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Turkish Validation of the Hallym Post Micturition Dribble Questionnaire (HPMDQ) and Evaluation of Bulbar Urethral Massage Response

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What's known on the subject? and What does the study add?

Quality of life scales, questionnaires and scoring systems have been used in many areas of modern medicine to provide reproducible and accurate measurements. Post-micturition dribble (PMD) is common as an isolated symptom in men, hallym post micturition dribble questionnaire (HPMDQ) has been developed as the only measurement tool for this symptom. This study could lead to the validation of HMPDQ in different countries. Moreover, thanks to this validation study, a valid questionnaire was obtained for Turkish studies on PMD. The effectiveness of bulbar urethral massage used in the treatment of PMD can be evaluated more objectively with this questionnaire.

Abstract

Objective: As the evidence has been increasing about the post-micturition dribble (PMD) symptom, widely accepted lower-urinary tract symptoms (LUTS) questionnaires fail to assess PMD alone. In this study, our primary aim was to evaluate the validity and reliability of the Turkish version of the hallym post micturition dribble questionnaire (HPMDQ). The secondary objective is to appraise the relationship between PMD and other LUTS and the effectiveness of bulbar urethral massage in patients with PMD.

Materials and Methods: The final draft of the Turkish HPMDQ and International Prostate Symptome score (IPSS) were compared for male patients who were admitted to the urology outpatient clinic between June 2020 and September 2020. The responses of 103 patients were analysed. Fifty-five people being affected by PMD were offered bulbar urethral massage for one month and then re-applied with the questionnaires.

Results: The kappa coefficient for the total score of the Turkish HPMDQ score was 0.789. Considering the relationship between the HPMDQ and the IPSS, the HPMDQ's total score correlated significantly with that of the total IPSS ($p=0.660$, $p<0.001$), the voiding symptoms of the LUTS ($p=0.621$, $p<0.001$), and post-void residual volume ($p=0.614$, $p<0.001$) but not with the storage symptoms of the LUTS ($p=0.245$). The mean value of HPMDQ-Q5, evaluating the treatment response of bulbar urethra massage, was 1.81+1.02, suggesting an effective treatment of PMD.

Conclusion: The Turkish version of HPMDQ was observed as a reliable tool for evaluating patients with PMD. This study also showed that bulbar urethral massage is an effective method to relieve PMD.

Keywords: Post-micturition dribble, questionnaire, Turkish validation, incontinence

Introduction

Post-micturition dribble (PMD) and the sensation of incomplete emptying are considered the post-micturition symptoms (PMS). PMD is defined as the involuntary loss of urine generally just after leaving the toilet in men or immediately after a person has finished urinating (1). The exact pathophysiological mechanism for PMD is unclear and it can be found in men without any underlying pathognomonic findings (2). The prevalence rate of PMD in men is positively associated with advanced age and was reported to a wide range between 5.5% and 58.1% (3,4). PMD was also shown to account for much of the PMS in men (5) and

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it was postulated that PMD is perhaps one of the most common lower urinary tract symptoms (LUTS) (5,6).

The universally accepted questionnaires, such as the Danish Prostatic Symptom score (DAN - PSS - 1), and the International Prostate Symptom score (IPSS) developed for diagnosis, treatment, follow-up of LUTS (7,8). PMS has always been evaluated together with other LUTS in these questionnaires. However, an isolated questionnaire for PMD was lacking and out of the researchers' interest. As the recent epidemiologic studies, including TAMUS and EpiLUTS demonstrated higher rates of PMD prevalence (4,9,10), Jeong et al. (11) Developed and validated a five-item questionnaire, Hallym Post Micturition Dribble Questionnaire (HPMDQ), as a symptom assessment tool for PMD in 2019. This questionnaire's original language is Korean and has not yet been validated in any other language, but the authors also published the English version in the same study (11).

Our primary aim in this study was to evaluate the reliability and validity of the Turkish version of the HPMDQ. The secondary purpose was to evaluate the relationship between PMD and other LUTS using this questionnaire and to show whether there is a correlation between HPMDQ scoring and IPSS.

