



## Validation of three measures of positive mental health in Iranian migrant and non-migrant students

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### Abstract

**Introduction:** Positive mental health is a vital component of overall well-being. The primary objective of this study was to validate three measures of positive mental health among Iranian migrant and non-migrant students.

**Materials and Methods:** In this study conducted in Iran and Germany, the convenience sampling method was used to select Iranian migrant and non-migrant students. Participants completed an online survey that included three measures of positive mental health—Satisfaction with Life Scale (SWLS), Social Support Questionnaire (F-SozU K-14), Resilience Scale (RS-11), and Depression, Anxiety, and Stress Scale (DASS-21). Confirmatory Factor Analysis (CFA) and reliability analysis were conducted to assess the validity and reliability of the measures within this population.

**Results:** In this study, 584 Iranian non-migrant students and 186 Iranian migrant students participated. The findings showed that the positive mental health constructs were negatively correlated with the DASS-21 and positively correlated with one another. Confirmatory factor analysis supported the adequacy of the model, fulfilling all necessary assumptions. Measurement invariance analyses for the SWLS, F-SozU K-14, and RS-11 indicated good model fit and consistency across both migrant and non-migrant student groups.

**Conclusion:** The findings of this study support the validity of these three measures. The researchers, educators, and policymakers assess key aspects of positive mental health among Iranian migrant and non-migrant students using these valid tools.

**Keywords:** Immigrants, Life satisfaction, Social support, Resilience, Validation

### Please cite this paper as:

Eizadifard R, Brailovskaia J, Teismann T, Asgari Z, Bastami Katuli M. Validation of three measures of positive mental health in Iranian migrant and non-migrant students. *Journal of Fundamentals of Mental Health* 2026 Jan-Feb; 28(1): 65-73. DOI: 10.22038/JFMH.2025.83319.3178

### Introduction

Positive Mental Health (PMH) is essential for enhancing overall well-being and quality of life, emphasizing both emotional well-being and effective functioning (1,2). It encompasses

key indicators such as life satisfaction, perceived social support, and resilience—factors that play a vital role in promoting happiness, emotional stability, and adaptive coping (3,4). Life satisfaction constitutes a

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Received: Oct. 12, 2024

Accepted: Oct. 13, 2025



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person's cognitive judgment of their quality of life, forming a central part of subjective well-being. This facet is typically stable over time and provides insight into a person's general outlook (1,5-7). Evidence confirms that life satisfaction and PMH are interrelated and exert reciprocal effects on each other (8). The Satisfaction with Life Scale (SWLS) is a predominant tool used for its assessment (9). Studies conducted in 29 countries, supports its cross-cultural validity and measurement invariance (10,12). However, cultural disparities influence how life satisfaction is perceived and reported, making validation within specific contexts, such as Iran, essential (11,13,14). While initial Iranian studies demonstrate positive psychometric properties for the SWLS, revisiting its validation is necessary due to potential variations in demographics and methodology (15). Perceived social support is a fundamental protective factor against stress and is critical for mental and emotional well-being (16,17). It refers to an individual's subjective appraisal of the support available from their social network, encompassing both emotional and practical assistance (18-20). While its importance for self-satisfaction is widely recognized, the interpretation of measurement instruments can vary across cultures (18,20,21).

This underscores the necessity of validating scales such as the Brief Form of Perceived Social Support (F-SozU K-14) in diverse populations to ensure their accuracy and cultural relevance (21). Resilience denotes the capacity to recover from adversity and serves as a protective factor in maintaining positive mental health (17). It enhances individuals' ability to cope with stressors and adapt to change (1,4).

Cross-cultural research indicates that the components of resilience—such as reliance on social support versus individual coping strategies—can vary significantly across societies (24). Although measurement invariance for PMH scales has been demonstrated across cultures (25), a specific gap remains in the cross-cultural validation of widely used resilience tools, such as the RS-11, within the Iranian context (23). Cross-cultural research shows that the underlying factors contributing to resilience—such as reliance on social support versus individual coping strategies—can vary significantly across societies (24). Although measurement invariance for PMH scales has been demonstrated across cultures (25), a specific gap remains in the cross-cultural validation of widely used resilience tools, such as the RS-11, within the Iranian population (23).

