

The Beach Centre Family Quality of Life scale: Validity, reliability and factor structure of Croatian version

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Aim: Family quality of life (FQoL) is mainly described with dimensions that include daily family life, parenting, family interactions, financial well-being, and sometimes additionally relationships among family members and overall family well-being. The aim of this study was to determine the validity, reliability, and factor structure of the Croatian version of the Beach Center FQoL scale in Croatian-speaking families.

Methods: 165 parents participated in this research (87 % females, 13 % males, 38 ± 12 years). The FQoL scale was utilized as the instrument, and its Croatian version was developed using forward-backward translation. Reliability was assessed through Cronbach's α and test-retest analysis. Pearson's correlation examined the relationship between the FQoL total scale and its domains. Construct validity was evaluated with exploratory factor analysis.

Results: The mean for the FQoL total scale measured 4.43 ± 0.40 . The FQoL total scale and its domains demonstrated excellent internal consistency (α : 0.72-0.97). The test-retest reliability of all FQoL domains and total scale were excellent (ICC: 0.97-0.99). There was a strong relationship between the FQoL total scale with its domains (r : 0.71-0.87). Bartlett's test of sphericity indicated a high and significant correlation ($\chi^2=1478.15$, $p<0.001$). The Kaiser-Meyer-Olkin value measured 0.82. The factors extracted accounted for 58.02 % of the total variance, with factor loadings ranging from 0.51-0.98.

Conclusion: The Croatian version of the Beach Center FQoL scale has demonstrated validity, reliability, and factor structure for FQoL measurement in Croatian-speaking families.

Keywords: FAMILY; QUALITY OF LIFE; REPRODUCIBILITY OF RESULTS; CROATIA

INTRODUCTION

Numerous changes in society have affected the tasks and roles in the family. However, despite the changes, the family has still remained the framework in which there is an aim to satisfy the emo-

tional, social, and material needs that enable the growth and development of all members within the family (1). A child needs parental love, and the warmth of the family home cannot be provided or replaced by other institutions (2). In such an environment, a child gains new knowledge, learns how

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to behave toward others, creates ethical attitudes and basic habits, and develops his emotions and the foundations of all other personality dimensions (3). The family has the existential task of preserving and transmitting educational values. It not only raises but also provides education, motivation, and support to its members (4).

On the other hand, every family is different, so there are complete and incomplete families, as well as functional and dysfunctional families. All the factors that are causing differences between the mentioned types of families usually affect the quality of life (QoL) in the family. The family quality of life (FQoL) is often defined in many different ways. For instance, Park et al. define FQoL as a state in which the needs of the family meet, and in which members of the family enjoy their common life by having a chance to do things that they consider as important (5). Zabriskie and McCormick state that family satisfaction and family togetherness are basic indicators of FQoL (6). Furthermore, Bhojti et al. point out that the FQoL has a dynamic nature (7). According to them, QoL changes when some significant events, such as moving homes or the death of a family member occur. Poston et al. defined four functional domains of the FQoL - daily family life, parenting, family interactions, and financial well-being (8). As time passed, some researchers added additional domains to the FQoL - relationships among family members, and overall family well-being added by Hoffman et al., and then later the well-being of individual family members which was added by Jansen-van Vuuren et al. (9, 10).

However, when speaking about FQoL, it is very important to develop strategies to assess QoL in the family before taking any actions. Until today, many researchers tried to develop specific instruments for measuring some separate aspects of family life such as family spare time or the burden of family caregivers (11, 12). The mentioned instruments had good results in measuring FQoL in the case of families with healthy children, but still, there was not any reliable instrument for FQoL measurements in families with children suffering from specific disorders, especially when it comes to intellectual disorders. Current studies that measure FQoL in families that except healthy children also include children with an intellectual dis-

order, mainly use one of the following two questionnaires, Family Quality of Life Survey-2006 and Beach Center FQoL scale whose Croatian version will be translated and validated in this study (9,13). The Beach Center FQoL scale is a widely used instrument because it is simple to administer, easily understandable by participants, and covers several life domains. Other advantages include the short time required to complete the questionnaire, and age and gender appropriateness. Today, the Beach Center FQoL scale is translated and validated in countries such as the USA - Kansas, Spain, China, Turkey, Brazil, South Africa, France, Taiwan, Singapore, and Indonesia (14 - 24).

Because of the earlier stated benefits of the Beach Center FQoL scale over other already available questionnaires in Croatia, we decided to translate and validate the Croatian version of the Beach Center FQoL scale. In this paper, we present the main results of our study whose aim was to determine the validity, reliability, and factor structure of the Croatian version of the Beach Center FQoL scale in Croatian-speaking families.

