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ORIGINAL ARTICLE

Anxiety among Nurses in East Java, Indonesia: A Comparative Study between Nurses Working in Primary Health Centers and Hospitals

Heni Dwi Windarwati[1], Tantut Susanto[2], Budi Anna Keliat[3], Hanik Endang Nihayati[4], Retno Lestari[1], Adji Achmad Rinaldo Fernandes[5], Niken Asih Laras Ati[6], Mira Wahyu Kusumawati[7]

[1]*Department of Mental Health Nursing, Faculty of Health Sciences, Universitas Brawijaya, Malang, Indonesia*
[2]*Department of Community, Family, and Geriatric Nursing, Faculty of Nursing, Universitas Jember, Jember, Indonesia*
[3]*Department of Mental Health Nursing, Faculty of Nursing, Universitas Indonesia, Depok, Indonesia*
[4]*Department of Mental Health Nursing, Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia*
[5]*Department of Statistics, Faculty of Mathematics and Natural Sciences, Universitas Brawijaya, Malang, Indonesia*
[6]*Department of Mental Health Nursing, Faculty of Nursing, Universitas Jember, Jember, Indonesia*
[7]*Department of Health, Politeknik Negeri Indramayu, Indramayu, Indonesia*

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Corresponding Author:
Heni Dwi Windarwati
Department of Mental Health Nursing, Faculty of Health Sciences, Universitas Brawijaya, Malang, Indonesia
Email: henipsik.fk@ub.ac.id

Abstract

Background: Nurses face considerable psychosocial demands that may contribute to anxiety symptoms. Workplace settings and work schedules, particularly shift work, may contribute to these symptoms. However, evidence comparing anxiety symptoms across healthcare settings and examining associated demographic and occupational factors among nurses in Indonesia remains limited.
Purpose: This study examined anxiety symptoms among nurses working in primary health centers (PHCs) and hospitals in East Java, Indonesia, and identified associated demographic and occupational factors.
Methods: A descriptive cross-sectional study was conducted among 315 nurses working in PHCs and hospitals in East Java, Indonesia. Anxiety symptoms were assessed using the Generalized Anxiety Disorder-7 (GAD-7). Descriptive statistics summarized participant characteristics and the prevalence of anxiety symptoms. The Mann–Whitney U test, chi-square test, and Fisher's exact test were used to assess differences in demographic and occupational characteristics and to examine associations with anxiety symptoms.
Results: Of the 315 nurses, 72.1% worked shifts. Participant characteristics differed significantly across workplace settings by age (p = 0.002), years of experience (p = 0.001), city (p = 0.001), marital status (p = 0.003), income (p = 0.038), and work schedule (shift vs. non-shift; p = 0.001). Anxiety symptoms (GAD-7 ≥ 7) were significantly associated with age (p = 0.001), work experience (p = 0.008), marital status (p = 0.001), and work schedule (p = 0.006). Hospital nurses had higher odds of anxiety symptoms than PHC nurses (OR = 4.842; p = 0.010). Shift work was also associated with higher odds of anxiety symptoms than non-shift work (OR = 6.801).
Conclusion: Hospital employment and shift work were associated with anxiety symptoms among nurses, along with demographic factors such as younger age, shorter work experience, and unmarried status. These findings highlight the importance of targeted anxiety screening and suggest potential benefits of workplace interventions, including shift management and psychosocial support, particularly for hospital nurses.

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1. Introduction

Nurses are the largest component of the global health workforce, comprising approximately 29 million individuals, representing 59% of all health professionals (World Health Organization, 2025). In Indonesia, nurses account for 44.3% of the total health workforce, with 583,347 nurses distributed across provinces (Ministry of Health of the Republic of Indonesia, 2024). Nurses

provide continuous, direct patient care across healthcare settings, including hospitals and primary health centers (PHCs), and play a critical role in ensuring patient safety, maintaining service quality, and supporting healthcare system performance. Their responsibilities include clinical care, coordination, and patient and family education, all of which require sustained cognitive and emotional engagement (Febrianti et al., 2024; Jackson et al., 2022; Wilandika et al., 2023).

Anxiety symptoms are among the most common mental health concerns experienced by nurses due to the demanding nature of their work (de Paz et al., 2025). Click or tap here to enter text.Nurses frequently encounter high workloads, emotional strain, and exposure to critical events, all of which contribute to psychological distress (Nirgiz et al., 2026). The reported prevalence of anxiety among nurses ranges from 7.2% to 19.8% and may reach up to 42.9% in high-demand settings, depending on measurement tools, cut-off values, and study populations (Arimon-Pagès et al., 2022; Belayneh et al., 2021). Nurses working in hospitals are often exposed to higher patient acuity and more intensive workloads, while nurses in PHCs face challenges related to resource limitations and community-based demands. These contextual differences suggest that anxiety symptoms may vary across healthcare settings (de Paz et al., 2025). Click or tap here to enter text.

Anxiety symptoms among nurses have important consequences at both the individual and organizational levels (Candra et al., 2024). At the individual level, anxiety is associated with fatigue, impaired concentration, reduced productivity, and decreased quality of life. At the organizational level, it contributes to increased medical errors, reduced quality of care, lower job satisfaction, and higher turnover intention (Alonica et al., 2023). If left unaddressed, anxiety may compromise patient safety and overall healthcare service delivery, highlighting the need for early identification and intervention.