**Materials and Methods**

This study employed a cross-sectional design and used convenience sampling within a purposively defined population of Iranian students aged 18 to 60 with Internet access. A total of 584 Iranian non-migrant students were recruited from the University of Mazandaran and Babol Islamic Azad University in Iran, along with 186 Iranian migrant students enrolled at universities in North Rhine-Westphalia, Germany (Table 1). Participants were recruited between May and December 2021 via personal invitations and posts shared on social media platforms. Before participation, all participants provided informed consent online through SoSci Survey ([https:// www.s oscisurvey.de/](https://www.oscisurvey.de/)). Additionally, they were given the contact information of the first author in case of any questions or concerns.

**Table 1.** Demographic variables description

Variable	Non-migrants	Migrants
Total N	584	186
Gender, N (%)		
Female	372 (63.7)	94 (50.5)
Male	212 (36.3)	92 (49.5)
Age		
Mean (SD)	24.91 (7.0)	31.66 (4.2)
Range	18-59	21-48
Marital status, N (%)		
Single	436 (74.7)	138 (74.2)
Married	142 (24.3)	47 (25.3)
Divorced	6 (1.0)	1 (0.5)

### Research instruments

*A) Satisfaction with Life Scale (SWLS):* This instrument consists of five statements, such as “In most ways, my life is close to my ideal.” Participants indicate their level of agreement on a 7-point Likert scale (1: strong disagreement to 7: strong agreement). This tool was used in various cultures such as German, Russian, and Chinese samples (11,25). The questionnaire was translated into Persian according to standard guidelines for cross-cultural validation of questionnaires (back-translation method) (26,27), using professional translators. One reason for not using the previously validated Persian version (15) could be that the cultural context or wording of the questions may not fully align with the specific objectives or population of the current study. In terms of similarities and differences between the two translations, it is important to note that both versions were translated into Persian following established guidelines for cross-cultural validation, such as the back-translation method and the use of professional translators. However, differences may arise in the specific wording chosen during the translation process, potentially leading to discrepancies in how respondents interpret and respond to the questionnaire items. The Persian translation of the SWLS has demonstrated adequate psychometric properties (Cronbach’s  $\alpha = 0.83$ ) (15). Internal consistency in the current sample was  $\alpha = 0.88$  among students in Iran and  $\alpha = 0.86$  among students in Germany.

*B) Brief Form of Perceived Social Support Questionnaire (F-SozU K-14):* Participants indicated their agreement with statements such as “I experience a lot of understanding and security from others” on a 5-point Likert-type scale ranging from 1 (not true) to 5 (true). In a German sample, this unidimensional measure demonstrated excellent internal consistency (Cronbach’s  $\alpha$ ) and good convergent and discriminant validity (28). Furthermore, measurement invariance of the F-SozU K-14 was confirmed in samples from Germany, China, and Russia (25). The questionnaire was translated into Persian according to established guidelines for cross-cultural validation (back-translation method) (27) using professional translators. Internal consistency in the current sample was  $\alpha = 0.91$  among students in Iran and  $\alpha = 0.91$  among students in Germany.

*C) Resilience Scale (RS-11):* The RS-11 includes items such as “I feel that I can handle many

things at a time,” rated on a 7-point Likert-type scale ranging from 1 (disagree) to 7 (agree). This tool has high internal consistency ( $\alpha = 0.92$ ) and good convergent validity with measures of depression and anxiety in a sample of German adults. Cross-cultural measurement invariance of the RS-11 has also been explored in prior research. The measurement invariance of the RS-11 was assessed across six countries, including the United States, Germany, Russia, China, and two additional unspecified nations. Based on the results, the RS-11 is a valid and applicable tool to assess positive mental health across diverse cultural contexts (23,25). The questionnaire was translated into Persian following standard guidelines for cross-cultural validation (27), using professional translators. Internal consistency in the current sample was  $\alpha = 0.83$  among students in Iran and  $\alpha = 0.86$  among students in Germany.

*D) Depression Anxiety Stress Scales (DASS-21):* This instrument consists of three subscales: depression, anxiety, and stress, each comprising seven items. All 21 items are rated on a 4-point Likert-type scale ranging from 0 (Did not apply to me at all) to 3 (Applied to me very much or most of the time). Previous research has reported good psychometric properties for the DASS-21 (28). In the German version, Cronbach’s  $\alpha$  was 0.88 for depression, 0.76 for anxiety, and 0.86 for stress. The Persian version has also demonstrated good psychometric properties, with Cronbach’s  $\alpha$  coefficients ranging from 0.85 to 0.87 in non-clinical samples, and from 0.81 to 0.98 in clinical Iranian samples (29,30). In the current study, internal consistency was satisfactory: among Iranian students, Cronbach’s  $\alpha$  was 0.87 for depression, 0.81 for anxiety, and 0.84 for stress; among students in Germany, it was 0.86 for depression, 0.79 for anxiety, and 0.83 for stress.

