e-ISSN 2795-3248
p-ISSN 2795-3222

www.gphjournal.org
SOCIAL SCIENCE AND HUMANITIES RESEARCH
Open Access
Global Publication House
International Journal

10.5281/zenodo.14769449 Vol. 08 Issue 01 January - 2025 Manuscript ID: #01732

Family stress scale

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Abstract

The daily activities of individuals are often filled with stressful events, from managing daily engagements to addressing survival needs. However, there is currently no established instrument that measures stress specifically within the family context, particularly considering the critical factors identified in existing literature that can trigger stress. This highlights the necessity of developing a new instrument to assess stressful events related to the family setting.

In the study, a total of 453 participants were involved, consisting of 293 females and 160 males, with ages ranging from 25 to 65 years. The mean age of the participants was 36.98 years, with a standard deviation of 10.27. The scale is a 19-item instrument that utilizes a 5-point Likert response format, where 1 represents "strongly disagree" and 5 indicates "strongly agree."The scale consists of four dimensions that assess various factors that can cause stress in individuals. In a reliability test conducted by the researchers, the Argument dimension had a Cronbach alpha of 0.915, the Family discord dimension with Cronbach alpha of 0.831, the Health problems dimension with Cronbach alpha of 0.858, the Difficulties outside the home dimension with Cronbach alpha of 0.706. Overall, the general Cronbach alpha for the scale was 0.946. The Confirmatory Factor Analysis (CFA) indicates that the instrument meets the necessary cut-off criteria for validation, while the assessment of convergent validity demonstrates that the different dimensions are interrelated. In conclusion, the instrument is valid for measuring what it is intended to measure.

How to cite: John Ufuoma, D., & Obiageli, O. (2025). Family stress scale. *GPH-International Journal of Social Science and Humanities Research*, 8(01), 152-166. https://doi.org/10.5281/zenodo.14769449

Introduction

Individuals experience stress in their day-to-day lives, which can stem from various sources such as the workplace (Muhammad & Abdul, 2024), academic pressure (Okika et al., 2024), family dynamics (Mendes-Sousa et al., 2023), marital issues (Rakhshani et al., 2024), or situational challenges (Ahmad et al., 2024). It's important to note that stress can be either positive (Eustress) or negative (distress) (Franks, 2023). Family stress which is a part of stress in particular, can lead to discord within the family, causing disharmony, bitterness, and cynicism. If left unchecked, these factors can contribute to a dysfunctional family (Lamoreux, 2022).

Family stress is characterised as stressors affecting one or more family members or the entire family unit at a specific time, exerting an impact on the emotional bonds among family members, their emotional states, overall well-being, and the sustenance of family relationships. (Randall, &Bodenmann, 2013). According to Brown (2022), family stress is best described as the overwhelming burden of stressors that surpass the coping capacity of family members. This can result from a series of interconnected and escalating stressful events or a single, extremely demanding circumstance.Family stress can be described as a disruption in the stable state of the family system, stemming from external factors such as war or unemployment, internal family events like death or divorce, or a combination of both (Boss, 2014). In any scenario, the equilibrium of the family system is jeopardized or disrupted. Consequently, family stress is also characterized as a shift in the family's equilibrium (Boss, 2014).This can cause change which can manifest in different form such as the birth of a baby, or unforeseen, as with winning a lottery. These changes can originate from within or outside the family. Family stress may manifest as conflicts, unmet obligations, and health issues (Brown, 2022).

The primary family-related factor that has garnered the attention of numerous researchers regarding family stress is the number of children, with the presence of very young children in the household being linked to family role strain (Lero, 1992; Anyaegbu et al., 2020). This suggests that younger children typically demand more attention from working parents, necessitating additional time for their care. Similarly, the increasing need to support aging parents or other elderly relatives has become a reality for many parents, leaving them with the responsibility of caring for both children and elderly family members (Duxbury & Higgins, 1998; Anyaegbu et al., 2020).Financial concerns are becoming a common reality for many families due to the rising cost of living in recent years and the lack of a corresponding increase in real family income. Financial difficulty can continue to be a source of stress for families as members struggle to provide for their families in the face of unstable economic conditions.

