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Original Article

Psychometric Properties of the Persian Version of the Social Support Questionnaire in Online Courses: A Transcultural Adaptation and Psychometric Study

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ABSTRACT

Background: Learners perceived social support plays a pivotal role in enhancing engagement, satisfaction, and academic success in online learning. Despite its importance, there is a lack of culturally adapted and psychometrically validated tools for assessing social support among Iranian online learners. This study aimed to examine the psychometric properties of the Social Support Questionnaire (SSQ) in online courses within the Iranian context.

Methods: A total of 399 graduate students from five Iranian universities who enrolled in online courses between November 2023 and January 2024 took part in this transcultural adaptation and psychometric study through convenience sampling. The researchers used a 15-item self-report questionnaire, adapted from five previously validated tools, to assess two dimensions of social support: Emotional and Educational support. The questionnaire was initially translated following a standardized forward-backward translation method. Its psychometric characteristics, such as face validity, content validity, and construct validity, were examined, along with reliability tests measured by Cronbach's alpha and McDonald's omega coefficients.

Results: The translated questionnaire demonstrated satisfactory linguistic and conceptual equivalence, with all item impact scores above 1.5. An expert review established that content validity was satisfactory (Content Validity Ratio (CVR)=0.75; Content Validity Index (CVI)=0.81), leading to the retention of all items. Exploratory Factor Analysis (EFA) revealed a clear two-factor structure, explaining 61.35% of the total variance. Confirmatory Factor Analysis (CFA) supported the model, with fit indices indicating a good fit (χ^2/df=2.98, RFI=0.91, NFI=0.93, CFI=0.95, TLI=0.94, IFI=0.95, RASEA=0.07). Reliability analysis showed high internal consistency, with Cronbach's alpha and McDonald's omega coefficients ranging from 0.87 to 0.92 for subscales, and 0.94 for the total scale.

Conclusion: The Persian version of the SSQ demonstrated robust psychometric properties, confirming it as a reliable and valid tool for assessing social support in online learning environments among Iranian students. This tool can support educators and researchers in identifying students' social support needs and designing interventions to enhance engagement, well-being, and academic outcomes.

Keywords: Education, Distance, Online Learning, Social Support, Psychometrics, Transcultural Adaptation, Students

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Introduction

Although traditional face-to-face education is valuable, it often faces challenges such as geographic limitations, fixed schedules, and limited classroom space. These issues restrict access and reduce learning flexibility. Conversely, electronic learning (e-learning)—encompassing online learning, distance education, and MOOCs (1–3)—provides effective solutions to address these barriers. E-learning integrates digital resources with delivery through electronic devices, making it as a highly effective pedagogical strategy (4). Nevertheless, the growing popularity of online courses has been accompanied by concerns regarding students' academic performance and sustained engagement (5). Many learners in online contexts report feelings of alienation and disconnection, which may negatively affect their persistence and satisfaction (6).

Social support, typically defined as the help and protection people receive during challenging times (7), has been consistently associated with mental health and overall well-being (8–10). Broadly, it can be viewed as a mutual exchange of resources or assistance (8). Early studies of social support primarily emphasized interpersonal interactions and behavioral exchanges (8), but recent studies have expanded this perspective to include online settings (11, 12). Virtual communities can provide supportive networks that strengthen resilience and help mitigate negative emotions (13). In online education, where students often struggle with technical tools, applications, and content acquisition, support is indispensable. Based on Self-Determination Theory (SDT), instructors can meet students' needs for autonomy and competence, while peers play a stronger role in supporting relatedness (14). Even though social support may not directly resolve academic problems, it remains essential for fulfilling psychological needs and mitigating isolation in online learning (2, 12, 15).

Despite its importance, research on social support within e-learning contexts remains scarce (16, 17). Weng and colleagues (2015) emphasized its significance for e-learning acceptance, noting the roles of peers, supervisors, and family (17). Similarly, Hsu and colleagues (2018) found that social support enhances resilience, cognitive processing, and engagement in learning (16). These findings emphasize its significance but often treat social support as a single construct without differentiating its dimensions. In reality, social support is multidimensional (10). House (1983) proposed four types: informational, emotional, instrumental, and appraisal (19). Cohen and Syme (1985) proposed a similar framework, categorizing support into informational, instrumental, companionship, and esteem support (18).

To align with the e-learning context, this study adopted a framework with two overarching categories: educational and emotional support. Educational support refers to informational and instrumental assistance that directly facilitates learning. Examples include instructors clarifying challenging concepts or classmates sharing study materials (20). Effective educational support reduces barriers to completing tasks, enhances perceived ease of use, and encourages active participation and self-regulated learning (20). Emotional support, on the other hand, encompasses empathy, encouragement, companionship, esteem, and care. Although it does not directly solve academic tasks, emotional support alleviates stress, reduces negative emotions, and frees cognitive resources for learning (20, 21). From the perspective of cognitive load theory, by lowering the mental effort needed to cope with stress, students can devote more attention to course content, enhancing learning efficiency and effectiveness.

