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Associations of psychological flexibility, mindfulness, and valued living with psychological distress among nursing students

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Abstract

Background Nursing students frequently experience psychological distress due to the intensive academic and clinical demands of their training. This distress can undermine not only their personal well-being but also their academic performance and readiness for clinical practice. Recent studies have emphasized the importance of identifying modifiable psychological factors that may buffer such distress. Within this context, this study aimed to examine the associations between psychological flexibility, mindfulness, and valued living—defined as the extent to which individuals act in accordance with their personal values in daily life—and symptoms of psychological distress (depression, anxiety, and stress) among nursing students.

Methods This cross-sectional descriptive study was conducted in October and November 2022. Participants included 631 nursing students enrolled in a nursing school located in western Türkiye. Data were collected using the Depression Anxiety and Stress Scale-21, Acceptance and Action Questionnaire-II, Mindful Attention Awareness Scale, and Valuing Questionnaire. Binary logistic regression analysis was used.

Results Among nursing students, 53.6% reported symptoms of depression, 65.5% reported anxiety, and 40.3% reported stress. Lower psychological flexibility showed significant associations with higher odds of depression, anxiety, and stress. Higher mindfulness was associated with lower odds of these symptoms. Valued living was associated with lower odds of depression, but no significant associations were observed with anxiety or stress.

Conclusions The findings of this study indicate that enhancing psychological flexibility, mindfulness, and valued living may be beneficial for supporting the mental health of nursing students. Recommendations for practice include incorporating mindfulness exercises such as breathing practices and body scans into training sessions in nursing schools; organizing psychological flexibility workshops; and offering valued living–focused seminars and activities that support students in aligning their actions with personal values. In addition, online guides, short videos, or modules could be provided by universities to make these components more accessible to students. These concepts may also be incorporated into the design of mental health interventions to both alleviate distress and strengthen well-being

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among nursing students. However, due to the cross-sectional design, causal inferences cannot be made; thus, future longitudinal and experimental studies are needed to evaluate the feasibility and effectiveness of these approaches.

Keywords Nursing students, Psychological distress, Psychological flexibility, Mindfulness, Values

Introduction

Psychological distress—including symptoms of depression, anxiety, and stress—is a prevalent mental health concern among nursing students [1, 2]. A meta-analysis reported that approximately 62% of nursing students experience significant levels of stress [3], while another study found that 63.5% are at risk for clinical depression, with stress identified as a major contributing factor [4]. Psychological distress not only undermines mental and physical health but also negatively affects academic performance, clinical competence, patient safety, and the quality of care provided [3, 5–7]. The demanding academic and clinical nature of nursing education exposes students to substantial psychological risk, underscoring the importance of identifying psychological factors that may influence mental health [8–10].

Understanding how modifiable psychological processes contribute to distress is crucial for developing preventive strategies and for strengthening nursing education with a well-being perspective [11]. In recent years, the Acceptance and Commitment Therapy (ACT) model has been increasingly proposed as a relevant framework for understanding psychological processes associated with mental health, especially in nursing populations [12–14]. ACT promotes openness to difficult internal experiences, present-moment awareness, and engagement in personally meaningful actions based on individual values [15, 16]. These principles are operationalized through six interrelated processes—acceptance, cognitive defusion, mindfulness, self-as-context, values, and committed action—which are collectively conceptualized as psychological flexibility. ACT, as one of the third-wave cognitive-behavioral approaches, is grounded in this framework [17–21]. In addition, these components are particularly relevant for nursing students, as they may support more adaptive coping with distress [10]. Therefore, ACT was adopted as the theoretical framework of the present study to investigate the association between these processes and psychological distress in this population.

Psychological flexibility refers to the capacity to pursue meaningful goals while accepting uncomfortable internal experiences [18, 19]. Mindfulness involves present-moment, nonjudgmental awareness that may help reduce cognitive entanglement with stressors [19–22]. Values represent core life directions that provide meaning and behavioral guidance [18, 23]. Although ACT distinguishes between values and committed action, their behavioral expression is often described as valued living, defined as the extent to which individuals act consistently with what matters to them [16, 24]. In this study, valued living is conceptualized as a measurable indicator of value-based functioning.

