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THE SOCIETAL IMPACT OF STRESS AMONG INTENSIVE CARE UNIT NURSES AND MANAGEMENT MECHANISMS FOR ITS MITIGATION

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Abstract

This article examines how occupational stress among intensive care unit nurses extends beyond the individual worker and affects patient safety, workforce stability, healthcare service capacity, families, and society. The study used an integrative secondary synthesis of three unique scientific sources provided for analysis: a 2021 systematic review and meta-analysis of burnout among intensive care unit nurses, a 2025 cross-sectional survey of 189 newly graduated intensive care nurses using the PSS-10 and ENSS-57, and a 2026 scoping review covering 26 studies, 6,877 nurses, and 17 countries. The evidence was compared across four domains: determinants of stress, health and professional consequences, pathways of societal impact, and management responses. The synthesis indicates that workload, long working hours, inadequate staffing, poor supervisory and peer support, uncertainty regarding treatment, emotional strain, discrimination, and insufficient organizational resources are recurrent stressors. Consequences include emotional exhaustion, reduced job satisfaction, intention to leave, impaired well-being, and an increased risk of care-related errors. A five-stage management mechanism is proposed: early identification, risk stratification, targeted intervention, reassessment, and stabilization. A limited pharmaceutical-care component is incorporated through structured cooperation between nurses and pharmacists in medication-related communication, workload sharing, treatment clarification, and error-prevention routines. This pharmaceutical component is presented as a conceptual management extension rather than as a directly validated causal finding from the included sources. The proposed framework may help hospital managers translate evidence on stress into coordinated workforce, patient-safety, and pharmaceutical-care actions.

Keywords: occupational stress; intensive care unit nurses; burnout; patient safety; stress management; workforce sustainability; pharmaceutical care; clinical pharmacy; interdisciplinary collaboration.

Introduction

Intensive care units are among the most complex clinical environments in the healthcare system. In these settings, rapid changes in patients' conditions, the need for continuous monitoring, life-threatening situations, high levels of responsibility, and the requirement to make correct decisions within a short period of time occur simultaneously.

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As the healthcare professional who has the most frequent and continuous contact with the patient, the nurse directly experiences a substantial share of this pressure. Therefore, stress among intensive care unit nurses cannot be interpreted merely as an individual psychological condition. It is a multilayered management problem that intersects with work organization, patient safety, staff turnover, family well-being, healthcare resources, and public trust in medical services [1, 20].

Occupational stress arises when the mismatch between job demands and an employee's capacity to meet those demands increases. In intensive care settings, this mismatch extends far beyond a heavy workload alone: high patient acuity, frequent exposure to death and severe complications, continuous use of technological equipment, rapid collaboration with physicians and other professionals, emotionally demanding communication with patients' relatives, and prolonged shifts may all be concentrated within a single working day. A 2026 scoping review synthesized findings from 26 studies involving 6,877 nurses in 17 countries and identified high workload, resource shortages, and organizational factors as central sources of stress [1].

Burnout is particularly important as one of the long-term consequences of unmanaged stress. Its manifestations, including emotional exhaustion, depersonalization toward patients, and a reduced sense of personal accomplishment, affect both nurses themselves and the care provided to patients. A 2021 systematic review and meta-analysis based on studies involving 1,986 intensive care unit nurses estimated the prevalence of high emotional exhaustion at 31%, high depersonalization at 18%, and low personal accomplishment at 46% [20]. These figures indicate that the problem of stress extends far beyond the level of isolated individual complaints.

The societal impact of stress develops through several intermediate pathways. The first pathway concerns the employee's physical and mental health. Burnout may be accompanied by insomnia, anxiety, depressive symptoms, prolonged fatigue, and job dissatisfaction [20]. The second pathway concerns workforce stability: absenteeism, the desire to transfer to another unit, or the intention to leave the profession may increase. The third pathway is patient safety; employee exhaustion and reduced attentional capacity may affect the quality of care and the risk of errors [11, 20]. The fourth pathway concerns the staffing and financial stability of the healthcare system.

