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DEVELOPMENT AND PSYCHOMETRIC VALIDATION OF THE FORMAN IMPOSTOR SYNDROME SCALE (FISS)

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ABSTRACT

The study aimed to develop and psychometrically validate the Forman Impostor Syndrome Scale (FISS) among university-going young adults aged 18-29 years across Lahore, Punjab. As part of a mixed methods research design, the study was conducted in two phases. Phase one comprised item generation through two focus group discussions with the study sample and subject-matter experts, face validity evaluation, and pilot testing, resulting in an initial pool of 73 items. Phase two established the psychometric validation of the scale through content validity ratings by eight subject-matter experts, exploratory factor analysis (EFA), factor labeling, confirmatory factor analysis (CFA), internal consistency analysis, and construct validity assessment. The sample was divided into two parts. Sample 1, composed of N = 330 young adults, was used to explore the factor structure, resulting in a three-factor solution with 32 items. A separate sample of N = 160 participants was used for CFA and construct validity assessment through Pearson Product Moment Correlation. CFA further supported the three-factor structure of the FISS and provided additional evidence for its factorial validity and psychometric adequacy. The internal consistency of the scale was α = .95. Findings indicated very strong positive correlations between the total scores and factors of the Clance Impostor Phenomenon Scale (CIPS) and the FISS. Moreover, discriminant validity was established through strong negative correlations between the FISS and its subscales and the Rosenberg Self-Esteem Scale. The FISS offers a psychometrically sound measure for assessing impostor syndrome and supporting future academic research and practice.

Keywords: *impostor syndrome, impostor phenomenon, scale development, psychometric validation, Pakistan*

INTRODUCTION

Consistently high grades, academic recognition, and visible achievement do not always translate into a stable sense of self-assurance. In competitive academic settings, students often internalize an unspoken expectation to perform flawlessly, meet comparisons, and justify every success. These pressures can lead to persistent self-doubt, particularly when students begin to credit their accomplishments to influences beyond themselves such as luck, timing, or others' assistance. Even among those with top academic standing, fear of being exposed can quietly grow beneath the surface (El-Setouhy et al., 2024). The experience tends to intensify in contexts that value GPA, social comparison, and perfection, and is

especially common among students who experience added pressures due to gender-based expectations, socioeconomic disadvantage, or cultural norms. Over time, these internal conflicts may contribute to emotional exhaustion, anxiety, and diminished self-worth (Bravata et al., 2020; Diaconescu et al., 2024; Peteet et al., 2015).

The conceptual understanding of the impostor phenomenon has significantly evolved since its original formulation. Initially described by Clance and Imes (1978), the impostor phenomenon was viewed as an internal struggle particularly common among high-achieving women who, despite clear evidence of success, felt undeserving and feared being exposed as intellectual frauds. However, Harvey (1981) broadened this view and argued that impostor feelings are not confined to gender or status, but can arise in a wide range of individuals, especially in performance-driven contexts (Harvey & Katz, 1985). Later research reinforced this perspective and showed that tasks involving evaluation often intensify self-doubt, anxiety, and low self-esteem in individuals prone to impostorism (Chrisman et al., 1995; Cozzarelli & Major, 1990).

A significant shift in the conceptual landscape came with Kolligian and Sternberg's (1991) model of perceived fraudulence, which captured the multidimensional nature of impostorism. Their framework highlighted the roles of self-criticism, emotional distress, achievement pressure, and social impression management. Unlike early models that approached impostorism as a fixed trait, this approach framed it as a recurring self-perception shaped by identity regulation and social evaluation.

Leary et al. (2000) identified three core features of impostorism: the belief that one is a fraud, the fear of being exposed, and the inability to internalize success. Although consistent with earlier models, their contribution emphasized the persistent fear that others have overestimated one's abilities, a paradox that lies at the heart of the impostor experience. Their work demonstrated how impostor-related behaviors vary based on social context, for example, whether feedback is public or private, or whether the observer holds higher status (McElwee & Yurak, 2007, 2010).

Impostor syndrome is a common occurrence in academic settings where intellectual performance is both publicly visible and intensely evaluated. Many students and early-career professionals struggle with ongoing self-doubt and a sense of fraudulence and believe their success is unearned despite tangible evidence of achievement. Disciplines that place an emphasis on intellectual prowess or competitive performance tend to amplify these emotions and make even competent people feel inadequate. Whether it stems from academic orientation or persistent self-doubt, these factors often interact in a cyclical manner and undermine both achievement and self-esteem. This loop is frequently accompanied by maladaptive perfectionism and procrastination, as well as a tendency to underestimate one's own intelligence (Muradoglu et al., 2021).

Low self-esteem and self-doubt are strongly related to impostor syndrome, as they make it difficult for people to absorb their accomplishments. Persistent insecurity also fuels a chronic dread of failing (Siraj et al., 2024). Schubert and Bowker (2017) noted that people with low self-esteem are particularly susceptible to impostor feelings due to difficulty acknowledging accomplishments. Furthermore, self-esteem stability seems protective, as people with high but unstable self-esteem are more likely to have impostor thoughts than those with consistently stable self-esteem. Similarly, Ghorbanshirodi (2012) found that those who felt like impostors were more prone to attribute achievements to external forces, such as circumstance or luck.

Although research on impostor syndrome in Pakistan is still emerging, available studies have examined its prevalence and associated factors, particularly among medical and dental students. Amir et al. (2025), using the CIPS among postgraduate residents across four training hospitals, found that a sizable proportion experienced impostor syndrome, with women more likely than men to be affected; symptom intensity also varied by marital status, number of children, job hours, and other interests. Similarly, Mashhadi et al. (2022) reported that 62.65% of medical students in Lahore and Islamabad exhibited impostor syndrome, with significant

associations with gender, age, year of study, and academic performance. Maqsood et al. (2018) found severe impostor syndrome among 54.49% of students, while Khan and Khan (2021) reported frequent to intense impostor feelings among 52.1% of dental students at CMH Lahore.

Walker and Saklofske (2023) proposed a multidimensional framework and developed the 54-item Impostor Phenomenon Assessment (IPA). Wang et al. (2022) validated the CIPS-10, while Freeman et al. (2022) compared the CIPS and Leary Impostorism Scale and found high internal reliability. Şahin and Uslu Gülşen (2022) validated the Turkish CIPS, Yaffe (2020) validated a Hebrew version, and Dudău (2014) found that impostor syndrome in Romanian students was predicted by self-evaluative perfectionism and rumination. Variations in factor structures indicate that the construct may not operate identically across cultural and educational settings.