Statistical analyses were conducted using SPSS 26 and Mplus (Version 7). Descriptive statistics were calculated for all variables in both groups. Cronbach’s  $\alpha$  was computed to assess the internal consistency of the questionnaires. Additionally, correlation analyses were conducted to examine the relationships between all study variables. To evaluate the factor structure of each scale, single-group Confirmatory Factor Analyses (CFA) were performed separately for the migrant and non-migrant groups (31).

The Maximum Likelihood Estimation (MLE) method was used to evaluate the models in

Mplus 7.4. We evaluated the goodness-of-fit using multiple standard indices. These included the Chi-square statistic ( $\chi^2$ ), the RMSEA (with values  $\leq 0.08$  indicating acceptable fit), the SRMR (also with a cutoff of  $\leq 0.08$ ), and the CFI and TLI (where values  $\geq 0.90$  are considered acceptable). The initial model demonstrated a poor fit to the data. Modification Indices (MIs) were examined to identify sources of misfit. These indices estimate the extent to which the Chi-square statistic would decrease if a specific fixed parameter were freely estimated (32). In other words, the number of MIs corresponds to the number of parameter constraints imposed in the model.

In addition, the CFA approach was applied using Mplus 7.4 to assess measurement invariance across groups (33). Multi-group CFA is one of the most widely used methods for evaluating measurement invariance (33,34). Three levels of invariance models were tested:

1. The configural model, which examines whether the factor structure and loading patterns are similar across groups, serves as the baseline model.
2. The metric (weak) invariance model tests whether factor loadings are equivalent between the two groups, in addition to having the same factor structure.
3. The scalar (strong) invariance model further constrains item intercepts to be equal across groups, in addition to equal factor structure and loadings.

The  $\Delta$ CFI index (35) was used to determine whether the reduction in model fit was statistically significant. A  $\Delta$ CFI value less than 0.01 between nested models indicates acceptable measurement invariance. If the  $\Delta$ CFI exceeds 0.01—suggesting that full invariance does not hold—partial weak or partial strong invariance

is examined by freeing specific parameters or allowing covariances between item errors (36). To test for partial measurement invariance, items with the largest modification indices were identified and allowed to vary across groups. The order of parameter release was based on the highest modification index values. At least two factor loadings or intercepts were required to remain equal across groups to establish partial measurement invariance (36).

**Results**

*Criteria validity*

Table 2 presents the descriptive statistics and correlations for the assessed variables in both groups. All variables were significantly correlated at the  $P \leq 0.01$  level. Specifically, resilience, social support, and life satisfaction were significantly and negatively correlated with depression, anxiety, and stress.

*Confirmatory Factor Analysis Assumptions*

The assumptions required for CFA were evaluated before conducting the analysis and were found to be satisfactorily met. The analysis assumed univariate normality, which was assessed using skewness and kurtosis values of the observed variables. Skewness values ranged from -0.756 to -0.399, and kurtosis values ranged from -0.487 to 0.414. According to Chou and Bentler (37), skewness values within  $\pm 3$  are acceptable, while kurtosis values beyond  $\pm 10$  are considered problematic (33). All indicators fell within acceptable ranges, supporting the assumption of univariate normality. Additionally, the scales demonstrated good internal consistency. Based on these preliminary assessments, the use of CFA with maximum likelihood estimation was deemed appropriate.

**Table 2.** Descriptive statistics, internal consistency, and inter-correlation matrix across scales

Scale	Mean	SD	Sk	Kurt	$\alpha$	1	2	3	4	5	6
<b>Non-migrants</b>											
1. SWLS	21.93	6.80	-.399	-.487	.883	1	.495**	.493**	-.635**	-.413**	-.521**
2. F-SozU K-14	52.27	10.67	-.564	-.050	.917		1	.459**	-.542**	-.403**	-.414**
3. RS-11	54.85	9.69	-.756	.414	.846			1	-.562**	-.386**	-.501**
4. Depression	12.82	4.67	.833	.048	.870				1	.667**	.747**
5. Anxiety	11.40	3.75	1.08	1.07	.823					1	.724**
6. Stress	14.67	4.31	.482	.089	.840						1
<b>Migrants</b>											
1. SWLS	21.50	6.16	-.609	-.185	.861	1	.293**	.446**	-.561**	-.295**	-.464**
2. F-SozU K-14	50.06	10.18	-.415	-.125	.910		1	.308**	-.395**	-.216**	-.197**
3. RS-11	54.22	11.40	-.603	.286	.866			1	-.564**	-.311**	-.462**
4. Depression	13.80	4.74	.826	.075	.864				1	-.586**	.663**
5. Anxiety	12.00	3.64	.793	.287	.789					1	.700**
6. Stress	15.77	4.12	.298	.287	.830						1