Anxiety among nurses is influenced by multiple factors, including sociodemographic and work-related characteristics. Previous research has identified age, marital status, and years of experience as important individual factors, while workplace conditions such as workload, shift work, job demands, workplace violence, and organizational support are key occupational determinants (Yang et al., 2024). Shift work, in particular, disrupts circadian rhythms and sleep patterns, increasing vulnerability to psychological distress. Both hospital and primary health care settings present distinct stressors that may contribute differently to anxiety symptoms among nurses.

Although anxiety symptoms may be experienced by nurses in both hospital and primary health care settings, these environments differ substantially in their working conditions and occupational demands, which may influence psychological outcomes. According to the Job Demands-Resources (JD-R) model, psychological distress emerges when high job demands, such as workload, time pressure, emotional strain, and shift work, are not balanced by adequate job resources (Bakker & Demerouti, 2017). The JD-R model therefore provides a useful theoretical perspective for understanding the potential relationship between occupational demands, particularly shift work, and anxiety symptoms among nurses. Recent empirical studies have shown that nurses are exposed to high levels of occupational stress, with shift work, night duties, and extended working hours significantly associated with anxiety symptoms and mental health problems (Ikhram et al., 2025). In particular, shift work has been consistently linked to sleep disturbances and increased anxiety among nurses, reflecting disruption of circadian rhythms and recovery processes (Czyż-Szypenbejl & Mędrzycka-Dąbrowska, 2024). Furthermore, recent cross-sectional and post-pandemic studies have reported a persistently high prevalence of anxiety symptoms among hospital nurses, often exceeding one-third of the workforce, highlighting the sustained psychological burden in high-demand clinical environments (Pachi et al., 2025).

However, current evidence remains limited, as many studies focus on single healthcare settings or specific subgroups (e.g., hospital-based or night-shift workers), limiting comparisons of anxiety symptoms and associated factors across different healthcare settings. Moreover, findings regarding key factors such as age and shift work remain inconsistent, suggesting that their associations with anxiety may vary depending on the work environment and organizational conditions (Maria et al., 2025). Therefore, a comparative analysis between hospital and PHC nurses is needed to examine differences in anxiety symptoms and identify associated demographic and occupational factors, thereby providing evidence to inform more context-specific mental health interventions. Accordingly, this study aimed to compare anxiety symptoms

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between hospital and PHC nurses and to identify factors independently associated with anxiety, with a particular focus on age and shift work among nurses in East Java, Indonesia.

2. Methods

2.1. Research design

An analytic cross-sectional comparative design was employed to examine anxiety symptoms among nurses working in hospitals and PHCs in East Java, Indonesia. This design allows simultaneous estimation of prevalence and assessment of associations between exposure variables and outcomes within a defined population at a single point in time. A cross-sectional comparative approach is particularly suitable for identifying differences between groups exposed to distinct workplace contexts, such as hospital and primary health care settings, while controlling for temporal variation. Unlike longitudinal or experimental designs, which require extended follow-up periods, higher costs, and complex implementation, cross-sectional designs are more feasible in healthcare environments with rotating shifts, workforce constraints, and limited access to centralized sampling frames. This design is also widely used in occupational health research to explore associations between work-related factors and mental health outcomes, including anxiety symptoms. By comparing two workforce strata, hospital and PHC nurses, within the same geographical and temporal context, the study assessed whether differences in work environments and job characteristics were associated with variations in anxiety symptoms. However, consistent with the limitations of cross-sectional studies, the study cannot establish causal relationships.

2.2. Setting and samples

The study was conducted in three cities in East Java Province, Indonesia: Jember, Malang, and Surabaya, from September to October 2024. These locations were selected to represent nurses from both hospital and PHC settings across diverse regional contexts. Surabaya has the largest nursing workforce in East Java, followed by Malang and Jember (Statistics of East Java Province, 2024), which supports their inclusion as major service areas. The required sample size was determined using an a priori power analysis for comparing two independent groups (hospital versus PHC nurses). With a two-tailed test, a significance level of 0.05, statistical power of 0.80, and a medium effect size (Cohen's d = 0.50), the minimum sample size was estimated at 128 participants per group, totaling 256. To account for potential non-response and incomplete questionnaires, the target sample size was increased by approximately 20%, resulting in a minimum target of 307 participants. The final sample comprised 315 nurses, exceeding the overall target sample size. However, the PHC group did not reach the minimum of 128 participants, which may have reduced the statistical power of comparison between workplace settings.

Participants were recruited using convenience sampling, according to predefined inclusion and exclusion criteria. Eligible participants were nurses employed in hospitals or PHCs, aged 21 to 60 years, and willing to participate. Exclusion criteria included nurses on extended leave during data collection and those diagnosed with severe mental health disorders that could interfere with participation. Probability sampling was not feasible due to the absence of a centralized, accessible sampling frame, rotational work schedules, and limited institutional access during the data collection period. Consequently, recruitment relied on voluntary participation among eligible nurses present during data collection. Group allocation was determined by workplace setting to facilitate comparison of anxiety symptoms between hospital and PHC nurses. An approximately balanced allocation was targeted to optimize statistical comparability and power. However, the final group sizes reflected the number of eligible and consenting nurses available in each setting during the study period. The final sample included 220 hospital nurses and 95 PHC nurses. Both groups exceeded the minimum sample size required for independent group comparisons, supporting the adequacy of the sample for analysis.