Theoretical Framework

Clance (1985) proposed that the impostor phenomenon is maintained through a recurrent pattern of thoughts, emotions, and behaviors referred to as the impostor cycle. She identified six core characteristics commonly observed in individuals with impostor traits: the impostor cycle itself, a need to be exceptional, superman or superwoman tendencies, fear of failure, denial of competence and discounting of praise, and fear and guilt associated with success. While not all individuals experiencing impostorism exhibit every trait, the presence of at least two is generally considered indicative of the phenomenon (Sakulku & Alexander, 2011).

The cycle typically begins when an individual is given an achievement-related task, such as academic or professional responsibility. This often triggers high levels of anxiety (Clance & Imes, 1978; Chrisman et al., 1995; Thompson et al., 2000). The anxiety leads to one of two behavioral responses: either over-preparation or procrastination followed by intense last-minute effort (Thompson et al., 2000). After the task is completed, a temporary sense of relief or minor satisfaction may follow. However, success is often attributed to external factors such as luck rather than personal ability. Those who over-prepare may credit their success to excessive effort, while procrastinators may believe they succeeded merely by chance (Casselman, 1991; Clance, 1985).

One of the most problematic behaviors in this cycle is overworking. Individuals often devote far more time and energy than necessary and believe any deviation from their high standards may lead to failure (Clance, 1985). Paradoxically, repeated success does not lessen impostor feelings but instead deepens the belief that success is not the result of true competence (Clance & Imes, 1978). High-achieving impostors also tend to measure themselves against unrealistic internal standards, and any deviation, however minor, reinforces feelings of inadequacy. Want and Kleitman (2006) found that these individuals frequently underestimate their abilities and offer harsh self-evaluations.

Clance (1985) also presented the Clance Impostor Phenomenon Scale (CIPS) as a psychometric instrument to evaluate the presence and severity of impostor traits. The CIPS has 20 self-report items rated on a 5-point Likert scale. Higher scores reflect greater intensity and prevalence of impostor experiences. The scale's reliability and factor structure have been examined in numerous validation studies. French et al. (2008) used confirmatory factor analysis to evaluate the scale's internal consistency and construct validity and provided evidence of adequate reliability.

Based on the foundational work of Clance and Imes (1978) and its operationalization through the CIPS (Clance, 1985), three core domains informed the present study: fear of failure, attribution of success to external factors, and difficulty internalizing success. Fear of failure represents a recurring dread of failing to meet expectations, receiving a negative evaluation, or being exposed despite prior accomplishment. Attribution of success to external factors reflects the tendency to explain achievements through luck, timing, excessive effort, or assistance from others rather than personal ability. Difficulty internalizing success describes the failure to accept recognition as authentic indications of one's abilities.

Rationale

Existing instruments, including the Clance Impostor Phenomenon Scale (Clance, 1985), Harvey Impostor Phenomenon Scale (Harvey, 1981), Perceived Fraudulence Scale (Kolligian & Sternberg, 1991), and Leary Impostorism Scale (Leary et al., 2000), were developed and validated primarily in Western contexts. Although these measures have demonstrated useful psychometric properties, variations in their factor structures and cultural applications suggest that they may not fully capture the sociocultural dynamics of non-Western populations. The present study developed the Forman Impostor Syndrome Scale (FISS), a culturally contextualized and psychometrically sound English-language measure grounded in Clance's multidimensional framework for assessing impostor syndrome among Pakistani university students across diverse academic disciplines and supporting future research on its psychological and academic correlates.

Objectives

- To develop the Forman Impostor Syndrome Scale (FISS) for assessing impostor syndrome
- To establish the psychometric properties of the Forman Impostor Syndrome Scale (FISS)

METHOD

The study included two phases: Phase I focused on FISS development, whereas Phase II involved its psychometric validation.

Phase I: Development of the Forman Impostor Syndrome Scale (FISS)

Phase I comprised item generation through focus groups, face-validity assessment, and pilot testing. It aimed to develop an item pool from focus-group transcripts and evaluate its preliminary psychometric properties.

Step I: Generation of the Item Pool

Focus groups allow researchers to explore how individuals think and feel about a specific issue through guided discussion in a permissive setting (Krueger & Casey, 2015). The original item pool was generated from two focus groups. One group included university students who experienced impostor syndrome, whereas the other included clinical psychology professionals. Participant responses were recorded as detailed transcripts and analyzed to generate statements for the item pool (Khan, 2008).

Purposive sampling was used to recruit focus group participants, as this nonprobability technique enables the selection of individuals likely to provide relevant information for the research objectives (Campbell et al., 2020). The first focus group included six students from Lahore, comprising three men and three women, with a 75% response rate. Participants were aged 18 to 29 years, enrolled in undergraduate or graduate university programmes, and had a CGPA of 3.0 or above. Students with diagnosed psychological conditions or enrolled in nondegree or certificate programmes were excluded. The age range reflected young adulthood and Ministry of Youth Affairs (2008) and UNDP National Human Development Report (2017; Arnett, 2000). Higher GPA has been associated with greater impostor feelings (El-Setouhy et al., 2024).

The second focus group included four women professionals working in Lahore, all with degrees in clinical psychology, and had a 100% response rate. Participants held at least a master's degree, had a minimum of two years of combined academic and clinical experience, and were actively working in the field. Both focus groups used a focus-group protocol, informed-consent form, and demographic sheet.

The first focus group used a 16-item semi-structured protocol comprising introductory, transition, key, and ending questions (Krueger & Casey, 2015). The student focus group was conducted in person, while the professional group was conducted online via Zoom using an 11-item protocol. Ethical considerations included informed consent, confidentiality, and the right to withdraw. Both sessions were moderated by the researcher, with a trainee clinical psychologist as co-moderator.

Transcripts were read repeatedly, relevant statements were highlighted and rephrased into scale items. The initial pool of 300 statements was reduced to 176 and then 123 items that met the

recommendation that an initial pool be at least twice the desired final scale length (Boateng et al., 2018). Items were organized according to the foundational work of Clance and Imes (1978) and the Clance Impostor Phenomenon Scale (Clance, 1985): fear of failure (26), attribution of success to external factors (26), and difficulty internalizing success (28). The remaining 43 culturally relevant items covered physical and emotional impact, maladaptive coping and safety behaviors, social comparison, cultural and religious attribution, and family and societal achievement pressure. A 5-point Likert scale was adapted from Clance (1985).

Step II: Establishing Face Validity

Face validity refers to whether a test appears appropriate, relevant, and aligned with its intended purpose (Allen et al., 2023). The 123-item pool was reviewed by five trainee clinical psychologists enrolled in a master's in clinical psychology program, under a professor's supervision. Convenience sampling was used because participants were selected based on availability and accessibility (Galloway, 2005). The group included one female professor, four female trainee clinical psychologists, and one male trainee clinical psychologist. Items were reviewed for relevance, clarity, redundancy, and necessity. The pool was reduced to 73 items after 50 were discarded due to irrelevance, redundancy, or lack of necessity.