Newly graduated nurses constitute a distinct high-risk group. In a 2025 cross-sectional study of 189 newly graduated intensive care unit nurses, the mean overall perceived stress score was 29.80, with a standard deviation of 5.02. The highest-ranked sources of stress were discrimination, problems with supervisors, and workload; insufficient peer support, uncertainty regarding treatment, and working with patients and their relatives were also identified as important factors [2]. These findings highlight the need to manage adaptation particularly carefully during the first months of employment.

For society, the problem is not limited to a nurse's emotional state at the workplace. If stress becomes persistent in intensive care units, retaining experienced staff becomes more difficult, the cost of preparing new employees increases, and the workload imposed on the remaining team intensifies further. This creates a self-reinforcing cycle: staff shortages increase workload, workload intensifies stress, and stress increases the likelihood that

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employees will leave. This mechanism directly affects the healthcare system's preparedness for emergencies, continuity of services, and capacity to provide timely care to the population [13, 18].

Another important dimension of the problem is the medication-use process in intensive care units. In such units, prescribing, preparing, administering, and monitoring the effects of medications require multistage collaboration. Nurses occupy a central position in the practical implementation of this chain. Stress, fatigue, uncertainty regarding treatment, and inadequate communication may be associated with an increased general risk of care-related errors [11, 20]. It is therefore logically justified to consider clear and regular collaboration with pharmacy professionals as an auxiliary organizational mechanism for stress management. However, it should be noted that the principal sources analyzed did not specifically measure a causal relationship between medication errors and nurses' stress.

In the 2026 scoping review, the authors emphasized that findings on reducing stress may be applicable not only to nurses but also to physicians, pharmacists, and other healthcare professionals. The review recommended measures such as interdisciplinary support networks, peer support, mental health services, rational shift organization, and improvement of nurse-to-patient ratios [1]. This provides a basis for interpreting pharmaceutical activity in the present article not as an artificial addition to the main topic, but as an interdisciplinary management mechanism that contributes to a safe treatment process in the intensive care unit.

Although current literature provides substantial evidence on individual indicators of stress and burnout, the questions of how these effects are transmitted to the societal level, in what sequence management decisions should be implemented, and at what stage cooperation related to medication safety should be incorporated are often addressed in a fragmented manner. Integrating the evidence into a single management cycle is therefore of practical importance. The present article seeks to address this gap by proposing one system that extends from the identification of stress through risk stratification, targeted intervention, reassessment, and stabilization.

The aim of the study is to analyze the consequences of occupational stress among intensive care unit nurses at the levels of the employee, the patient, the healthcare organization, and society; to formulate multilevel management mechanisms for reducing stress; and to conceptually identify points of interdisciplinary collaboration related to pharmaceutical services. To achieve this aim, evidence from three principal scientific sources was compared, duplicate files were treated as a single source, stress factors and consequences were organized into thematic groups, and a practical management cycle was developed.

Materials and methods

This study was not based on the collection of new primary clinical data. The research design was structured as a targeted integrative secondary analysis. Three unique scientific studies directly relevant to the topic were included in the analytical base: a 2021 systematic review and meta-analysis on the prevalence and risk factors of burnout among intensive care unit nurses; a 2025 cross-sectional study involving 189 newly graduated intensive care

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nurses; and a 2026 scoping review covering 26 studies, 6,877 nurses, and 17 countries [1, 2, 20]. Duplicate files with identical content were not counted as separate studies.

Three criteria were applied in selecting the sources. First, the study had to examine nurses working in intensive or critical care units. Second, it had to address at least one of the following: occupational stress, burnout, workload, mental health, attitudes toward work, or management interventions. Third, the results had to be sufficiently explicit to support practical management conclusions. This approach made it possible to combine, on the one hand, quantitative indicators and, on the other hand, management recommendations at the organizational, team, and individual levels.

The 2021 study included 15 articles in the systematic review, four of which were included in the quantitative meta-analysis. The total sample consisted of 1,986 nurses, and the three principal components of burnout were assessed [20]. In the present article, this source served as a primary evidence base for evaluating the prevalence of burnout, the role of workload and long working hours, and the importance of the work environment as a protective factor.

