

## The Importance of Verbal and Written Instructions for Patients Undergoing Pressure-Flow Urodynamic Studies

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### Abstract

**Background:** Urodynamic procedure identifies how well bladder, sphincters, and urethra are storing and releasing urine.

**Aim:** Evaluate the importance of verbal and written instructions in outcomes of patients undergoing pressure-flow urodynamic studies.

**Research Design:** Randomized controlled trial.

**Patients and Methods:** A total of 130 adult patients with no previous experience with urodynamics were attended to urodynamic outpatient clinic at Assiut Urology and Nephrology University Hospital to perform pressure-flow urodynamic studies from April 2016 to April 2018. Patients were divided randomly into 2 groups; odd numbers = study group (65 patients received routine instructions, detailed explanation about the procedure and received pressure-flow urodynamic brochure) and even numbers = control group (65 patients received routine instructions only).

**Tools:** Assessment sheet for patients undergoing pressure-flow urodynamic studies, Spielberger six-item short form state trait anxiety inventory, urodynamic – patient satisfaction questionnaire and pressure-flow urodynamic brochure.

**Results:** Study group was significantly better regarding all outcome parameters; cooperation, satisfaction, less procedure time and repetition, and less state trait anxiety inventory score.

**Conclusion:** Patients education and good communication skills significantly affect outcomes of patients undergoing pressure-flow urodynamic studies.

**Keywords:** Pressure-flow urodynamic studies, Pressure-flow urodynamic brochure, Anxiety, Cooperation, Satisfaction

### What is Already Known about the Topic?

- Invasive urodynamics are stressful procedures.
- Education of patients can improve various aspects of health care.

### What This Paper Adds?

- It emphasizes the importance of written and verbal health education for patients undergoing urodynamics.
- This should make the availability of the educational brochure in urodynamic clinics the standard of care.

### 1. INTRODUCTION

Urodynamic is a group of tests carried out to evaluate bladder function and efficiency and to diagnose urinary incontinence, bladder outflow obstruction, overactive bladder, neurogenic bladder and lower urinary tract symptoms (Nambiar et al., 2017 and Patel and Kobashi, 2013). It evaluates the pressure-flow relationship between the bladder and the urethra and reveals the underlying pathophysiology responsible for patients' complaints (Gill et al., 2016).

Urodynamic procedure provides information cues about appropriate treatment options as surgery in diagnosis of genuine stress incontinence or drug therapy in presence of detrusor instability.

However, this diagnostic procedure is potentially distressing and embarrassing for patients (Winters et al., 2012).

Urodynamic tests usually encompass uroflowmetry, post-void residual measurement and filling and voiding cystometry and pressure-flow studies (Haylen et al., 2010). Invasive urodynamics involve any test that includes insertion of one or more catheters into the bladder and/or other body cavities. Non-invasive urodynamics are done without insertion of catheters such as uroflowmetry and post-void residual measurement (Rosier et al., 2015).

To perform pressure-flow urodynamic studies, patient should attend to clinic with full bladder. Patient is asked to undress and empty bladder into a commode-like toilet which is electronically attached to a recording machine. This measures the rate of the flow of urine. Two catheters are inserted; one into the bladder and one into the rectum. Normal saline is slowly passed into the bladder via transurethral catheter (Rosier et al., 2010). Intra-abdominal pressure is simultaneously measured by a balloon catheter that is inserted transrectally while vesical pressure is measured by the transurethral catheter. The detrusor pressure is measured by subtracting intra-abdominal pressure from intravesical pressure. When the patient indicates full bladder, normal saline flow is discontinued and the patient is asked to cough to assess leakage from the bladder. Finally patient empties bladder into the commode and the two catheters are removed. This procedure takes about 40-60 minutes. It is not normally painful but it can be unpleasant (Valdevenito et al., 2014 and Yamanishi et al., 2011).

