with UI, implementing it in a single public health care post (PHCP) located in rural South Korea. PHCPs are public health facilities directed by the Korean local governments; their primary healthcare providers are community health nurse practitioners (CHNPs) who are registered nurses or midwives whose responsibilities include organizing, developing, planning, and implementing community health education programs [16].

The purpose of our pilot study was to develop, implement, and evaluate the effectiveness of an evidence-based UI self-management program for community-dwelling older women (aged ≥55 years) with UI. Our specific aims were to evaluate: (1) participants’ outcomes concerning the severity of UI symptoms, UI knowledge, and UI attitudes; (2) fidelity of the implementations (i.e., participants’ responsiveness to the program and lecturers’ adherence to the planned education intervention); and (3) participants’ satisfaction with the program.

2. Material and methods

2.1. Participants and settings

The clinical setting for our study was the Sosa PHCP, run by a CHNP with the help of several village health volunteers. The Sosa community, is a traditional rural, agricultural farm base,
with a population of 468; 266 (56.8%) are aged 55 or older and 41.3% of this older population suffers from one or more chronic illnesses (Y-O Kim, pers. comm., March 4, 2013). While many government-led projects are run by the department of public health, PHCPs have the autonomy to operate smaller independent education programs. Hence, CHNPs have the flexibility to tailor their activities to local residents’ characteristics and health care needs.

Through local announcements, distribution of leaflets, and word of mouth, 25 potential participants were identified from the Sosa community. To be included in the intervention, the participants had to meet all the following criteria: (1) female aged 55 years or older; (2) mild to moderate UI score in the International Consultation on Incontinence Questionnaire-Short Form (ICIQ-SF) (sum of total scores <12); (3) willingness and ability to participate in weekly 90-min group sessions for 5 weeks; and (4) provision of written informed consent.

Participants were excluded if they met one of the following criteria: (1) non-ambulatory; (2) persistent pelvic pain; (3) taking UI, overactive bladder, or any other bladder control medication; or (4) participation in another health project that may influence the results of the intervention. Of the 25 women who showed interest in the study, 20 met the inclusion criteria. Since the 5-week intervention took place during winter, a village community centre easily accessible to the participants and where accidents from slipping and falling could be avoided was used.

2.2. Interventions

The evidence-based self-management UI risk factor modification tool developed by Holroyd-Leduc et al. [15] served as a framework for the educational intervention. The goals of the educational intervention were to decrease the severity of participants’ UI symptoms during the intervention period while increasing participants’ knowledge and positive attitudes toward UI self-management. Four teaching topics were addressed: (1) self-management principles, (2) myths and facts about UI, (3) behavioral and lifestyle factors on bladder health, and (4) effective communication with care providers and interactions with family and friends.

Prior to the actual intervention, the investigators convened a community meeting with village representatives, consisting of a village leader, president of senior group, and president of the village women’s society. This community forum played an important role in solidifying buy-in from community leaders, building trust, and encouraging long-term commitment in the community. Opinions of the community regarding the intervention process and the content of the program were reflected in the implementation and evaluation phases.

Low health literacy was expected among older women living in Korean rural areas. Hence, it was important that the concepts in the educational program were easy to understand, follow, and apply. To address these issues we used popular folk songs for rhythm and created lyrics related to UI prevention, which made education sessions fun and effective. Instead of simply using pencils and paper to record adherence to the protocol, we provided a sketchbook filled with a bladder diary that could be completed with colorful stickers. As identifying the correct muscles to do Kegel exercises could be a difficult task for some older women, small yoga balls or beach balls were provided to assist with performing the exercises [17]. Since most of the participants were farmers, self-management group sessions were planned to be held during the agricultural off-season to enhance participation.

