Reliability and Validity of the Persian Version of the Quality of Life Questionnaire for Mothers of Children with Disabilities

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Abstract

Background: Mothers of children with disabilities experience significant psychological and emotional stress, necessitating a valid and reliable tool to assess their quality of life. This study aimed to determine the psychometric properties and standardize the Quality of Life Questionnaire for mothers of children with disabilities.

Methods: A cross-sectional study was conducted among mothers of children with disabilities residing in Kermanshah, Iran, in 2022, to evaluate the reliability and validity of the Persian version of the quality of Life Questionnaire. The target population encompassed all mothers meeting these criteria, from which a simple random sample of 379 participants was drawn. The Quality of Life Questionnaire and a perceived social support measure were administered to the study participants. The psychometric properties of the Quality of Life Questionnaire were evaluated using SPSS version 26. Internal consistency was assessed using Cronbach's alpha, while content validity was determined through expert judgment and calculated using the Content Validity Ratio and Content Validity Index.

Results: The results indicated satisfactory internal consistency, as demonstrated by Cronbach's alpha (α=0.955) and composite reliability (0.965). All 16 items exhibited excellent item-total correlations (Cohen's kappa >0.60), suggesting strong internal consistency. Content validity was established through experts panel review (content validity index range: 0.86-1.00). Confirmatory factor analysis confirmed the construct validity of the questionnaire, and normative data were successfully established.

Conclusions: The findings demonstrated that the questionnaire possesses adequate psychometric properties, including reliability and validity, thus supporting its suitability for assessing the quality of life among mothers of children with disabilities.

Keywords: Psychometrics, Quality of life, Disabled children, Women

1. Introduction

Intellectual, physical, sensory (visual and auditory), and neurological disabilities encompass impairments in cognitive abilities, adaptive functioning across conceptual, social, and practical domains, and consequently, affect an individual's capacity to meet everyday demands and responsibilities (1). Families play a crucial role in coping with the impact of an event or illness on one of their members, especially a child (2). Therefore, managing a child with a disability is one of the most stressful experiences for families. According to systemic family theories, any psychiatric disorder in children impacts the entire family (3). The negative consequences of having a child with a disability are associated with significant stress and can lead to various psychological impairments for the family, particularly the mother as the primary caregiver. Many mothers of children with disabilities experience psychological problems.

Consequently, mothers of children with disabilities are more prone to depression and feelings of parental incompetence (4, 5). Research on disability has shown that intellectual, physical, sensory (visual and auditory), and other developmental disorders lead to significant impairment in social and occupational functioning, increased anger, feelings of loneliness and guilt, irritability, hopelessness, and a decline in quality of life for mothers of these children (6).

Quality of life is an individual's subjective assessment of their well-being within their cultural and societal context, considering personal aspirations, expectations, and values (7). It is now considered as one of the indicators of development, and improving it is of paramount importance. Factors such as happiness, emotional functioning, life satisfaction, level of consciousness, well-being, satisfactory sexual function, level of social activity, memory, financial and occupational status, and

general health are considered as components of quality of life (8, 9). Research suggested an increased risk of depression, anxiety, and health problems as a consequence of having a child with a disability (10, 11). The extent of the impact on quality of life in families with children with intellectual, physical, sensory (visual and auditory), neurological, or developmental disabilities depends on environmental factors and variables such as socioeconomic status, social support, child and parental characteristics, and coping strategies (12). Mothers with disabled children may be blamed by society with incorrect assumptions about their child's abilities, leading to despair about their child's future (13). Since mothers play a crucial role in child-rearing and family harmony as the primary pillar of the family, paying attention to their health and quality of life is of particular importance for the health of the entire family and society (14).

Various instruments have been developed to measure the quality of life (15, 16). However, the specific experiences of mothers with children with disabilities in this regard have been under-explored. To address this gap, Reeves and colleagues (17) developed a questionnaire designed to assess quality of life in its entirety and across specific domains (16). The questionnaire comprises 16 items grouped into five factors: physical well-being, relationships with others, social activities, personal development and fulfillment, and recreation. Responses are rated on a 7-point Likert scale. In the original study by Reeves and colleagues (17), the instrument was validated with five factors, which were also examined in the present study.