Patients undergoing urodynamic procedure experience a combination of anxiety because of fear of unknown and embarrassment due to the intimate nature of the procedure and lack of privacy (Biardeau et al., 2017).

Nurses should take more active role in urodynamic procedure. Interpersonal and communication skills of the healthcare team were central in alleviating these negative feelings. Establishment of a relationship based on mutual respect and trust is important in preventing/reducing anxiety and embarrassment (Yeung et al., 2014). Pre-urodynamic information is extremely important. Patients should receive information prior to urodynamic to relieve

anxiety (Stav et al., 2016). Nurses should be sure that patients are aware at all times of what is happening and how it is relevant to the procedure. Preparing the urodynamic outpatient clinic to ensure that the procedure environment is as comfortable as possible will help to alleviate patient anxiety and ensure more accurate procedure results. Maintaining privacy and covering unnecessary medical equipment is also important (Lajiness and Quallich, 2016). Pre-urodynamic information make patients satisfied with the care provided (Terry et al., 2018).

### **Aim of the Study**

To evaluate the importance of verbal and written instructions in outcomes of patients undergoing pressure-flow urodynamic studies.

### **Research Hypothesis**

The study group will do significantly better regarding all outcome parameters; cooperation, satisfaction, less procedure time and repetition, and less Spielberger six-item short form state trait anxiety inventory score than the control group.

### **Patients' Outcomes**

Spielberger six-item short form state trait anxiety inventory score, cooperation, satisfaction and procedure time and repetition.

## **2. PATIENTS AND METHODS**

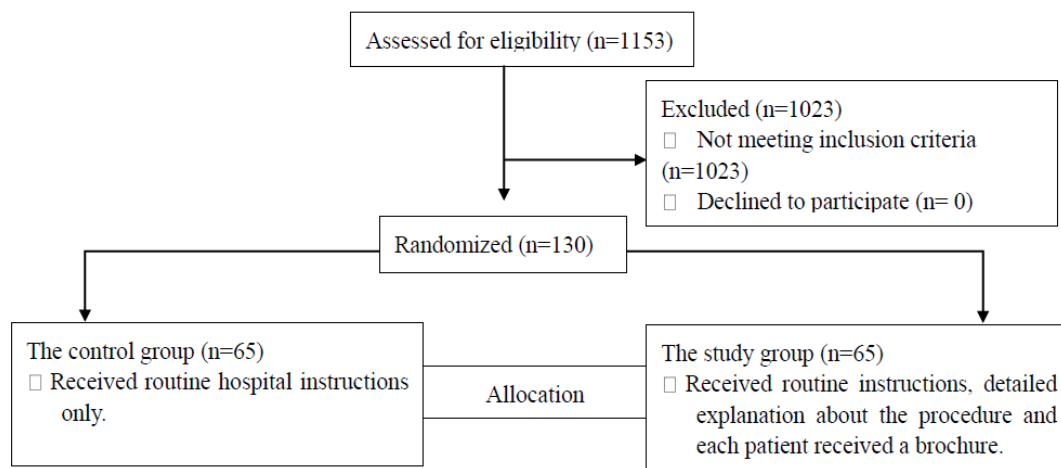
Randomized controlled trial research design was used to conduct our study.

### **Patients and Study Setting**

Through a period of 2 years from April 2016 to April 2018, a total of 130 patients meeting the inclusion criteria had been referred to urodynamic outpatient clinic at Assiut Urology and Nephrology University Hospital for pressure-flow urodynamic assessments and those were recruited to our study.

Inclusion criteria included all male and female patients with age ranged from 18-65 years with no previous experience with urodynamic assessments and undergoing pressure-flow urodynamic studies.

Patients divided randomly into 2 groups; odd numbers represented study group (65 patients received routine instructions, detailed explanation about the procedure and each patient received a brochure containing detailed information about the procedure) and even numbers represented control group (65 patients received routine hospital instructions only).



