Original Article

Translation and Validation of the Thai Version of the Wisconsin Quality of Life Questionnaire (TH WISQoL) for Kidney Stone Patients

Winn Wisawasukmongchol, MD[1], Parinya Wichitworawong, MD[1], Manint Usawachintachit, MD[1,2]

[1] Division of Urology, Department of Surgery, Faculty of Medicine, Chulalongkorn University, King Chulalongkorn Memorial Hospital, The Thai Red Cross Society, Bangkok, Thailand

[2] STAR Unit of Renal Biochemistry and Stone Disease, Chulalongkorn University, Bangkok, Thailand

Objective: To develop and validate a Thai version of the Wisconsin Quality of Life (TH WISQoL) Questionnaire.

Materials and Methods: The authors developed the TH WISQoL Questionnaire based on a standard multi-step process. Subsequently, the authors recruited patients with kidney stone and requested them to complete the TH WISQoL and a validated Thai version of the 36-Item Short Form Survey (TH SF-36). The authors calculated the internal consistency and interdomain correlation of TH WISQoL and compared the convergent validity between the two instruments.

Results: Thirty kidney stone patients completed the TH WISQoL and the TH SF-36. The TH WISQoL showed acceptable internal consistency for all domains (Cronbach's alpha 0.768 to 0.909). Interdomain correlation was high for most domains (r=0.698 to 0.779), except for the correlation between Vitality and Disease domains, which showed a moderate correlation (r=0.575). For convergent validity, TH WISQoL demonstrated a good overall correlation to TH SF-36, (r=0.796, p<0.05).

Conclusion: The TH WISQoL is valid and reliable for evaluating the quality of life of Thai patients with kidney stone. A further large-scale multi-center study is warranted to confirm its applicability in Thailand.

Keywords: Quality of life, Kidney stone, Validation, Outcome measurement

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Kidney stone affects approximately 10% of the population during their lifetime[1]. Patients may suffer from pain, infection, and loss of kidney function. Despite the advancement in medical and surgical treatment, the recurrent rate is still high, and the kidney stone disease remarkedly impacts on physical health, mental health, economy, and quality of life[2].

Quality of life is an indicator of patient status and burden from diseases. Additionally, it can be used to compare the treatment outcome and individualize the management for each patient[3]. In western countries, several diseases-specific instruments are available for assessing the quality of life[2,4]. Nevertheless, this issue is underrated in Thailand, and a specific instrument is generally unavailable.

Short-Form 36 (SF-36) questionnaire, developed in 1993, is a commonly used instrument for quality of life[5]. It consists of 38 questions in eight domains including physical functioning (PF), role-physical (RP), bodily pain (BP), general health (GH), vitality (VT), social functioning (SF), role-emotional (RE), and mental health (MH). The SF-36 is being used in various diseases, including kidney stone. It was translated into several languages, including Thai[6-8]. Although widely utilized, SF-36 was not specifically created for the kidney stone patient. Some questions are irrelevant to kidney stone disease, and some kidney stone-specific items are not included.

Recently, an expert group from the United States proposed the Wisconsin Quality of Life Questionnaire

Correspondence to:

Usawachintachit M.

Division of Urology, Department of Surgery, Faculty of Medicine, Chulalongkorn University, Rama IV Road, Patumwan, Bangkok 10330, Thailand.

Phone: +66-2-2564515, **Fax**: +66-2-2564515

Email: manint.u@chula.ac.th

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(WISQoL) to accurately evaluate the quality of life of kidney stone patients[9]. This instrument has been rapidly adopted in the field of nephrolithiasis, either for clinical practice or medical research[10-12]. It was translated into several languages; however, the Thai version was still lacking. Thus, the authors aimed to systematically translate the original WISQoL into the Thai version of WISQoL (TH WISQoL) and validate it among Thai patients with kidney stone.

Materials and Methods

The original WISQoL

The WISQoL comprises of 28 questions, grouped into seven subjects, which can be assessed in four domains (social, emotional, disease, and vitality domains)[9]. Patients are asked to rate the impact of kidney stone on their life during the past month. Each question is rated from 1 to 5. Additionally, there are an additional six yes-no questions about their general health related to kidney stone or its consequences (not included in the total score). The total WISQoL score ranges from 28 to 140, and a higher score is reflective to a better quality of life.

