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Psychometric properties of the multidimensional scale of perceived social support among university of Ibadan medical students

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Abstract

Introduction The Multidimensional Scale of Perceived Social Support (MSPSS) is widely used to measure perceived social support. Despite its extensive application, the scale's psychometric properties have not been tested among Nigerian medical students, who face high levels of psychological distress. This study aims to evaluate the reliability, validity and factor structure of the MSPSS among medical students at the University of Ibadan, Nigeria.

Method A cross-sectional observational study was conducted with 355 preclinical and clinical medical students from the University of Ibadan. Data were collected through an online questionnaire utilising the MSPSS, which includes three subscales: family, friends, and significant other. Internal consistency was assessed using Cronbach's alpha, and construct validity was evaluated through factor analysis. Confirmatory factor analysis (CFA) was conducted to assess model fit.

Results The MSPSS demonstrated excellent internal consistency (Cronbach's alpha = 0.927), with subscale reliability for family (α = 0.892), friends (α = 0.927), and significant other (α = 0.927). Factor analysis confirmed a three-factor structure consistent with the original MSPSS, explaining 80.3% of the variance. CFA showed strong model fit indices (CFI = 0.976, TLI = 0.966, RMSEA = 0.071).

Conclusion The MSPSS is a reliable and valid tool for assessing perceived social support among Nigerian medical students. The findings highlight the scale's applicability for identifying students at risk and guiding necessary interventions in medical education.

Clinical trial number Not Applicable.

Keywords Social support, University of Ibadan, MSPSS, Psychometric properties, Nigerian medical students

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Introduction

As of 2019, the Institute of Health Metrics and Evaluation estimates that 1 in 8 people – 12.5% of the global population – were living with a mental disorder [1]. However, the Nigerian Federal Ministry of Health found that at least 10% of Nigerians suffer from Common Mental Disorders, while over 25% of older Nigerians have experienced Major Depressive Disorder during their lives. Nigeria's enormous mental health burden is further worsened by the cultural misrepresentation of psychiatric care, poor health financing, and a paucity of providers due to the nation's ratio of one psychiatrist per 1 million population [2].

Medical students grapple with a thoroughly tasking, yet lengthy training. In medical school, they are required to deal with academic pressure, financial burdens, social expectations, and clinical rotations under intense conditions while juggling the numerous potential requirements of an increasingly competitive job market [3]. These pressures culminate in mental health challenges, which have been shown to be more severe than those experienced by their peers, with the prevalence of common mental disorders (CMDs) among medical students reaching as high as 44.9%, where a lack of social support is identified as the most significant risk factor [4]. Consistent with their multiple predispositions to mental health challenges, Nigerian medical students are reported to have a 54.5% predisposition to psychological distress and burnout, with psychiatric diagnoses increasing threefold after commencing medical school, requiring a higher level of social support [5].

Social support is defined by the Encyclopaedia of Behavioural Medicine (pg. 389) as "the availability of a variety of social contacts from whom to derive benefits… [including] emotional support, tangible aid, feelings of belonging and emotional support" [6]. This support may consist of the assurance of availability of aid, termed perceived social support, or the actual act of obtaining assistance, termed received support. Both perceived and received support may come from tangible acts, known as practical support, or mental and psychological reinforcement, known as emotional support [6]. High levels of social support have been proven to cushion the negative health outcomes of stress. Perceived family support, especially when present over a long period from childhood, improves an individual's ability to cope, mitigates psychological distress, improves their health behaviours, and, as a result, their health outcomes [6]. Despite their dire needs, however, medical students are found to have low perceived social support with the specific levels varying by gender, ethnicity, and choice of residence [7].

Social support can be measured using a number of scales: the 2-Way Social Support scale measuring the giving and receiving of emotional and instrumental support [8], the originally-Chinese 10-item Social Support Rating Scale measuring subjective support, objective support, and support utilisation [9, 10], the four-item Social Support Scale measuring the instrumental, informational, appraisal, and emotional dimensions of social support [11], and the Multidimensional Scale of Perceived Social support (MSPSS) [12]. The MSPSS was developed to incorporate both qualitative and quantitative methods of social support from three distinct sources – family, friends, and significant other –in a simple, timely, and self-explanatory manner [12].