The recruitment process identified 347 eligible nurses across participating facilities, of whom 331 were approached (95.38%). Informed consent was obtained from 321 nurses (94.5%), and 315 (90.77%) completed the questionnaire and were included in the final analysis. Due to the lack of detailed demographic and occupational data for non-responders, formal comparisons between responders and non-responders by workplace setting or shift status were not possible, and potential non-response bias cannot be excluded. While convenience sampling may limit generalizability and introduce selection bias, contextual representation was enhanced by including multiple cities and both hospital and PHC settings.

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2.3. Measurement and data collection

A structured questionnaire was distributed between September and October 2024. Before data collection, permission was obtained from the management of participating hospitals and PHCs, and access was coordinated through head nurses or unit supervisors. Trained researchers approached eligible nurses directly during various work shifts (morning, afternoon, and night) in their respective hospital units and PHC service areas, preferably during less busy periods to minimize disruption. The study objectives, procedures, voluntary nature, and confidentiality were explained, and written informed consent was obtained prior to participation. Participants completed the questionnaire independently in a designated area, which required approximately 25 to 30 minutes. Researchers were available to provide clarification if needed.

The questionnaire comprised two sections: demographic characteristics and anxiety symptom assessment. Demographic and work-related variables were selected for their relevance to the Job Demands–Resources (JD-R) model, which proposes that psychological outcomes are shaped by individual characteristics as well as work-related demands and resources. Core variables included workplace setting (hospitals vs. PHCs), shift work, age, marital status, and work experience, as these are theoretically associated with job demands and coping capacity. Additional variables, such as income, number of close contacts, comorbid conditions, and duration of social media use, were incorporated as contextual and potential confounding factors that may affect psychological well-being through socioeconomic status, social support, physical health, and digital behavior. Key occupational confounders, including burnout, workload intensity, nurse-to-patient ratio, and organizational support, were not directly measured due to feasibility constraints and concerns regarding respondent burden during field data collection. These factors are recognized as important determinants within the JD-R framework and are discussed as limitations, with recommendations for their inclusion in future research.

Anxiety symptoms were assessed using the Generalized Anxiety Disorder-7 (GAD-7), a validated self-report instrument comprising seven items that evaluate the frequency of anxiety symptoms over the preceding two weeks. Each item is rated on a 4-point Likert scale from 0 (“not at all”) to 3 (“nearly every day”), yielding a total score of 0-21. Higher scores correspond to greater anxiety severity. Standard interpretation defines scores of 5, 10, and 15 as thresholds for mild, moderate, and severe anxiety symptoms, respectively (Löwe et al., 2008). The original validation study reported strong psychometric properties for the GAD-7, including high internal consistency (Cronbach’s $\alpha = 0.92$) and robust criterion validity, with a sensitivity of 89% and a specificity of 82% at a cut-off score of ≥10 for identifying generalized anxiety disorder (Löwe et al., 2008).

In the present study, a lower cut-off score of ≥7 was used to identify anxiety symptoms. This threshold was selected based on prior validation in the Indonesian context, which demonstrated acceptable construct validity (item-total correlations: 0.64–0.80) and good internal consistency (Cronbach’s $\alpha = 0.86$). The lower cut-off was chosen to enhance sensitivity for detecting subclinical or screening-level anxiety symptoms, rather than for diagnosing clinical anxiety. A non-standard cut-off may influence prevalence estimates and limit direct comparability with studies that use the conventional threshold of ≥ 10 (Larasari, 2015).

2.4. Data analysis

Descriptive statistics summarized respondent characteristics and the distribution of anxiety symptoms among nurses in PHCs and hospitals. The Mann–Whitney U test was used to compare continuous variables between groups, as several variables were not normally distributed, making it a more suitable nonparametric test than parametric alternatives. The chi-square test examined associations between categorical variables when the assumptions regarding expected cell counts were satisfied, enabling comparison of proportions between groups. When the expected frequency in any cell was less than five, Fisher’s exact test provided a more accurate alternative for small sample sizes. Crude odds ratios (ORs) with 95% confidence intervals (CIs) were calculated for categorical variables to quantify the strength and precision of bivariate associations between exposure variables and anxiety symptoms.

A multivariable binary logistic regression analysis was conducted to evaluate the adjusted associations between demographic and occupational factors and anxiety symptoms (GAD-7 ≥ 7). Candidate variables were selected based on their theoretical relevance to the Job Demands–Resources (JD-R) model, the study objectives, and the results of bivariate analyses. The final model comprised age, gender, marital status, education, monthly income, city, years of work

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experience, work schedule, workplace setting, workplace change history, job satisfaction, and past medical history, as well as daily social media use and number of close contacts. Past mental health history was excluded due to the limited number of cases, which could affect model stability. Age, work experience, daily social media use, and number of close contacts were entered as continuous predictors, while categorical variables were entered using their respective reference categories. Multicollinearity was assessed using variance inflation factors (VIF < 5). Model fit was evaluated using the Hosmer–Lemeshow test and Nagelkerke pseudo-R^2. Adjusted odds ratios (AORs) with 95% confidence intervals (CIs) were reported, and statistical significance was set at $p < 0.05$.

2.5. Ethical considerations

The study was classified as minimal risk. It involved no invasive procedures, medical interventions, or biological sampling. Data collection was conducted using questionnaires, including the GAD-7. Participants were informed of their right to skip questions and withdraw at any time without penalty. Before data collection, each participant received an information sheet. This sheet outlined the study's purpose, benefits, procedures, duration, potential risks and discomforts, confidentiality measures, and participant rights. Written informed consent was obtained prior to participation. Questionnaires did not include direct identifiers. Responses were assigned unique identification codes and stored on password-protected devices. Only authorized researchers had access to the data. Data were reported in aggregate form to prevent individual identification. The study protocol received approval from the Ethics Committee of the Faculty of Dentistry, Universitas Jember (Approval No. 2768/UN25.8/KEPK/DL/2023). Participation was voluntary, with no coercion or excessive compensation.

