Psychometric Analysis of the Broome Pelvic Muscle Self-Efficacy Scale® in African-American Women with Incontinence

Barbara A. Shelton Broome

Urinary incontinence (UI) is a physiological disorder that can have psychological, sociological, and economic consequences for patients and their families (Agency for Health Care Policy and Research [AHCPR], 1996). The National Institutes of Health Urinary Incontinence Consensus Conference (1989) defines UI as the involuntary loss of urine. An estimated 15% to 35% of the community dwelling, adult, ambulatory population 60 years of age and older suffers from UI.

The National Association for Continence (1997) estimates that of the 13 million Americans with incontinence, 85% are women. Reported prevalence rates for women are twice that of men (AHCPR, 1996). The actual prevalence of UI may be higher than reported since many sufferers fail to report the occurrence of UI to their health care provider. Reasons suggested for this failure are that many individuals believe UI to be a normal phenomena associated with aging or that UI is untreatable, therefore not worth discussing.

There is a paucity of research on African-American women and incontinence. Previous research has demonstrated that pelvic muscle exercises can reduce or eliminate incontinence in women. This methodological study reports findings about incontinence, self-efficacy, depression, and quality of life in African-American women with incontinence. This study further reports the psychometric analysis of the Broome Pelvic Muscle Self-Efficacy Scale® in this population.

(Baum, Suarez, & Appell, 1991; Burgio, Ives, Locher, Arena, & Kuller, 1994; Smith, Newman, & Blackwood, 1992). However, there are few published reports on prevalence rates of incontinence or treatment outcomes for African-American women in the literature (Bump, 1993; Fultz, Herzog, Raghunathan, Wallace, & Diokno, 1999; Knobel, 1975; Peacock, Wiskind, & Wall, 1994).

Purpose of the Study

The purpose of this research was to: (a) develop a scale that can be used to measure perceived self-efficacy and outcome expectation for performing pelvic muscle exercises (PMEs) and strategies to prevent urine loss in women with UI; and (b) determine the reliability and validity of the self-efficacy scale using a group of African-American women age 50 and older. This methodologic research on the development of a scale to measure self-efficacy for performing PME in women may be useful in assisting clinicians to identify women with low self-efficacy. The scale, developed by this researcher, may provide clinicians with a reliable and valid instrument to measure self-efficacy for PMEs (Broome, 1999). Because self-efficacy is a factor that may influence behavioral change, self-efficacy evaluation prior to implementing PME for UI may facilitate the development of interventions that foster positive self-efficacy during treatment. This study is especially important since it examines reliability and validity of the scale in African-American women rather than generalizing that Caucasian and African-American women are the same.

Review of Literature

Consequences of UI. Involuntary loss of urine has multiple implications for the sufferer (NIH Urinary Incontinence Consensus Conference, 1989; Ouslander & Schnelle, 1995). The individual suffering from UI may avoid social situations to prevent embarrassment related to leaking and odor (Ashworth & Hagan, 1993; Dowd, 1991; Hunskar & Vinsnes, 1991). UI may influence quality of life and be a major bar-

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Note: For more information on this instrument, readers may contact the author at babroome@aol.com.
rier to social interests, entertainment, or physical recreation (Grimby, Milsom, Molander, Wiklund, & Ekelund, 1993; Hunskar & Vinsnes, 1991; Wette et al., 1995). Depression and anxiety may occur in incontinent persons (AHCPR, 1996; Burgio, Whitehead, & Engel, 1985; Grimby et al., 1993; MacCaulay, Stern, Holmes, & Stanton, 1987; Rosenzweig, Hischke, Thomas, Nelson, & Bhatia, 1991).

The NIH Urinary Incontinence Consensus Conference (1989) and the AHCPR Urinary Incontinence Guideline Panel (1996) recommend use of the least invasive and lowest risk intervention as first-line treatment of UI. Behavioral interventions, such as PMEs, meet the criteria of low risk and minimal invasiveness (AHCPR, 1996; NIH Urinary Incontinence Consensus Conference, 1989). Pelvic muscle exercises require active patient participation; thus, motivation and belief that the exercises are beneficial and important to success.

Types of incontinence. UI is classified as either acute or chronic. Acute or reversible UI refers to episodes of incontinence that are of a sudden onset, usually related to an acute illness or an iatrogenic problem (Kane, Ouslander, & Abrass, 1994).

