

Predictors of intention to adhere to physiotherapy among women with urinary incontinence

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Abstract

During the last decade, pelvic floor muscle exercise (PFME) therapy has proved its short-term efficacy among women with urinary incontinence. Long-term success with PFME therapy is hampered by non-adherence. So far, specific knowledge on determinants of adherence behavior has been scarce. A cross-sectional study was conducted to elucidate the relative importance of determinants of the intention to adhere to PFME therapy in women with urinary incontinence. Based on behavioral theories, literature research and interviews, a questionnaire measuring determinants of the intention to adhere to PFME therapy was developed. In total, 129 women, aged 17 years or over, with symptoms of urinary incontinence, completed this questionnaire. Multiple regression analysis with backward elimination was carried out to identify determinants that predict intention. Significant predictors of the intention to adhere to PFME therapy were the amount of urinary loss per wet episode and women's perception of their ability to do the exercises as recommended under various circumstances. Building self-efficacy might be a good starting point for health education interventions aiming to promote adherence to PFME therapy, which can be used by physiotherapists and general practitioners.

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Introduction

Urinary incontinence is defined as the involuntary loss of urine, which is objectively demonstrable, with such a degree of severity that it is a social and/or hygienic problem (Abrams *et al.*, 1988). Approximately 15% of the adult population in the US and 7% in The Netherlands are affected, of whom 75% are women (Berghmans *et al.*, 1998a). Stress, urge and mixed urinary incontinence are the most frequently diagnosed types of urinary incontinence (Jolleys, 1988; Lagro-Janssen, 1991). A safe and non-invasive treatment for women with these incontinence types is physiotherapeutic pelvic floor muscle exercise (PFME) therapy (Klarskov *et al.*, 1986; Blowman *et al.*, 1991; Wall and Davidson, 1992).

During the last decade, PFME therapy has proved its efficacy among female patients in short-term studies (up to 6 months follow-up) (Castleden *et al.*, 1984; Burgio *et al.*, 1986; Klarskov *et al.*, 1986; Bø *et al.*, 1990; Burns *et al.*, 1990; Wells *et al.*, 1991; Lagro-Janssen *et al.*, 1994; Berghmans *et al.*, 1996; Nygaard *et al.*, 1996). However, little is known about long-term results of PFME therapy. Three studies have reported 1-year follow-up results of PFME therapy (Ferguson *et al.*, 1990; Mouritsen *et al.*, 1991; Lagro-Janssen *et al.*, 1992), three other studies followed their participants up to 5 years after therapy (Cammu and Van Nylen, 1994; Bø and Talseth, 1996; Lagro-Janssen and Van Weel, 1998) and one study followed them up to 7 years (Hahn *et al.*, 1993). The lowest success rates found were the result of practicing alone at home or with a minimum of guidance, whereas

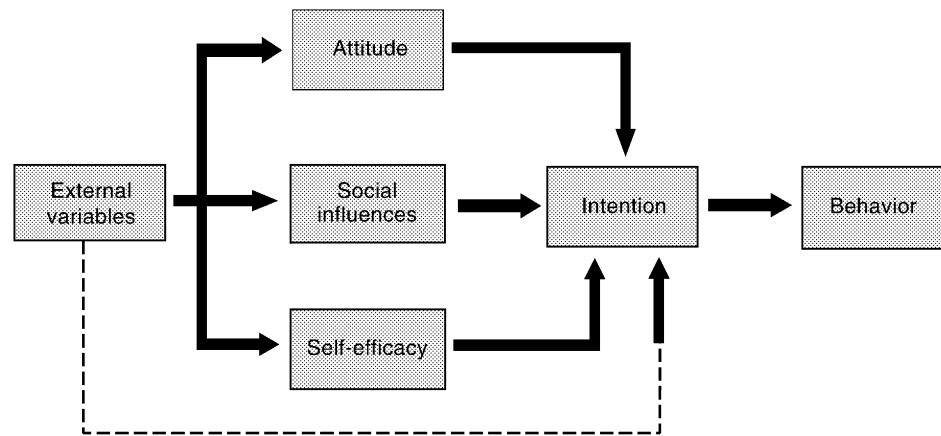


Fig. 1. The ASE model of behavioral determinants. The dotted line between external variables and intention indicates a possible direct influence of external variables on intention.

the highest success rates were the result of frequent and intensive training guided by a physiotherapist.

In general, the results of the studies above showed that success rates declined during the follow-up period. Lack of motivation and non-adherence to continuous exercise were important causes of this decline. How better adherence to PFME therapy can be achieved needs further study. In the present study we wanted to elucidate the relative importance of determinants of adherence to PFME therapy among women with urinary incontinence.

How to analyze determinants of adherence behavior?