Step III: Pilot Study

A pilot study was conducted to evaluate the 73-item pool and assess its preliminary psychometric properties. Pilot studies help identify potential problems in procedures, instruments, recruitment, and research design before the main study (Hassan et al., 2006). Item clarity, relevance, and item-total correlations were examined to improve the scale (Carpenter, 2017; Riaz, 2017). Purposive sampling was used to select 67 students, including men and women aged between 18 and 29 years from public and private universities in Lahore, with a mean age of $M = 23.1$ ($SD = \pm 2.39$). They were enrolled in undergraduate or graduate programs and were required to have a CGPA of 3.0 or above. Students with a diagnosed psychological condition or those enrolled in nondegree or certificate programs were excluded. The instruments included an informed-consent form, demographic sheet, and 73-item pool. Institutional permission and written informed consent were obtained, and participants were informed about confidentiality and their right to withdraw. Data from 67 completed forms were analyzed, yielding an 89% response rate. Internal consistency and total-item correlations were examined using IBM SPSS Statistics (Version 25). Six items were removed, reducing the pool to 67 items.

Phase II: Validation of the Forman Impostor Syndrome Scale (FISS)

Once the 67-item scale was developed, content validity was assessed through subject-matter experts. The factor structure was then explored through EFA, appropriate labels were assigned to the extracted factors, the resulting structure was examined through CFA, and internal consistency and construct validity were assessed.

Step I: Establishing Content Validity

Content validity refers to the extent to which a collection of items adequately represents the content domain of the construct (DeVellis, 2017). Subject-matter experts evaluated content validity using Lawshe's (1975) technique. Each expert categorized items as essential, useful but not essential, or not necessary. The content validity ratio was calculated as $CVR = (ne - N/2) \div (N/2)$, where ne is the number of experts rating an item as essential and N is the total number of experts. The sample comprised eight subject matter experts from Lahore, including six men and two women with academic and clinical experience in public and private universities. Participants held at least a master's degree in clinical psychology, had a minimum of two years of combined academic and clinical experience, and were actively working in the field. Subject matter experts assess item clarity, relevance, and representativeness of the theoretical construct (Haynes et al., 1995). Seven received materials in person and one by email. Items rated essential by more than 50% were

retained. Of 14 experts approached, eight participated, yielding a 57% response rate. Following CVR and pilot study results, 57 items were retained for the main study.

Step II: Exploratory Factor Analysis (EFA)

EFA was conducted to identify the underlying factor structure of the 57-item FISS. Factor analysis groups related variables into underlying dimensions and allows theoretical assumptions about psychological constructs to be examined empirically (DeVellis, 2017). Purposive sampling was used to select 330 students, exceeding the minimum recommendation of five participants per item (Carpenter, 2017). Participants were men and women aged 18 to 29 years from public and private universities in Lahore, with a mean age of *M* = 22.05 (*SD* = 2.25). They were enrolled in undergraduate or graduate programs and met the same inclusion and exclusion criteria as previous student samples.

The instruments included informed consent, a demographic sheet, and the 57-item pool. Institutional permission and written consent were obtained, and participants were informed about the study, confidentiality, and withdrawal rights. Data was entered and analyzed using IBM SPSS Statistics (Version 25). Principal Axis Factoring with Varimax rotation was used. Although 285 participants were required, 330 completed forms were analyzed, yielding a 94% response rate. EFA produced a three-factor solution comprising 17, 8, and 7 items, respectively. The 57-item pool was reduced to 32 items after 25 items were discarded.

Step III: Determining Appropriate Labels for Factors

The factors were named according to Clance's (1985) theoretical model, which outlines three core domains: fear of failure and exposure, attribution to external factors, and difficulty internalizing success. Following EFA, three distinct factors emerged. Factor labels were selected according to theoretical alignment and the conceptual themes represented by the items loading on each factor, consistent with Fabrigar and Wegener (2012).

Step IV: Confirmatory Factor Analysis (CFA)

CFA was conducted to confirm whether the three-factor structure identified through EFA adequately represented the observed data. CFA examines the correspondence between a hypothesized measurement model and the covariance structure of the data and provides evidence of factorial validity (Brown, 2015). A separate sample of 160 university students was used for CFA. Participants met the same inclusion and exclusion criteria used for the EFA sample, and the instrument was the 32-item FISS. The hypothesized three-factor model was tested using IBM SPSS Amos (Version 24.0). Items were specified to load on their respective factors. Model fit was evaluated through chi-square (χ^2), degrees of freedom (*df*), Normed Fit Index (NFI), Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA). Standardized factor loadings and relationships among the factors were also examined.

Step V: Exploring Internal Consistency

The internal consistency of the overall scale and its factors were examined. Cronbach's alpha is a measure of the extent to which a set of items assesses the same underlying construct (Field, 2009). Internal-consistency analysis was conducted using IBM SPSS Statistics (Version 25).

Step VI: Establishing Construct Validity

Construct validity refers to the extent to which a measure corresponds with theoretical expectations and behaves in relation to other established measures as expected (DeVellis, 2017). Convergent validity was evaluated using the Clance Impostor Phenomenon Scale, whereas discriminant validity was evaluated using the Rosenberg Self-Esteem Scale. Purposive sampling was used to recruit 160 student participants aged between 18 and 29 years from public and private universities. The participants' mean age was *M* = 22.14 (*SD* = ±1.78). Participants were enrolled in undergraduate or graduate programs and met the same inclusion and exclusion criteria applied in previous student samples.

The instruments included an informed-consent form, demographic sheet, the newly developed 32-

item FISS, the Clance Impostor Phenomenon Scale, and the Rosenberg Self-Esteem Scale. The CIPS (Clance, 1985) is a 20-item self-report measure designed to assess the intensity of impostor feelings, including fear of failure, discounting praise, and attributing success to external factors. The Rosenberg Self-Esteem Scale, developed by Rosenberg (1965), is a 10-item measure designed to assess global self-esteem and has demonstrated strong reliability and validity.

Formal institutional permission was obtained. Participants were informed about the study, confidentiality, and their right to withdraw, and written informed consent was obtained. Correlation analysis was conducted using IBM SPSS Statistics (Version 25) The FISS and its subscales demonstrated positive correlations with the total score and subscales of the CIPS. The Rosenberg Self-Esteem Scale demonstrated negative correlations with the total FISS score and its subscales.

Ethical Considerations

Ethical considerations were prioritized throughout the study. Approval was obtained from the Board of Advanced Studies and Research, Institutional Review Board, and Ethical Review Committee. Permission letters, approved by the department head, were obtained from relevant public and private institutions. The study followed the American Psychological Association's principles of informed consent, confidentiality, privacy, voluntary participation, and research integrity (American Psychological Association, 2017). Participants were informed about the study's purpose, confidentiality, and their right to withdraw at any time. Written informed consent was obtained in each phase. Participation was voluntary, no incentives were provided, recordings were securely stored, and data were anonymized before analysis.