The 2025 cross-sectional study was conducted in the adult and pediatric intensive care units of a large medical center in Saudi Arabia. Using convenience sampling, it included 189 newly graduated nurses with less than one year of experience [2]. The 10-item Perceived Stress Scale was used to measure stress levels, while the 57-item Expanded Nursing Stress Scale was used to identify sources of occupational stress. The latter instrument covers nine domains: death and dying, conflict with physicians, inadequate emotional preparation, problems with peers, problems with supervisors, workload, uncertainty concerning treatment, working with patients and their families, and discrimination.

The 2026 scoping review examined studies published between 2019 and 2024 and ultimately included 26 studies. The overall coverage comprised 6,877 nurses from 17 countries [1]. The authors thematically synthesized occupational stressors, coping strategies, and general health outcomes. This source provided particularly broad information on resource shortages, high nurse-to-patient ratios, shift characteristics, social stigma, relationships with management, problem-focused coping strategies, and the role of psychological resilience.

A four-domain analytical matrix was used for data extraction. The first domain recorded sources of stress; the second, nurses' physical, psychological, and professional consequences; the third, pathways through which effects extend to patient safety, the organization, and society; and the fourth, management and preventive measures. Each finding was interpreted in conjunction with the design of its source study. Accordingly, associations observed in the cross-sectional study were treated as observed associations rather than causal relationships, while recommendations from the systematic and scoping reviews were evaluated at the level of evidence synthesis.

Quantitative results were not recalculated, and no new pooled statistical indicators were generated. Percentages, means, standard deviations, and confidence intervals reported in the original sources were selectively retained without changing their substantive

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meaning. This approach was adopted because the three principal sources differed in design: one was a systematic review and meta-analysis, one was a cross-sectional observational study, and one was a scoping review of the literature. Combining them into a single new quantitative estimate would have been methodologically unjustified.

In analyzing societal impact, directly measured indicators were strictly distinguished from the logical management pathway. For example, absenteeism, job dissatisfaction, intention to leave the profession, deterioration in mental health, and errors related to patient safety were treated as outcomes documented in the literature [11, 14, 18, 20]. However, the monetary value of society-wide economic losses, increases in pharmaceutical expenditure, and the precise frequency of medication errors were not measured in the three principal sources. Therefore, such aspects were not quantified in the Results section and were presented in the Discussion as cautious conceptual inferences.

The pharmaceutical dimension was included as a separate supplementary layer of analysis. It was based on three lines of evidence: first, uncertainty regarding treatment was identified as a source of stress among newly graduated nurses [2]; second, high stress and burnout were associated with quality of care and risk of errors [11, 20]; and third, the 2026 scoping review indicated that its findings were relevant to other healthcare professionals, including pharmacists, and emphasized the importance of interdisciplinary collaboration [1]. On this basis, the participation of a clinical pharmacist was proposed as a management element that could strengthen treatment clarity, medication-related communication, and safety.

At the final stage, the evidence was organized into a five-stage management cycle: early identification, risk stratification, targeted intervention, reassessment, and stabilization. This cycle is not a new psychometric scale or a clinical diagnostic instrument. It is a conceptual framework developed to translate existing scientific evidence into practical management decisions. Consequently, the effectiveness of the model should be tested in future prospective research, inter-unit comparisons, or stepwise implementation studies.

Table 1. Characteristics of the three principal sources included in the analysis

Source	Study design	Coverage	Main measure or focus	Relevance to the present article
Al-Qaisi et al., 2026	Scoping review	26 studies; 6,877 nurses; 17 countries	Occupational stressors, coping strategies, general health	Multilevel organizational measures and interdisciplinary collaboration

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Alqarni et al., 2025	Cross-sectional study	189 newly graduated nurses	Perceived stress and nursing stressors across nine domains	Early-employment risks; supervisors, peers, workload, and treatment uncertainty
Ramírez-Elvira et al., 2021	Systematic review and meta-analysis	15 articles; 1,986 nurses in the quantitative synthesis	Burnout levels, prevalence, and risk factors	Burnout prevalence, workload, long working hours, and protective factors

Results

The integrative analysis of the three principal sources showed that stress among intensive care unit nurses cannot be explained by a single cause. Recurrent factors were classified into five groups: workload and time pressure; organizational resources and staffing shortages; leadership and team relationships; clinical uncertainty and high responsibility; and emotional burden and individual adaptation. These groups may occur independently, but in practice they often reinforce one another. For example, staff shortages prolong shifts, prolonged shifts increase fatigue, and fatigue reduces tolerance for complex decision-making and communication.

