



Original Research Article

Development and Psychometric Validation of a Multidimensional Mental Health Screening Scale for Adults in an Indian Community Sample.

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Abstract: *Background:* Psychological distress in adults frequently remains undetected until it progresses to clinically significant mental illness. Efficient screening instruments capable of identifying early psychological burden are essential for improving access to mental health support. *Objective:* To develop and psychometrically validate a multidimensional screening instrument assessing psychosocial risk indicators, psychological symptoms, and functional impairment among adults aged 18–60 years. *Methods:* Scale development followed a multiphasic psychometric design comprising item generation, pilot testing (n = 50), test-retest reliability assessment (n = 50), and cross-sectional validation in 1,005 adults. Participants included non-clinical adults (n = 503), hospital attendants (n = 201), and psychiatric patients (n = 301). The developed scales — Risk, Symptom, and Level of Functioning (LOF) — were evaluated against the 12-item General Health Questionnaire (GHQ-12) and WHO-derived functioning measures. Psychometric evaluation included reliability analysis, concurrent validity testing, receiver operating characteristic (ROC) analysis, and group comparisons. *Results:* The scales demonstrated acceptable to excellent reliability (Cronbach's α = 0.78–0.91; ICC = 0.79–0.84). Significant correlations with the GHQ and WHO functioning measures supported concurrent validity. Mean scores increased progressively from non-clinical adults to attendants and psychiatric patients, indicating strong discriminant validity. ROC analysis showed good screening performance, with the Symptom scale demonstrating the highest accuracy (AUC = 0.91). Moderate-to-severe psychological burden was substantially higher among psychiatric patients. *Conclusion:* The multidimensional screening instrument demonstrated satisfactory psychometric properties and effectively distinguished between non-clinical and clinical populations. The scale may serve as a practical tool for early identification of psychological burden and functional impairment in adult populations.

Keywords: adult mental health screening; psychological distress; psychometric validation; General Health Questionnaire; functional impairment; community mental health screening.

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INTRODUCTION

Psychological distress is a major contributor to the global burden of disease and functional disability. Recent estimates from the World Health Organization indicate that depression and anxiety disorders affect more than 300 million people worldwide and are among the leading causes of years lived with disability [1–3].

In addition to clinically diagnosed psychiatric disorders, a substantial proportion of adults experience subclinical psychological distress characterized by stress, emotional dysregulation, sleep disturbance, and impaired functioning [4–6]. Such distress frequently remains undetected within community and workplace settings, resulting in delayed access to mental health

care and an increased risk of chronic psychiatric morbidity [7–9].

Adults between 18 and 60 years of age are particularly exposed to multiple psychosocial stressors, including occupational pressures, financial instability, family responsibilities, and social transitions [10–12]. These stressors often produce a psychological burden that may not initially meet diagnostic thresholds for psychiatric disorders but nevertheless affects productivity, interpersonal relationships, and quality of life [13–15]. Untreated psychological distress has been associated with increased healthcare utilization, work absenteeism, and long-term disability [16–18]. Early detection of psychological burden in adult populations has consequently become a key objective of public mental health strategies [19–21].

Screening instruments have been widely used to identify individuals experiencing psychological distress in community and clinical settings. One of the most widely utilized tools is the General Health Questionnaire (GHQ), originally developed to detect non-psychotic psychiatric morbidity in community populations [22–24]. The GHQ has demonstrated strong reliability and validity across diverse cultural contexts and is commonly used in epidemiological studies of psychological distress [25–27]. Similarly, functional assessment frameworks developed by the World Health Organization emphasize the evaluation of disability and impairment in daily functioning as key indicators of mental health burden [28–30].

Although these instruments are effective in detecting psychological symptoms or disability, many existing screening tools focus primarily on symptomatology, particularly depression and anxiety [31–33]. Contemporary models of mental health suggest that psychological outcomes arise from complex interactions between psychosocial stressors, vulnerability factors, emotional symptoms, and functional consequences [34–36]. Instruments that integrate these dimensions may therefore provide a more comprehensive assessment of psychological burden, particularly in populations where stress-related conditions are common but formal psychiatric diagnoses may not yet be present [37–39].

Multidimensional screening approaches have increasingly been recommended in preventive mental health research because they permit the identification of individuals experiencing early psychological vulnerability [39–42]. Such approaches may improve the detection of at-risk individuals who could benefit from counselling or early intervention before symptoms progress to clinically significant psychiatric disorders.