*Flow diagram of selecting randomized study sample*

**Ethical Issues**

Official approval to conduct our study was obtained from the local ethical committee. After researchers explanation to the study nature and aim, patients gave us oral permission to participate in our study. The researchers respect the dignity of patients as human beings, we deal with patients in simple and respectful manner and privacy was maintained. Patients informed that their participation in our study was not compulsory, they can withdraw from the study when they want and their care would not be affected. The researchers explained to patients that their names would not be used in reporting of the study.

**Tools**

**I. Assessment Sheet for Patients Undergoing Pressure-Flow Urodynamic Studies**

We developed this tool to assess patients' age, gender, level of education, causes of referral to urodynamic, cooperation during urodynamic procedure and need for repetition. Whether the patient was cooperative or not was determined by the operator physician. The length of the procedure was reported from the beginning of catheters fixation till the removal of catheters.

**II. Spielberger Six-Item Short Form State Trait Anxiety Inventory**

Marteau and Bekker (1992) developed the six-item short form of the state scale of the Spielberger state-trait anxiety inventory (Spielberger et al., 1983). It is a reliable and sensitive self-reported measure to indicate the intensity of feeling with anxiety. It has anxiety absent and anxiety present statements.

Six-item answered on a 4-point Likert scale indicate how feel right now, at this moment. (1)

= not at all, (2) = somewhat, (3) = moderately and (4) = very much.

**Scoring:** Reverse scoring of the positive items [calm, relaxed, content] so [1=4], [2=3], [3=2] and [4=1]. Sum all six scores. Multiply total score by 20/6. The total score range from (20–80). Normal score is approximately (34–36) (Bekker et al., 2003).

**III. Urodynamic – Patient Satisfaction Questionnaire**

This questionnaire was developed by (Sait et al. 2014) to assess how patients found the service that was offered. It consists of 9 questions; 7 questions answered on a visual analogue scale [0-10] with (0) =not at all and (10) =extremely. Other 2 questions concerning waiting time to perform urodynamic procedure and recommending urodynamic procedure to others.

**Pressure-Flow Urodynamic Brochure**

Our brochure for patients undergoing pressure-flow urodynamic studies consisted of Arabic information and illustrated images. In designing the pressure-flow urodynamic brochure we were guided by similar brochures from (British Association of Urological Surgeons, 2017), (International Urogynecological Association, 2011) and (Canadian Urological Association, 2014). The brochure consisted of illustrated diagrams of the procedure with different answered questions:

- What is pressure-flow urodynamic studies?
- Why is pressure-flow urodynamic studies performed?
- Are any preparations required?
- Are there any risks?
- How is the procedure performed?
- What to expect afterwards?

### **Content Validity and Reliability**

Our study content was valid and reliable; our study tools and pressure-flow urodynamic brochure were formulated after extensive national and international literature review. Validity of the content was revised and checked by five academic experts (3 staff of urology and 2 staff of medical-surgical nursing departments in Assiut University). Reliability was investigated by correlation coefficient (0.86).

Pilot study; our study procedures were conducted on (10% of patients) 13 patients for testing clarity, feasibility and applicability of study tools. No problem was encountered. No changes were done in our study tools. So, those patients were included in the main study.

### **Procedures**

All pressure-flow urodynamic procedures were performed in the urodynamic outpatient clinic at Assiut Urology and Nephrology University Hospital with the attendance of the researchers before, during and after the procedure. Pre-procedure all patients were assessed for their age, gender, level of education and causes of referral to urodynamic. Pre-procedure anxiety was assessed for all patients using Spielberger six-item short form state trait anxiety inventory.

Patients interviews were carried out in urodynamic outpatient clinic at Assiut Urology and Nephrology University Hospital, the morning before the procedure. The researchers were present with patients before, during and after pressure-flow urodynamic procedure. The control group received routine care by the healthcare provider.