The MSPSS has been translated into numerous languages, including Hausa, a major Nigerian language [13]. Most translations have retained considerable validity as evidenced by a Cronbach's alpha of at least 0.7 in a systematic review of 22 translations [14]. These translations have been used to assess social support in groups including children, adolescent, and elderly populations, psychiatric and cancer patients as well as their caregivers [15]. In the Nigerian setting, the MSPSS has been used to measure the influence of social support on depression, anxiety, and stress in healthcare workers [16], bullying and suicidal ideation in children [17] and adolescents [18], caregiver burden [19] and physical and psychological outcomes in stroke survivors [20–22], stigma in people living with HIV (PLWH) [23], preoperative anxiety [24] and emotional reactivity in surgical patients [25], psychological outcomes in elderly Nigerian [26–30], quality of life in post-conflict communities [31], weight reduction in obese patients [32], psychiatric patients [33], depression and minority stress among Nigerian gay, bisexual, and other men who have sex with men (GBMSM) [34], common mental disorders in urban slum dwellers [35], and exposure to occupational biomechanical risk factors in patients with chronic lower back pain [36].

However, the validity of MSPSS in the Nigerian context has only been tested for stroke survivors and GBMSM. For medical students, evidence of validity globally has only been reported in a study of Brazilian healthcare students [14]. Hence, there is a need to determine the reliability, validity and consistency of the MSPSS in assessing social support as an important predictor of the psychological status of Nigerian young adults, undergraduate students, and medical students in particular.

Methodology

Study design

This is a cross-sectional observational study. Data collection was via online questionnaire on Google form. Students enrolled in the MB; BS degree programme were invited to participate in the study by sharing the link to the online questionnaire to the central WhatsApp group of the students. Data collection extended over four weeks across November and December, 2023.

Study population, procedure and sample size

Participants were current undergraduate students in the MB; BS degree programme in the College of Medicine, University of Ibadan, Nigeria. The six-year undergraduate MBBS degree programme in the College of Medicine comprises preliminary, preclinical and clinical phases. The scope of this research excluded medical students in their preliminary (first year) as they are yet to be fully integrated into the College of Medicine. Participants included in this study were medical students in the preclinical (second and third year) and clinical phases (fourth, fifth and sixth year) of medical school who consented to participate in the study by indicating their choice in the 'Informed Consent' section on the first page of the online questionnaire. All students from the second year to sixth year were invited to participate in the survey and the resulting response rate was 51% (355 students). The sample size for this study was 355 participants, which exceeds the minimum sample size of 100 participants recommended by the COSMIN guidelines for psychometric studies.

Survey instrument

This tool was developed by Zimet et al. [12] and has been used in previous studies [37–39]. The survey consists of two sections. The first section covers sociodemographic information such as age, sex and level. The second section utilises the Multidimensional Scale of Perceived Social Support (MSPSS). The MSPSS has three subscales comprising family, friends and a significant other. There were 12 questions on the scale, with four questions on each subscale. The MSPSS has a seven-point Likert scale ranging from 1 (very strongly disagree) to 7 (very strongly agree). Students with low support had mean scores ranging from 1 to 2.9, those considered moderate support ranged between 3 and 5, and those with high support between 5.1 and 7. Items 1, 2, 5 and 10 covers the significant other subscale; items 3, 4, 8 and 11 covers the family subscale; and items 6,7, 9 and 12 covers the friends subscale.

Table 1 Sociodemographic data

Sociodemographic variable		Frequency	%	*P* value
Age				0.042
Mean(SD): 22.63(2.44)	18–22	184	51.8	
	23–27	157	44.2	
	28–32	13	3.7	
	> 32	1	0.3	
Sex	Male	210	59.2	0.001
	Female	145	40.8	
Level	200	82	23.1	0.789
	300	64	18.0	
	400	69	19.4	
	500	88	24.8	
	600	52	14.6	

Ethical considerations

Ethical approval was obtained from the University of Ibadan / University College Hospital (UI/UCH) Ibadan Ethics Committee with ethical approval number 23/0726 in November 2023. Informed consent to participate was obtained from all participants prior to their inclusion in the study. This process adhered to ethical principles outlined in the Declaration of Helsinki.