To analyze determinants of adherence, the social psychological Attitude–Social influence–self-Efficacy (ASE) model was applied (De Vries and Backbier, 1994). According to this model, behavioral change is best predicted by someone's intention to perform that behavior. The ASE model assumes that behavioral intention is determined by three types of cognitive factors: attitudes, social influences and self-efficacy expectations. External variables such as socio-demographic, psycho-social and medical variables are expected to influence behavioral intention through the cognitive ASE variables (see Figure 1) (De Vries and Mudde, 1998; Lechner, 1998).

The ASE model, which includes attitudes and social norms, has been influenced by the Theory of Planned Behavior (TPB) (Ajzen, 1991) and Bandura's concept of self-efficacy (Bandura, 1986), a construct derived from the Social Learning Theory (SLT). The TPB and the ASE model partly overlap with respect to the concepts that are integrated but differ in the way these concepts are measured (De Vries and Mudde, 1998). Besides social norms, the ASE model also includes the influence of modeling and social pressure/support (De Vries and Backbier, 1994).

Thus, according to the ASE model, the key to changing adherence to PFME therapy is to analyze determinants of the intention to adhere. Knowing what determinants influence this particular intention could help health care providers such as general practitioners (GPs), urologists and gynecologists to motivate women for PFME therapy or to identify patients who are in need of extra counseling. Furthermore, physiotherapists can use this information to optimize short-term success rates of PFME therapy as well as to achieve long-term behavioral maintenance.

Although no reports on model-based analysis of determinants of the intention to adhere to PFME therapy can be found in the literature, several authors have suggested variables that might influence the adherence to PFME therapy. Variables

affecting adherence are: difficulties remembering to do the exercises (Gallo and Staskin, 1997), lack of discipline and motivation, going through emotional periods or being busy with work and childcare (Hahn *et al.*, 1993; Lagro-Janssen *et al.*, 1994), unfamiliarity with or feeling uncomfortable with one's pelvic floor because of the social taboos on continence and sexuality (Ashworth and Hagan, 1993; Janetzsky, 1993), or because of experiences with sexual violence (Janetzsky, 1993). In contrast, feelings of shame and experienced burden of incontinence symptoms were found to stimulate adherence to PFME therapy (Burns *et al.*, 1993; Lagro-Janssen *et al.*, 1994).

This paper presents cross-sectional results regarding cognitive ASE and external determinants of the intention to adhere to PFME therapy among women with urinary incontinence. Data were obtained as pre-test of a behavioral intervention study to promote adherence to PFME therapy.

Method

Pre-test questionnaire

The questionnaire was developed on the basis of a qualitative needs assessment. An extensive literature search identified important ASE and external determinants of the intention to adhere to PFME therapy. Furthermore, salient beliefs were identified through tape-recorded interviews: 15 individual and one focus group with six women with and without PFME therapy experience, and one focus group with seven female physiotherapists specialized in PFME therapy and working in Maastricht and the surroundings (Assema *et al.*, 1992; Morgan and Krueger, 1998).

The needs assessment revealed many aspects of ASE and external determinants which were translated into measurable concepts. Available scales were used as well. The questionnaire was pilot-tested for readability, comprehensibility and credibility among 25 women doing PFME therapy. Screening of the subscales of the questionnaire with factor analysis using principal component analysis confirmed that all subscales constituted a

coherent set of items. The validity of the subscales was checked with Cronbach's α values, using the standardized item α values (Tabachnick and Fidell, 1996). The content of the questionnaire is described below and in Table I.

Intention and cognitive ASE determinants

The items 'Do you intend to adhere to the exercise advice of your physiotherapist?' and 'Do you intend to exercise every day?' measured *intention* on seven-point scales (certainly not–yes, certainly; 1–7). The two items were summed to form one scale of intention ($r = 0.56$).

Two scales were developed for *attitude*. The *pros* scale referred to what women might expect to gain by adhering to PFME therapy. These expectations were assessed on seven-point scales. For example: 'If I do pelvic floor muscle exercise therapy, I will feel very much–totally not content about myself' (7–1). The *cons* scale referred to the negative consequences of adherence to PFME therapy and was assessed on five-point scales. For example: 'If I do pelvic floor muscle exercise therapy, I will become very tired–I don't know–not tired' (5–1).