MATERIALS AND METHODS

Participants and measurement

165 parents participated in this research (87 % females, 13 % males, 38 ± 12 years). Prior to participation, all participants provided written informed consent, and they were informed of their right to withdraw from the study at any time. Our research problem was examined using the Beach Center FQoL scale (9), which includes 25 items divided into five domains: Disability-related support (DRS) - 4 items, Family interaction (FI) - 6 items, Parenting (PA) - 6 items, Emotional well-being (EW) - 4 items and Physical/material well-being (PMW) - 5 items. Responses to the items in the Beach Center FQoL scale are measured on a Likert scale ranging from 1-5. Each item inside five domains is scored between 1 (very dissatisfied) and 5 (very satisfied). Also, each item aims to question satisfaction with different things in participants' families over the past 12 months. The higher score means the higher satisfaction with FQoL. We received approval from the original author to translate the Beach Center FQoL scale into Croatian. The translation process followed a

forward-backward procedure. These translation and adaptation procedures are detailed in the works of Guillemin et al. and Beaton et al. (25, 26). The name of the Croatian version of the questionnaire when translated into the Croatian language is “Beach Centre skala za procjenu kvalitete života u obitelji”.

Data analysis

The sample size was calculated using G-Power with a 0.5 effect size, a significance level of 0.05, and a statistical power of 0.80. Descriptive analysis was performed on the data. A Cronbach's α coefficient was computed for each FQoL domain as well as for the total scale. A Cronbach's value greater than 0.70 was considered indicative of excellent internal consistency (27). Test-retest reliability was evaluated to assess the reproducibility of the FQoL. The similarity between the two separate assessments was measured with the intra-class correlation (ICC, 95 % CI). An ICC value above 0.80 was regarded as demonstrating strong reliability (28). The normality of the distribution was tested with the Shapiro-Wilk test. To assess convergent validity, Pearson's correlation was calculated to examine the relationship between the total scale and the domains. A correlation coefficient greater than 0.50 was interpreted as indicating strong validity, a value between 0.35 and 0.50 was considered moderate, and a value less than 0.35 was viewed as weak validity (29). Construct validity was evaluated with exploratory factor analysis (EFA) with varimax rotation. The adequacy of the sample was considered sufficient with a Kaiser-Meyer-Olkin (KMO) value ranging from 0.70–1.00, while Bartlett's test of sphericity (BTS) confirmed statistical significance at $p < 0.001$, supporting the appropriateness of EFA for the data (30, 31). The analysis included the examination of the scree plot, the proportion of variance explained by the factor model, and the patterns of factor loadings.

RESULTS

The mean ($\pm$ standard deviation) for the FQoL total scale measured was 4.43 ± 0.40 . Cronbach's α for the FQoL total scale and its domains ranged from 0.72–0.97, indicating excellent internal consistency (Table 1). The test-retest reliability of all FQoL domains and total scale were excellent. The

Table 1. Descriptive analysis, internal consistency, and correlation of the FQoL domains and FQoL total scale

FQoL (n of items)	M $\pm$ SD	Median (IQR)	Cronbach's α	r
DRS (4)	4.11 $\pm$ 0.88	4.00 (1.00)	0.97	0.71*
FI (6)	4.57 $\pm$ 0.41	4.67 (0.83)	0.79	0.82*
PA (6)	4.50 $\pm$ 0.46	4.50 (0.83)	0.81	0.87*
EW (4)	4.21 $\pm$ 0.54	4.25 (0.50)	0.72	0.78*
PMW (5)	4.62 $\pm$ 0.42	4.80 (0.80)	0.79	0.75*
Total scale (25)	4.43 $\pm$ 0.40	4.48 (0.76)	0.92	

FQoL – family quality of life; n – number; M – mean; SD – standard deviation; IQR – interquartile range; r – Pearson's correlation coefficient; DRS – disability-related support; FI – family interaction; PA – parenting; EW – emotional wellbeing; PMW – physical/material wellbeing; * – statistically significant at $p < 0.05$