In the 2025 study, the mean overall perceived stress score was 29.80, with a standard deviation of 5.02. The authors interpreted this level as indicating that stress was experienced frequently [2]. Among sources of occupational stress, discrimination ranked first with a mean score of 3.12, problems with supervisors ranked second at 3.03, and workload ranked third at 2.90. Conflict with physicians had a comparatively lower mean score of 2.48 among the reported factors. This finding indicates that it is incorrect to attribute stress solely to the severity of patients' conditions; management and the team environment are at least equally important.

Specific risk points were observed among newly graduated staff during the first months of employment. Problems related to peer support were more common during the period from zero to three months. The discussion of the study noted that a newly graduated nurse may have difficulty fully integrating theoretical knowledge into practical situations, may lack experience and professional confidence, and may fear making errors in a technologically complex environment [2]. Therefore, applying the principle of 'the same workload - the same expectations' equally to novice and experienced nurses may intensify rather than reduce stress.

Working time also emerged as an important factor. The 2025 study reported higher stress among full-time nurses than among part-time nurses and higher perceived stress among those who worked more hours [2]. The 2021 systematic review likewise identified workload and long working hours as major work-related risk factors for burnout [20]. The

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2026 scoping review also listed extended working hours, high nurse-to-patient ratios, and shift characteristics among factors associated with stress levels across different countries [1, 22].

The 2021 findings on burnout quantitatively demonstrate a long-term occupational consequence of stress. High emotional exhaustion was estimated at 31%, high depersonalization at 18%, and low personal accomplishment at 46% [20]. A low sense of personal accomplishment is particularly important from a management perspective because employees may begin to perceive less meaning in their work, view themselves as less effective, and experience a weaker psychological connection with the organization. This may negatively affect policies aimed at staff retention and attracting a new generation of nurses to the profession.

Psychological and physical consequences are also important. Burnout has been associated with anxiety, depressive symptoms, sleep problems, prolonged fatigue, and certain somatic complaints [20]. The 2026 scoping review likewise reported that mental health problems and sleep disturbances occurred more frequently in groups experiencing higher stress; task-oriented coping strategies, particularly problem solving and planning, were associated with better psychological outcomes in some studies [1]. Thus, stress management should not be limited to changing work schedules but should also include individual recovery and coping skills.

Patient-safety outcomes represent one of the most important pathways through which stress extends to society. The 2021 review associated burnout with poorer quality of care, errors in professional practice, and a higher risk of adverse patient outcomes [20]. A separate systematic review of healthcare staff well-being, burnout, and patient safety also demonstrated this association in general healthcare settings [11]. Although these sources do not establish every stage of the causal mechanism with equal certainty, they support the conclusion that staff well-being cannot be separated from patient safety.

The second pathway of societal impact operates through workforce stability. Stress and burnout are associated with absenteeism, reduced job satisfaction, and intention to leave the profession [14, 18, 20]. This risk is particularly important for newly graduated nurses because leaving an organization before completion of the professional adaptation period disrupts continuity of experience and increases the burden of retraining [12, 13]. As a result, the workload of the staff who remain in the unit may increase. Thus, an employee's individual stress may, in a cyclical manner, generate new stressors within the system.

The third pathway of societal impact concerns the family and social spheres. The 2026 scoping review identified family concerns, social stigma, and prolonged periods away from home as sources of stress in some countries [1]. In the 2025 study, some newly graduated nurses with children experienced higher stress related to peer support [2]. These findings provide a basis for viewing the balance between work and home roles as a management issue. Employers should consider not only filling the shift schedule but also ensuring that employees have sufficient time for recovery and family responsibilities.

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The fourth pathway of societal impact operates through the resource efficiency of the healthcare organization. Staff turnover, sickness absence, retraining, and orientation of new employees require management resources. The principal sources analyzed did not calculate the exact monetary value of these costs. Nevertheless, the association of burnout with job satisfaction and intention to leave [18, 20], together with the challenge of retaining newly graduated nurses [13], allows stress management to be interpreted as an indirect factor in an organization's economic sustainability.