A weekly interactive 90-min group sessions that included lecture, role-plays, reflective discussions, pelvic muscle exercises, and assignments related to action plans were carried out between 6 December 2013 and 3 January 2014. We designated a main lecturer, who is the CHNP at Sosa PHCP, and a co-lecturer for each session, and there were at least two community health nurses assisting the participants and the lecturers. The participants grouped in teams of 2 or 3, supporting each other throughout the program. In order to promote active participation, various types of learning methods, such as playing games, signing, moving or dancing with the music, and sharing experiences and testimonials, were preferred by the participants to commonplace informational lecture.

2.3. Instruments

A variety of data collection instruments were developed, translated, and administered to measure the outcomes of the educational intervention.

2.3.1. Sociodemographic questionnaire

Age, gender, level of education, number of children, and duration of UI symptoms (years) as well as UI diagnosis and treatment history (yes/no) were obtained during baseline interviews.

2.3.2. ICIQ-SF

The Korean version of ICIQ-SF was used to evaluate the symptoms and impact of UI. Permission to use was granted by the ICIQ study group (N Cotterill, pers. comm., April 14, 2013). All translated ICIQ-SF instruments underwent the mandated protocol to establish validity and reliability of the instrument by the ICIQ group [18]. Scored on a scale from 0 to 21, with greater values indicating increased severity, the questionnaire consisted of four components: frequency (0 = never; 1 = about once a week or less often; 2 = two or three times a week; 3 = about once a day; 4 = several times a day; 5 = all the time), quantity (0 = none; 2 = a small amount; 4 = a moderate amount; 6 = a large amount), and overall impact on daily life scored from 0 = not at all to 10 = a great deal. A total of 5 points or less is considered as mild UI; 6–12 as moderate; 13–18 as severe; and 19–21 as very serious. The fourth component was a self-diagnostic item, which is not scored [19]. The ICIQ-SF was used for baseline measures and to evaluate the effect of the educational intervention.

2.3.3. UI knowledge scale (UIKS) and UI attitude scale (UIAS)

Yuan and colleagues’ UIKS [20] and UIAS [21] instruments were used to measure changes in participants’ knowledge and attitudes about UI. Permission to use and translate these two scales to Korean was obtained (H Yuan, pers. comm., April 14, 2013). The UIKS consisted of 30 items with dichotomous choices (1 = correct; 0 = false or do not know), and the UIAS
has 15 items with a 4-point Likert scale (1 = strongly disagree; 2 = disagree; 3 = agree; 4 = strongly agree). Higher UIKS scores indicate more knowledge about UI and its management while higher average scores on UIAS indicate more positive attitude toward UI care and its management. Five experts tested the values of content validity for both UIKS and UIAS [20,21]. The internal consistency reliability was .69 for the UIKS and .70 for the UIAS used in community-dwelling older persons [20,21]. In our study, the Cronbach’s alpha was .72 for UIKS and .58 for UIAS.

The Korean versions of the UIKS and UIAS were developed using a translation-back-translation procedure; the original English version was translated into Korean and then back-translated into English by three bilingual/bicultural nurses. The items of the Korean instruments were formulated with the same contents as the items in the original instrument, taking into account the cultural features of the Korean healthcare system. The appropriateness of the final translated versions of UIKS and UIAS was reviewed by a panel of experts and verified by ten Korean older women who did not participate in the self-management program in order to identify any unclear content. Some need for clarification and modification of a few items was identified to make the instrument more suitable to the Korean culture. After comparing the original English and the back-translated versions, we finalized the instruments to be used in our study.

2.3.4. Fidelity evaluation form
Checklists for attendance rates and for completion of weekly assignments were used to evaluate participants’ responsiveness to the intervention. Research assistants assessed lecturers’ adherence to the lesson plan, using weekly audit checklists that contained 10–12 to-do tasks in each session.

2.3.5. Satisfaction
The Short Assessment Patient Satisfaction (SAPS), which deemed to be valid and reliable (Cronbach’s alpha = .85) [22], was used to assess the satisfaction with the intervention. This 7-item instrument based on a 5-point Likert scale ranged possible scores from 0 (extremely dissatisfied) to 28 (extremely satisfied). Permission to use and revise the SAPS was obtained (S Korn, pers. comm., May 12, 2013). The development of the Korean SAPS version involved the same procedures of translation and back-translation used for the Korean UIKS and UIAS. In our study, the Cronbach’s alpha for the revised SAPS was .62.