Furthermore, the scarcity of financial resources significantly limits individuals' ability to access legal, medical, financial, or other professional support in nearly any stressful situation (Lazarus & Folkman, 1984; Anyaegbu et al., 2020). While neighbours and the community serve as vital sources of social support, they can also contribute to the level of stressors within an individual's home environment. Neighbourhoods vary in the services they provide to individuals, including access to recreational, shopping, and entertainment facilities, as well as the availability of counselling services. Additionally, neighbourhoods vary in vocabulary of their orderliness, natural beauty, cleanliness, safety, transportation, and road conditions (Matteson &Ivanceviah, 1987; Anyaegbu et al., 2020).According to Brown (2022), among other factors, the following are recognized as potential sources of stress for parents within the family: child discipline, financial challenges, work-life balance, overloaded schedules, divorce or separation, serious illness (both physical and mental), death of a loved one, birth of a child, work-related stress, parenting responsibilities, and caregiving for another family member.

Family stress scale

The ability of a family and its members to cope with a stressful event or situation is influenced by both internal and external contexts, encompassing how the family perceives the stressor, the significance it holds for them, and their perceived capacity to address it (Boss, 2014). Given the malleability of the family's internal context, interventions often concentrate on aspects within the family's control. While the external context is considered, and family members' varying perceptions of external factors can be altered, substantial change is more likely to occur at the micro level, involving family structure, psychology, and philosophy. For instance, adapting to the absence of a loved one necessitates learning to embrace ambiguity, which can be challenging in cultures that prioritize certainty (Boss, 1999, 2006, 2011, 2014).The contextual model enables researchers and professionals to consider the extensive variations in internal and external influences on families, thereby facilitating the development of more credible and efficient interventions for stress, crises, and trauma, regardless of the nature or origin of the stressor.

Expanding on this idea, Burr and Klein (1994) suggest specific categories of family resources, including cognitive, emotional, community, and spiritual resources, as well as relationships and individual development. In Burr's ABC-X model (1982), the family's perception of the stressor is influenced by factors such as each family member's role within the family, relationships within the family, and each individual's contribution to the collective process of assigning meaning in response to a stressor. The power dynamics within families, which can be influenced by factors such as family roles and gender, make it difficult for individual members to fully participate in the family's process of making sense of things. This process involves figuring out who or what is responsible for the stress experienced by the family, whether it's something within the family or a change in the situation outside of it. Blaming a family member can lead to more conflict and resentment while blaming an external source can help the family to better deal with the stressor itself.

The ABC-X model developed by Burr and Klein (1994) serves as a theoretical framework for understanding family resources. This model identifies specific types of resources, including cognitive, emotional, community, and spiritual resources, as well as the importance of relationships and individual development. According to Burr (1982), a family’s perception of stressors is influenced by various factors. These include the positions of each family member within the family, the relationships among them, and each individual’s role in the collective process of meaning-making in response to stress. Power dynamics within families can complicate this process, as they may arise from factors such as family roles and gender.

The collective meaning-making process involves deciding where to assign blame for the stress experienced by the family. This blame may be directed toward either internal sources, such as family dynamics, or external sources, such as changes in the situational context.Assigning blame to an internal source, such as an individual family member, can result in heightened conflict and resentment within the family unit. Conversely, attributing the source of stress to external factors can facilitate a more constructive approach to addressing the stressor itself. The interaction between a family's available resources and their perceptions of a stressor plays a critical role in determining their susceptibility to and adaptability in response to stress. In this framework, Variable X denotes the degree of crisis that emerges from the interplay between the stressor and the family's resources and perceptions. For families equipped with adequate resources and constructive perceptions, a stressor may not precipitate a crisis. A crisis manifests when a family experiences a deficiency in resources and is unable to clearly define the stressor, leading to dysfunction, disorganization, or disruption.

According to Burr (1982), the nature and impact of crises on families can vary significantly, affecting essential functions such as the provision of material resources, emotional support, and effective

parenting and socialization of children. Additionally, a crisis may be conceptualized as a state in which families are immobilized by perceived stress and a lack of available resources (Boss, 1988).

