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Review Article

Understanding King's Health Questionnaire (KHQ) in assessment of female urinary incontinence

Shripad Hebbar[1], Harshita Pandey[1]*, Arun Chawla[2]

[1]Department of Obstetrics and Gynaecology, KMC Manipal, Manipal University, Manipal, Karnataka, India
[2]Department of Urology, KMC Manipal, Manipal University, Manipal, Karnataka, India

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***Correspondence:**
Dr. Harshita Pandey,
E-mail: pandey.kmc@gmail.com

ABSTRACT

Urinary incontinence has emerged as one of the leading medical problems for the geriatric population worldwide. Women are affected physically, mentally and socially and face embarrassment, depression and isolation. Increased life expectancy further adds to the prevalence of the condition and social, economic and health care burden. Although not sinister by itself, urinary incontinence has a profound impact on a woman's quality of life and warrants appropriate management. The efficacy of interventional procedures is measured by the caregiver mainly by improvement in urodynamic parameters. However, these gadgets do not assess the individual's satisfaction and feeling of wellbeing following the therapeutic intervention. Several generic QoL tools have been developed in an attempt to quantify these changes. But ironically, generic QoL questionnaires lack precision when applied to subjects with specific disease condition. In the context of female urinary problems, various QoL tools have been designed and investigated. King's Health Questionnaire (KHQ), which was formulated as early as 1997 by the group of researchers from King's College Hospital London still enjoys popularity till today, because of its strong psychometric properties, ease of administration and it adds objectivity to patient's subjective symptoms. However, the available information about KHQ is somewhat inadequate for the novice research scholar. The following brief essay aims at easy understanding of implementation, documentation, analysis and interpretation of King's Health Questionnaire in research settings.

Keywords: Urinary incontinence (UI), King's health questionnaire (KHQ), Quality of life (QoL)

INTRODUCTION

Urinary Incontinence (UI) in women, according to International Continence Society (ICS) refers to an involuntary, uncontrollable, unwitting leakage of urine causing physical discomfort and problems due to maintenance of feminine hygiene.[1] Urinary incontinence in elderly women is one of the common problems and nearly one third of women face continence problems during their life.[2] Although not life threatening by itself, urinary incontinence brings about distress, anxiety, loss of self-esteem and affects woman's social, cultural, marital, domestic, physical, psychological and sexual wellbeing.[3] When the symptoms are severe, the affected women are forced to give up many aspects of their lifestyles, retire from social interactions, develop pessimistic attitudes and confine themselves to four walls of the house and some even develop gynaecological problems such as stress related secondary amenorrhoea.[4] Though considered as a problem of older and multiparous women, in recent years urinary incontinence has been reported even in young women involved in sports activity

and also those who belong to early and mid-reproductive age groups, especially following difficult vaginal deliveries.[5] Urinary incontinence is considered as one of the major economic burdens to the society, especially in countries where significant numbers of females contribute to the domestic and financial growth. A recent systematic review on economic burdens of urgency urinary incontinence in the United States revealed loss of $65.9 billion in 2007, with projected costs of $76.2 billion in 2015 and $82.6 billion in 2020.[6]

A good documentation and record keeping of various urinary symptoms, clinical signs and objective urodynamic data provide information for the treating physician for treatment plan and follow-up of the patients. But it is unclear whether these measures provide enough evidence regarding the impact of urinary incontinence on women's lives. There are several other perspectives beyond medical description of the condition and International Continence Society strongly insists on standardisation of the outcome measures with respect to Quality of Life (QoL) in clinical trials involving urinary incontinence.[7]

Quality of life refers to the degree to which a person enjoys important possibilities of his or her life, and includes both subjective and objective indicators. It is a reflection of individual's sense of well-being and satisfaction with life. Objective indicators are easily measurable and include socioeconomic status (as decided by one's education, profession and per-capita income), living conditions and physical functioning. But subjective indicators are contextual and represent person's perception of important life domains and satisfaction with those domains. The quality of life is affected by experiences in life, disease occurrence, medical disabilities, accidents, social interactions, beliefs, goals and expectations. Though there are wide individual variations, they are minimised by administration of structured questionnaires to the affected person. The questionnaires contain a variable number of sections (domains), which provide information focused on different aspects of health, such as bodily function, role performance, emotional elements, social role, self-esteem, sleep, energy and disease specific symptoms such as pain perception, limitation of activities and mental stress.

