



Tools for assessing the quality of life of hysterectomized women: A systematic review

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Abstract

Aims and Objectives: Since hysterectomy surgery is a major and invasive procedure, it can affect the quality of life of women in many ways. This study aimed to review and critique the psychometric properties of tools used to measure the quality of life of hysterectomized women.

Method: An advanced search was conducted in international (PubMed, Web of Science, Scopus, PsycINFO, Embase) as well as national databases (SID and Magiran) to retrieve articles published from 2000 to 2024, using keywords related to hysterectomy and quality of life. Then, the psychometric properties of the tools found in these articles were evaluated by COSMIN checklist.

Results: The psychometric properties of tools were analyzed using the COSMIN checklist. Among the 20 general and specific tools examined, content validity had not been evaluated in 15 tools, construct validity had not been evaluated in four tools, criterion validity had not been evaluated in eight tools, internal consistency had not been evaluated in five tools, responsiveness had not been evaluated in 16 tools, and interpretability had not been assessed in 18 tools, and measurement error had not been evaluated in any of the tools.

Conclusion: The results showed that none of the evaluated tools have all the criteria of Cosmin's checklist. Of course, construct validity and reliability had been assessed in most of the tools. Meanwhile, there was no tool to measure the quality of life of hysterectomized women specifically. Therefore, it seems that developing a tool with acceptable psychometric properties is necessary to measure the quality of life of hysterectomized women specifically.

KEYWORDS

health-related quality of life, HRQOL, hysterectomy, quality of life, questionnaire, tool

1 | INTRODUCTION

The surgical removal of a woman's uterus, known as hysterectomy, can be either partial or complete. Various forms of hysterectomy, such as total, subtotal, and radical hysterectomy, along with salpingo-oophorectomy, are typically selected based on the specific disease and the patient's overall health status. The main objective of

performing a hysterectomy is to mitigate the risk of life-threatening complications caused by diseases affecting the uterus, thereby promoting women's health and safety.

Hysterectomy is mainly performed to give women a better and healthier life. The second most prevalent surgery performed on women worldwide is hysterectomy, after a cesarean section.¹ Until a recent juncture, the exploration and discourse on hysterectomy were

predominantly centered on developed nations. Community-based studies conducted in India, El Salvador, and Jordan have provided data on the prevalence of hysterectomy among adult women, with rates ranging from 1.7% to 9.8%. The prevalence rates of hysterectomy in high-income countries such as the United States, Australia, and Ireland are not age-standardized. The overall prevalence is estimated to be around 26.2%, 22%, and 22.2% respectively. In contrast, in underdeveloped nations like Taiwan and Singapore, the general occurrence of hysterectomy stands at 8.8% and 5.7% or lower, respectively.² In a comprehensive cohort study undertaken by Huque et al.³ the investigation of risk factors associated with perinatal hysterectomy was conducted. The study encompassed data from 193 hospitals across 21 countries spanning Africa, Asia, Europe, and America. The findings revealed a noteworthy disparity in the prevalence of perinatal hysterectomy between Asia and other continents, with Asia exhibiting a 7% higher occurrence rate.³

In recent years, it has become common to perform hysterectomy before natural menopause in a way that 65% of hysterectomies are performed during reproductive age. On the other hand, it has been stated in many studies that 75% of women who have undergone hysterectomy are between 20 and 49 years old.^{4,5} Hysterectomy is performed for benign or malignant reasons. Benign reasons include myomas or fibroids, uterine prolapse, unexplained uterine bleeding, endometriosis or adenomyosis, and chronic pelvic pain.¹ Also, hysterectomy can be performed as an emergency procedure due to postnatal untreatable bleeding or uterine rupture.⁶ Among the malignancies, we can point to endometrial cancer, cervical cancer, and ovarian cancer, which can ultimately lead to hysterectomy.⁷ Although hysterectomy is not the only way to overcome reproductive organ problems, it is the best strategy to permanently deal with many diseases.^{8,9} Furthermore, although hysterectomy is a treatment, it is a heavy and invasive surgery that has a mortality rate of 1 in 1000,¹⁰ while having various side effects such as physical, mental, sexual, emotional, and social complications.¹¹⁻¹³

Hysterectomy has several effects on women's quality of life.¹⁴⁻¹⁶ One of the aspects of quality of life is health-related quality of life, which is defined by the Centers for Disease Prevention and Control as "the perceived physical and mental health of an individual or a group over time"¹⁷ (16 June). For example, the impact of hysterectomy has been examined and confirmed on various aspects of quality of life, including personal relationships, social support, and sexual activity. Also, out of these three aspects of quality of life, sexual activity is most affected among hysterectomized women.¹⁸ Women often refrain from sexual activity after hysterectomy due to anxiety and depression.¹⁹ The recovery period and quality of life following a hysterectomy can be positively impacted by the social support from friends, family, and healthcare professionals.¹⁸

Because 90% of benign hysterectomies are conducted to enhance the quality of life,¹⁸ it is essential to comprehend patient-reported outcomes, particularly post-surgery satisfaction. This is crucial as the decision to undergo a hysterectomy, which may be perceived as a loss of organs, can have enduring effects on women, thereby influencing their quality of life.^{20,21} Hence, opting for the

most reliable instrument to accurately gauge the quality of life is crucial in pinpointing relevant challenges and hurdles, creating clinical pathways, offering services and healthcare, devising interventions, and outlining plans to enhance the quality of life of these individuals.