Data analysis

Data analysis was performed using SPSS version 27 and SPSS AMOS version 23. Means, standard deviations, and frequencies were calculated to summarise the demographic characteristics of the sample. Reliability analysis was conducted using Cronbach's alpha to assess the internal consistency of the Multidimensional Scale of Perceived Social Support (MSPSS) and its subscales, with values above 0.70 considered acceptable.

To establish the construct validity of the MSPSS among our sample population, confirmatory factor analysis (CFA) was conducted. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity were performed to evaluate the suitability of the data for factor analysis. KMO value greater than 0.6, and Bartlett's test with a p-value less than 0.05 indicates that the sample is adequate, suggesting that the correlation matrix significantly deviated from an identity matrix.

The CFA was conducted using the maximum likelihood estimation (MLE) method to test the factor structure of the MSPSS. Model fit indices such as Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR), were examined to assess goodness-of-fit.

A Scree plot and Monte Carlo Parallel Analysis (PA) were utilised to determine the factors to retain in the CFA. The scree plot visually inspected the eigenvalues and the point of levelling off to determine the number of factors. The number of factors that account for meaningful variation in the data was identified by comparing the observed eigenvalues with randomly generated eigenvalues using the Monte Carlo PA.

Results

A total of 355 medical students were involved in this validation process. The demographic characteristics of the participants have been summarised in Table 1. The age and sex characteristics of the participants are statistically significant, showing that their respective distributions are different from one another. The mean age is 22.63(2.44) and 51.8% of participants are within the 18–22 age range followed by 23–27 age range which is represented by 44.2%. There are more male participants (59.2%) than female participants (40.8%). In terms of level, 500 level

represents 24.8% of participants, followed by 200 level (23.1%), 400 level (19.4%), 300 level (18.0%) and 600 level (14.6%).

Table 2 shows the division of perceived level of social support for the significant other, friends and family subscales and the summation of the perceived level of social support.

The internal consistency MSPSS questionnaire was high with a Cronbach's alpha value of 0.927. Also, the Cronbach's alpha value for the family, friends and significant other subscales were 0.892, 0.927 and 0.927 respectively.

Table 3 presents descriptive statistics for the items on the Multidimensional Social Support Perception Scale (MSPSS), including the mean, standard deviation (SD), and Cronbach's alpha if the item were deleted. The mean scores across the items range from 4.56 to 5.74, indicating that respondents generally perceive a high level of social support from both their family and friends. The standard deviations are relatively low, ranging from 1.220 to 1.660, suggesting that there is minimal variability in the responses. The Cronbach's alpha values for each item, which range from 0.919 to 0.923, indicate excellent internal consistency and suggest that the MSPSS items are reliable measures of social support. Deleting any single item does not substantially impact the overall internal consistency, as the Cronbach's alpha remains above 0.90 for all items, reinforcing the reliability of the scale in assessing social support perceptions.

Table 2 Perceived level of social support

Categorisation		Frequency	%
(Total)	Low support	19	5.4
	Medium support	126	35.5
	High support	210	59.2
Family	Low support	14	3.9
	Medium support	99	27.9
	High support	242	68.2
Friends	Low support	17	4.8
	Medium support	149	42
	High support	189	53.2
Significant other	Low support	42	11.8
	Medium support	156	43.9
	High support	157	44.2