Empirical evidence supports the relevance of these processes in healthcare and student populations. Psychological flexibility has been associated with better mental health outcomes in nurses, mediating the effects of job satisfaction and burnout [25]; mindfulness-based interventions have reduced depression, anxiety, and stress among nursing students [26]; and valued living has been linked to greater resilience in university students facing stressful events [24]. Drawing on this evidence, the present study adopts ACT as its theoretical framework to investigate the relationship between psychological flexibility, mindfulness, and valued living with psychological distress among nursing students.

Background

Nursing education is a highly demanding process characterized by academic workload, clinical practice requirements, and continuous performance evaluations [27]. In Türkiye, however, systematic and structured efforts to integrate psychological support into nursing curricula remain scarce [9]. Current literature indicates that ACT-based interventions may effectively reduce stress, burnout, and general psychological distress among nursing populations [12–14, 28, 29]. Yet, existing studies have generally evaluated ACT as a whole, without distinguishing the unique contributions of its core processes. Although some research has examined psychological flexibility, mindfulness, or valued living separately, their comparative or combined roles in psychological distress among nursing students remain underexplored [24–26].

Therefore, this study aimed to examine the extent to which three ACT-based processes—psychological flexibility, mindfulness, and valued living—are associated with symptoms of psychological distress (depression, anxiety, and stress) in nursing students. Given the cross-sectional design, the analyses were intended to identify associations rather than infer causality. Nevertheless, the results may inform future longitudinal studies and guide the development of evidence-informed mental health interventions tailored for nursing students. Additionally, the findings may contribute to efforts to integrate psychological well-being content into nursing education programs. In line with this framework, the following research questions were addressed:

Research questions

- What are the levels of psychological distress (depression, anxiety, and stress) among nursing students?
- To what extent is psychological flexibility associated with psychological distress (depression, anxiety, and stress) among nursing students?
- To what extent is mindfulness associated with psychological distress (depression, anxiety, and stress) among nursing students?
- To what extent is valued living associated with psychological distress (depression, anxiety, and stress) among nursing students?

Methods

Study design

The study was conducted as a cross-sectional descriptive study between October and November 2022 with students enrolled in the School of Nursing in the west of Türkiye.

Study setting and sampling

The study was conducted at a four-year accredited School of Nursing with a total enrollment of 1,014 students. The campus where the nursing school is located offers the provision of counselling services to students by a psychologist. However, there are no other services in place to protect and strengthen students' mental health. A total of 666 students agreed to participate and completed the questionnaires. After excluding 35 students with missing data, the final sample consisted of 631 nursing students. The proportion of missing data was small (5.3%), and no systematic pattern was observed across key demographic variables. Therefore, listwise deletion was applied. Given the very small proportion of missing data (5.3%) and the absence of systematic bias across key demographics, listwise deletion was considered an appropriate and methodologically sound approach. Under these conditions, imputation was not deemed necessary and would have added little value to the analysis.

Sample size was calculated using logistic regression analysis in G*Power, based on data from a prior study conducted at the same faculty [11]. The minimum required sample was 478 students; considering a 20% attrition rate, a target of 573 participants was set. Exceeding this number was deemed beneficial to increase statistical power. Consequently, the study was conducted with a total of 631 nursing students.

Inclusion and exclusion criteria

Inclusion Criteria; (a) To be enrolled in a four-year nursing school (nursing undergraduate education) where the study is conducted. Exclusion Criteria; (a) Initiation of psychiatric treatment or receiving a psychiatric diagnosis within the past six months. This criterion was included to reduce potential confounding effects related to acute psychiatric symptoms or recent treatment initiation that might independently influence psychological distress scores. (b) Experiencing an acute physical or psychological health condition during the data collection period that could significantly interfere with participation in the study.

Instruments

All scales used in the study had validity and reliability established in the language in which the study was conducted. Additionally, permission to use the scales was obtained via email.

Personal information form

The personal information form includes descriptive information about the nursing student's age, gender, marital status, type of residence, grade year, and income status.

Depression anxiety and stress scale 21 (DASS-21)

The Depression, Anxiety, and Stress Scale-21 (DASS-21), developed by Lovibond and Lovibond [30] and adapted into Turkish by Yılmaz et al. [31], was used to assess psychological distress. The scale comprises 21 items across three subscales: depression, anxiety, and stress, and is rated on a 4-point Likert scale (0 = never, 3 = always), with higher scores indicating greater distress. To align with the original DASS-42 scoring, total scores were multiplied by two. Participants were classified as distressed if they scored ≥ 10 for depression, ≥ 8 for anxiety, and ≥ 15 for stress [30, 31]. Reported Cronbach's alpha coefficients for the Turkish version are 0.82 (depression), 0.81 (anxiety), and 0.76 (stress).