The questionnaire is the most common tool used to evaluate and measure the quality of life. Other tools and methods have many drawbacks, especially respecting data comparison and studies conducted on large populations.²² Nowadays, the selection of appropriate measurement tools poses a significant challenge in academic research. It is crucial to choose tools that can accurately measure the desired variable, as this is just as essential as the research process itself.²³ The success of healthcare interventions is closely tied to the precise measurement of variables under investigation, underscoring the essential role of utilizing suitable tools.²⁴ Before the implementation of a tool, it is crucial to assess and consider its psychometric properties thoroughly.²⁵

Numerous articles have put forth various standards for assessing questionnaires used in data collection. The most well-known and comprehensive criteria is the Consensus-Based Standards for selecting Health Status Measurement Instruments (COSMIN),²⁶ Using the Delphi technique, Mokkink et al.²⁷ designed the COSMIN checklist to investigate the psychometric properties of health measurement tools.²⁸ The COSMIN checklist emphasizes responsiveness and interpretability, validity, and reliability, as key characteristics of an assessment tool. Responsiveness and interpretability encompass 12 distinct domains and assess psychometric characteristics through four phases,²⁹ which consist of validity (content, criteria, construct), reliability (internal consistency, retest, inter-rater agreement, measurement error), responsiveness (sensitivity and capacity to detect changes), and interpretability (the extent of qualitative importance of minimal significant changes in the tool's score).²⁸ The new version of this checklist was also published in 2018.³⁰

According to our investigations, there has been no review article to examine the quality of tools used to measure the quality of life of hysterectomized women. Therefore, the purpose of this study was to review and evaluate the tools used to measure the quality of life of hysterectomized women, using COSMIN criteria.

2 | METHODS

This study is a systematic review that was undertaken to evaluate the various instruments utilized in measuring the quality of life of women who have undergone hysterectomy, with the aid of the COSMIN checklist. To accomplish this objective, the following guidelines were adhered to:

1. The Systematic Review Reporting System (PRISMA) identifies and expresses the problem, collects and analyzes data, interprets findings, and draws conclusions.
- 2- Utilizing the consensus-based standards for selecting health measurement tools (COSMIN), the quality of measurement tools was evaluated.



2.1 | Search strategy

To identify pertinent articles, an extensive search was performed across international databases (PubMed, Web of Science, Scopus, ProQuest) and national databases (SID and Magiran). Relevant articles published between 2000 and 2024 were identified and extracted by two independent researchers using relevant MESH keywords, including "Quality of Life," "Hysterectomy," "Health-Related Quality of Life," and "HRQOL." Boolean operators corresponding to each database were used to formulate the search strategy.

2.2 | Inclusion and exclusion criteria

The articles that underwent review were incorporated into the study if they met the following criteria:

1. Original articles (review, commentary, and pilot studies as well as letters to the editor were excluded)
2. Full texted articles
3. Conducted on hysterectomized women
4. Assessed quality of life variable
5. Were in English or Farsi
6. Published between 2000 and 2024.

Articles that did not mention the source of the data collection tool, and articles that used researcher-made tools were excluded from the study.

2.3 | Selection of articles and documents

Before the initial screening of the studies, all required permits were obtained from the Ethics Committee [Code: IR. SBMU. PHARMACY. REC.1402.055] of Shahid Beheshti University of Medical Sciences. Then, all the articles in which the quality of life of hysterectomized women had been measured by non-researcher-made valid tools were searched. After the initial search, all articles found were entered into EndNote software version X9.1.19.0.0.12062, to remove duplicate articles. After removing duplicate studies, titles and abstracts of the articles (after removing names of journals and authors), as well as the identified citations were evaluated by two researchers independently, and disagreements were resolved by discussing with a third researcher. After removing irrelevant articles and studies that did not meet the inclusion and exclusion criteria, the tools used in the article were identified. Then, by studying the references cited in the articles, the sources of tools used in the articles were examined. In the next step, the articles that examined the validity of desired tools were searched and their full texts were downloaded. Then, the validity of the tools used in each article was independently evaluated by two researchers using the COSMIN checklist. The following information was also checked:

1. The author's name along with the publication year
2. The title of the article
3. The tool's name

4. The tool's content validity
5. The tool's construct validity
6. The tool's criterion validity
7. The tool's internal consistency
8. The test-retest
9. The intra-rater agreement
10. The measurement error
11. The responsiveness
12. The interpretability

2.4 | Findings from the search

The process of selecting articles involved multiple stages. A comprehensive search strategy, as depicted in Figure 1, led to the identification of 7279 articles. After screening the titles and abstracts, 161 articles were assessed by examining their full texts. From this analysis, 20 tools were extracted. The search process for locating pertinent articles is illustrated in Figure 1.

2.5 | Data analysis

The validity of the identified tools was assessed using the COSMIN checklist. Two researchers individually performed an independent assessment of the COSMIN checklist, and any inconsistencies were resolved through consultation with a third researcher. The development of the COSMIN checklist was undertaken by Mokkink, Terwee et al.^{25,28}

The checklist outlines nine criteria utilized for assessing the quality of measurements, encompassing internal consistency, reliability, measurement error, content validity (encompassing face validity), construct validity (comprising structural validity, hypotheses testing, and cross-cultural validity), criterion validity, and responsiveness.

An additional tool is utilized to assess the caliber of research focusing on the interpretability. While interpretability may not be categorized as a measurable attribute, it plays a crucial role in determining the appropriateness of a tool for use in research or clinical settings.³²

Guidance on how to apply the COSMIN checklist can be accessed on the COSMIN website (www.cosmin.nl).