A finding particularly relevant to pharmaceutical activities is that the 2025 study identified uncertainty regarding treatment as a distinct domain of stress [2]. In intensive care units, questions may frequently arise concerning medication doses, infusion rates, compatibility, monitoring requirements, and dose adjustment according to the patient's renal or hepatic function. The analyzed sources did not measure each of these processes separately. Nevertheless, introducing a rapid consultation mechanism among nurses, physicians, and pharmacy professionals to reduce uncertainty regarding treatment may be proposed as an organizational solution that simultaneously supports stress management and patient safety.

On the basis of the evidence synthesis, a five-stage stress-management cycle was developed. The first stage is early identification. At this stage, employees' perceived well-being, sources of occupational stress, and signs of burnout are assessed regularly. The second stage is risk stratification; situations involving new staff, long shifts, high workload, or weak supervisory or peer support are classified as higher risk. The third stage is targeted intervention; measures are implemented to improve shift design, workload distribution, mentoring, peer support, psychological assistance, and clarity regarding treatment.

The fourth stage is reassessment. Following intervention, trends in stress, absenteeism, staff turnover, patient-safety incidents, conflicts within the team, and requests for consultation about treatment are reviewed regularly. The fifth stage is stabilization. Effective measures are incorporated into standard operating procedures, responsibilities are assigned to managers, and unit-level results are discussed periodically. After completion of the cycle, the process returns to the stage of early identification. In this way, stress management becomes not a one-time activity but a continuous quality-management process.

The pharmaceutical component of the management cycle is positioned at three points. The first is during risk stratification, when employees or shifts characterized by frequent uncertainty regarding treatment are identified. The second is during intervention, when scheduled consultation periods with a pharmacy professional, brief guidance on complex medications, and a communication channel during shifts are introduced. The third is during reassessment, when medication-related clarifications, delays, and near-miss events are analyzed without blame. Such a mechanism manages stress not as a 'personal weakness of the nurse' but by reducing uncertainty and workload within the system.

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Table 2. Pathways through which stress affects society

Initial factor	Consequence for the nurse	Impact on the organization and patient	Potential outcome at the societal level
High workload and long shifts	Fatigue, emotional exhaustion	Reduced attention and job satisfaction	Weakened workforce stability
Insufficient supervisory and peer support	Isolation, insecurity	Poorer team coordination	Pressure on continuity of healthcare services
Uncertainty regarding treatment	Fear of making errors, psychological strain	Slower decision-making and communication	Indirect effects on patient safety and trust
Burnout	Job dissatisfaction, intention to leave	Staff turnover and need for retraining	Additional burden on healthcare resources
Family and social pressure	More difficult recovery	Disruption of shift stability	Effects on family well-being and work capacity

Table 3. Proposed multilevel stress-management cycle

Stage	Primary task	Nurse level	Organization level	Point of pharmaceutical collaboration
1. Early identification	Identify signs of stress and burnout	Self-assessment, confidential survey	Periodic screening and a safe reporting channel	Record recurrent questions related to treatment uncertainty
2. Risk stratification	Identify priority risk groups	New staff, family burden, limited experience	High workload, long shifts, staffing shortages	Identify shifts involving many complex medication processes
3. Targeted intervention	Select measures appropriate to the cause	Resilience and problem-solving skills	Shift redesign, mentoring, supervisory support	Nurse-physician-pharmacist consultation procedure

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4. Reassessment	Monitor outcomes	Stress trends and job satisfaction	Monitor turnover, absence, and team climate	Analyze medication-related clarifications and near-miss events
5. Stabilization	Standardize effective measures	Reinforce safe work practices	Integrate quality indicators into management	Incorporate pharmaceutical consultation into routine service delivery

Discussion

The findings indicate that explaining stress among intensive care unit nurses solely in terms of insufficient individual resilience is a narrow approach from both scientific and management perspectives. Workload, long working hours, staffing shortages, relationships with supervisors, peer support, uncertainty regarding treatment, and emotional preparedness recur across the principal sources [1, 2, 20]. Therefore, if a stress-reduction program consists only of psychological training, it will not change the organizational sources of stress. Conversely, merely redesigning shift schedules will not fully address employees' need for emotional recovery. An effective model should integrate both dimensions.