Chronic or persistent UI is unrelated to an acute illness. Types of chronic or persistent UI are stress, urge, and mixed (Engberg, McDowell, & Wilkerson, 1996; Kane et al., 1994). Stress UI is the involuntary loss of small amounts of urine that can occur when the intravesical pressure exceeds the maximum urethral pressure (Abrams, Blavas, Stanton, & Anderson for the International Continence Society Committee on Standardization of Terminology, 1990). This occurs during activities that increase intra-abdominal pressure such as coughing, laughing, or lifting (Engberg et al., 1996; Kane et al., 1994). Urge UI is the involuntary leakage, usually of large amounts of urine, associated with an aha! and strong desire to void (Abrams et al., 1990; Engberg et al., 1996). Urge incontinence may be idiopathic or associated with involuntary detrusor contractions or hypersensitivity. Neurologic disorders, such as a cerebral vascular accident, can also be associated with urge UI (Abrams et al., 1990). Often, no specific etiology can be identified despite detailed evaluation (NIH Urinary Incontinence Consensus Conference, 1989).

Symptoms of both stress and urge UI are called mixed UI (Houston, 1993). Mixed UI is common in older women. Usually either stress or urge UI will be predominant. Stress UI in older patients with mixed UI has usually been of a long duration with urge UI occurring more recently (Diokno, 1990).

Treatment. Treatment of UI is based on a thorough assessment (AHCPR, 1996). Treatment and interventions for UI can include medications, surgery, mechanical devices, and behavioral modification. Several medications have proved beneficial for UI; however, risk-to-benefit ratios are not clear (AHCPR, 1996).

Surgery can be effective and may be indicated in certain cases of stress UI that are not responsive to pharmacological and behavioral interventions (Kane et al., 1994). Mechanical devices such as urethral plugs, weighted vaginal cones, and pessaries have been effective in select situations (AHCPR, 1996).

Behavioral interventions have been successful as a treatment for stress and urge UI (Burgio, Courtland-Robinson, & Engel, 1986; McDowell, Burgio, Dombrowski, Locher, & Rodriguez, 1992). Behavioral interventions are noninvasive, free from side effects, and can be used with other treatment (AHCPR, 1996; NIH Urinary Incontinence Consensus Conference, 1989). Behavioral interventions include pelvic muscle or Kegel exercises.

Historical perspective. Pelvic muscle exercises are based on the research of Dr. Arnold Kegel (1948, 1952). Kegel proposed PMEs as a means to restore and strengthen visceral tone and pelvic muscle function after childbirth (Kegel, 1948; 1952; 1956). The exercises involved are directed toward “drawing in the perineum” (Kegel, 1948, p. 242) to restore normal muscle function.

Self-efficacy has two components: (a) efficacy expectations, the conviction that one can successfully execute behavioral change, and (b) outcome expectations, the judgment of the likely consequences of behavioral change (Bandura, 1986). These two components play a vital role in behavioral change (Bandura, 1986). Measuring self-efficacy expectations and outcome expectations for PMEs can assist in assessing individual perceptions of PME performance and outcomes. Measures of self-efficacy must include an evaluation of these three dimensions: (a) magnitude, (b) generality, and (c) strength (Bandura, 1977a, 1986). Magnitude is the level of difficulty of a task being measured. Individuals may believe they can perform pelvic exercises when they are sitting but may not believe they can do them while standing. Generality is the degree that a task can be transferred from one activity to another. Individuals may believe they can perform a pelvic muscle contraction when coughing but not when they pick up something heavy. Finally, strength is the degree to which people believe they can succeed at a given level of magnitude of an activity. Individuals may have confidence they can perform the exercise when guided by the clinician but not when they do not have that guidance. These important dimensions must be measured since they impact self-efficacy performance and outcome expectations.

Based on this assessment, interventions may then be tailored to enhance skill mastery and self-efficacy. Success of behavioral interventions may be related to one’s self-efficacy (Bandura, 1977a). Self-efficacy reflects one’s confidence to perform specific behaviors, such as
PMEs, and one’s belief that performing the behavior will produce a specific outcome (Bandura, 1977a; 1982; 1986).