3 | RESULTS

In the initial search, 7279 articles were obtained and after removing duplicate and unrelated articles, the number of articles was reduced to 281 articles. Following the secondary evaluation of the articles in terms of full text and inclusion criteria, 161 articles were selected and 20 tools were extracted from them. During the phase of reviewing articles, the study exclusively retained articles that were pertinent to the design of the tool, the psychometric development of the tools, and the assessment of the quality of life measurement tools. Finally,

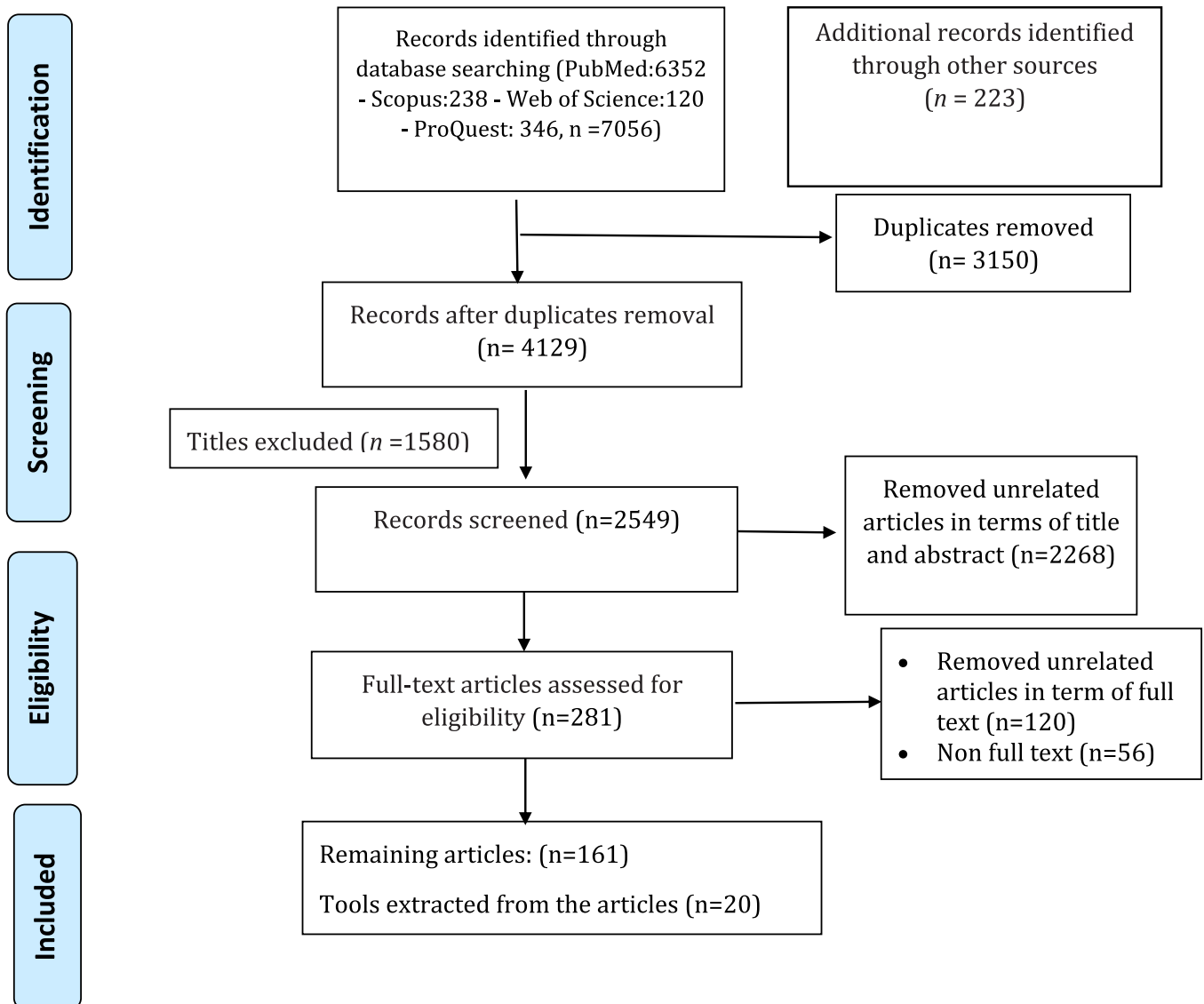


FIGURE 1 The conclusions extracted from the literature review, search, and screening activities. Moher et al.³¹ present the Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA statement.

the psychometric properties of 20 tools used to measure the quality of life were analyzed by COSMIN checklist (Table 1). Among the tools extracted, five tools were found to pertain to the general quality of life, as outlined in Table 1. Furthermore, a total of 15 tools were identified as specialized instruments used for evaluating the quality of life within specific patient populations, including women who have undergone hysterectomy, as detailed in Table 2.

In the examination of 15 specific tools, it was revealed that seven tools were specifically aimed at measuring the quality of life in women who had undergone hysterectomy as a consequence of prolapse. Three tools were linked to evaluating the level of well-being for women who had undergone hysterectomy due to urinary disorders. Three instruments were associated with assessing the quality of life of women who had undergone hysterectomy as a result of genital tract cancers, while two instruments were linked to evaluating the quality of life of women with uterine fibroids.

Among the five general tools used to measure quality of life, only one tool had undergone the content validity assessment. All tools had undergone construct validity evaluation, but their criterion validity, measurement error, and responsiveness had not been measured. Interpretability had only been measured in one tool. Internal consistency had only been measured in two tools with Cronbach's alpha, and stability had been evaluated in three tools by the test-retest method.

Out of 15 specific tools, content validity had not been evaluated in 11 of them, construct validity had not been evaluated in three tools, and criterion validity and internal consistency had not been evaluated in two tools. Responsiveness had not been measured by only one tool. Also, measurement error and interpretability had not been assessed in any of the tools, and stability through test-retest had not been assessed in seven tools.

In general, none of the reviewed tools had accurately examined content validity, construct validity, and criterion validity based on the



TABLE 1 The review of the general tools used to measure the quality of life of hysterectomized women based on the COSMIN checklist.