Acceptance and action questionnaire – II (AAQ-II)

Psychological flexibility was measured using the AAQ-II, originally developed by Bond et al. [32] and adapted to Turkish by Yavuz et al. [33]. The scale consists of 7 items rated on a 7-point Likert scale (1 = never true, 7 = always true). Higher total scores indicate lower psychological flexibility. The Turkish version reported a Cronbach's alpha of 0.84.

Mindful attention awareness scale (MAAS)

Mindfulness was assessed using the MAAS, developed by Brown and Ryan [34] and adapted into Turkish by Özyeşil et al. [35]. The scale consists of 15 items and uses a 6-point Likert scale. A single total score is obtained, with higher scores indicating higher mindfulness. The Turkish version demonstrated a Cronbach's alpha of 0.80.

Valuing questionnaire (VQ)

Valued living levels were measured using the Valuing Questionnaire (VQ), developed by Smout et al. [36] and adapted into Turkish by Yasin Aydın and Gökçen Aydın [37]. The scale consists of 10 items rated on a 6-point Likert scale, with items 1, 2, 6, 8, and 10 reverse coded. Higher scores indicate greater consistency with personal values. The Turkish adaptation reported a Cronbach's alpha of 0.78.

Data collection

During the data collection process, the first researcher contacted the students at the end of the course, and questionnaires were distributed to those who volunteered. Data were collected in a quiet classroom setting to provide a comfortable environment for participants. The researcher explained the purpose of the study, the procedures, and the expected duration of participation. Verbal and written informed consent was obtained from all participants. To ensure anonymity, the questionnaires were completed without any identifying information, and data were securely stored. The researcher was available during the completion of the questionnaires to answer any questions and clarify survey items when needed. Each participant completed the questionnaires within approximately 20 min, and the forms were collected immediately upon completion.

Ethical considerations

This study was approved by the Dokuz Eylul University Non-Invasive Research Ethics Committee (Approval Date: 22/09/2021, Decision Number: 2021/26 – 08). All procedures adhered to the ethical standards outlined in the Declaration of Helsinki. Prior to data collection, institutional approval was obtained from the nursing school, and informed written and verbal consent was obtained from all participants.

Data analysis

All statistical analyses were conducted using IBM SPSS Statistics version 25.0. Descriptive statistics were employed to summarize the data: categorical variables were presented as frequencies (n) and percentages (%), while continuous variables were expressed as means.

To categorize psychological distress, DASS-21 subscale scores were dichotomized. Students with scores of DASS-D ≥ 10, DASS-A ≥ 8, and DASS-S ≥ 15 were classified as experiencing psychological distress, while those below these thresholds were considered not experiencing psychological distress [30, 31]. This approach was chosen because it enabled logistic regression analyses and facilitated the identification of meaningful levels of psychological distress, which are more directly interpretable in the context of nursing students' mental health. Although continuous or ordinal regression approaches could provide more nuanced insights, they were beyond the scope of the present study. The potential loss of data granularity resulting from dichotomization has been acknowledged as a limitation in Sect. 5.1.

Independent samples t-tests were used to compare levels of psychological flexibility, mindfulness, and valued living between students with and without psychological distress (i.e., depression, anxiety, and stress). As all comparisons were statistically significant ($p < 0.05$), all three variables were included in the regression models. Before conducting the binary logistic regression analyses, multicollinearity among the independent variables was assessed using VIF values derived from a linear regression model, and no violations were found.

Binary logistic regression analyses were performed to assess the associations of psychological flexibility, mindfulness, and valued living levels with psychological distress. The analyses were conducted using the Enter method, and model fit was evaluated using the Hosmer-Lemeshow goodness-of-fit test. A non-significant p-value ($p > 0.05$) indicates a good model fit. The Hosmer-Lemeshow test results confirmed acceptable model fit for all outcomes: depression ($p = 0.438$), anxiety ($p = 0.303$), and stress ($p = 0.453$).