The morning before the procedure each patient in the study group received detailed explanation and instructions about the procedure and their roles during procedure. Each patient in that group received the designed brochure about the procedure. Time spent on explanations varied from one patient to another. The researchers used simple understandable words according to the level of patients education with friendly, relaxed and informal approach.

The patients were informed about certain measures that were prepared to afford as much privacy as possible including small room, presence of curtains in the examination area and few healthcare personnel. The researchers answered all the patients questions about the

procedure. After that pre-procedure anxiety was assessed for study group.

Post- procedure we recorded the length of the procedure for all patients. Patients' satisfaction was assessed for all patients using urodynamic-patient satisfaction questionnaire immediately after the procedure.

**Sample Size:** To reach 90% power of study for detection of a moderate effect size assuming 5% type I statistical error, a sample size of 125 patients (in both groups) was found to be sufficient. So, we included 65 patients in each group.

**Statistical Analysis:** Statistical analysis was done using IBM SPSS version 21. The two study groups were compared regarding pre-procedure and outcome parameters. Qualitative data was analyzed using Chi-square test, while quantitative data was analyzed using student t test. Statistical significance was considered when p value equals to or less than 0.05.

### **3. RESULTS**

This study included 97 (74.6%) males and 33 (25.4%) females. Regarding age, half of the patients of each group exactly lie between 50-65 years with mean age (44.8±10.37) for study and (42.9±8.56) for control groups. The level of education was high in 2 (1.6%) patients only, while 44 (33.8%) patients had a secondary education level, 40 (30.8%) can only read and write and 44 (33.8%) were totally illiterates. The clinical presentations were obstructive and retentive symptoms in 70 (53.8%) patients, nocturnal enuresis in 27 (20.8%), stress urinary incontinence in 26 (20%) and overactive bladder in 7 (5.4%).

The mean time taken for pressure-flow study was 29.3 (±8.5) minutes. The operators declared that 37 (28.5%) patients were uncooperative, and needed to repeat pressure-flow urodynamic study for 73 (56.2%) patients. The mean state trait anxiety inventory score was 64.9 (±14.1).

On comparison between the study and control groups (table 1), there was no significant difference regarding pre-procedure criteria (gender, age, education level and presenting symptoms). On the other hand, the study group was significantly better regarding all outcome parameters. Patients in the study group was more cooperative, needed less repetition, had less procedure time and had less Spielberger six-item short form state trait anxiety inventory score (table 1).

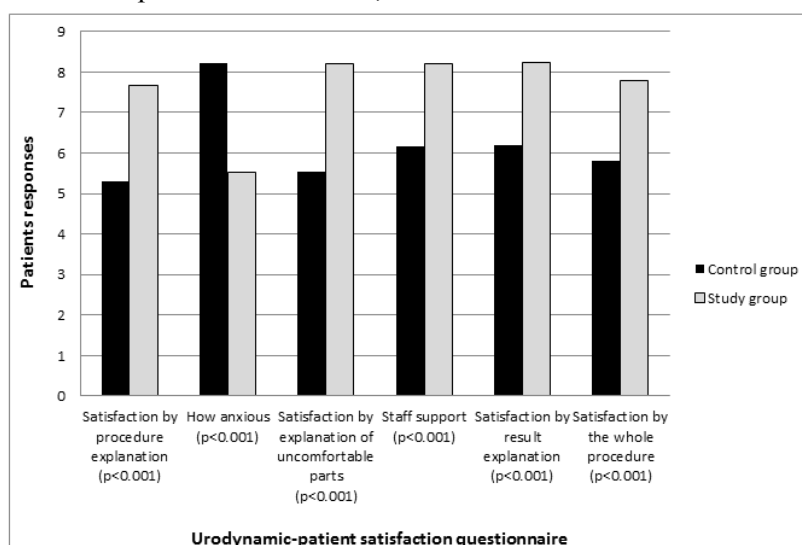
**Table1.** Comparison between study and control groups regarding pre-procedure criteria and outcome parameters