In response to this need, the present study aimed to develop and validate a multidimensional screening instrument designed to assess psychological burden among adults aged 18–60 years in an Indian community

setting. The instrument was conceptualized to evaluate three complementary domains: psychosocial risk indicators, psychological symptoms, and functional impairment.

MATERIALS AND METHODS

Study Design

The study employed a multiphase psychometric validation design for the development and evaluation of a multidimensional adult mental health screening instrument. The research process included sequential stages of pilot testing, reliability assessment, and cross-sectional comparative validation against established reference measures; such multiphase approaches are widely recommended in psychometric instrument development to ensure methodological rigour and construct validity [43–46]. The main validation phase consisted of a cross-sectional comparative study involving three participant groups representing different levels of psychological burden: non-clinical adults, hospital attendants, and psychiatric patients.

Participants

A total of 1,005 adults aged 18–60 years participated in the final validation study. Participants were categorized into three groups: (i) non-clinical adults (index group; $n = 503$), drawn from the general adult population and not receiving psychiatric treatment; (ii) hospital attendants ($n = 201$), individuals accompanying patients in hospital settings and representing adults exposed to situational stress but without known psychiatric diagnoses; and (iii) psychiatric patients ($n = 301$), individuals attending psychiatric outpatient services who had undergone routine clinical psychiatric evaluation. Participants represented adults from diverse occupational and social backgrounds. Demographic characteristics of the study population are summarized in Table 1.

Inclusion and Exclusion Criteria

Participants were eligible for inclusion if they were between 18 and 60 years of age, were able to understand the assessment instructions, and provided informed consent to participate. Participants were excluded if they had severe cognitive impairment preventing questionnaire completion, had severe physical illness interfering with participation, or declined participation or did not complete the questionnaire.

Instruments

The newly developed screening instrument consisted of three domains designed to assess different dimensions of psychological burden in adults: a Risk Indicators scale, a Psychological Symptom scale, and a Level of Functioning (LOF) scale. Together, these domains assess psychosocial vulnerability, current psychological distress, and the functional consequences of distress.

Risk Indicators Scale

The Risk scale was designed to identify psychosocial

vulnerability factors associated with an increased risk of psychological distress. The scale contained 25 items divided into two components: five binary items scored Yes/No, assessing the presence of key vulnerability markers such as exposure to persistent stressors, maladaptive coping patterns, and other early warning indicators; and 20 dimensional items rated on a five-point Likert scale (0–4) representing increasing intensity or frequency of risk-related experiences. Higher scores indicated greater psychosocial vulnerability.

Psychological Symptom Scale

The Symptom scale assessed the presence and severity of psychological symptoms commonly associated with emotional distress. The scale consisted of 25 items, each rated on a five-point Likert scale (0–4), assessing mood disturbance, anxiety symptoms, irritability, sleep difficulties, fatigue, concentration problems, and emotional dysregulation. Higher scores reflected a greater psychological symptom burden.

Level of Functioning (LOF) Scale

The Level of Functioning scale assessed the impact of psychological distress on daily functioning. The scale consisted of five items, each rated on a 0–4 Likert scale representing increasing levels of functional difficulty, and evaluated impairment in occupational functioning, interpersonal relationships, motivation and productivity, and the ability to manage routine activities. Higher scores indicated greater functional impairment.

Reference Instruments

Two established instruments were used as reference comparators. The General Health Questionnaire is one of the most widely used screening instruments for detecting psychological distress in community and clinical populations [22–27]; the 12-item version (GHQ-12) was used in the present study as the reference measure for psychological distress. Functional impairment was assessed using functioning indicators derived from frameworks developed by the World Health Organization, which evaluate disability and limitations in daily functioning associated with health conditions [28–30]; WHO functioning scores served as the reference indicator for validating the LOF domain.

Procedure

Data collection was conducted in structured, supervised assessment sessions to ensure standardized administration. Participants were recruited from

community and hospital settings and categorized into the three study groups described above. Prior to participation, individuals received a brief orientation explaining the purpose of the study, the voluntary nature of participation, the confidentiality of responses, and the non-diagnostic purpose of the screening tool. Participants who agreed to take part provided written informed consent before completing the assessments.