3. Results

3.1. Characteristics of the participants

As presented in Table 1, a total of 315 nurses participated in the study (mean age, 34.77 years; SD = 6.76). Female nurses comprised 64.1% of the sample. Participants were distributed across Surabaya (32.7%), Malang (33.3%), and Jember (34.0%). Over half (53.7%) held a nursing diploma, and 79.7% reported a monthly income of IDR 5 million or less. The mean duration of work experience was 9.38 years, and 72.1% worked shifts. Additionally, 53.7% reported having changed workplace at least once. Most participants (92.1%) reported job satisfaction. Nearly all reported no history of medical or mental health problems, with only 4.8% indicating a past medical history and 0.6% reporting past mental health problems. On average, participants reported having 2.32 close contacts and spending 3.5 hours per day on social media

3.2. Differences in participant characteristics by workplace settings (PHC and hospital)

Of the total sample, 30.2% worked in PHCs, and 69.8% worked in hospitals (Table 1). Continuous variables (age and years of experience) were compared using the Mann–Whitney U test, while categorical variables were analyzed using the chi-square or Fisher's exact test. Significant differences between PHC and hospital nurses were observed for age ($p = 0.002$) and work experience ($p = 0.001$). City ($p = 0.001$) and marital status ($p = 0.003$) also differed significantly by workplace setting, and income differed between groups ($p = 0.038$), with PHC nurses having lower odds of earning more than IDR 5 million than hospital nurses (OR = 0.467; 95% CI 0.237–0.923). In addition, shift work varied significantly across workplaces ($p = 0.001$), with hospital nurses having higher odds of working shifts than PHC nurses (OR = 3.451; 95% CI 2.049–5.812). No significant differences were identified for gender, education, social media use, number of close contacts, job satisfaction, workplace change history, past medical history, and past mental health problems ($p > 0.05$) (Table 1).

3.3. Differences in participant characteristics by anxiety symptoms

Nurses with anxiety symptoms were significantly younger ($p = 0.001$) and had fewer years of work experience ($p = 0.008$), based on the Mann–Whitney U test. Marital status was significantly associated with anxiety symptoms ($p = 0.001$), with the highest prevalence observed among single nurses. Shift work was also significantly associated with anxiety symptoms ($p = 0.006$), with nurses working shifts having higher odds of anxiety symptoms than those working non-shift schedules (OR = 6.801; 95% CI 1.592–29.058). Workplace setting was significantly associated with anxiety symptoms ($p = 0.010$). Hospital nurses had higher odds of reporting anxiety

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symptoms than PHC nurses (OR = 4.842; 95% CI 1.440–16.281). Other variables, including gender, education level, income, city, workplace change history, job satisfaction, past medical history, past mental health problems, duration of social media use, and number of close contacts, were not significantly associated with anxiety symptoms ($p > 0.05$) (Table 2).

Table 1. Characteristics of nurses by workplace setting (N = 315)

Characteristics	Total (N = 315)	Workplace setting		OR (95% CI)	*p*-value
		PHC (n=95)	Hospital (n=220)		
Age (years), mean (SD)	34.77 (6.76)	36.83 (7.34)	33.89 (6.31)	–	0.002*[a]
Gender, n (%)					0.130[b]
Female	202 (64.1)	55 (57.9)	147 (66.8)	0.683 (0.416–1.120)	
Male	113 (35.9)	40 (42.1)	73 (33.2)	Reference	
Marital Status, n (%)					0.003*[c]
Single	37 (11.7)	3 (3.2)	34 (15.5)	–	
Married	273 (86.7)	89 (93.7)	184 (83.6)	–	
Divorced/widowed	5 (1.6)	3 (3.2)	2 (0.9)	–	
Education, n (%)					0.088[c]
Diploma	169 (53.7)	52 (54.7)	117 (53.2)	–	
Bachelor's degree	144 (45.7)	41 (43.2)	103 (46.8)	–	
Master's degree	2 (0.6)	2 (2.1)	0 (0.0)	–	
Monthly income, n (%)					0.038*[b]
≤ IDR 5 million	251 (79.7)	83 (87.4)	168 (76.4)	Reference	
> IDR5 million	64 (20.3)	12 (12.6)	52 (23.6)	0.467 (0.237–0.923)	
City, n (%)					0.001*[c]
Surabaya	103 (32.7)	1 (1.1)	102 (46.4)	–	
Malang	105 (33.3)	63 (66.3)	42 (19.1)	–	
Jember	107 (34.0)	31 (32.6)	76 (34.5)	–	
Work experience (years), mean (SD)	9.38 (7.90)	11.20 (7.50)	8.59 (7.96)	–	0.001*[a]
Work schedule, n (%)					0.001*[b]
Shift	227 (72.1)	51 (53.7)	176 (80.0)	0.290 (0.172–0.488)	
Non-shift	88 (27.9)	44 (46.3)	44 (20.0)	Reference	
Workplace change, n (%)					0.142[b]
Never	146 (46.3)	50 (52.6)	96 (43.6)	Reference	
At least once	169 (53.7)	45 (47.4)	124 (56.4)	0.697 (0.430–1.129)	
Job Satisfaction, n (%)					0.806[b]
Yes	290 (92.1)	88 (92.6)	202 (91.8)	Reference	
No	25 (7.9)	7 (7.4)	18 (8.2)	0.893 (0.360–2.214)	
Past medical history, n (%)					0.395[b]
Yes	15 (4.8)	6 (6.3)	9 (4.1)	1.581 (0.546–4.752)	
No	300 (95.2)	89 (93.7)	211 (95.9)	Reference	
Past mental health problems, n (%)					0.513[c]
Yes	2 (0.6)	1 (1.1)	1 (0.5)	–	
No	313 (99.4)	94 (98.9)	219 (99.5)	–	
Social media use (hours/day), mean (SD)	3.50 (3.11)	3.29 (3.49)	3.60 (2.92)	–	0.163[a]
Number of close contacts, mean (SD)	2.32 (0.50)	2.31 (0.49)	2.32 (0.51)	–	0.739[a]
Anxiety symptoms (GAD-7 ≥ 7), n (%)					0.010[b]
Present	33 (10.5)	3 (3.2)	30 (13.6)		
Absent	282 (89.5)	92 (96.8)	190 (86.4)		