Variables	Study group (No. = 65)	Control group (No. = 65)	P value
<b>Gender</b>			
• Male	48	49	0.840
• Female	17	16	
<b>Age (years)</b> Mean ± SD	44.8±10.37	42.9±8.56	0.380
<b>Level of education</b>			
• High	2	0	0.105
• Secondary	19	25	
• Read and write only	25	15	
• Illiterate	19	25	
<b>Clinical presentation</b>			
• Obstructive and retentive symptoms	37	33	0.402
• Nocturnal enuresis	13	14	
• Stress incontinence	10	16	
• Overactive bladder	5	2	
<b>Patient cooperation</b>			
• Yes	60	33	< 0.001**
• No	5	32	
<b>Need for repetition</b>			
• Yes	27	46	0.001**
• No	38	19	
<b>Procedure time (minutes) Mean ± SD</b>	24.7 (±7.1)	33.9 (±7.2)	< 0.001**
<b>Spielberger state-trait anxiety inventory score (initial assessment) Mean ± SD</b>	74.2(±9.6)	72.3 (±8.2)	0.750
<b>Spielberger state-trait anxiety inventory score (post-education) Mean ± SD</b>	57.6 (±15)	72.3 (±8.2)	< 0.001**

\*\*p ≤ 0.001

Regarding urodynamic-patient satisfaction questionnaire results, patients in the study group had significantly better responses for six questions as shown in (figure 1). They were more satisfied by explanation of the procedure, more satisfied by explanation of uncomfortable parts, more satisfied by explanation of results and more satisfied by the whole experience. Moreover,

they were less anxious and felt that the healthcare providers were more supportive. All patients were satisfied by the privacy policy in the urodynamic outpatient clinic, and 109 (83.8%) [65 (100%) of study group and 44 (67.69%) of control group] said that they would recommend it for others that are indicated for urodynamic studies.



**Figure1.** Bar chart comparing responses of study and control groups patients toward urodynamic-patient satisfaction questionnaire

#### **4. DISCUSSION**

The main targets of our study were reducing patients' feelings of anxiety, fear and improving satisfaction. Cooperation during procedure and procedure duration and repetition are also essential items for the quality of procedure. The importance of pre-procedure education and good interpersonal and communication skills in alleviating anxiety and fear, reducing procedure time, lessing procedure repetition and gaining patients` cooperation and satisfaction is our theme.

Our study showed that half of the patients of each group their age ranged from (50-65 years) with mean age (44.8±10.37) for study and (42.9±8.56) for control groups. The largest percentages of them were males. More than half of patients of both groups presented with obstructive and retentive symptoms. Other clinical presentations included nocturnal enuresis, stress urinary incontinence or overactive bladder.

In the same line, Janjua et al. (2008) conducted a study on 466 patients undergoing urodynamic procedure with mean age 46.8±11.16 years. More than half of them their age lie from 50-60 years. The largest percentages of them were males. Those patients presented with various voiding disorders included obstructive and retentive symptoms, incontinence or neurogenic bladder.

Our study showed that pre-urodynamic procedure anxiety was decreased after verbal and written information (pressure-flow urodynamic brochure) for study group patients than control group. This result clarified the benefit from verbal and written information in addition to interpersonal and good communication (friendly, relaxed and informal approach) by the researchers. Patients experienced anxiety because of fear of unknown, fear of procedure and fear of lack of privacy.

Improving various aspects of health care can be done by patients education (Adams, 2010). The provision of patients education at the point of care improves patients satisfaction and outcomes, improves quality of care and lowers health care costs (Eckman et al. 2012). Effective counseling and constant communication with patients help allay anxiety and shame in patients undergoing urodynamics (de Lima Junior et al. 2015).