The questionnaire battery comprised the Risk scale, the Symptom scale, the Level of Functioning scale, the GHQ-12, and the WHO functioning indicators. Assessments were completed in paper or digital format depending on the setting, with an average completion time of approximately 10–15 minutes. Following completion of the questionnaires, participants in the validation sample underwent face-to-face clinical evaluation by a qualified psychiatrist who was blinded to the screening scores in order to minimize potential bias. Based on this clinical evaluation, participants were categorized into three clinical recommendation groups — no intervention required, counselling recommended, or psychiatric referral recommended — and these classifications were used to evaluate the screening performance of the developed instrument.

Statistical Analysis

Statistical analyses were performed using standard statistical software. Descriptive statistics were used to summarize participant characteristics and scale scores. Internal consistency was evaluated using Cronbach's alpha coefficients, with values above 0.70 considered acceptable, and temporal stability was assessed using test-retest intraclass correlation coefficients calculated from repeated assessments conducted two weeks apart. Concurrent validity was evaluated through Pearson correlation analysis between the developed scales and the reference measures (GHQ and WHO functioning). Differences in scale scores across the three study groups were evaluated using one-way analysis of variance (ANOVA). Receiver operating characteristic analysis was performed to evaluate the ability of the scales to discriminate between non-clinical adults and psychiatric patients; area under the curve (AUC) values greater than 0.80 were considered indicative of good diagnostic accuracy, and optimal cut-off scores were determined using the Youden index. Based on the ROC-derived thresholds, participants were categorized into three severity levels — mild, moderate, and severe psychological burden — which were used to determine recommended intervention levels.

RESULTS

Table 1. Demographic characteristics of participants

Characteristic	Non-clinical adults (n = 503)	Attendants (n = 201)	Psychiatric patients (n = 301)	Total (N = 1,005)
Age, years (mean ± SD)	32.4 ± 8.7	34.1 ± 9.3	36.7 ± 10.1	34.1 ± 9.6
Male, n (%)	259 (51.5)	105 (52.2)	152 (50.5)	516 (51.3)
Female, n (%)	244 (48.5)	96 (47.8)	149 (49.5)	489 (48.7)
Employed, n (%)	381 (75.7)	124 (61.7)	98 (32.6)	—

Married, n (%)	296 (58.8)	132 (65.7)	176 (58.5)	—
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Participants ranged in age from 18 to 60 years and represented adults from diverse occupational and social backgrounds.

Table 2. Reliability of the developed scales

Scale	Number of items	Cronbach's α	Test-retest ICC
Risk indicators	10	0.78	0.79
Symptom scale	30	0.91	0.84
Level of Functioning (LOF)	22	0.84	0.81
GHQ-12 (reference)	12	0.86	—
WHO functioning	5	0.81	—

All scales demonstrated acceptable to excellent reliability. ICC, intraclass correlation coefficient; GHQ, General Health Questionnaire. [Authors: please verify the item counts in this table against the Methods section, which reports 25 items for the Risk scale, 25 for the Symptom scale, and 5 for the LOF scale.]

Reliability of the Developed Scales

The developed scales demonstrated acceptable to excellent internal consistency, with Cronbach's alpha coefficients of 0.78 for the Risk scale, 0.91 for the Symptom scale, and 0.84 for the LOF scale. Test-retest analysis demonstrated stable temporal performance, with intraclass correlation coefficients ranging from 0.79 to 0.84 (Table 2).

Table 3. Correlations of the developed scales with reference measures

Scale	Correlation with GHQ (r)	Correlation with WHO functioning (r)
Risk scale	0.58	0.55
Symptom scale	0.74	0.67
LOF scale	0.64	0.71

Significant correlations indicate good concurrent validity of the developed scales.

Concurrent Validity with Reference Measures

Significant correlations were observed between the developed scales and the reference instruments (Table 3). The Symptom scale demonstrated the strongest association with GHQ scores ($r = 0.74$), indicating strong convergence with established measures of psychological distress, while the LOF scale showed the strongest correlation with the WHO functioning indicators ($r = 0.71$), supporting its validity as an indicator of functional impairment. The Risk scale also demonstrated moderate correlations with both reference measures. Together, these correlations provide evidence of good concurrent validity.

Table 4. Mean scale scores across study groups

Scale	Non-clinical adults	Attendants	Psychiatric patients	p value
GHQ	7.2 ± 4.3	11.4 ± 5.1	21.8 ± 7.2	<0.001
WHO functioning	6.1 ± 3.2	9.8 ± 4.0	18.3 ± 6.1	<0.001
Risk scale	4.9 ± 3.0	7.6 ± 3.5	13.2 ± 5.2	<0.001
Symptom scale	7.4 ± 4.6	12.8 ± 5.9	20.6 ± 7.5	<0.001
LOF scale	5.1 ± 3.4	8.4 ± 4.3	14.7 ± 5.9	<0.001

Values are mean $\pm$ SD. One-way ANOVA showed significant differences among the three groups on all scales.