Table 3 MSPSS items and their Cronbach's alpha if item deleted

S/N	MSPSS Items	Mean	SD	Cronbach's Apha if Item deleted
1.	There is a special person who is around when I am in need	4.56	1.610	0.923
2.	There is a special person with whom I can share my joys and sorrows	4.86	1.564	0.920
3.	My family really tries to help	5.74	1.220	0.923
4.	I get emotional help and support I need from my family	5.48	1.347	0.922
5.	I have a special person who is a real source of comfort to me	4.83	1.660	0.919
6.	My friends really try to help	5.12	1.275	0.920
7.	I can count on my friends when things go wrong	4.99	1.374	0.921
8.	I can talk about my problems with my family	5.13	1.458	0.921
9.	I have friends with whom I can share my joys and sorrows	5.12	1.369	0.919
10.	There is a special person in my life who cares about my feelings	4.97	1.564	0.920
11.	My family is willing to help me make decisions	5.30	1.403	0.920
12.	I can talk about my problems with my friends	4.94	1.387	0.922

Factor analysis

The Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy yielded a value of 0.906, which significantly exceeds the recommended threshold of 0.6, indicating that the sample size is adequate for conducting factor analysis. Additionally, the Bartlett's Test of Sphericity returned a p-value of less than 0.001, which confirms that the correlation matrix is not an identity matrix. Both the KMO and Bartlett's Test of Sphericity supports the appropriateness of the data for factor analysis.

Principal component analysis revealed the presence of three components with eigenvalues greater than 1, which explained 55.9%, 13.4%, and 11% of the total variance, respectively as presented in Table 4. Together, these three factors accounted for 80.3% of the variance. The factor solution aligns with the original multidimensional structure of the MSPSS. A scree plot depicting the eigenvalues of each factor is presented in Fig. 1. The results were further corroborated by Monte Carlo PCA parallel analysis, which indicated that only three components had eigenvalues exceeding the criterion values for similarly sized randomly generated data. The consistency observed across the scree plot, eigenvalue rule, and Monte Carlo PCA parallel analysis highlights the stability and robustness of the three-factor structure extracted from the data.

The three factors identified were Friend, Significant Other, and Family, which align with the original dimensions of the MSPSS. Each item exhibited significant loadings on their respective factors, with values ranging from 0.886 to 0.718. These factor loadings are summarized in Table 5. As observed, the distribution of items across the three factors mirrored that of the original MSPSS construct. Moderate positive correlations were noted between the subscales, with Friend vs. Significant Other ($r = 0.528$), Friend vs. Family ($r = 0.594$), and Significant

Table 4 Principal component analysis of the MSPSS

Component	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	6.707	55.895	55.895	6.707	55.895	55.895	3.296	27.469	27.469
2	1.606	13.380	69.275	1.606	13.380	69.275	3.281	27.340	54.809
3	1.319	10.988	80.263	1.319	10.988	80.263	3.055	25.454	80.263
4	0.490	4.085	84.348						
5	0.352	2.932	87.280						
6	0.304	2.531	89.811						
7	0.281	2.341	92.152						
8	0.214	1.786	93.938						
9	0.208	1.735	95.673						
10	0.193	1.609	97.282						
11	0.175	1.460	98.742						
12	0.151	1.258	100.000						