Given the cross-sectional nature of this study, findings are interpreted in terms of statistical association rather than causality. All analyses were conducted in accordance with the STROBE guidelines for reporting observational studies.

Results

Sociodemographic characteristics of the participants

The mean age of the nursing students participating in the study was 20 years. Among the participants, 66.6% were female, and 98.7% were single. It was found that 62.9% of the students were residing in dormitories, 35% were in the first year of their nursing undergraduate education, and 49% reported low income levels (Table 1).

Prevalence of psychological distress

To categorize the level of psychological distress, the scores obtained from the DASS-21 scale were dichotomized. Participants with DASS-D ≥ 10, DASS-A ≥ 8, and DASS-S ≥ 15 were classified as having psychological distress. The prevalence of depression was 53.6%, anxiety was 65.5%, and stress was 40.3% among the participants (Table 2).

Associations of psychological flexibility, mindfulness, and valued living with psychological distress among nursing students

Binary logistic regression analyses were conducted to examine the extent to which psychological flexibility,

Table 1 Socio-demographic characteristics of nursing students ($n = 631$)

Variable		M	SD
Age		20.63	2.6
		Frequency	**%**
Gender	Female	420	66.6
	Male	211	33.4
Marital status	Married	8	1.3
	Single	623	98.7
Type of residence	Family home	101	16.0
	Relatives	9	1.4
	Shared apartment with friends	105	16.6
	Dormitory	397	62.9
	Other	19	3
Grade	1	221	35
	2	106	16.8
	3	128	20.3
	4	176	27.9
Income status	Low income	309	49
	Equal	263	41.7
	Excess income	59	9.4

Note. M ± SD = Mean ± Standard Deviation

Table 2 Prevalence of psychological distress among nursing students ($n = 631$)

Variable	Category	*n*	%
Depression	Yes	338	53.6
	No	293	46.4
Anxiety	Yes	413	65.5
	No	217	34.5
Stress	Yes	254	40.3
	No	377	59.7

mindfulness, and valued living were statistically associated with symptoms of depression, anxiety, and stress. All three variables were statistically significant in preliminary comparisons and were included in the models (Table 3).

For depression, the model demonstrated acceptable fit (Hosmer–Lemeshow $\chi^2 = 7.38$, $p = 0.497$) and explained approximately 12% of the variance (Nagelkerke $R^2 = 0.118$). The classification accuracy was 43%. Lower psychological flexibility was associated with greater likelihood of reporting depressive symptoms (OR = 1.10, $p < 0.001$), while higher mindfulness (OR = 0.98, $p = 0.029$) and valued living (OR = 0.90, $p < 0.001$) were linked to lower likelihood (Table 4).

For anxiety, model fit was also acceptable (Hosmer–Lemeshow $\chi^2 = 10.25$, $p = 0.247$), with an explained variance of approximately 8% (Nagelkerke $R^2 = 0.076$). The classification accuracy was 29%. Psychological flexibility (OR = 1.12, $p < 0.001$) and mindfulness (OR = 0.98, $p = 0.010$) showed significant associations with anxiety, whereas valued living did not reach statistical significance ($p = 0.118$) (Table 4).

Table 3 Examination of psychological distress among nursing students by variable characteristics ($n = 631$)

Variables	Depression (≥ 10)	Depression (< 10)	Statistical analysis		Anxiety (≥ 8)	Anxiety (< 8)	Statistical analysis		Stress (≥ 15)	Stress (< 15)	Statistical analysis	
	M ± SD	M ± SD	t	*p*	M ± SD	M ± SD	t	*p*	M ± SD	M ± SD	t	*p*
Psychological flexibility	27.25 ± 9.4	17.67 ± 7.17	-14.741	**0.001***	25.83 ± 9.27	17.03 ± 7.16	-13.182	**0.001***	28.69 ± 9.00	18.83 ± 7.69	-14.285	**0.001***
Mindfulness	54.20 ± 11.86	63.23 ± 16.46	7.791	**0.001***	55.61 ± 12.73	63.82 ± 16.95	6.262	**0.001***	53.88 ± 12.43	61.43 ± 15.61	6.739	**0.001***
Valued living	30.00 ± 8.77	39.74 ± 7.92	14.534	**0.001***	32.32 ± 9.17	38.72 ± 9.28	8.282	**0.001***	30.59 ± 9.28	37.17 ± 9.04	8.868	**0.001***