Our study results are in agreement with study of (Terry et al. 2018) who concluded that prior to

watching the video, a large number of patients had a poor understanding of how urodynamic works and why it is performed. They had a general interest in learning more about the procedure. The majority of them were satisfied by the video, felt well-prepared and felt that urodynamic procedure aligned with their expectations. All patients agreed that the video provided useful information, and the majority of them recommended the video to anyone prior to urodynamic procedure.

In contrary, study of (Solomon and Ridgeway, 2016) concluded that music and an educational video did not decrease anxiety in patients undergoing urodynamic compared to usual care.

Our study showed that education before urodynamics made study group patients more cooperative and led to less procedure time and repetition than control group.

These findings support those of (Ku et al, 2004) who reported that urodynamic procedure should be undertaken after explaining the nature of the procedure and why it required. When patients undergoing urodynamic procedure provided with necessary information about the nature of the procedure, they would be less anxious and would cooperate more willingly during the procedure.

Study of (Suskind et al. 2015) stated that emotional support prior to urodynamic procedure might enhance the level of patient cooperation.

Also, our findings are consistent with those of (Selman et al., 2018) who found that urodynamic procedure was well-tolerated with patients experiencing minimal to moderate discomfort and embarrassment. Levels of discomfort and embarrassment experienced during urodynamic procedure varied, it were related to the intimate nature of the procedure and lack of awareness or preparation. The key to reduce embarrassment was good communication and privacy. To ensure that patients are prepared and informed, good communication before and during urodynamic procedure is essential. Privacy should be prioritized and urodynamic procedure should be discussed promptly with sufficient details.

Previous research suggested that urodynamics are less acceptable to younger patients (Yiou et al. 2015). This was not evident among our patients, but this could be due to the large percentage of patients ranged from 50-65 years.

Patients in study group were more satisfied by explanation of the procedure, explanation of uncomfortable parts, explanation of results and

the whole experience. They were less anxious and felt that the healthcare providers were more supportive. All patients were satisfied by the privacy policy in the urodynamic unit, and all patients in study group and more than half of patients in control group recommend urodynamic procedure for others that are indicated for urodynamic studies.

Overall patients` satisfaction provides an overoptimistic evaluation of patients` experiences. Patients` satisfaction has become important as independent outcome measure and as assessment of the quality of nursing services. It has been used as a predictor of health behavior to continue using services, comply with care protocols, disclose important information and have better health outcomes (Mosadeghrad, 2014).

Our study results are in agreement with study of (Shaw et al. 2000) who recommended that to provide vital information effectively health care team must have good communication and interpersonal skills with patients undergoing urodynamic procedure based on mutual respect and trust. Maintaining the patients' privacy and self-respect is important in relieving anxiety and improving patients' satisfaction.

Our study findings are supported by the study of (Suskind et al. 2015) who found that the majority of patients reported that urodynamic procedure was the same as or better than expected and the majority would undergo urodynamic procedure again if medically indicated.

Hence, education for patients undergoing pressure-flow urodynamic procedure is an important issue which was the motive to provide verbal information and design educational brochure for them.

## **5. CONCLUSION**

Education before and during pressure-flow urodynamic procedure, constant and effective communication and ensuring privacy are important and vital parts to minimize patients` anxiety, gain cooperation, improving satisfaction and lessing procedure time and repetition.

### **Recommendations**

1. Nurses should aim to take on a much wider role in urodynamic clinic.
2. Allocate a room for health education in the urodynamic outpatient clinic to provide

emotional support and needed information to patients.

3. Patients undergoing pressure-flow urodynamic procedure should prepared enough and informed with necessary information.
4. Urodynamic staff should maintain effective communication and provide emotional support to patients before and during urodynamic to enhance the level of patients` cooperation.
5. Educational brochures should be available in any urodynamic clinics.