2.4. Data collection
Prior to the first group session, participants completed the sociodemographic questionnaire, ICIQ-SF, the UIKS, and the UIAS. On the last day of the session, they submitted the ICIQ-SF, the UIKS, the UIAS, and the satisfaction questionnaire. Because of low literacy, all but one participant needed help from the assistants trained by the project team for reading the questions and filling in the answers. Participants responded to the questions in a quiet and private place with the help of the researchers and three trained graduate-level nursing students who collected data using the pencil-and-paper method.

2.5. Data analysis
A paired t-test or the Wilcoxon signed-rank test was used to compare the ICIQ-SF, the UIKS, and the UIAS data obtained before and after the intervention. All P values were two-tailed, and p < 0.05 was considered significant. Descriptive statistics were applied to describe sociodemographic data, fidelity evaluation measures, and satisfaction ratings. All data were analyzed using the SPSS for Windows 21.0 (SPSS Inc., Chicago, IL, USA).

2.6. Ethical considerations
At the beginning of the study, an ethics form was provided to inform participants that there were no physical, financial, or legal risks involved in this study after which participants signed their informed consent form. We made our best effort to guard against these risks by putting in place careful data security procedures and by informing the participants that they could decline to answer any of the questions or stop participating in the study at any time. The questionnaire was coded and each participant was identified with numerical identifiers to maintain privacy. The first and second authors obtained approval from their respective university’s institutional review board.

3. Results

3.1. Characteristics of the participants
Of the 20 community-dwelling participants, 3 dropped out from the study due to time conflict, illness, or death in family. Seventeen attended at least 4 group sessions, including the last session, for a 15% attrition rate. Thus, our analyses included the final sample of 17 community-dwelling participants. Participants ranged in age from 60 to 84 years, with a mean age of 71.5 (SD = 7.1). With regard to years of schooling, the mean was 5.6 years (SD = 4.0) with a range of 0–16. The majority of participants (n = 10, 58.8%) completed 6 years of elementary education, and 3 (17.6%) did not attend school at all. One participant (5.9%) completed 4-years of college. The mean number of children was 4.2 (SD = 2.2) with a range of 0–8. The mean duration of experiencing UI symptoms was 7.5 years (SD = 10.1) with a range of 1–35. Among the 17 participants, two (11.8%) reported that they had a history of UI diagnosis and treatment.

3.2. Participants’ outcomes
There were significant changes in the frequency, quantity, and mean overall impact on daily life before and after the intervention. The mean of the overall interference on daily life from urine leakage (pre-test: M = 5.76 ± 2.68 [range: 1–10], post-test: M = 2.29 ± 1.35 [range 0–7], t = −4.609, p < 0.001) and the sum of International Consultation on Incontinence Questionnaire scores (pre-test: M = 11.59 ± 3.00 [range 7–17], post-test: M = 5.29 ± 3.02 [range 0–11], t = −5.881, p < 0.001). A statistically significant mean score difference was found in the overall interference on daily life from urine leakage.
(−3.471, 95% confidence interval [CI]: −5.067 to −1.874) and in the sum of ICIQ-SF (−6.294, 95% CI: −8.563 to −4.025). No episodes of ‘once a day’ or ‘several times a day’ were noted on the 5th week assessment (see Table 1).

Statistically significant differences were also found between pre- and post-test on the overall mean knowledge and attitudes scores (both $p < 0.001$). The mean score of UIKS pre-test was 19.07 ($SD = 3.34$, range 14–25) and the mean of the post-test was 23.15 ($SD = 2.60$, range 18–28). Of the 30 UIKS questions, we selected the 4 lowest scored items answered correctly by 30% of the group and compared them with post-test measures (see Table 2).