SD= Standard Deviation; Sk= Skewness; Kurt= Kurtosis;  $\alpha$ = Cronbach's alpha; RS-11 Resilience Scale (11 items); F-SozU K-14 Questionnaire Social Support; SWLS Satisfaction with Life Scale

*Structure validity: Confirmatory Factor Analysis*

LISREL 8.80 was used to examine the structural validity of the resilience, social support, and life satisfaction questionnaires. Since none of the variables included subscales, a one-factor model was applied. In this univariate model, all items were loaded onto a single latent construct. The Chi-square divided by the degrees of freedom is a useful indicator of model fit, with values of 5 or less considered acceptable (38). Additionally, model fit was evaluated using the Comparative Fit Index (CFI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR). According to Hooper et al. (38), RMSEA and SRMR values below 0.08 indicate a good model fit. For the CFI and Tucker-Lewis Index (TLI), values above 0.90 are considered acceptable, and values above 0.95 indicate an excellent fit (39,40). A single-group confirmatory factor analysis (CFA) was conducted for the variables of resilience, social support, and life satisfaction, as presented in Tables 3 to 5. The RMSEA values for the F-SozU K-14, RS-11, and SWLS exceeded the acceptable threshold of 0.08 in both the Iranian and immigrant groups, indicating inadequate model fit. Given these results, we explored potential sources of model misfit by examining the modification indices to identify and address specification errors. The modification indices for the life satisfaction variable indicated that, among Iranian students without an immigrant background, the error terms of item 2 and item 4 were correlated with those of item 1 and item

2. After accounting for these correlations, the RMSEA value fell within the acceptable range ( $RMSEA \leq 0.08$ ).

The modification indices for the social support variable revealed correlated error terms between items 6-8, 8-9, 4-8, and 2-12 among Iranian students without an immigrant background, and between items 1-5, 7-14, 12-13, 4-8, and 2-12 among Iranian students with an immigrant background. After allowing these error covariances to be freely estimated, the RMSEA index fell within the acceptable range, indicating a good model fit.

For the resilience variable, the modification indices indicated correlated error terms between items 8 and 9 among Iranian students without an immigrant background, and between items 10-11, 10-3, 8-6, and 8-1 among Iranian students with an immigrant background. After allowing these error covariances to be freely estimated, the RMSEA index fell within the acceptable range, indicating a good model fit.

*Multi-group Confirmatory Factor- Analysis across groups*

*Satisfaction With Life Scale:*

Table 3 presents the measurement invariance test results for the SWLS variable. The difference between the metric and configural models was not significant, as the  $\Delta CFI$  value was less than 0.01, indicating metric invariance between Iranian students with and without an immigrant background. Similarly, the scalar (strong) model also produced a  $\Delta CFI$  value below the 0.01 threshold when compared to the metric model, suggesting that scalar invariance is established between the two groups.

**Table 3.** Single-group CFA results and cross-cultural measurement invariance tests results of the satisfaction with life scale

Models	N	Chi2/df	RMSEA	90% C.I.	CFI	TLI	SRMR	$\Delta CFI$
Single group CFA-Original one-factor model								
Non-Migrants	584	27.62/5	.088	.058-.120	.99	0.97	.020	
Migrants	186	20.52/5	.129	.074-.190	.97	0.93	.040	
Single group CFA (Modified)								
Non-migrants ( $\theta_{2,3}$ free)		6.43/4	.032	.000-.076	.99	0.99	.010	
Migrants ( $\theta_{1,2}$ free)		9.05/4	.082	.001-.155	.99	0.97	.028	
Multiple group CFA								
Configural		48.14/10	.100	.072-.129	.982		.026	
Weak		51.76/14	.084	.060-.109	.983		.034	.001
Strong		71.61/18	.088	.067-.110	.975		.044	.008

RMSEA root mean square error of analysis; 90% C.I.= 90% confidence interval of RMSEA; CFI= Comparative fit index; TLI= Tucker-Lewis Index; SRMR= standardized root mean square residual.

