Original Article

Cross-Cultural Adaptation and Psychometric Properties of the Thai Version of the Short-Form Urinary Quality of Life Questionnaire (SF-Qualiveen) in Individuals with Neurogenic Lower Urinary Tract Dysfunction Following Spinal Cord Injury

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ABSTRACT

Objectives: To develop the Thai version of the short form of the Urinary Quality of Life Questionnaire (SF-Qualiveen) and evaluate its validity and reliability in patients with neurogenic lower urinary tract dysfunction following spinal cord injury

Study design: Cross-cultural adaptation and psychometric validation study

Setting: Department of Rehabilitation Medicine, Faculty of Medicine Siriraj Hospital, Mahidol University, Thailand, a tertiary care university hospital

Participants: Patients with spinal cord injury and neurogenic lower urinary tract dysfunction who visited Siriraj Hospital between July and December 2024.

Methods: Following the translation of the SF-Qualiveen into Thai and its evaluation for content validity, 56 patients with spinal cord injury (SCI) (34 males, 22 females) were assessed using the Thai SF-Qualiveen to determine construct validity. This was done using Pearson's correlation coefficient to analyze its positive correlation with the Urinary Distress Inventory-6 (UDI-6) and negative correlation with the WHOQOL-BREF-THAI. Reliability was evaluated through internal consistency and test-retest reliability with patients reassessed after one week.

Results: The Thai SF-Qualiveen demonstrated excellent content validity, with a Content Validity Index (CVI) of 1.00 after linguistic adjustment. Regarding construct validity, it showed a significant moderate positive correlation with the UDI-6 ($r = 0.52$, $p < 0.001$) and a low negative correlation with the WHOQOL-BREF-THAI ($r = -0.46$, $p < 0.001$). Internal consistency was very good with a Cronbach's alpha of 0.86 (95% CI: 0.79, 0.91). Test-retest reliability was excellent, with an Intraclass Correlation Coefficient of 0.93 (95% CI: 0.89, 0.96).

Conclusions: The Thai SF-Qualiveen questionnaire is a valid and reliable instrument for assessing quality of life in Thai patients with neurogenic lower urinary tract dysfunction following spinal cord injury.

Keywords: neurogenic lower urinary tract dysfunction, spinal cord injury, quality of life, SF-Qualiveen

ASEAN J Rehabil Med. 2026; 36(3): 147-153.
doi: 10.67880/ajrm.2026.36.06

Introduction

Patients with spinal cord injuries (SCI) experience neurogenic lower urinary tract dysfunction (NLUTD) in approximately 70%-80% of cases.[1] The type and severity of bladder and sphincter dysfunction depend on the location of the lesion and the area of spinal cord injury. Symptoms in these patients can vary, ranging from urinary incontinence to incomplete bladder emptying.[2] These issues significantly reduce quality of life[3] by adversely affecting physical health, emotional well-being, social interactions, and increasing dependence on others.

Although generic instruments such as the SF-36[4] and the EQ-5D-5L[5] are commonly used, they lack the specificity needed to capture the unique impact of NLUTD. The International Continence Society (ICS) therefore recommends using condition-specific tools,[6] as standard measures often fail to account for specific stressors such as the burden of bladder management or the psychological distress associated with potential leakage. Tools like the King's Health Questionnaire,[7] the Incontinence QOL Instrument,[8] and the Overactive Bladder Questionnaire[9] focus primarily on storage symptoms, such as urinary incontinence, while neglecting voiding symptoms. This limitation is particularly relevant in patients with SCI, who frequently experience both storage and voiding dysfunction.

The Qualiveen questionnaire was originally developed as a comprehensive instrument to evaluate the impact of urinary disorders on the quality of life (QoL) of patients with neurological conditions.[10,11] This tool has been translated into multiple languages, tested for validity, and is recognized for its

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Received: March 19, 2026 Revised: April 27, 2026 Accepted: May 17, 2026

effectiveness in evaluating patients.[12,13] Although recognized for its effectiveness, its length (30 items) can be impractical for routine outpatient clinical settings. To enhance feasibility while maintaining psychometric rigor, the Short Form Qualiveen (SF-Qualiveen) was developed.[14] This 8-item version is specifically designed to capture four key domains: bother with limitations, fears, daily frequency of urinary reflections, and feelings related to urinary problems. These components address unique disease-specific factors that generic tools often overlook. Since QoL is inherently a subjective experience, the SF-Qualiveen is designed for self-administration to directly reflect the patient's perspective. Consequently, meticulous translation and cross-cultural adaptation are essential to ensure conceptual equivalence when applied across different populations.