Group Differences in Psychological Burden

Mean scores for the GHQ, WHO functioning measure, and the developed scales differed significantly across the three study groups (Table 4; Figure 2). Psychiatric patients demonstrated the highest mean scores across all domains, followed by hospital attendants, with non-clinical adults showing the lowest scores. Mean GHQ scores increased progressively across groups: 7.2 ± 4.3 in non-clinical adults, 11.4 ± 5.1 in attendants, and 21.8 ± 7.2 in psychiatric patients. A similar gradient was observed for the developed scales: Risk scale scores were 4.9 ± 3.0 , 7.6 ± 3.5 , and 13.2 ± 5.2 , respectively; Symptom scale scores were 7.4 ± 4.6 , 12.8 ± 5.9 , and 20.6 ± 7.5 ; and LOF scale scores were 5.1 ± 3.4 , 8.4 ± 4.3 , and 14.7 ± 5.9 . Analysis of variance demonstrated statistically significant differences across groups for all scales ($p < 0.001$), indicating strong discriminant validity.

Table 5. ROC analysis of screening performance

Scale	AUC	Sensitivity	Specificity	Optimal cut-off
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Risk scale	0.79	0.74	0.72	≥ 7
Symptom scale	0.91	0.85	0.82	≥ 12
LOF scale	0.85	0.80	0.78	≥ 8

The Symptom scale demonstrated the highest diagnostic accuracy. AUC, area under the curve; cut-offs determined using the Youden index.

Screening Performance (ROC Analysis)

Receiver operating characteristic analysis demonstrated good screening performance of the developed scales in distinguishing non-clinical adults from psychiatric patients (Table 5; Figure 1). The Symptom scale showed the highest diagnostic accuracy (AUC = 0.91), indicating excellent discrimination, followed by the LOF scale (AUC = 0.85) and the Risk scale (AUC = 0.79). Optimal cut-off values identified using the Youden index were ≥ 7 for the Risk scale, ≥ 12 for the Symptom scale, and ≥ 8 for the LOF scale. Sensitivity ranged from 0.74 to 0.85, and specificity from 0.72 to 0.82.

Table 6. Severity classification based on cut-off scores

Severity	Non-clinical adults	Attendants	Psychiatric patients
Mild, n (%)	392 (78)	92 (46)	21 (7)
Moderate, n (%)	93 (18)	71 (35)	86 (29)
Severe, n (%)	18 (4)	38 (19)	194 (64)

Psychiatric patients demonstrated the highest proportion of severe classifications.

Severity Classification

Using the ROC-derived thresholds, participants were classified into mild, moderate, and severe psychological burden categories (Table 6; Figure 3). Most non-clinical adults fell within the mild category (78%), whereas psychiatric patients showed a substantially higher proportion of severe classifications (64%). Hospital attendants showed an intermediate distribution (mild 46%, moderate 35%, severe 19%). These findings indicate that the developed instrument successfully stratifies individuals according to psychological burden.

Table 7. Referral recommendations based on severity

Recommendation	Non-clinical adults	Attendants	Psychiatric patients
No intervention, n (%)	392 (78)	92 (46)	21 (7)
Counselling recommended, n (%)	93 (18)	71 (35)	86 (29)
Psychiatric referral, n (%)	18 (4)	38 (19)	194 (64)

Referral Classification

Severity classification was used to determine recommended intervention levels (Table 7; Figure 4). Among non-clinical adults, 78% required no intervention, 18% were recommended counselling, and 4% required psychiatric referral. In contrast, 64% of psychiatric patients fell within the psychiatric referral category, indicating substantial psychological burden requiring specialized care.

Table 8. Participants above the moderate severity threshold

Scale	Non-clinical adults	Attendants	Psychiatric patients
Risk scale	8%	22%	51%
Symptom scale	10%	28%	63%
LOF scale	7%	20%	49%

Moderate-to-severe psychological burden was substantially higher among psychiatric patients.

