PYSCHE 165 JOURNAL
LPPM Universitas Putra Indonesia YPTK Padang
Lubuk Begalung Main Street, Padang, Zip Code: 25221, Sumatera Barat, Indonesia
Volume: 19, Issue: 1, Page: 1 - 8, March 30th, 2026, e-ISSN: 2502-8766
Available online at website: https://jpsy165.org/ojs/index.php/jpsy165/index

Investigating Perceived Stress and Quality of Life Among Pharmacy Students: A Systematic Review

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Abstract

Pharmacy students experience substantial stress due to demanding academic requirements, competitive educational environments, and challenges associated with transitioning into professional roles, which may negatively affect their quality of life. This systematic review aims to examine the relationship between perceived stress and quality of life among pharmacy students and to identify key stress determinants influencing their well-being. Eligible studies focused on pharmacy students, used validated instruments to measure perceived stress and quality of life, and were published between 2020 and 2024. A total of 1,040 records were identified through database searching, of which 12 studies met the inclusion criteria after screening. Two additional studies were identified through manual searching, resulting in 14 studies included in the review. The findings indicate that academic workload, financial pressure, limited social support, and concerns about transitioning into professional practice are the main contributors to perceived stress, which in turn negatively impacts students' quality of life. Commonly used assessment tools included the Perceived Stress Scale and the Short Form-12 Health Questionnaire. This review highlights the significant impact of perceived stress on the quality of life of pharmacy students and underscores the need for targeted stress management interventions to support their well-being.

Keywords: perceived stress, quality of life, pharmacy students, mental health, higher education

1. Introduction

In recent years, stress among pharmacy students has become a major concern, primarily due to its significant impact on mental health and academic performance [1]. Previous research has shown that stress and depression act as substantial barriers for pharmacy students in seeking help and achieving academic goals. Moreover, elevated stress levels have been associated with academic misconduct and a decline in overall quality of life (QoL) among this population [2,3]. Students in health-related disciplines, including pharmacy, are frequently exposed to high academic workloads, strong performance expectations, and intense competition. Several studies have reported that pharmacy students experience higher levels of stress compared to students in other academic fields [4,5].

Perceived stress refers to the extent to which individuals perceive their life situations as unpredictable, uncontrollable, and overwhelming. This psychological construct has been consistently associated with adverse health outcomes, including anxiety, depression, and reduced life satisfaction [6,7]. Among pharmacy students, the demanding nature of academic training, combined with external stressors such as those introduced during the COVID-19 pandemic, may intensify perceived stress and negatively affect mental well-being. Consequently, understanding how perceived stress influences the QoL of pharmacy students is essential for addressing their psychological health needs [8].

Quality of life is a multidimensional concept encompassing physical, psychological, social, and environmental domains. Within the context of higher education, students' QoL is shaped by multiple factors, including academic stress, social support, and the balance between academic responsibilities and personal life [9]. QoL is commonly assessed using indicators such as perceived happiness, functional ability in daily activities, and individuals' evaluations of their living conditions [10]. Empirical evidence from studies conducted in various settings, including Ghana, has demonstrated a significant association between elevated stress levels and poorer QoL among pharmacy students,

Submitted: 05-01-2026 | Revised: 12-02-2026 | Accepted: 10-03-2026 | Published: 30-03-2026

highlighting the need for greater attention to student mental health and well-being [3].

However, despite the growing body of research examining stress and quality of life among pharmacy students, existing evidence remains fragmented and varies across countries, educational systems, and measurement instruments. Differences in study design, assessment tools, and contextual factors limit the ability to draw comprehensive conclusions regarding the relationship between perceived stress and QoL in this population. To date, a systematic synthesis of available evidence that integrates findings across diverse settings remains limited.

Therefore, the primary objective of this systematic review is to examine perceived stress and quality of life among pharmacy students by synthesizing existing research. This review aims to identify common stressors, explore their impact on students' well-being, and highlight potential strategies for mitigating adverse outcomes. By providing a comprehensive overview of current evidence, this study seeks to contribute to the understanding of psychological challenges faced by pharmacy students and to inform the development of targeted interventions and educational policies that support their mental health and preparation for future roles in healthcare.

2. Methods

2.1 Criteria for Considering Studies for This Review

Studies were eligible for inclusion if they were published between 2020 and 2024, written in English, and examined perceived stress and quality of life among undergraduate pharmacy students. Observational studies that employed a cross-sectional design were included, as this design was the most commonly used approach to assess stress-related outcomes in the included literature. Studies were excluded if they were books, narrative reviews, literature reviews, or conference abstracts, or if full-text access was unavailable. In addition, studies involving participants who were not pharmacy students or that explicitly focused on students with prediagnosed mental health conditions were excluded.

