

# The Development and Evaluation of an Incontinence Intervention Program for the Elderly Women at Elderly Welfare Center

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**Purpose.** The elderly with UI experienced urine leakage for a long time. The prevalence of UI has increased and it makes costly. Particularly, the elderly were reluctant to visit a hospital or a clinic for the reasons of modesty and poverty. To solve this problem, incontinence intervention programs should be provided at the elderly welfare center. The purpose of this research was to develop Incontinence Intervention Program for the Elderly Women (IPE) and evaluate in its effect.

**Methods.** The study design was quasi-experimental with pre and post-test. The study was performed for ten weeks at one elderly welfare center, Seoul, Korea. The subjects were gathered through an official announcement and informed consent was obtained. IPE, in this study, was consisted of diagnosis, education, exercise and evaluation. The study variables were PFM exercise adherence, pelvic muscle strength, Continence self-efficacy, geriatric depression and incontinence stress. The effects of the IPE on PFM exercise adherence, pelvic muscle strength, Continence self-efficacy, geriatric depression and incontinence stress were also evaluated.

**Results.** The mean age of the subjects was 75.2 years. The average attendance was 6.2 times. The IPE improved PFM exercise adherence, intra-vaginal contraction power and CSE significantly. But it was not significant in incontinence stress and geriatric depression. Other important results were that the two-finger test and urine stream interruption were more useful for elderly women with rigid vaginas in teaching and evaluating.

**Conclusion.** The Findings suggest that IPE is effective to the community-residing elderly. Further investigation is needed on a long-term basis with control group.

**Key Words:** Incontinence, Aged, PFM exercise, Pelvic muscle strength, Self - efficacy

## INTRODUCTION

Urinary incontinence (UI) is defined as the involuntary leakage of urine (Abrams, Cardozo, Fall, Griffiths, Rosiers, & Ulmstem et al., 2002). These days, UI rate and the costs related UI have been increasing in Korea as well as European countries. UI reportedly affects 15-39% of all community-residing elderly (National

Institute of Health, 1990). In South Korea, the prevalence of UI in the elderly has been reported at 4% in males and 13% in females in one city (Kim, 2002), and 8.2% in males and 27.2% in females over the whole country (Ju & Kim, 2000).

UI can cause physical and psychosocial problems including infection, decubitus ulcers, low self-esteem., and is frequently accompanied by depression, stigmatization, impaired integument commune, and family-caregiver

burnout (National Institute of Health, 1990).

UI depends largely on the underlying causes (Resnick, 1990). Approximately two-thirds of all incontinent individuals suffer from UI, of which the two categories of urge and stress represent 80% of all chronic incontinence in older adults (Herzog & Fultz, 1990; Smith & Newman, 1990). The characteristics of elderly with UI can be summarized as follows. Many elderly have experienced urine leakage for a long time: Kim (2001) reported that in many subjects, urine loss had been present for over 5 years. Moreover, many elderly with UI have one disease at least and take types of medicine. Many elderly with UI also have weakened physical abilities.

Though effective methods to manage UI, a few trials have attempted to solve UI in the elderly. Some researchers have considered exercising the pelvic floor muscles (PFMs) as the most recommendable treatment for the elderly (McCormick, Scheve, & Leahy, 1988). Nursing interventions using PFM exercises result in both clinically and statistically significant decreases in urinary incontinence among the elderly (Flynn, Cell, & Luisi, 1994).

Some elderly suffering from urge incontinence prefer pelvic muscle exercises to bladder training as the behavioral intervention of choice (Agency for Health Care Policy and Research, 1992).

Then, PFM exercise is certainly often effective in the management of incontinence, but not all subjects benefit from it. Some elderly people are unable to perform PFM exercises due to disease or weak physical abilities. Moreover, subjects that have experienced leakage of urine for a long time may disregard their symptoms. Therefore, incontinence-intervention programs need to be developed for the elderly whilst considering the above physical characteristics, as well as psychological factors such as why some elderly do not seek medical help and do not take the treatment, and why others who have visited a clinic for further medical help even when their symptoms do not change.