Method

Participants

A total of 453 participants were involved in the study, comprising 293 females and 160 males. The participants' ages ranged from 25 to 65 years, with a mean age of 36.98 years and a standard deviation of 10.27. The samples were drawn from two distinct countries, Nigeria and the Philippines, utilizing online instruments for recruitment. All participants voluntarily consented to engage in the study.

Instrument

Family stress scale

The scale is a 19-item instrument that employs a 5-point Likert response format, ranging from 1 (strongly disagree) to 5 (strongly agree). It has been developed to assess the level of stress experienced by individuals within the family context. Furthermore, the scale takes into account various factors that may contribute to this stress and consists of four dimensions that evaluate different elements that can provoke stress among individuals.**Reliability:** Cronbach's Alpha should be above 0.6, ideally not exceeding 0.9 to avoid overly similar questions. Interpretations are: - > 0.9: Excellent, - > 0.8: Good, - > 0.7: Acceptable, - > 0.6: Questionable, - > 0.5: Poor, - < 0.5: Unacceptable (Datatab, 2024). In a reliability test carried out by the researchers, the Argument dimension had a Cronbach alpha of 0.915, theFamily discorddimension with Cronbach alpha of 0.831, the Health problems dimension with Cronbach alpha of 0.858, the Difficulties outside the home dimension with Cronbach alpha of 0.706, and a general Cronbach alpha of .946.

Data Analysis

To ensure the instrument's approval and applicability, the study must fulfil specific criteria. Crucial among these are the instrument's appropriateness for measuring the intended construct and the reliability of the utilized products. To assess the validity of the constructs and items employed, we conducted Exploratory Factor Analysis (EFA), calculated Cronbach’s Alpha for reliability, and performed Confirmatory Factor Analysis (CFA). A total of 453 respondents completed the validated questionnaire. Reliability tests, exploratory factor analysis (EFA), and Cronbach’s alpha tests were conducted using the Statistical Package for Social Sciences (SPSS) version 27.0. Additionally, confirmatory factor analysis (CFA) was performed with AMOS SPSS version 23. EFA is a technique within factor analysis aimed at identifying the underlying relationships between measured variables (Norris et al., 2009; Omeje et al., 2022). It is commonly used by researchers during scale development to identify a set of latent constructs underlying a range of measured variables (Omeje et al., 2022).Confirmatory factor analysis (CFA) is a specialized form of factor analysis used to test whether measurements of a construct align with a researcher’s understanding of that

construct. The primary objective of CFA is to determine if the data fit a proposed measurement model, which is based on theory and/or prior analytical research (Preedy& Watson, 2009; Omeje et al., 2022). In contrast, exploratory factor analysis should be used when the researcher does not have a prior hypothesis regarding the factors or patterns among the measured variables (Omeje et al., 2022).

Results

Exploratory Factor Analysis (EFA)

The exploratory factor analysis (EFA) identified four factors, comprising a total of nineteen items across these sub-constructs. The Kaiser-Meyer-Olkin (KMO) measure and Bartlett's Test are components of the EFA used to assess the factorability of the study items (Pallant, 2010; Omeje et al., 2022). The KMO measure confirms the sampling adequacy of the data, while Bartlett's Test evaluates the acceptability of the sampling method.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.838
Bartlett's Test of Sphericity	Approx. Chi-Square	591.476
	df	171
	Sig.	.000

The results from Bartlett's Test were significant, with a p-value of 0.000, and the KMO value was 0.838. This indicates a strong overlap among the variables, suggesting a significant presence of partial correlations (Analysis INN, 2020). Additionally, both the KMO test and Bartlett's Test showed that all ratios met the established criteria. This finding supports the development of dimensions for the 19-item factor analysis, which was conducted using Principal Component Analysis (PCA).

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	9.868	51.935	51.935	9.868	51.935	51.935	5.487	28.881	28.881
2	1.901	10.005	61.941	1.901	10.005	61.941	4.228	22.253	51.134
3	1.204	6.338	68.279	1.204	6.338	68.279	2.779	14.625	65.759
4	1.097	5.774	74.053	1.097	5.774	74.053	1.576	8.293	74.053
5	.873	4.596	78.648						
6	.735	3.867	82.515						
7	.589	3.098	85.612						
8	.499	2.626	88.239						
9	.437	2.300	90.539						
10	.372	1.957	92.496						
11	.296	1.557	94.053						
12	.261	1.374	95.427						
13	.241	1.268	96.696						
14	.174	.918	97.614						
15	.134	.704	98.318						
16	.121	.637	98.955						
17	.107	.562	99.517						

18	.056	.296	99.813						
19	.036	.187	100.000						

Extraction Method: Principal Component Analysis.