Social influence was measured with the concepts of social norms, modeling, social support and social pressure. Social norms were measured on seven-point scales by six items assessing the normative beliefs of important persons. For example: 'My friends think I should do the recommended exercises'; 'I totally agree–I totally disagree' (7–1). The items were summed to form one sumscore. *Modeling* was assessed by one item containing 10 categories forming one index score (yes/no; 0–10), measuring how many other women with PFME therapy experience the respondents knew, such as their mother, sister or neighbor. The two items assessing *social support* asked with how many other persons women discussed their incontinence and PFME therapy ($r = 0.85$). The two items were summed to form one index score (yes/no; 0–35). *Social pressure* was measured by one item asking 'Has anyone ever put pressure on you not to perform the recommended pelvic floor muscle exercises?'. Because only two respondents had

Table I. Construct, number of items, Cronbach's standardized item α , mean (SD) scale scores, item range and mean item scores of the cognitive ASE and external determinants and intention to adhere to PFME therapy

| Construct, no. of items (<i>n</i>) | Cronbach's α of scale | Mean (SD) scale score | Item range | Mean (median) item score |
|---|------------------------------|-----------------------|------------|--------------------------|
| Intention, 2 (<i>n</i> = 124) | | 12.8 (1.5) | 1–7 | 6.4 (6.5) |
| Attitude | | | | |
| pros, 8 (<i>n</i> = 127) | 0.83 | 41.4 (5.3) | 1–7 | 4.6 (4.7) |
| cons, 5 (<i>n</i> = 128) | 0.55 | 11.0 (2.6) | 1–5 | 2.8 (2.7) |
| Social influence | | | | |
| social norms, 6 (<i>n</i> = 128) | | 32.6 (5.0) | 1–7 | 5.4 (5.3) |
| modeling, 1 (<i>n</i> = 127) | | 0.3 (0.5) | 0–10 | 0.3 (0.0) |
| social support, 2 (<i>n</i> = 125) | | 5.1 (3.5) | 0–17/18 | 2.6 (2.0) |
| Self-efficacy | | | | |
| abilities, 9 (<i>n</i> = 126) | 0.78 | 40.7 (6.4) | 1–7 | 4.5 (4.6) |
| difficulties, 9 (<i>n</i> = 125) | 0.87 | 35.0 (9.0) | 1–7 | 3.9 (3.8) |
| IQOL, 22 (<i>n</i> = 128) | 0.92 | 83.9 (15.8) | 1–5 | 3.8 (3.9) |
| IIQ-7, 7 (<i>n</i> = 129) | 0.79 | 2.2 (2.7) | 0–3 | 0.3 (0.1) |
| Self-esteem, 12 (<i>n</i> = 126) | 0.79 | 60.0 (10.8) | 1–7 | 5.0 (5.0) |
| Body esteem, 13 (<i>n</i> = 126) | 0.84 | 62.2 (12.0) | 1–7 | 4.8 (4.8) |
| VOEG, 13 (<i>n</i> = 129) | | 7.2 (3.2) | 0–13 | 0.6 (0.5) |
| Social desirability, 10 (<i>n</i> = 127) | 0.63 | 80.0 (12.7) | 0–10 | 8.0 (8.0) |

ever experienced any social pressure, this item was excluded from further analysis.

Self-efficacy expectations were measured as both 'difficulties' and 'abilities' on seven-point scales (Bandura, 1997). In the 'abilities' scale, women's expectations of their own ability with respect to the situational demands were measured. For example: 'I certainly can–cannot do PFM exercises when I am very busy' (7–1). The 'difficulties' scale referred to the expectations of their own skills regarding adherence to PFME therapy: 'Reminding myself every day to do PFM exercises is very easy–very difficult' (7–1).

External variables

An objective assessment of incontinence symptoms involved three questions regarding the frequency and amount of wet episodes, and the use of protective garments, based on the PRAFAB score (Vierhout, 1990). These three aspects were noted in a 7-day diary as well (Lagro-Janssen *et al.*, 1992). Another two items measured the duration of symptoms and the type of urinary incontinence. Subjective severity of incontinence symptoms was

measured by the Incontinence Quality of Life scale (IQOL) (Wagner *et al.*, 1996) and the Incontinence Impact Questionnaire (IIQ-7) (Uebersax *et al.*, 1995; Lagro-Janssen and Moonen, 1997). Higher IQOL scores mean a better quality of life in relation to incontinence symptoms, whereas higher IIQ-7 scores mean experiencing a higher impact of symptoms in daily life.

Self-esteem was measured using 12 items of one seven-point subscale of Bekker's Autonomy Questionnaire (Bekker, 1993). The subscale consisted of statements like 'I usually know quite well what I like best' (totally agree–totally disagree; 7–1). For the concept of *body esteem*, no existing scale suitable for women with urinary incontinence was available, so a scale was developed based on the interviews and literature (Franzoi and Shield, 1984; Franzoi, 1994). A pilot-test was conducted among 15 male and 15 female university staff. Body esteem was assessed by items on seven-point scales using statements like 'I feel ashamed about my body' (totally agree–totally disagree; 1–7). *Sexual abuse* was assessed by asking: 'Do you have any experience of sexual harassment, rape or

incest before the age of 18' and a similar question focussing on the period after the age of 18.

The *subjective general health* of the women was assessed with the abbreviated 13-item 'Inventory of Subjective Health' (VOEG) (Sikkel, 1980) and two items of the Dutch National Health Survey (Van den Berg, 1992). The 13 items about chronic physical complaints, such as headache, back pain and tiredness, were summed to form one index score (0–13). Furthermore, we assessed *morbidity, use of medication, use of health care resources* and previous experience with PFME therapy.