And we used urine-stream-interruption test (UST) had developed to assess the effectiveness of the PFM in impeding urine flow (Sampselle & DeLancey, 1992). In their research, stronger pelvic muscle strength was correlated with more rapid interruption of the stream of urine. Their results are considered applicable to the elderly as guidance for future development.

Another important factor is the subject's will. Since

one-time practicing is much easier than keeping to an exercise program lasting for 8 or more weeks. PFM exercise was reported as effective, but long-term adherence to it received little attention. Kim (2001) insisted that a continence efficacy intervention program (CEIP) was effective for incontinent women.

However, CEIP focused to increase self-efficacy to do a PFM exercise and didn't guide for the elderly to do a PEM exercise and it didn't consider the limited physical abilities of the elderly. Physical fitness was considered the most important factor since it was crucial to be able to repetitively contract and relax the PFM. In this meaning, IIPE stressed subjects' perception of PFM by vaginal palpation and promotion of subjects' physical ability.

Other factors that needed to be considered were the reluctance of Korean elderly women to visit a hospital or a clinic for reasons of modesty (i.e., they did not want anyone to examine their perineum), and these subjects often regard UI as attributable to their age and hence untreatable.

Therefore, the IIPE needs to address these factors, and make the elderly effective in their own symptom management in the community by being implemented at the level of elderly welfare centers.

### *Purpose of the study*

The purpose of this research was to develop and evaluate IIPE (incontinence intervention program for the elderly) on PFM exercise adherence and Pelvic muscle strength. The effects of the IIPE on CSE (continence Self-efficacy), geriatric depression, and incontinence stress were also measured.

## METHODS

A weekly intervention was performed to develop the IIPE and Pretest-post test design was applied to evaluate its effect on physical and psychological aspects.

### *Study Design*

This study was an one-group pretest-post-test design and conducted for 10 weeks from August 25 to October 31, 2002, at Elderly Welfare Center, Seoul, Korea. Figure 1 depicts the flow of this study. Social workers at the welfare center gathered the subjects through an official announcement, and informed consent was obtained at the first meeting day. One researcher ran the IIPE, and observed the changes and barriers.

**Sample**

This study considered the characteristics of both incontinent and continent community-residing elderly, since continent elderly women may become incontinent at any time due to the weakness of their pelvic muscles. An elderly welfare center was considered appropriate for obtaining the data. Subjects were assembled by official announcement. The 30 individuals who agreed to participate became the subjects at this time, regardless of their continence status, and all were aged 60 years or over. Every week one nurse and one social worker helped in

the study.

***Incontinence Intervention Program for the Elderly (IIFE)***

This 10-week program comprised of a weekly assessment, instruction in physical activity, instruction in PFM exercise by verbal guide and vaginal palpation, instruction in PFM exercise by audiovisual tape, promotion of bowel regularity, diet and hydration counseling, and instruction on urine-stream interruption. The weekly program flow is specified in Table 1.