Note. M ± SD = Mean ± Standard Deviation; *Bold values indicate statistically significant $p < 0.05$

Table 4 Associations of psychological flexibility, mindfulness, and valued living with psychological distress among nursing students (n: 631)

	DASS-D	DASS-A	DASS-S
Parameter	OR** [95 CI]; *p* value	OR [95 CI]; *p* value	OR [95 CI]; *p* value
Psychological flexibility	1.101 [1.072–1.131]; **< 0.001***	1.115 [1.084–1.146]; **< 0.001***	1.130 [1.100–1.160]; **< 0.001***
Mindfulness	0.98 [0.971–0.998]; **0.029***	0.98 [0.970–0.996]; **0.010***	0.98 [0.969–0.998]; **0.025***
Valued Living	0.90 [0.883–0.934]; **< 0.001***	0.98 [0.957–1.005]; 0.118	0.98 [0.962–1.010]; 0.236
Nagelkerke R^2	0.118	0.076	0.084
The Hosmer-Lemeshow test *p*-value of the model	0.438	0.303	0.453

Note. OR = Odds Ratio; CI = Confidence Interval; *$p < 0.05$ considered statistically significant; ** 95% confidence interval for Exp(B); DASS-D: Depression, DASS-A: Anxiety, DASS-S: Stress

For stress, model fit was also acceptable (Hosmer–Lemeshow χ^2 = 9.66, $p = 0.287$), with an explained variance of 8% (Nagelkerke R^2 = 0.084). The classification accuracy was 35%. Lower psychological flexibility (OR = 1.13, $p < 0.001$) and lower mindfulness (OR = 0.98, $p = 0.025$) were significantly associated with higher stress. Valued living was not significantly associated with stress in the model ($p = 0.236$) (Table 4).

Discussion

This study aimed to examine the extent to which psychological flexibility, mindfulness, and valued living are associated with symptoms of psychological distress (depression, anxiety, and stress) among nursing students. The findings highlight the high prevalence of psychological distress, consistent with prior evidence reporting elevated rates of anxiety, depression, and stress in this population [4, 38–40]. These high rates of distress may be attributed to the inherently demanding nature of nursing education, which integrates rigorous theoretical coursework with intensive clinical practice [8]. University life itself presents challenges such as identity development, adaptation difficulties, and financial strain, which are further compounded in health-related fields [27]. Specifically for nursing students, the combination of academic rigor, emotional labor, and heightened performance expectations contributes to significant psychological burden [41]. In Türkiye, these challenges are further intensified by heavy academic workloads, extended clinical placements, a high number of required course credits, frequent examinations, large class sizes, financial pressures, and strong societal expectations placed on health professionals [9, 42]. Taken together, these structural and cultural stressors point to the need for structured psychological support strategies within nursing programs [9, 27, 41]. Beyond structural and cultural stressors, individual-level psychological factors also play a critical role in shaping students' mental health outcomes [42].

Within this context, the role of psychological flexibility is particularly salient. Our findings support earlier research by indicating that lower levels of flexibility are linked with greater psychological distress among nursing students [43–46]. This suggests that limited flexibility may heighten vulnerability to emotional challenges in high-pressure academic and clinical environments. Within the framework of ACT, psychological flexibility refers to the ability to regulate emotions and maintain commitment to personally meaningful actions despite distress [18]. Previous studies also indicate that psychological flexibility may serve a protective function for mental health [6, 47]. Building on this evidence, enhancing flexibility could be a promising target for future interventions aimed at supporting student well-being. However, while this study examined the psychological flexibility

processes within the ACT framework independently, their potential interrelationships were not addressed. Future research may employ structural equation modeling or mediation analysis to explore how these processes interact and contribute to psychological distress.

In addition to these considerations, mindfulness was associated with reduced psychological distress, aligning with systematic reviews showing that mindfulness-based interventions effectively lower depression, stress, and burnout in nursing students [48, 49]. Similarly, a recent review from Türkiye reported positive links between mindfulness and emotion regulation, and negative associations with depressive symptoms [50]. These findings together suggest that mindfulness-based approaches could be considered as practical strategies in contexts where academic and cultural pressures are high.