Social desirability was assessed using the Social Desirability scale (Visser and Breemhaar, 1989). Items such as 'If I make a mistake, I will always be prepared to admit it', were measured on a VAS scale (true/false, 0–10), and summed to form an index score ranging from 0 to 100. To assess *socio-demographic variables*, questions were asked about age, education level, insurance status, having a partner, number of children, and hours per week spent on (paid) labour, housekeeping, care for relatives or other persons, physical and other leisure activities.

Recruitment

The study was approved by both the Medical Ethical Committee of Maastricht University and the Maastricht University Hospital, and the Review Committee of the Registration Network Family Practices (RNH). The RNH consists of 23 general practices with 55 GPs, covering a population of around 100 000, whose data on relevant chronic health problems and demographic variables are registered (Metsemakers *et al.*, 1992). The database was used as a sampling frame. We chose not to select on urinary incontinence as most women do not seek help for this problem and thus this is not a common registered health problem in the database. Therefore, women over 17 years with the following risk factors for urinary incontinence were selected: vaginal delivery, medical history of gynecological operations, asthma, arthritis and obesitas (Yarnell *et al.*, 1982; Diokno *et al.*, 1990; Snooks *et al.*, 1990; Lagro-Janssen, 1991; Milson *et al.*, 1993; Weijts *et al.*, in preparation). Women

were recruited from the RNH in two phases. Participants were informed about the study design and were asked to confirm their agreement with the terms of the study.

In the first phase, in June 1995, nine general practices participated in the recruitment. Through their GP, 2914 women received a short recruitment questionnaire accompanied by a letter explaining that the data to be collected would be used in a study on the prevalence of urinary incontinence among women with risk factors for this condition. The recruitment questionnaire consisted of items on risk factors for urinary incontinence, continence status, quality of life according to continence status and use of health care resources for urinary incontinence (Weijts *et al.*, in preparation). Women reporting urinary incontinence could fill in their names and addresses if they were interested in individual PFME therapy and participation in the behavioral intervention study.

In January 1998, 198 of the initial interested women ($n = 320$) still wanted to participate. A second similar recruitment phase was then started, in which 1341 women were selected from the databases of four other general practices. This phase resulted in 166 women who were willing to participate. Finally, a recruitment poster in the waiting room of the 13 participating general practices resulted in an additional 12 women. From January to October 1998, these 376 women received a letter from the researcher explaining that participation in the behavioral intervention study involved engaging in individual PFME therapy with a female physiotherapist and completing four questionnaires. The letter asked the women to make an appointment with their GP. After this letter 180 women were still prepared to participate.

The GP checked the women on the inclusion and exclusion criteria for the behavioral intervention study. Inclusion criteria were: ability to fill out questionnaires and full understanding of the Dutch language. Excluded from the study were women without symptoms of stress, urge or mixed urinary incontinence ($n = 11$), women suffering from neurological conditions such as MS, CVA and spina bifida or suffering from venereal disease

($n = 5$), women with viral infections ($n = 4$), women using medication for urinary incontinence or using medication that enhances/influences urinary incontinence ($n = 1$), women who were pregnant or within 3 months after delivery, women who had been operated upon for urinary incontinence ($n = 20$), women with physical impairments making PFME therapy impossible ($n = 6$), and women who failed to complete the consent form. Women with urinary tract infection were treated and included when cured.

Altogether, 47 women were excluded from the study. The remaining 133 participants received the pre-test questionnaire from the GP's assistant. Four women declined to complete the questionnaire, leaving 129 women whose questionnaires were used in the present study's analyses.

Statistical analyses

Statistical analyses were performed using SPSS version 7.5. Multiple linear regression analysis with backward elimination was used to determine the significant predictors of the intention to adhere to PFME therapy. For this purpose, two-tailed tests on Pearson correlation coefficient were used to check the relation of the continuous variables with intention. Two-tailed tests on Spearman correlation coefficient were used for the ordinal variables, while independent samples *t*-tests were used to reveal the relation between intention and the dichotomous variables. The external determinants that correlated significantly with intention were entered into the regression equation, together with the ASE variables. Furthermore, independent samples *t*-tests were used to check for differences in scores between the two recruitment phases. Recruitment phase was used as an independent variable in the regression analyses as a possible confounder. One by one, variables with the lowest standardized regression coefficient were eliminated from the equation using a removal *P* value of 0.05. We used adjusted R^2 to describe the explained variance of intention rather than R^2 , as adjusted R^2 corrects for both the number of independent variables used in the first regression equation ($n = 12$) and for the number of observations ($n = 129$).