Tool's name	Article's title	References	Validity			Reliability			Interpretability	Responsiveness
			Content	Construct	Criterion	Internal consistency	Intra-rater reliability	Measurement error		
EQ-5D*	Feasibility, reliability, and validity of the EQ-5D *: results from a multinational study	Ravens-Sieberer, et al. ³³	-	Convergent validity with KIDSCREEN-10* = moderate to high correlations ($r = -0.41$ to -0.52) Spearman rank coefficient with PedsQL* $p = -0.47$	-	-	-	Test-retest agreement = 69.8%–93.8% for Italy & 86.2%–99.7% for Spain	-	Complete data was obtained for 91%–100% of respondents.
WHO-QOL-Bref TAIWAN VERSION	Development and verification of validity and reliability of the WHOQOL-BREF Taiwan version	Yao et al. ³⁴	Content validity coefficients: item-domain correlations: 0.53 to 0.78 inter-domain correlations: 0.51 to 0.64 (all $p < 0.01$).	EFA* & CFA* .4 Factors (physical, psychological, social, and environmental) model 88% of the variance of the total QOL* core	-	Cronbach's $\alpha = 0.70$ to 0.77 for the four domains.	-	Test-retest coefficients = 0.41 to 0.79 at item/ facet level and 0.76 to 0.80 at domain level (all $p < 0.01$).	-	-
SF-12	Cross-Validation of Item Selection and Scoring for the SF-12* Health Survey in Nine Countries: Results from the IQOLA* Project	Gandek, et al. ³⁵ Cross sectional	-	Convergent Validity: Correlations SF-12 with SF-36 = ranging from 0.94–0.96 and 0.94–0.97	-	-	-	-	-	-
WHO-QOL-Bref	WHOQOL-BRE*: introduction, administration, scoring, and generic version of the assessment	WHOQOL Group, ³⁶	-	Discriminant validity with whoqol-100 b ill and well= excellent CFA* = all four WHOQOL-BREF domain scores made a significant contribution to explaining variance	-	Cronbach alpha ranged from 0 \pm 66 to 0 \pm 84)	-	Test-retest = 0 \pm 66 for physical health, 0 \pm 72 for psychological, 0 \pm 76 for social relationships and 0 \pm 87 for environment	-	-

(Continues)

TABLE 1 (Continued)

Tools name	Article's title	References	Validity		Reliability							
			Content	Construct	Criterion	Internal consistency	Test-retest	Intra-rater reliability	Measurement error	Interpretability	Responsiveness	
MOS-36 (SF-36)	The MOS* 36-Item Short-Form Health Survey (SF-36): II. Psychometric and clinical tests of validity in measuring physical and mental health constructs	McHorney, et al. ³⁷	-	Clinical validity: general health perception scale (All comparisons between groups = $p < 0.01$ Total variance: 56%	-	-	-	-	-	-	-	-

Abbreviations: CFA, Confirmatory factor analysis; EFA, Explanatory factor analysis; EQ-5D, EuroQol for health-related quality of life; FSFI, Female sexual function index; IQOLA, International quality of life assessment; KIDSCREEN-10, Health-related quality of life of children from low-income families; MOS, Medical outcomes study; PedsQL*, Pediatric quality of life inventory; SF-12, Short form (12) health survey; WHOQOL-Bref, WHO quality of life questionnaire.

COSMIN checklist. In the majority of the articles, the experts did not thoroughly and precisely assess and report the face and content validity of the tool.

4 | DISCUSSION

Hysterectomy has the potential to influence women's quality of life across a spectrum of areas, encompassing physical, psychological, environmental, and social domains,¹⁴⁻¹⁶ assessing and measuring these variables seem necessary. Thus, this systematic review study was conducted for the first time to examine the psychometric properties of the tools used to measure the quality of life of hysterectomized women using COSMIN checklist.²⁵

Assessing the methodological rigor of a research study should be conducted independently within systematic reviews.²⁹ Inadequate methodological rigor in a study raises doubts about the reliability of its findings and leaves the effectiveness of the research tools in question.⁵³ These days, the Equator Network is one of the main sources used to check the quality of studies and deal with the problems of insufficient systematic reporting on a global scale. The Equator Network aims to increase the quality and transparency of health research, promote clear and accurate reporting, and wider use of guidelines. Effective reporting enhances the reliability and validity of health research publications, thereby mitigating the squandering of financial and human resources in healthcare research initiatives. Equator Network is available at: www.equator.network.org.

The checklist of consensus-based standards for selecting tools that measure health status (COSMIN) is a comprehensive and valid checklist used to assess the quality of tool-design studies.²⁶ In our study, although most of the articles found did not refer to the COSMIN checklist, all considered the validity and reliability of the tools.

The tools commonly used to evaluate the quality of life of women who have undergone hysterectomy are typically grouped into those that measure the general quality of life across the population. It is important to note the absence of a distinct tool dedicated to assessing the quality of life of hysterectomized women.¹⁴ The WHOQOL and SF tools share similarities in physical health, mental health, and social relationships. However, the WHOQOL encompasses an additional dimension known as the health of the surrounding environment. On the other hand, the SF focuses on role limitations caused by emotional factors, physical pain, energy levels, and vitality. In the EQ-5D questionnaire, pain was considered as one of the aspects of quality of life. In addition, mobility, personal care, general activity, social activity, anxiety, and depression were the other aspects of quality of life. The construct validity of general tools is evaluated by factor analysis,^{34,36} discriminant validity,³⁶ convergent validity,^{33,35} and clinical validity.³⁷

Hysterectomy can have significant adverse effects on the body image and self-esteem of women after surgery.⁵⁴ A qualitative study that investigated sexual relations after hysterectomy found that women's sexual ability will be affected after the surgery due to the



TABLE 2 The review of the specific tools employed for assessing the quality of life among women who have undergone hysterectomy, by the COSMIN checklist.