It is important to note that social support in online courses can manifest differently than in face-to-face settings. Online environments lack non-verbal cues, and communication often occurs asynchronously, which may alter learners' perceptions of support. These differences raise concerns about whether instruments developed for traditional settings can effectively measure support in virtual contexts. In Iran, several validated

instruments are available (22–24), but they primarily focus on face-to-face interactions. In contrast, studies on online education in Iran frequently utilize tools that lack documented psychometric validation. As a result, there is currently no reliable, culturally adapted instrument that accurately captures learners' perceived social support specifically in Persian online courses.

Recognizing the significant impact of social support on achievement and learning outcomes, it is essential to develop practical assessment tools. Even when a questionnaire is validated and proven reliable in one culture, those qualities may not automatically carry over after translation due to differences in language and culture. With the globalization of education and the increasing diversity of learners, there is a demand for standardized yet adaptable instruments applicable across cultural contexts. These efforts enhance both the generalizability of research findings and their practical relevance.

Accordingly, the current study aimed to adapt the Social Support Questionnaire (SSQ) for Persian learners in online contexts, while also examining its psychometric properties. Specifically, it sought to answer the following questions:

1. To what extent is the SSQ valid in online courses within the Iranian context?
2. To what extent is the SSQ reliable in online courses within the Iranian context?

Methods

Study Design and Setting

This transcultural adaptation and psychometric study was conducted from November 2023 to January 2024, encompassing five universities across Iran. These universities provided a variety of programs in the humanities, engineering, and basic sciences. In addition to their in-person courses, they also provided online programs.

Participants and Sampling

The study involved a diverse group of participants who had completed at least two semesters of online coursework and were willing to take part. A total of 429 students submitted questionnaires, but after excluding those with more than 20% missing responses, 399 were retained. These participants were selected through convenience sampling and completed the SSQ, which was administered specifically within the context of their online learning experiences.

Regarding sample size adequacy, the final number of participants (399) was deemed sufficient for the statistical analyses planned. For Exploratory Factor Analysis (EFA), a common guideline suggests having 10 to 20 participants per item, with a minimum acceptable sample size of 200. In the case of Confirmatory Factor Analysis (CFA), it is recommended to have about 20 participants per latent variable. Therefore, a CFA with ten factors requires around 200 participants. Given that the final sample exceeded these recommendations, the study was adequately powered for both the EFA and CFA, supporting the reliability and validity of the factor analyses conducted.

Tools/Instruments

The SSQ in Online Contexts*:* This 15-item self-report questionnaire, developed by the researchers and adapted from five previously validated instruments (2, 17, 25, 26, 27), assesses the students' perceived educational and emotional social support in online courses. Items are rated on a 5-point Likert scale (1=strongly disagree, 5=strongly agree), with higher scores indicating higher perceived support. The instrument evaluates the support provided by family, peers, and teachers and was initially translated following a standardized forward-backward translation process.

Some items originally addressing professional settings were modified for the e-learning context. For instance, "supervisor" was replaced with "teacher", and "monetary rewards or opportunities for promotion" was modified to "positive feedback". A sample item states: *"When I am using the e-learning service, my teacher will provide the relevant information and help me improve my learning."*

The study consisted of two main phases: translation and transcultural adaptation, followed by validity and reliability assessment.

A. Translation and Transcultural Adaptation: *The* questionnaire was translated into Persian using the forward-backward method, consisting of three stages:

• Forward translation: Two bilingual Persian translators rendered the original English questionnaire into a simplified Persian version.

• Inconsistency resolution and back-translation: Discrepancies in the Persian draft were resolved. A native English speaker proficient in Persian then back-translated the Persian version without referencing the original text. The back-translated version was compared to the original to ensure consistency of psychological meaning.

• Expert review and finalization: All translated versions were reviewed by experts. Minor adjustments were made to refine and finalize the Persian questionnaire.

B. Validity and Reliability: To determine the validity of the instrument, face validity, content validity, and construct validity were assessed, followed by an evaluation of the questionnaire's reliability.

Face Validity- Quantitative face validity was assessed using an impact score for each item. The 15-item questionnaire was administered to 42 students, and the impact score was calculated as: Importance × Frequency (%)=Impact Score (28).

Content Validity- Qualitative content validity was assessed by ten experts in educational sciences and psychology, who provided feedback on item placement, grammar, wording, relevance, and expected completion time. In the next stage, quantitative content validity was evaluated using:

• Content Validity Ratio (CVR): Each expert rated items as *necessary*, *useful but not essential*, or *not necessary*. Items with CVR>0.62 were retained (29).