Early versions of Health-Related Quality of Life (HRQoL) focused mainly upon simple assessment of patient's physical ability for example, ability to be mobile, perform daily routines, being capable of eating, drinking and taking care of personal hygiene.[8] Some tools even referred to single measurement such as measuring degree of mobility of joints (by noting the angle of flexion and extension). These questionnaires assessed man as anatomical living being and assessed factors such as vitality, physical functioning, bodily pain, general health perceptions, physical role functioning, etc. However they did not project other dimensions of human life such as social interactions, interpersonal and sexual relationships, careers and psychological wellbeing. These tools were further classified as 'generic' and 'disease specific'. Generic measures were designed to assess a broad range of populations without taking into consideration their physical ailments (for example, Sickness Impact Profile,[9] Nottingham Health Profile,[10] Short form 36).[11] Generic tools enjoyed vast popularity as they were readily available, their reliability and validity were tested in many studies, but unfortunately researchers started using them inappropriately. They failed to address many issues relevant to the disease condition in question and hence focus changed to 'disease specific' tools such as Minnesota Living with Heart Failure Questionnaire (MLHFQ),[12] Hemophilia-QoL,[13] CDDUX for celiac disease,[14] and many. There are several disease specific QoL assessment tools addressing gynaecological ailments, for example, PCOSQ for polycystic ovaries,[15] Menopause-Specific Quality of Life Questionnaire (MENQOL)[16], European Organization for Research and Treatment of Cancer quality of life questionnaire (EORTC)[17] etc.

There are several gadgets to measure quality of life and sexual function in women with urinary incontinence, for example, Urogenital Distress Inventory (UDI),[18] Bristol Female Lower Urinary Tract Symptoms Questionnaire (B-FLUTS),[19] Urinary Incontinence Quality of Life Instrument (I-Qol),[20] Incontinence Impact Questionnaire (IIQ)[21], King's Health Questionnaire (KHQ),[22] Pelvic Organ Prolapse/Urinary Incontinence Sexual Function Questionnaire (PISQ),[23] International Consultation on Incontinence Questionnaire-Short Form (ICIQ-SF).[24] Among them King's Health Questionnaire (KHQ) is widely used as these questionnaires are simple to administer, easily understandable by the participant and cover several domains of life. Several reports on medical and surgical interventions in urinary incontinence have liberally used KHQ system of QoL assessment not only to demonstrate improvement in the condition before and after the procedure, but also the persistence and continuation therapeutic benefits during short term and long term surveillances. There are more than 45 language versions of KHQ available (French, Dutch, Italian, German, Portuguese, Spanish, South African English, Japanese, Korean, Chinese etc.).[25] Other advantages include the short time required to administer and complete the questionnaires (on average 5 minutes), age and gender appropriateness (valid for both male and females between 17 and 85 years) and coverage of various bladder conditions (stress incontinence, urge incontinence, mixed incontinence, over active bladder). KHQ is a recommended tool by European Clinical Practice Guidelines.[26]

King's Health Questionnaire (KHQ) was formulated by Dr. C. J. Kelleher (along with his colleagues Dr. V. Khullar, Dr. S. Salvator under the guidance of professor Dr. L. D. Cardozo) in 1997 during his tenure as senior registrar in department of urogynaecolgy, King's College,

London. The final version of the questionnaire was the result of six different pilot studies, after testing for validity and reliability using standard psychometric techniques. There were 293 respondents and the article was published in British Journal of Obstetrics and Gynaecology in December 1997. It was concluded that KHQ is a valid and reliable instrument for the assessment of quality of life in women with urinary incontinence. They also opined that KHQ will be useful for the rapid appraisal and follow-up in many clinical trials involving new treatments for urinary incontinence.