Tool's type	Tool's name	Article's title	References	Validity			Reliability			Interpretability	responsiveness
				Content	Construct	Criterion	retest	Intra-rater reliability	Measurement error		
Cervical cancer	FACT-CX* in Thai patients	Validation of the Functional Assessment of Cancer Therapy with Cervical Cancer Subscale (FACT-CX) for Quality of Life in Thai patients before chemoradiotherapy	Peerawong, et al. ³⁸	-	EFA* revealed an accumulative variance of 0.42 with 4 factors. convergent validity with who-bref correlation coefficient = 0.80 ($p > 0.001$)	There was a correlation between the domains of the modified FACT-CX and WHOQOL-Bref*	Cronbach's alpha: perception of self = 0.84 suffering symptoms = 0.81 family support = 0.78 life resilience = 0.77 total questions = 0.90	-	-	-	-
Cancer	EORTC QLQ-CX24*	The European Organization for Research and Treatment of Cancer (EORTC)* quality-of-life questionnaire cervical cancer module	Greimel, et al. ³⁹	-	Convergent Validity: all item-own scale correlations = >0.40 except Symptom Experience (0.24–0.50). Discriminant Validity: were fulfilled with scaling errors below 3%. Clinical validity: KPSS* correlation with the SES*; ($r = 0.20$; $p = 0.010$). single-item scales Lymphoedema ($r = 0.16$; $p = 0.47$) and Sexual Worry ($r = 0.16$; $p = 0.044$)	Correlation between CCM* and QLQ-C30* scales: Symptom Experience scale: moderately with the QLQ-C30* functioning scales ($r = 0.40$ – 0.48 – cognitive functioning ($r = 0.34$)- Body Image scale: moderately with emotional functioning ($r = 0.43$) global health/QoL* ($r = 0.41$) (correlation coefficient with cervical cancer module = weak [$r < 0.40$])	Cronbach a: (Symptom experience = 0.72 body image = 0.86 sexual/vaginal functioning = 0.87	-	-	-	Response rate = 86% complete without help = 65%

(Continues)

TABLE 2 (Continued)

Tool's type	Tool's name	Article's title	References	Validity		Reliability								
				Content	Construct	Criterion	Internal consistency	retest	Intra-rater reliability	Measurement error	Interpretability	responsiveness		
Cancer	EORTC-QLQ-C30	The European organization for research and treatment of cancer QLQ-C30: a quality-of-life instrument for use in international clinical trials in oncology	Aronson, et al. ⁴⁰	-	All items exhibited good compliance with missing values < 3%	-	Inter-scale correlations before and during treatment are significant. ($p < 0.01$)	-	Cronbach's alpha coefficient ≥ 0.70	-	-	-	-	-
Urogenital dysfunction	IIQ*, UDI*	Measuring health-related quality of life in women with urogenital dysfunction: The urogenital distress inventory and incontinence impact questionnaire revisited	van der Vaart, et al. ⁴¹	-	Varimax rotation SCC* UDI/IIQ scales and the RAND-36.* All correlations were significant at $p < 0.001$ clinical sample had a significantly higher score on all the IIQ subscales than community sample $p < 0.0001$	with the physician's diagnosis (SCC = 0.44 and, 0.28)	-	Cronbach's a(UDI): 0.74 and 0.82 Cronbach's a(IIQ): 0.83 and 0.93	-	-	-	-	-	-



TABLE 2 (Continued)

Tool's type	Tool's name	Article's title	References	Validity		Reliability						
				Content	Criterion	Internal consistency	retest	Intra-rater reliability	Measurement error	Interpretability	responsiveness	
Urinary incontinence	IIQ*–7 & UDI*–6	Short forms to assess life quality and symptom distress for urinary incontinence in women: The incontinence impact questionnaire and the urogenital distress inventory	Uebersax, et al. ⁴²	-	Compare B pre and post: IIQ-7: $p < 0.001$ UDI-6: $p < 0.001$ Correlation with Clinical Measures: IIQ-7: $p < 0.001$ UDI-6: $p < 0.01$	With UDI-19: correlated 0.93 With IIQ-30: 1.0	-	-	-	-	-	-
Urinary incontinence:	IIQ* and UDI*	Health-related quality of life measures for women with urinary incontinence: the incontinence impact questionnaire and the urogenital distress inventory	Shumaker, et al. ⁴³	face validity = +	PCA* and PFA* IIQ = 4 Factor UDI = 3 Factor- varimax rotation. Convergent validity with RAND 36-Item Health Survey, All but one correlation between IIQ subscales and the generic measures = $p < 0.05$ Divergent = minimally correlated with age	With physician examination $r = 0.54$, 84% of times	Cronbach's alpha for irritative symptoms (0.70), obstructive discomfort (0.77), and stress symptoms (0.48). Reliabilities for the subscales of the IIQ were physical activity (0.87), social travel (0.87), social (0.90), and emotional (0.90).	-	-	-	-	-

(Continues)



TABLE 2 (Continued)