Given the need for a reliable tool to measure quality of life, the crucial role of mothers' quality of life in the success and future of children, and the limitations of previous research (15, 16) in terms of the lack of norming of this scale in Iran, this study aimed to develop a criterion by examining the level of quality of life and determining the validity and reliability of the quality of life questionnaire for mothers with children with intellectual disabilities in Kermanshah, Iran. This would allow each mother, regardless of the type of disability of her child, to be considered based on realistic expectations, and for future tasks and programs to be developed accordingly. Therefore, the present study aimed to determine the psychometric properties and standardize

the quality of life questionnaire for mothers of children with intellectual disabilities.

2. Methods

This cross-sectional study aimed to examine the validity and reliability of the Quality of Life Questionnaire for mothers of children with disabilities. The target population consisted of all mothers of children with intellectual, physical, sensory (visual and auditory), and neurological disabilities residing in Kermanshah, Iran, in 2022 (N=2,216). A simple random sample of 379 mothers of children with disabilities, who met the inclusion criteria, was selected. The inclusion criteria were: providing an informed consent, living with a spouse, completing all questionnaire items, and having at least a middle school education to understand the questionnaire items. Incomplete questionnaires were excluded from the study.

2.1. Measures

2.1.1. The Multidimensional Scale of Perceived Social Support (MSPSS): MSPSS, developed by Zimet and co-workers (18), is a well-established measure of an individual's subjective perception of social support. This 12-item scale assesses perceived support from family, friends, and significant others using a 5-point Likert scale ranging from complete disagreement to complete agreement. Higher scores indicate greater perceived social support. Demonstrating robust psychometric properties, the scale has reported Cronbach's alpha coefficients of 0.89 (19) and 0.85 in the present study, respectively.

2.1.2. Quality of Life Questionnaire: The Quality of Life Questionnaire was developed by Reeves and colleagues (17). This 16-item questionnaire comprises five dimensions: physical well-being (items 1 and 2), relationships with others (items 3, 5, 6, and 7), social activities (items 8, 11, and 13), personal development and fulfillment (items 4, 9, 10, and 12), and recreation (items 14, 15, and 16). The questionnaire uses a 7-point Likert scale, ranging from 1 to 7. The total score is calculated by summing the scores of all items, with lower scores indicating lower quality of life and higher scores indicating higher quality of life. The scale's total score ranges from 16 to 112. The developers reported a Cronbach's alpha of 0.75 for the questionnaire, and confirmatory factor analysis supported its construct validity (17).

2.2. Procedure

A letter of permit was obtained by Islamic Azad University, Ahvaz Branch. Next, the officials provided the researcher with a list of mothers with children with intellectual, physical, sensory (visual and auditory), and neurological disabilities. The researcher then used simple random sampling method to select the sample. The individuals who met the inclusion criteria completed the questionnaires. Questionnaires with missing items were excluded. For high accuracy and to prevent intentional or unintentional errors, the researcher personally distributed and collected the questionnaires. The questionnaires were individually given to mothers with children with disabilities, and the method of answering the questionnaires was explained. During the completion of the questionnaires, the researcher guided the mothers by answering their questions patiently and clarifying any ambiguities. To ensure ethical considerations, the mothers were assured that their responses would remain confidential.

2.3. Data Analysis

The psychometric properties of the questionnaire were assessed using SPSS version 26. Quantitative face validity was established through expert review of the questionnaire items. Experts were asked to rate the clarity, relevance, and comprehensibility of each item on a Likert scale. Qualitative face validity was assessed through a pilot study where participants were asked to provide open-ended feedback on the questionnaire's clarity, relevance, and comprehensibility. Content validity was evaluated using both the Content Validity Ratio (CVR) and Content Validity Index (CVI). A panel of

eight experts in the fields of psychology, education, and social work rated each item's relevance to the construct being measured. The experts were selected based on their expertise in assessing quality of life measures and their familiarity with the target population. Confirmatory factor analysis (CFA) was employed to assess construct validity. The CFA model was tested for fit using various indices, such as the chi-square test, Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA). Cronbach's alpha coefficient was used to assess the internal consistency of the scale.