Through the Varimax Rotation Method, the analysis extracted four dominant factors, each with Eigenvalues greater than 1. These four components collectively explain 74.053% of the total variance. These extraction criteria align with the recommendations of Hair et al. (2010) (Omeje et al., 2022).

		Component			
S/N	Items	1	2	3	4
1	Experiencing increased conflict with spouse	.908			
2	Intense conflict with spouse	.880			
3	Spouse and Children becoming difficult to manage	.754			
4	Experiencing increased conflict with member(s) of the family	.634			
5	Significant decrease in family income	.619			
6	Undue interference from in-law(s)		.898		
7	Overwhelm by family responsibility		.758		
8	Financial bankruptcy		.599		
9	Incompatible goals/values		.543		
10	Being overburdened by extended family relation(s)		.509		
11	Death or illness of a loved one			.772	
12	Disruption of children's education by uncontrollable event(s)			.722	
13	Parenting/family responsibilities			.705	
14	Separated from loved ones/family due to work/duties			.619	
15	Difficulty balancing work/family responsibilities			.607	
16	Difficulty in developing new family/personal routine			.560	
17	stress at work				.847
18	visiting or hosting relatives				.744
19	Dealing with/attending to social obligations				.619

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 8 iterations.

The component matrix reveals that all the items examined exhibit a correlation coefficient between 0.5 and 0.9. This range suggests a significant relationship among the items, indicating that they are appropriately related to the underlying construct being measured. For example, item 10—"Being overburdened by extended family relations"—shows the lowest correlation at 0.509, indicating a modest association with the overall construct. In contrast, item 1—"Experiencing increased conflict with spouse"—displays a much stronger correlation at 0.908, reflecting a strong relationship to the construct. These findings suggest that the items included in the analysis are well correlated, as none of them fall below the established benchmark of 0.5. Therefore, we can conclude that the items function cohesively in capturing the dimensions of the phenomenon being studied (Hair et al., 2010; Omeje et al., 2022).

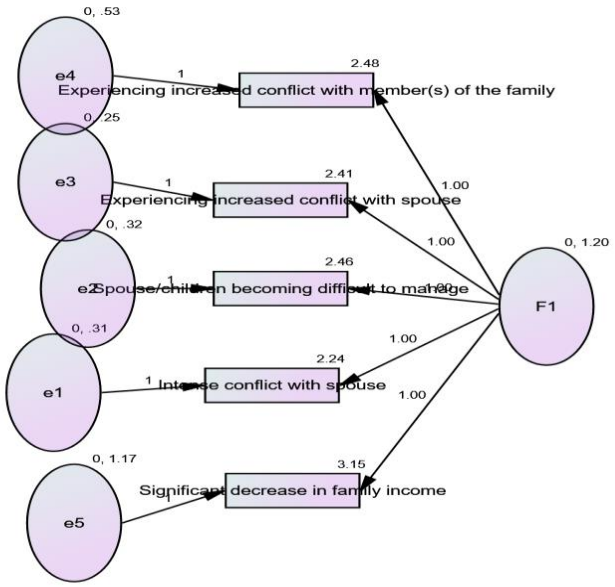
Confirmatory Factor Analysis (CFA)

Confirmatory factor analysis (CFA) is a statistical method used to analyse the validity of measurement models and test hypotheses about relationships between variables (Smeekes& Jetten, 2019).