Self-efficacy is a domain-specific construct; therefore, a propensity for performing one behavior does not necessarily transfer to other behaviors (Bandura, 1977a; 1977b; 1986). Because the behavior does not necessarily transfer, it is necessary to develop behavior-specific measures for the construct under study (Bandura, 1989; Hofstetter et al., 1990). This enables interventions to be individually tailored to increase and reinforce self-efficacy for the specific behavior. Measures of self-efficacy have not been a part of the detailed physiological and psychosocial UI assessment (AHCRP, 1996; Engberg et al., 1996). Measuring self-efficacy for performing PMEs as a behavioral intervention for UI can provide important information regarding one’s motivation and belief about the efficacy of the prescribed intervention. The measurement of self-efficacy may also provide a foundation for better understanding the relationship between self-efficacy and successful outcomes (Grembowski et al., 1993; Hofstetter et al., 1990).

Methodology

Description of sample. A sample of 31 African-American community-dwelling women age 50 and older with UI were recruited from multiple sites in Northeastern Ohio to collect data for examining the technical qualities of the scale. Using the Broome Pelvic Muscle Self-Efficacy Scale® (PMSES) (Broome, 1999), data were collected from subjects before treatment for UI using PME and after treatment (see Table 1). Informed consent was obtained from all subjects.

Instrumentation

The Broome PMSES (see Table 1) was developed following the steps outlined by Devellis (1991). Testing the scale involved administering the scale to a sample of community-dwelling women with UI. Also a small sub-study of a group of women treated with PMEs at continence clinics for UI completed the scale before treatment.

The Geriatric Depression Scale (GDS) measured depression (Yesavage et al., 1983). The GDS is a 15-item dichotomous response format. Scores range from zero to 15. The scoring for the GDS was 0 to 4 (mild depression), 5 to 9 (moderate depression), and 10 to 15 (severe depression). The GDS has been validated for community, well-elderly, and hospitalized elderly (Hamilton, 1967; Steuer, Mintz, & Hammen, 1984). Reliability measured by alpha coefficient (r = .94), split half reliability (r = .94), and test-retest reliability (r = .85) has been established. Convergent validity was determined by positive correlations with The Zung Self-Rating Depression Scale (r = .84) and the Hamilton Rating Scale (r = .83) for Depression (Yesavage et al., 1983).

Quality of life was measured by The Incontinence Impact Questionnaire—Short Form (Uebersax et al., 1995). This seven-item questionnaire was adapted from The Incontinence Impact Questionnaire—Long Form (IIQ-LF), which consists of 30 items that reflect symptoms associated with UI and the way that UI interferes with different aspects of daily living (Shumaker et al., 1994). Responses range from zero (not at all) to three (greatly). The average score of items is multiplied by 33.3, so that scores are on a scale of 0 to 100 (Uebersax et al., 1995). The IIQ-SF correlation with the IIQ-long form (Shumaker et al., 1994) total was .97. The correlation of the short form subscales with the long form was .99 to .94 (M=.91).

Demographic information about race, marital status, and age were collected using a form developed for this study by the researcher. To better understand any variables that may affect behavior, educational and employment data were collected. General information about the participant’s experience with UI and any past treatment were also obtained. All guidelines for participant informed consent were followed.

Results/Analysis

Indices of reliability and validity were calculated in addition to descriptive statistics. Demographic information and estimates of reliability and validity were also analyzed.

Results reported in this article are based on the 31-ambulatory, cognitively-intact, and community-dwelling African-American women recruited from social and religious community organizations. All women included in the study reported experiencing UI. The majority of the women were married (41.9%), between the ages of 50 and 60 (64.5%), and lived with a spouse (38.7%). Almost two-thirds (64.5%) of the women in the study sample are currently employed. Seventeen (54.8%) reported an educational level within grades 9 through 12 and 11 (35.5%) reported some college education.

The women were queried regarding events that precipitated their UI. Structured and open-ended questions were used to help establish cause and type of UI experienced by the women. More women reported loss of urine with activities that were indicative of stress UI. Twenty (64.5%) of the women reported a loss of urine associated with sneezing, coughing, or lifting. In comparison, 7 (22.6%) affirmed urine loss with activities associated with urge incontinence, such as experiencing a loss of urine while on the way to the toilet.

An open-ended question was added so that participants could give information about other times that leakage occurred. Eight (22.5%) of the participants reported other times when leakage occurred, such as aerobics, hearing or being in running water, and increased liquid intake, especially coffee, tea, and sodas. The mean length of time the women had been incontinent was 3.1 years (SD=1.4).