3. Results

The study participants were 379 mothers of children with disabilities, aged between 25 and 55 years. A high percentage of respondents (84.96%) had children with a single disability, while 15.04% had children with multiple disabilities. The demographic characteristics of the participants are shown in Table 1.

The panel of experts rated the clarity, relevance, and comprehensibility of each item on a three-point scale: "essential," "useful but not essential," and "not necessary." The majority of experts (approximately 80%) agreed that the questionnaire items were logical and pertinent to the construct of workplace stress, supporting the questionnaire's face validity.

Content validity was assessed through expert judgment of the questionnaire items. The Content Validity Ratio (CVR) and Content Validity Index (CVI) were employed to evaluate content validity. Experts rated each item on a three-point scale:

Table 1: Demographic characteristics of the participants

Demographic variables		n	%
Age (years)	25-35	124	32.72
	35-45	159	41.95
	45-55	96	25.33
Marital duration (years)	1-10	138	36.41
	10-20	160	42.22
	20-30	81	21.37
Education	Middle School	108	28.50
	High school	205	54.09
	University education	66	17.41
Type of disability of the child	Single disability	322	84.96
	Multiple disabilities	57	15.04
Occupation	Homemaker	268	70.71
	Employed	111	29.29

"essential," "useful but not essential," and "not necessary." The responses were then calculated using the following formula:

$$CVR = \frac{n_e - \frac{N}{2}}{\frac{N}{2}}$$

where N represents the total number of experts, and n_e represents the number of experts who responded: "essential". In this study, the CVR for the 16 questions ranged from 0.86 to 1.00, indicating that the content validity of the questions was confirmed. The CVI was calculated by summing the agreement scores for each item that received a score of "relevant but needs revision" or "highly relevant" and dividing by the total number of experts. In this study, the CVI for the 16 questions ranged from 0.83 to 1.00, indicating that the content validity of the questions was confirmed.

Prior to conducting exploratory factor analysis (EFA), Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity were performed. The KMO value was found to be 0.958, indicating that the sample size was adequate for factor analysis. Bartlett's test of sphericity was also significant (χ^2=46.3481, P<0.001), suggesting that factor analysis was appropriate to identify the underlying factor structure. To extract factors for the Quality of Life Questionnaire, principal component analysis was initially employed. Three main criteria were used to determine the factors: eigenvalue, percentage of variance explained by each factor, and cumulative percentage of variance explained. Subsequently, the Varimax rotation method was applied to identify the potential underlying factors of the questionnaire. The results indicated a single factor with an eigenvalue greater than one, explaining 55.21% of the variance in quality of life. A scree plot is presented in Figure 1. As depicted in Figure 1, following the first factor, all other factors exhibited eigenvalues less than one. Moreover, the slope of the scree plot experienced a notable change after the first factor. Consequently, it can be inferred that the Quality of Life Questionnaire is comprised of a single factor. The results of the Varimax rotation revealed that the factor loadings of all items exceeded 0.40, indicating that none of the items were eliminated.

Confirmatory Factor Analysis (CFA) was conducted to evaluate the construct validity of the Quality of Life Questionnaire. The CFA results indicated a satisfactory model fit, as evidenced by the following indices: IFI=0.94, TLI=0.93, CFI=0.94, and RMSEA=0.074 (Table 2). The structural equation model is depicted in Figure 2.

The discriminant validity of the questionnaire was assessed by calculating the Heterotrait-Monotrait Ratio (HTMT), a reliable index for discriminant validity. A social support questionnaire was used to assess the discriminant validity of the Quality of Life Questionnaire, resulting in an HTMT of 0.41. It can be concluded that the discriminant validity of the Quality of Life Questionnaire was confirmed.