Note. Data are presented as mean (SD) or n (%). Percentages are calculated using the respective column totals. PHC = primary health center; SD = standard deviation; OR = odds ratio; CI = confidence interval; GAD-7 = Generalized Anxiety Disorder-7. Superscripts indicate the statistical tests used: [a] Mann–Whitney U test; [b] chi-square test; [c] Fisher's exact test. $p < 0.05$ indicates statistical significance.

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Table 2. Characteristics of nurses by anxiety symptom status (N = 315)

Characteristics	Total (N = 315)	Anxiety Symptoms		OR (95% CI)	*p*-value
		Anxiety present (n = 33)	Anxiety absent (n = 282)		
Age (years), mean (SD)	34.77 (6.76)	30.03 (5.15)	35.33 (6.72)	–	0.001*[a]
Gender, n (%)					0.096[b]
Female	202 (64.1)	26 (78.8)	176 (62.4)	Reference	
Male	113 (35.9)	7 (21.2)	106 (37.6)	0.447 (0.188–1.066)	
Marital status, n (%)					0.001*[c]
Single	37 (11.7)	12 (36.4)	25 (8.9)	–	
Married	273 (86.7)	21 (63.6)	252 (89.4)	–	
Divorced/widowed	5 (1.6)	0 (0.0)	5 (1.8)	–	
Education, n (%)					0.709[c]
Diploma	169 (53.7)	16 (48.5)	153 (54.3)	–	
Bachelor's degree	144 (45.7)	17 (51.5)	127 (45.0)	–	
Master's degree	2 (0.6)	0 (0.0)	2 (0.7)	–	
Monthly income, n (%)					0.925[b]
≤ IDR 5 million	251 (79.7)	27 (81.8)	224 (79.4)	1.165 (0.459–2.955)	
> IDR 5 million	64 (20.3)	6 (18.2)	58 (20.6)	Reference	
City, n (%)					0.279[c]
Surabaya	103 (32.7)	12 (36.4)	91 (32.3)	–	
Malang	105 (33.3)	7 (21.2)	98 (34.8)	–	
Jember	107 (34.0)	14 (42.4)	93 (33.0)	–	
Work experience (years), mean (SD)	9.38 (7.90)	6.16 (5.22)	9.75 (8.08)		0.008*[a]
Work schedule, n (%)					0.006*[b]
Shift	227 (72.1)	31 (93.9)	196 (69.5)	6.801 (1.592–29.058)	
Non-shift	88 (27.9)	2 (6.1)	86 (30.5)	Reference	
Workplace setting, n (%)					0.010*[b]
PHC	95 (30.2)	3 (9.1)	92 (32.6)	Reference	
Hospital	220 (69.8)	30 (90.9)	190 (67.4)	4.842 (1.440–16.281)	
Workplace change, n (%)					0.237[b]
Never	146 (46.3)	19 (57.6)	127 (45.0)	1.656 (0.799–3.434)	
At least once	169 (53.7)	14 (42.4)	155 (55.0)	Reference	
Job satisfaction, n (%)					0.161[c]
Yes	290 (92.1)	28 (84.8)	262 (92.9)	–	
No	25 (7.9)	5 (15.2)	20 (7.1)	–	
Past medical history, n (%)					0.520[c]
Yes	15 (4.8)	1 (3.0)	14 (5.0)	–	
No	300 (95.2)	32 (97.0)	268 (95.0)	–	
Past mental health problems, n (%)					0.801[c]
Yes	2 (0.6)	0 (0)	2 (0.7)	–	
No	313 (99.4)	33 (100.0)	280 (99.3)	–	
Social media use (hours/day), mean (SD)	3.50 (3.11)	3.82 (2.22)	3.47 (3.19)	–	0.127[a]
Number of close contacts, mean (SD)	2.32 (0.50)	2.27 (0.57)	2.32 (0.49)	–	0.706[a]

Note. Data are presented as mean (SD) or n (%). Percentages are calculated using the respective column totals. PHC = primary health center; SD = standard deviation; OR = odds ratio; CI = confidence interval. Superscripts indicate the statistical tests used: [a] Mann–Whitney U test; [b] chi-square test; [c] Fisher's exact test. $p < 0.05$ indicates statistical significance. "Reference" indicates the reference category used to calculate the OR.