Materials and Methods

The validation and reliability study of HPMDQ Turkish was conducted between June 2020 and September 2020 at the urology outpatient clinic. This study was approved by the Selcuk University Faculty of Medicine Ethics Committee with the decision number 2020/260. In addition, written informed consent was obtained from each participant, and detailed information about the study was included.

HPMDQ

HPMDQ is the first developed questionnaire specific to PMD. Question-1(Q1) evaluates the frequency of dribbling, question-2(1.1) [Q2 (1.1)] evaluates the amount of dribbling, question-3(Q3) evaluates the discomfort the dribbling caused, question-4(Q4) evaluates the quality of life and question-5(Q5) evaluates the post-treatment improvement. Each question consists of four answers scoring between 0 to 3 points (11). In the case of Q5, it is applied only after the suggested treatment.

IPSS

The first official tool to systematically evaluate and measure LUTS is the American Urology Association Symptom Index (AUA-7). It consists of seven items that question frequency, urgency, nocturia, weak stream, intermittent stream, straining, and incomplete emptying sensation. Each item has five different responses rated between 0 and 5 points and with a total score of 35 points (12). Later on, the World Health Organization's International Consultation on Benign Prostatic Hyperplasia (BPH) added a quality of life item to AUA-7 and constituted the IPSS (8). IPSS is a self-administered questionnaire, and with this aspect, it is an easy-to-apply screening and diagnostic tool. This symptom inquiry index, whose original version is in English, has been translated into their languages by many countries, validated, and widely used for LUTS (13).

The Translation Process

Before beginning translation, a author in developing and validating the original HPMDQ (Lee WK) was contacted to request his approval to translate the English version of the questionnaire into Turkish (Supplementary File 1). Having secured this permission, the translation process began, involving extensive linguistic transformation in multiple stages. First, the HPMDQ was sent to a professional translation centre to be translated into Turkish by two independent native Turkish-speaking translators fluent in English. Arrangements were also made for two urologists (MG and MGÇ) work with the translators to provide medical advice regarding the development of the Turkish text. Thereafter, the translated text was rearranged to make it more understandable and to cover different educational and socio-cultural levels. In the next step, the final Turkish version of the HPMDQ was interpreted back into English by two independent translators who speak professional Turkish and whose native language is English. These translations were subsequently revised, and minimal corrections were made. For verification, a pilot test was then trialed with five participants with PMD and the final alterations were performed. At this point, the Turkish HPMDQ was considered ready for use (Supplementary File 2).

Study Design and Inclusion Criteria

Study participants were recruited from the Selcuk University urology outpatient clinic, between June and September 2020. Men who could read and write in Turkish were included in the study, were mentally capable, and were aged 18 years or over. Patients under 18 years, female patients, patients unable to read or write in Turkish and those with a history of LUTS-related surgery (e.g., transurethral resection or internal urethrotomy) or taking active LUTS treatment, or having illness that was related to LUTS such as urinary tract infections, bladder stones and urethral strictures were excluded from the study. Clinical secretaries oversaw the completion of forms before the face-to-face interviews. Patients diagnosed with PMD were recommended bulbar urethral massage after voiding, and they were asked to complete the Turkish HPMDQ again one month later.

Statistical Analysis

The reliability and validity of the Turkish HPMDQ were measured using internal consistency and test–retest statistical tools. To calculate the overlap in the HPMDQ response scores of the same people at different time points (i.e., initially and one month later), the intraclass correlation coefficient (ICC) was calculated for the aggregate scoring and the weighted Cohen's kappa was calculated for the scoring of each item. Concurrent validity was evaluated using correlation with the outer criteria (IPSS). Correlation coefficients of 0.1 weak, 0.3 medium and 0.5 strong were used, as proposed by Cohen.

Statistical analysis was completed using the IBM Statistical Package for the Social Sciences, version 22.0 (IBM SPSS Statistics). The level of significance was set at $p<0.05$, internal consistency reliability was evaluated using Cronbach's alpha, and test-retest reliability was assessed using the Wilcoxon signed-rank test. Spearman correlation analysis was used for simultaneous external validity. Consistency and reliability are assumed to be sufficient for values >0.70.