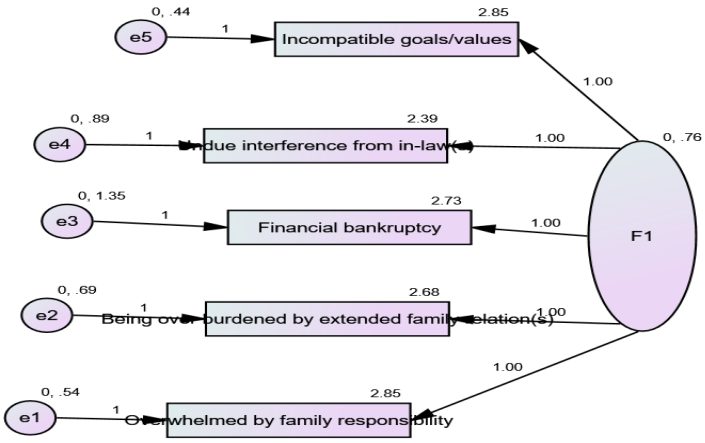
Key indices include:Chi-squared (Chisq): Assesses overall fit and the discrepancy between sample and fitted covariance matrices. A p-value > .05 indicates a good fit, but it's sensitive to sample size.Goodness of Fit Index (GFI) / Adjusted Goodness of Fit Index (AGFI): Reflects the proportion of variance accounted for by the estimated population covariance. Ideal values are > .95 for GFI and > .90 for AGFI (Byrne, 1994).Normed Fit Index (NFI) / Non-Normed Fit Index (NNFI) / Tucker Lewis Index (TLI): An NFI > .95 suggests improvement in fit, while NNFI is preferred for smaller samples; both should generally exceed > .90 (Byrne, 1994) or > .95 (Schumacker & Lomax, 2004).Comparative Fit Index (CFI): A revised NFI that is less sensitive to sample size; values should be > .96 (Hu & Bentler, 1999) or > .90 (Byrne, 1994).Relative Fit Index (RFI): Can vary outside of 0 to 1, with values close to 1 indicating a good fit.Incremental Fit Index (IFI): Adjusts NFI based on sample size and degrees of freedom, with values ideally over 0.90, but can exceed 1 (Bollen, 1989).Parsimony-Adjusted Measures Index (PNFI): No universally accepted cutoff, but values > 0.50 are preferable.Root Mean Square Error of Approximation (RMSEA): A parsimony-adjusted index where values closer to 0 indicate a good fit; should be < .08 (Awang, 2012) or < .05 (Byrne, 1994). The accompanying p-value tests the hypothesis for good fit and should be non-significant.Root Mean Square Residual (RMR) / Standardized Root Mean Square Residual (SRMR): Evaluates the difference between the sample covariance matrix and the hypothesized model. SRMR is preferred for interpretability, with ideal values < .08 (Byrne, 1994).

S/N	Dimension	RMSEA	CFI	PCLOSE	IFI	RFI	PNFI	TLI
	Threshold	.05<	.90>	.05>	.90>	.5>	.5>	.9>
1	Argument	.044	.995	.454	.995	.898	.563	.992
2	Family discord	.000	1.000	.560	1.007	.882	.804	1.007
3	Health problems	.000	1.000	.661	1.017	.875	.824	1.018
4	Difficulties outside the home	.000	1.000	.603	1.154	.783	.570	1.281

RMSEA: The Root Mean Square Error of Approximation. CFI: The Comparative Fit Index. RMR: the (Standardized) Root Mean Square Residual. IFI: the Incremental Fit Index (IFI). RFI: the Relative Fit Index. PNFI: the Parsimony-Adjusted Measures Index. TLI: The (Non) Normed Fit Index. GFI/AGFI: The (Adjusted) Goodness of Fit#

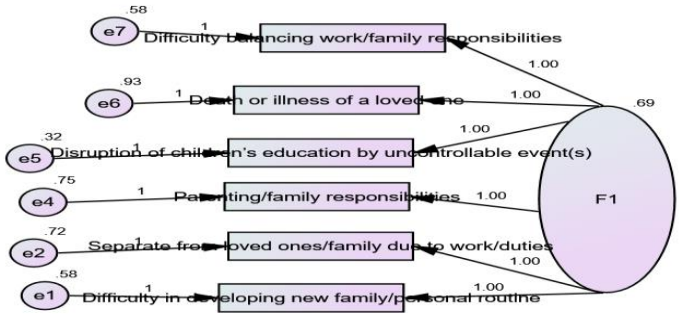


Chi-square = 9.710, Degrees of freedom = 9, Probability level = .374, CMIN/DF1.079