The mean score of UIAS pre-test was 2.64 ($SD = 0.19$, range 2.40–2.87) and the mean score of the post-test was 3.08 ($SD = 0.41$, range 2.60–3.60). As noted in Tables 2 and 3 items showed improvement after the intervention, but one item indicated a decrease in knowledge. Significant differences in attitudes toward UI after the intervention were found on 3 items of the UIAS, one being a more negative attitude toward, “UI is not serious enough to warrant treatment” than at the baseline measure (see Table 3).

### 3.3. Fidelity of the implementation of the program

Of the 17 participants, 70.6% ($n = 12$) attended all 5 sessions while 5 women participated in 4 of the 5 sessions. The main lecturer checked participants’ homework assignments at weeks 2 and 4, which showed a completion rate of 82.4% each time. Weekly audits of fidelity to lesson plans were determined by the number of recorded items divided by the number of expected items, revealing 100% adherence to the planned intervention in all 5 sessions.

### 3.4. Satisfaction with the intervention

SAPS results of community-dwelling participants indicated a high satisfaction level ($M = 26.82 \pm 1.74$, range 22–28) with the program; there was no “very dissatisfied” or “dissatisfied” on the overall score. About 70% of the participants responded “very satisfied” and the rest “satisfied” (Table 4). The items “I’m satisfied with lecturers’ teaching and explanations”, “I felt respected throughout the program”, and “I’m satisfied with the program content” resulted in the highest mean score ($M = 3.94 \pm 0.24$). On the other hand, the items “time spent on the program” and “overall satisfaction with the program” had the lowest ranking (see Table 4).

### 4. Discussion

This pilot study implemented an evidence-based practice (EBP) approach to improve knowledge and attitudes about UI

### Table 1 – Effects of intervention on severity of UI symptoms ($n = 17$).

<table>
<thead>
<tr>
<th>International Consultation on Incontinence Questionnaire-Short Form (ICIQ-SF)</th>
<th>Rank</th>
<th>$n$</th>
<th>Mean rank</th>
<th>Sum of ranks</th>
<th>$Z^*$</th>
<th>$p^*$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency of UI episodes</td>
<td>Week 5–week 1</td>
<td>Negative ranks</td>
<td>14</td>
<td>7.50</td>
<td>105.00</td>
<td>−3.401</td>
</tr>
<tr>
<td></td>
<td>Positive ranks</td>
<td>6</td>
<td>0.00</td>
<td>0.00</td>
<td> </td>
<td> </td>
</tr>
<tr>
<td></td>
<td>Ties</td>
<td>3</td>
<td> </td>
<td> </td>
<td> </td>
<td> </td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>17</td>
<td> </td>
<td> </td>
<td> </td>
<td> </td>
</tr>
<tr>
<td>Amount of urine loss per episode</td>
<td>Week 5–week 1</td>
<td>Negative ranks</td>
<td>10</td>
<td>6.80</td>
<td>68.00</td>
<td>−2.389</td>
</tr>
<tr>
<td></td>
<td>Positive ranks</td>
<td>2</td>
<td>5.00</td>
<td>10.00</td>
<td> </td>
<td> </td>
</tr>
<tr>
<td></td>
<td>Ties</td>
<td>5</td>
<td> </td>
<td> </td>
<td> </td>
<td> </td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>17</td>
<td> </td>
<td> </td>
<td> </td>
<td> </td>
</tr>
</tbody>
</table>

Note: *Wilcoxon signed-rank test.

a Week 5 < week 1.
b Week 5 > week 1.
c Week 5 = week 1.

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### Table 2 – Changes in UI knowledge ($n = 17$).