• Content Validity Index (CVI): Experts rated relevance, clarity, and simplicity on a 4-point scale. Items with CVI>0.79 were included (30).

Construct Validity- The EFA was conducted to identify the underlying factor structure. Subsequently, a CFA was performed through Structural Equation Modeling (SEM), resulting in a first-order CFA model accompanied by fit indices.

Reliability- Cronbach's alpha and McDonald's omega coefficients were calculated to assess internal consistency, ranging from 0.87 to 0.92 for subscales, and 0.94 for the total scale.

Data Collection

The study was conducted in two phases: first, translation and cultural adaptation through collaborative sessions with translators; second, psychometric evaluation, which included assessments of face, content, and construct validity, as well as reliability. After content validity was confirmed, the Persian questionnaire was reviewed by ten experts in educational sciences and psychology, all with extensive experience in psychometric evaluation. To facilitate data collection, a link to the questionnaire was provided to instructors at five selected universities, with a request for them to share it among their students for completion.

Data Analysis

Descriptive statistics, such as means and standard deviations, were calculated using SPSS version 25. EFA was conducted in SPSS to identify the underlying factor structure of the questionnaire. Subsequently, CFA was performed using AMOS v8 to evaluate the construct validity and assess model fit. A significance level of 0.05 was used for hypothesis testing.

Ethics - This research was conducted in accordance with the research protocols of the Vice Chancellor for Research at Farhangian University of Tehran, Iran. Participation was voluntary and anonymous, with written informed consent obtained from all participants. They were fully informed about the study's purpose, assured of confidentiality, and told they could withdraw at any time.

Table 1: Descriptive characteristics of quantitative face validity and content validity of the questionnaire

Items	Mean±SD	Impact Score	CVR	CVI	Skewness	Kurtosis
1. When I am using the e-learning service, my peers will encourage and praise me.	3.06±1.13	1.97	0.68	0.80	-0.43	-0.68
2. When I encounter difficulties during e-learning, my teachers are willing to listen and provide the emotional support I need.	3.15±1.12	2.13	0.77	0.81	-0.46	-0.64
3. When I am using the e-learning service, my family will encourage and praise me.	3.24±1.05	2.02	0.79	0.79	-0.64	-0.19
4. My teachers nicely tell me the truth about how I do on things.	3.04±1.13	2.18	0.76	0.80	-0.34	-0.74
5. When I face problems during e-learning, my peers will listen and provide the emotional support I need.	2.96±1.14	3.11	0.69	0.83	-0.27	-0.84
6. When I have great performance in e-learning, my teacher will provide positive feedback.	3.13±1.11	2.25	0.80	0.81	-0.43	-0.55
7. When I use the e-learning services, peers will provide information, advice, and guidance.	3.12±1.09	3.14	0.79	0.82	-0.48	-0.70
8. When I am using the e-learning service, my teacher will provide the relevant information and help me improve my learning.	2.86±1.17	2.74	0.75	0.81	-0.14	-1.00
9. When there is something I do not understand, my teacher will be there to help me.	3.35±1.12	2.02	0.79	0.79	-0.68	-0.24
10. When there is something I do not understand, I can always turn to my peers for help.	2.85±1.07	3.22	0.69	0.80	-0.33	-0.86
11. While using the e-learning services, if there are problems with the computer or system, my teacher will come to help right away.	2.96±1.10	2.98	0.78	0.84	-0.31	-0.89
12. When I face problems during e-learning, peers will provide support for analyzing the problems and help find the best solution to resolve it.	2.62±1.15	3.33	0.80	0.82	0.15	-0.93
13. When I use the e-learning service, my family will help me collect the necessary information I need.	2.70±1.14	3.19	0.75	0.83	0.01	-1.05
14. When I use the e-learning service, my family will share with me their experience of e-learning and any other important things we need to know.	3.07±1.15	2.87	0.76	0.81	-0.35	-0.74
15. When I face problems during e-learning, my teacher will give me support, help me analyze problems, and make decisions on ways to solve the problem.	2.95±1.12	3.24	0.77	0.79	-0.33	-0.80
Total Mean	3.00±1.11	2.69	0.75	0.81	-0.33	-0.72

SD: Standard Deviation; CVI: Content Validity Index; CVR: Content Validity Ratio

Results

Demographic Characteristics

From the 429 questionnaires distributed, 399 were deemed eligible, representing a 93% eligibility rate. Participants' ages spanned from 22 to 51 years, with an average age of 31.27 (SD=10.31). The sample included 172 males (43%) and 227 females (57%), all of whom were graduate students (N=399, 100%).