Results

In total, 367 patients completed the Turkish HPMDQ and IPSS forms. Of these, 103 patients met the inclusion criteria, and their Turkish HPMDQs and IPSSs were evaluated. Of the participants, n=55 (52.3%) was affected by PMD (Q1≥1) and n=48 (45.7%) were found to be completely dry. The demographic data and clinical findings of the participants are summarized in Table 1. For the HPMDQ, Cronbach's alpha was 0.903, mean inter-item correlation was 0.727 an intraclass correlation coefficient was 0.903 (confidence interval 95%: 0.869-0.931) (Table 2).

No significant difference was found between the test and retest scores for the Turkish HPMDQ; the responses to each item mostly overlapped. The Turkish translation of this questionnaire thus has medium to good reliability. While the kappa coefficient for the individual item scores was 0.628-0.838, it was 0.789 for the total score for the Turkish HPMDQ (Table 3). The relationship between the HPMDQ and the IPSS, which is the most widely used tool for evaluating LUTS, was also investigated. Considering the concurrent validity, it was observed that the HPMDQ's total score correlated significantly with that of the total IPSS ($p=0.660$, $p<0.001$), the voiding symptoms of the LUTS ($p=0.621$, $p<0.001$), and post-void residual volume ($p=0.614$, $p<0.001$) but not with the storage symptoms of the LUTS ($p=0.245$) (Table 4). The mean value of HPMDQ-Q5, evaluating the treatment response of bulbar urethra massage, was 1.81+1.02, suggesting an effective treatment of PMD.

Table 1. Demographic and clinical data of patients

Patient characteristics and findings (n=103)	Mean ± SD	Min-Max
Age	49.74±15.99	18-85
Prostate volume (mL)	60.59±27.67	27-155
Q_{max} (mL/s)	15.03±5.86	1.70-32
Q_{ave} (mL/s)	7.33±2.74	2.40-12
Post-voiding residual urine (mL)	59.22±51.68	0-200
IPSS total score	8.55±7.68	0-30

IPSS: International Prostate Symptom Score; Q_{max}: Maximum flow rate; Q_{ave}: Average flow rate, SD: Standart deviation

Discussion

According to the International Continence Society, PMD is described as "non-volitional loss of urine instantly after he or she has completed passing urine, generally leaving after the toilet for men or after outgoing the toilet for women" (1). It is a symptom of LUTS, but cannot be assessed with in the widely used symptom questionnaires such as IPSS, DAN-PSS-1 (14). These questionnaires have been validated to evaluate BPH or obstructive pathologies affecting the lower urinary system; nevertheless, they do not contain a query for PMD (12,15). Therefore, current literature is insufficient to evaluate PMD and lacks detailed reports of PMD compared with other urinary symptoms. Recently, Jeong et al. (11) Have developed a multidimensional tool (HPMDQ) to evaluate PMD; however, further studies must prove its clinical utility.

In this study, data obtained from patients PMD patients living in Turkey were used to evaluate the reliability and validity of the Turkish version of the HPMDQ. Test-retest reliability and inter-item correlation were calculated to evaluate the reliability of the HPMDQ. The IIC for this study was 0.727, which ensured sufficient circumstances for clinical trials. For each matter in HPMDQ, weighted kappa parameters varying between 0.628 and 0.838 were found. The lowest weighted kappa parameter was for PMD, and the highest was for the fourth question (quality of life). The Cronbach α value calculated as 0.903 was used for internal consistency and the questionnaire was found to be valid.

Table 2. Internal consistency analysis for each HPMDQ item and total score (n=103)

Items	Mean ± SD
HPMDQ Q-1	0.90±1.15
HPMDQ Q-2	1.17±1.39
HPMDQ Q-3	0.79±0.98
HPMDQ Q-4	1.07±1.25
Total	3.92±4.12

HPMDQ: The Hallym Post Micturition Dribble Questionnaire; SD: Standart deviation, Cronbach Alpha: 0.903, Inter-Item correlations: 0.727, Intraclass correlation coefficient: 0.903 (CI 95%: 0.869-0.931), CI: Confidence interval

Most of the previously published reports on PMD were related to its prevalence rather than its clinical significance. The prevalence of PMD in the male population has varied over a wide range in the literature. This could be caused by the various tools that were used to evaluate the PMD. Besides, some studies categorized patients as symptomatic if they had symptoms at least "sometimes", but some other studies defined the symptomatic patients as having symptoms at least "fairly often" (5,9). Nevertheless, more recent studies have shown that the prevalence rate of PMD are around 30-60% (4,9,10,16). In the HPMDQ development study, the prevalence rate of PMD in 2134 patients was found 51%, which is consistent with our findings as the 52.3% of the participants were symptomatic.