<table>
<thead>
<tr>
<th>UIKS$^a$ questions</th>
<th>Correct answer ($n$)</th>
<th>Change$^c$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q$^b$ number</td>
<td>Pre-test</td>
<td>Post-test</td>
</tr>
<tr>
<td>Q1. Taking anxiety agents or sleeping pills can lead to UI.</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Q4. Urinary incontinence is a normal part of ageing</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Q5. Urinary incontinence is a normal occurrence after childbirth.</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Q16. Avoiding constipation can promote urinary continence.</td>
<td>4</td>
<td>9</td>
</tr>
</tbody>
</table>

$a$ UIKS: urinary incontinence knowledge scale.

$b$ Q number: 4 lowest scored items answered correctly by 30% of the group in the pre-test.

$c$ Change: + (increase), − (decrease).
Changes in UI Attitudes (Satisfaction level with the program (17)).

<table>
<thead>
<tr>
<th>UIAS* questions</th>
<th>M ± SD</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1 number</td>
<td>Pre-test</td>
<td>Post-test</td>
<td></td>
</tr>
<tr>
<td>Q3. UI is shameful.</td>
<td>1.76 ± 0.66</td>
<td>2.41 ± 0.80</td>
<td>4.400</td>
</tr>
<tr>
<td>Q5. UI may be prevented.</td>
<td>2.76 ± 0.56</td>
<td>3.28 ± 0.59</td>
<td>2.729</td>
</tr>
<tr>
<td>Q7. UI is not serious enough to warrant treatment.</td>
<td>2.76 ± 0.83</td>
<td>2.24 ± 0.66</td>
<td>-2.314</td>
</tr>
</tbody>
</table>

* UIAS: urinary incontinence attitude scale.

Table 3 – Changes in UI Attitudes (n = 17).

Table 4 – Satisfaction level with the program (n = 17).

<table>
<thead>
<tr>
<th>SAPS* item (0–4)</th>
<th>Ranking</th>
<th>Comparison with the mean score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Overall satisfaction with the program</td>
<td>3.65 ± 0.70</td>
<td>6</td>
</tr>
<tr>
<td>2. Lecturers' teaching/explanations</td>
<td>3.94 ± 0.24</td>
<td>1</td>
</tr>
<tr>
<td>3. Lecturers' careful listening</td>
<td>3.88 ± 0.33</td>
<td>4</td>
</tr>
<tr>
<td>4. Lecturers' assistance with homework completion</td>
<td>3.82 ± 0.39</td>
<td>5</td>
</tr>
<tr>
<td>5. Felt respected throughout the program</td>
<td>3.94 ± 0.24</td>
<td>1</td>
</tr>
<tr>
<td>6. Satisfied with time spent on the program</td>
<td>3.65 ± 0.70</td>
<td>6</td>
</tr>
<tr>
<td>7. Satisfied with the program content</td>
<td>3.94 ± 0.24</td>
<td>1</td>
</tr>
<tr>
<td>Average of total items combined</td>
<td>3.83 ± 0.25</td>
<td></td>
</tr>
</tbody>
</table>

* SAPS: short assessment patient satisfaction interpreting scores of each SAPS item: 0 (strongly disagree), 1 (disagree), 2 (neither), 3 (agree), 4 (strongly agree).
5. Conclusion

Our pilot study suggests that UI self-management is useful in improving outcomes for older Korean women living in rural communities who have scarce resources for UI management and treatment. The educational program was successfully implemented in a rural community health center, demonstrating how a self-management UI program can be implemented in collaboration with a community agency to improve access to care for hard-to-reach low literacy older adults in rural communities with limited resources. It is feasible to provide an innovative short-term intervention program that could yield a high level of satisfaction among the participants and positive outcomes. Future research is needed to determine if the effects of self-management programs are sustained over the long-term among community-dwelling older women with UI in rural South Korea.

Acknowledgments

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Author contributions: JCD conceived the study, obtained funding, and drafted the manuscript. JCD and AS undertook recruitment of participating a center and patients and managed the data, including quality control. AS provided statistical advice on study design and analyzed the data. BW, MHP, and ESMc participated in the conception of the study design and in the critical review and approval of the final manuscript. JCD takes responsibility for the paper as a whole.

REFERENCES