RESULTS

A series of statistical analyses were conducted to examine the factor structure, internal consistency, and construct validity of the Forman Impostor Syndrome Scale (FISS). Construct validity was assessed through both convergent and discriminant validity procedures. All analyses were carried out using IBM SPSS Statistics (Version 25). The results are presented in two phases, as outlined below.

Phase I: Development of Forman Impostor Syndrome Scale (FISS)

The development of the FISS involved three key steps: generation of the initial item pool, evaluation of face validity by expert reviewers, and pilot testing of the preliminary scale.

Pilot Testing

The pilot version of the FISS consisted of 73 items and was administered to 67 participants. Internal consistency and corrected item-total correlations were examined to determine the preliminary reliability and item performance of the scale.

Internal Consistency. It was assessed to determine how well the items measured the same underlying construct.

Table 1

Cronbach's α values of FISS

Scale	*M*	*SD*	Range	Cronbach's α
Forman Impostor Syndrome Scale	3.0	1.6	73-365	.98

Note. *M*= mean, *SD*= standard deviation, *Cronbach's* α= Cronbach's alpha reliability coefficient.

The preliminary version of the FISS showed excellent internal consistency, with a Cronbach's α of .98. This indicated that the items were highly interrelated and measured the same underlying construct. A reliability coefficient above .90 is generally considered excellent (Kline, 2015).

Item Total Correlation. This step aimed to reduce the initial 73-item pool by calculating item-total correlations through reliability analysis to determine how well each item aligned with the total scale score.

Table 2

Item-Total Correlations for the 73 Items of FISS

Subscales	Item Number	Item-total Correlation (*r*)
Fear of Failure	1	.65**
	4	.51**
	7	.66**
	10	.70**
	13	.58**
	17	.67**
	21	.66**
	25	.71**
	29	.68**
	33	.73**
	37	.73**
	40	.74**
	43	.71**
	46	.69**
	49	.68**
	53	.66**
	56	.73**
	59	.70**
	61	.75**
	63	.68**
Attribution to External Factors		
	2	.66**
	5	.63**
	8	.68**
	11	.69**
	14	.64**
	18	.72**
	26	.66**
	30	.73**
	34	.67**
	38	.69**
	41	.60**
	44	.62**
	47	.75**
	50	.59**
	54	.55**
	55	.61**
Difficulty Internalizing Success		
	3	.59**

IEER
Institute for Excellence in Education & Research

	6	.55**
	12	.61**
	15	.59**
	19	.68**
	23	.77**
	27	.61**
	31	.70**
	35	.63**
	42	.67**
	45	.67**
	48	.62**
	51	.76**
Indigenous		
Items	16	.53**
	20	.77**
	24	.63**
	28	.67**
	32	.69**
	36	.59**
	52	.58**
	57	.55**
	58	.72**
	60	.73**
	64	.65**
	65	.56**
	66	.78**
	67	.51**
	68	.73**
	70	.74**
	71	.55**
	73	.61**

Note. $p<.01$**, r = correlation coefficient.

Items with corrected item-total correlations below .50 were removed, as they may not adequately reflect the underlying construct (Carpenter, 2017). Consequently, six items (22, 39, 62, 65, 69, and 72) were removed, reducing the item pool from 73 to 67 items for further analysis.

Phase II: Validation of the Forman Impostor Syndrome Scale (FISS)

The validation phase of FISS involved six key steps: establishing content validity using the Lawshe method and Content Validity Ratio (CVR), conducting Exploratory Factor Analysis (EFA), labeling the extracted factors, conducting Confirmatory Factor Analysis (CFA), evaluating internal consistency, and assessing construct validity through convergent and discriminant validity analyses.

Step I: Establishing Content Validity of the Scale

The content validity of the scale was established through expert evaluation using the Lawshe (1975) method. Eight subject matter experts independently reviewed 73 items and rated each as *essential*, *useful but not essential*, or *not necessary*. Items rated as *essential* by more than 50% of the experts were retained. Based on the computed Content Validity Ratios (CVRs), 10 items were removed from the initial pool.

Step II: Exploring the Factor Structure of the Scale

Prior to analysis, required assumptions were tested. The sample size (N = 285) was adequate, meeting the recommended ratio of 5 to 20 participants per item (Carpenter, 2017; DeVellis & Thorpe, 2021). Forms with more than 10% missing data were excluded. Data was entered into SPSS Version 25 and screened using frequency analysis to identify missing values and entry errors. No outliers were detected, and the data were normally distributed (Field, 2024).

Assumptions of Normality

Another assumption assessed was sampling adequacy using the Kaiser-Meyer-Olkin (KMO) measure. The KMO statistic determines whether the dataset is suitable for factor analysis by assessing the proportion of shared variance among items. Values above .60 are considered acceptable, whereas values above .80 are considered meritorious (Kaiser, 1974). In the present study, the KMO value indicated that the sample was adequate for conducting EFA on the Forman Impostor Syndrome Scale.

Kaiser-Meyer-Olkin (KMO)

The Kaiser-Meyer-Olkin (KMO) measure was used to assess the sampling adequacy for factor analysis, indicating whether the items were appropriate for extraction (Field, 2009).

Table 3

Factorability of FISS

KMO	.96	Excellent

Note. KMO = Kaiser-Meyer-Olkin. *N*= 330.

The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was .96, indicating an excellent level of shared variance among items and strong suitability for conducing exploratory factor analysis of Impostor syndrome (Kaiser, 1974).

Bartlett's Test of Sphericity

Bartlett's Test of Sphericity was used to determine whether the correlation matrix was significantly different from an identity matrix, indicating that the items were sufficiently correlated for factor analysis (Arsham & Lovric, 2011).

Table 4

Factorability of FISS by Bartlett's Test

Sphericity	5880.93 (df = 496)	p =.000***

Note. p= level of significance.

Bartlett's Test of Sphericity was statistically significant, χ^2 (496) = 5880.93, p < .001, indicating that the correlation matrix was not an identity matrix. This confirmed sufficient inter-item correlations to justify Exploratory Factor Analysis (EFA) for FISS.

Communality

Communality is a key indicator of the quality and appropriateness of items in Exploratory Factor Analysis (EFA). It reflects the proportion of each item's variance shared with the other items in the factor solution, with values ranging from 0 to 1. In the present study, communalities of .40 or greater were considered acceptable (Carpenter, 2017), although cutoff criteria may vary depending on overall item performance (Field, 2024).