Descriptive Statistics

The total scores on the questionnaire ranged from 17 to 75, with a mean score of 45.06 (SD=12.18, N=399). This average score indicates a relatively high level of social support among the participants. A descriptive analysis of the individual questionnaire items, as shown in Table 1, revealed an average item score of 3.00 on a scale of 1 to 5. Additionally, both skewness and kurtosis indices remained within acceptable limits, below the concern thresholds of 3 and 2, respectively, indicating a normal distribution of data. Furthermore, regarding face validity, the impact score for each item was reported. For content validity, the obtained CVR and CVI values confirmed that both indices were acceptable (Table 1).

***Face Validity**:* The face validity of the tool was confirmed, as the impact scores for all items (averaging 2.69) surpassed the threshold of 1.5. This outcome supports the inclusion of every question in the survey (28).

Content Validity: Regarding content validity, an average CVR of 0.75 was observed for all items, with each item exceeding the necessary benchmark of 0.62 for ten expert assessments, as indicated by the Lawshe table (29). Furthermore, the mean CVI for both individual items and the overall set of items was 0.81, which is above the acceptable standard of 0.79 (29). These findings collectively affirm the scale's content validity (Table 1).

Construct Validity: The construct validity of the questionnaire was assessed using both EFA and CFA.

Exploratory Factor Analysis

Initially, the suitability of the dataset for factor analysis was evaluated using the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's Test of Sphericity. The KMO value was 0.953, indicating a high level of sampling adequacy. Likewise, Bartlett's Test of Sphericity yielded a statistically significant result (3600.700 / 105, P<0.001), confirming that the correlation matrix was not an identity matrix. The analysis further involved examining eigenvalues (specifically those greater than one), the proportion of variance explained, and the scree plot to determine the optimal number of latent factors. As evidenced by Table 2 and Figure 1, both the principal component analysis and the scree plot consistently indicated the presence of two factors, which together explained 61.357% of the total variance, thereby supporting the construct validity of the scale (Table 2).

Following a rotation, the factor loadings for all the 15 items are presented in Table 3. This analysis revealed that items 1, 2, 3, 4, 5, and 6 loaded onto Factor 1, which represents Emotional Social Support. Concurrently, items 7, 8, 9, 10, 11, 12, 13, 14, and 15 loaded onto Factor 2, indicative of Educational Social Support (Table 3).

Table 2: indices for questionnaire factors after a Varimax rotation

Factors	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.997	53.314	53.314	7.997	53.314	53.314	5.471	36.475	36.475
2	1.206	8.043	61.357	1.206	8.043	61.357	3.732	24.882	61.357