The survey questions regarding treatment of incontinence
Table 1.
Broome Pelvic Muscle Exercise
Self-Efficacy Scale

Instructions
This survey contains two parts that describe different situations related to unwanted urine loss (incontinence). After each statement in Section A, indicate your level of confidence in your ability to perform the activity. In Section B, indicate your level of confidence that the activity will prevent unwanted urine loss.

Examples
Please read each statement and think about the situation. Circle the number from the scale at the side of the page that best indicates how confident you are that you can perform each of the following activities.

On the scale a zero (0) means that you do not feel confident at all in performing the activity, a 100 means that you feel very confident that you can perform the activity (a 100% chance that you can perform the behavior).

Example 1 (Part A)
Part A: For each statement below, please indicate your level of confidence in performing pelvic muscle contractions to prevent unwanted urine loss.

Let’s say you are 80% confident you can perform pelvic muscle contractions. Therefore, your answer would be 80 and you would circle 80.

<table>
<thead>
<tr>
<th>Level of Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 10 20 30 40 50 60 70 80 90 100</td>
</tr>
</tbody>
</table>

How confident are you that you can contract your pelvic muscles 15 times as instructed?

Select a number from the scale that best indicates your level of confidence.

<table>
<thead>
<tr>
<th>How Confident Are You That You Can:</th>
<th>Level of Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Contract your pelvic muscles?</td>
<td>0 10 20 30 40 50 60 70 80 90 100</td>
</tr>
<tr>
<td>2. Perform pelvic muscle contractions 3 times a day?</td>
<td>0 10 20 30 40 50 60 70 80 90 100</td>
</tr>
<tr>
<td>3. Perform pelvic muscle contractions while lying down?</td>
<td>0 10 20 30 40 50 60 70 80 90 100</td>
</tr>
<tr>
<td>4. Perform pelvic muscle contractions while standing?</td>
<td>0 10 20 30 40 50 60 70 80 90 100</td>
</tr>
<tr>
<td>5. Perform pelvic muscle contractions while sitting?</td>
<td>0 10 20 30 40 50 60 70 80 90 100</td>
</tr>
<tr>
<td>6. Contract your pelvic muscles without contracting your abdominal muscles?</td>
<td>0 10 20 30 40 50 60 70 80 90 100</td>
</tr>
<tr>
<td>7. Contract your pelvic muscles while washing fruits and vegetables under running water?</td>
<td>0 10 20 30 40 50 60 70 80 90 100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How Confident Are You That You Can:</th>
<th>Level of Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>8. Contract your pelvic muscles when lifting a bag of groceries?</td>
<td>0 10 20 30 40 50 60 70 80 90 100</td>
</tr>
<tr>
<td>9. Contract your pelvic muscle while standing at the sink brushing your teeth?</td>
<td>0 10 20 30 40 50 60 70 80 90 100</td>
</tr>
<tr>
<td>10. Contract your pelvic muscle rapidly?</td>
<td>0 10 20 30 40 50 60 70 80 90 100</td>
</tr>
<tr>
<td>11. Perform pelvic muscle contractions when you are sad?</td>
<td>0 10 20 30 40 50 60 70 80 90 100</td>
</tr>
<tr>
<td>12. Contract your pelvic muscle to while showering after a busy and tiring day?</td>
<td>0 10 20 30 40 50 60 70 80 90 100</td>
</tr>
<tr>
<td>13. Perform pelvic muscle contractions when you are tired?</td>
<td>0 10 20 30 40 50 60 70 80 90 100</td>
</tr>
<tr>
<td>14. Contract your pelvic muscle when you awaken at night with a strong urge to urinate?</td>
<td>0 10 20 30 40 50 60 70 80 90 100</td>
</tr>
</tbody>
</table>
Table 1. (continued)
Broome Pelvic Muscle Exercise
Self-Efficacy Scale

**Examples**
Please read each statement and think about the situation. Circle the number from the scale at the side of the page that best indicates your confidence that the activity will eliminate unwanted urine loss.

On the scale a zero (0) means that you do not feel confident at all that the activity will prevent unwanted urine loss, a 100 means that you feel very confident that the activity will prevent unwanted urine loss.

**Example 1 (Part B)**
**Part B:** Read each statement and think about the situation. Assume that you have mastered pelvic muscle contractions when you answer each question.