Table 2. The test-retest reliability of the FQoL domains and FQoL total scale

FQoL (n of items)	Test M $\pm$ SD	Retest M $\pm$ SD	ICC (95 % CI)
DRS (4)	4.11 $\pm$ 0.88	4.17 $\pm$ 0.83	0.99 (0.98–0.99)
FI (6)	4.57 $\pm$ 0.41	4.59 $\pm$ 0.38	0.98 (0.97–0.99)
PA (6)	4.50 $\pm$ 0.46	4.53 $\pm$ 0.43	0.98 (0.96–0.98)
EW (4)	4.21 $\pm$ 0.54	4.24 $\pm$ 0.52	0.99 (0.98–0.99)
PMW (5)	4.62 $\pm$ 0.42	4.63 $\pm$ 0.38	0.97 (0.96–0.98)
Total scale (25)	4.43 $\pm$ 0.40	4.43 $\pm$ 0.39	0.99 (0.98–0.99)

FQoL – family quality of life; n – number; M – mean; SD – standard deviation; ICC – intra-class correlation coefficient; CI – confidence interval; DRS – disability-related support; FI – family interaction; PA – parenting; EW – emotional wellbeing; PMW – physical/material wellbeing

ICC score of the FQoL domains and total scale were 0.97–0.99 (Table 2). There was a strong relationship between the FQoL total scale with its domains ($r > 0.50$) (Table 1).

BTS of the correlation matrix is high and significant ($\chi^2 = 1478.15$, $p < 0.001$). The KMO sampling adequacy index was 0.82, which shows that the correlation matrix of the measuring instrument variables is suitable for factorization. The fact that the calculated values were statistically within the desired range showed that the sample size and structure of the study were suitable for EFA. According to the Gutman-Kaiser criterion, five factors with significant eigenvalues (9.22, 2.96, 1.68, 1.33, and 1.24) were obtained. The extracted factors which consist of 25 items and five dimensions explained 58.02 % of the variance. The fac-

Table 3. Exploratory factor analysis of the FQoL scale

Variable	Factor loading
Factor 1: Disability-related support	
My family member with a disability has support to accomplish goals at school or at workplace.	0.82
My family member with a disability has support to accomplish goals at home.	0.96
My family member with a disability has support to make friends.	0.98
My family has good relationships with the service providers who provide services and support to our family member with a disability.	0.91
Factor 2: Family interaction	
My family enjoys spending time together.	0.59
My family members talk openly with each other.	0.73
Our family solves problems together.	0.75
My family members support each other to accomplish goals.	0.62
My family members show that they love and care for each other.	0.71
My family is able to handle life's ups and downs.	0.63
Factor 3: Parenting	
My family members help the children learn to be independent.	0.61
My family members help the children with schoolwork and activities.	0.72
My family members teach the children how to get along with others.	0.70
Adults in our family teach the children to make good decisions.	0.53
Adults in my family know other people in the children's lives (friends, teachers, etc.).	0.55
Adults in my family have time to take care of the individual needs of every child.	0.53
Factor 4: Emotional wellbeing	
My family has the support we need to relieve stress.	0.59
My family members have friends or others who provide support.	0.58
My family members have some time to pursue our own interests.	0.56
My family has outside help available to us to take care of special needs of all family members.	0.52
Factor 5: Physical/material wellbeing	
My family members have transportation to get to the places they need to be.	0.59
My family gets medical care when needed.	0.62
My family has a way to take care of our expenses.	0.52
My family gets dental care when needed.	0.54
My family feels safe at home, work, school, and in our neighbourhood.	0.51

tor structure of the Croatian version of the questionnaire matches the factor structure of the original questionnaire, and since none of the items showed low loading, so no item needs to be removed from the Croatian version of the questionnaire (9). The factor loadings calculated as a result of the EFA are given in Table 3.

DISCUSSION

The aim of this study was to determine the validity, reliability, and factor structure of the Croatian version of the Beach Center FQoL scale in Croatian-speaking families (9). Even though there

are some papers in Croatia written in the FQoL domain, to the best of our knowledge, and since this was a process of validation, this is the first study in Croatia that investigates FQoL in families and uses the Croatian version of the Beach Center FQoL scale for its measurement.

We found it necessary and important to investigate FQoL in families since it is proven that the family has the existential task of preserving and transmitting educational values. It not only raises but also provides education, motivation, and support to its members (4). Moreover, in a healthy family environment, a child gains new knowledge,

learns how to behave toward others, creates ethical attitudes and basic habits, and develops his emotions and the foundations of all other personality dimensions (3). To take some actions and improve the mentioned FQoL in families, it is first necessary to make as complete and high-quality assessment of that QoL as possible.