In this study, after collecting data on expert judgments about the questionnaire items, Cohen's kappa coefficient was used as a statistical measure of inter-rater agreement.
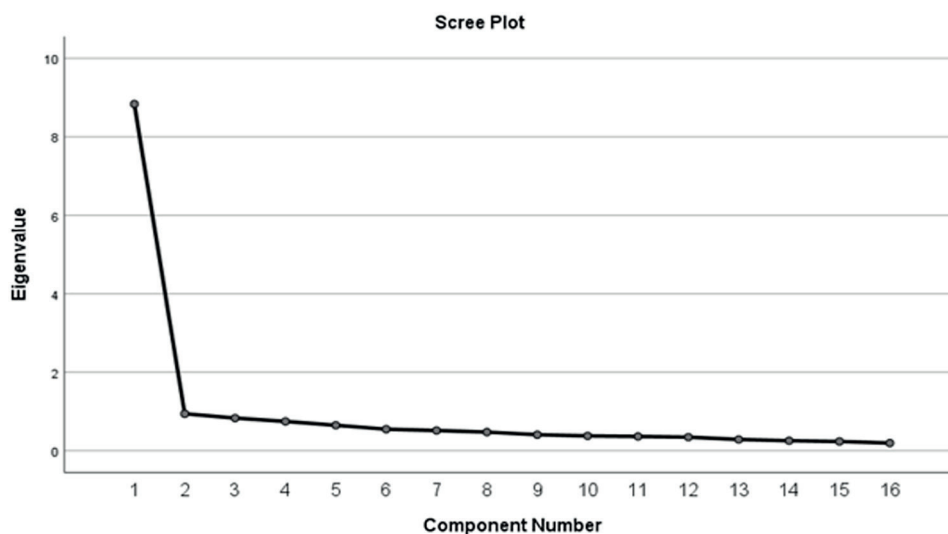

Figure 1: The figure shows the scree plot of eigenvalues.

Table 2: Fit indices of the model

Fit indicators	χ^2	df	(χ^2/df)	IFI	TLI	CFI	RMSEA
Values	293.90	103	2.85	0.94	0.93	0.94	0.074