3.4. Multivariable analysis of factors associated with anxiety symptoms among nurses

A multivariable binary logistic regression analysis was conducted to identify factors independently associated with anxiety symptoms (GAD-7 ≥ 7) (Table 3). The model included demographic, occupational, and behavioral factors considered relevant to the study objectives. After adjustment for the other variables in the model, age was significantly associated with anxiety symptoms (AOR = 0.854; 95% CI: 0.758–0.961; $p = 0.009$), indicating that older age was associated with lower odds of anxiety symptoms. Shift work was also independently associated with anxiety symptoms (AOR = 8.571; 95% CI: 1.042–70.486; $p = 0.046$), with nurses working shifts having higher odds of anxiety symptoms than those working non-shift schedules. However,

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the wide confidence interval for shift work indicates limited precision, and this finding should be interpreted cautiously. Workplace setting was not significantly associated with anxiety symptoms after adjustment (AOR = 2.728; 95% CI: 0.641–11.612; p = 0.174), despite its significant association in the bivariate analysis. Gender, marital status, education, monthly income, city, work experience, workplace change history, job satisfaction, past medical history, daily social media use, and number of close contacts were also not statistically significantly associated with anxiety symptoms in the multivariable model ($p > 0.05$). The model yielded a Nagelkerke pseudo-R^2 of 0.280.

Table 3. Multivariable logistic regression analysis of factors associated with anxiety symptoms among nurses (N = 315)

Variables	p-value	AOR	95% CI
Age (years)	0.009*	0.854	0.758–0.961
Gender (female)	0.340	1.599	0.610–4.192
Marital status (single)	0.140	2.221	0.769–6.414
Education (diploma)	0.390	0.617	0.205–1.856
Monthly income (≤ IDR 5 million)	0.438	0.624	0.189–2.058
City (Surabaya)	0.774	1.218	0.318–4.668
City (Malang)	0.464	1.607	0.452–5.718
Work experience (years)	0.198	0.962	0.903–1.025
Work schedule (shift)	0.046*	8.571	1.042–70.486
Workplace setting (hospital)	0.174	2.728	0.641–11.612
Workplace change (at least once)	0.223	0.584	0.246–1.387
Job satisfaction (no)	0.238	2.100	0.613–7.191
Past medical history (yes)	0.478	2.330	0.225–24.169
Social media use (hours/day)	0.979	1.002	0.870–1.154
Number of close contacts	0.167	0.871	0.712–1.066

Notes. AOR = adjusted odds ratio; CI = confidence interval. *$p < 0.05$ indicates statistical significance. Nagelkerke pseudo-R^2 = 0.280.

4. Discussion

This study investigated anxiety symptoms among nurses working in PHCs and hospitals in East Java, Indonesia, with a particular focus on their associations with demographic and occupational factors. The findings indicated that age and shift work were independently associated with anxiety symptoms among nurses, whereas workplace setting and other variables were not statistically significant after adjustment. Younger nurses had higher odds of anxiety symptoms, while those engaged in shift work exhibited substantially higher odds of anxiety symptoms than nurses working non-shift schedules. The observed associations between demographic characteristics, such as age and years of work experience, and anxiety symptoms are consistent with prior research indicating that anxiety among nurses is associated with the interaction of individual and workplace factors (Zheng et al., 2021). Nurses are widely recognized as a high-risk occupational group at increased risk of mental health problems due to demanding job requirements, exposure to clinical stressors, and substantial emotional burdens (Chen et al., 2024). Younger nurses, in particular, tend to report higher anxiety levels, potentially due to limited professional experience and increased vulnerability during the early stages of their careers (Liu et al., 2024). Nevertheless, occupational factors may influence anxiety more than demographic characteristics alone (Buivydienė et al., 2025). These findings align with the broader literature, which emphasizes the central role of work-related stressors in shaping mental health outcomes among nurses (Søvold et al., 2021).

Shift work showed a significant association with anxiety symptoms, consistent with previous studies reporting an increased risk of anxiety and depressive symptoms among nurses working rotating and night shifts (Li et al., 2022). This association may reflect disrupted circadian rhythms and impaired sleep quality, which can contribute to emotional dysregulation and psychological distress (Boivin et al., 2022). Physiological mechanisms, such as altered cortisol and melatonin secretion patterns, may further substantiate the link between shift work and anxiety (Brum et al., 2022). Additionally, workload intensity and psychological strain before, during, and after night shifts have been associated with elevated anxiety levels (Li et al., 2022). These findings underscore

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the necessity for organizational interventions, including improved shift scheduling, fatigue management, and sleep support programs (Søvold et al., 2021). The sleep disturbances, psychological factors, and social conditions are closely interrelated with anxiety, suggesting that mental health outcomes may be shaped by multiple interacting physiological, psychosocial, and environmental factors (Sari et al., 2025). However, the wide confidence interval observed for shift work in the present study indicates considerable uncertainty in the magnitude of the association. Thus, the association between shift work and anxiety symptoms is relevant but should be interpreted cautiously and further investigated in future studies with larger samples.

Although workplace setting (hospital vs. PHC) was significantly associated with anxiety symptoms in the bivariate analysis, the association was no longer statistically significant in the multivariable model. This finding suggests that the observed differences between hospital and PHC nurses may be attributable to underlying factors, such as shift work, workload, and demographic characteristics, rather than to the workplace setting alone. Nevertheless, variations in stressor profiles across healthcare settings remain important. Hospital nurses in this study had a higher prevalence of anxiety symptoms than PHC nurses, consistent with evidence that hospital environments may involve greater work intensity, case complexity, and time pressure (Khani et al., 2025). Excessive workload and demanding service organization have been associated with increased psychological distress among nurses (Ayuso-Murillo et al., 2020). Furthermore, factors such as staff shortages, patient-to-nurse ratios, and leadership support may mediate anxiety but are not always captured in survey-based studies (Alansari et al., 2025). Nurses in high-intensity settings, including intensive care units and emergency departments, may experience greater exposure to traumatic events and ethical challenges, which potentially elevate psychological strain (Moudatsou et al., 2020).