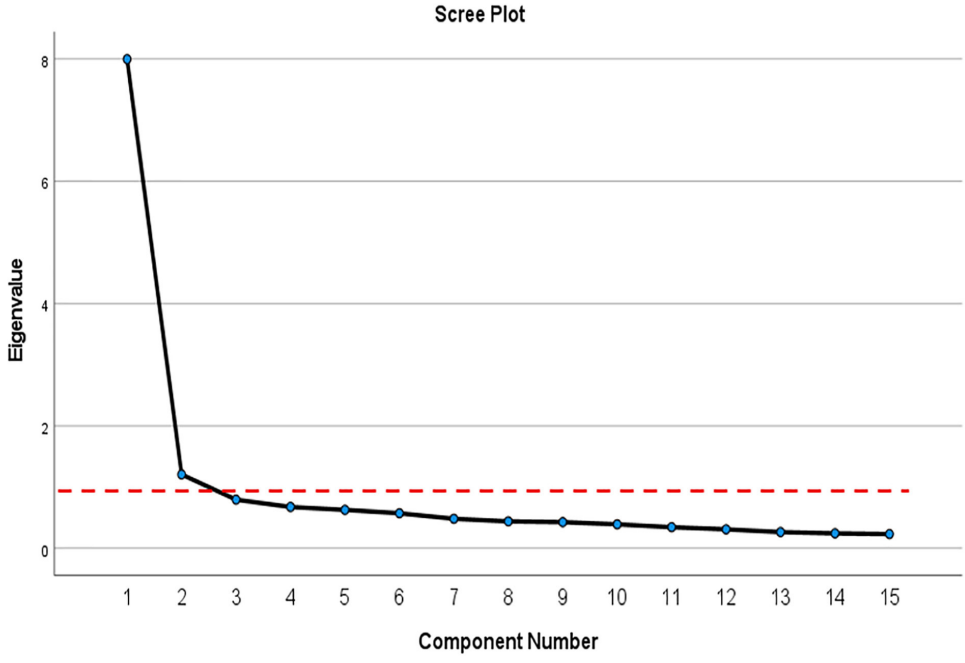

Figure 1: The scree plot of principal component number

Table 3: Factor loadings of items in each subscale

Items	Factor 1	Factor 2
Q1. When I am using the e-learning service, my peers will encourage and praise me.	0.62	
Q2. When I encounter difficulties during e-learning, my teacher are willing to listen and provide the emotional support I need.	0.81	
Q3. When I am using the e-learning service, my family will encourage and praise me.	0.74	
Q4. My teachers nicely tell me the truth about how I do on things.	0.57	
Q5. When I face problems during e-learning, my peers will listen and provide the emotional support I need.	0.59	
Q6. When I have great performance in e-learning, my teacher will provide positive feedback.	0.64	
Q7. When I use the e-learning services, peers will provide information, advice, and guidance.		0.58
Q8. When I am using the e-learning service, my teacher will provide the relevant information and help me improve my learning.		0.79
Q9. When there is something I do not understand, my teacher will be there to help me.		0.66
Q10. When there is something I do not understand, I can always turn to my peers for help.		0.85
Q11. While using the e-learning services, if there are problems with the computer or system, my teacher will come to help right away.		0.71
Q12. When I face problems during e-learning, peers will provide support for analyzing the problems and help find the best solution to resolve it.		0.76
Q13. When I use the e-learning service, my family will help me collect the necessary information I need.		0.76
Q14. When I use the e-learning service, my family will share with me their experience of e-learning and any other important things we need to know.		0.56
Q15. When I face problems during e-learning, my teacher will give me support, help me analyze problems, and make decisions on ways to solve the problem.		0.73

*Factor 1: Emotional social support; Factor 2: Educational social support.

Confirmatory Factor Analysis

To validate the questionnaire's factor structure, a CFA model was executed. The results of this analysis are illustrated in Table 4.

These results indicate an acceptable but not optimal model fit. While most indices met the recommended thresholds (≥0.90), the Root Mean Square Error of Approximation (RMSEA) was at the upper boundary of acceptability, and the chi-square ratio slightly exceeded the ideal range (≤3.00). This suggested that the initial model could benefit from targeted refinements (Figure 2).

To enhance the model's fit, Modification Indices (MI) were examined. Based on the statistical suggestions and theoretical justification, a series of correlated error terms were added between items with overlapping content or similar phrasing. These adjustments were conceptually defensible and aimed at reducing unexplained variance arising from common measurement artifacts.

Following these modifications, the revised model demonstrated improved fit indices, indicating a better representation of the underlying construct structure. The refined model, shown in Figure 3, was subsequently used for further validation and interpretation.

Figure 3 displays the modified first-order factor model after the applied theoretical and statistical refinements, including correlated error terms between specific items identified through high modification indices and conceptual similarity.

Table 4: Fit indices for the initial first-order factor model

	Model	$\chi 2/df$	RFI	NFI	CFI	TLI	IFI	RMSEA
Fit indices	First-order factor model	3.64	0.89	0.91	0.93	0.92	0.93	0.08
	Optimal Fit	$0 \leq \chi^2/df \leq 3$	$0.90 \leq RFI \leq 1$	$0.90 \leq NFI \leq 1$	$0.90 \leq CFI \leq 1$	$0.90 \leq TLI \leq 1$	$0.90 \leq IFI \leq 1$	$0 \leq RMSEA \leq 0.08$

RFI: Relative Fit Index, NFI: Normed Fit Index, CFI: Comparative Fit Index, IFI: Incremental Fit Index, TLI: Tucker-Lewis Index, RMSEA: Root Mean Square Error of Approximation; df: degree of freedom