Results

Differences between women from the two recruitment phases

Independent samples *t*-tests were used to check for differences between the participants from the two recruitment phases. Women from the first recruitment phase spent more hours taking care of others ($P < 0.05$), engaging in sports activities ($P < 0.05$) and following courses ($P < 0.01$), and they had fewer physical complaints ($P < 0.001$), a more positive body esteem ($P < 0.05$) and a slightly more negative attitude ($P < 0.05$) towards adherence to PFME therapy, than women from the second recruitment phase. Women recruited in phase I or II did not differ in their intention to adhere to PFME therapy.

Non-response analysis

Of the women who responded to the recruitment and who reported having symptoms of urinary incontinence but who declined to participate in the study, reasons for non-participation were collected in two ways. First, the replies in the recruitment questionnaire to the question 'If you don't want to start PFME therapy and be involved in the study, would you write down the reason why?' were summarized. Second, we telephoned the 196 women who wanted to participate but declined after receiving the letter about the start of the study, asking if they would tell us their reasons. These 526 women mentioned a total of 659 reasons for non-participation. The most frequently mentioned reason (246 times; 37%) was that their symptoms were minor or that they were not sufficiently bothered by their wet episodes to start PFME therapy. Other frequently mentioned reasons were: having other more severe health problems (94 times; 14%), having done PFME therapy (with or without a physiotherapist) or having been operated upon for incontinence (82 times; 12%), being too busy with work and/or caring for relatives (63 times; 10%), or no longer having symptoms of urinary incontinence but being only interested in getting information about urinary incontinence (30 times; 5%). Less frequently mentioned reasons

Table II. *Characteristics of the study population (n = 129)*

| Characteristics of study population | No of women | Percentage of population | Mean (SD) |
|--|-------------|--------------------------|-------------|
| Socio-demographic variables | | | |
| age | 129 | | 55.4 (10.8) |
| having a partner | 107 | 82.9 | |
| having children | 118 | 91.5 | |
| no. of children | 118 | | 2.3 (1.1) |
| having a paid job | 45 | 34.9 | |
| hours paid labor per week | 45 | | 22.1 (11.3) |
| education level | 127 | | |
| low ^a | 96 | 75.7 | |
| medium ^b | 16 | 12.6 | |
| high ^c | 15 | 11.8 | |
| recruitment phase 1995 | 69 | 53.5 | |
| recruitment phase 1998 | 60 | 46.5 | |
| Severity and type of incontinence | | | |
| frequency of wet episodes per week (7-day diary) | 127 | | 23.3 (23.6) |
| frequency of wet episodes | | | |
| maximum once per week | 27 | 20.9 | |
| 2–7 times per week | 54 | 41.9 | |
| several times a day | 48 | 37.2 | |
| amount of urinary loss | | | |
| droplets | 21 | 16.3 | |
| droplets and dashes | 76 | 58.9 | |
| dashes | 23 | 17.8 | |
| dashes and whole bladders | 8 | 6.2 | |
| whole bladders | 1 | 0.8 | |
| duration of symptoms (years) | 127 | | 7.2 (6.7) |
| less than 2 years | 11 | 8.7 | |
| 2–7 years | 74 | 58.2 | |
| over 7 years | 42 | 33.0 | |
| score on IQOL | 128 | | 83.9 (15.8) |
| score on IIQ-7 | 129 | | 2.2 (2.7) |
| type of incontinence | | | |
| stress | 50 | 38.8 | |
| urge | 16 | 12.4 | |
| mixed | 63 | 48.8 | |

^aLow education level: completed primary school and vocational school.

^bMedium education level: completed secondary (vocational) school.

^cHigh education level: completed the highest level of secondary (vocational) school or university.

were: no interest in participation in a study, being afraid of vaginal palpation by the GP, feeling ashamed, being satisfied with the use of protective garments or medication, feeling too old to engage in PFME therapy, having no means of transport to the physiotherapist, or loss of mental capacity. Fifteen women had moved to another city or had died between recruitment and the start of the study.

External determinants

Socio-demographic characteristics as well as the objective and subjective severity of incontinence symptoms of the 129 participants are presented in Table II. The youngest woman in the study was 27, the oldest 82. Of the 45 women with a job, 40% worked more than 3 days per week. Three in four women were insured under the Social Health

Insurance scheme, while the other women had private health insurance. Forty-five percent of the women were taking courses or engaged in leisure activities such as voluntary work, club work or sports. One in three women had children living at home. Nearly all women (94.5%) were taking care of the household for on average 3.8 h/day (SD 2.2), while 77.8% of the partners did so, spending a mean of 1.3 h/day (SD 1.5). Some women (11.7%) cared for ill relatives or friends for on average 0.9 h/week (SD 3.2). Experiences of sexual violence in the youth and adult life were reported by 22 (17.1%) and 16 (12.4%) women, respectively.

