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Confirmatory Factor Analysis of the Components of Psychological Well-Being in the Persian Version of the Ryff Scale Across Different Ethnic Groups of Afghan Families

Zarifullah. Ahmadyar[1], Mahmood. Heidari[2*], Mohammad Ali. Mazaheri[3], Fereshteh. Mootabi[4]

[1] PhD Candidate, Faculty of Education and Psychology, Department of Clinical Psychology, Shahid Beheshti University, Tehran, Iran
[2] Associate professor, Faculty of Education and Psychology, Department of Clinical Psychology, Shahid Beheshti University, Tehran, Iran
[3] Professor, Faculty of Education and Psychology, Department of Clinical Psychology, Shahid Beheshti University, Tehran, Iran
[4] Assistant Professor, Family Therapy Research Institute, Shahid Beheshti University, Tehran, Iran

*** Corresponding author email address**: mahmood.heidari@gmail.com

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A B S T R A C T

Objective: This study aimed to evaluate the validity and reliability of the short form of the Ryff Psychological Well-Being Scale (1989), consisting of 18 items, within the population of Afghan families across four provinces in Afghanistan.
Methods: The present research was descriptive and correlational in nature. A total of 320 families, including fathers, mothers, and one child from each family (960 participants in total), participated in this study using convenience sampling. Data were analyzed through confirmatory factor analysis (CFA) using the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach with the statistical packages SmartPLS 4 and SPSS 27.
Findings: After obtaining feedback from Afghan university professors and participants, the face validity of the scale was confirmed. The reliability of the scale was assessed using Cronbach's alpha and composite reliability (CR). The reliability coefficients were calculated as 0.79 for fathers, 0.78 for mothers, and 0.78 for children, with CR values at satisfactory levels. Convergent validity was evaluated using the average variance extracted (AVE), and discriminant validity was assessed and confirmed using the Heterotrait-Monotrait (HTMT) ratio. To improve the model and enhance discriminant validity, two items related to the dimensions of Environmental Mastery and Personal Growth were removed. The findings demonstrated that the reliability and validity evaluations of the scales used in this study were statistically sound and reliable.
Conclusion: The study concluded that the 18-item version of the Ryff Psychological Well-Being Scale is a valid and reliable instrument for use within the Afghan family population. Therapists in Iran working with Afghan migrants, as well as Afghan therapists residing in Afghanistan, can utilize this tool in their clinical and research settings.
Keywords: *Afghans, Psychological Well-Being, Instrument Reliability, Convergent Validity, Discriminant Validity*

1. Introduction

Today, psychological well-being is considered one of the key and critical topics in psychology and social sciences (Khanjani et al., 2014), attracting significant attention from researchers in recent years across domains such as social life, work life, and health (Yiğit & Çakmak, 2024). Psychological well-being, as a comprehensive concept, was defined by Ryff, focusing on enhancing positive states and reducing negative ones (Marietta et al., 2024). Therefore, understanding psychological well-being is vital for human survival, adaptation, and flourishing in the face of 21st-century challenges (Garcia et al., 2023). Consequently, psychological well-being has been extensively studied across various cultures (Khanjani et al., 2014).

A historical overview of the subject reveals that particular attention was devoted to studying well-being in the early 20th century (Sarvestan, 2019). Jahoda was the first to recognize the importance of "psychological well-being," initially introducing it as a clinical perspective on mental health. Ryff (1989) expanded Jahoda's work by describing the behaviors and scope of psychological well-being (Nazir et al., 2021).

In fact, neglecting cultural considerations in examining psychological well-being constitutes a fundamental limitation in existing research. In other words, this issue remains incomplete without considering cultural contexts (Morad Haseli et al., 2024). Cross-cultural research shows that individuals' psychological well-being, from its meaning to lived experiences, is influenced by cultural differences (Morad Haseli et al., 2024). Therefore, while addressing psychological well-being is essential (Sinha & Verma, 1992), understanding the factors influencing it is equally necessary, as it is affected by physical health, personality, life experiences, gender, socioeconomic status, and culture (Sharma et al., 2021).