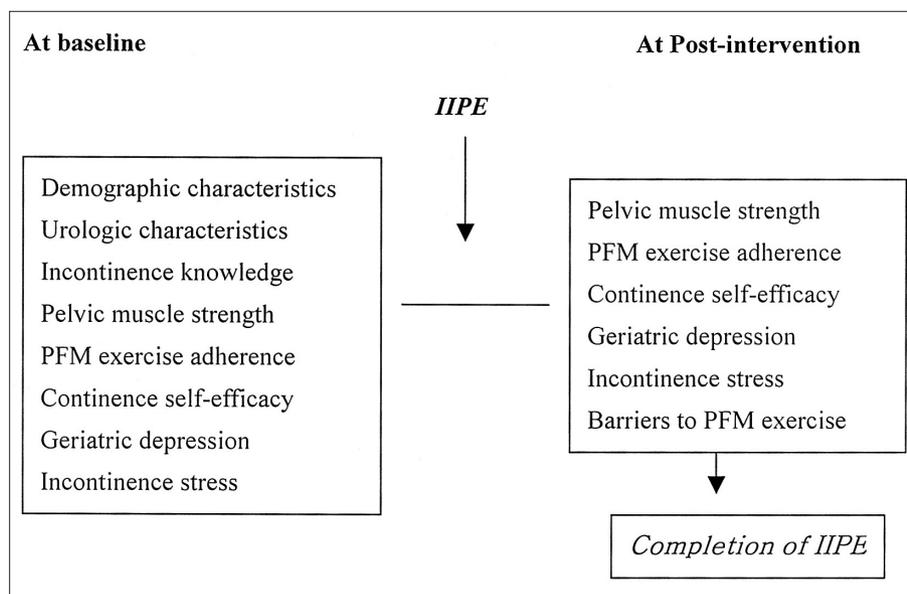


Figure 1. Research flow.

Table 1. Weekly Program Flow

1 <sup>st</sup> week: diagnostic stage
Pad test
Cystocele or rectocele, leakage (stress) test, two-finger test and vaginal palpation
Physical fitness and instruction on PFM exercise for incontinence by audio-visual tape*
2 <sup>nd</sup> week: specific education contents
Education with pamphlet (including consuming at least 1000 ml of fluid per day, constipation prevention by consuming vegetables and fruits, calorie intake management. ex; candy, coke, cookie, fruits, etc).
Physical fitness and instruction on PFM exercise for incontinence by audiovisual tape
Homework: bladder training, 100-times repetition of PFM exercise for 10 minutes each week.
3 <sup>rd</sup> -9 <sup>th</sup> week: exercise
Physical fitness and instruction on PFM exercise for incontinence by audio-visual tape
Counseling on last week's homework accomplishment (ex; exercise frequency, good positioning to do, and diet) and looking out PFM exercise adherence barriers.
10 <sup>th</sup> week
Physical fitness and instruction on PFM exercise for incontinence by audio-visual tape
Evaluation IIFE

\*The tape was revised from one designed for middle-aged woman with incontinence by J.I. Kim: comprising explanation for 5 minutes, physical fitness for 5 minutes, and 13 sets of PFM exercise and cooling down during traditional Korean music, with the actions based on the tape for general people by JCAS (Japan Continence Action Society) (each set of PFM exercise comprised four quick contractions and four a long-lasting contraction for 10 seconds).

### Survey Instruments

To describe the interacting factors, a questionnaire was used that consisted of general characteristics, urologic characteristics, incontinence knowledge, PFM exercise adherence, Continence Self-efficacy, geriatric depression, and incontinence stress. Grasping power was measured in order to quantify the physical ability. Incontinence knowledge was evaluated by a 10-item check-list. A higher score indicated a greater level of knowledge.

#### 1) PFM Exercise Adherence

PFM exercise adherence was evaluated using a five-item questionnaire with each item scored from 0 to 10 developed by Kim (2001). The items were bladder training, sufficient fluid intake, diet to prevent an increase in weight, diet to prevent constipation, and continuity of PFM exercise. To check for barriers to PFM exercise adherence, every week each subject was interviewed personally using a record sheet.

#### 2) Pelvic muscle strength

Pelvic muscle strength was measured by perineometry (Peritron) and the two-finger test. The two-finger test was performed by a researcher and evaluated as '0: no response, 1: feathery, 2: weak, 3: moderate 4: good, 5: strong' by Oxford grading system (Hughes, Jackson, Smith & Abrams, 2001). But the data using perineometry were not analyzed, since many of the subject complained of pain or discomfort during this procedure.

#### 3) Psychological Variables

Continence Self-Efficacy was measured by CSES (CSES means the scale to evaluate the confidence of the subject toward urinary continence) with a higher score indicating a higher CSE developed by Kim & Kanagawa (1998). Depression was measured by 15-item of Geriatric Depression Scale (GDS). Incontinence stress was measured using the Incontinence Stress Index (ISI) (Yu, 1987). These scales were translated and tested and the reliabilities for three instruments with Cronbach's alpha in this study were CSES, 0.895; ISI, 0.902; and GDS, 0.846, respectively.