Tool's type	Tool's name	Article's title	References	Validity			Reliability					
				Content	Construct	Criterion	Internal consistency	retest	Intra-rater reliability	Measurement error	Interpretability	responsiveness
Prolapse	Translation, transcultural adaptation, and validation of the pelvic organ prolapse (P-QoL* in Amharic	Translation, transcultural adaptation, reliability, and validation of the pelvic organ prolapse (P-QoL*) in Amharic	Belayneh, et al. ⁴⁴	inter-views with experts ten Patients: CVI* = 0.98	CFA* = (CFI = 0.69, RMSEA = 0.17, SRMR = 0.43, TLI = 0.65 PCLOSE = 0.00) EFA*three-factor with satisfactory convergent and discriminant validity cumulative variance explained was 70.01%. Incontinence impact questionnaire	with SPOP-Q* = correlated with stage of prolapse (SCC = 0.42 to 0.64, $p < 0.001$) low to moderate strength	Cronbach's alpha $\alpha = 0.96$ CI* 0.95–0.97; $p < 0.001$	ICC = 0.87 CI: 0.82 0.92; $p < 0.001$	-	-	-	-
Prolapse	P-QoL* questionnaire in Thai version	Validation of the prolapse quality of life (P-QoL*) questionnaire in Thai version	Manchana and Bunyavejch-evin ⁴⁵	-	-	Significant correlation between PQoL* domain scores and vaginal examination p for all domains except Personal relationships were < 0.05	Cronbach's alpha for each domain was greater than 0.70	Test-retest with SCC* The p -value for all domains was > 0.05	-	-	The level of missing data was $\leq 2.2\%$.	94% response rate
Prolapse	P-QoL* in a Turkish population	Validation of the prolapse quality of life questionnaire (P-QoL*) in a Turkish population	Cam, et al. ⁴⁶	-	-	The severity of P-QoL* was strongly correlated with the vaginal examination findings among the symptomatic group $p < 0.001$ SCC* between total, P-QoL, and vaginal examination = SCC* = 0.61	-	Spearman's rho was from 0.91 to 1.00 for all domains $p < 0.001$	-	-	-	-



TABLE 2 (Continued)

Tool's type	Tool's name	Article's title	References	Validity		Reliability					Interpretability	responsiveness
				Content	Construct	Criterion	Internal consistency	retest	Intra-rater reliability	Measurement error		
Prolapse	IIQ*-7 UDI*-6 in a Turkish popu- lation	Validation of the short forms of the incontinence impact questionnaire (IIQ-7) and the urogenital distress inventory (UDI-6) in a Turkish population	Cam, et al. ⁴⁷	Content and face validity with an expert panel	-	The general and subscale scores compared with urodynamic diagnoses: P-value Kruskal Wallis IIQ < 0.001 P-value UDI = < 0.005	Cronbach's alpha for the IIQ-7 = 0.87 Cronbach's alpha for the UDI-6 = 0.74	Spearman's rho was 0.99 for both of the scales <i>p</i> < 0.0001	-	-	-	-
Prolapse	P-QOL*	P-QOL: a validated questionnaire to assess the symptoms and quality of life of women with urogenital prolapse	Digesu, et al. ⁴⁸	-	Severity according to P-QOL strongly correlated with the vaginal examination findings (<i>p</i> < 0.01, rho > 0.5)	-	All items achieved a Cronbach alpha greater than 0.80	All items = <i>p</i> > 0.001 SCC* ranged from 0.644-0.872	-	-	-	-
Prolapse	PFDI*-20 and PFIQ*-7	Short forms of two condition-specific quality-of-life questionnaires for women with pelvic floor disorders (PFDI-20* and PFIQ-7*)	Barber, et al. ⁴⁹	-	excellent correlation for the scales of the short and long forms of the PFDI and PFIQ-20: <i>r</i> = 88 to 94 for scales. PFIQ with PFIQ-7: <i>r</i> = 95 to 96 for scales. <i>p</i> < 0.0001 for all.	-	Cronbach's alpha PFDI-20* = 0.88 PFIQ-7* = 0.97	ICC* values between 0.70 and 0.91	-	-	-	SRM for PFDI-20* = 1.09 <i>p</i> < 0.001 SRM for PFIQ-7* = 0.63 <i>p</i> < 0.001

(Continues)

TABLE 2 (Continued)

Tool's type	Tool's name	Article's title	References	Validity			Reliability					
				Content	Construct	Criterion	Internal consistency	retest	Intra-rater reliability	Measurement error	Interpretability	responsiveness
Prolapse	PFDI* & PFIQ*	Psychometric evaluation of 2 comprehensive condition-specific quality of life instruments for women with pelvic floor disorders	Barber, et al. ⁵⁰	Content and face validity with the expert panel were done	Interclass correlations: PFDI: 0.86–0.87 PFIQ: 0.77–0.92	Correlation with the stage of prolapse ($p < 0.01$) correlation with the number of fecal incontinence episodes per month ($p = 0.49$, $p < 0.0001$ and $p = 0$ and $p < 0.01$)	Internally consistent: PFDI: 0.82–0.89 PFIQ: 0.96–0.97	PFDI ICC = 87% PFIQ ICC = 86%	-	-	-	-
Uterine fibroid	UFS-QOL*	The UFS-QOL*, a new disease-specific symptom and health-related quality of life questionnaire for leiomyomata	Spies, et al. ⁵¹	-	EFA*: Subscale to-subscale correlations were high and ranged from $r = 0.45$ – 0.75 D*: All subscales and HRQOL total between normal and patient people were significant $p < 0.05$ (PCC*: SF-36*, Menorrhagia Questionnaire, Sexual Function Scale)	s-m* correlations with the SF-36 subscales ranging from 0.10 to 0.64. M* correlations with Menorrhagia Questionnaire scales ($r = 0.44$ – 0.76)	Subscale Cronbach's range from 0.83 to 0.95, with the overall health-related quality of life score of 0.97	Test-retest reliability was good with ICC* = 0.76–0.93	-	-	-	-



TABLE 2 (Continued)

Tool's type	Tool's name	Article's title	References	Validity			Reliability			Interpret-ability	respon-siveness
				Content	Construct	Criterion	Internal consistency	retest	Intra-rater reliability		
Uterine fibroid	UFS-QOL* - Hysterectomy questionnaire: Modifying an existing measure for comparative effectiveness research	Validation of the UFS-QOL-hysterectomy questionnaire: Modifying an existing measure for comparative effectiveness research	Coyne, et al. ⁵²	-	-	Good concurrent validity: correlations with SF-36 at 6 months: 0.00-0.70 at 12 month:0.03-0.70	Cronbach's α : 0.70 to 0.96 at 6-month 0.66 to 0.95 at 12 months	-	-	-	Effect size from 1.23 to 2.55