IFI: Incremental Fit Index; TLI: Tucker–Lewis index; CFI: Comparative Fit Index; RMSEA: Root Mean Square Error of Approximation
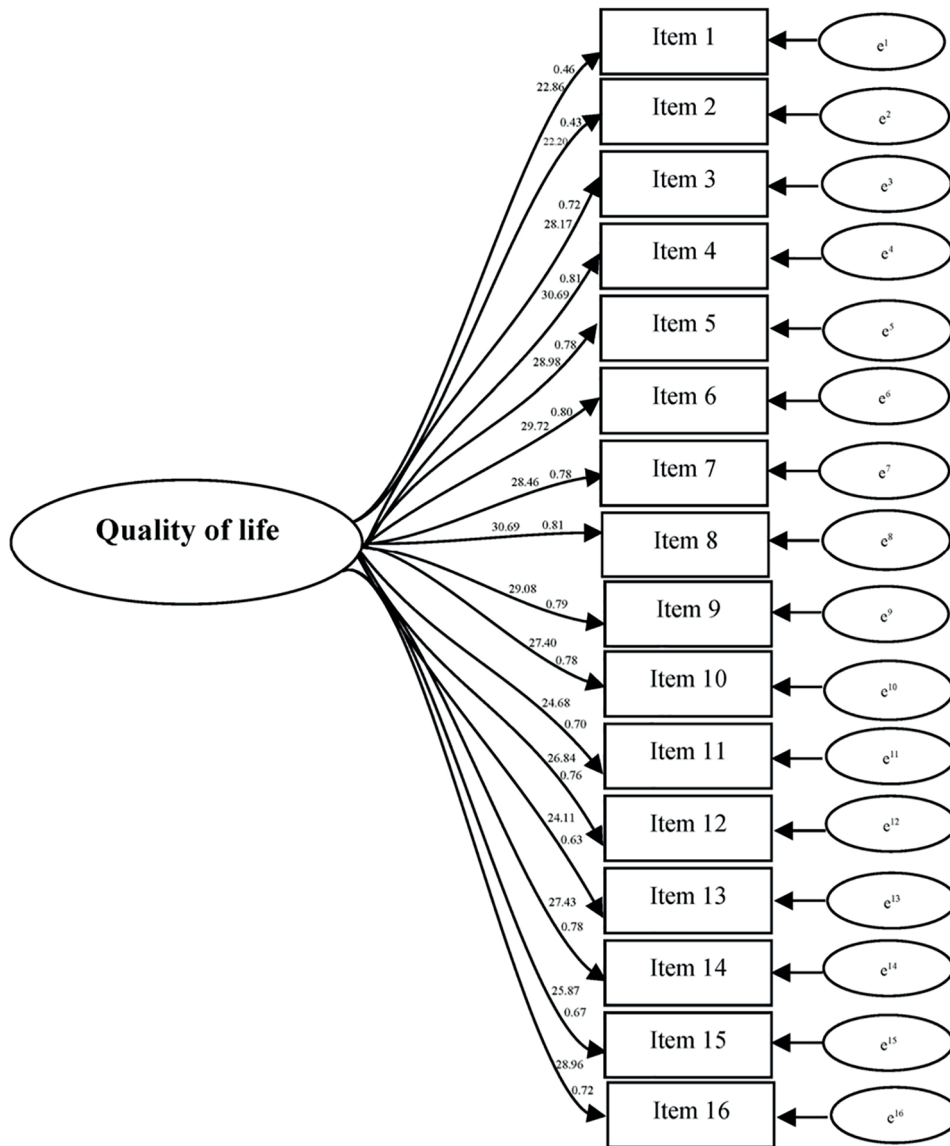

Figure 2: The figure shows the results of confirmatory factor analysis (CFA) with t-values.

The calculated values for these items are presented in Table 3. Results showed that all 16 questions had a kappa coefficient greater than 0.60. Cohen's kappa coefficient was calculated to assess inter-rater reliability, with values exceeding 0.60 indicating substantial agreement and those surpassing 0.80 suggesting almost perfect agreement.

Table 4 presents the reliability estimates for the questionnaire, including Cronbach's alpha and composite reliability, along with the average variance extracted (AVE). The Cronbach's alpha value of 0.955 indicates excellent internal consistency among the items within the scale, suggesting that they are measuring a single underlying construct. The composite reliability value of 0.965 further supports the scale's reliability and suggests that it is a stable and consistent measure. The AVE value of 0.609 indicates that the scale adequately captures the variance in the underlying construct, providing evidence of its convergent validity. Overall, the results suggested that the questionnaire demonstrates strong psychometric properties in terms of reliability and convergent validity.

Table 3: Cohen's kappa coefficient values of questionnaire items

Item	Cohen's kappa	P
1. Material comfort of home, food, amenities, financial security	1.00	0.001
2. Health - being physically fit and strong	0.91	0.001
3. Relationships with parents, siblings, and other relatives - communication, visits, help	1.00	0.001
4. Having and raising children	0.95	0.001
5. Relationships with spouse or significant others	1.00	0.001
6. Close friends	0.85	0.001
7. Helping and encouraging others, volunteering, giving advice	1.00	0.001
8. Participation in organizations and public affairs	0.74	0.001
9. Learning - attending school, improving understanding, acquiring additional knowledge	1.00	0.001
10. Self-understanding - knowing one's strengths and limitations - knowing what life is about	1.00	0.001
11. Employment outside or inside the home	1.00	0.001
12. Creative expression	0.95	0.001
13. Socializing - meeting people, doing things, parties	0.68	0.001
14. Reading, listening to music, or watching entertainment	0.84	0.001
15. Engaging in active recreation	0.76	0.001
16. Independence, doing things for oneself	1.00	0.001

Table 4: Cronbach's alpha and composite reliability of the questionnaire

Factor	Cronbach's alpha	Composite reliability	Average variance extracted (AVE)
Values	0.955	0.965	0.609

4. Discussion

The present study successfully established the psychometric properties and developed a normative standard for the Quality of Life Questionnaire tailored to mothers of children with disabilities. Our findings highlighted the strong internal consistency, convergent validity, discriminant validity, and inter-rater reliability of the questionnaire.