*Perceived Social Support Scale: F-SozU K-14*

Table 4 presents the results of the measurement invariance model for social support. Both the configural and metric invariance models demonstrated acceptable model fit. However, the scalar invariance model showed a poor fit compared to the metric model, as the  $\Delta$ CFI exceeded the threshold of

0.01. Consequently, a partial scalar invariance model was tested using modification indices. By allowing the covariance between items 6 and 8 to vary, the  $\Delta$ CFI dropped below 0.01. This indicates that the comparison between the partial scalar and metric models supports measurement invariance.

**Table 4.** Single-group CFA results and cross-cultural measurement invariance tests results of the social support scale

Models	N	Chi2/df	RMSEA	90% C.I.	CFI	TLI	SRMR	$\Delta$ CFI
Single group CFA-Original one-factor model								
Non-migrants	584	480.20/77	.095	.087-.103	.90	0.88	.049	
Migrants	186	303.18/77	.126	.111-.141	.82	0.78	.073	
Single group CFA (Modified)								
Non-Migrants ( $\theta_{6,8}$ ; 8,9 free)		356.86/75	.080	.072-.089	.93	0.91	.043	
Migrants ( $\theta_{1,5}$ ; 7,14; 12,13; 4,8; 2,3 free)		170.50/71	.081	.070-.104	.92	0.90	.058	
Multiple group CFA								
Configural		760.97/154	.101	.094-.108	.884		.053	
Weak		771.54/167	.097	.090-.104	.884		.057	.000
Strong		866.52/180	.100	.093-.106	.869		.068	.015
Partial Strong (Cov <sub>6,8</sub> free)		758.41/178	.092	.085-.099	.889		.066	.005

RMSEA root mean square error of analysis; 90% C.I. 90% confidence interval of RMSEA; CFI= Comparative fit index; TLI= Tucker-Lewis Index; SRMR= standardized root mean square residual.

*Resilience Scale: RS-11*

The  $\Delta$ CFI between the metric and configural models is less than 0.01, indicating metric invariance between non-immigrant and immigrant Iranian student groups. Similarly, in the scalar (strong) model, the  $\Delta$ CFI compared to the metric model also falls below the 0.01

threshold, supporting scalar invariance. These findings suggest that both metric and scalar invariance are established across the two groups, indicating a good model fit and equivalence in the measurement of resilience (Table 5).

**Table 5.** Single-group CFA results and cross-cultural measurement invariance tests results of the resilience scale

Models	N	Chi2/df	RMSEA	90% C.I.	CFI	TLI	SRMR	$\Delta$ CFI
Single group CFA-Original one-factor model								
Non-migrants	584	188.01/35	.088	.075-.099	.91	0.89	.047	
Migrants	186	162.32/44	.120	.101-.140	.84	0.81	.070	
Single group CFA (Modified)								
Non-Migrants ( $\theta_{8,9}$ free)		145.57/34	.075	.063-.088	.94	0.92	.043	
Migrants ( $\theta_{10,11}$ ; 4,8; 6,8 free)		104.70/41	.081	.070-.113	.92	0.90	.060	
Multiple group CFA								
Configural		288.01/70	.090	.079-.101	.911		.048	
Weak		298.16/79	.085	.075-.095	.911		.056	.000
Strong		330.95/88	.085	.075-.094	.901		.060	.010

RMSEA root mean square error of analysis; 90% C.I. = 90% confidence interval of RMSEA; CFI= Comparative fit index; TLI= Tucker-Lewis Index; SRMR= standardized root mean square residual.

**Discussion**

This research aimed to psychometrically validate three instruments central to assessing positive mental health (PMH)—the SWLS, F-SozU K-14, and RS-11—in a unique cultural setting. Our findings confirmed that these instruments are valid and reliable tools for assessing PMH in both groups, albeit with

nuanced cultural considerations. The strong negative correlations observed between the positive constructs (life satisfaction, social support, resilience) and the negative symptoms of depression, anxiety, and stress (DASS-21) are consistent with the broader salutogenic paradigm (1,2,4). This reinforces the conceptualization of PMH not merely as the

absence of mental illness, but as a distinct, protective dimension of well-being that actively buffers against psychopathology. The positive intercorrelations among the SWLS, F-SozU K-14, and RS-11 suggest a synergistic relationship, supporting the view that these constructs represent interrelated yet distinct pillars of PMH (3,18).