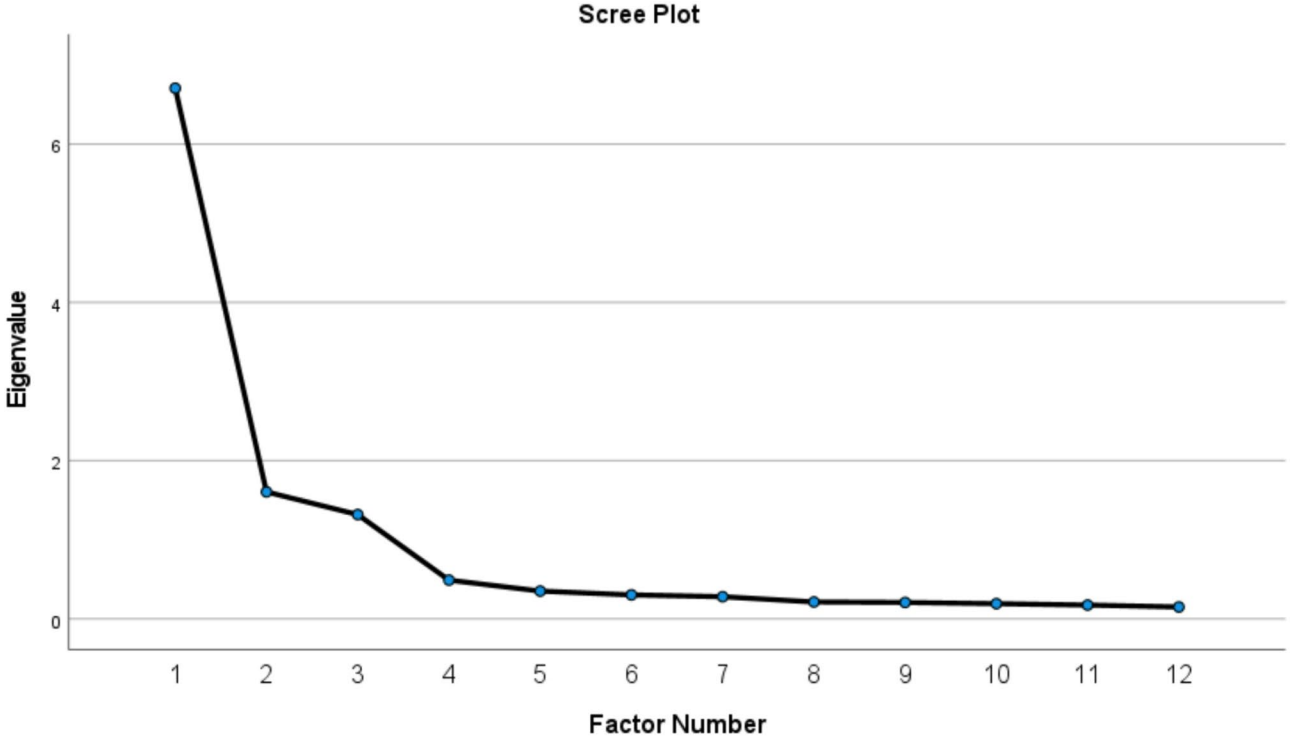

Fig. 1 Eigenvalue of each factor

Other vs. Family ($r = 0.554$), suggesting relatedness between the factors, yet maintaining their distinctiveness.

The path diagram from the structural equation modelling (SEM) (Fig. 2) analysis indicates that the standardised coefficients for the relationships between the factors were high, ranging from 0.77 to 0.92. SEM also shows a good model fit, with significant results ($p < 0.001$) and fit indices: CFI = 0.976, TLI = 0.966, RMSEA = 0.071, and SRMR = 0.074.

Discussion

This study evaluated the psychometric properties of the Multidimensional Scale of Perceived Social Support (MSPSS) among medical students at the University of Ibadan, Nigeria. The findings demonstrate robust psychometric properties of the MSPSS in this population, supporting its utility as a reliable and valid instrument for assessing perceived social support among Nigerian medical students.

The results largely align with similar literature on this population, with findings showing that the MSPSS has high internal consistency and factors which are a good fit for the study population [40–45].

Table 5 Factor loading for the MSPSS items

MSPSS Items	Friend	Significant Other	Family
There is a special person who is around when I am in need		0.874	
There is a special person with whom I can share my joys and sorrows		0.856	
My family really tries to help			0.864
I get emotional help and support I need from my family			0.841
I have a special person who is a real source of comfort to me		0.843	
My friends really try to help	0.810		
I can count on my friends when things go wrong	0.886		
I can talk about my problems with my family			0.718
I have friends with whom I can share my joys and sorrows	0.810		
There is a special person in my life who cares about my feelings		0.805	
My family is willing to help me make decisions			0.783
I can talk about my problems with my friends	0.855		