Table 5

Communalities of the 57-Item FISS Derived from Exploratory Factor Analysis

Item number	h^2	Item number	h^2
FISS8	0.59	FISS39	0.58
FISS9	0.43	FISS40	0.48
FISS10	0.43	FISS41	0.40
FISS11	0.45	FISS43	0.42
FISS14	0.44	FISS44	0.54
FISS17	0.48	FISS45	0.63
FISS22	0.45	FISS46	0.40
FISS24	0.43	FISS49	0.40
FISS25	0.46	FISS50	0.53
FISS26	0.51	FISS52	0.54
FISS27	0.44	FISS53	0.51
FISS29	0.46	FISS54	0.57
FISS30	0.51	FISS55	0.60
FISS31	0.34	FISS56	0.50
FISS32	0.38	FISS57	0.43
FISS35	0.63		
FISS36	0.56		

Note. h^2 = communality, all communalities are greater than equal to .40.

All items met the assumption for factor analysis, with communalities above the acceptable threshold of .30. Values ranged from .34 (FISS31) to .63 (FISS35 and FISS45), indicating that each item shared sufficient variance with the underlying factors.

Rotations and Extractions

Different extraction and rotation methods were explored to identify the most suitable factor solution. Principal Component Analysis (PCA) and Principal Axis Factoring (PAF), together with orthogonal (Varimax) and oblique (Direct Oblimin) rotations, were compared. Principal Axis Factoring with Varimax rotation was selected because PAF focuses on shared variance among items and is appropriate for identifying underlying psychological constructs (Fabrigar et al., 1999; Costello & Osborne, 2005). Varimax rotation was selected because it produced a clearer factor structure with fewer cross-loadings than Direct Oblimin. As the inter-factor correlations were low to moderate, the use of an orthogonal rotation was also supported (Tabachnick & Fidell, 2019).

Factor Analysis

Factor analysis was used to identify the underlying structure of the Forman Impostor Syndrome Scale (FISS) and to group related items into meaningful factors.

Table 6

Results from Factor Analysis of FISS

	FISS Items	Factor Loadings		
Factor 1		1	2	3
FISS44	I feel afraid of failing when I take on something new, even though I usually do well.	**.66**		
FISS52	I feel ashamed when I make mistakes, as they prove my incompetence.	**.65**		
FISS55	I feel drained from constantly doubting myself.	**.64**		

FISS50	I fear that I will fail important tasks, even when I have prepared well.	**.62**		
FISS53	I hesitate to ask for help because I fear others will realize I am struggling.	**.60**		
FISS43	I find it hard to handle criticism, as it pushes me into self-doubt.	**.60**		
FISS56	I procrastinate because I think I might fail at a task.	**.60**		
FISS29	I avoid opportunities because I secretly fear I cannot handle them.	**.58**		
FISS46	I stay awake at night worrying that I might fail.	**.58**		
FISS22	I fear being exposed as unqualified when performing in front of others.	**.57**		
FISS24	I compare my effort with others.	**.57**		
FISS49	I compare myself to people online and feel I have not achieved enough.	**.56**		
FISS57	I seek reassurance from others because I doubt myself.	**.56**		
FISS40	I try to avoid being evaluated by others because I fear being judged.	**.55**		
FISS25	I feel like a complete failure if I do not perform exceptionally well.	**.54**		
FISS10	I feel pressured to succeed because failure would reveal my inadequacy.	**.49**		
FISS31	I find it hard to talk about my achievements with people.	**.42**		
Factor 2				
FISS36	I believe my success is more about timing than my own effort.		**.72**	
FISS45	I tend to credit my achievements to timing rather than my own abilities.		**.71**	
FISS35	I worry I attained my position by chance and that I will fail at it.		**.68**	
FISS54	I feel as if I do not deserve to be among accomplished people.		**.58**	
FISS26	I feel that my accomplishments are not truly deserved.		**.58**	
FISS32	I think I advanced in life due to connections, and not my qualifications.		**.57**	
FISS41	I feel my success is only because I had help.		**.55**	
FISS30	I feel my successes are largely due to circumstances outside my control.		**.54**	
Factor 3				
FISS8	I have trouble taking credit for my accomplishments.			**.67**
FISS9	I find it hard to accept compliments about my abilities.			**.56**
FISS39	I find it hard to believe in myself even when others praise my work.			**.54**
FISS17	I downplay my success by thinking anyone could have done the same.			**.52**
FISS11	I feel others overestimate my abilities when I succeed.			**.52**
FISS14	I think people are just being nice when they give me good feedback.			**.51**
FISS27	I find it hard to celebrate my achievements as I feel I could have done more.			**.51**

Note. N = 330. Factor loadings above .40 are in bold.

Factor loadings were derived using Principal Axis Factoring with Varimax rotation. All retained items demonstrated loadings above .40, indicating meaningful associations with their respective factors. Seventeen items loaded on Factor 1, eight on Factor 2, and seven on Factor 3. Based on the conceptual content and item groupings, the factors were assigned thematically appropriate labels representing distinct dimensions of impostor syndrome.

Eigen Criteria

Eigen values were computed using SPSS version 25. Eigenvalues reflect the total variance explained

by each factor. They are generally expected to be greater than zero. They represent the contingency matrix of the sum of squared loadings across variables accounted for by each factor (Field, 2018).

Table 7

Eigen Values and Variance Explained by Factors of FISS

Factors	Eigen Values	% of Variance	Cumulative Percentage
1	13.87	43.37	43.37
2	1.98	6.18	49.55
3	1.32	4.12	53.68

Note. N = 330, Final 32 item scale.

Based on the eigenvalue ≥ 1 criterion, three factors were extracted from the Forman Impostor Syndrome Scale (FISS). Factor I had an eigenvalue of 13.87 and explained 43.37% of the total variance. Factor II (eigenvalue = 1.98) explained an additional 6.18% of the variance, whereas Factor III (eigenvalue = 1.32) explained 4.12%. Collectively, the three factors explained 53.68% of the total variance that supported a stable and interpretable factor structure.