Despite the global utility of the SF-Qualiveen and its recommendation in recent clinical guideline (2026),[15] a validated Thai version is currently unavailable. Therefore, this study aims to translate the SF-Qualiveen into Thai and evaluate its psychometric properties—specifically validity and reliability—among Thai patients with NLUTD following SCI. The availability of this validated tool will provide a precise and practical instrument for both clinical practice and future research in Thailand.

Methods

Study design

This study involved the cross-cultural adaptation and psychometric validation of the SF-Qualiveen from English to Thai, following the guidelines established by Beaton et al.[16] The protocol was approved by the Siriraj Institutional Review Board (COA No. Si 054/2024) on January 22, 2024. The Thai Clinical Trials Registry number is TCTR20240609006. Formal authorization for the translation and adaptation process was granted by the Mapi Research Trust, the copyright holder of the instrument.

Participants

Fifty-six patients with spinal cord injury and NLUTD were recruited from the outpatient and inpatient departments of Urology, Orthopedic Surgery, and Rehabilitation Medicine at Siriraj Hospital. Eligible patients were aged 18 and above who used Thai as their primary language of communication. Exclusion criteria included cognitive impairments, difficulty understanding language or reading problems due to limited proficiency in Thai (not caused by visual impairment), unstable medical conditions, and symptoms suggestive of urinary tract infection during the study, including fever, chills, a burning sensation during urination, cloudy or bloody urine, or abdominal/back pain. Participants who could not attend two questionnaire sessions or who did not complete all questions in the questionnaire were also excluded.

After providing written informed consent, participants completed the Thai SF-Qualiveen, the Urinary Distress Inventory-6 (UDI-6),[17] and the WHOQOL-BREF-THAI,[18] either at the outpatient clinic or the inpatient department (test session). One week later, participants completed the Thai SF-Qualiveen questionnaire again (re-test session). The participants' clinical characteristics were obtained from their medical records.

Translation and cross-cultural adaptation

Prior to initiating the translation process, formal permission was obtained from the MAPI Research Trust to translate and culturally adapt the copyrighted SF-Qualiveen into Thai. The cross-cultural adaptation was conducted according to the guidelines proposed by Beaton et al.,[16] comprising five stages.

First, two bilingual Thai translators independently performed initial translations without consultation; one was a clinical expert, and the other was a linguistic expert with no medical background. This was done to provide two distinct perspectives on the translated items. Second, the two independent versions were synthesized into a single Thai version after resolving any discrepancies. Third, two native English speakers, working independently and blinded to the original version, performed back-translations to ensure conceptual equivalence. Fourth, an expert committee comprising one clinician-translator, one clinical methodologist, two physicians, and one nurse reviewed all translations to ensure semantic, idiomatic, experiential, and conceptual equivalence. Finally, a pre-testing phase was conducted with 10 patients with SCI using cognitive debriefing for every item. After participants completed the Thai SF-Qualiveen they were then asked the following questions: "Are the questions easy to understand? Do you find them relevant for your condition? Do you have any suggestions?" The threshold for item revision during pre-testing was set at a 15.0–20.0% frequency of uncertain responses.

Validity

In this study, both content and construct validity were evaluated, with construct validity including assessments of convergent and discriminant validity.

Content validity

The Thai version of the SF-Qualiveen was reviewed by five bilingual experts: two urologists, two rehabilitation physicians, and one nurse. All experts had at least five years of experience in managing patients with neurogenic bladder and were well-versed in instrument translation and validation. These experts evaluated the relevance and comparability of each of the eight questions to the original version using a 4-point scale (1 = not relevant to 4 = highly relevant). Any question rated as irrelevant (scores of 1 or 2) by more than 20% of the experts was revised. The Content Validity Index (CVI) was then calculated as the proportion of items rated 3 or 4. Following the recommendations of Polit et al., the interpretation criteria for an acceptable CVI with five experts required an item-level CVI (I-CVI) of 1.00. For the overall

instrument, a scale-level CVI based on the average method (S-CVI/Ave) of 0.90 or higher was considered to indicate excellent content validity.[19]