2.2 Search Strategy

A systematic literature search was carried out using electronic databases, namely ScienceDirect, Scopus, and PubMed, between October and December 2024. Keywords related to stress (e.g., "perceived stress," "stress," "distress"), quality of life (e.g., "quality of life," "QoL"), and population (e.g., "pharmacy students," "student pharmacists," "undergraduate pharmacy students") were combined using Boolean operators ("AND" and "OR"). In addition, targeted journal searching was conducted in *Pharmacy Education*, and the reference lists of included studies were manually screened to identify further relevant articles.

2.3. Study Selection

All identified records were imported into the Zotero reference manager, and duplicate entries were removed. Titles and abstracts were screened to assess eligibility based on the predefined inclusion criteria. Full-text articles of potentially relevant studies were then reviewed in detail to confirm eligibility. The study selection process followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.

2.4 Data Extraction and Quality Assessment

Data extraction was performed using a standardized form that captured information on authors, publication year, study location, sample characteristics, outcome measures, determinants of stress, and quality of life outcomes. Extracted data were organized using Microsoft Excel. The methodological quality of included studies was assessed using the Joanna Briggs Institute (JBI) critical appraisal tool for prevalence studies. Each item was scored as 1 ("yes") or 0 ("no," "unclear," or "not applicable") [11]. The quality assessment results were used to support the interpretation of findings but did not serve as exclusion criteria.

2.5 Data Synthesis

Due to heterogeneity in study design, measurement instruments, and reported outcomes, a narrative synthesis approach was employed to summarize and interpret the findings.

3. Results and Discussions

3.1 Study Selection, Study Characteristics, and Methodological Quality of Included Studies

A total of 1,040 records were identified through database searching (ScienceDirect, Scopus, and PubMed) and targeted journal searching (*Pharmacy Education*). After removing records prior to screening based on publication year, article type, and full-text availability, 75 records remained for title and abstract screening. Of these, 48 records were excluded, resulting in 21 full-text articles assessed for eligibility. Following full-text evaluation, 12 studies met the inclusion criteria. In addition, two relevant studies were identified through manual searching, leading to a total of 14 studies included in the final review (Figure 1).

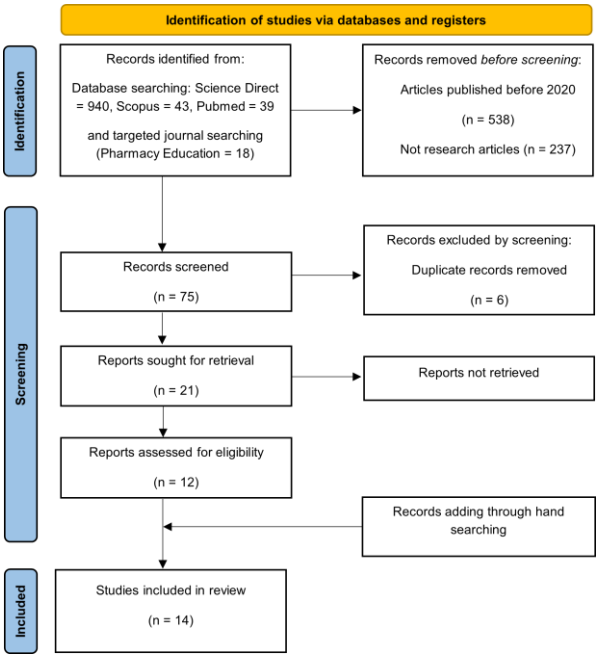

Figure 1. PRISMA flow diagram of the study selection process

The general characteristics of the included studies are summarized in Table 1. The studies were conducted across diverse geographic settings, including Nigeria [12,13], the United States [14–16], Saudi Arabia [7], Indonesia [17,18], Malaysia [10], the United Arab Emirates [19], Thailand [20], Romania [21], France [22], and Jordan [23], with the majority originating from the United States. All included studies employed an observational cross-sectional design and focused on undergraduate pharmacy students. Sample sizes varied substantially across studies, reflecting heterogeneity in study populations and educational contexts. A range of validated instruments was used to assess perceived stress and quality of life, including the Perceived Stress Scale (PSS), Depression Anxiety Stress Scale (DASS-21), WHOQOL-BREF, and SF-12.