Given the absence of a precise tool for assessing the quality of life of mothers with children with disabilities, this study focused on validating and norming a quality of life questionnaire. Consequently, further development of assessment procedures for the quality of life of mothers with disabled children will contribute to expanding the focus of psychological research, providing a more comprehensive view of their lives (20). Due to the unique characteristics of children with disabilities and the mother's non-acceptance of the existing situation, which exposes her to negative perceptions of her own position, their quality of life is reduced (21). Assessing the quality of life using a normed questionnaire in the present study will lead to the development of intervention methods for self-control and environmental mastery, resulting in improved quality of life and reduced anxiety (22, 23). Quality of life is related to factors such as personal and family goals and objectives, functional ability, social support, communication skills, activities of daily living, cognition, problem-solving skills, and decision-making ability, pain and comfort, economic resources, basic human needs, food, shelter, and security (24, 25).

Psychologists have asserted that an individual's sense of satisfaction and personal perception of well-being is fundamental to achieving a good quality of life (26). Families with children with disabilities face numerous challenges in terms of care, education, and upbringing, ultimately impacting the overall quality of life (27). These issues place significant stress on parents, disrupting family harmony and cohesion and consequently affecting their adaptation and coping. Mothers, in particular, bear a greater burden of responsibility (4). As mentioned, there are few tools for assessing the quality of life of mothers. Those tools that do exist vary in terms of their application, from research to practical uses. Additionally, the availability of validity and reliability data varies across different tools. Therefore, further development of assessment procedures for the quality of life of mothers with disabled children will contribute to expanding the focus of psychological research, providing a more comprehensive view of the lives of caregivers. Furthermore, research that increases our knowledge of mothers having children with

disabilities and the necessary interventions in this area facilitates the developmental process of children with disabilities.

4.1. Limitations

While the present study provides strong evidence for the psychometric properties of the Quality of Life Questionnaire, it is important to acknowledge certain limitations. The study sample was predominantly composed of mothers of children with single disabilities, limiting the generalizability of the findings to mothers of children with multiple disabilities. Future research should investigate the questionnaire's psychometric properties in a more diverse sample to enhance its applicability. Moreover, the cross-sectional design of the study precluded the examination of the questionnaire's stability over time and its responsiveness to changes in quality of life. Longitudinal studies are needed to address these questions and provide further insights into using the questionnaire for monitoring changes in well-being. The findings of this study have significant implications for both future research and clinical practice. The validated questionnaire can be used to assess the quality of life of mothers of children with disabilities, informing interventions and support services. Additionally, the questionnaire's normative data can serve as a valuable reference point for interpreting scores and comparing individuals. Future research can build upon the foundation established in this study by exploring the sensitivity of the Questionnaire to change over time, particularly in response to interventions aimed at improving the quality of life in this population.

5. Conclusions

The present study successfully established the psychometric properties of the Quality of Life Questionnaire for mothers of children with disabilities, demonstrating its reliability and validity. The robust psychometric characteristics of the questionnaire indicate its suitability for accurately assessing the quality of life in mothers caring for children with disabilities. These findings underscore the importance of using standardized and validated instruments to measure the well-being of mothers caring for children with disabilities. By employing this questionnaire, researchers can gain valuable insights into the factors influencing the quality

of life in these mothers, thereby informing the development of targeted interventions and support services. It is recommended that future research explore the use of the questionnaire in diverse cultural and socioeconomic contexts to assess its generalizability. Additionally, longitudinal studies can investigate changes in quality of life over time in mothers of children with disabilities, providing valuable information for monitoring the impact of interventions and policies.

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