The burnout indicators reported in the 2021 systematic review demonstrate the depth of the problem [20]. In particular, the high proportion of low personal accomplishment suggests that simply sending an employee to 'rest' may not be sufficient. Nurses need to experience meaning in their work, opportunities for professional growth, recognition from supervisors, and a sense that they are useful members of the team. This dimension is also related to quality of care. If professional meaning and support are not restored, the intention to leave the unit may persist. Therefore, remuneration, workload, fair appraisal, and professional development should be considered as an integrated management system.

The 2025 study of newly graduated nurses provides a particularly practical signal for management. The fact that discrimination and problems with supervisors ranked among the highest stressors indicates that the challenges faced by new staff are not limited to insufficient knowledge [2]. If asking questions is perceived as risky, speaking about an error leads to shame or punishment, and requesting help is interpreted as weakness, a newly graduated nurse may rapidly develop defensive behavior. This may increase the likelihood of concealing clinical uncertainty, delaying requests for assistance, and weakening collective learning. Creating an environment of open communication and blame-free discussion should therefore be a central element of stress management.

The first three months of employment should be regarded as a distinct period requiring observation. The source reported more frequent problems related to peer support specifically during this period [2]. In practical management, this may be addressed by assigning a mentor, conducting brief post-shift debriefings, pairing staff when caring for

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complex patients, and clearly defining rapid routes for contacting the appropriate specialist. The objective is not to teach a new nurse to perform every task independently from the outset, but to guide the nurse gradually toward safe autonomy.

The 2026 scoping review shows that stress factors vary across countries and organizations [1]. In one setting, financial insecurity and relationships with management may predominate; elsewhere, long shifts or social stigma may be more important; in another setting, nurse-to-patient ratios and resource shortages may dominate. This challenges the assumption that one standardized program will produce the same results in every hospital. The strength of the proposed five-stage cycle lies precisely in the fact that it does not begin with a fixed list of interventions; instead, it requires identification of local sources of stress first.

The association in some studies between problem-solving and planning-oriented coping strategies and better psychological outcomes [1] indicates the importance of equipping employees with active coping skills. However, this finding must not be misinterpreted in a way that shifts responsibility for system deficiencies onto the employee. If one nurse is assigned too many patients, works two consecutive long shifts, or lacks necessary equipment and staff support, breathing exercises or resilience training alone will not resolve the problem. Individual training should therefore complement organizational reform rather than replace it.

Nurse-to-patient ratios and shift design are important management tools. The 2026 review associated high nurse-to-patient ratios, extended working hours, and shift characteristics with stress [1, 22]. The 2021 review likewise linked workload and long working hours with the risk of burnout [20]. On the basis of this evidence, scheduling shifts solely to fill vacancies is insufficient. Patient acuity, staff experience, the proportion of new employees, sequences of night shifts, and recovery time should also be taken into account.

Leadership is of particular importance. Problems with supervisors were among the major sources of stress for newly graduated nurses [2], while the 2026 review identified good relationships with management as important for preventing stress [1]. A manager's role does not end with assigning tasks and monitoring outcomes. Managers should distribute workloads fairly, listen to employees' concerns, establish clear standards against discrimination and humiliation within the team, encourage help-seeking, and, when an error occurs, first analyze contributing system factors.

Peer support may be viewed as a collective protective layer against stress. The 2025 study clearly identified difficulties in this area during the first months of employment [2]. The 2026 review also emphasized that peer-support groups may reduce loneliness and facilitate coping with stress [1]. Such support should not be limited to informal friendly relationships. At the unit level, it may include mentoring by experienced nurses, brief end-of-shift debriefings, team discussions after difficult patient deaths, and clearly defined procedures for obtaining assistance from a second nurse in complex situations.

Caution is required when considering the societal impact of stress. The three principal sources analyzed did not directly measure society-wide economic losses or public trust in

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the healthcare system. Therefore, such effects are interpreted in this article not as causally proven outcomes but as logical systemic consequences that may arise through staff turnover, absenteeism, quality of care, and patient safety. This distinction is scientifically important: the point at which the available evidence ends and management inference begins must be stated clearly.