Translation process

Prior to the study initiation, the authors officially contacted the WISQoL original author to ask for permission and for further suggestions. The authors followed the Recommendations for the Cross-Cultural Adaptation of Health Status Measures proposed by Beaton et al in 2000[13] (Figure 1). This multi-step process began with a forward translation from English to Thai. This was performed by two bilingual translators from the Language Institute, Chulalongkorn University, Bangkok, Thailand. Both translators' mother tongues are Thai. One translator (T1) was aware of the survey concepts and familiar in the medical field while the other translator (T2) neither knew the survey concepts nor had any medical background (naïve translator). They compared and discussed their translations and synthesized into one Thai translation (T1-2 version). Thai culture and traditional aspects were cautiously applied during the translation process. This Thai version was then back-translated to English by another group of two bilingual translators from the Language Institute (BT1 and BT2), whose mother tongues are English. Both were unaware of the study concepts and did not have any medical background. They compared their works and generated one English translation (BT 1-2 version), which was subsequently sent to the original author of WISQoL for review and approval. Then, a prefinal version of TH WISQoL was developed by two Thai urologists whose expertise was in kidney stone and another healthcare expert in quality of life assessment. They reviewed the questionnaire by rating a comprehension score of each question and revised the wording to be more appropriate. Content validity was excellent (content validity index, CVI=0.89). An additional minor adjustment was performed by the expert committee to finalize the consensus version, which was tested for validity in the present study.

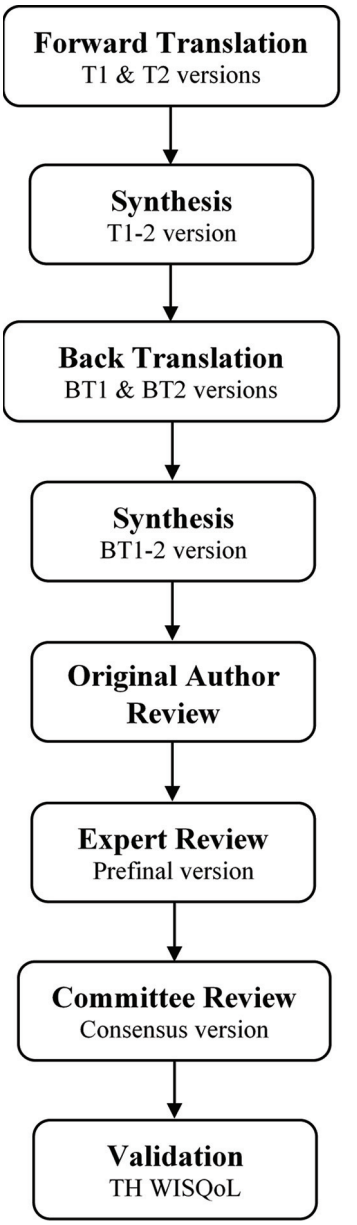

Figure 1. The multi-step cross-cultural adaptation of WISQoL used for the translation process.

Patient selection, study design, and data collecting

The Institutional Review Board approved the translation and validation processes (IRB No.260/60, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand). Thirty patients were required based on the standard recommendation[13]. The authors recruited all participants from the urology clinic of King Chulalongkorn Memorial Hospital between November 2018 and January 2019. They were prospectively informed about the study concept and gave informed consents. Inclusion criteria were Thai patients older than 18 years who were diagnosed with kidney or ureteral stone, able to read and speak Thai like a native language and graduated at least elementary degree. The authors excluded patients who were in an emergency condition with high fever, severe pain, or unstable vital signs, or had a communication inability such as deaf or blindness. All participants were requested to complete the TH WISQoL and a standardized Thai version of the 36-Item Short Form Survey (TH SF-36)[8]. Baseline characteristics, including gender, age, education level, religious belief, occupation, and monthly income, were also collected.

Statistical analysis

Patient characteristics were presented in frequency with percentage or ratio. Internal consistency of TH WISQoL was determined by Cronbach' alpha coefficient (accepted value at 0.7 or higher). Pearson's correlation was utilized to evaluate the 1) interdomain correlation within different TH WISQoL domains, and 2) convergent validity to determine the association between each TH WISQoL domain and the corresponding TH SF-36 domains. Statistical analysis was performed with IBM SPSS Statistics, version 23.0 (IBM Corp., Armonk, NY, USA) with a significant level set at p-value less than 0.05.

