Turkish validation of the Hallym Post Micturition Dribble Questionnaire (HPMDQ) and evaluation of bulbar urethral massage response

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Abstract

Abstract Background: 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 is to evaluate the validity and reliability of the Turkish version of the Hallym Post Micturition Dribble Questionnaire (Turkish 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. Methods: The English version of HPMDQ went through a multi-stage translation process. The final draft of the Turkish HPMDQ and IPSS were queried to male patients who admitted to the urology outpatient clinic between June 2020 and September 2020. The responses of 103 patients who satisfy the inclusion criteria were analysed. 55 people suffering from PMD were offered bulbar urethral massage for one month and then re-applied with the questionnaires. Results: The kappa coefficient for the total score for the Turkish HPMDQ 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 (ρ: 0.660, $p < 0.001$), the voiding symptoms of the LUTS (ρ: 0.621, $p < 0.001$), and post-void residual volume (ρ: 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. Conclusions: 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

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Methods: The English version of HPMDQ went through a multi-stage translation process. The final draft of the Turkish HPMDQ and IPSS were queried to male patients who admitted to the urology outpatient clinic between June 2020 and September 2020. The responses of 103 patients who satisfy the inclusion criteria were analysed. 55 people suffering from PMD were offered bulbar urethral massage for one month and then re-applied with the questionnaires.

Results: The kappa coefficient for the total score for the Turkish HPMDQ 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 (ρ: 0.660, $p < 0.001$), the voiding symptoms of the LUTS (ρ: 0.621, $p < 0.001$), and post-void residual volume (ρ: 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**.**

Conclusions: 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

What's already known about this topic?

Quality of life scales, questionnaires and scoring systems have been used in many

areas of modern medicine to provide reproducible and accurate measurements.

PMD is common as an isolated symptom in men, HPMDQ has been developed as the only measurement tool for this symptom.

There are not many options in the treatment of PMD and the most common management is the bulbar urethral massage for this condition.

What does this article add?

- This study could lead to the validation of HPMDQ by different countries.
- Moreover, thanks to this validation study, a valid questionnaire was obtained for Turkish studies on PMD.
- The effectiveness of bulbar urethral massage is used in the treatment of PMD can be evaluated more objectively with this questionnaire.

1. Introduction:

Post micturition dribble (PMD) is considered one of the post-micturition symptoms (PMS) along with the sensation of incomplete emptying. It is defined as the involuntary loss of urine immediately after a person has finished urinating, generally just after leaving the toilet in men[1]. The exact pathophysiological mechanism for PMD is unclear and it can be found in men without any underlying pathognomonic findings [2]. The

prevalence rates of PMD in men is positively associated with advanced age and were reported in a wide range between 5.5% and 58.1% [3,4]. PMD was also shown to be accounted for much of PMS in men [5] and it was postulated that PMD is perhaps one of the most common lower urinary tract symptoms (LUTS) [5-7].

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[8,9]. PMS has always been evaluated together with other LUTS in these questionnaires. However, an isolated questionnaire for PMD was lacking and out of researchers' interest. As the recent epidemiologic studies including TAMUS and EpiLUTS demonstrated higher rates of PMD prevalence [4,10,11], Jeong et al.[12] 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[12].

In this study, our primary aim was to evaluate the validity and reliability of the Turkish version of HPMDQ (Turkish HPMDQ). The secondary aim 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.

2. Methods:

The validation and reliability study of HPMDQ Turkish was conducted between June 2020 and September 2020 at the urology outpatient clinic. Selcuk University Faculty of Medicine Local Ethics Committee approved this study with a decision number of 2020/260. Each participant was informed about the study, and their written consent was obtained.

2.1 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 [12]. In case of Q5, it is applied only after the suggested treatment.

2.2 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 [13]. 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 [9]. IPSS is a self-administered questionnaire, and with this aspect, it is an easy-to-apply screening and diagnosis tool. This symptom inquiry index, which original version is in English, has been translated into their languages by many countries, validated, and widely used for LUTS [14].