The MSPSS demonstrated excellent internal consistency with a Cronbach's alpha of 0.927 for the total scale. This indicates that the items in the scale have a good homogeneity. This finding aligns with those of previous validation studies, including those conducted in other African settings. For instance, a study among attendees of a postnatal clinic in Uganda reported a Cronbach's alpha of 0.83 [46], whereas a study conducted in Malawi evaluating relationship between social support, intimate partner violence and antenatal depression reported a similarly high internal consistency ($\alpha = 0.88$) [47]. Another validation conducted among adult stroke survivors in Northern Nigeria, reported a Cronbach's alpha of 0.78 [13]. The subscale reliability coefficients (Family: 0.892, Friends: 0.927, Significant Other: 0.927) were notably robust, exceeding those reported in some previous studies. For example, a lower but still acceptable subscale reliabilities ranging from 0.72 to 0.84 were reported in their systematic review of MSPSS validation studies in African settings [14]. The results also align with similar validation conducted among medical students in contexts other than Africa. A validation performed among Brazilian health students also reported high internal consistency (Cronbach's alpha = 0.96, 0.97, and 0.97, respectively) [15].

The three-factor structure of the MSPSS was strongly supported by our findings, with the factors cumulatively explaining 80.3% of the total variance. This is particularly impressive when compared to previous studies; for instance, a lower total variance explained (66%) in a Thai medical student sample [48]. The clear differentiation of the three factors - Family, Friends, and Significant Other - with high factor loadings (0.718–0.886) demonstrates the robust construct validity of the scale in our sample.

The Kaiser-Meyer-Olkin value of 0.906 not only exceeds the recommended threshold but also surpasses values reported in similar validation studies, such as the value of 0.84 reported in a Swedish validation study [49], 0.87 reported in a validation conducted among Turkish students [40] and 0.83 in another validation conducted in Malaysia [43]. This exceptional sampling adequacy strengthens the confidence in our factor analysis results as it confirms and its suitability for factor analysis.

The confirmatory factor analysis through SEM yielded impressive fit indices (CFI = 0.976, TLI = 0.966, RMSEA = 0.071, SRMR = 0.074) that meet or exceed conventional thresholds for good model fit. These results are comparable to, and in some cases better than, those reported in other cultural contexts. For example, our CFI value of 0.976 exceeds the 0.92 reported in a validation study among urban adolescents in the United States [12]. The results compare to that of a study among first year University students in the U.S. that reported a CFI of 0.97 and RMSEA of 0.07 [42].

The high levels of perceived social support reported by our sample, particularly from family (68.2% reporting high support), reflect the collectivist nature of Nigerian society. However, the relatively lower scores for significant other support (44.2% reporting high support) may reflect cultural differences in how relationships outside family and friendship circles are perceived and valued in the Nigerian context. This trend has also been reported in multiple studies [15, 43, 45]. This may be attributed to the perception of family and friends as a more acceptable support system than significant others among university students.

The validation of the MSPSS in this population has important implications for medical education in Nigeria. Given the documented stress levels among medical students [50] and the protective role of social support in academic settings, this validated tool can serve as a valuable resource for identifying students at risk of insufficient social support. The high reliability and clear factor structure suggest that the scale can be confidently used in student support services and research within medical education settings in Nigeria.

While our study has strong psychometric properties, several limitations should be noted. First, test-retest reliability was not assessed, which would have provided additional evidence of the scale's temporal stability. Future studies should incorporate longitudinal designs to address this gap. Second, while our sample size was adequate for factor analysis, larger multi-centre studies