Table 1. General Characteristics of the Included Studies

Author (Year)	Sample Description	Outcome Measures	Determinants of Stress & QOL
Anene-Okeke *et al*., (2024)	740 undergraduate pharmacy students from the University of Nigeria were sampled between June and July 2023	SSEIT, PSS-10	Academic demands, time and financial management difficulties, psychological pressure
Saul et al., (2021)	113 PharmD students from a public research university in the United States were sampled during the spring semester	PSS-10, SF-12	Academic rigor, cultural and language factors, transition phases
Zakeri et al., (2021)	238 PharmD students from the University of Houston were sampled in April 2020	CCAPS-62	Academic distress, family distress, financial distress
Kristina et al., (2020)	330 pharmacy students from Universitas Gadjah Mada were sampled in December 2019	PSS-10	Academic pressure, transition to professional practice
Alkatheri *et al*., (2020)	479 health sciences students from King Saud Bin Abdulaziz University were sampled during the 2015-2016	WHOQOL-BREF, PSS-14, EDS	Academic pressure, financial concerns, lack of support
Aluh *et al*., (2020)	408 undergraduate pharmacy students from seven universities in Nigeria were sampled between April and September 2019	DASS-21	Academic pressure, time management challenges, financial concerns
Mardea *et al*., (2020)	487 pharmacy students from universities in Yogyakarta were sampled between June and July 2019	PSS-10	Academic pressure, financial issues, social stressors
Blebil *et al*., (2021)	371 pharmacy students from public and private universities in Malaysia were sampled between March and May 2020	PSS-4, PHQ-9, WHOQOL-BREF	Academic pressure, lack of support, social and emotional factors
Alomar *et al*., (2021)	81 final-year BPharm students from Ajman University were sampled between April and May 2020	PSS-10. WHOQOL-BREF	Academic pressure, social isolation, adaptation to virtual learning
Tiaprapong *et al*., (2021)	1001 health professional students in Thailand were sampled between September and October 2020	PSS-10, PHQ-9, MSPSS, WHOQOL-BREF	Sociodemographic factors, changes in the learning environment
Mihăilescu *et al*., (2024)	613 undergraduate medical students from Carol Davila University were sampled between June 2020 and March 2022	BFI-2XS, FCV-19S, PSS-10, SWLS	Changes in the academic environment, Social isolation
Van Hooser *et al*., (2022)	253 pharmacy students across four academic years from the University of Minnesota were sampled during the fall semester of 2019	QOL, PSS-4	Academic pressure, desire to work with underserved populations

Leaune *et al*., (2022)	1765 health sciences students from Claude Bernard Lyon 1 University were sampled in April 2020	BDI-SF, Brief-COPE, SF-12	Academic pressure, pandemic-related financial restraint, social isolation
Almhdawi *et al*., (2021)	485 undergraduate healthcare students from multiple universities in Jordan were sampled during 2020	SF-12. DASS-21, IPAQ-SF, NDI	Physical health issues, increased academic load, social isolation

The methodological quality of the included studies was evaluated using the Joanna Briggs Institute standardized critical appraisal checklist for prevalence studies, with detailed results summarized in Table 2. Overall, the studies demonstrated good methodological quality, with quality scores ranging from 7 to 8 out of a possible 8 and a mean score of 7.43, indicating a generally low risk of methodological bias. The most frequently identified limitation was the absence of explicit reporting on approaches used to control potential confounding factors, which was observed in eight studies. Despite this limitation, all included studies applied sample stratification during data analysis, suggesting efforts to improve analytical rigor and enhance the reliability of the findings.

Table 2. Methodological Quality Assessment of Included Studies

Author (Year)	JBI Score	Overall Quality
Anene-Okeke *et al*., (2024)	7	Good
Saul et al., (2021)	7	Good
Zakeri et al., (2021)	8	High
Kristina et al., (2020)	7	Good
Alkatheri *et al*., (2020)	8	High
Aluh *et al*., (2020)	7	Good
Mardea *et al*., (2020)	7	Good
Blebil et al., (2021)	7	Good
Alomar *et al*., (2021)	8	High
Tiaprapong *et al*., (2021)	7	Good
Mihăilescu *et al*., (2024)	8	High
Van Hooser *et al*., (2022)	8	High
Leaune *et al*., (2022)	8	High
Almhdawi *et al*., (2021)	7	Good

3.2 Determinants of Stress and Quality of Life among Pharmacy Students

This systematic review evaluated and analyzed the levels of stress experienced by undergraduate pharmacy students and its impact on their QoL. The stress experienced by students may negatively affect various aspects of their QoL, including their physical and mental health [24,25]. Perceived stress among pharmacy students is influenced by a complex interaction of individual and contextual factors. Previous evidence suggests that academic stress is shaped by multiple internal characteristics, such as self-efficacy, optimism, achievement motivation, and procrastination, as well as external factors including social support and the academic environment [26]. Several factors that influence the relationship between stress and QoL have been identified, such as gender differences, academic demands, years of study, transition to professional practice, and financial distress.