Previous studies have also shown that PMD is positively associated with aging men and BPH, but this symptom can also occur in young adults and impair the quality of life (16,17). While the enlargement of the prostate in aging men explains the pathophysiological mechanism of PMD, its occurrence in young and middle age indicates that other factors are interwoven in its pathophysiology. In a urodynamic study, it has been shown that the bulbocavernosus contraction insufficiency at the end of micturition causes PMD with pooling of urine in the bulbar urethra (18). In several different studies, it was thought that the weakening of the urethra-corpora cavernosal reflex with a similar mechanism could cause both erectile dysfunction and PMD and that these two diseases were found to be related to each other (19,20).

Regarding the clinical significance of PMD, the data on literature is scarce. In the BACH study, post micturition symptoms were more closely associated with voiding symptoms than the storage symptoms (5). Similarly, Jeong et al. (11) found that the HPMDQ total score was significantly correlated with the voiding symptoms of LUTS, PVR and prostate size but not with the irritative (storage) symptoms of LUTS. In a Japanese-men based study, PMD did not show a significant association with prostate volume and peak flow rate (16). In our study, PMD showed a significant correlation with total IPSS score, voiding symptoms of LUTS and PVR, indicating that the Turkish version of HPMDQ can reflect PMD well, as in the original development study.

Considering the treatment options for PMD, bulbar urethral massage and pelvic floor exercise (PFE) are the recommended treatment strategies. The rationale behind these treatments is based on the hypothesis that weakened pelvic floor muscle might induce PMD. It was shown that while bulbar urethral massage may show immediate treatment effect, PFE may need a longer time to take effect (3 to 6 months) (21,22). In this study, we recommended bulbar urethral massage method to patients and found that it is an effective and safe method for relieving PMD. Currently, no pharmacological treatment has been established to relieve PMD, but recently a 75 mg udenafil has been introduced as an effective treatment for PMD (23).

Several factors may limit the extrapolation and transferability of the findings from this study. First, we did not include female patients as PMD is seen in males more common and the original

Table 3. Test-retest reliability analysis for the Turkish HPMDQ

PMD (+) (n=55)	First test score	Re-test score	Weighted kappa coefficient
HPMDQ Q-1	1.69±0.77	1.04±0.84	0.829*
HPMDQ Q-2	2.18±1.17	2.12±1.03	0.628*
HPMDQ Q-3	1.47±0.88	1.02±0.73	0.793*
HPMDQ Q-4	2.00±1.02	2.00±0.98	0.838*
Total	7.35±2.53	5.62±2.63	0.789*

PMD: Post micturition dribble, HPMDQ: The Hallym Post Micturition Dribble Questionnaire, *p<0.001

Table 4. Spearman correlation analysis and concurrent validity between HPDMQ and IPSS

Items	p/r value	IPSS	Prostate volume	Q_{max}	PVR
HPMDQ Q-1	p	<0.001	0.024	0.041	0.003
	r	0.652	0.399	-0.363	0.501
HPMDQ Q-2	p	<0.001	0.015	0.144	<0.001
	r	0.520	0.427	-0.264	0.615
HPMDQ Q-3	p	<0.001	0.035	0.006	0.017
	r	0.650	0.374	-0.476	0.418
HPMDQ Q-4	p	<0.001	0.080	0.251	0.005
	r	0.559	0.314	-0.209	0.484
HPMDQ Q-5	p	0.027	0.122	0.268	0.452
	r	0.218	-0.279	0.202	0.138
Total	p	<0.001	0.009	0.035	<0.001
	r	0.660	0.453	-0.373	0.614

IPSS: International Prostate Symptom Score; Q_{max}: Maximum flow rate; PVR: Post-void residual urine (mL)

symptom assessment tool (HPMDQ) was developed for male patients with LUTS (11). Second, we did not use a paper test to evaluate the quantity of PMD, instead we relied on the self-assessments of the patients with PMD. Third, to evaluate the fifth question, only bulbar urethral massage was suggested as a treatment method. Although PFE was shown to be more effective than bulbar urethral massage in relieving PMD, bulbar urethral massage has also proven itself as a simple and effective self-help technique in the literature (24,25).