The Ryff Psychological Well-Being Scale has been translated into multiple languages and studied across various cultural and environmental contexts with diverse sample sizes and socio-demographic characteristics (Sirigatti et al., 2009). Its findings highlight the scale's diversity and complexity across cultures. The original Ryff questionnaire includes 20 items per subscale, totaling 120 items (Abbott et al., 2006). Moreover, various versions of the instrument (comprising 84, 54, 42, and 18 items) have been translated into multiple languages (Torabi et al., 2022). The proliferation of these versions is due to validation studies failing to provide sufficient and conclusive support for Ryff's original six-factor model (Abbott et al., 2006).

For example, in Pakistan, Khalid (2012) examined the adequacy of the 54-item Urdu version of the Ryff Psychological Well-Being Scale, finding it suitable for evaluating psychological well-being in both clinical and research contexts (Khalid, 2012). In India, Mala (2013) conducted a study to measure and validate variables in the 84-item version developed by Carol Ryff. Data were collected from 270 Indian men, and factor analysis results revealed three factors (Malla, 2013). These findings indicate that Ryff's six-factor model was not well-supported, urging caution in interpreting its subscales, particularly in non-Western countries.

Additionally, a five-factor model, excluding the subscale Purpose in Life, was identified as a valid and reliable tool for assessing psychological well-being in the general population of Sweden (Garcia et al., 2023). In Spain, Traidou et al. (2007) examined the factorial and content validity of the Ryff Psychological Well-Being Scale in a sample of 442 elderly individuals aged 65 and above, reporting moderate to low internal consistency coefficients for the subscales (Triadó et al., 2007). Furthermore, research by Henn et al. (2016) in South Africa analyzed the factorial structure of the Ryff scale, finding two factors: one grouping all positive items and another grouping all negative items (Henn et al., 2016). These studies highlight the importance and wide applicability of this tool in various research and clinical contexts. They also emphasize that psychological well-being depends not only on multiple dimensions but also on the cultural and social contexts of each country.

Given the growing interest in studying well-being across different cultural contexts, obtaining more information on the validity of the Ryff scale in various countries and languages is essential (Khalid, 2012). Despite the psychometric validation of the Persian version of this tool in Iran, considering cultural and linguistic differences, this study examines the structural validity of the Persian version of the Ryff scale among Afghan families from four provinces in Afghanistan. Confirmatory factor analysis and SmartPLS 4 software were used for this evaluation.

This research seeks to answer whether the factor structure of the short-form Persian Ryff Psychological Well-Being Scale, originally developed in the United States and translated and standardized in Iran, can be replicated and confirmed in a sample of Afghan families. The study aims to evaluate the internal validity of the questionnaire and its usability in the Afghan population. Notably, few studies

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have addressed family populations, particularly among Afghan families, where no such research has been conducted. Examining this topic can significantly contribute to understanding psychological well-being in Afghan family populations.

2. Methods

2.1. Study Design and Participants

This study is a descriptive and correlational research design and is applied in terms of its purpose. The statistical population included all Afghan families residing in the provinces of Balkh, Jawzjan, Bamyan, and Kandahar. From this population, 320 families were selected using convenience sampling, including the father, mother, and one child from each family, totaling 960 participants. After necessary coordination, the research questionnaire was distributed to the target population. Participants were invited to collaborate with detailed explanations about the research objectives. Invitations were extended at various locations, including residences, universities, and schools. Upon obtaining consent, families were requested to complete the questionnaires separately in the presence of their spouse and one of their older children.

Inclusion Criteria: The families included in the sample met the following criteria:

- Familiarity with the Dari-Persian language.
- Belonging to one of the four major ethnic groups.
- Presence of all three family members in the primary household (father, mother, and the eldest child residing at home).

Exclusion Criteria: Families were excluded based on the following conditions:

- Absence of one family member (father, mother, or the eldest child).
- Marriages between individuals from different ethnic groups.
- Incomplete completion of research questionnaires.