Construct validity

Construct validity was assessed through convergent and discriminant validity analyses. To evaluate convergent validity, the correlation between the Thai SF-Qualiveen and the UDI-6 was analyzed using Pearson's correlation coefficient (r). It was hypothesized that the Thai SF-Qualiveen would show a moderate to high positive correlation with the UDI-6 based on previous findings.[20] Discriminant validity was assessed by comparing the Thai SF-Qualiveen with the WHOQOL-BREF-THAI, under the premise that the former focuses on urinary-related quality of life (UrQoL) while the latter measures overall subjective well-being across broader life contexts, thereby expecting a low negative correlation. The magnitude of the correlation coefficients was interpreted based on the criteria of Hinkle et al. (2003): 0.90 to 1.00 as very high, 0.70 to 0.90 as high, 0.50 to 0.70 as moderate, 0.30 to 0.50 as low, and 0.00 to 0.30 as little or no correlation.[21]

The SF-Qualiveen is a validated 8-item questionnaire that assesses the impact of NLUTD on QoL in patients with SCI or multiple sclerosis (MS). The 8 items cover four domains (two items each): Bother with limitations, Fears, Feelings, and Frequency of limitations. Items are rated on a Likert scale from 0 to 4, with 0 meaning "no impact/bother" and 4 meaning "high impact/bother". A higher score indicates a greater negative impact on QoL.[14]

The UDI-6 questionnaire is used to assess the impact of urinary incontinence on QoL and consists of six items, each scored on a 4-point scale from 0 to 3, with higher scores indicating poorer quality of life, and lower scores indicating a better QoL.[17]

The WHOQOL-BREF-THAI is a QoL assessment tool developed by the World Health Organization. It consists of 26 items and evaluates four domains: physical health, psychological health, social relationships, and the environment. Each item is rated on a 5-point Likert scale, with higher scores indicating a better QoL, and lower scores indicating a poorer QoL.[18]

Reliability

Reliability was assessed using internal consistency and test-retest reliability. Internal consistency was determined by measuring the coherence of each question using Cronbach's alpha. The internal consistency was interpreted based on the criteria suggested by DeVellis et al.[22]: a Cronbach's alpha between 0.80 and 0.95 was considered very good, 0.70 to 0.80 as respectable, 0.65 to 0.70 as undesirable, and below 0.60 as unacceptable.

Test-retest reliability was evaluated by administering the Thai SF-Qualiveen to all 56 patients one week after the initial assessment. The Intraclass Correlation Coefficient (ICC) was interpreted according to the guidelines by Koo et al. ICC values were interpreted as follows: below 0.50 as poor, 0.50 to 0.75 as moderate, 0.75 to 0.90 as good, and above 0.90 as excellent reliability.[23] This one-week interval is commonly used to balance recall bias and clinical stability. To minimize carryover effects, the same questionnaire items were used during the retest, but in a different order.

Sample size calculation

The sample size was determined based on both validity and reliability requirements. For construct validity, the primary expected outcome was the correlation coefficient (r) between the SF-Qualiveen and the UDI-6. Based on a previous study by Reuvers et al.[20] which reported a correlation of $r = 0.66$ ($p < 0.001$), we utilized this coefficient as our primary parameter. Although the reference study did not provide the standard deviation (SD) for the total scores, the r value served as a robust basis for power analysis. We hypothesized a conservative expected correlation coefficient of 0.50 (representing a large effect size according to Cohen[24]) against a null hypothesis of 0.10 (small effect size). With a type I error of 0.05 and a type II error of 0.10 (90% power), a minimum of 56 participants was required.

Reliability was assessed using the Intraclass Correlation Coefficient (ICC). To ensure at least good reliability, an expected ICC of 0.75 was used at the 95% confidence level, with a precision (margin of error) of 0.25, requiring 48 participants. To account for a potential 15% dropout rate, the final sample size was set at 56 participants, which met the requirements for both validity and reliability testing.

Statistical analysis

The CVI was calculated to assess content validity. All statistical analyses were performed using IBM SPSS Statistics for Windows, version 29.0 (IBM Corp., Armonk, NY, USA). Pearson's correlation coefficient was used to evaluate convergent and discriminant construct validity. Internal consistency was assessed using Cronbach's alpha, and test-retest reliability was evaluated using the ICC.

Results

A total of 56 patients with SCI were enrolled in this study. The study population was comprised of 60.7% males and 39.3% females. The distribution of SCI levels was as follows: cervical level, 34.0%; thoracic, 44.6%; and lumbar, 21.4%. The methods of ambulation were categorized into three groups: (1) wheelchair ambulation, including both self-propulsion and attendant propulsion (60.7% in household and 78.6% in the community settings); (2) ambulation with gait aids and/or assistance (30.4% in the household and 16.1% in the community settings); and (3) independent ambulation without gait aids or assistance (8.9% in the household and 5.4% in the community settings). Bladder-emptying methods were categorized according to the predominant technique

used by participants. These included indwelling catheterization (42.9%), voluntary voiding (35.7%), and clean intermittent catheterization (CIC) (21.4%). Detailed demographic and clinical characteristics of the participants are summarized in Table 1.