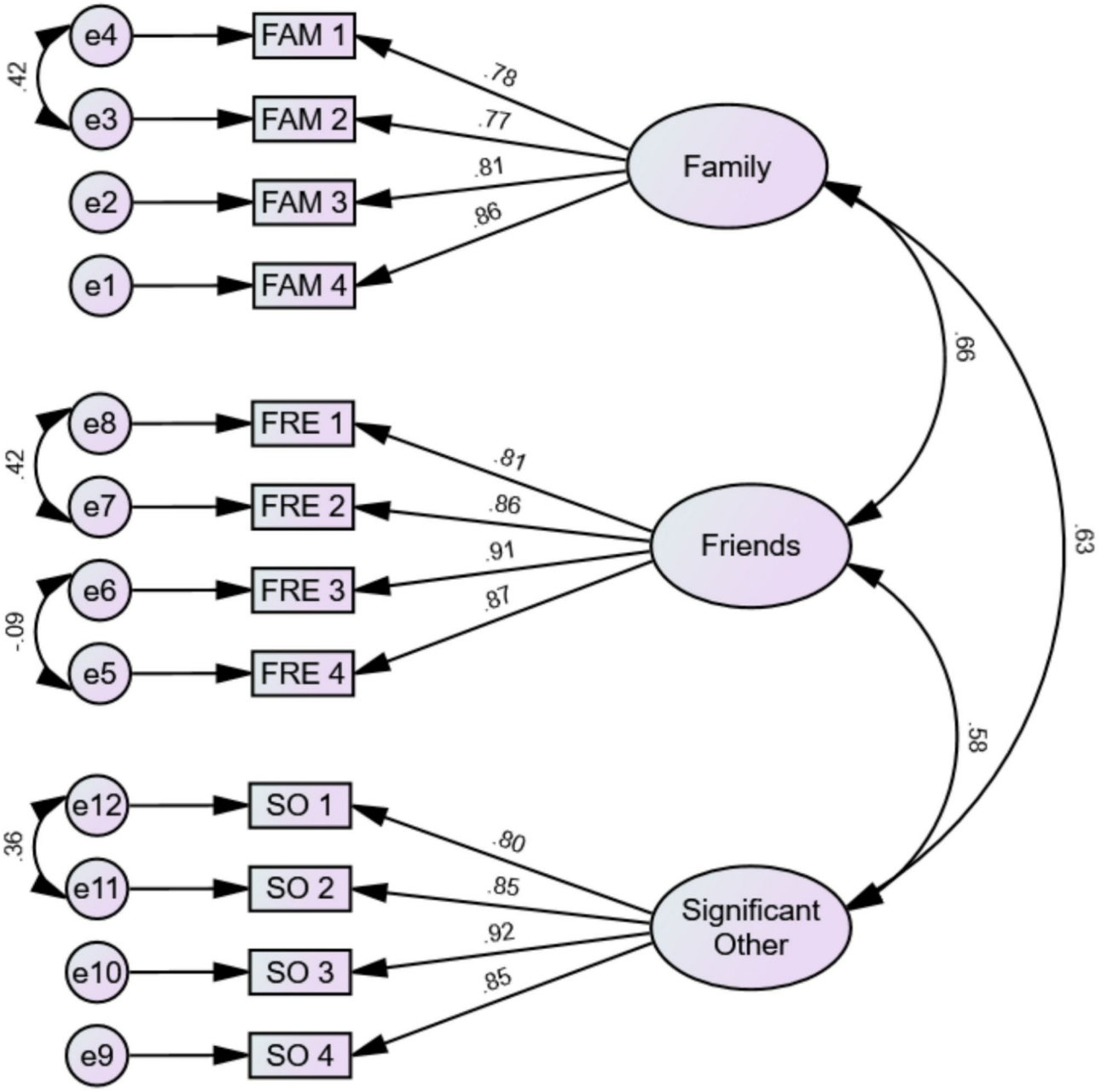

Fig. 2 SEM image of the MSPSS

across different Nigerian medical schools would enhance the generalisability of our findings.

Conclusion

The MSPSS is a robust instrument for assessing perceived social support among Nigerian medical students. This study confirms its excellent internal consistency, strong construct validity, and stable three-factor structure. These findings underscore the utility of the MSPSS in identifying at-risk students and informing pertinent interventions in medical education.

Author contributions
AAA conceptualised the study. AAA, DMA and TVA collected the data. AAA analysed the data. AAA, DMA, TVA and MIA wrote the manuscript. All the authors read and approved the manuscript.

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Data availability
This information will be made available upon request from the corresponding author.

Declarations

Human ethics and consent to participate

Ethical approval was obtained from the University of Ibadan / University College Hospital (UI/UCH) Ibadan Ethics Committee with ethical approval number 23/0726 in November 2023. Informed consent to participate was obtained from all participants prior to their inclusion in the study. This process adhered to ethical principles outlined in the Declaration of Helsinki.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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