Ethnic group selection was based on the geographic distribution of residences using voluntary and convenience sampling. For instance, Uzbek participants were selected from Sheberghan, Pashtun participants from Kandahar, Hazara participants from Bamyan, and Tajik participants from Mazar-e-Sharif.

As the questionnaire had already been translated in Iran, its Persian version was utilized. To enhance cultural adaptation and comprehension, certain words and phrases were modified to align with Dari-Persian language and context. The content validity of the Ryff Psychological Well-Being Scale was evaluated using the Content Validity Index (CVI) and Content Validity Ratio (CVR), with all items achieving acceptable scores and being retained in the questionnaire. Face validity was qualitatively assessed through feedback from eight Afghan university professors, leading to minor adjustments in three items to simplify and enhance comprehension.

Adjustments Made to the Adapted Questionnaire:

1. **Item 1**: The phrase "knocks me down" was modified to "brings me down" for improved cultural alignment and face validity.
2. **Item 7**: The sentence "I think having new experiences that challenge one's thoughts about oneself and the world is important" was revised to "I think having new experiences that challenge one's thinking about oneself and the world is very important" for better clarity.
3. **Item 15**: The sentence "For me, life is a continuous process of learning, changing, and growing" was modified to "For me, life is a continuous stage of learning and transformation, always growing and evolving." These changes were made to enhance validity and cultural adaptation.

2.2. Measure

Given that most studies have utilized the 18-item version of the Ryff scale (Sirigatti et al., 2009) and examined its psychometric properties (Mikaeili, 2010), the present study also employed this version. Developed by Carol Ryff in 1989 at the University of Wisconsin (Mikaeili, 2010), this scale measures psychological well-being across six dimensions (Aditia & Ahman, 2024) and is widely used for this purpose (Malla, 2013).

The scale items measure the following dimensions:

- **Environmental Mastery**: Items 1, 4, 6
- **Autonomy**: Items 9, 12, 18
- **Purpose in Life**: Items 5, 14, 16
- **Positive Relations with Others**: Items 3, 11, 13
- **Self-Acceptance**: Items 2, 8, 10
- **Personal Growth**: Items 7, 15, 17

Responses are rated on a 6-point Likert scale ranging from "Strongly Disagree" (1) to "Strongly Agree" (6), and the scores across the six dimensions are aggregated as the overall psychological well-being score (Hashemi et al., 2022). In the original version, the reliability coefficients

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using Cronbach's alpha were reported as 0.88 for the overall scale and 0.78, 0.76, 0.82, 0.83, 0.82, and 0.75 for the subscales of personal growth, purpose in life, environmental mastery, autonomy, positive relations, and self-acceptance, respectively (Torabi et al., 2022). In a study by Bayani et al. (2008), the reliability of the entire scale was 0.82, with subscale reliability coefficients ranging from 0.70 to 0.78 (Torabi et al., 2022).

In Afghanistan, Hashemi et al. (2022) reported the overall reliability of this tool as 0.93 for mothers and 0.93 for children. In the present study, reliability coefficients for the subscales of positive relations, autonomy, environmental mastery, personal growth, purpose in life, and self-acceptance were 0.70, 0.70, 0.72, 0.85, 0.84, and 0.87, respectively (Hashemi et al., 2022).

2.3. Data Analysis

The collected data were analyzed using SPSS 27 and SmartPLS 4 software. Descriptive statistical methods, including mean, standard deviation, percentages, and frequencies, were employed. Additionally, structural equation modeling (SEM) techniques were used to examine structural relationships between variables and evaluate the proposed models.