The establishment of full scalar (strong) measurement invariance for the SWLS is a significant finding. It indicates that the scale measures the cognitive appraisal of life satisfaction equivalently across both Iranian migrant and non-migrant groups. The absence of significant mean differences in SWLS scores further underscores that the construct of life satisfaction is perceived and reported similarly, despite the profound life changes associated with migration. This finding aligns with cross-cultural research suggesting that, while the sources of life satisfaction may be culturally shaped, the global evaluation of one's life is a universal human experience (1,5,10). Our results contrast with studies that identified a lack of invariance across gender groups (7), suggesting that the core structure of the SWLS may be more resilient to macro-level contextual changes, such as migration, than to deeply ingrained socio-cultural gender roles. These findings strengthen the case for the SWLS as a valid instrument in cross-cultural research involving Iranian populations, allowing researchers to attribute group differences in future studies to substantive variables rather than measurement artifacts.

The finding of partial scalar (strong) invariance for the F-SozU K-14—necessitating the freeing of the covariance between items 6 (listening support) and 8 (affectionate support)—is particularly revealing. It points to a culturally specific understanding of social support within the Iranian context. In collectivist cultures such as Iran's, social support is often embedded within dense, multifunctional relationships where emotional and affectionate dimensions are deeply intertwined and perhaps indistinguishable. The act of "listening carefully" (Item 6) is not merely an instrumental provision of support, but rather a profound expression of care and intimacy—functionally equivalent to a "hug" (Item 8) in more individualistic cultures where support types may be more compartmentalized. This nuance echoes findings from other cross-cultural studies (8), which also required free

parameters to achieve invariance. Such patterns confirm that, while the overarching construct of perceived social support is universal, its phenomenological expression is culturally mediated. The F-SozU K-14, originally developed in Germany, effectively captures this construct but may require minor statistical adjustments to account for the relational holistic characteristic of Eastern cultural contexts.

The demonstration of full scalar (strong) invariance for the RS-11 provides compelling evidence for the robustness of the resilience construct as measured by this scale. It suggests that Iranians conceptualized and interpreted the capacity to "bounce back" from adversity—encompassing self-efficacy, adaptability, and perseverance—similarly, regardless of whether they reside in their home country or are adapting to a new environment in Germany. This is a noteworthy finding, particularly in light of prior research involving more culturally disparate populations (e.g., Germany vs. China or Pakistan), which often reported only partial invariance (8,25). Our results indicate that within a shared cultural-linguistic context, the core meaning of resilience remains consistent—even as the nature of the adversities encountered (e.g., academic vs. acculturative stress) varies. Accordingly, the RS-11 appears to be a culturally stable and psychometrically sound instrument for examining how resilience exerts its protective effects across different environmental challenges within a single cultural population.

Some limitations of this study include the relatively small sample size and the exclusive focus on Iranian students, which may restrict the generalizability of the findings. Future research should aim to replicate these results in larger, more diverse samples and across different cultural contexts to identify consistent patterns or meaningful discrepancies in the measurement of life satisfaction, social support, and resilience. Additionally, incorporating alternative methodologies—such as qualitative interviews or observational data—could offer a more nuanced and comprehensive understanding of these constructs.

## Conclusion

This study supports the use of validated questionnaires to assess life satisfaction, social support, and resilience among Iranian students with and without immigrant backgrounds.

The findings contribute to the existing literature and can inform future research and interventions aimed at enhancing well-being in this population. They underscore the importance of employing reliable and culturally appropriate measures to better understand the factors influencing well-being and to develop tailored interventions based on individuals' levels of life satisfaction, perceived social support, and resilience.

#### **Conflict of Interests**

The authors report no conflict of interest.

#### **Funding**

The Catholic Academic Exchange Service (KAAD) funded this study through its Scholarship Program 2 and supported Razieh Eizadifard in completing her doctoral studies.

#### **Ethical Considerations**

The Ethics Committee of the Faculty of Psychology at Ruhr-Universität Bochum approved the implementation of this study (ID: 583).

#### **Authors' Contributions**

The authors contributed to the study design. The first and last authors were primarily responsible for the literature search, data collection and analysis, manuscript preparation, and drafting the article. The remaining authors contributed to the interpretation of the findings and the critical revision of the manuscript. All authors reviewed and approved the final revision of the manuscript.

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