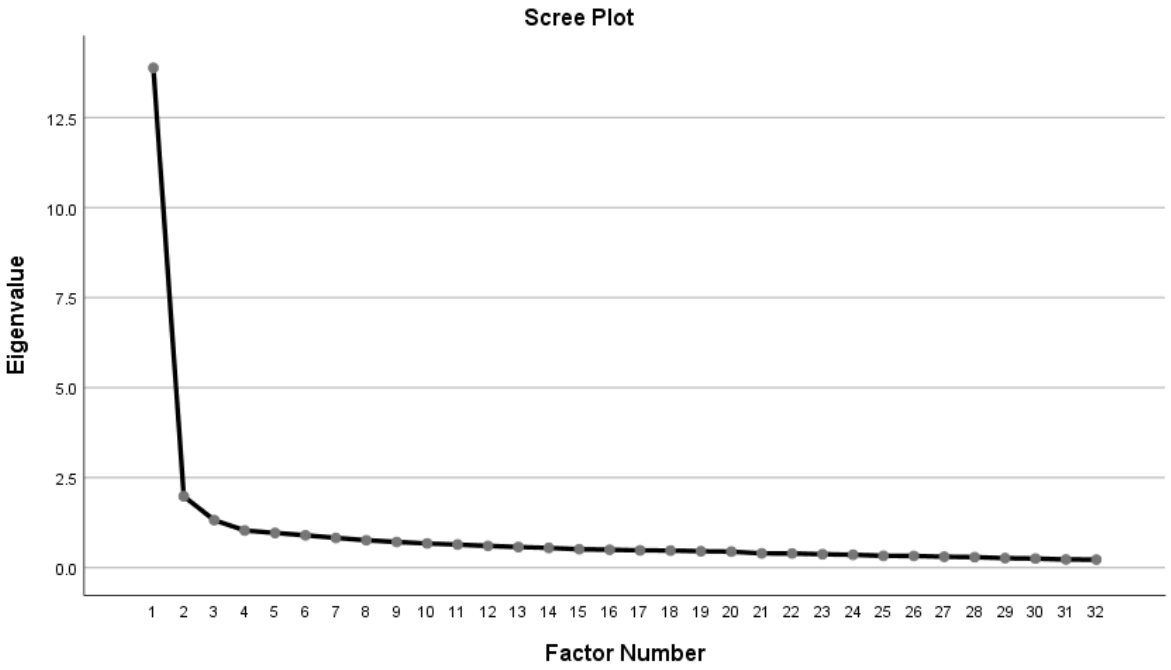


Figure 1 Scree-Plot of Factors of FISS

The scree plot displayed the eigenvalues associated with each extracted factor. A clear inflection point (elbow) after the third factor supported the retention of a three-factor solution based on both visual inspection and the eigenvalue ≥ 1 criterion.

Step III: Determining Appropriate Label for each Factor

As 32 items were retained, the extracted factors were labeled as Fear of Inadequacy and Exposure (17 items), External Attribution of Success (8 items), and Difficulty Internalizing Achievements

(7 items). Further details of these factors are provided below.

Factor I: Fear of Inadequacy and Exposure

The first factor was labeled Fear of Inadequacy and Exposure. This label was based on items reflecting fear of failure, feeling incompetent, mental exhaustion from ongoing self-doubt, anxiety about being exposed as unqualified, self-comparison, avoidance of tasks due to fear of failure, and worry about being judged by others. These themes closely matched Clance's (1985) domain of fear of failure and being found out.

Factor II: External Attribution of Success

The second factor was labeled External Attribution of Success, reflecting the tendency to attribute accomplishments to luck, timing, or other external circumstances. Items loading on this factor revealed self-doubt in one's ability and the belief that success was not due to personal competence. This factor corresponded with Clance's (1985) domain describing how individuals experiencing impostorism dismiss success as unrelated to their actual efforts.

Factor III: Difficulty Internalizing Achievements

The third factor was labeled Difficulty Internalizing Achievements, representing a tendency to reject praise, minimize success, and feel undeserving despite external validation. The items reflected discomfort with acknowledgment and an inability to emotionally accept personal accomplishments. This dimension reflected Clance's (1985) third domain, which highlighted the impostor's resistance to integrating success into self-identity. The label was selected to remain faithful to this conceptual foundation while ensuring distinctiveness and relevance (Fabrigar & Wegener, 2012).

Inter Scale Correlation of FISS

Inter-scale correlation was conducted to examine how closely the subscales of FISS were related to each other and to the total score

Table 8

Inter Scale Correlation of FISS

Variables	1	2	3
FIA	-		
EAS	.68**	-	
DIA	.75**	.69**	-
Full Scale	.95**	.84**	.87**

Note. **p< .01. FIA = Fear of Inadequacy and Exposure, EAS = External Attribution of Success, DIA = Difficulty Internalizing Achievements.

The inter-scale correlation analysis revealed strong and significant positive relationships among the three domains of FISS, supporting its multidimensional yet interrelated nature. Fear of Inadequacy and Exposure (FIA) showed the highest correlation with Difficulty Internalizing Achievements (DIA; r = .75, p < .01), indicating that individuals who fear being exposed as incompetent are also more likely to struggle with accepting their accomplishments. External Attribution of Success (EAS) was also strongly correlated with FIA (r = .68) and DIA (r = .69), suggesting that attributing success to external factors is closely associated with self-doubt and difficulty internalizing achievements. All subscales demonstrated strong correlations with the total FISS score (r = .84-.95), indicating that each domain meaningfully contributed to the overall experience of impostorism.

Step IV: Confirmatory Factor Analysis (CFA)

A confirmatory factor analysis (CFA) was conducted using AMOS 24.0 to evaluate the proposed three-factor structure of FISS. The model included the latent constructs of Fear of Inadequacy and Exposure, External Attribution of

Success, and Difficulty Internalizing Achievement, represented by their observed indicators.

Table 9

Confirmatory Factor analysis of FISS

Model	χ^2	*df*	NFI	CFI	RMSEA
Model Fit	696.16***	453	.83	.93	.05

Note. χ^2= Chi-square; *df*= Degree of Freedom; NFI= Normed Fit Index; CFI= Comparative Fit Index; RMSEA= Root Mean Square Error of Approximation.

The results indicated generally acceptable model fit, χ^2 (453) = 696.16, $p < .001$, NFI = .83, CFI = .93, and RMSEA = .05. CFI exceeded the .90 criterion, and RMSEA indicated close fit. Although NFI was below .90, it may underestimate fit in smaller samples compared with later indices such as CFI (Bentler, 1990). FISS items reflected related manifestations of the same construct, and similarity in item meaning may produce shared residual variance (Bandalos, 2021). Thus, NFI was interpreted alongside CFI and RMSEA, consistent with recommendations to evaluate fit indices collectively (Goretzko et al., 2024). Overall, findings supported the proposed three factor structure of the FISS.