Conclusion

The Turkish version of the HMPDQ, which allows the evaluation of different aspects of PMD (frequency, severity, amount and discomfort), has been developed and has been identified as a reliable tool in evaluating patients with PMD. PMD was also significantly correlated with IPSS scores, which generally assess the severity of LUTS. This study also showed that bulbar urethra massage is an effective method to relieve PMD. This simple questionnaire would aid researchers in clinical studies and facilitate the understanding of medical applications' responses to among Turkish-speaking patients with PMD.

Ethics

Ethics Committee Approval: This study was approved by the Selcuk University Faculty of Medicine Ethics Committee with the decision number 2020/260.

Informed Consent: Written informed consent was obtained from each participant, and detailed information about the study was included.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: K.B., A.F.B., Ö.K., Concept: M.G., A.F.B., M.K., S.G., Design: A.F.B., M.K., S.G., Ö.K., Data Collection or Processing: K.B., E.A., Analysis or Interpretation: M.G.Ç., M.K., Ö.K., Literature Search: E.A., Writing: M.G., K.B., A.F.B.

Conflict of Interest: No conflict of interest was declared by the authors.

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Supplementary File 1. The Hallym Post Micturition Dribble Questionnaire (HPMDQ)
1. Over the last month, how often have you experienced dribbling after voiding when you feel you have finished urination?
0: not at all
1: 1 out of 3 times
2: 2 out of 3 times
3. almost always or always
2.(1.1) How much is dribbled urine after voiding?
1: immediately after voiding, a little
2: immediately after voiding, a lot
3: after wearing underwear, a little
4: after wearing underwear, a lot
3. Do you feel frustrated because of dribbling after voiding, when you feel you have finished urination?
0: not at all
1: slightly
2: moderately
3: a lot
4. If you were to spend the rest of your life with dribbling after voiding when you feel you have finished urination, how would you feel about that?
0: not dissatisfied
1: slightly dissatisfied
2: moderately dissatisfied
3: very dissatisfied
5. Compared to before treatment, have you experienced improvement in dribbling after voiding when you feel you have finished urination?
0: not at all
1: slightly
2: moderately
3: a lot

Supplementary File 2. Turkish validation of the Hallym Post Micturition Dribble Questionnaire (HPMDQ)
Türkçe Hallym İdrar Yapma Sonrası Damlama Anketi
1. Geçtiğimiz ay, ne sıklıkla idrarınızın bittiğini hissetmenize rağmen işeme sonrası damlama yaşadınız?
0: Hiç olmadı
1: 3 'te birinde
2: 3 'te ikisinde
3: Neredeyse her zaman ya da her zaman
2.(1.1) İdrarınızı yaptıktan sonra damlayan idrar miktarı nedir?
1: İdrar yaptıktan hemen sonra, biraz
2: İdrar yaptıktan hemen sonra, çok
3: İç çamaşırı giydikten sonra, biraz
4: İç çamaşırı giydikten sonra, çok
3. İdrarınızın bittiğini hissetmenize rağmen, işeme sonrası damlama için kendinizi rahatsız hissettiğiniz oldu mu?
0: Hiç olmadı
1: Biraz oldu
2: Kısmen oldu
3: Çok oldu
4. Farz edelim ki hayatınızın geri kalanını işemeniz bitmiş hissetmenize rağmen idrar yaptıktan sonra damlama ile geçireceksiniz, bu düşünce sizi nasıl hissettirir?
0: Olumsuz etkilemez
1: Biraz memnuniyetsiz olurum
2: Kısmen memnuniyetsiz olurum
3: Çok memnuniyetsiz olurum
5. Aldığınız tedavi öncesine göre, işemenizin bittiğini hissetmenize rağmen işeme sonrası idrar damlaması durumunda düzelme yaşadınız mı?
0: Hiç olmadı
1: Biraz oldu
2: Kısmen oldu
3: Çok oldu