The same caution is maintained with regard to the pharmaceutical dimension. The principal sources contain evidence on uncertainty regarding treatment, resource shortages, and general risk of errors [1, 2, 20], but they do not provide a new quantitative causal coefficient linking nurses' stress to specific medication-administration errors. Accordingly, incorporating a clinical pharmacist into the stress-management model is not based on a claim that 'stress increases medication errors by a certain percentage.' Rather, it is based on the principle of reducing uncertainty in a complex treatment environment, enabling rapid access to answers, and improving interprofessional coordination.

The practical forms of pharmacy-professional involvement may be several. First, a brief pre-shift review may be conducted for high-risk or complex medication regimens. Second, clear procedures may specify whom to contact, and how quickly, regarding medication dosage, administration rate, mixing, or interaction issues. Third, near-miss events may be analyzed without blame, and recurrent uncertainties may be converted into guidance or educational materials. Fourth, access to pharmaceutical consultation may be facilitated for newly graduated nurses during their first months of employment. These measures may help reduce the clinical-uncertainty component of stress.

Such an interdisciplinary approach is consistent with an important conclusion of the 2026 review: stress affects different groups of healthcare professionals, and collaboration, mutual support, and interdisciplinary networks may strengthen system resilience [1]. The purpose of incorporating pharmaceutical services into a model of nurses' stress is not to assign pharmacists the role of psychological therapists. Within their professional scope, their role is to help reduce medication-related uncertainty and cognitive load, strengthen clear communication, and contribute to a safer treatment environment.

The management advantage of the proposed five-stage model is that it links indicators to action. Many organizations may conduct stress surveys, yet remain uncertain about what decision should follow the results. In this model, if high stress is identified, the source of risk is stratified; if the problem is workload, shift and staff allocation are reviewed; if the problem concerns the team, leadership and peer support are strengthened; and if there is uncertainty regarding treatment, consultation mechanisms with physicians and pharmacists are activated. Outcomes are then measured again.

During the monitoring stage, reliance on a single psychological indicator should be avoided. Alongside stress levels, organizations may monitor absenteeism, requests to change shifts, staff turnover, conflicts within the unit, patient-safety incidents, near-miss events, training needs, and the number of pharmaceutical consultations. However, such data must not become tools for punishment or stigmatization of employees. Otherwise, staff may begin to conceal problems, causing monitoring to produce results contrary to its intended purpose.

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The stabilization stage of the model is an aspect that is often overlooked. If an intervention is implemented once and the organization subsequently returns to its previous routines, short-term improvements may not be sustained. Effective solutions should therefore be incorporated into standard work procedures, a responsible person should be designated, the measures should be integrated into orientation programs for new employees, and they should be taken into account when evaluating managerial performance. This approach treats stress not as an exceptional problem, but as a permanent indicator of quality and workforce management.

The scientific novelty of the article does not lie in creating a new stress scale. The proposed contribution is the integration of three different layers of evidence - the prevalence of burnout, sources of stress among newly graduated staff, and multinational organizational experience - into a single management cycle of 'identification - stratification - intervention - reassessment - stabilization.' In addition, on the basis of evidence concerning uncertainty regarding treatment and interdisciplinary support, clinical pharmacist involvement is positioned as an auxiliary organizational component of stress management. This component is a conceptual proposal that requires separate empirical testing.

The study has several limitations. First, the analysis deliberately relied on three principal scientific sources, and no completely new systematic search was conducted. Second, many of the studies included in the 2026 review used cross-sectional designs and self-reported data; the authors noted that this limits the ability to draw causal conclusions [1]. Third, the 2021 meta-analysis included a relatively small number of articles and showed high heterogeneity across studies [20]. Fourth, the 2025 study concerned newly graduated nurses at a single center, and its findings cannot be fully generalized to all countries or experience groups [2].

Fifth, the pharmaceutical component is the part of the present article that requires the most cautious interpretation. It has a general basis in interdisciplinary collaboration [1], but the analyzed sources did not directly test the effect of clinical pharmacist participation on nurses' stress. Future research could compare intensive care shifts with and without continuous pharmacist involvement and examine uncertainty regarding treatment, changes in stress, near-miss events, and staff satisfaction. Such research would allow empirical testing of the conceptual proposal advanced in this article.