3. Findings and Results

In this study, participants were divided into four ethnic groups: Uzbek (25%), Tajik (25%), Hazara (25%), and Pashtun (25%). Regarding family roles, participants were categorized into fathers (34.2%), mothers (32.9%), and children (32.9%). By gender, participants were divided into males (62.2%) and females (37.8%). Marital status was classified as married (71.5%) and unmarried (28.5%). Participants came from either extended families (42.7%) or nuclear families (57.3%). The minimum ages for the Uzbek, Tajik, Pashtun, and Hazara ethnic groups were 13, 14, 13, and 14 years, respectively, while the maximum ages were 84, 79, 73, and 74 years, respectively.

Table 1 presents descriptive statistics, including mean, standard deviation, skewness, kurtosis, and the results of the Kolmogorov-Smirnov test.

Table 1

Descriptive Statistics: Mean, Standard Deviation, Skewness, Kurtosis, and Kolmogorov-Smirnov Test

Variable	Mean ± SD	Skewness	Kurtosis	K-S Statistic	K-S Sig. Level	Distribution
Self-Acceptance	12.86 ± 3.63	-0.563	-0.867	0.165	0.000	Non-Normal
Purpose in Life	11.01 ± 4.38	-0.245	-1.275	0.148	0.000	Non-Normal
Positive Relations	11.27 ± 3.60	-0.126	-0.786	0.091	0.000	Non-Normal
Autonomy	11.47 ± 3.71	-0.368	-0.867	0.114	0.000	Non-Normal
Environmental Mastery	7.47 ± 3.01	-0.348	-1.075	0.153	0.000	Non-Normal
Personal Growth	8.01 ± 2.95	-0.442	-1.073	0.188	0.000	Non-Normal

Given that the significance levels for the research variables were less than 0.05, the null hypothesis (H0), which assumes normality, was rejected. This confirmed the non-normal distribution of the research variables. Before data analysis using confirmatory factor analysis (CFA), univariate normality assumptions were tested by estimating skewness and kurtosis values. Outliers were identified using z-scores, and missing data were addressed using the expectation-maximization method.

As shown in the descriptive statistics, the highest mean was for the Self-Acceptance dimension (12.86 ± 3.63), while the lowest mean was for Environmental Mastery (7.47 ± 3.01).

To analyze the confirmatory factor model for Ryff's Psychological Well-Being Scale, structural equation modeling (SEM) was performed using SmartPLS 4 software. SEM is a robust statistical technique that combines measurement models (CFA) and structural models (regression or path analysis) into a single test.

The researcher first outlined the model and subsequently assessed its fit. The software output is shown in Figure 1 (before modification) and Figure 2 (after modification).

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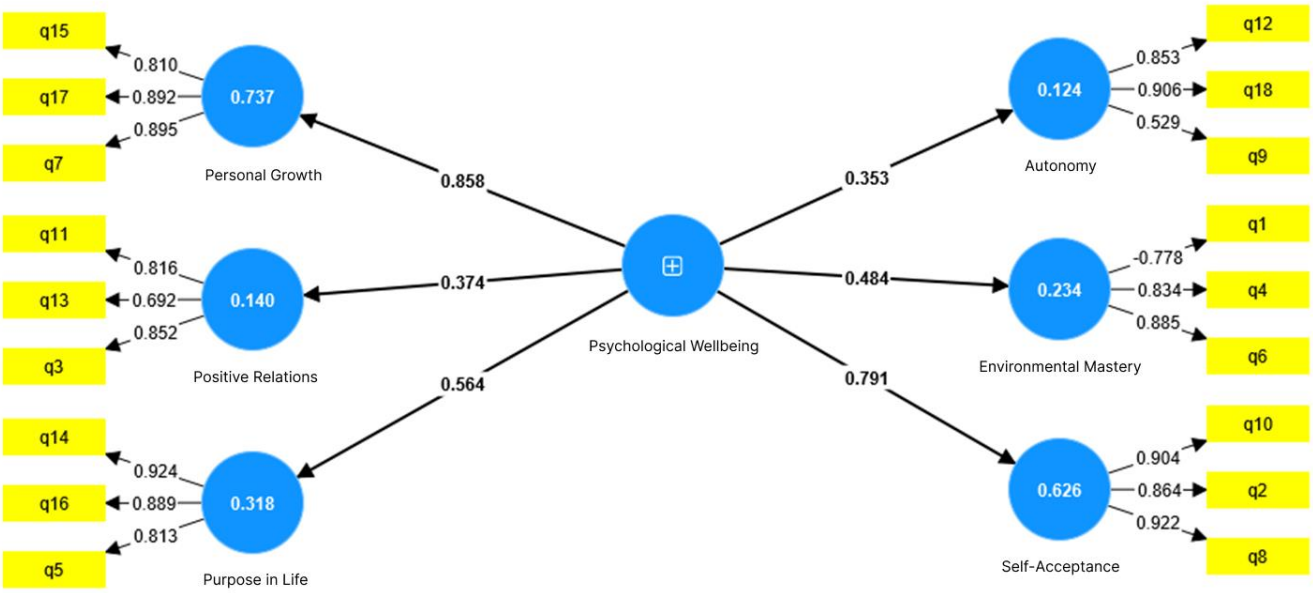
Figure 1