### **REFERENCES**

- [1] Adams R.J., (2010). Improving health outcomes with better patient understanding and education. *Risk Management and Healthcare Policy*, 3, 61.
- [2] Bekker H.L., Legare F., Stacey D., O'Connor A., and Lemyre L., (2003). Is anxiety a suitable measure of decision aid effectiveness: a systematic review? *Patient education and counseling*, 50(3), 255-262.
- [3] Biardeau X., Lam O., Van Ba L.C., and Corcos J., (2017). Prospective evaluation of anxiety, pain, and embarrassment associated with cystoscopy and urodynamic testing in clinical practice, *Canadian Urological Association Journal*, 11(3-4), 104.
- [4] British Association of Urological Surgeons, (2017). Urodynamic Studies: Pressure tests on your bladder, Information about your procedure, Leaflet No: 16/039, 1-5, [http://www.baus.org.uk/\\_userfiles/pages/files/Patients/Leaflets/Urodynamics.pdf](http://www.baus.org.uk/_userfiles/pages/files/Patients/Leaflets/Urodynamics.pdf)
- [5] Canadian Urological Association, (2014). Urologic Health: Urodynamic Assessment, Information Leaflet, 1-2
- [6] de Lima Junior M. M., Pereira Y. P., de Souza Silva J., and Granja F., (2015). Influence of Pre-Examination Counseling in Women with Incontinence Undergoing Urodynamic Assessments: A Retrospective Study, *Journal of Pioneering Medical Sciences*, 5(4).
- [7] Eckman M.H., Wise R., Leonard A.C., Dixon E., Burrows C., Khan F., and Warm E., (2012). Impact of health literacy on outcomes and effectiveness of an educational intervention in patients with chronic diseases, *Patient Educ Couns.*, 87(2), 143-51. DOI: <http://dx.doi.org/10.1016/j.pec.2011.07.020>.
- [8] Gill B.C., Rackley R.R., Talavera F., Noble M.J., Kim E.D., and Terris M.K., (2016). Urodynamic Studies for Urinary Incontinence, Published article, WebMD LLC., <https://emedicine.medscape.com/article/1988665-overview#showall>