KHQ is a patient self-administered self-report and has 3 parts consisting of 21 items. Part 1 contains general health perception and incontinence impact (one item each). Part 2 contains role limitations, physical limitations, social limitations (two items each), personal relationships, emotions (three items each) and sleep/energy (two items), severity measures (four items). Part 3 is considered as a single item and contains ten responses in relation to frequency, nocturia, urgency, urge, stress, intercourse incontinence, nocturnal enuresis, infections, pain, and difficulty in voiding. The responses in KHQ have four point rating system. The eight subscales ("domains") scored between 0 (best) and 100 (worst). The Symptom Severity scale is scored from 0 (best) to 30 (worst). Decreases in KHQ domain scores indicate an improvement in quality of life. The minimally important difference - the smallest change in score that subjects perceive as beneficial is 3 points for the symptom severity scale and 5 points for all other KHQ domains. It is interesting to note that lower scores indicate patient wellbeing and higher scores mean that the person is severely affected by the disease condition.[27]

MEANING OF DOMAINS IN KING'S HEALTH QUESTIONNAIRE (KHQ)

1. General health perception: Refers to how individuals are able to rate their wellbeing, often in terms of their age or how things are better/worst compared to previous years. Depends upon their current health and previous health and is affected by their attitude towards sickness, visit to the doctors, health outlook etc. Consists of one question and graded as very good, good, fair, poor and very poor.

2. Incontinence impact: Refers to degree of bother the incontinence problems affects one's personal life. Consists of one question and rated as not at all, a little, moderate and a lot.

3. Role limitations: Refers to limitations of daily activities such as routine house hold tasks (cooking, cleaning) and outside tasks (buying, shopping, job and workplace responsibilities). Consists of two questions and rated as not at all, a little, moderate and a lot.

4. Physical limitations: Refers to degree of physical or functional activities such as walking, climbing, running, bending, kneeling, and participating in known sports, physical exercises, travel etc. Consists of two questions and rated as not at all, a little, moderate and a lot.

5. Social limitations: Refers to the degree of affection of one's relationships and interactions with others (family, friends and so on), including their participation in activities, and the strength and size of social networks. Consists of two questions and rated as not at all, a little, moderate and a lot.

6. Personal relationships: In general context, personal relationship refers to close connections between people, formed by emotional bonds and interactions. These bonds often grow from and are strengthened by mutual experiences. But in KHQ, the relationship is mainly focused upon relationship with the sexual partner, sex life and marital harmony. Consists of three questions and rated as not applicable, not at all, a little, moderate and a lot.

7. Emotions: By definition, emotion means a mental state that arises spontaneously rather than through conscious effort and is often accompanied by physiological changes and feeling such as joy, sorrow, and anger. In KHQ, various types of emotions are taken into consideration such as depression, anxiety, nervousness, loss of self-esteem and self-respect. This parameter is a measure of how these problems affect one's life.. Refers to degree of bother the incontinence problems affects one's personal life. Consists of three questions and rated as not at all, a little, moderate and very much.

8. Sleep/energy: A healthy and sound sleep is required for conserving energy and vitality. Refers to degree of sleep deprivation due to bladder problem in KHQ. Consists of three questions and rated as never, sometimes, often and all the time.

9. Severity Measures: Refers to degree of affection of day to day functioning because of incontinence problems such as necessary to wear pads for urinary leakage, restriction of fluid intake, changing under garments often and constant worry about the urinary odour. Consists of four questions and rated as never, sometimes, often and all the time.

The individual items in the domains are scaled from 0 (best) to 100 worst. Another dimension is added which is called as Symptom severity scale; where in there are 10 different bladder symptoms, the score ranges from 0 to 30 and the values are not converted to percentages.

The following Table 1 gives overall synopsis of King's Health Questionnaire.

Table 1: Synopsis of King's health questionnaire (KHQ).