Table 1. Demographic characteristics of the 56 participants

Variable	n = 56
Age, years[1]	53 (16.2)
Sex[2]	
Male	34 (60.7)
Female	22 (39.3)
Onset of SCI[2]	
≤ 6 months	13 (23.2)
> 6 months - 1 year	6 (10.7)
> 1 year - 5 years	15 (26.8)
> 5 years	22 (39.3)
Level of SCI[2]	
Cervical	19 (34)
Thoracic	25 (44.6)
Lumbar	12 (21.4)
ASIA Impairment Scale[2]	
A	13 (23.2)
B	4 (7.1)
C	18 (32.13)
D	20 (35.7)
E	1 (1.8)
Ambulation (household)[2]	
Wheelchair (self-propulsion/attendant propulsion)	34 (60.7)
Walk with gait aid and/or assistance	17 (30.4)
Independent walking	5 (8.9)
Ambulation (community)[2]	
Wheelchair (self-propulsion/attendant propulsion)	44 (78.6)
Walk with gait aid and/or assistance	9 (16.1)
Independent walking	3 (5.4)
Manner of bladder emptying[2]	
Indwelling catheterization	24 (42.9)
Clean intermittent catheterization	12 (21.4)
Voluntary voiding	20 (35.7)

[1]Mean (SD), [2]Number (percentage)
SCI, spinal cord injury; ASIA, American Spinal Injury Association

Validity

Content validity and cultural adaptation

During the expert committee review, Item 2 received an initial I-CVI score of 0.6, resulting in an overall Scale-level Content Validity Index (S-CVI/Ave) of 0.88. This necessitated a targeted revision. The committee identified a cultural-linguistic discrepancy: the phrase 'disturbing daily life' in the initial Thai translation was too broad and failed to capture the specific 'subjective bother' intended by the SF-Qualiveen. Consequently, the committee refined the phrasing from the initial version: 'Are you disturbed by the amount of time required for urination or catheterization?' (Thai original: 'เวลาที่ใช้ไปกับการปัสสาวะหรือสวนปัสสาวะรบกวนการดำเนินชีวิตของคุณหรือไม่'; Romanization: Wela thi chai pai kap kan patsawa rue suan patsawa ropkuan kan damnoen chiwit khong khun ruemai?)" to 'คุณถูกรบกวนเพราะเวลาที่ใช้ในการปัสสาวะหรือสวนปัสสาวะหรือไม่' (Romanization: Khun thuk ropkuan phro wela thi chai nai kan patsawa rue suan patsawa ruemai?). This adjustment emphasizes the participant's direct perception of being bothered by the time consumed. This adjustment ensured superior idiomatic and conceptual equivalence. Following this revision, the final evaluation demonstrated perfect consensus, with the I-CVI for Item 2 and the overall S-CVI/Ave both reaching 1.0, indicating excellent content validity.

To complement the expert-based evaluation, a pre-test was conducted with 10 patients with SCI. Cognitive debriefing confirmed that the revised phrasing was not only clear but also culturally relevant. All 10 participants (100.0%) reported a clear understanding of the items, and the frequency of uncertain responses was 0%, which is well below the 15.0–20.0% threshold for further adjustment. These results demonstrate that the items accurately reflect personal experiences with NLUTD, providing robust target-population evidence for the cultural and content validity of the Thai SF-Qualiveen.

Construct validity

In terms of convergent validity, Pearson's correlation coefficient between the Thai SF-Qualiveen and the UDI-6 was 0.52 ($p < 0.001$), indicating a significant moderate positive correlation between the two instruments (Table 2).

To assess discriminant validity, the correlation between the Thai SF-Qualiveen and the WHOQOL-BREF-THAI was analyzed. The Pearson correlation coefficient for these two instruments was -0.46 ($p < 0.001$), indicating a significantly low negative correlation between the Thai SF-Qualiveen and the WHOQOL-BREF-THAI (Table 2). The correlation between the Thai SF-Qualiveen and the WHOQOL-BREF-THAI domains were also analyzed, revealing negligible to low correlations across all domains (Table 3).