Table 1. Patient characteristics and summary of the TH WISQoL score

Parameters	Value n (%)
Age (years); mean±SD	50±11.5
Sex	
Male	18 (60.0)
Female	12 (40.0)
Religious belief	
Buddhism	28 (93.3)
Islam	2 (6.7)
Level of education	
Elementary	4 (13.3)
Junior high school	4 (13.3)
High school	6 (20.0)
Bachelor's degree	11 (36.7)
Master's degree	5 (16.7)
Occupation	
Management	12 (40.0)
Business and financial operations	6 (20.0)
Sales and retail	4 (13.3)
Retired or otherwise unemployed	4 (13.3)
Healthcare practitioner	2 (6.6)
Farming, fishing and forestry	1 (3.4)
Architecture and engineering	1 (3.4)
Monthly income (Thai Baht); median (IQR)	15,000 (12,000 to 36,000)
Overall TH WISQoL score; mean±SD	81.1±12.9
Emotional domain	79.7±12.0
Social domain	86.0±16.0
Disease domain	76.3±15.5
Vitality domain	79.3±19.3

SD=standard deviation; IQR=interquartile range; TH WISQoL=Thai version of the Wisconsin Quality of Life Questionnaire

Results

All 30 patients completed TH WISQoL and TH SF-36 without missing data. The mean age was 50±11.5 years, and males (n=18) slightly predominated females (n=12). Most patients practiced Buddhism (n=28), and half of them have graduated with at least a bachelor's degree. The majority of the patients worked in management and business operations. The median monthly income was 15,000 Thai Baht (Table 1). The mean total score of TH WISQoL was 81.1, and comprised of Emotional, Social, Disease, and Vitality domain scores at 79.7, 86.0, 76.3, and 79.3, respectively (Table 1). One-Sample Kolmogorov-Smirnov test showed a normal distribution of the overall data.

The internal consistency was high for all TH WISQoL domains (Cronbach's alpha 0.768 to 0.909) (Table 2). The interdomain correlation was high among most domains (r=0.698 to 0.779), except for the correlation between Vitality and Disease domains, which showed moderate correlation (r=0.575) (Table 3).

For convergent validity, TH WISQoL demonstrated a good overall correlation to TH SF-36, (r=0.796, $p<0.05$). To be more specific, Emotional, Social, and Vitality domains showed a

Table 2. Internal consistency of TH WISQoL

Domain	Cronbach's alpha
Overall score	0.945
Emotion impact	0.768
Social impact	0.909
Disease impact	0.862
Vitality impact	0.799

Table 3. Interdomain correlation of TH WISQoL

Domain		Emotion impact	Social impact	Disease impact	Vitality impact
Emotion impact	r	-			
	p-value	-			
Social impact	r	0.779			
	p-value	<0.001			
Disease impact	r	0.717	0.698		
	p-value	<0.001	<0.001		
Vitality impact	r	0.707	0.742	0.575	-
	p-value	<0.001	<0.001	0.001	-

good correlation to the corresponding TH SF-36 domains (r=0.739, 0.643, and 0.735, respectively, p<0.05). However, a moderate correlation was found in Disease domain (r=0.535, p<0.05) (Table 4).

Discussion

Not only physically affecting, but kidney stones may significantly impact mental health and quality of life. Patients can suffer from severe pain, limited daily activity, loss from work, sleep disturbance, and financial cost of treatment[2,14,15]. The prevalence of depression in stone patients was also higher than societal norms[16]. Besides, surgical treatment is sometimes required, and the procedure itself may temporarily alter the patient's quality of life[15,17,18]. A general tool such as SF-36 was widely utilized and demonstrated a lower quality of life in kidney stone patients[19,20]. Several determinants, including age, gender, body mass index, and the number of surgical procedures, significantly impacted the quality of life[21,22]. Although extensively employed, some limitations of SF-36 exists on the assessment of symptomatic and functional aspects from kidney stone[2,19]. This general instrument may be beneficial in most situations, but it lacks the specificity to capture some details only found in kidney stone disease. Moreover, it is possible to get the same quality of life score for two patients while certain symptoms or functional status were significantly divergent[9].