2.3 Translation process

Before beginning translation, one of the authors involved 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. 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) to work with the translators to provide medical advice regarding the development of the Turkish text. After that, the translated text was rearranged to make it more comprehensible to cover different socio-cultural and educational levels. In the next step, the last Turkish version of the HPMDQ was translated back into English by two native English-speaking independent, professional translators fluent in Turkish. Back translations then were reviewed and minimal revisions were made. For

verification, a pilot test was then trialled with five participants with PMD and the final alterations were performed. At this point, the Turkish HPMDQ was considered ready for use.

2.4 Study design and inclusion criteria

Study participants were recruited from the Selçuk University urology outpatient clinic, between June and September 2020. Participants were included in the study if they were male, could read and write in Turkish, 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, urethral strictures and those who did not wish to participate the study 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.

2.5 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 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 sufficient for values >0.70.

3. 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%) suffered from PMD (Q1[?]1) and n = 48 (45.7%) were found to be completely dry. The demographic data and clinical findings of the participants are summarised 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 (CI 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 the evaluation of 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 (ρ: 0.660, $p < 0.001$), the voiding symptoms of the LUTS (ρ: 0.621, $p < 0.001$), and post-void residual volume (ρ: 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.

4. Discussion

According to International Continence Society, PMD is defined as "involuntary loss of urine immediately after he or she has finished passing urine, usually leaving after the toilet for men or after rising from the toilet for women" [15]. It is a symptom of LUTS, but cannot be assessed with in the widely used symptom questionnaires such as IPSS, DAN-PSS-1 [16]. 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 [13,17]. Therefore, current literature is insufficient to evaluate PMD and lacking detailed reports of PMD compared with other urinary symptoms. Recently, Jeong et al.[12] have developed a multidimensional tool (HPMDQ) to evaluate PMD; however, further studies are required to prove its clinical utility.

In this study, the validity and reliability of the Turkish version of HPMDQ were evaluated using the data collected from PMD patients residing in Turkey. For assessing the reliability, the test-retest reliability and inter-item correlation of HPMDQ were evaluated. The IIC for this study was 0.727, which provided a sufficient condition for clinical trials. For each item in HPMDQ, weighted kappa coefficients ranging from 0.628 to 0.838 were found. The highest weighted kappa coefficient was for the fourth question (quality of life), while the lowest weight was for the amount of PMD. For internal consistency, a Cronbach α value of 0.903 was calculated, and it was determined that the survey was valid.

Most of the previous published reports on PMD have focused on the prevalence of PMD rather than its clinical significance. The prevalence of PMD in the male population varied in a wide range in the literature. This could be caused by the various tools that were used to evaluate the PMD. Besides, some studies categorised patients symptomatic if they had symptoms at least "sometimes" , but some other studies defined the symptomatic patients as they had symptoms at least "fairly often"[5,10]. Nevertheless, more recent studies have shown that the prevalence rates of PMD are around 30-60%[4,10,11,18]. 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 quality of life [18,19]. While enlargement of the prostate in aging men explains the pathophysiological mechanism of PMD, its occurrence in young and middle ages 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[20]. 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 related to each other [21,22].

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. 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 [12]. In a Japanese-men based study, PMD did not show significant association with prostate volume and peak flow rate[18]. In our study, PMD showed a significant correlation with total IPSS score, voiding symptoms of LUTS and PVR, indicating that 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 longer times to take effect (3 to 6 months)[23,24]. 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 of udenafil has been introduced as an effective treatment for PMD [25].

Several factors may limit the extrapolation and transferability of findings from this study. First, we did not include female patients as PMD is seen in males more common and the original symptom assessment tool (HPMDQ) was developed on male patients with LUTS[12]. Second, we did not use paper test to measure the amount 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 [26,27].

In conclusion, The Turkish version of HPMDQ, which assesses the different aspects of PMD including frequency, severity, amount and discomfort has been developed and determined as a reliable tool for 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 among Turkish speaking patients with PMD.

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on

request from the corresponding author. The data are not publicly

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Disclosure:

The authors declare that they have no conflict of interest. The authors are alone responsible for

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