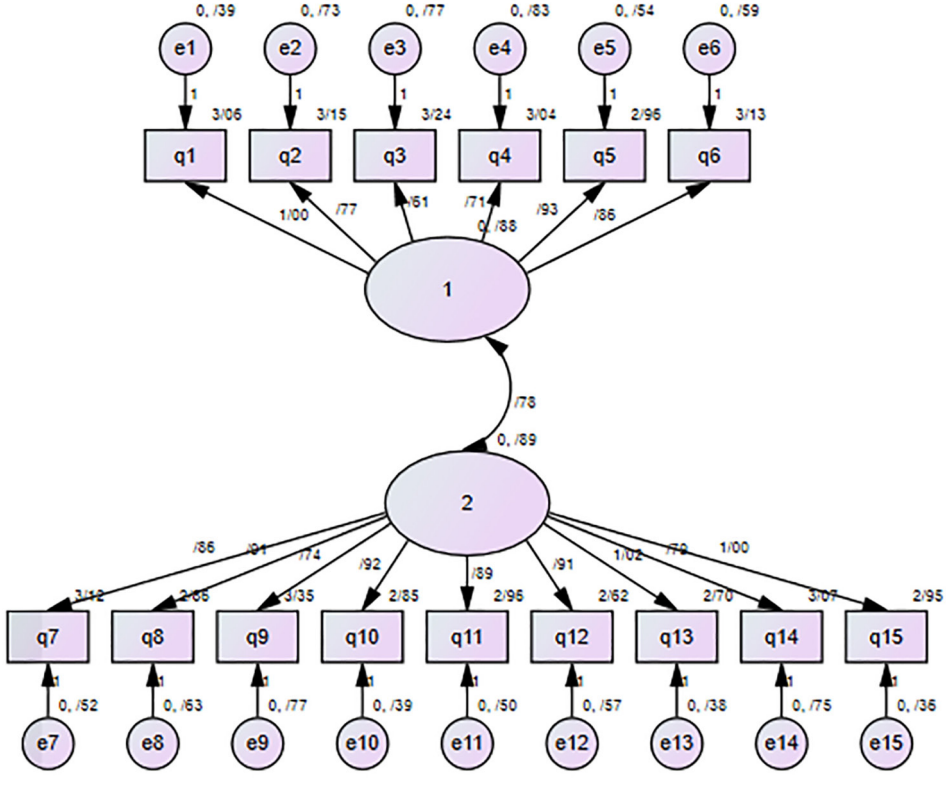

Figure 2: Initial first-order Confirmatory Factor Model

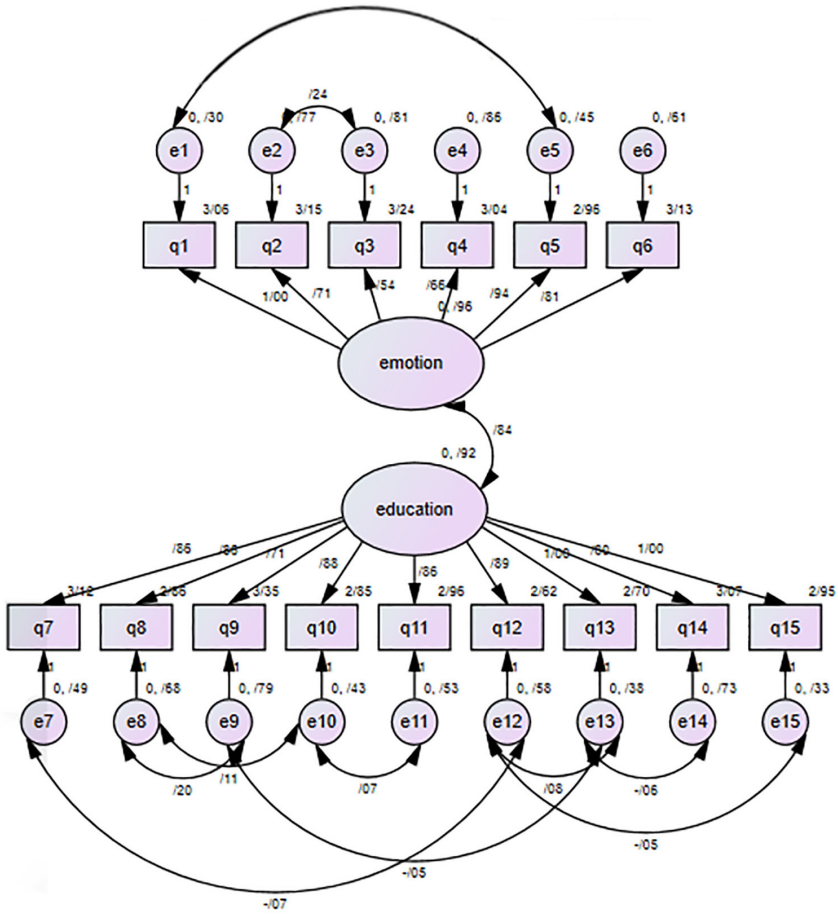

Figure 3: Revised First-order Confirmatory Factor Model

Table 5: Fit indices for the revised first-order Confirmatory Factor Model

	Model	$\chi 2/df$	RFI	NFI	CFI	TLI	IFI	RMSEA
Fit indices	First-order factor model	2.98	0.91	0.93	0.95	0.94	0.95	0.07
	Optimal Fit	$0 \leq \chi^2/df \leq 3$	$0.90 \leq RFI \leq 1$	$0.90 \leq NFI \leq 1$	$0.90 \leq CFI \leq 1$	$0.90 \leq TLI \leq 1$	$0.90 \leq IFI \leq 1$	$0.90 \leq RMSEA \leq 0.08$

RFI: Relative Fit Index, NFI: Normed Fit Index, CFI: Comparative Fit Index, IFI: Incremental Fit Index, TLI: Tucker-Lewis Index, RMSEA: Root Mean Square Error of Approximation; df: degree of freedom

The model demonstrates improved fit, with fit indices reported in the Table 5.