However, PHC settings also carry risks. Community-based nurses may experience anxiety associated with limited resources, workforce shortages, and substantial responsibilities in public health services (Kakemam et al., 2024). During crises such as the COVID-19 pandemic, anxiety levels among PHC nurses may increase due to uncertainty and infection risk (Selçuk Tosun et al., 2021). Work–life imbalance and role ambiguity may also contribute to psychological distress in community settings (Smallwood et al., 2021). Consequently, these findings do not show that PHC environments are inherently protective; rather, different settings may present distinct stressor profiles (de Paz et al., 2025).

Marital status was significantly associated with anxiety symptoms in the bivariate analysis but was not statistically significant in the multivariable model. This finding suggests that other variables, such as age, shift work, or occupational stress, may have influenced the observed association (Zheng et al., 2021). Marital status may also be related to differences in social support, which has been identified as a protective factor against anxiety (Katsiroumpa et al., 2025). Accordingly, workplace-based support mechanisms, including peer and supervisory support, may be more pertinent for anxiety prevention (Søvold et al., 2021). Previous research has also identified associations between anxiety among nurses and sociodemographic and occupational factors, including age, marital status, work experience, and comorbid conditions (Mondal et al., 2025).

Interestingly, job satisfaction was not significantly associated with anxiety symptoms. This finding may reflect the multidimensional nature of job satisfaction and the limitations of using a single-item measure, which may not adequately capture different aspects of psychological distress (Buivydienė et al., 2025). The low prevalence of self-reported mental health problems may also reflect underreporting or stigma, leading to potential misclassification. Therefore, these nonsignificant associations should be interpreted cautiously, as they may reflect measurement limitations rather than the absence of meaningful relationships (Buivydienė et al., 2025; Khani et al., 2025).

The findings in this study underscore the need to address modifiable workplace factors, particularly shift work, when developing strategies to support nurses' mental health, especially related to anxiety. Organizational strategies such as optimizing shift scheduling, minimizing excessive night work, strengthening social support systems, and enhancing resilience are essential (Katsiroumpa et al., 2025). Future research should use longitudinal or interventional designs to establish causal relationships and include additional variables, including workload, burnout, and organizational support. Moreover, integrating implementation indicators such as feasibility,

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uptake, and cost is critical to facilitate the translation of evidence-based interventions into effective policies in both hospital and PHC settings (Søvold et al., 2021).

5. Implications and limitations

Based on the study's findings, organizational and occupational health strategies addressing modifiable workplace factors, particularly shift scheduling, may be considered to support nurses' mental well-being. Additional strategies, such as workload management, may also be relevant. Routine screening using validated anxiety assessment tools could be explored to facilitate the early identification of psychological distress. However, these strategies should be further evaluated through longitudinal or interventional studies to determine their effectiveness and feasibility across different healthcare settings.

The current study has several limitations. First, the cross-sectional design does not allow conclusions about causality or the temporal relationships between the factors and anxiety symptoms. Second, the study did not measure potentially relevant factors such as workload, sleep quality, burnout, and organizational support, and therefore could not include them in the analysis. Third, using a GAD-7 cutoff score of ≥7 may limit comparability with studies using conventional thresholds. Finally, the limited number of anxiety cases relative to the number of predictors raises concerns about overfitting and imprecise estimates. These limitations should be considered when interpreting the findings. Despite these limitations, the study offers meaningful contributions to understanding factors associated with anxiety among nurses.

6. Conclusion

The findings of this study indicate that anxiety symptoms among nurses in East Java are associated with both individual characteristics and workplace factors. Shift work was significantly associated with higher odds of anxiety symptoms, whereas increasing age was associated with lower odds. Although differences were observed between hospital and PHC settings, these differences may be partly explained by other demographic and occupational factors, rather than healthcare setting alone. Organizational factors, particularly work schedules, may play an important role in nurses' mental well-being. Addressing these factors should be considered in efforts to support nurses' mental health. Further research using longitudinal or interventional designs is necessary to clarify these relationships and guide the development of effective strategies.

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Author contribution

Conceptualization: HDW, TS, BAK, HEN; Data curation: RL, AARF, NALA, MWK; Formal analysis: AARF, NALA; Investigation: HDW, RL, AARF, NALA, MWK; Methodology: HDW, TS; Project administration: RL, MWK; Supervision: BAK, HEN; Validation: HDW, TS; Visualization: HDW, TS, BAK, HEN; Writing – original draft: HDW, RL, AARF, NALA, MWK; Writing – review & editing: HDW, TS, BAK, HEN.

Conflict of interest

The authors declare that there is no conflict of interest

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Declaration of Use of AI in Scientific Writing

The authors used artificial intelligence (AI)-assisted tools to support language refinement, editing, and structuring of the manuscript. The AI tool was used to improve clarity, grammar, and

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academic writing style. All content, interpretation, and conclusions presented in this manuscript are the sole responsibility of the authors. The authors have carefully reviewed and validated all outputs generated with AI assistance to ensure accuracy and integrity.