<table>
<thead>
<tr>
<th>How confident are you that you that pelvic muscle contractions can prevent unwanted urine loss?</th>
<th>Level of Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 10 20 30 40 [50] 60 70 80 90 100</td>
</tr>
</tbody>
</table>

*A zero (0) means that you do not feel confident in pelvic muscle contractions to prevent unwanted urine loss, a 100 means you feel very confident in pelvic muscle contractions to prevent unwanted urine loss.*

<table>
<thead>
<tr>
<th>How Confident Are You That Pelvic Muscle Contractions Will Prevent Unwanted Urine Loss:</th>
<th>Level of Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 10 20 30 40 50 60 70 80 90 100</td>
</tr>
<tr>
<td>1. When you experience a strong urge to urinate?</td>
<td>0 10 20 30 40 50 60 70 80 90 100</td>
</tr>
<tr>
<td>2. When you sneeze?</td>
<td>0 10 20 30 40 50 60 70 80 90 100</td>
</tr>
<tr>
<td>3. When you laugh?</td>
<td>0 10 20 30 40 50 60 70 80 90 100</td>
</tr>
<tr>
<td>4. While waiting 2 minutes for a restroom?</td>
<td>0 10 20 30 40 50 60 70 80 90 100</td>
</tr>
<tr>
<td>5. While waiting 5 minutes for a restroom?</td>
<td>0 10 20 30 40 50 60 70 80 90 100</td>
</tr>
<tr>
<td>6. When you wake up at night with a strong urge to urinate?</td>
<td>0 10 20 30 40 50 60 70 80 90 100</td>
</tr>
<tr>
<td>7. When you lift a heavy package?</td>
<td>0 10 20 30 40 50 60 70 80 90 100</td>
</tr>
<tr>
<td>8. When you cough?</td>
<td>0 10 20 30 40 50 60 70 80 90 100</td>
</tr>
<tr>
<td>9. When washing fruits and vegetables?</td>
<td>0 10 20 30 40 50 60 70 80 90 100</td>
</tr>
</tbody>
</table>

asked: (a) Have you ever been evaluated or seen a doctor or nurse and had an examination for this problem? and (b) Have you had treatment for the problem of leaking urine? If the women had treatment, the next questions asked were: (c) What type of treatment have you had for the problem of leaking urine? and (d) Was this treatment effective? The final question asked the women if they were still using the treatment. Of the total sample, 23 (74.2%) of the women had no treatment for incontinence. Seven (22.6%) of the 31 women completing the survey reported being evaluated for incontinence by their health care provider. Of the 8 women who reported treatment for UI by a health care provider, 4 (12.9%) had surgery, 4 (12.9%) were treated with medication, and 1 (3.2%) was prescribed pelvic muscle exercises. Four (12.9%) of the women who received treatment for UI evaluated the treatment as very effective, 3 (9.7%) reported the treatment as somewhat effective, and 1 (3.2%) found the treatment to be not at all effective.

The women completed the Broome PMSES©, the GDS, and the IIQ-SF. Scores on the 23-item Broome PMSES© that were above 66 were considered to have high self-efficacy, scores between 33 and 66 had moderate self-efficacy, and scores below 33 were considered indicative of low self-efficacy. Based on the Broome PMSES© scores, 17
Table 2. Evaluation of Reliability for the Broome PMSES (N=31)

<table>
<thead>
<tr>
<th>Scale</th>
<th>M</th>
<th>(SD)</th>
<th>Alpha</th>
<th>Test-Retest (N=12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficacy (Part A)</td>
<td>42.41</td>
<td>(13.04)</td>
<td>.98</td>
<td>.49</td>
</tr>
<tr>
<td>Outcome (Part B)</td>
<td>24.01</td>
<td>(7.92)</td>
<td>.96</td>
<td>.56</td>
</tr>
<tr>
<td>Total Scale</td>
<td>66.42</td>
<td>(20.20)</td>
<td>.98</td>
<td>.55</td>
</tr>
</tbody>
</table>

(55%) had high self-efficacy for performing PME, 12 (39%) had moderate self-efficacy, and 2 (1%) of the women had perceived low self-efficacy.

The scores on the GDS indicated that 28 (90%) of the women scored within the normal range (scores between 0 and 5) and were not considered depressed, two (1%) were moderately depressed (scores between 6 and 10), and one (1%) was severely depressed (scores greater than 10).