Reliability

Internal consistency

The Thai SF-Qualiveen demonstrated satisfactory internal consistency, with a Cronbach's alpha coefficient of 0.86 (95% CI: 0.79, 0.91). Item-level analysis showed that removing individual items generally maintained acceptable internal consistency; however, deleting Item 8 increased Cronbach's alpha to 0.91. Detailed internal consistency results are shown in Table 4.

Test-retest reliability

To evaluate test-retest reliability, the Thai SF-Qualiveen was re-administered to 56 patients one week after the initial assessment. The order of the questionnaire items was altered for the re-test to minimize carry-over effects. An ICC of 0.93 indicated excellent test-retest reliability for the Thai SF-Qualiveen (Table 5).

Table 2. Construct validity of the Thai SF-Qualiveen compared to the UDI-6 and WHOQOL-BREF-THAI

Variables		SF-Qualiveen	UDI-6	WHOQOL-BREF-THAI
Pearson's correlation coefficient	Pearson's correlation coefficient	1.00	0.52	- 0.46
p-value	*p*-value	-	< 0.001	< 0.001

SF-Qualiveen, Short form-Qualiveen; UDI-6, Urinary Distress Inventory-6; WHOQOL-BREF-THAI, World Health Organization Quality of Life Brief Version - Thai Version

Table 3. Correlation between the Thai SF-Qualiveen and the four domains of the WHOQOL-BREF-THAI

		SF-Qualiveen	Physical domain	Psychological domain	Social domain	Environment domain	Overall
Pearson's correlation coefficient	Pearson's correlation coefficient	1.00	- 0.35	- 0.40	- 0.26	- 0.44	- 0.46
p-value	*p*-value	-	0.008	0.002	0.051	0.001	< 0.001

SF-Qualiveen, Short form-Qualiveen; WHOQOL-BREF-THAI , World Health Organization Quality of Life Brief Version - Thai Version

Table 4. Internal consistency of the Thai SF-Qualiveen assessed using Cronbach's alpha coefficients

		Scale mean if item deleted	Scale variance if item deleted	Corrected item total correlation	Cronbach's Alpha if item deleted
1.	In general, do your bladder problems complicate your life?	10.12	43.38	0.65	0.84
2.	Are you bothered by the time spent passing urine or realizing catheterization?	10.70	43.45	0.71	0.83
3.	Do you worry about your bladder problems worsening?	10.25	40.56	0.77	0.82
4.	Do you worry about smelling of urine?	10.70	42.40	0.74	0.83
5.	Do you feel worried because of your bladder problems?	10.32	39.97	0.86	0.81
6.	Do you feel embarrassed because of your bladder problems?	10.71	43.37	0.71	0.83
7.	Is your life regulated by your bladder problems?	10.21	44.57	0.57	0.84
8.	Can you go out without planning anything in advance?	9.61	52.83	0.03	0.91

SF-Qualiveen, Short form-Qualiveen; WHOQOL-BREF-THAI , World Health Organization Quality of Life Brief Version - Thai Version

Table 5. Test-retest reliability of the Thai SF-Qualiveen assessed using intraclass correlation coefficients

		95% confidence interval	95% confidence interval	F Test with true value	F Test with true value	F Test with true value	F Test with true value
	Intraclass Correlation	Lower bound	Upper bound	Value	df1	df2	Sig
Average	0.93	0.89	0.96	15.16	55	55	< 0.001

SF-Qualiveen, Short form-Qualiveen; WHOQOL-BREF-THAI, World Health Organization Quality of Life Brief Version - Thai Version

Discussion

The Thai SF-Qualiveen was developed to address the absence of a disease-specific instrument for assessing UrQoL in Thai patients with SCI. This study demonstrates that the Thai version demonstrated excellent content validity and test-retest reliability, along with good convergent validity and internal consistency.

Regarding construct validity, the moderate positive correlation with the UDI-6 (r = 0.52) aligns with findings from the Dutch and Russian versions,[20,25] confirming its ability to capture distress related to neurogenic bladder. In contrast, the low correlation with the WHOQOL-BREF-THAI (r = - 0.46) highlights a fundamental difference in the nature of these instruments. As a disease-specific tool, the Thai SF-Qualiveen detects subtle psychosocial impacts of urinary dysfunction, whereas the WHOQOL-BREF-THAI is a generic instrument for assessing global domains. In the SCI population, global QoL is often dominated by factors like mobility and social accessibility, which may outweigh specific urinary concerns. Despite this weak statistical discrimination against a generic proxy, the tool's high clinical sensitivity and strong content validity justify its suitability for specialized assessments where generic tools lack sufficient detail.