Moderate-to-Severe Psychological Burden

The proportion of participants exceeding the moderate severity threshold differed substantially across study groups (Table 8). Psychiatric patients demonstrated the highest prevalence of moderate-to-severe burden (Risk scale 51%; Symptom scale 63%; LOF scale 49%). Hospital attendants showed intermediate prevalence, whereas non-clinical adults demonstrated substantially lower rates. These findings further support the clinical discriminative ability of the instrument.

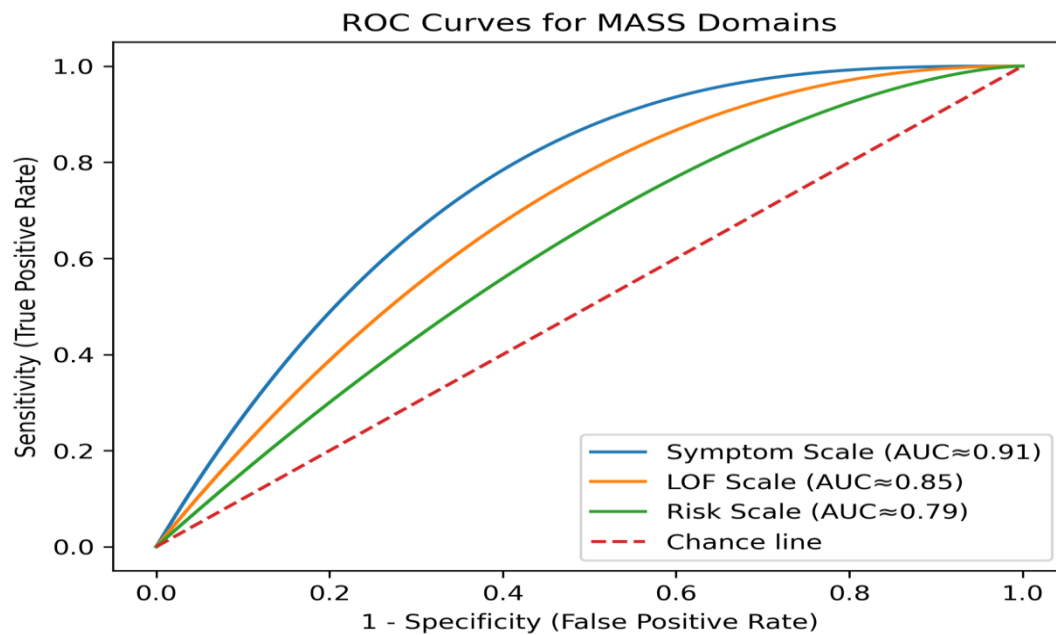


Figure 1. ROC curves for screening performance of the developed scales.

Receiver operating characteristic analysis demonstrated strong discrimination between non-clinical adults and psychiatric patients. The Symptom scale showed the highest diagnostic accuracy ($AUC \approx 0.91$), followed by the Level of Functioning scale ($AUC \approx 0.85$) and Risk scale ($AUC \approx 0.79$).