The responses of the women to the IIEF-SF indicated that 26 (84%) of the women perceived that UI did not or only slightly influence their quality of life. Three (1%) women reported that UI moderately influenced their quality of life, and 2 (1%) women reported UI had a severe impact on their quality of life. This finding is consistent with the literature (Hunskaar & Vinsnes, 1991; Wyman, Hinks, Choi, Taylor, & Fantl, 1987) that women with detrusor instability report a poorer quality of life than those with sphincter incompetence. In this study, 20 (64.5%) reported symptoms of sphincter incompetence. It is also important to note that some older women perceive incontinence as a normal part of aging (Hunskaar et al., 1991; Jeter & Wagner, 1990) which may also explain this finding. These data provide an overview of the sample's perceived self-efficacy, quality of life, and feelings of depression.

Psychometric Analysis of the Broome PMSES

Self-efficacy scale reliability. The Broome PMSES (1999) is a rating scale with responses ranging from 0 to 100 in increments of 10. Internal consistency reliability was estimated by Cronbach’s alpha for the total scale and the subscales of efficacy expectations (Part A) and outcome expectations (Part B). Table 2 reports these coefficients for the sample of 31 African-American women. The alphas for all scales are high and meet the criterion for acceptable reliability indicated by Nunnally and Bernstein (1994). The alpha for all the scales remained stable (between .913 and .986) even if each item were to be individually deleted.

The stability of the scale was estimated by the test-retest method. Twelve (38%) of the total sample randomly received the scale to complete 14 days after the initial evaluation. Results of correlating scores across the two administrations are presented in Table 2. The moderate stability of the scale may be related to the construct being measured. Self-efficacy is a state and may change over time, based on a person’s performance of an activity and the outcome of that activity.

Item-scale correlations. For the total sample of 31 women, items were correlated with the corresponding corrected scale total to examine whether any items did not relate well enough to be retained. Based on the moderate-to-high correlations (.56 to .94), no items were deleted. Although the correlations suggest redundancy of the items and a call for brevity of the scale, the correlations are appropriate for scales that measure self-efficacy. Self-efficacy dimensions of magnitude, strength, and generality must be measured in a way that promotes examination of the variable of interest.

Inter-item correlations. To examine the relationship of items within each of the two scales (efficacy expectations and outcome expectations), the items were correlated. The correlations provide evidence that item scores can be averaged to form an efficacy and an outcome scale score. The correlations also help to explain the high internal consistency reliability estimate.

Validity. Content validity of the Broome PMSES was established by having experts in the fields of self-efficacy or urinary incontinence evaluate the instrument for sampling adequacy. The experts in the area of UI were all doctoral-prepared nurse educators and active clinicians in UI evaluation and treatment. The experts in self-efficacy theory had doctorates in psychology. The Broome PMSES was sent to the experts with a cover letter asking for their evaluation of the adequacy of the content for the domain of self-efficacy or UI. Comments received from the experts were used to modify the instrument prior to administration.

Data were also collected to examine the construct validity of the Broome PMSES. After an exhaustive search of the literature, no other instruments with reported reliability and validity that examine self-efficacy and PME were found. However, the literature does report a relationship between quality of life, depression, and self-efficacy. The higher the perceived self-efficacy, the better the quality of life (Carroll, 1995; Ewart et al., 1986; Grembowski et al., 1993). Reported depression is also lower (Bandura, 1982; 1986;
Grembowski et al., 1993; Yusaf & Kavanagh, 1990) when self-efficacy is high.

The GDS identifies the responses that are most likely to indicate a mood disorder. One point is assigned each response. Thus, the higher the sum on the GDS, the greater the depression. The lower the score on the IIQ-SF, the better the quality of life. On the Broome PMSES®, the higher the score, the greater the perceived self-efficacy. Therefore, the Broome PMSES® would be expected to correlate negatively with the GDS and IIQ-SF. Correlations between the Broome PMSES® and the depression and quality of life scales are presented in Table 3 for the sub-sample of African American women.

The correlations of the Broome PMSES® with the IIQ-SF was moderate and in the anticipated direction for the sample, providing some initial evidence for the construct validity of the scale. The GDS correlated in a slightly positive way with the Broome PMSES®. This finding is most likely related to the small sample size. The correlations for construct validity have not been examined in other studies; therefore, other studies examining self-efficacy, depression, and quality of life are encouraged.