Most women reported having symptoms of stress and mixed urinary incontinence of moderate severity for several years. For 76.7% of the women, wet episodes had some negative impact on daily life activities (IIQ-7). The impact of the involuntary wet episodes was most keenly felt on physical activities like swimming, biking, walking and sports activities, with 42.6% experiencing some impact and 17% experiencing considerable impact on these activities. Nearly all the women (97.7%) worried now and then about their incontinence (IQOL). Most important worries were about deterioration of symptoms when growing older (58.9%), possible wet episodes occurring when coughing or laughing (55%) or when feeling a sudden urgency (40%).

Women who had a lower quality of life in relation to incontinence symptoms had more frequent wet episodes ($r = -0.45$, $P < 0.01$) and assessed their health as more negative ($r = 0.26$, $P < 0.01$) than women with higher IQOL scores. For the IIQ-7 these correlations were nearly the same: 0.40 ($P < 0.01$) and -0.29 ($P < 0.01$), respectively. IQOL and IIQ-7 scores did not correlate with the amount of urine lost per wet episode nor with the duration of symptoms.

Subscales of several medical and psycho-social determinants are shown in Table I. Twice as many physical complaints (VOEG) were reported as found among middle-aged healthy women (Joosten and Drop, 1987). Four in five women mentioned having other diseases (mean 1.9; SD 1.9; range 1–12) and three in four women were using drugs

(mean 2.4; SD 2.5; range 1–15). One in three women evaluated their own health status as good, one in four as not so good and two in five as moderate. Mean item scores indicated that most women had a relatively high self-esteem and a slightly positive body esteem.

ASE determinants and intention

Table I presents mean scale scores, item range, mean and median item scores and SD of the ASE determinants and intention to adhere to PFME therapy. Women had a slightly positive attitude (pros) towards the intention to adhere to PFME therapy. At the same time they expected some negative outcomes (cons). The mean item scores indicate that many women did not know what to think. Many women (76.0%) were convinced that significant others would want them to follow the advice of the physiotherapist. Three in four women knew no other women who engaged in PFME therapy, while the other women knew one or two women who used this therapy. Almost all women had discussed their incontinence problem (92.2%) and the PFME therapy (91.5%) with one or more other people, mostly their partners, daughters, female friends, sisters and mothers.

Most women expected that doing the recommended PFM exercises would be neither difficult nor easy. Not going to the toilet each time they felt an urge was expected to be slightly to very difficult by 62.2% of the women, and 56.6% of the women expected to have difficulties relaxing. The participants had slightly positive expectations about doing the PFM exercises every day, as recommended, in various situations such as while working, while taking care of others or when nervous. Most women expected to be able to do the exercises as advised during the weekend (80.3%) or during holidays (64.3%). The mean item score on intention indicated that most participants had a very positive intention to adhere to PFME therapy.

Relative importance of determinants of intention

Of the external variables, four were significant correlates of intention. Two variables dealt with

Table III. Multiple regression analysis with backward elimination with intention as dependent variable and all independent variables entered in first equation; standardized β coefficients, P and explained variance; 95% confidence interval (CI) for final equation

| Variables entered in first equation | β 's in first equation $R^2 = 0.33$ R^2 adjusted = 0.25 | β 's in final equation $R^2 = 0.24$ R^2 adjusted = 0.22 | 95% CI |
|--|---|---|-------------|
| External variables | | | |
| recruitment group | -0.056 | | |
| amount of urinary loss per wet episode | 0.207 ^a | 0.218 ^b | 0.102–0.717 |
| stress incontinence | 0.102 | | |
| hours of paid labor per week | -0.057 | | |
| subjective general health | -0.204 ^a | | |
| ASE variables | | | |
| attitude: pros | 0.034 | | |
| attitude: cons | -0.150 | | |
| social influence | | | |
| social norms | 0.162 | | |
| modeling | 0.151 | | |
| social support | -0.080 | | |
| Self-efficacy | | | |
| abilities | 0.242 ^a | 0.299 ^b | 0.027–0.110 |
| difficulties | 0.173 | 0.211 ^a | 0.005–0.067 |

^a $P < 0.05$.^b $P < 0.01$.

urinary incontinence itself: the amount of urinary loss per wet episode ($r = 0.218$, $P < 0.05$) and stress urinary incontinence ($t = -2.363$, $P < 0.05$). Furthermore, subjective general health ($r = -0.211$, $P < 0.05$) and hours of paid labour per week ($r = -0.190$, $P < 0.05$) correlated significantly with intention. Of the ASE variables, self-efficacy in terms of both 'abilities' ($r = 0.401$, $P < 0.01$) and 'difficulties' ($r = 0.306$, $P < 0.01$), were significantly correlated with intention.