Path Coefficients (Factor Loadings) of the Psychological Well-Being Model Before Modification

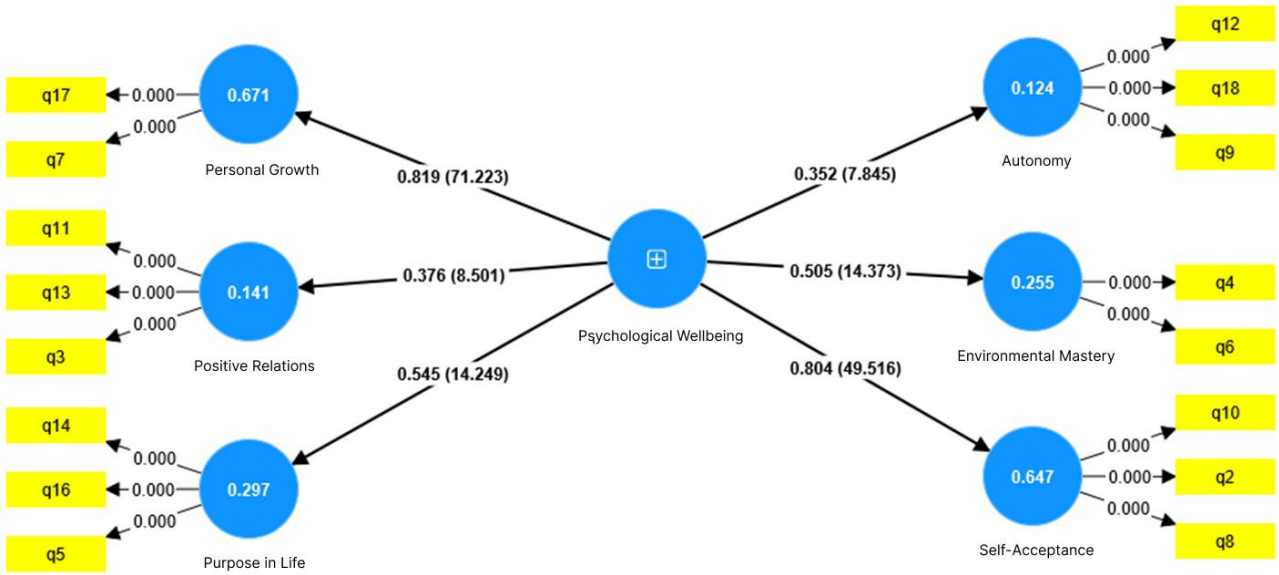


The researcher examined the factor loadings of each item on its respective dimension, as factor loadings indicate the validity of the items. Factor loadings range between 0 and 1, with accepted thresholds of 0.40 or higher for validation. Items or dimensions with lower factor loadings were identified and removed to improve the model (Tafreshi et al., 2022). As observed, all items had factor loadings of 0.50 or higher.

Therefore, without removing items, the researcher evaluated the significance of each item using the bootstrap method (sample size: 5000).