Parts	Domain (9 in number)	Sub items (21 in number)	Responses	Score
Part I	1. General health perception	1. Self-perceived health	5 (Very good, Good Fair, Poor, Very poor)	0 to 100
	2. Incontinence impact	2. Life burden due to disease	4 (Not at all, A little, Moderately, A lot)	0 to 100
Part II	3. Role limitations	3. House hold tasks	4 (Not at all, A little, Moderately, A lot)	0 to 100
		4. Limitation of daily activities	4 (Not at all, A little, Moderately, A lot)	0 to 100
	4. Physical limitations	5. Limitation of physical activities	4 (Not at all, A little, Moderately, A lot)	0 to 100
		6. Limitation of daily activities	4 (Not at all, A little, Moderately, A lot)	0 to 100
	5. Social limitations	7. Limitation of social life	4 (Not at all, A little, Moderately, A lot)	0 to 100
		8. Inability to visit friends, relatives	4 (Not at all, A little, Moderately, A lot)	0 to 100
	6. Personal relationships	9. Partner relationship	4 (Not at all, A little, Moderately, A lot)	0 to 100
		10. Sex life	4 (Not at all, A little, Moderately, A lot)	0 to 100
		11. Family life	4 (Not at all, A little, Moderately, A lot)	0 to 100
	7. Emotions	12. Depression	4 (Not at all, A little, Moderately, Very much)	0 to 100
		13. Anxiety, nervousness	4 (Not at all, A little, Moderately, Very much)	0 to 100
		14. Feeling bad	4 (Not at all, A little, Moderately, Very much)	0 to 100
	8. Sleep/energy	15. Sleep deprivation	4 (Not at all, A little, Moderately, All the time)	0 to 100
		16. Tiredness	4 (Not at all, A little, Moderately, All the time)	0 to 100
	9. Severity measures	17. Pad usage	4 (Not at all, A little, Moderately, All the time)	0 to 100
		18. Fluid restriction	4 (Not at all, A little, Moderately, All the time)	0 to 100
		19. Change of underclothes	4 (Not at all, A little, Moderately, All the time)	0 to 100
		20. Urinary odour	4 (Not at all, A little, Moderately, All the time)	0 to 100
Part III	Symptom severity scale	21. Ten bladder related symptoms such as frequency, nocturia, urgency, urge & stress incontinence, bedwetting, intercourse incontinence, urinary infection, dysuria and dribbling.	For each sub question: 4 (Nil, Mild, Moderate, Severe)	0 to 30

ANNEXURE 1

Annexure 1 gives a single page format of King's Health Questionnaire.

The scoring system is slightly complex. The following annexure (Figure 1) give detailed account of assessment of each domain, the formulae involved and ready reckoner for conversion of total score to final scores.

ANNEXURE 1

BRITISH SOCIETY OF UROGYNAECOLOGY

King's Health Questionnaires (KHQ)