The revised first-order confirmatory factor model was developed following a series of theoretically justified modifications aimed at improving model fit. Based on the initial CFA results and the examination of modification indices, several error covariances were introduced between items that shared semantic or structural similarities. These modifications were theoretically justified, as they accounted for shared measurement variance potentially arising from overlapping item wording or content.

These values fall within recommended thresholds, suggesting that the revised model provides a valid and reliable representation of the latent structure underlying the questionnaire. The model is therefore considered appropriate for further validation and use in subsequent analyses.

The revised model retained the original factor structure, with observed variables loading onto their respective latent constructs. However, by allowing selected error terms to correlate, unexplained variance was more

Table 6: Internal consistency of the social support questionnaire in online contexts

Subscales	The number of items	Cronbach's alpha coefficient	McDonald's omega coefficient
Emotional social support	6	0.85	0.85
Educational social support	9	0.92	0.92
Total scale	15	0.94	0.94

accurately accounted for, resulting in improved fit indices across the board. Fit statistics for the revised model indicate a satisfactory level of model-data correspondence.

Reliability

Table 6 presents data indicating that the Cronbach's alpha and McDonald's omega coefficients range from 0.87 to 0.94. These metrics collectively confirm that each subscale and the overall scale exhibit acceptable internal consistency, confirming the reliability of the instrument.

Discussion

In the context of online education, perceived social support is regarded as a key factor influencing students' engagement, motivation, and overall well-being. It represents learners' personal perception that they can rely on supportive resources from instructors, peers, and family members—resources that can help reduce stress and enhance learning (31, 32). Prior studies have consistently demonstrated the positive impact of social support on academic outcomes, persistence, and satisfaction in digital learning environments (33, 34). However, before the current study, no validated Persian tool was available to thoroughly assess social support specifically within online learning environments.

The rigorous process of transcultural adaptation and psychometric validation in this study included translation, back-translation, expert review, and pilot testing, ensuring both linguistic and cultural equivalence of the Persian version. Such methodological rigor is critical in cross-cultural research, as direct translation without adaptation may compromise the validity of constructs, particularly those with social and psychological dimensions (35).

For face validity, all items achieved impact scores between 1.97 and 3.33 (Mean=2.69), exceeding the minimum acceptable value of 1.5 (28), indicating that participants found the items to be clear, relevant, and suitable for assessing social support in online courses. This high face validity suggests that the items appropriately captured the subjective experience of students, which aligns with previous studies emphasizing the importance of participant comprehension in e-learning contexts (36, 37).

Content validity indices also confirmed the adequacy of the instrument. The average CVR of 0.75 exceeded the Lawshe minimum of 0.62 (29), and the average CVI of 0.81 surpassed the 0.79 benchmark (30). These results indicate that the Persian version effectively captures the full scope of the social support construct, encompassing both emotional and educational support dimensions, consistent with global findings that underscore the multidimensionality of social support (10, 19).

The EFA results revealed a two-factor structure corresponding to emotional and educational social support, explaining 61.35% of the variance. CFA confirmed the first-order factor structure with robust fit indices, indicating a strong alignment between the hypothesized model and the observed data. The initial confirmatory factor model did not fully meet the recommended fit criteria, indicating that the hypothesized structure required refinement. To address this, modification indices were examined, and a series of theoretically justified adjustments were made. Specifically, error covariances were added between items with overlapping semantic content or similar measurement characteristics. These modifications were

not purely statistical; they were conceptually grounded in the design of the instrument and the nature of the constructs being measured. Following these adjustments, the revised model demonstrated improved fit across all indices, including RMSEA, Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and χ^2/df. This suggests that the refined structure provides a more accurate representation of the latent dimensions underlying the questionnaire. The process highlights the importance of balancing empirical fit with theoretical coherence when validating measurement models.

The inclusion of correlated error terms between certain items in the revised model may reflect semantic overlap or similarities in phrasing. Items with comparable linguistic structures or thematic content can elicit similar cognitive processing from respondents, resulting in shared measurement variance. This phenomenon, often referred to as a "method effect," is common in self-report instruments and does not necessarily indicate a conceptual flaw in the underlying theoretical model. By allowing these error terms to correlate, the revised model accounts for this shared variance, thereby improving overall fit indices while preserving the integrity of the two-factor structure (38). These findings reinforce the theoretical distinction between emotional support (e.g., empathy, encouragement) and educational support (e.g., guidance, informational assistance), supporting their separate evaluation in online contexts (17).

The questionnaire demonstrated excellent internal consistency, with Cronbach's alpha and McDonald's omega coefficients ranging from 0.85 to 0.94 for subscales and the total scale. This high reliability indicates that the instrument consistently measures the intended constructs across diverse respondents—a critical requirement for longitudinal studies or interventions in online learning environments (39-41).