Linear multiple regression analysis with backward elimination was conducted to determine the solely important determinants of intention to adhere to PFME therapy (Table III). The four external determinants that significantly correlated with intention, all the ASE determinants and recruitment group were entered as independent variables. In nine steps, the following variables with the lowest standardized regression coefficient were removed from the regression equation: (1) attitude: pros, (2) hours of paid labour per week, (3) recruitment group, (4) social support, (5) stress incontinence, (6) social norms, (7) attitude: cons, (8) subjective

general health and (9) modeling. Three determinants remained which significantly predicted intention, explaining 22% of the variance in intention. A positive intention to adhere to PFME therapy could be explained by large amounts of urine lost per wet episode and a strong perceived ability to perform all the recommended exercises (difficulties), also in various situations (abilities).

Discussion

The purpose of the present study was to examine the relative importance of determinants of the intention to adhere to PFME therapy among women with symptoms of stress, urge and mixed urinary incontinence. As intention is not behavior itself, results have to be interpreted with caution. However, according to the theory of the ASE model, intention has proved to be the best predictor of actual behavior (Godin and Kok, 1996), which could justify comparison with studies on determinants of adherence and tentative recommendations for practice.

Of the ASE determinants, self-efficacy was the only significant predictor of intention. Positive intentions depended on the women's own perception that they would not only be able to do PFMEs but also to do them under various circumstances, such as when busy, during the weekend or when not feeling well. In studies on determinants of intention of health behavior in general as well as studies on exercise behavior in particular, self-efficacy was found to be an important predictor of intention as well (Kok *et al.*, 1991; Marcus and Owen, 1992; McAuley, 1993; Lechner and De Vries, 1995; Godin and Kok, 1996). Furthermore, self-efficacy has been found to predict adherence to physiotherapeutical exercise therapy (Sluijs and Knibbe, 1991).

A possible explanation for attitude being of no importance to intention might be that the women did not know exactly what PFME therapy involved, as was indicated by the neutral mean item scores. If one does not yet know the exact nature of a recommended behavior, it is probably very hard to evaluate the possible positive and negative outcomes of performing this particular behavior. Another explanation might be that the construct validity of the attitude questions, and especially those of the cons questions, was not optimal. It is suggested that better attitude scales should be developed.

In our study, 92.2% of the women talked about their incontinence and 91.5% about PFME therapy almost exclusively with their partners, daughters, female friends, mothers and sisters. These contacts, however, did not influence their intention. This might be explained by the fact that the women were not yet engaged in PFME therapy when filling in the questionnaire. Thus it is not likely that they were receiving social support for this therapy. Another possibility is that just talking about these topics with other women had the effect of mutual support rather than resulting in social support to promote intention. As only 25.6% of the women knew other women doing PFME therapy, 74.4% had no opportunity to benefit from modeling with respect to PFME therapy, which might explain the modest influence of modeling on intention.

However, it could be argued that modeling did have some modest influence on intention, as it was only eliminated from the regression equation in the last step. Godin and Kok (Godin and Kok, 1996) argue that there is a consistent, though small, contribution of social norms to intention and that modeling might be a better predictor of intention.

Although the theory of the ASE model assumes that the influence of external variables on intention is mediated through the ASE variables, we found one external variable that directly influenced intention. Women who lost large amounts of urine per wet episode had a positive intention to adhere to PFME therapy. The direct influence of external variables on intention has also been found in a determinant study on the health risk behavior of sunbathing (Lechner and De Vries, 1997). In other studies, women with frequent wet episodes were more likely to adhere to PFME therapy than those with fewer episodes (Burns *et al.*, 1993) and women who were more bothered by their wet episodes had a better adherence than less bothered women (Lagro-Janssen *et al.*, 1994). A similar relation between the perceived severity of symptoms and adherence to exercise therapy was found in physiotherapy research (Sluijs *et al.*, 1993). Our finding cannot be explained by the mediating effect of the amount of urine lost per wet episode for the frequency of wet episodes, IQOL or IIQ-7 scores, as the amount of urine lost per wet episode was not significantly correlated with these variables. A possible explanation might be that, knowing that the larger the amounts of urine lost per wet episode, the more positive the intention; having wet episodes of a dash or even a whole bladder is such a nasty experience itself that it directly influences intention rather than through the ASE or other variables.

A limitation of the present study was that much of the variance in intention could not be accounted for, as only 22% of the variance in intention could be explained. The nine variables successively removed from the regression equation together only contributed 3% to the variance in intention. Other studies have reported somewhat better predictions of intention. In a study by Lechner and De Vries, 33% of the intention to start exercise

behavior was explained by ASE variables (Lechner and De Vries, 1995), and a review by Godin and Kok of the relative importance of ASE variables for the intention to adopt various health behaviors (Godin and Kok, 1996), found that ASE variables could predict an average of 42% of intention.