Q1. GENERAL HEALTH PERCEPTION: How would you describe your health at present?	○ Very good	○ Good	○ Fair	○ Poor	○ Very poor
Q2. INCONTINENCE IMPACT: How much do you think your bladder problem affects your life?	○ Not at all	○ A little	○ Moderately	○ A lot	
Q3. ROLE LIMITATIONS: Does your bladder problem affect					
A. your house hold tasks e.g. cleaning, shopping etc?	○ Not at all	○ A little	○ Moderately	○ A lot	
B. your job or normal daily activities outside the home?	○ Not at all	○ A little	○ Moderately	○ A lot	
Q4. PHYSICAL LIMITATIONS: Does your bladder problem affect					
A. your physical activities (e.g., going for walk, run, sports, gym, etc.)?	○ Not at all	○ A little	○ Moderately	○ A lot	
B. your affect travel?	○ Not at all	○ A little	○ Moderately	○ A lot	
Q5. SOCIAL LIMITATIONS: Does your bladder problem limit					
A. your social life	○ Not at all	○ A little	○ Moderately	○ A lot	
B. your limit your ability to see / visit friends?	○ Not at all	○ A little	○ Moderately	○ A lot	
Q6. PERSONAL RELATIONSHIPS: Does your bladder problem affect					
A. your relationship with your partner?	○ Not at all	○ A little	○ Moderately	○ A lot	○ Not applicable
B. your sex life?	○ Not at all	○ A little	○ Moderately	○ A lot	○ Not applicable
C. your family life?	○ Not at all	○ A little	○ Moderately	○ A lot	○ Not applicable
Q7. EMOTIONS: Does your bladder problem make					
A. you feel depressed?	○ Not at all	○ A little	○ Moderately	○ Very much	
B. you feel anxious and nervous?	○ Not at all	○ A little	○ Moderately	○ Very much	
C. you feel bad about yourself?	○ Not at all	○ A little	○ Moderately	○ Very much	
Q8. SLEEP / ENERGY : Does your bladder problem					
A. afect your sleep?	○ Not at all	○ A little	○ Moderately	○ A lot	
B. make you feel worn out and tired?	○ Not at all	○ A little	○ Moderately	○ A lot	
Q9. SEVERITY MEASURES:					
A: Wear pads to keep dry?	○ Never	○ Sometimes	○ Often	○ All the time	
B: Be careful how much fluid you drink?	○ Never	○ Sometimes	○ Often	○ All the time	
C: Change your underclothes because they get wet	○ Never	○ Sometimes	○ Often	○ All the time	
D: Worry in case you smell	○ Never	○ Sometimes	○ Often	○ All the time	
Q10. SYMPTOM SEVERITY SCALE					
A. Frequency of urination	○ None	○ Mild	○ Moderate	○ Severe	
B. Nocturia	○ None	○ Mild	○ Moderate	○ Severe	
C. Urgency	○ None	○ Mild	○ Moderate	○ Severe	
D. Urge Incontinence	○ None	○ Mild	○ Moderate	○ Severe	
E. Stress Incontinence	○ None	○ Mild	○ Moderate	○ Severe	
F. Nocturnal Enuresis	○ None	○ Mild	○ Moderate	○ Severe	
G. Intercourse Incontinence	○ None	○ Mild	○ Moderate	○ Severe	
H. Waterworks infection	○ None	○ Mild	○ Moderate	○ Severe	
I. Bladder pain	○ None	○ Mild	○ Moderate	○ Severe	
J. Postvoid dribble	○ None	○ Mild	○ Moderate	○ Severe	

Calculation of Scores

Q1. Very good=1, Good=2, Fair=3, Poor=4, Very poor=5	Q1 Overall Score= ((Actual Score – 1) / 4) x 100
Q2. Not at all=1, A little=2, Moderately=3, A lot=4	Q2 Overall Score= ((Actual Score – 1) / 3) x 100
Q3. Not at all=1, A little=2, Moderately=3, A lot=4	Q3 Overall Score= ((Actual Total Score – 2) / 6) x 100
Q4. Not at all=1, A little=2, Moderately=3, A lot=4	Q4 Overall Score= ((Actual Total Score – 2) / 6) x 100
Q5. Not at all=1, A little=2, Moderately=3, A lot=4	Q5 Overall Score depends upon Q6C Score
If Q6 C response is "Not Applicable"	Q5 Overall Score= ((Actual Total Score – 2) / 6) x 100
If Q6 C response is other than "Not Applicable"	Q5 Overall Score= (Sum of scores to 5A, 5B, 6C)-3 /9 X 100
O6. Not at all=1, A little=2, Moderately=3, A lot=4, Not applicable=0	
If (6A+6B) ≥ 2	Q6 Overall score is (Sum of scores to 6A, 6B)-2 /6 X 100
If (6A+6B) =1	Q6 Overall score is (Sum of scores to 6A, 6B)-1 /3 X 100
If (6A+6B) =0	Q6 Score should be treated as missing value
Q7. Not at all=1, A little=2, Moderately=3, Very much=4	Q7 Overall Score= (Sum of scores to 7A, 7B, 7C)-3 /9 X 100
Q8. Not at all=1, A little=2, Moderately=3, A lot=4	Q8 Overall Score= ((Actual Total Score – 2) / 6) x 100
Q9. Never=1, Sometimes=2, Often=3, All the time=4	Q9 Overall Score: (Actual Total Score -4) / 12 X 100
Q10. None=0, Mild=1, Moderate=2, Severe=3 (for Responses A to J)	Q10 Overall Score is the total of responses to ten questions.