In 2013, Penniston et al proposed the WISQoL[9,10]. It is the only available disease-specific instrument designed for the evaluation of health-related quality of life in kidney stone patients. Later in 2016, WISQoL was validated alongside with SF-36 among 1,609 American and Canadian kidney stone patients. The original authors have found an excellent internal consistency (overall Cronbach's alpha 0.97), and good convergent validity when compared to SF-36[10]. Various studies in stone-related quality of life were conducted with WISQoL across the United States[11,12,23].

Because of its distinctive benefits, the WISQoL was translated into several languages, including Turkish, Russian, and Korean, with excellent validity and reliability[24-26]. Atalay et al[24] validated the Turkish version in 84 kidney stone patients undergoing percutaneous nephrolithotomy. This Turkish version demonstrated good internal consistency (Cronbach's alpha 0.72 to 0.78), substantial interdomain correlation between various WISQoL domains, and moderate to high convergent validity when compared to the corresponding validated Turkish SF-36 questionnaire (r=0.44 to 0.78)[24]. Similarly, Shestaev et al[25] performed a validation of the Russian version in 108 patients who underwent treatment for nephrolithiasis. This Russian group found satisfactory internal consistency (Cronbach's alpha 0.71 to 0.99) and convergent validity between Russian WISQoL and SF-36 questionnaires[25]. Yoon and Cho[26] from Korea used a different approach. Their group translated

Table 4. Concergent validity of TH WISQoL vs. TH SF-36

Domain	r	p-value
TH WISQoL emotion impact vs. TH SF-36 role emotional and mental health	0.739	<0.001
TH WISQoL social impact vs. TH SF-36 social functioning	0.643	<0.001
TH WISQoL disease impact vs. TH SF-36 bodily pain	0.535	0.002
TH WISQoL vitality impact vs. TH SF-36 physical functioning, role physical, general health, and vitality	0.735	<0.001

TH WISQoL=Thai version of the Wisconsin Quality of Life Questionnaire; TH SF-36=Thai version of the 36-Item Short Form Survey

WISQoL into Korean and performed linguistic validation by the cognitive debriefing process in five recurrent stone formers[26].

In the present study, the authors translated WISQoL into the Thai version and validated it within a group of 30 Thai patients. The internal consistency was high for all TH WISQoL domains, suggesting strong reliability of this translated version. The interdomain correlation was also at a satisfactory level, which confirmed its concordance in the evaluation of patients with similar kidney stone disease. The moderate to high convergent validity also established a strong correlation with the corresponding validated TH SF-36 domains.

In Thailand, most studies in quality of life utilized the validated TH SF-36 for outcome assessment[8,27]. Some disease-specific standard questionnaires were translated and validated, and they were used across various medical fields[28-32]. However, none of them is specific for kidney stone patients. Although medical and surgical management of kidney stone patients is rapidly evolving in Thailand, the issue of quality of life is still underestimated and usually overlooked. The present study validated TH WISQoL will be a useful utility for evaluating the quality of life in Thai patients, not only in medical research but also in real-life practice.

The authors strictly followed the standard process of translation and adaptation of instruments. A group of experts, either in cross-cultural translation or kidney stone management, gathered to develop the consensus version. However, some limitations of the present study should be mentioned. Patient enrollment was conducted in a single tertiary-care center, mostly serving patients residing in the capital city of Bangkok. Therefore, the authors are uncertain if the results could be generalized to a different population group living in a rural area. Furthermore, the authors did not perform a test-retest validity, which may provide more reliability of the instrument. Following the present initial study, the authors determine to conduct a large-scale multicenter study with the complementary statistical assessment to broaden the applicability of TH WISQoL into Thai society.

Conclusion

The TH WISQoL is a valid and reliable instrument for evaluating the quality of life in Thai patients with kidney stones. The validated Thai version showed a high internal consistency, good interdomain correlation, and moderate to high convergent validity to the validated TH SF-36. A further large-scale multi-center study is warranted to confirm its applicability in Thailand.

What is already known on this topic?

Quality of life is an important marker for health status and disease burden in kidney stone patients. This issue is broadly investigated worldwide but still underrated in Thailand. The WISQoL is a well-recognized, disease-specific tool for quality of life assessment, however, the Thai version was not available.

What this study adds?

This study confirms the validity and reliability of the TH WISQoL for evaluating the quality of life in Thai patients with kidney stone.

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Conflicts of interest

The authors declare no conflict of interest.

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