Abbreviations: CCM, Cervical cancer module; CFA, Confirmatory factor analysis; CI, 95% confidence interval; CRAIQ-7, Colorectal-anal impact questionnaire-7; CRADI-8, Colorectal-anal distress inventory-8; CVI, Content validity index; EFA, Explanatory factor analysis; EORTC-QLQ-C30, The European Organization for Research and Treatment of Cancer (EORTC); EORTC QLQ-CX24, The European Organization for Research and Treatment of Cancer (EORTC); EQ-5D, Euro quality of life - 5 dimensions; FACT-CX, Functional assessment of cancer therapy with cervical cancer subscale; FSAD, Female sexual arousal disorder; GP, Genital prolapse; ICC, Intra-class correlation coefficient; ILQ, Incontinence impact questionnaire; IQOLA, International quality of life assessment; KPSS, Karnofsky performance status scores; M, Moderate; PCA, Principal components analysis; PCC, Pearson correlation coefficients; PFA, Principal factor analyses; PFIQ, Pelvic floor distress inventory; PFDI, Pelvic floor impact questionnaire; POP, Pelvic organ prolapse; POPDI-6, Pelvic organ prolapse distress inventory-6; POPIQ, Pelvic organ prolapse impact questionnaire; POPIQ-7, Pelvic organ prolapse impact questionnaire-7; POP-Q, Pelvic organ prolapse quantification system; P-QoL, Prolapse quality of life; QOL, Quality of life; Quality-of-Life questionnaire cervical cancer module; RAND-36, Generic and disease-specific questionnaire (49); rho, Spearman's rank correlation coefficient; SCC, Spearman correlation coefficient; SD, Standard deviation; SES, Symptom experience scale; s-m, Small to moderate; SPOP-Q, Simplified pelvic organ prolapse quantification system; UI, Urinary incontinence; UDI, Urinary distress inventory; UFS-QOL, Uterine fibroid symptoms and health-related quality of life; UIQ-7, Urinary impact questionnaire-7; WHOQOL-Bref, World Health Organization quality of life questionnaire (26 items).

sense of guilt, ambiguity in the sense of being feminine, and being conscience about not having a uterus. Therefore, general tools that do not consider the consequences of hysterectomy after surgery may not be suitable for measuring the quality of life of hysterectomized women.⁵⁵ Thus, considering the concept and complications of hysterectomy is necessary to design a tool to measure the quality of life of hysterectomized women specifically. Another factor that should be noted about the EQ-5D tool is that the face and content validity, criterion validity, internal consistency, and responsiveness of this tool have not been evaluated. Criterion validity, interpretability, and responsiveness have also not been measured in the studies that analyzed the psychometric properties of WHOQOL or SF tools.

Among the specific tools, Fact-cx,³⁸ EORTC QLQ-CX24,³⁹ and EORTC QLQ-C30⁴⁰ tools are mainly used to assess the quality of life of patients with cervical cancer. The two EORTC QLQ-CX24 and EORTC QLQ-C30 tools have similar domains, including function (physical, role, emotional, cognitive, and social aspects), symptoms (fatigue, nausea, vomiting, pain, shortness of breath, sleep disorder, loss of appetite, constipation, and diarrhea), financial impact and global scale of quality of life. The Fact-cx tool emphasizes various dimensions of well-being, including physical, social, familial, emotional, and functional aspects. The Fact-cx also has several items related to cervical cancer examination. In many studies, abdominal pressure pain, vaginal pressure pain,⁵⁶ pelvic abscess, intestinal obstruction or severe ileus, and vaginal cuff⁵⁷ have been mentioned as the most common postoperative symptoms and complications of hysterectomy, which have not been considered in the above-mentioned tools. In addition, content validity and interpretability have not been measured in any of the above-mentioned tools. Responsiveness has also been measured for only one of the above tools.³⁹

The IIQ-7 and the UDI-6^{41-43,47} tools are both related to the quality of life of people with urinary incontinence. These tools are usually used together. However, the IIQ-7 is often used to assess variables such as physical activity, travel, social activities, and emotional health, while UDI-6 covers three areas of irritating symptoms (urgency, frequency, and urinary leakage), stress and obstruction symptoms, and pain and discomfort in the lower abdomen or genitals. These tools specifically measure the quality of life of people with urinary incontinence, while the most common causes of hysterectomy include fibroids and abnormal uterine bleeding.⁵⁸ Therefore, the items of aforementioned tools are not comprehensive enough to examine the quality of life of hysterectomized women because, in addition to the possible complications of hysterectomy, women who have undergone this surgery are also affected by the symptoms of other underlying diseases that have led to hysterectomy. Therefore, there is a need for a tool that has sufficient comprehensiveness to investigate and measure the causes and consequences of hysterectomy that affect the quality of life of women undergoing this surgery. Also, in two studies,^{41,42} content validity has not been measured for the mentioned tools, while interpretability and responsiveness have not been measured in any of the tools.