The Cronbach's alpha of the Thai SF-Qualiveen was 0.86, demonstrating good internal consistency (0.8–0.9).[22] This result is comparable to those reported for the Dutch and Greek versions[20,26] but slightly lower than that of the Russian version, which was validated in patients with MS.[25] The observed increase in alpha to 0.91 upon excluding Item 8

suggests a conceptual shift from emotional distress to functional behavior. Item 8 is unique in its "positive" framing and broad "planning" requirement, which in the Thai context often involves accessibility issues beyond urinary management. To enhance future consistency, we propose: (1) rephrasing Item 8 to focus on the distress caused by planning, aligning its directionality with other items; and (2) explicitly linking "planning" to urinary issues to minimize cultural-linguistic ambiguity.

The ICC for test-retest reliability of the Thai SF-Qualiveen was 0.93, which is excellent (> 0.90).[23] Compared to other studies, this reliability is consistent with the Dutch version[20] but higher than that of the Russian version.[25]

Limitations

A primary limitation is the lack of a Thai gold-standard UrQoL measure for SCI, necessitating the use of the UDI-6 and WHOQOL-BREF-THAI as suboptimal proxies. While the UDI-6 focuses on symptom distress, it does not fully encompass the UrQoL construct, and the WHOQOL-BREF evaluates broader life domains. Furthermore, the generalizability of our findings may be constrained by the single-center design, a relatively modest sample size (n = 56), and the clinical heterogeneity in bladder management among participants. These sample size constraints also precluded a formal factor analysis to identify key determinants of neurogenic bladder-related QoL. Regarding reliability, the one-week retest interval was selected to balance the need for clinical stability with the risk of recall bias; however, we recognize that minor fluctuations in urinary symptoms or participants' recall of previous responses could still affect stability scores. Finally, the exclusion of patients with cognitive or language impairments—though necessary for data integrity in self-administered tools—may have introduced a selection bias, limiting the applicability of these results to a broader SCI population with concurrent cognitive challenges. Future multicenter studies with larger, more diverse cohorts are warranted to further validate these findings and to explore multifaceted determinants of UrQoL in individuals with SCI.

Conclusion

This study demonstrated that the Thai SF-Qualiveen is a reliable and valid instrument for assessing UrQoL in individuals with spinal cord injury. Its simplicity and conciseness make it a practical tool for routine clinical assessment, enabling a more precise evaluation of UrQoL than generic measures. While future studies might benefit from using more closely aligned reference instruments to further strengthen comparative validation, the current Thai SF-Qualiveen is suitable for clinical and research applications to enhance the management of patients with NLUTD.

Conflict of interest declaration

All authors confirm that there is no conflict of interest related to the manuscript.

Generative AI declaration

The authors confirm that no large language models (LLMs) or artificial intelligence (AI) tools were used in the creation of this manuscript, including the writing, editing, or preparation of figures and tables, except for using Grammarly for basic grammar and spell-checking.

Acknowledgements

We sincerely thank all the participants in this study, Mr. Suthipol Udompunthurak for his invaluable statistical consultation, and all personnel of the Rehabilitation Medicine Outpatient Department for their dedicated support.

Funding

This research project was supported by the Siriraj Research Development Fund, Grant number (IO) R016731036, Faculty of Medicine Siriraj Hospital, Mahidol University.

Data Availability

The data that support the findings of this study are available from the corresponding author, Thanitta Thanakiatpinyo, upon reasonable request.

Author contributions

Pasinee Theerapap: conceptualization, methodology, data curation, funding acquisition, investigation, formal analysis, writing-original draft preparation,

Chayaporn Chotiyarnwong: conceptualization, methodology, investigation, validation, writing-review & editing,

Thanitta Thanakiatpinyo: conceptualization, methodology, funding acquisition, supervision, validation, writing-review & editing.

Supplementary materials

The following supporting information can be downloaded at: Supplementary file

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Supplementary material

Table S1. Synthesis of linguistic and conceptual adjustments for the Thai SF-Qualiveen.

Stage	Item No.	Original Issue	Resolution / Adjustment	Rationale
Stage IV (Synthesis of Translations)	Item 2	Cultural-linguistic discrepancy: The phrase "disturbing daily life" was too broad	Refined phrasing	To capture the specific "subjective bother" intended by the original tool, emphasizing the participant's direct perception rather than general lifestyle impact
Stage V (Pre-testing)	All items	No issues reported	Maintained pre-final version	High clarity (100%) among target users