Gender differences in the context of stress levels and QoL among pharmacy students exhibited varying results. Research indicates that female students tend to report higher levels of stress and are twice as likely to experience depression compared to their male counterparts [12,16,27]. This may be attributed to the higher levels of academic difficulty they encounter [15]. Two other studies also reported that female pharmacy students experience higher levels of stress [18,19]. The Student-Life Stress Inventory scores were significantly higher for females than for males. In addition, the HRQOL mental component score (MCS-12) for females was significantly lower than that for males. It is thus intuitive that because females have higher stress scores, they should have lower mental component HRQOL score [4,28]. In this pilot study, the female subset of students reported significantly higher levels of perceived stress and lower mental HRQOL than their male classmates. In this study, female respondents most often indicated that family and relationships were the most common stress triggers [29]. However, another study indicated that no significant differences in stress levels were found between male and female pharmacy students. This suggests that the causes of stress experienced by students are not dependent on their gender, but rather that these factors are common and affect male and female students similarly [19,30]. The magnitude of the correlation coefficient between students' life stress and the mental component of HRQOL does not vary by gender, and the relationship between stressful life events and mental health is not moderated by gender [31].

A mental health report revealed findings related to academic stress and perceived stress among elite students from South Africa. In terms of academic performance, high levels of stress resulted in academic fatigue and procrastination [32]. Conversely, students with less stress were more likely to succeed [29]. When students are given a large number of tasks that they find challenging to complete, they become more stressed. This may also be a result of financial issues and feelings of disappointment that they experience [33,34]. During the COVID-19 pandemic, students faced more responsibilities, such as studying from home and managing other matters. These increased pressures led to heightened levels of stress and depression, which resulted in a lower QoL [23,35]. One study from Indonesia mentioned that among the various causes of stress examined, the highest stress factor was the national high-stakes examination, followed by final projects and coursework. Difficult and unexpected tasks, along with the long study durations and special

skills required, caused the students to feel pressured and frustrated [18].

The number of years of study has a considerable impact on the stress levels and QoL of pharmacy students. Fifth-year students reported feeling higher levels of stress than students in other years [17,18]. However, this contrasts with other research that indicates that final-year students have lower levels of depression compared with students in their earlier years of studies [36]. The pharmacy curriculum in Nigeria is designed in such a way that the final year has fewer courses and exams. Therefore, with fewer assignments, final-year students typically have a lighter workload, which allows them more time for self-care and ultimately experiencing fewer health issues [12].

Perfectionism plays a critical role in influencing the distress levels of pharmacy students, with both self-oriented and socially prescribed perfectionism contributing to heightened anxiety and feelings of inadequacy [37]. This pattern aligns with findings that show a difference in stress levels based on grade point average (GPA) and the types of stressors experienced. Students with higher GPAs tended to feel more stressed compared to those with lower GPAs. This may be explained by the fact that high-achieving students generally have higher academic outcome expectations, and thus they may be more vulnerable to depression due to parental expectations [2,18,38].

The transition to professional practice is a crucial phase for pharmacy students. Students approaching the end of their studies must prepare to enter the workforce, and uncertainty about the future and pressure to be professionally ready can add to their stress burden [1,39]. In addition, the shift from a structured academic environment to the more unpredictable nature of professional practice can create uncertainty and a fear of failure. This transition period can substantially affect their mental health and overall QoL, as students struggle to adapt to their new roles while managing the stress associated with their educational experiences [17,40].

Financial factors have been identified as notable contributors to increased stress levels and decreased QoL among pharmacy students, particularly during the COVID-19 pandemic. The pandemic caused economic uncertainty, job losses, and changes in financial support systems, which increased the financial pressure on students [22,41]. The cost of pharmacy education is often higher than that of non-pharmacy programs, which may lead to financial stress. Many pharmacy students have reported that financial problems were a substantial source of stress, affecting their overall well-being and QoL [42].