One of the reasons why much of the variance in intention was left unexplained in our study might be that the intention data were negatively skewed, which was caused by the fact that most women had a very positive intention to adhere to PFME therapy. This, in turn, can be explained by the fact that the women involved in the present study were already willing to participate in a subsequent behavioral intervention study in which they would start PFME therapy. It was to be expected that these women would also have a positive intention to adhere to this therapy. Furthermore, transformation to normality revealed the same results. Another explanation might be that the women in the present study had a strong tendency to give socially desirable answers. This may also have affected other answers on determinant questions. However, all answers would then be flawed in the positive direction, which would probably not influence the correlations between the determinants. Our overall conclusions would thus probably not have been different if our respondents had given less socially desirable answers. Furthermore, the Cronbach's α value of the social desirability scale was 0.63, which raises questions about its reliability. This is understandable, as the women in the pre-test found these items very annoying and strange. Nevertheless, since adherence behavior is a socially desirable behavior, we have to be cautious in drawing conclusions.

Many of the women we approached declined to participate in our study. Most of the women who declined to be involved in the subsequent behavioral intervention study said that they did not feel the need to start PFME therapy because they had mild symptoms of urinary incontinence or were not bothered by their wet episodes. This seems to agree with our finding that women who lost large amounts of urine per episode also had a

positive intention to adhere to PFME therapy. Another frequently mentioned reason was that the women were too busy with their job and/or taking care of important others. This fits in with the negative correlation we found between the number of hours of paid labor and the intention to adhere.

More insight into women's intentions to start and adhere to PFME therapy could be obtained from further studies which take into account motivational stages of behavioral change, as recent findings indicate the usefulness of incorporating motivational stages into studies of exercise behavior (Laforge *et al.*, 1999). Care should be taken in the timing of recruitment for such studies, as the unfortunate delay between our two recruitment phases may have caused the relatively high level of non-response.

Implications for practice

The results of this study suggest that GPs, but also gynecologists and urologists, can identify women with urinary incontinence whose intention to adhere to PFME therapy is likely to be positive, by asking two questions. First, they can ask the women's amount of urinary loss per wet episode. Secondly, they can ask women if they feel able to perform PFMEs and integrate them in their daily life activities. If a woman answers that she is losing large amounts of urine per wet episode and/or has a positive estimate of her self-efficacy, such a woman is likely to have a positive intention to adhere to PFME therapy. In this case, referral to a physiotherapist specialized in the field of PFME therapy is highly recommended, as success can be expected.

However, we would certainly not suggest that women with small amounts of urinary loss per wet episode should not be referred to PFME therapy. The problem is that these women are less likely to seek help. In our study, most of the women recruited had never sought help for their incontinence, even though they had moderately severe symptoms for up to 35 years. It is known that 50–75% of women with urinary incontinence fail to seek help because of feelings of shame, lack of knowledge about management options or because

they think that urinary incontinence is an inevitable fact of life after childbirth or with increasing age (Lagro-Janssen, 1991; O'Dowd, 1993). It is thus important that health professionals ask about symptoms of urinary incontinence if a woman is at increased risk. Another method of inducing women to disclose their symptoms is to display leaflets about PFMEs in the waiting room. As the women hardly responded to our recruitment poster in the waiting rooms and in view of the taboo aspect of the condition, it might be better to put up posters on the doors of public toilets, explaining that PFME therapy is an effective and safe therapy. The use of models on such posters can be recommended. For those women who are bothered by their wet episodes, but are not aware of management options, this might be the right incentive to seek help for this treatable condition.

GPs might try to promote self-efficacy regarding the intention to adhere to PFME therapy. For example, many women may be expected to claim that they are too busy with daily life activities and thus do not deem themselves capable of integrating exercises in their busy lives. In such cases, GPs can say that PFMEs take very little time per day and can be performed during any kind of activity without this being noticed by others. Furthermore, good results have been reported in a study in which GPs themselves treated women with PFME therapy (Lagro-Janssen, 1991). Women who have no time for regular visits to a physiotherapist could be instructed in PFMEs by their GP, during which consultations, for example, vaginal palpation with giving biofeedback might be used as method for promoting self-efficacy (Lagro-Janssen *et al.*, 1995; Berghmans *et al.*, 1998b). However, standard training of GPs does not include PFME therapy, and several consults are necessary to evaluate progress and stimulate self-efficacy for adherence (Wall and Davidson, 1992; Hahn *et al.*, 1993; Cammu and Van Nylen, 1994).

Physiotherapists could address aspects of self-efficacy in an open discussion in the first few sessions of PFME therapy. This means discussing issues in such a way that a woman feels comfortable discussing adherence problems with the physio-

therapist. Future health education research should explore systematically which determinants stimulate women's intention to adhere to PFME therapy. Building self-efficacy might be a good starting point for health education interventions aiming to promote adherence to PFME therapy, which can be used by physiotherapists and GPs. In the subsequent intervention study, health education interventions to promote adherence to PFME therapy will be evaluated in a randomized controlled trial with the 129 women who participated in the present cross-sectional study.

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