### Statistical Methods

Descriptive statistics were used to quantify the demographic characteristics and urinary symptoms, and paired t-tests were used to evaluate the IIPE effects.

## RESULTS

### Characteristics of Subjects

The average attendance and practice rates were 6.2 and 4.2 times during the 10-week program, respectively. The mean age of the subjects was 75.2 years. Mean parity to deliver a baby was 5.33 times. The mean grasping power of the right hand was 35.07. Comorbidity of disease was 3.57 and symptoms for the previous 1 month was 2.72. The mean score for incontinence knowledge was 6.47. The provoking number of voiding leakage was 2.87 (Table 2). Twenty-six of the subjects were incontinent, of which 10 experienced UI at least once per day and 16 experienced it at least once per week. In terms of the degree of incontinence, 18 subjects were classified as mild and 8 were classified as severe. Fourteen subjects had a rectocele or a cystocele. Many of them have urinary frequency, 4 in the daytime and 15 in the nighttime.

### Weekly Interview and Evaluation

Questions such as the following were asked during the weekly evaluation: "Can you understand the position of the pelvic muscle?" "Can you feel the pelvic muscle when exercising?" "How many times have you performed PFM exercise?" "How long can you endure after feeling the need to void?" "What makes you not exercise?" "Which position is most efficient for you to perform exercise?"

The results were as follows: The position of the pelvic muscle needed to be explained once only. But to feel the pelvic muscle during exercise required 2-4 weeks of exercise, and to feel it directly it was useful to use "touch method inside the vagina". The most frequent reason for not performing PFM exercise was forgetting to do so;

Table 2. Characteristics of Subjects (n = 30)

Item	Min	Max	Mean	SD
Age	63	89	75.23	6.36
Parity	1	9	5.33	2.40
BMI	19	32	25.05	3.53
Height	138	158	147.71	5.04
Weight	40	74	55.74	7.89
Grasping power	5	70	35.07	18.39
No. of diseases	1	6	3.57	1.48
No. of symptoms	0	9	5.17	2.72
Incontinence knowledge	0	10	6.47	2.32
Provoking no.	0	8	2.87	2.52

they wanted “someone to remind them”.

Therefore, to perform PFM exercise 5–10 times a day is thought to be sufficient for the elderly. The optimal exercise position varied between subjects. Example subject evaluations are as follows: “I became self-confident”, “I knew the exercise method”, “I could interrupt urination during voiding”, “I want to buy the video tape”, “I have some disability in my leg”, and “If somebody let me know the time to do exercise, I will do them”.

Therefore it appears that this program could be performed successfully at the level of a welfare center for the elderly. However, since many sufferers of UI have a high nocturnal frequency, the program should also be planned and provided as a nocturnal program.

### *IIPE Evaluation*

Nine subjects dropped out by the reason of moving of home, sickness or dining room service, etc. The evaluation was performed in 21 persons on the day of the post-IIPE assessment. The pre and post-test was only in 21 subjects, PFM exercise adherence was increased after program ( $t=-5.88$ ,  $p=0.004$ ). Pelvic muscle strength (as measured by the two-finger test) was also significantly increased ( $t=-4.776$ ,  $p=0.00$ ). Among the psychological variables, only CSE was improved significantly after IIPE ( $t=-3.206$ ,  $p=0.05$ ), but GDS and incontinence stress was not changed significantly in Table 3.

## DISCUSSION

This study evaluated the IIPE by questionnaire and interview of elderly subjects (both continent and incontinent) attending a welfare center for the elderly in Seoul. The effects of PFM exercise are well known, and the exercise method is simple. However, maintaining the exercise is not so simple, especially for the elderly since they often attribute urinary incontinence to their age and physical condition (Mariann Goldstein, 1992), and are less willing to perform PFM exercise.

Recently a low-intensity behavioral treatment program

has been reported to be effective for older women (Subak, Quesenberry, Posner, Cattolica, and Soghikian, 2002). That 6-week program provided bladder training and individualized schedules. Moreover, Kincade, Peckous, and Busby-Whitehead (2001) insisted that the only significant predictor of treatment completion in one outpatient clinic for UI was keeping a 7-day bladder diary. However, this method may not be directly applicable to the elderly in Korea, because many of them are not literate, though total literacy rate is 97.2% and they may prefer to attend a course involving various activities rather than only a single activity. However, the inclusion of bladder training in any UI program may be a good idea since many elderly women have urinary frequency.