3.3 Supportive Factors for Managing Stress and Enhancing Quality of Life

In the context of pharmacy education, a comprehensive understanding of the factors that influence stress and QoL among students is crucial for creating a supportive learning environment. One important aspect that requires attention is how the interaction between individual factors and the social environment can influence the levels of stress experienced by students. For example, students who have good time management skills and strong social support from friends and family are generally better able to cope with high academic pressure [5,43]. However, those who feel isolated or lack a support network often experience increased anxiety and depression, which can negatively impact their academic performance [44,45].

Evidence further suggests that higher levels of perceived social support are associated with lower stress levels and better psychological well-being among university students [46]. Social support may function as a buffering mechanism that helps students manage academic demands by providing emotional reassurance, practical assistance, and a sense of belonging. In addition to social support, resilience has been identified as an important protective factor, particularly among final-year students facing elevated academic stress. Higher resilience and stronger social support networks have been shown to reduce stress levels and contribute to better quality of life by enhancing students' ability to adapt to academic challenges and maintain psychological stability [47].

In addition, it is important to consider the role of institutional policies in addressing stress among pharmacy students. Policies that support mental well-being, such as providing easily accessible counseling services and programs for the development of coping skills, can help students manage stress more effectively [48]. Research has shown that an academic environment that is inclusive and responsive to students' needs contributes to improved QoL and mental well-being [49,50]. Career decision levels (e.g., decidedness and comfort) in relation to academic self-efficacy are also important factors influencing how pharmacy students perceive their career paths and manage stress.. A clear career decision may lead to reduced anxiety and improved quality of life, as students feel more secure in their future prospects [51]. The implications of self-compassion can be an effective strategy to reduce stress and enhance quality of life for students' mental health and academic performance [52]. The use of VR in mindfulness programs can be particularly beneficial for pharmacy students, who often face high levels of stress. By utilizing VR, students can engage in mindfulness exercises that help them manage stress more effectively. This innovative approach can provide a unique and effective way to cope with the pressures of academic life [53]. Therefore, a holistic approach that integrates academic, social, and emotional aspects in pharmacy education would be highly beneficial in creating a generation of healthcare professionals who are competent as well as mentally and emotionally healthy.

3.4 Limitations and Future Work

This study has several limitations. First, it only included studies published in English for the last five years (2020-2024); thus, relevant research from other languages or earlier periods may have been potentially excluded. This may limit the generalizability of the findings, as stress and QoL among pharmacy students could differ across time and cultural contexts. Second, the use of cross-sectional studies, while valuable for identifying associations, does not allow for determining causal relationships between perceived stress and QoL. Longitudinal studies would offer better insights into the long-term effects of stress. Third, variations in the measurement tools used across the studies (e.g., PSS-10, SF-12, and DASS-21) could influence the comparability of the results. Moreover, the review did not consider potential confounding factors, such as institutional policies, cultural differences, or existing mental health conditions, which could have affected the findings. Finally, the manual search for additional studies, although thorough, could have introduced selection bias. Future reviews should expand the inclusion criteria, include longitudinal approaches, and account for confounding factors to better elucidate the link between stress and QoL among pharmacy students.

4. Conclusions

This systematic review demonstrates that perceived stress is consistently associated with poorer quality of life among pharmacy students across diverse educational and geographic contexts. Higher stress levels were found to negatively affect physical, psychological, and social well-being, with academic workload and performance pressure emerging as the most prominent stressors, followed by financial challenges, limited social support, and concerns related to the transition to professional practice. These findings directly address the research objective by clarifying how perceived stress and its key determinants influence quality of life in this population. By synthesizing evidence from multiple countries and educational systems, this review contributes to the literature by providing a structured overview of common stress determinants and their implications for pharmacy students' well-being. The findings highlight the need for targeted and context-sensitive interventions within pharmacy education, including institutional mental health support, workload management strategies, and programs to strengthen coping skills and self-compassion. Several limitations should be acknowledged. The predominance of cross-sectional study designs limits causal interpretation, and heterogeneity in measurement instruments may affect comparability across studies. Future research should employ longitudinal and interventional designs and utilize standardized assessment tools to better evaluate the long-term impact of stress reduction strategies on quality of life among pharmacy students.

Funding Information

The authors state no funding involved.

Author Contributions Statement

Name of Author	C	M	So	Va	Fo	I	R	D	W
Dhea Ananda Fitri	✓	✓	✓		✓	✓		✓	✓
Susi Ari Kristina		✓		✓	✓		✓		✓
Vo Quang Trung				✓	✓				✓

Conflict of Interest Statement

The authors state no conflict of interest.

Data Availability

The authors confirm that the data supporting the findings of this study are available within the article.

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