PART 1 SCORE = (Q1. OVERALL SCORE) + (Q2. OVERALL SCORE)
PART 2 SCORE = OVERALL SCORE OF Q3 to Q9
PART 3 SCORE = OVERALL SCORE OF Q10

Layout Design: Dr Shripad Hebbar, MD, Department of Obstetrics Gynaecology, KMC Manipal, Manipal Univerisity

Figure 1: Annexure 1- King's Health Questionnaire: Layout design.

Scoring pattern of answers to questions in Annexure 1

For Q1

Q1 overall score: (Actual response ticked - 1) / 4 x 100, for example score of 3 fetches (3 - 1)/4 x 100 = 50%.

Conversion of score to percentage: 1 - 0%, 2 - 25%, 3 - 50%, 4 - 75%, 5 - 100%.

For Q2

Q2 overall score: (Actual response ticked - 1) / 3 x 100, for example score of 3 fetches (3 - 1)/3 x 100 = 66.6%.

Conversion of total score to percentage: 1 - 0%, 2 - 33.3%, 3 - 66.6%, 4 - 100%.

For Q3

Q3 overall score: (Total score - 2) / 6 x 100, for example total score (3A & 3B together) of 8 fetches (8 - 2)/6 x 100 = 100%.

Conversion of total score to percentage: 2 - 0%, 3 - 16.6%, 4 - 33.3%, 5 - 50%, 6 - 66.6%, 7 - 83.3%, 8 - 100%.

For Q4

Q4 overall score: (Total score - 2) / 6 x 100, for example total score (4A & 4B together) of 6 fetches (6 - 2)/6 x 100 = 66.6%.

Conversion of total score to percentage: 2 - 0%, 3 - 16.6%, 4 - 33.3%, 5 - 50%, 6 - 66.6%, 7 - 83.3%, 8 - 100%.

For Q5

If 6C = 0, Q5 overall score is: (Sum of scores to 5A, 5B) - 2/6 x 100, for example total score (5A & 5B together) of 5 fetches (5 - 2)/6 x 100 = 50%.

If 6C ≥1, Q5 overall score is: (Sum of scores to 5A, 5B, 6C) - 3/9 x 100, for example total score (5A, 5B & 6C together) of 10 fetches (10 - 3)/9 x 100 = 77.7%.

Conversion of score to percentage:

If 6C = 0: 2 - 0%, 3 - 16.6%, 4 - 33.3%, 5 - 50%, 6 - 66.6%, 7 - 83.3%, 8 - 100%

If 6C ≥1,: 3 - 0%, 4 - 11.1%, 5 - 22.2%, 6 - 33.3%, 7 - 44.4%, 8 - 55.5%, 9 - 66.6%, 10 - 77.7%, 11 - 88.8%, 12 - 100%.

For Q6

Conversion of score to percentage:

If (6A+6B) ≥2: 2 - 0%, 3 - 16.6%, 4 - 33.3%, 5 - 50%, 6 - 66.6%, 7 - 83.3%, 8 - 100%.

If (6A+6B) = 1: 1 - 0%, 2 - 33.3%, 3 - 66.6%, 4 - 100%.

If (6A+6B) = 0, Then treat as missing value, many statistical tools such as SPSS calculate statistics with missing values.

For Q7

Q7 overall score is: (Sum of scores to 7A, 7B, 7C) - 3/9 x 100, for example total score (7A, 7B & 7C together) of 11 fetches (11 - 3)/9 x 100 = 88.8%.

Conversion of score to percentage: 3 - 0%, 4 - 11.1%, 5 - 22.2%, 6 - 33.3%, 7 - 44.4%, 8 - 55.5%, 9 - 66.6%, 10 - 77.7%, 11 - 88.8%, 12 - 100%.

For Q8

Q8 overall score: (Total score - 2)/6 x 100, for example total score (8A & 8B together) of 3 fetches (3 - 2)/6 x 100 = 16.6%.