The P-QOL,^{44-45,48} PFDI-20 and PFIQ-7,^{49,50} tools are three specific tools that examine the quality of life of people with pelvic floor

prolapse. The P-QOL evaluates the aspects of general health perception, the effects of prolapse, the role of limitation, physical limitation, social limitation, personal relationships, emotions, sleep/energy, and the severity of prolapse. The other two tools are each made from the subscales of other tools. The PFDI-20 instrument comprises three sub-tools, namely the Pelvic Organ Prolapse Distress Inventory (POPDI-6), the Colorectal-Anal Distress Inventory (CRADI-8), and the Urinary Distress Inventory (UDI-6). These sub-tools are designed to assess symptoms related to pelvic organ prolapse, anorectal distress, and urinary distress, respectively. The PFIQ-7 tool also has the sub-tools of the UIQ-7 questionnaire, the pelvic organ dysfunction questionnaire (POPIQ-7), and the colorectal-anal impact questionnaire (CRAIQ-7). The use of tools that examine the impact of pelvic organ prolapse or the severity of prolapse in women who have undergone hysterectomy for reasons such as fibroids, abnormal uterine bleeding, or cancer is not compatible. In addition, many specific aspects of hysterectomy such as heterogeneous feelings and perceptions of the body such as conflicting feelings about physical changes and body image, regret for the loss of body parts and capabilities,⁵⁹ infertility, and cervical stenosis⁶⁰ after hysterectomy have not been considered in these tools. Content and face validity have not been measured in some tools.^{45,46,48,49} Criterion validity has also not been measured in some studies.^{49,50}

The UFS-QOL⁵¹ and UFS-QOL-Hysterectomy⁵² tools are also the only specialized tools for examining the quality of life of people with uterine fibroids, both of which include the domains of symptom severity, worry, activity, energy-mood, control, self-awareness, and sexual performance. The UFS-QOL-Hysterectomy tool is the same as the UFS-QOL tool, which has been modified only for women who have undergone hysterectomy due to uterine fibroids. In the mentioned tools, attention has been paid to the special conditions and characteristics of patients with fibroids. They also include constructs such as checking the severity of symptoms, which are not applicable in hysterectomized women. The UFS-QOL-Hysterectomy tool is only used for women who have undergone hysterectomy due to fibroids, while hysterectomy can be carried out for many other reasons.⁶¹ Thus, the necessity of a specialized tool is felt when we need to measure the conditions and special characteristics of these women who, due to various reasons, have undergone hysterectomy. Regarding these two specialized tools, we should note that content validity and interpretability have not been measured for both tools.

Construct validity of the questionnaire has been evaluated in specific tools by factor analysis,^{40,42,46,49,51} divergent validity,^{40,48} convergent validity,^{46,48} and clinical validity.^{38,48} Except for studies focused on translating a tool or developing a shortened version, all the tools mentioned exhibit satisfactory stability. This stability is assessed through two key measures: internal consistency, as determined by Cronbach's alpha coefficient, and test-retest reliability, which requires a correlation coefficient greater than 0.7. Elevated levels of internal consistency suggest strong inter-item correlations, pointing toward the likelihood that the instrument effectively assesses the targeted concept.⁶²

Regarding the intra-rater reliability criterion in the COSMIN checklist, it should be noted that the tools examined in this study are



used to measure quality of life with the self-reporting method, but intra-rater agreement has not been examined in any of them, because this criterion is used in tools that are completed by the evaluator.⁶²

The quality of life of hysterectomized women has unique dimensions because these women face different problems at individual, social, psychological, and familial levels. The quality of life of hysterectomized women is a relatively new field in research, to which recent healthcare researchers pay special attention. However, there is no tool to assess the quality of life hysterectomized women. This lack of a dedicated tool hinders the ability of healthcare professionals to accurately describe the present condition and evaluate the impact of interventions. Consequently, there exists a requirement for a dedicated instrument for accurate evaluation of the well-being of women who have undergone hysterectomy. Also, identifying the tools used in studies to measure the quality of life of hysterectomized women and comparing these tools in terms of validity and reliability can be an objective of various research in the future to help people choose the right tools for measuring the quality of life of these women. In the clinical setting, selecting the most appropriate tool is essential for correct situation analysis, planning, and evaluating the evidenced-based interventions to improve the quality of life of hysterectomized women. Also, by identifying the challenges of quality of life in hysterectomized women using the appropriate tools, we can take further steps towards planning more appropriately and making effective policies to improve the quality of life of these women. The results of this study can be used for planning workshops for hysterectomized women and also for retraining medical staff who work in medical and counseling centers for educational purposes.

5 | STRENGTH AND LIMITATION

The present study has some strengths. According to our searches, this is the first study to investigate the quality of tools used to measure the quality of life of hysterectomized women using PRISMA and COSMIN guidelines. In line with the COSMIN group's suggestions, two reviewers appraised the quality of each tool separately, seeking the input of a third researcher to resolve any discrepancies. Nevertheless, it is essential to recognize the limitations of this study. The search in this study did not encompass unpublished studies or gray literature and was restricted to selected databases. The choice to exclusively incorporate articles that have been published in our peer-reviewed journals indicates a potential bias in publication.

6 | CONCLUSION

This systematic review has demonstrated that none of the checklists and tools assessed in the study encompassed all the essential elements required for accurately measuring the quality of life in women who have undergone hysterectomy. There was no information about the measurement properties of the tools examined in this study. The results of this systematic review can be used to prepare a standardized tool to

assess the quality of life of hysterectomized women in a more specific way. It can also broaden the vision of healthcare managers and policy-makers in plans and programs that deal with the challenges associated with the quality of life of hysterectomized women.

AUTHOR CONTRIBUTIONS

Mahdiye Taheri: Conceptualisation; study design; searching; data extraction; writing the primary draft. Masoumeh Simbar: Supervision; study design; data analysis; critical thinking; editing of the manuscript. Abbas Ebadi: Study design; critical thinking; supervision. Mahrokh Dolatian: Searching; data extraction; manuscript writing. All authors read and approved the final manuscript.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

The manuscript contains all the necessary data.

ETHICS STATEMENT

The study received approval from the Ethics Committee [Code: IR.SBMU. PHARMACY. REC.1402.055] of Shahid Beheshti University of Medical Sciences.

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