McCormick, Scheve, and Leahy (1988) stated that PFM exercise was the best activity for elderly with UI. Various methods are used in PFM exercise: one is to use a quick contraction and maintain this for a few seconds (Kimberly-Clark, 1991); another is to keep contraction for 3–10 second (McCormick, Scheve, & Leahy, 1988). The recommended frequencies of PFM exercise vary from 30 to 150.

Another method is to use biofeedback and oral teaching (Burgio, Ronbinson & Engel 1986). Biofeedback has been found to be more effective, and visual feedback was more efficient than oral teaching (Montgomery & Shepherd, 1983). Our IIPE was composed of PFM exercises mostly with four quick contractions and four a long-lasting contraction for 10 seconds. The evaluation of elderly women whilst performing PFM exercise was also found helpful for controlling their symptoms.

In this study, the use of UST was an effective to allow subject to evaluate their accomplishment: e.g., “I could stop in the stream of urine, though I couldn’t do at first”. The results were consented that Sampselles and DeLancey (1992) found that stronger pelvic muscles were correlated with more rapid interruption of the stream of urine. It can be used for both routine clinical use and as an outcome measure for women who undergo rehabilitation treatment (Sartore, Pregazzi, Bortoli, Grimaldi, Ricci, & Guaschino, 2002).

The method that is both useful and applicable for the elderly without reluctance needs to be considered. Also it must be remembered that the elderly dislike the perineal examinations, and the rigidity of the vaginal canal caused pain during insertion of intravaginal perineometry. In this point, the two-finger test was more acceptable because it allowed accurate determination of the posi-

Table 3. Comparison of Variables at Pre- and Post-IIPE (n=21)

Variable	Pre-IIPE	Post-IIPE	t value	p value
PFM adherence	23.5	45.5	-5.880	0.004
Pelvic muscle strength	1.56	2.61	-4.776	0.000
Continence self-efficacy	85.95	109.4	-3.206	0.005
Incontinence stress	26.8	25.3	-0.85	0.409
Geriatric depression	7.0	6.7	0.27	0.790

tion of the PFM and evaluation of improvement.

Compliance was thought to be a very important factor in the effectiveness of an UI program. On this point, Reuben, Frank, Hirsch, McGuigan, and Maly (1999) insisted that a comprehensive geriatric assessment with adherence interventions could prevent functional and health-related decline in the quality of life among older persons who have specific geriatric conditions.

Among psychological variables assessed in the present study, only CSE improved; whereas in another research, incontinence stress and depression were decreased significantly (Kim, 2001). This difference may be due to the intervention period and needs to be studied on a long-term basis with control group.

Audiovisual education is considered to be adjusted to the needs of the elderly. The audiovisual tape used here was evaluated as useful, which could be attributed the explanation of the cooling-down period and the rhythm under traditional Korean music. Also, exercise performed whilst watching a video over a 10-week program will be useful to elderly with recent memory difficulties.

In this study the IPE was provided for 10 weeks, it was effective in increasing pelvic floor muscle strength, PFM adherence and continence self-efficacy. Also the weekly assessment and interview was useful for identifying factors to improve adherence to the PFM exercise by individuals. But it was not effective in decreasing incontinence stress and geriatric depression. Because this study design was one group pretest-post test, it has some limitation. That is, though the integrate program out of the previous researches was effective for the elderly, it needed to be done further study with control group.

Lastly, nurses are in a key position to identify and treat urinary incontinence among the elderly, and should incorporate continence-restoration interventions into their practice (Flynn, Cell, & Luisi, 1994). We suggest nurses at elderly welfare centers learn about IPE and apply it to the elderly so that they may maintain their physical fitness and urinary continence. In conclusion, the IPE may helpful and easily applicable to the senior facilities.

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