- [9] Haylen B.T., de Ridder D., and Freeman R.M., (2010). IUGA/ICS joint report on the terminology for female pelvic floor dysfunction, *Neurourol Urodynamics*, 29:4–20.
- [10] International Urogynecological Association, (2011). *Urodynamics: A Guide for Women*, 1-2
- [11] Janjua S.H., Mehmood T., and Yasmin, R., (2008). Uro-Dynamic evaluation, *Professional Med J*, 15, 361-66.
- [12] Ku J.H., Kim S.W., Kim H.H., Paick J.S., Son H., and Oh S.J., (2004). Patient experience with a urodynamic study: a prospective study in 208 patients, *J Urol*, 171, 2307–10
- [13] Lajiness M., and Quallich S., (2016). *The nurse practitioner in urology*, Springer International Publishing, 198
- [14] Marteau T.M. and Bekker H., (1992). The development of a six item short - form of the state scale of the Spielberger State-Trait Anxiety Inventory, *British Journal of Clinical Psychology*, 31, 301-306
- [15] Mosadeghrad A. M., (2014). Factors influencing healthcare service quality, *International journal of health policy and management*, 3(2), 77.
- [16] Nambiar A.K., Lemack G.E., Chapple C.R., and Burkhard F.C., (2017). The Role of urodynamics in the evaluation of urinary incontinence: The European Association of Urology Recommendations in 2016. *European urology*, 71(4), 501-503.
- [17] Patel B.N., and Kobashi K.C., (2013). Practical use of the new American Urological Association adult urodynamics guidelines, *Current urology reports*, 14(3), 240-246.
- [18] Rosier P.F., GaJewski J.B., Sand P.K., Szabó L., Capewell A., and Hosker G.L., (2010). Executive summary: The International Consultation on Incontinence Committee on “Dynamic Testing”; for urinary incontinence and for fecal incontinence, Part 1: innovations in urodynamic techniques and urodynamic testing for signs and symptoms of urinary incontinence in female patients, *Neurourology and Urodynamics: Official Journal of the International Continence Society*, 29(1), 140-145.
- [19] Rosier P.F., Schaefer W., Lose G., Goldman H.B., Guralnick M., Eustice S., and Hashim H., (2015). International Continence Society Standard Good Urodynamic Practices and Terms, *Urodynamics, Uroflowmetry, Cystometry and Pressure-Flow Study*, In *International Continence Society Annual Meeting*, Montreal, Canada.
- [20] Sait M.S., Mitha N., Fazili Z., and Masood S., (2014). Patient Satisfaction After Urodynamics, *Medway Foundation Trust Hospital Gillingham, A prospective Study*, 598, <https://www.ics.org/Abstracts/Publish/218/000598.pdf>
- [21] Selman L.E., Ochieng C.A., Lewis A.L., Drake M.J., and Horwood J., (2018). Recommendations for conducting invasive urodynamics for men with lower urinary tract symptoms: Qualitative interview findings from a large randomized controlled trial, *Neurourology and urodynamics*.
- [22] Shaw C., Williams K., Assassa P.R., and Jackson C., (2000). Patient satisfaction with urodynamics: a qualitative study, *Journal of advanced nursing*, 32(6), 1356-1363.
- [23] Solomon E. R., and Ridgeway B., (2016). Interventions to decrease pain and anxiety in patients undergoing urodynamic testing: A randomized controlled trial, *Neurourology and urodynamics*, 35(8), 975-979.
- [24] Spielberger C.D., Gorsuch R.L., Lushene R., Vagg P.R., and Jacobs G.A., (1983). *Manual for the State-Trait Anxiety Inventory*, Consulting Psychologists Press, Inc.; Palo Alto, CA.
- [25] Stav K., Siegel Y.I., Beberashvili I., Sella H.Z. and Zisman A., (2016). Provision of information leaflet before urodynamic study reduces the pre-examination anxiety level, *Neurourology and urodynamics*, 35(7), 805-808.
- [26] Suskind A.M., Clemens J.Q., Kaufman S.R., Stoffel J.T., Oldendorf A., Malaeb B.S., Jandron T., and Cameron A.P., (2015). Patient perceptions of physical and emotional discomfort related to urodynamic testing: a questionnaire-based study in men and women with and without neurologic conditions, *Urology*, 85(3), 547-551.
- [27] Terry R., Gupta M., Brafman A., Zann A., Han J., Rabley A., and Moy L., (2018). Education Prior to Urodynamics Increases Patient Satisfaction, *The Journal of Urology*, 199(4), 348.
- [28] Valdevenito J.P., Leonard A., Griffiths C.J., Pickard R., and Harding C., (2014). Differences in urodynamic voiding variables recorded by conventional cystometry and ambulatory monitoring in symptomatic women, *International braz j urol*, 40(5), 666-675.
- [29] Winters J.C., Dmochowski R.R., Goldman H.B., Herndon C.A., Kobashi K. C., Kraus S.R., and Wein A.J., (2012). Urodynamic studies in adults: AUA/SUFU guideline, *The Journal of urology*, 188(6), 2464-2472.
- [30] Yamanishi T., Sakakibara R., Uchiyama T., and Hirata K., (2011). Role of urodynamic studies in the diagnosis and treatment of lower urinary tract symptoms, *Urological Science*, 22(3), 120-128.



- [31] Yeung J.Y., Eschenbacher M.A., and Pauls R.N., (2014). Pain and embarrassment associated with urodynamic testing in women, *International urogynecology journal*, 25(5), 645-650.
- [32] Yiou R., Audureau E., Loche C.M., Dussaud M., Lingombet O., and Binhas M., (2015). Comprehensive evaluation of embarrassment and pain associated with invasive urodynamics, *Neurourol Urodynamics*, 34, 156–160.

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