The validation of this Persian version carries significant implications. For researchers, it provides a reliable and valid tool to quantify perceived social support in online learning, enabling cross-cultural comparisons and the investigation of its influence on learning outcomes. For practitioners, understanding the levels and types of social support perceived by students can inform targeted interventions, such as peer mentoring, group projects, and structured teacher feedback, which have been shown to enhance engagement and reduce isolation in online courses (26, 32). Low scores on either subscale may highlight areas where students require additional emotional or educational support, offering actionable guidance for instructors and administrators. This study contributes to the field by providing the first validated Persian instrument tailored explicitly to online learning contexts. It also expands the evidence base for the reliability and construct validity of social support measures across different socio-cultural and technological environments. Furthermore, by differentiating emotional and educational support, it enables researchers and educators to identify specific mechanisms through which social support influences learning, motivation, and resilience in online settings (42, 43).

Limitations and Suggestions

Several limitations should be acknowledged when interpreting the findings of this study. First, reliance on self-report measures may introduce bias, as participants could provide socially desirable or inaccurate responses. Future studies could address this by adopting mixed-method approaches, such as combining surveys with interviews, or incorporate more objective measures of social support in online courses to triangulate data. Second, the study lacked additional instruments to assess concurrent validity, limiting comparisons with other validated social support scales. Third, the use of convenience sampling may reduce the generalizability of results, since voluntary participants might differ from the wider online learning population in terms of demographics or access to technology. Fourth, potential inconsistencies may have arisen during the translation and cultural adaptation process. Although rigorous

forward–backward translation and expert review were conducted, subtle variations in meaning or cultural context are often difficult to eliminate completely, potentially affecting cross-cultural validity.

Moreover, while this study supports the reliability and validity of the questionnaire within Persian online learning contexts, longitudinal investigations are needed to evaluate its temporal sensitivity and predictive power for academic and psychological outcomes. Future studies could also examine the impact of social support interventions (e.g., peer mentoring, discussion forums, or instructor feedback) on student engagement and performance. Finally, given the observed error covariances between items with overlapping content, future research should consider refining item wording to reduce redundancy. In cases where semantic similarity is unavoidable, merging such items into a single, more comprehensive statement may enhance the clarity and parsimony of the instrument. This approach could minimize correlated measurement errors and improve construct validity. Additionally, researchers are encouraged to pay close attention to linguistic structure during questionnaire design to avoid repetitive phrasing that may artificially inflate error terms. Consequently, future versions of the questionnaire may benefit from consolidating semantically similar items to reduce redundancy and improve measurement precision.

Despite these limitations, the validated instrument enables educators to identify students at risk of low social support and implement targeted interventions to enhance emotional and educational support, thereby reducing stress, burnout, and academic disengagement in online learning environments.

Conclusion

This study provides robust evidence regarding the psychometric properties of a social support questionnaire designed for online learning settings, using data from Iranian university students—a group that has received limited attention in prior research. The findings revealed a clear two-factor structure, comprising educational and emotional social support, both demonstrating satisfactory fit indices and reliability. These results underscore the validity and reliability of the instrument, confirming its suitability as a practical tool for assessing social support in Iranian online learning contexts and guiding efforts to improve student engagement and well-being.

Abbreviations

CFA: Confirmatory Factor Analysis
CFI: Comparative Fit Index
CVI: Content Validity Index
CVR: Content Validity Ratio
EFA: Exploratory Factor Analysis
IFI: Incremental Fit Index
NFI: Normed Fit Index
RFI: Relative Fit Index
TLI: Tucker-Lewis Index
RMSEA: Root Mean Square Error of Approximation

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Authors' Contribution

AT designed the study, supervised data collection and analysis, and managed overall project coordination. MHL participated in data collection and helped develop the study's initial concept. All authors reviewed and approved the final manuscript.

Conflict of Interest

The authors have no financial, personal, or professional relationships that could have influenced the research, analysis, or conclusions presented in this work. All efforts have been made to ensure objectivity and integrity throughout the study.

Ethical Considerations

This study adhered to the research guidelines established by the Vice Chancellor

for Research at Farhangian University of Tehran, Iran, under protocol number 52400/371. Participation in the study was entirely voluntary, and all data were gathered anonymously. Participants were informed that their personal information would remain completely confidential during the data collection, analysis, and publication phases. Written informed consent was obtained from all participants, who were also made aware of their right to withdraw from the study at any point. Additionally, they were fully briefed on the study's purpose and assured of the confidentiality of their responses.

Availability of Data and Materials

Datasets or materials that support the findings of this study are available from the corresponding author upon reasonable request.

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