The reason why we chose to validate the Croatian version of the Beach Center FQoL scale to assess FQoL in families rather than use already translated and used questionnaires in Croatia, is mainly because of the Beach Center FQoL scale's specific design, which is easy to administer, easily understandable by participants and it covers several domains of life. Some other advantages include the short time required to complete the questionnaire, and age and gender appropriateness. It is good and valuable to measure FQoL with this specific questionnaire because 5 domains from which the questionnaire consists (Disability-related support - DRS, Family interaction - FI, Parenting - PA, Emotional well-being - EW, and Physical/material well-being - PMW) perfectly cover physical, emotional and social components of life which are key dimensions for QoL measurement for both individual and family. As the main strengths of this study, we point out the mentioned facts about the used questionnaire, the exploratory factor analysis that we measured for the questionnaire, and our authentic translation from English to Croatian language.

Out of all mentioned validation and adaptation studies of the Beach Center FQoL scale, seven studies, including the original study of validation of the Beach Center FQoL scale, were focused on families of children with intellectual disabilities (IDs), two studies included families of children with autism and only two studies validated the Beach Center FQoL scale on families of children without disabilities, which was also the case in our study (9, 14 – 24). Apart from the original study of validation of the Beach Center FQoL scale, the results of those two studies on families of healthy children or children without disabilities are the best ones to compare our results with (9, 14, 24).

The original validation and evaluation of psychometric properties of the Beach Center FQoL scale was made by Hoffman et al in 2006 (9). Their research was divided into two phases. The second

phase was conducted mainly to test the psychometric properties of five Beach Center FQoL subscales and see if those would be replicated in an additional sample. Secondly, the purpose of the second phase was to obtain additional information about the reliability and convergent validity of the scale. Parents of children with IDs were included in the first and second phases. In the first phase of the study, mean values were measured at 3.75 for the DRS domain, 3.95 for the FI domain, 3.80 for the PA domain, 3.15 for the EW domain, and 3.95 for PMW domain. Cronbach's α coefficients were measured at 0.70 for the DRS domain, 0.85 for the FI domain, 0.81 for the PA domain, 0.83 for the EW domain, and 0.64 for the PMW domain. Compared to our results, all mean values were lower than in our study, which is probably connected to the fact that families in their study included children with IDs while the families included in our study had healthy children. In terms of Cronbach's α coefficients, measures in their study were higher for FI and EW domains, lower for PMW and DRS domains, and the same for PA domains. In the second phase of the study, mean values were measured at 4.55 for the DRS domain, 4.55 for the FI domain, 4.40 for the PA domain, 4.30 for the EW domain, and 4.60 for the PMW domain. Cronbach's α coefficients were measured at 0.92 for the DRS domain, 0.92 for the FI domain, 0.88 for the PA domain, 0.80 for the EW domain, and 0.88 for the PMW domain. Compared to our results, the two mean values were lower than in our study, (PA and PMW domains) and three mean values were higher (DRS, FI, and EW domains). In terms of Cronbach's α coefficients, measures in their study were higher for all domains except for the DRS domain. When speaking about the whole research or two study phases combined, Cronbach's α coefficient for the total score was 0.88 compared to 0.92 that we measured in our study. Moreover, when it comes to the correlation of domains with total Beach Center FQoL scale score, correlation coefficients were measured at 0.60 for DRS, 0.74 for FI, 0.70 for PA, 0.75 for EW, and 0.77 for PMW (9). In our study, all domains were significantly correlated with the total scale score. We found higher correlation coefficients with total scale scores for all domains except for the PMW domain compared to the original validation study (9).

Zuna et al. investigated confirmatory factor analysis of the Beach Center FQoL scale for families of kindergarten children without disabilities in 2009, in Kansas, USA (14). Parents of kindergarten children participated in their study in which they also used the Beach Center FQoL scale which consisted of 21 items divided into four domains, without the DRS domain consisting of 4 items. The mean values of the Beach Center FQoL scale ranged from 4.0 for the EWB domain to 4.5 for the PA domain. All subscales in their study measured lower mean values than in our study except for the PA domain whose values were 4.5 in both studies. In terms of internal consistency reliability, Cronbach's α ranged from 0.77 for the PMW domain to 0.85 for the FI domain. The Cronbach's α that they measured for the total scale score was 0.92 which is the exact same score that we measured for our study. Moreover, the PMW domain was the only domain in which Cronbach's α value was higher in our study (0.79) than in one made by Zuna et al (14). When it comes to exploratory factor analysis, the higher values of factor loadings than in our study were reported for the first item of Family interaction factor (0.66), for the first and the fifth items of Parenting factor (0.62; 0.66), for the third item of Emotional wellbeing factor (0.64) and for the first, the fourth and the fifth items of Physical/material wellbeing factor (0.67; 0.58; 0.65).