Valued living was observed to play a more specific role, being linked with lower depressive symptoms but not with anxiety or stress. This finding is consistent with previous evidence indicating that diminished life meaning is particularly related to depression [51–53]. Building on this, the ACT framework posits that values enhance psychological flexibility by guiding individuals toward meaningful action in the face of emotional distress [18, 54]. For university students—particularly those in academically and clinically demanding disciplines such as nursing—a clear sense of personal values may support emotional regulation, psychological well-being, and a sense of direction [23]. Culturally, in Türkiye, where educational and career decisions are often shaped by familial and societal expectations, students may have limited opportunities to explore and internalize their own values [55]. This cultural influence may help explain the absence of significant associations between valued living and anxiety or stress observed in the present study. Another possibility is that stress and anxiety among nursing students may be more strongly shaped by external situational factors (e.g., academic workload, clinical responsibilities) than by internalized values, which could help explain the absence of significant associations in this study. In addition, collectivist cultural values and educational norms in Türkiye may further shape how nursing students internalize and act upon personal values [55]. In collectivist settings, the prioritization of family expectations and social obligations can limit opportunities for autonomous value exploration, which may, in turn, influence psychological flexibility and the degree to which values are integrated into daily functioning. Taken together, these considerations may indicate that incorporating value-based components into mental health programs is relevant for enhancing psychological flexibility, meaning in life, and student well-being among nursing students [23]. Nonetheless, since valued living was only associated with depression in the present study, future research could examine moderating factors such as cultural expectations or processes of value internalization.

Strengths and limitations of the work

This study has several strengths. The relatively large sample size and the use of binary logistic regression allowed for the investigation of multiple psychological variables associated with psychological distress. Additionally, applying the ACT model as a theoretical framework provided a coherent and conceptually grounded basis for interpreting the findings.

Nonetheless, some limitations should be acknowledged. First, the modest Nagelkerke R^2 values observed in this study (e.g., 0.076 for anxiety and 0.084 for stress) suggest that the explanatory strength of the models was limited. To improve model performance in future research, it may be beneficial to include additional variables such as social support, academic pressure, coping styles, and personality traits. In particular, these variables may account for contextual and interpersonal influences on student well-being that were not captured in the present analysis, and their inclusion could substantially enhance the explanatory power of future models. Additionally, the classification accuracy for some models—particularly for anxiety (e.g., 29%)—was relatively low. Future studies may consider alternative modeling approaches, such as decision trees or machine learning classifiers, to improve classification accuracy. Second, the cross-sectional nature of the study prevents any interpretation regarding the directionality of the observed associations between psychological flexibility, mindfulness, valued living, and psychological distress. Although significant relationships were identified, these findings should be interpreted cautiously and without assumptions of causality. Future research using longitudinal or experimental designs may help clarify how these psychological processes relate to distress over time.

Moreover, all psychological variables in this study were assessed using self-report instruments, which may have introduced biases such as social desirability or self-perception inaccuracies. To strengthen future research, it may be valuable to incorporate additional data sources—such as objective or behavioral measures, peer assessments, or clinician-rated scales—to help triangulate findings. The sample in this study was drawn from a single public university in western Türkiye and was relatively homogeneous in terms of gender and marital status (e.g., 66.6% female, 98.7% single). This limited demographic diversity may affect the generalizability of the findings. Future research should expand sampling to include diverse institutions, regions, and demographic groups to enhance generalizability. Moreover, although all instruments used in this study were validated in Turkish, cultural nuances in the expression of values and mindfulness

may still have influenced participants' responses. Future research could consider qualitative studies to explore how psychological flexibility and valued living are interpreted within specific cultural contexts. Additionally, while dichotomizing DASS-21 scores facilitated the use of logistic regression, this approach may have reduced the richness and nuance of the data. Future research might consider preserving the continuous nature of these variables or employing ordinal regression models to enhance analytical sensitivity and explanatory capacity. Although alternative approaches such as continuous or ordinal modeling could provide more detailed insights, these were beyond the scope of the current study and were therefore not implemented. Recognizing this limitation helps clarify the trade-off between statistical interpretability and data granularity.