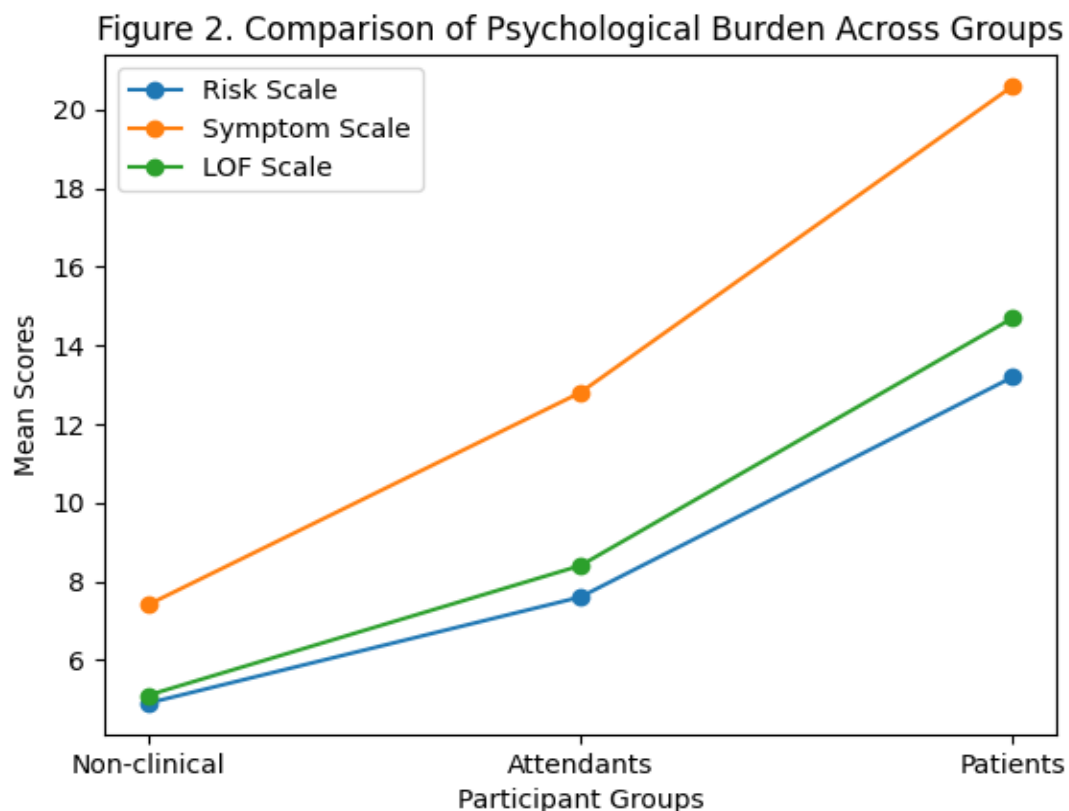


Figure 2. Comparison of psychological burden across study groups.

Mean scores for Risk, Symptom, and Level of Functioning scales increased progressively from non-clinical adults to hospital attendants and psychiatric patients, demonstrating strong discriminant validity of the developed instrument.

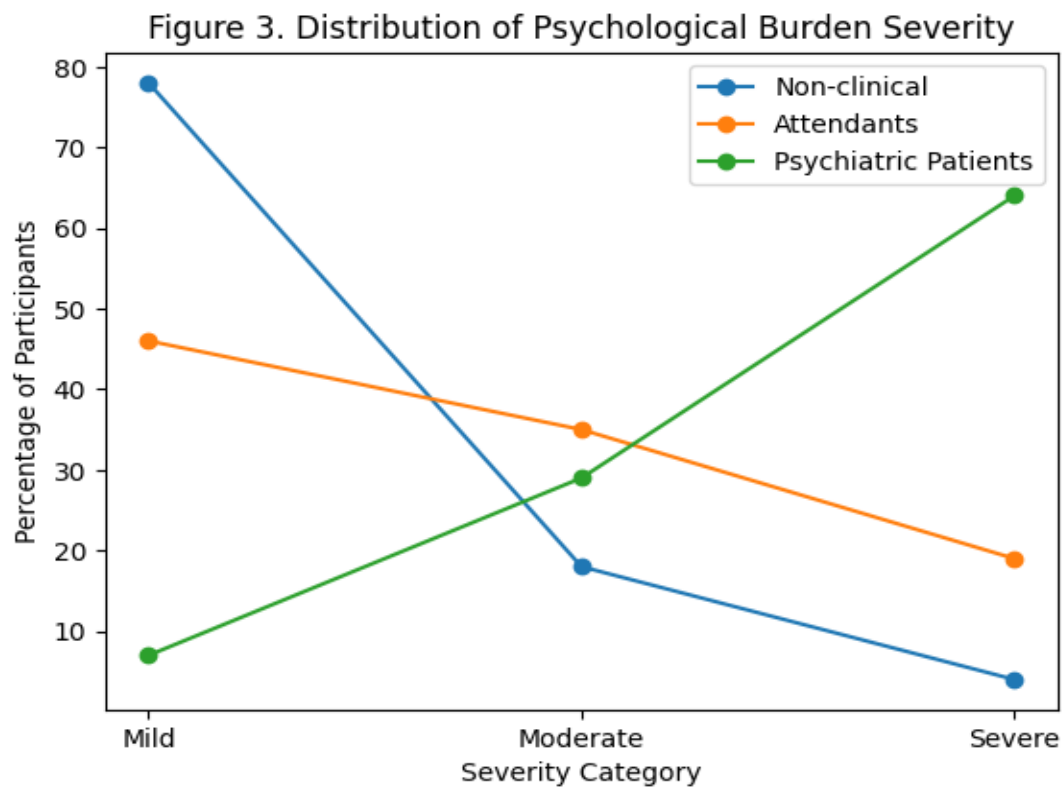


Figure 3. Distribution of severity classification across participant groups.