Widya Risnawaty and Suryadi conducted research on the psychometric properties of the Beach Center FQoL scale for Indonesian families of children without disabilities in 2020 on parents of children aged from 3 to 15 years (24). In their study, they also used the Beach Center FQoL scale which consisted of 21 items divided into four domains, without the DRS domain consisting of 4 items, the same as in the study of Zuna et al (14). Mean values ranged from 3.26 for the third item of the PA domain to 4.42 for the second item of the PA domain. In terms of reliability, all Cronbach's α coefficients measured higher values than 0.70 (0.96 for the FI domain, 0.87 for the PA domain, and 0.91 for the EW and PMW domains). Also, all Cronbach's α coefficients measured higher values than the ones in our study. When it comes to intra-class correlation coefficients (ICC - 95% CI), they ranged from 0.931 (0.919–0.999) for the PA domain to 0.979 (0.976–0.983) for the

FI domain (24). ICC values were measured lower for every domain than the ones we measured in our study.

Except for strengths, some limitations of the current study should also be acknowledged:

1. The sample size in this study was relatively small and not pre-determined. Nevertheless, our analysis, which demonstrated the validity and reproducibility of the Beach Center FQoL scale in this smaller group, emphasizes the robustness of the instrument.
2. Additional research is necessary to examine the limitations and strengths of the Beach Center FQoL scale in a prospective manner, involving a larger and more representative sample, especially with respect to different parts of the country and its specific culture which may have influence on QoL.

CONCLUSION

The findings indicate that the Beach Center FQoL scale exhibits a favorable pattern of correlations and internal consistency, aligning with the results from the original validation study and other relevant research within the FQoL domain in families. Thus, the Croatian Beach Center FQoL scale is a reliable, valid, and feasible instrument for assessing FQoL in Croatian-speaking families. Given the absence of other validated FQoL tools in the Croatian language, the Beach Center FQoL scale represents a promising instrument that can be effectively utilized as an outcome measure in assessing FQoL in Croatian families. The corresponding author and the first author of the paper can be contacted regarding the use of the Croatian version of the questionnaire.

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SAŽETAK

The Beach Center Family Quality of Life skala: valjanost, pouzdanost i faktorska struktura hrvatske verzije

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Cilj rada: Kvaliteta života obitelji uglavnom se opisuje dimenzijama koje uključuju svakodnevni obiteljski život, roditeljstvo, obiteljske interakcije i financijsko blagostanje, a ponekad i dodatno odnose među članovima obitelji i cjelokupno obiteljsko blagostanje. Cilj ovog istraživanja bio je utvrditi valjanost, pouzdanost i faktorsku strukturu hrvatske verzije Beach Center Family Quality of Life (FQoL) skale u obiteljima na hrvatskom govornom području.

Metode: Podaci ovog istraživanja analizirani su na 165 roditelja (87% žena, 13% muškaraca, 38 ± 12 godina). Kao instrument korištena je FQoL skala, čija je hrvatska verzija razvijena tehnikom prevođenja naprijed-natrag. Nad podacima je provedena deskriptivna analiza. Pouzdanost je procijenjena pomoću Cronbachove alfe i test-retest analize. Pearsonova korelacija ispitala je odnos između ukupnog rezultata FQoL skale i njezinih domena. Valjanost konstrukta procijenjena je eksplorativnom faktorskom analizom.

Rezultati: Srednja vrijednost ukupnog rezultata FQoL skale iznosila je $4,43 \pm 0,40$. Ukupni rezultat FQoL skale i njezine domene pokazale su izvrsnu unutarnju pouzdanost (α : 0,72–0,97). Pouzdanost test-retest svih FQoL domena i ukupnog rezultata bila je izvrsna (ICC: 0,97–0,99). Postojala je jaka veza između ukupnog rezultata FQoL skale i njezinih domena (r : 0,71–0,87). Bartlettov test sferičnosti pokazao je visoku i značajnu korelaciju ($\chi^2=1478,15$, $p<0,001$). Kaiser-Meyer-Olkinova vrijednost iznosila je 0,82. Izdvojeni faktori činili su 58,02% ukupne varijance, s opterećenjem faktora u rasponu od 0,51–0,98.

Zaključak: Hrvatska verzija Beach Center FQoL skale pokazala je valjanost, pouzdanost i faktorsku strukturu za mjerenje kvalitete života obitelji u obiteljima na hrvatskom govornom području.

Ključne riječi: OBITELJ; KVALITETA ŽIVOTA; PONOVLJIVOST REZULTATA; HRVATSKA