Figure 2

Path Coefficients and T-Statistics After Removing Two Items from the Model



Based on the T-values in the model, all items were significant. As shown in Figure 2, the T-values exceeded 2.58, confirming the model with 99% confidence and statistical significance at the 0.01 level. T-values serve as the primary criterion for hypothesis confirmation or rejection. If the T-values exceed thresholds of 1.64, 1.96, or 2.58, the hypothesis is confirmed at confidence levels of 90%, 95%, or 99%, respectively.

Evaluating the initial short-form (18-item) model of Ryff's Psychological Well-Being Scale revealed that removing one item from the Environmental Mastery dimension (Question 1) and one item from the Personal Growth dimension (Question 15) significantly improved model fit due to the negative impact of these items on validity. These modifications are clearly illustrated in Figure 2.

Convergent and discriminant validity allow researchers to establish the validity of their results. To examine reliability, Cronbach's alpha and Composite Reliability (CR) indices were utilized, with the results summarized in Table 2. In structural equation modeling (SEM), composite reliability values above 0.7 indicate adequate reliability for each construct.

Table 2

Validity and Reliability of Psychological Well-Being Components

Constructs	AVE	Composite Reliability (CR)	Cronbach's Alpha
Positive Relations	0.623	0.831	0.708
Autonomy	0.609	0.817	0.707
Environmental Mastery	0.778	0.875	0.720
Personal Growth	0.874	0.933	0.856
Purpose in Life	0.768	0.908	0.847
Self-Acceptance	0.805	0.925	0.878

According to Fornell and Larcker (1981), convergent validity exists when the Average Variance Extracted (AVE) exceeds 0.5. Based on Table 3, the measurement tool demonstrates acceptable validity, confirming its reliability for the Afghan family population. Cronbach's alpha and composite reliability values above 0.7 for all constructs further support the reliability of the instrument.

After verifying convergent validity, discriminant validity was assessed.

Table 3

Fornell-Larcker Discriminant Validity Matrix of Ryff's Psychological Well-Being Dimensions

Constructs	1	2	3	4	5	6
Positive Relations	0.789					
Autonomy	0.031	0.780				
Environmental Mastery	0.160	0.086	0.882			
Personal Growth	0.188	0.210	0.273	0.935		
Purpose in Life	0.165	0.107	0.183	0.260	0.876	
Self-Acceptance	0.177	0.201	0.258	0.659	0.203	0.897

The results of the Fornell-Larcker matrix indicate that the square root of AVE for all psychological well-being constructs exceeds the correlations between them, confirming discriminant validity for the Afghan family population. The diagonal values (square root of AVE) in the matrix are greater than the corresponding column values, indicating proper construct distinction.

Additionally, to verify discriminant validity, the Heterotrait-Monotrait Ratio (HTMT) was employed, which is considered more robust than Fornell-Larcker. Previous studies suggest acceptable HTMT thresholds of 0.85 and 0.90 for confirming discriminant validity.

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Table 4

Discriminant Validity Matrix Using HTMT

Constructs	Positive Relations	Autonomy	Environmental Mastery	Personal Growth	Purpose in Life
Positive Relations	-				
Autonomy	0.126	-			
Environmental Mastery	0.234	0.101	-		
Personal Growth	0.220	0.210	0.337	-	
Purpose in Life	0.206	0.132	0.229	0.304	-
Self-Acceptance	0.194	0.207	0.316	0.757	0.232

As shown in Table 4, all HTMT values are below the acceptable thresholds of 0.85 and 0.90, indicating that the constructs meet discriminant validity criteria.

To assess structural model fit, the R^2 and Q^2 indices were utilized:

- R^2: This indicator pertains to dependent (endogenous) latent variables and reflects the impact of an exogenous or independent variable on an endogenous variable. R^2 values of 0.67, 0.33, and 0.19 are described as substantial, moderate, and weak, respectively.
- Q^2: This evaluates the predictive relevance of the model, with values of 0.02, 0.15, and 0.35 indicating small, moderate, and large predictive relevance, respectively.