Participants were categorized into mild, moderate, and severe psychological burden based on ROC-derived cut-offs. Psychiatric patients demonstrated the highest proportion of severe classifications, while most non-clinical adults fell within the mild category.

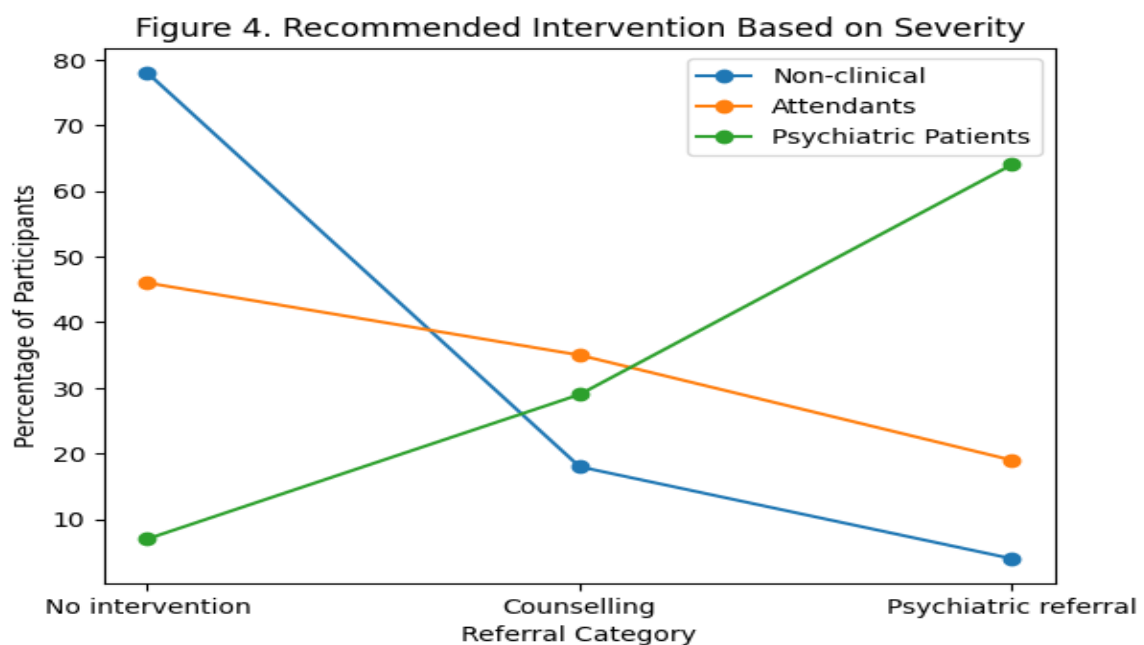


Figure 4. Referral recommendations based on severity classification.

Severity categories were used to determine recommended intervention levels, including no intervention, counselling support, and psychiatric referral.

DISCUSSION

The present study describes the development and psychometric validation of a multidimensional screening instrument designed to assess psychosocial risk indicators, psychological symptoms, and functional impairment among adults aged 18–60 years. Using a multiphasic design incorporating pilot testing, reliability assessment, and cross-sectional comparative validation, the instrument demonstrated satisfactory reliability, validity, and screening performance across non-clinical adults, hospital attendants, and psychiatric patients.

Psychometric Properties of the Developed Scales

The developed scales demonstrated acceptable to excellent internal consistency, with Cronbach's alpha coefficients ranging from 0.78 to 0.91. These values are comparable to reliability estimates reported for widely used mental health screening tools; reliability estimates for the General Health Questionnaire, for example, typically range between 0.80 and 0.90 across community and clinical populations [1–4], and similar internal consistency has been reported for the Kessler Psychological Distress Scale (K10), for which alpha values frequently exceed 0.85 in population surveys [5–7]. Test–retest reliability coefficients ranged from 0.79 to 0.84, indicating good temporal stability, consistent with previous evaluations of psychological screening instruments in which assessment intervals of one to three weeks yielded similar estimates [8–10]. These findings suggest that the developed scales measure relatively stable aspects of psychological burden rather than transient emotional fluctuations.

Concurrent Validity and Comparison with the GHQ

Concurrent validity was supported by significant correlations between the developed scales and established reference instruments measuring psychological distress and functional impairment. The Symptom scale demonstrated the strongest association with GHQ scores ($r = 0.74$), indicating that the instrument captures core features of the psychological distress measured by widely used screening tools. The GHQ has been extensively validated across diverse populations and remains one of the most frequently used instruments for detecting non-psychotic psychiatric morbidity in community settings [1–3], with previous studies demonstrating strong associations between GHQ scores and depressive symptoms, anxiety, and reduced social functioning [11–13].