A promising direction for future research is a stepwise implementation design at the unit level. Baseline indicators could first be measured over several months, followed by the sequential introduction of mentoring, shift optimization, leadership training, peer support, and pharmaceutical consultation components. After each stage, stress, burnout, staff retention, and patient-safety indicators could be reassessed. This would make it possible to determine which components are more effective under particular conditions.

When adapting the model for local healthcare systems, cultural and organizational context must be taken into account. The 2026 review showed that sources of stress and coping strategies differ across countries [1]. Therefore, a ready-made foreign program should not simply be copied; rather, it should be redesigned according to the local unit's workload, staffing levels, shift traditions, leadership style, medication supply, availability

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of pharmaceutical services, and employees' culture of seeking assistance. The cyclical structure of the model is particularly suitable for this type of adaptation.

Table 4. Recommended indicators for monitoring management effectiveness

Domain	Indicator	Monitoring period	Management decision
Staff well-being	Stress and burnout levels	Every three or six months	Increase or reduce the intensity of interventions
Work organization	Long shifts, overtime, workload	Monthly	Review shift design and staff allocation
Workforce stability	Absenteeism and intention to leave	Monthly and quarterly	Strengthen mentoring, leadership, and retention measures
Team environment	Anonymous assessment of supervisory and peer support	Quarterly	Improve team discussion and leadership practices
Patient safety	Errors and near-miss events	Continuous	Analyze system causes and modify work processes
Pharmaceutical safety	Treatment clarifications and recurrent uncertainties	Monthly	Update pharmaceutical consultation and brief guidance

Conclusion

Stress among intensive care unit nurses is a multilevel problem that does not remain confined to the individual employee; it extends to patient safety, team stability, staff turnover, and the healthcare system's capacity to serve society. The scientific evidence analyzed identifies workload, long working hours, staffing shortages, weak supervisory and peer support, uncertainty regarding treatment, emotional strain, and certain social factors as major sources of stress [1, 2, 20]. High levels of burnout may affect nurses' health and attitudes toward work and may be associated with the quality and safety of patient care.

Newly graduated nurses require particular management attention, especially during their first months of employment. Their stress is shaped not only by limited experience but also by integration into the team, relationships with supervisors, discrimination, peer support, workload, and uncertainty regarding treatment [2]. Mentoring, gradual allocation of responsibility, open communication, fair workload distribution, and rapid access to specialist consultation may therefore be important tools for retaining new staff.

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This article proposes a five-stage stress-management cycle: early identification, risk stratification, targeted intervention, reassessment, and stabilization. The central principle of the cycle is that measuring stress is not an end in itself. Measurement results should lead to management decisions, outcomes should be reassessed after intervention, and effective measures should be incorporated into routine work systems. In this way, stress management becomes not a one-time psychological activity but a continuous component of workforce and quality management.

The pharmaceutical dimension is proposed within this model as an auxiliary interdisciplinary component. The fact that uncertainty regarding treatment is a source of stress and that the 2026 review included pharmacists within a broader interdisciplinary approach to stress management [1, 2] provides a logical basis for collaboration with clinical pharmacists. The purpose of such collaboration is to reduce medication-related uncertainty, accelerate consultation, learn from near-miss events, and reduce nurses' cognitive load. At the same time, the direct effect of this component on nurses' stress requires separate empirical testing.

In practical terms, hospital management should view stress not as an employee's personal problem but as an indicator of system quality. Nurse-to-patient ratios, shift duration, the workload assigned to new staff, leadership culture, peer support, access to psychological assistance, and interdisciplinary clinical consultation should be managed not as isolated measures but as components of a unified management system. Such an approach is expected to support staff well-being, patient safety, workforce stability, and the reliability of the healthcare system in serving society simultaneously.

Thus, reducing stress among intensive care unit nurses is not a secondary issue for public health. It is an integral condition for safe treatment, retention of healthcare professionals, and rational use of healthcare resources. The proposed multilevel cycle may serve as a conceptual framework for translating existing evidence into practical management. As a next step, the model should be prospectively tested in local intensive care units, measurement results should be linked to management indicators, and the added value of the pharmaceutical-collaboration component should be evaluated separately.

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