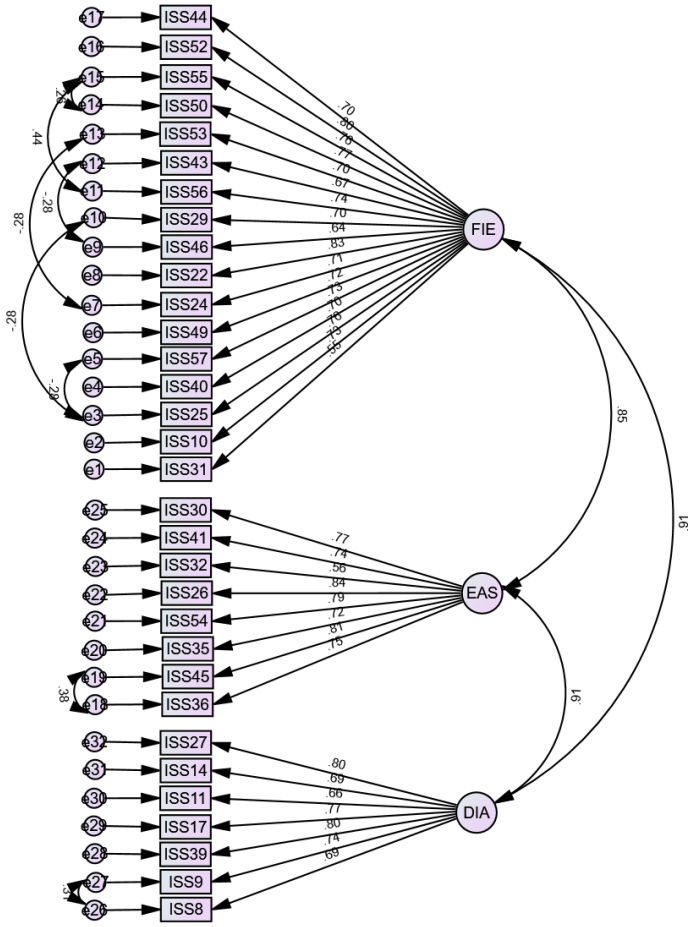


Figure 2 Confirmatory factor analysis of FISS

Step V: Exploring the Internal Consistency of FISS

This step aimed to assess the internal consistency of the 32-item FISS and its three emerging factors using reliability analysis.

Table 10

Cronbach's α values of the scales and subscales used in the present study

Scale/Subscales	M	SD	Range	Cronbach's α
Forman Impostor Syndrome Scale	2.72	.06	32-160	.95
Factor 1	2.82	.011	17-85	.93
Factor 2	2.36	.018	8-40	.89
Factor 3	2.80	.013	7-35	.86

Note. M= mean, *SD*= standard deviation, *Cronbach's α*= Cronbach's alpha reliability coefficient.

The Forman Impostor Syndrome Scale (FISS) demonstrated excellent internal consistency reliability, with Cronbach's alpha of .95. This indicates that the items are highly interrelated and measure the same underlying construct. A reliability coefficient above .90 is generally considered excellent (Kline, 2015).

Step VI: Establishing the Construct Validity of the Scale

This step aimed to establish the construct validity of the scale, which included both convergent and discriminant validity. For convergent validity, the Clance Impostor Phenomenon Scale (Clance, 1985) was used, as it measures similar traits related to Impostor feelings. To assess discriminant validity, the Rosenberg Self-Esteem Scale (Rosenberg, 1965) was used, since it measures a different construct and helped examine whether the new scale was distinct from self-esteem.

Table 11

Correlation between the Forman Impostor Syndrome Scale (FISS) and the Clance Impostor Phenomenon Scale

Variables	FOS	AEF	DIS	CIPS	FIA	EAS	DIA	FISS
FOS	-							
AEF	.80**	-						
DIS	.87**	.74**	-					
CIPS	.95**	.84**	.87**	-				
FIA	.90**	.76**	.82**	.89**	-			
EAS	.73**	.83**	.66**	.78**	.77**	-		
DIA	.79**	.77**	.79**	.84**	.82**	.79**	-	
FISS	.89**	.83**	.83**	.91**	.96**	.89**	.91**	-

Note. **p< .01. FOS = Fear of Failure and Exposure, AEF = Attribution to External Factors, DIS = Difficulty Internalizing Success, CIPS = Clance Impostor Phenomenon Scale, FIA = Fear of Inadequacy and Exposure, EAS = External Attribution of Success, DIA = Difficulty Internalizing Achievements, FISS= Forman Impostor Syndrome Scale.

All correlations were statistically significant at $p < .01$ and ranged from strong to very strong. The total FISS score showed a very strong positive correlation with the CIPS ($r = .91$), indicating close alignment with impostor experiences measured by an established scale. Among subscales, Fear of Inadequacy and Exposure showed the strongest correlation with the CIPS ($r = .89$), followed by Difficulty Internalizing Achievements ($r = .84$) and External Attribution of Success ($r = .78$). Parallel dimensions from the initial item pool also correlated strongly with final subscales: Fear of

Failure and Exposure with Fear of Inadequacy and Exposure (*r* = .90), Attribution to External Factors with External Attribution of Success (*r* = .77), and Difficulty Internalizing Success with Difficulty Internalizing Achievements (*r* = .79).

Table 12

Correlation between the Forman Impostor Syndrome Scale (FISS) and the Rosenberg Self Esteem Scale

Variables	RSE	FIA	EAS	DIA	FISS
RSE	-				
FIA	-.66**	-			
EAS	-.54**	.77**	-		
DIA	-.57**	.82**	.79**	-	
FISS	-.65**	.96**	.89**	.91**	-

Note. **$p < .01$. RSE = Rosenberg Self-Esteem Scale, FIA = Fear of Inadequacy and Exposure, EAS = External Attribution of Success, DIA = Difficulty Internalizing Achievements, FISS= Forman Impostor Syndrome Scale.

All correlations between RSE and the FISS (including its subscales) were significantly negative at the $p < .01$ level, supporting the discriminant validity of the FISS. The total FISS score showed a strong negative correlation with RSE ($r = -.65$, $p < .01$), indicating that higher levels of impostor syndrome were associated with lower self-esteem. Among the subscales, Fear of Inadequacy and Exposure had the strongest negative relationship with RSE ($r = -.66$, $p < .01$), which was also a strong negative correlation. This was followed by Difficulty Internalizing Achievements ($r = -.57$, $p < .01$) and External Attribution of Success ($r = -.54$, $p < .01$), both of which were moderate negative correlations according to the classification by (Meghanathan, 2016). These results suggested that individuals who reported higher impostor-related experiences tended to have lower self-esteem and supported the theoretical distinction between impostorism and global self-worth.

DISCUSSION

The present study was conducted to develop and validate a culturally relevant and psychometrically sound measure of impostor syndrome. Although the tool was developed in English, it was grounded in the local academic and psychological context to ensure its relevance for the population being assessed. Existing scales, including the Clance Impostor Phenomenon Scale (CIPS; Clance, 1985), Harvey Impostor Phenomenon Scale (Harvey, 1981), Perceived Fraudulence Scale (Kolligian & Sternberg, 1991), and Leary Impostor Scale (Leary et al., 2000), have been widely used globally. However, these tools were developed in western contexts and may not fully account for the sociocultural dynamics, academic pressures, and interpersonal patterns experienced by South Asian students. Therefore, the present study used a mixed-method approach to develop a scale that retained strong theoretical foundations while reflecting the academic realities and psychological experiences of Pakistani students.