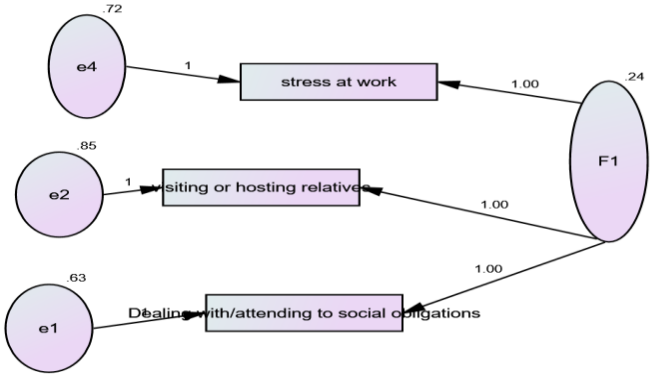


Chi-square = 8.535, Degrees of freedom = 9, Probability level = .481, CMIN/DF.948

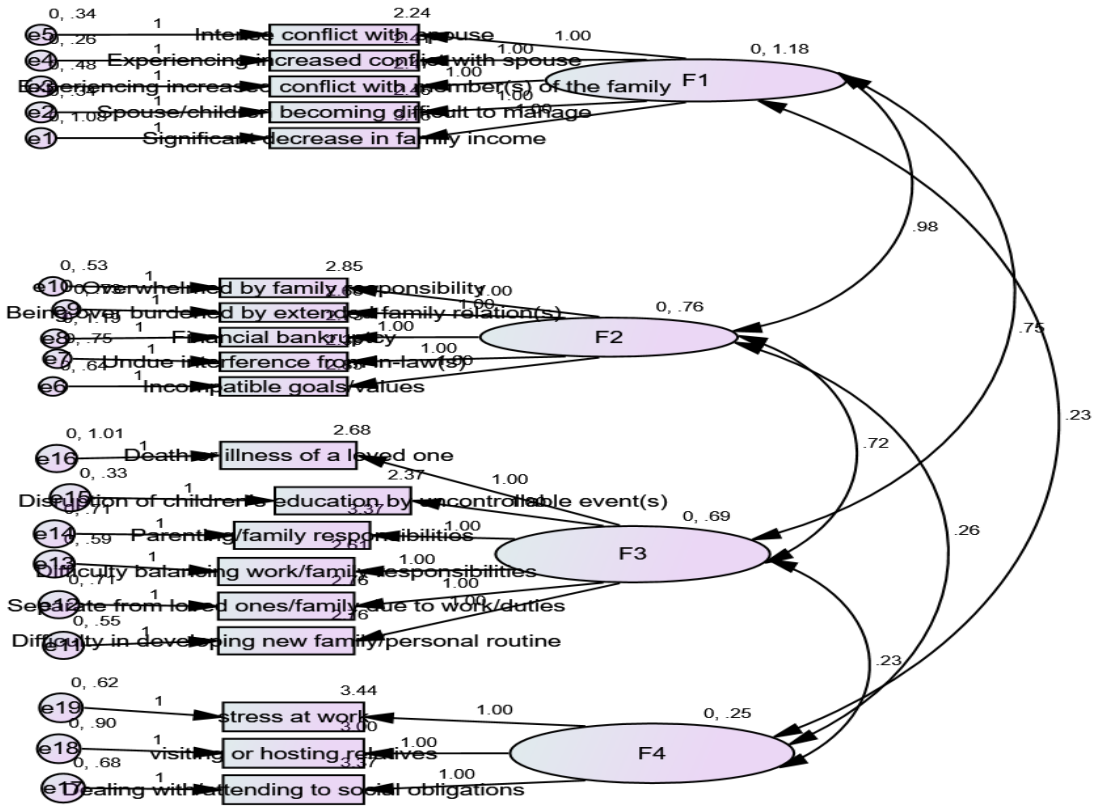
Family stress scale



Chi-square = 12.459, Degrees of freedom = 14, Probability level = .569, CMIN/DF= .890