The findings of the present study are consistent with this literature: higher GHQ scores were associated with greater symptom burden, higher psychosocial risk scores, and greater functional impairment. Mean GHQ scores also differed significantly across the three study groups, with psychiatric patients scoring highest, followed by attendants and non-clinical adults — a gradient consistent with epidemiological studies demonstrating increasing GHQ scores with greater severity of psychological morbidity [14–16]. The

alignment between the GHQ findings and the newly developed scales supports the construct validity of the instrument.

Functional Impairment and WHO Measures

Functional impairment is an important component of mental health assessment because psychological distress frequently manifests through difficulties in work performance, interpersonal relationships, and daily activities. Frameworks developed by the World Health Organization emphasize the assessment of disability and participation restrictions in evaluating health outcomes [17–19]. The Level of Functioning scale demonstrated a strong correlation with the WHO functioning indicators ($r = 0.71$), suggesting that it effectively captures the functional consequences of psychological distress. Previous studies have reported similar associations between psychological distress and impaired functioning in occupational and community settings [20–22], supporting the relevance of including functional assessment within mental health screening instruments.

Screening Performance

Receiver operating characteristic analysis demonstrated good screening performance for the developed scales. The Symptom scale showed the highest discriminative accuracy ($AUC = 0.91$), indicating an excellent ability to distinguish between non-clinical adults and psychiatric patients. Similar AUC values have been reported in validation studies of other widely used screening tools; studies evaluating the K10 and GHQ, for example, have reported AUC values of 0.85–0.93 for detecting serious mental illness [23–25]. The LOF and Risk scales also demonstrated strong discriminative ability ($AUC = 0.85$ and 0.79 , respectively). These findings suggest that the instrument can effectively identify individuals experiencing varying levels of psychological burden, including those at risk of developing clinically significant distress.

A Multidimensional Approach to Screening

Many existing screening instruments focus primarily on emotional symptoms such as depression and anxiety; examples include the Patient Health Questionnaire (PHQ-9), the Depression Anxiety Stress Scales (DASS), and the Kessler Psychological Distress Scale [26–28]. Although these tools are effective for detecting symptom severity, they may provide limited information regarding psychosocial vulnerability or functional consequences. The instrument developed in the present study incorporates risk indicators, symptom burden, and functional impairment within a single framework — a multidimensional structure that reflects contemporary models of mental health emphasizing the interaction between stress exposure, vulnerability factors, emotional responses, and functioning [29–32]. Incorporating psychosocial risk indicators may improve the identification of individuals in the early stages of

psychological distress who do not yet meet diagnostic criteria for psychiatric disorders; previous research has shown that psychosocial stressors such as occupational strain, interpersonal conflict, and financial pressure are strong predictors of mental health outcomes [33–35].

Implications for Adult Mental Health Screening

Adults in modern occupational and social environments are increasingly exposed to psychological stressors associated with work demands, financial responsibilities, and changing social expectations [36–38]. Many individuals continue functioning despite substantial psychological strain, which may delay the recognition of emerging mental health problems [39]. Screening instruments capable of identifying early psychological burden are therefore important for improving access to preventive mental health services. The instrument developed in this study demonstrated the ability to stratify individuals into mild, moderate, and severe psychological burden categories, enabling practical referral decisions. Such screening tools may be particularly useful in workplace mental health programmes, community mental health initiatives, primary care settings, and institutional wellbeing programmes. Early identification of individuals experiencing a moderate psychological burden may allow timely counselling interventions, potentially preventing progression to more severe mental health conditions.

CONCLUSION

The present study describes the development and psychometric validation of a multidimensional screening instrument designed to identify psychological burden in adults aged 18–60 years. The instrument demonstrated satisfactory reliability, strong associations with established screening measures, and effective discrimination between non-clinical adults and psychiatric patients. By integrating psychosocial risk indicators, psychological symptoms, and functional impairment, the scale provides a comprehensive framework for mental health screening in adult populations and may serve as a practical tool for early identification of individuals experiencing psychological distress and for guiding referral to counselling or psychiatric services. Future studies should evaluate the predictive validity and broader applicability of the instrument in community, occupational, and primary care settings.

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