Clance's (1985) theoretical framework guided the scale's development, as it views impostor syndrome as a multifaceted construct involving fear of failure and exposure, attribution of success to external factors, and difficulty internalizing achievements. The findings supported this framework, as Exploratory Factor Analysis (EFA) revealed three distinct yet interrelated factors: Fear of Inadequacy and Exposure, External Attribution of Success, and Difficulty Internalizing Achievements. These domains reflected the central features of impostorism and remained consistent with the broader literature, which identifies self-doubt, fear of being exposed, discounting success, and external attribution as key components of the Impostor experience (Bravata et al., 2020; Sakulku & Alexander, 2011). By integrating Clance's framework with qualitative data from local focus groups, the study ensured

both conceptual clarity and contextual relevance in the final scale design.

In the initial phase, focus groups were conducted to ensure that item generation reflected both lived experiences of impostorism and professional understanding of the construct. Including university students and clinical psychology professionals offered two important perspectives. Students described real-life experiences of self-doubt, academic pressure, comparison, and fear of exposure, while professionals contributed observations from academic and clinical contexts. Such qualitative input is important in early scale development because it helps generate items that are meaningful, understandable, and relevant to the target population (DeVellis & Thorpe, 2021; Willis, 2015). Face validity, pilot testing, and content validity further refined the item pool. Six items were removed during pilot testing due to low item-total correlations, while 10 items were removed through expert review using the Lawshe (1975) method. These steps improved the clarity, relevance, and representativeness of the scale before factor analysis.

Exploratory Factor Analysis produced a three-factor structure consisting of 32 items. Principal Axis Factoring with Varimax rotation was selected because it focused on shared variance among items and produced the clearest factor structure. This approach was consistent with recommendations for identifying latent psychological constructs during scale development (Costello & Osborne, 2005; Fabrigar et al., 1999). The three factors explained 53.68% of the total variance, indicating a stable and interpretable structure. The first factor, Fear of Inadequacy and Exposure, captured fear of failure, fear of judgment, self-comparison, emotional exhaustion, avoidance, and anxiety about being exposed as unqualified. The second factor, External Attribution of Success, represented the tendency to explain achievements through luck, timing, help, or external circumstances rather than personal competence. The third factor, Difficulty Internalizing Achievements, reflected discomfort with praise, minimization of success, and inability to emotionally accept accomplishments. Together, these factors supported the view that impostor syndrome is not a single uniform experience, but a combination of cognitive, emotional, and attributional patterns. The inter-scale correlations among the FISS subscales further supported the multidimensional yet related nature of the construct. All three factors were significantly and positively correlated with one another and with the total FISS score. This pattern showed that each factor represented a distinct aspect of impostorism while also contributing meaningfully to the overall construct. A strong relationship among factors was expected because the dimensions reflect closely connected manifestations of the same psychological experience.

Confirmatory Factor Analysis (CFA) provided additional support for the proposed three-factor model. The model showed generally acceptable fit, with CFI and RMSEA values supporting the adequacy of the structure. Although the NFI value was below the conventional .90 criterion, NFI may be influenced by sample size and model characteristics and should be interpreted alongside other fit indices rather than in isolation (Bentler, 1990; Goretzko et al., 2024). In addition, several FISS items represented closely related manifestations of impostor syndrome, and similarity in item meaning may contribute to shared residual variance among items (Bandalos, 2021). Therefore, the overall pattern of CFA results supported the proposed three-factor structure, while also suggesting that some item-level overlap may be expected in a scale measuring closely related dimensions of the same syndrome.

The final FISS demonstrated excellent internal consistency. The total scale α was .95, and the three subscales also showed strong reliability. These findings indicated that the items were statistically coherent and conceptually aligned. High internal consistency is important in early validation studies because it confirms that retained items work together to measure the intended construct (Tavakol & Dennick, 2011). Unlike some earlier impostor measures that reported high reliability but inconsistent factor structures, the FISS demonstrated both strong reliability and a clear multidimensional structure.

Construct validity was supported through convergent and discriminant validity analyses. The

total FISS score and its subscales showed strong positive correlations with the CIPS, indicating that the FISS measured the same core construct of impostorism while offering a more contextually grounded and multidimensional structure. Discriminant validity was supported through significant negative correlations with the Rosenberg Self-Esteem Scale. This pattern was theoretically expected because impostorism involves self-doubt, but it is not identical to self-esteem. Self-esteem reflects general self-worth, whereas impostorism includes a more specific pattern of discounting ability, fearing exposure, and attributing success to external causes (Bravata et al., 2020; Orth & Robins, 2014). Therefore, the findings supported the expected relationship between the constructs while showing that the FISS captured a distinct psychological experience.

Implications of the Study

The study contributes a multidimensional, locally developed instrument for assessing impostor syndrome among Pakistani students. The FISS enables researchers to assess both overall impostor feelings and their specific dimensions: Fear of Inadequacy and Exposure, External Attribution of Success, and Difficulty Internalizing Achievements. This may support a more nuanced understanding of the aspects of impostor experiences most prominent in academic settings. In practice, the FISS may assist counselors, academic advisers, and mental health professionals in identifying students who may be experiencing impostor related distress and in planning targeted support. Its multidimensional structure may also inform interventions addressing specific concerns, such as fear of exposure or difficulty recognizing personal achievements.

Limitations and Recommendations

The sample mainly comprised university students, and individuals with diagnosed psychological conditions were excluded to reduce symptom overlap with anxiety and depression. This may limit the generalizability of the FISS to clinical and broader community populations. Future studies should examine how impostor feelings interact with psychological diagnoses and other mental health concerns. Although CFA was conducted, the three-factor structure should be cross-validated using larger and more diverse samples. Finally, although the FISS was developed in English and was suitable for the academic sample in this study, future research may translate and validate it in Urdu to improve accessibility across diverse linguistic groups.

Conclusion

The present study developed and psychometrically validated the Forman Impostor Syndrome Scale (FISS), a multidimensional measure grounded in theory and tailored to Pakistani university students. The FISS demonstrated satisfactory psychometric properties, including internal consistency, convergent and discriminant validity, and support for a three-factor structure comprising Fear of Inadequacy and Exposure, External Attribution of Success, and Difficulty Internalizing Achievements. By assessing both overall impostor experiences and their distinct dimensions, the scale provides a nuanced understanding of impostor feelings in academic settings. Although further cross-validation with larger, more diverse, and clinical samples is needed, the FISS offers a useful tool for future research and student-support practice in Pakistan.

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