Table 5

Structural Model Quality and Variance Explained for Psychological Well-Being Components

Constructs	CV Redundancy	CV Communality	Adjusted R^2	F-Matrix
Positive Relations	0.085	0.281	0.140	0.164
Autonomy	0.067	0.306	0.123	0.141
Environmental Mastery	0.017	0.324	0.254	0.342
Personal Growth	0.578	0.519	0.671	2.039
Purpose in Life	0.198	0.535	0.296	0.422
Self-Acceptance	0.570	0.604	0.646	1.830

As the results indicate, the CV Communality index for all latent variables is positive, signifying the adequacy of the measurement model.

The Goodness of Fit (GOF) index is considered the most critical measure in the partial least squares (PLS) technique, as it evaluates the overall adequacy of both the structural and measurement models. GOF values of 0.01, 0.25, and 0.36 correspond to weak, moderate, and strong model fit, respectively, as suggested by Tenenhaus et al. (2004). In this study, the GOF value was calculated as 0.51, indicating a strong and satisfactory fit for the Afghan family population. Furthermore, additional fit indices were used to confirm the model's adequacy. The degrees of freedom (Df) were determined to be 95, while the chi-square per degree of freedom (χ^2/df) was 57.175, signifying a good balance between model complexity and explanatory power.

The Goodness of Fit Index (GFI) and Normed Fit Index (NFI) were 0.92 and 0.90, respectively, reflecting an acceptable level of model fit. Similarly, the Comparative Fit Index (CFI) achieved a value of 0.92, further supporting the model's suitability. The Root Mean Square Error of Approximation (RMSEA), which evaluates the error of approximation in the model, was calculated at 0.07. This value falls within the recommended range and indicates good model fit. GFI, NFI, and CFI values above 0.90, coupled with an RMSEA value below 0.07, confirm the model's robustness. Collectively, these indices confirm that the structural model in this study demonstrates a high degree of adequacy and reliability for the Afghan family population, meeting established statistical and theoretical thresholds.

4. Discussion and Conclusion

This study aimed to expand existing knowledge by conducting a confirmatory factor analysis (CFA) of psychological well-being in a sample of Afghans in Afghanistan. Validating the scale required CFA, making it essential to assess whether this scale is an appropriate measurement tool for the Afghan population. A sample of 960 individuals from four provinces—Mazar-e-Sharif (Tajiks), Jawzjan (Uzbeks), Kandahar (Pashtuns), and

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Bamyan (Hazaras)—was selected and analyzed using SmartPLS 4. The decision to employ PLS-SEM was based on its predictive capability and ability to explain target constructs (Hair et al., 2012). Additionally, PLS-SEM offers advantages over other analytical techniques. The results demonstrate reliable outcomes and stability, confirming the scale's suitability for evaluating the same constructs.

When a psychometric tool is translated into another language, its reliability and validity must be assessed to ensure accurate measurement (Esmi et al., 2015). The primary aim of this study was to validate the Persian version of the 18-item Ryff Psychological Well-Being Scale for Afghan families across various provinces. During the analysis, two items from the original short-form scale were excluded due to their negative impact on convergent validity and model fit, leaving 16 items for the CFA. The excluded items were: "Overall, I feel responsible for my current life situation" and "For me, life is a continuous, enduring process of learning, change, and growth."

Reliability and validity assessment using the PLS-SEM method demonstrated that the scale is both valid and statistically reliable. This confirms the psychometric properties of the scale for further analysis in this study.

These findings align with previous research. Hooman et al. (2014) conducted a validity assessment and CFA of the scale among firefighters and reported high reliability even after removing 16 items (Hooman et al., 2014). In Pakistan, Khalid (2012) validated the 54-item Urdu version of the Ryff Psychological Well-Being Scale, confirming its suitability for both clinical and research applications (Khalid, 2012). Similarly, Malla (2013) assessed the 84-item version of the Ryff scale among 270 Indian men in northern India, finding three factors instead of the original six (Malla, 2013). This suggested that the Ryff scale may not distinctly measure six dimensions, especially in non-Western contexts, necessitating caution in interpreting subscales.