Conversion of total score to percentage: 2 - 0%, 3 - 16.6%, 4 - 33.3%, 5 - 50%, 6 - 66.6%, 7 - 83.3%, 8 - 100%.

For Q9

Q9 overall score: (Total score - 4)/12 x 100, for example total score (9A, 9B, 9C & 9D together) of 13 fetches (13 - 4)/12 x 100 = 75%.

Conversion of total score to percentage: 4 - 0%, 5 - 8.3%, 6 - 16.6%, 7 - 25%, 8 - 33.3%, 9 - 41.6%, 10 - 50%, 11 - 58.3%, 12 - 66.6%, 13 - 75%, 14 - 83.3%, 15 - 91.6%, 16 - 100%.

DESIGNING AND VALIDATION OF KHQ INSTRUMENT FOR THE LOCAL POPULATION

The original KHQ is in English and many of the local respondents in India cannot understand English. To incorporate them into studies involving quality of life in urinary incontinence, the questionnaires have to be translated to local language using linguistic experts.

The next step is to test the reliability of questionnaires by assessing its internal consistency. Internal consistency estimates the degree of correlation between the items forming a scale (i.e., whether several items that propose to measure the same general construct produce similar scores). For example, if a respondent expressed

agreement with the statements "I feel distressed with my bladder problem" and "My bladder problem is affecting my sexual life", and disagreement with the statement "My bladder condition does not affect my social life", this would be indicative of good internal consistency of the test.

Internal consistency is usually measured with Cronbach's alpha, a statistic calculated from the pairwise correlations between items. Internal consistency ranges between negative infinity and one. It is expected that items forming a domain of the questionnaire should correlate moderately with each other, but should contribute independently to the overall score in that domain. Very high reliabilities (0.95 or higher) are not necessarily desirable, as this indicates that the items may be entirely redundant. Similarly very low reliability index suggests that researcher is trying to assess different traits of the condition which are not related to each other. An alpha value of ≥0.7 is generally considered as acceptable in reliability studies. These values can be easily derived from SPSS software which is a very well-known statistical package for medical professionals in academics. Table 2 gives interpretation of Cronbach's alpha values.

Table 2: Internal consistency measures.

Cronbach's alpha	Internal consistency
More than 0.9	Excellent
0.8 to 0.9	Good
0.7 to 0.8	Acceptable
0.6 to 0.7	Questionable
0.5 to 0.6	Poor
Less than 0.5	Unacceptable

The next procedure is to carry out what test-retest reliability. Test-Retest reliability means the study participants are consistently giving the same score even when the test conducted on two different occasions. In order to measure the test-retest reliability, we have to give the same test to the same respondents on two separate occasions. Then the mean and deviation of each item in the domain is calculated for two different occasions. If the values lie close to each other, then it would mean that the questionnaires are good and the test results are reproducible. However one should know that the time interval should be reasonably short, as longer intervals may be associated with improvement in symptoms (especially in follow-up studies after therapeutic interventions for stress urinary incontinence) and the values may differ significantly from each other.

Finally, one can test what is called as "criterion validity", which means whether the results of QoL measure in question correlates well with other well established scales. For example, we may want to compare KHQ with other urinary symptom assessment tools (for example, Urogenital Distress Inventory - UDI). Spearman's rank correlation coefficient is used to test the agreement between two scales. Usually this type of testing is required when the researcher wants to compare the results of intervention using different scales.

In order to decide whether the therapeutic intervention for stress urinary incontinence has resulted in significant benefit after the procedure, mean and standard deviations of the scores before after the treatment are analysed by Kruskal-Wallis non-parametric ANOVA for statistical significance. Another way to quantify the changes the scores would be looking at their Standardized Effect Size (SES) and Standardized Response Mean (SRM) values and testing benefit using Wilcoxon's signed rank test. All these statistical measures are well described in any of standard statistical text books and can be easily carried out using standard statistical packages such as SPSS, Epi Info, R Studio, Open Stat etc., which are available as free distributions online.

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