**Construct validity.** A principal component factor analysis was conducted to examine the factor structure of the Broome PMSES®. The scale was developed to yield two scores: efficacy expectation and outcome expectation. Factors were extracted using the Kaiser criterion of retaining factors with eigenvalues greater than 1.00. The first factor had an eigenvalue of 16.99 (73.8%) and the second factor an eigenvalue of 1.45 (6.3%) in the sample studied. A varimax rotation was done for both groups. In both factor analysis, questions 1 through 14 in (Part A) loaded highly on factor one (efficacy expectations) and questions one through nine (Part B) loaded on the second factor (outcome expectations). Therefore, the factor structure that was designed in the Broome PMSES® was confirmed.

### Table 3. Correlation of the Broome PMSES with a Measure of Depression and a Measure of Quality of Life

<table>
<thead>
<tr>
<th>Scale</th>
<th>r</th>
<th>Sample (N=31)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geriatric Depression Scale</td>
<td>.05*</td>
<td></td>
</tr>
<tr>
<td>Incontinence Impact Questionnaire</td>
<td>-.32*</td>
<td></td>
</tr>
</tbody>
</table>

Note: *p<.01

**Discussion**

The Broome PMSES® should have findings for predictive validity similar to other studies. The findings of other studies of self-efficacy and behavioral change indicate that the higher the initial self-efficacy, the more likely that the outcomes will be positive (Ewart et al., 1986; Grembowski et al., 1993; Robertson & Keller, 1992). Because there are no other scales that measure self-efficacy for performing PME, criterion validity or a measure against a “gold standard” could not be evaluated.

The psychometric analysis of the Broome PMSES® provides preliminary reliability and validity in African-American women. Continued evaluation of its psychometric properties in African-American women as well as other groups with urinary incontinence is encouraged. Additional studies using equivalent groups to determine the reliability and validity will increase knowledge about the use of the Broome PMSES® in these populations.

Further evaluation of post-treatment outcomes in a clinic sample should be objectively evaluated through the use of bladder diaries to obtain a more precise picture of decreases in urinary accidents. However, it is important to add a component of subjective appraisal of improvement, since self-efficacy expectation is affected the most by performance appraisal (Bandura, 1977a).

In summary, the psychometric analysis of the Broome PMSES® provides an initial estimate of reliability and validity in a community sample of African-American women. This sample was limited to 31 women age 50 and older, ambulatory, and cognitively intact. Any psychometric analysis is a snapshot of the scale’s properties in a specific population. Use in populations that have different characteristics and of different races should always involve a pilot study to examine the properties of the scale when used in different samples. Removing any items from a previously developed scale changes the psychometric properties of the scale (Green & Lewis, 1986). Therefore, any change in a scale requires re-evaluation of psychometric properties.

**Recommendations**

The Urinary Incontinence Guideline Panel recommends that the least invasive intervention for UI be used first (AHCP, 1996). Pelvic muscle exercises meet this criterion. The success of behavioral interventions, such as PMEs, requires patients who are motivated (AHCP, 1996). One factor that may influence motivation is self-efficacy. Prior to the Broome PMSES®, there was no scale with evaluated psychometric properties to measure self-efficacy for performing PMEs. This study has provided some initial evidence that self-efficacy may be reliably measured for performing PME. This measure may provide the clini-
cian with information about a person’s belief in ability to perform the exercise as well as belief in the outcome once the behavior is performed. Interventions can then be tailored to promote behavioral change, in this case performing PMEs as prescribed. Some preliminary evidence of construct validity was also provided in this study.

The Broome PMSES® may be a useful way to measure the self-efficacy of a person for performing PMEs. The Broome PMSES® can provide the clinician with knowledge about a person’s belief in personal performance and outcome expectations for PMEs to prevent unwanted urine loss. This knowledge may be useful in developing individualized patient intervention strategies to enhance self-efficacy. Research and validity of any scale is an ongoing process. Continued reliability and validity analysis of the Broome PMSES® will add to the body of knowledge in providing care for persons with urinary incontinence.

**Future Research**

Minimal research has been conducted on African Americans and the impact of incontinence on quality of life and depression. This study has provided some initial information on the reliability and validity of the Broome PMSES® in this population. The findings from this study may provide useful information into the impact of self-efficacy on treating incontinence in African-Americans. Future research should continue to evaluate women and improve treatment methods. The evaluation of self-efficacy may help the practitioner to develop interventions that are individualized to improve treatment outcomes.

**References**


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