Chi-square = 1.116, Degrees of freedom = 2, Probability level = .572, CMIN/DF= .558



Chi-square = 268.512, Degrees of freedom = 161, Probability level = .000

Construct Validity

Convergent validity and divergent validity are methods used to assess the construct validity of a measurement procedure, as outlined by Campbell and Fiske in 1959. The results obtained show that the Argument dimension has a strong convergent validity with the Family discord dimension, with a correlation coefficient of r = .943. The Health problems dimension shows a correlation of r = .726 with the Argument dimension. The Family discord dimension also converges with the Health problems dimension at r = .819 and with the Difficulties outside the home dimension at r = .344. Lastly, the Health problems dimension has a correlation of r = .324 with the Difficulties outside the home dimension.

Family stress scale

	Argument	Family discord	Health problems	Difficulties outside the home
Argument	1	.943**	.274	.792**
Family discord		1	.344*	.819**
Health problems			1	.324*
Difficulties outside the home				1

**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

Interpretation

	Argument dimension	Mean scores		
		Male	Female	General
1	Intense conflict with spouse	>11.68	>13.48	>12.63
2	Spouse and Children becoming difficult to manage			
3	Experiencing increased conflict with spouse			
4	Experiencing increased conflict with member(s) of the family			
5	Significant decrease in family income			

	Family discord	Mean scores		
		Male	Female	General
6	Incompatible goals/values	>12.05	>14.77	>13.51
7	Undue interference from in-law(s)			
8	Financial bankruptcy			
9	Being overburdened by extended family relation(s)			
10	Overwhelm by family responsibility			

	Health problems	Mean scores		
		Male	Female	General
		15.89	17.09	16.54
11	Difficulty in developing new family/personal routine			
12	Separated from loved ones/family due to work/duties			
13	Difficulty balancing work/family responsibilities			
14	Parenting/family responsibilities			
15	Disruption of children's education by uncontrollable event(s)			
16	Death or illness of a loved one			

	Difficulties outside the home	Mean scores		
		Male	Female	General
		9.63	9.95	9.80
17	Dealing with/attending to social obligations			
18	visiting or hosting relatives			
19	stress at work			

	Mean scores		
	Male	Female	General
Family stress	49.26	55.48	52.53

The aforementioned mean scores serve as the normative benchmark for interpreting the instrument. Participants exhibiting mean scores that exceed these specified dimensions indicate the presence of the associated attributes, while mean scores falling below these thresholds suggest an absence of the respective attributes.

Discussion

This scale was developed and validated to assess family stress. An Exploratory Factor Analysis (EFA) identified four distinct components associated with measuring family stress. The results of the Kaiser-Meyer-Olkin (KMO) test, which exceeded the threshold of 0.60, indicated adequate sampling adequacy and confirmed the appropriateness of conducting factor analysis. KMO values above 0.90 are considered excellent, values in the 0.80s are regarded as meritorious, those in the 0.70s as middling, in the 0.60s as mediocre, in the 0.50s as unsatisfactory, and values below 0.50 are deemed unacceptable (Hutcheson &Sofroniou, 1999; Hair et al., 2006; Revelle, 2016). Furthermore, the validity of factor analysis was reinforced by the outcomes of Bartlett's test of sphericity.

The scales demonstrated satisfactory Cronbach's alpha and composite reliability values, indicating that the internal consistencies met established criteria (Zachm, 2021). Additionally, the results of Confirmatory Factor Analysis (CFA), as outlined by Marsh et al. (2020), confirmed that the dimensions fulfilled the requisite standards.

In summary, the findings suggest that the family stress scale possesses structural validity, as evidenced by the robust factor analysis results. Consequently, this scale has the potential to serve as a reliable measurement tool in future research endeavours. The developed family stress scale exhibits adequate validity and reliability, with all constructs maintaining an acceptable level of internal consistency.

Ethical Consideration

The following are the ethical considerations that were avoided in this study: falsification andfabrication of data, faulty data, misleading authorship and plagiarism. In addition to this,the research used human subjects.The researcher also ensured that as part of ethical consideration,participants' consent was sought by including the consent form in front of the instrumentfor them to either accept or reject not to take part in the study.

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