Research in Sweden by García et al. (2023) showed that the Ryff scale is a reliable and valid tool for assessing psychological well-being in the general population, though findings supported a five-factor structure excluding the Purpose in Life subscale (Garcia et al., 2023). Triado et al. (2007) assessed the factorial and content validity of the Ryff scale among 442 Spanish elderly individuals aged 65 and above, reporting moderate to low internal consistency for subscales (Triadó et al., 2007). Henn et al. (2016) conducted a study in South Africa, finding that psychological well-being is represented by two factors: one grouping positive items and the other negative items (Henn et al., 2016).

Srigatti et al. (2009) analyzed the factorial structure of the Ryff scale among Italian adolescents using the 54-, 42-, and 18-item versions, applying maximum likelihood estimation with oblimin rotation. Their results confirmed the significant validity of the Ryff scale. Similarly, the factorial structure of the scale has been examined in Iran at different times (Sirigatti et al., 2009). For instance, Mikaeili (2010) assessed the Ryff scale among students at the University of Urmia using the 57-item version and reported Cronbach's alpha coefficients above 0.40 for all six dimensions, confirming the scale's appropriateness (Mikaeili, 2010). Bayani et al. (2008) validated the scale among 145 Iranian students at the Islamic Azad University, demonstrating its reliability and validity (Bayani et al., 2008).

In Afghanistan, Hashemi et al. (2022) validated the 18-item version of the Ryff scale among mothers and children in Jalalabad, confirming its reliability and validity. Overall, findings from this study indicate that the scale is suitable for use among Afghan families. It also enables mental health and clinical professionals in Iran and Afghanistan to use the scale in their research and therapeutic practices with Afghan samples (Hashemi et al., 2022).

Additionally, this study provides empirical evidence for the scale's applicability in non-clinical Afghan samples. Although the inclusion of four ethnic groups represents a robust sample, certain limitations affect the generalizability of the findings. First, broader studies on different populations, including outpatients and inpatients in Afghanistan, are necessary to confirm the reliability and validity of the Ryff scale. Second, longer versions of the scale should be examined within Afghan communities to provide more comprehensive insights. Therefore, further replication and extension of these findings in Afghanistan are strongly recommended.

5. Suggestions and Limitations

Despite the robust sample representing four major ethnic groups in Afghanistan, this study has certain limitations. First, the reliance on convenience sampling may limit the generalizability of the findings to broader Afghan populations. Second, the exclusion of two items from the original scale to improve model fit may have impacted the comprehensiveness of the assessment. Third, this study primarily focused on non-clinical populations, leaving a gap in understanding the scale's applicability in clinical settings or among specific vulnerable groups such as refugees or individuals experiencing severe psychological distress.

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Additionally, the short-form version of the scale was used, which may not capture the full breadth of psychological well-being dimensions compared to longer versions.

Future research should explore the validation of the full-length Ryff Psychological Well-Being Scale in Afghan populations to examine the comprehensiveness of its dimensions. Studies involving clinical populations, such as inpatients, outpatients, or refugees, are recommended to assess the scale's applicability in diverse psychological and cultural contexts. Longitudinal studies could provide insights into the temporal stability of psychological well-being constructs across different life stages. For practitioners, this study highlights the reliability of the 18-item scale as a practical tool for assessing psychological well-being in Afghan families, offering valuable support for mental health professionals and researchers. Its application can inform culturally relevant interventions, contributing to enhanced mental health care and well-being strategies in both clinical and non-clinical settings in Afghanistan and among Afghan communities globally.

Authors' Contributions

This article is dervied from first author's doctoral dissertation at Shahid Beheshti University, Tehran. All authors have contributed significantly to the research process and the development of the manuscript.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

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