Moreover, the exclusive focus on psychological flexibility, mindfulness, and valued living limits the scope of the present models. Future research could benefit from expanding the framework to include additional psychological and contextual variables, such as coping strategies, resilience, social support, and academic stressors, to provide a more comprehensive understanding of distress in nursing students. Finally, the limited association of valued living with anxiety and stress implies that additional factors—such as academic demands, sociocultural expectations, or perceived social support—may moderate these relationships. Future research should explore these contextual variables to better understand their influence.

Conclusions and implications

This study identified high levels of psychological distress among nursing students. Psychological flexibility and mindfulness were associated with lower levels of depression, anxiety, and stress, while valued living indicated a specific protective effect against depression. These results indicate that strengthening key psychological processes may support student well-being. However, due to the cross-sectional design and reliance on self-reported measures, the results should be interpreted with caution, and no causal relationships can be inferred. Future research could adopt longitudinal or experimental designs to evaluate the effectiveness of psychological interventions and identify additional protective or risk factors.

From an educational standpoint, the integration of structured mental health content into nursing curricula may yield significant benefits [28]. Based on the study's findings, interventions aimed at enhancing psychological flexibility and mindfulness may be prioritized, given their consistent associations with all forms of psychological distress.

For example, mindfulness practices, acceptance strategies, and values clarification can be delivered through elective courses, workshops, or brief seminar modules [48, 49]. Although such approaches are theoretically promising, future research could consider designing and evaluating pilot interventions (e.g., mindfulness workshops, values clarification sessions) within nursing curricula. Concrete examples of structured interventions could include an adapted mindfulness-based stress reduction program for nursing students, the integration of values clarification into reflective writing assignments, or ACT–based components within clinical debriefing. These formats are potentially feasible within nursing curricula as they can be integrated into existing courses or delivered as brief workshops with limited resource demands. Importantly, such pilot interventions could be systematically evaluated for feasibility, acceptability, and preliminary effectiveness, thereby providing an empirical foundation for larger-scale implementation. To support practical implementation, these components could be integrated into existing mental health or communication skills courses, included as part of clinical debriefing sessions, or offered through extracurricular student well-being programs. Embedding such content into clinical training and offering self-help resources or peer mentoring may enhance accessibility and engagement. While valued living was associated only with depressive symptoms, incorporating values clarification activities may still be beneficial for fostering meaning and motivation, particularly in demanding academic environments. Future research could also compare delivery formats (e.g., face-to-face workshops, digital modules, blended learning) to identify the most feasible and scalable strategies for nursing education. Additional measures could include integrating brief mindfulness or breathing exercises into regular classes, implementing values-based reflection activities, promoting student-led initiatives, and ensuring that mental health resources are accessible through university platforms. Beyond nursing, higher education institutions may consider offering brief, evidence-based programs or digital tools that cultivate psychological flexibility, promote well-being, and enhance students' ability to cope with academic stressors [12].

Abbreviations

AAQ-II	Acceptance and action questionnaire II
ACT	Acceptance and commitment therapy
DASS-21	Depression, anxiety, and stress scale- 21
MAAS	Mindful attention awareness scale
VQ	Valuing questionnaire

Supplementary Information

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Supplementary Material 1

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Author contributions
T.Ş.: Conceptualization, Methodology, Data Curation, Formal Analysis, Investigation, Writing – Original Draft, Writing – Review & Editing, Visualization, Project Administration. N.G.: Conceptualization, Methodology, Supervision, Investigation, Writing – Original Draft, Writing – Review & Editing. Ö.S.Y.: Conceptualization, Methodology, Formal Analysis, Data Curation, Writing – Original Draft, Writing – Review & Editing, Validation.

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Data availability
Data is available on request from the authors.

Declarations

Ethics approval and consent to participate
All procedures involving human participants were conducted in accordance with the Declaration of Helsinki and relevant ethical guidelines. Ethical approval was obtained from the Dokuz Eylul University Non-Invasive Research Ethics Committee (Approval Date: 22/09/2021, Decision Number: 2021/26 – 08). Institutional permission was also secured from the nursing school where the study took place. Participation was entirely voluntary. Students were informed both verbally and in writing about the study's objectives, procedures, their rights as participants, and their freedom to withdraw at any time without consequences. Written and verbal informed consent was obtained from all participants. To ensure confidentiality, the questionnaires were completed anonymously, and the primary researcher had no role in students' academic evaluation or instruction, minimizing the risk of coercion.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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