References

Alansari, A. N., Omri, A. E. L., & Singh, K. (2025). Staff shortages linked to burnout, depression, and anxiety among outpatient nurses: A cross-sectional analysis at Hamad General Hospital, Qatar. *BMC Nursing*, *24*(1), 1118. https://doi.org/10.1186/s12912-025-03758-7

Alonica, E. Sta. M., Matias, P. B., Mejia, E. C. V., Pineda, S. J. D., Ranchez, M. E. C., Ruiz, R. J. G., Santos, L. J. J., Reyno, M. C., Galingana, M. H. P., & Ganadin, V. D. (2023). Level of anxiety, depression, and stress among rural health unit nurses during the COVID-19 pandemic among selected municipalities in the 6th Congressional District of Isabela. *International Journal of Advanced Research in Science, Communication and Technology*, *3*(1), 207–220. https://doi.org/10.48175/ijarsct-12032

Arimon-Pagès, E., Fernández-Ortega, P., Fabrellas-Padrés, N., Castro-García, A. M., & Canela-Soler, J. (2022). Dealing with emotional vulnerability and anxiety in nurses from high-risk units—A multicenter study. *International Journal of Environmental Research and Public Health*, *19*(9), 5569. https://doi.org/10.3390/ijerph19095569

Ayuso-Murillo, D., Colomer-Sánchez, A., Santiago-Magdalena, C. R., Lendínez-Mesa, A., Benítez De Gracia, E., López-Peláez, A., & Herrera-Peco, I. (2020). Effect of anxiety on empathy: An observational study among nurses. *Healthcare*, *8*(2), 140. https://doi.org/10.3390/healthcare8020140

Bakker, A. B., & Demerouti, E. (2017). Job demands–resources theory: Taking stock and looking forward. *Journal of Occupational Health Psychology,* *22*(3), 273–285. https://doi.org/10.1037/ocp0000056

Belayneh, Z., Zegeye, A., Tadesse, E., Asrat, B., Ayano, G., & Mekuriaw, B. (2021). Level of anxiety symptoms and its associated factors among nurses working in emergency and intensive care units at public hospitals in *Addis* Ababa, Ethiopia. *BMC Nursing*, *20*(1), 180. https://doi.org/10.1186/s12912-021-00701-4

Boivin, D. B., Boudreau, P., & Kosmadopoulos, A. (2022). Disturbance of the Circadian System in Shift Work and Its Health Impact. *Journal of Biological Rhythms*, *37*(1), 3–28. https://doi.org/10.1177/07487304211064218

Brum, M. C. B., *Senger*, M. B., Schnorr, C. C., Ehlert, L. R., & Da Costa Rodrigues, T. (2022). Effect of night-shift work on cortisol circadian rhythm and melatonin levels. *Sleep Science*, *15*(2), 143–148. https://doi.org/10.5935/1984-0063.20220034

Buivydienė, A., Rapolienė, L., Truš, M., & Jakavonytė-Akstinienė, A. (2025). Connections between job *satisfaction* and depression, anxiety, and stress among nurses. *Frontiers in Psychology*, *16*, 1548993. https://doi.org/10.3389/fpsyg.2025.1548993

Candra, V. R. A., Susanti, H. I., & Danang, T. Y. (2024). The effect of nurses' anxiety levels about COVID-19 transmission on nurse-to-patient caring behavior in the inpatient room. *Journal of Midwifery and Nursing*, *6*(1), 263–267. https://doi.org/10.35335/jmn.v6i1.4501

Chen, Q., Zhao, Z., Bao, J., Lin, J., Li, W., & Zang, Y. (2024). Digital empowerment in mental health: A meta-analysis of internet-based interventions for enhancing mental health literacy. *International Journal of Clinical and Health Psychology*, *24*(3), 1000489. https://doi.org/10.1016/j.ijchp.2024.100489

Czyż-Szypenbejl, K., & Mędrzycka-Dąbrowska, W. (2024). The impact of night work on the sleep and health of medical staff—A review of the latest scientific reports. *Journal of Clinical Medicine*, *13*(15), 4505. https://doi.org/10.3390/jcm13154505

de Paz, O. B., Falguera, C. C., Brillantes, A. L., Balo, K. F., Cabugayan, V. V., Del Monte, R. T., Pimentel, B. T., & Valones, E. C. (2025). Anxiety, depression, and resilience among primary care nurses working in the rural health units of Samar Province during the COVID-19 pandemic. *Acta Medica Philippina*, *59*(9), 98. https://doi.org/10.47895/amp.vi0.9325

Febrianti, V., Pitono, A. J., Arifin, A., & Yudha, E. K. (2024). The workload and stress levels among staff nurses in the inpatient ward of a secondary health care service in Indonesia. *Fundamental and Management Nursing Journal*, *7*(2), 58–65. https://doi.org/10.20473/fmnj.v7i2.49397

Copyright © 2026, e-ISSN 2406-8799, p-ISSN 2087-7811

Ikhram, H. S., Hapsah, H., Yuliati, Y., & Ramadhani, S. (2025). Job and organizational factors determining nurses' work stress at regional general hospital. *The Indonesian Journal of Occupational Safety and Health*, *14*(2), 155–163. https://doi.org/10.20473/ijosh.v14i2.2025.155-163

Jackson, J., Maben, J., & Anderson, J. E. (2022). What are nurses' roles in modern healthcare? A qualitative interview study using interpretive description. *Journal of Research in Nursing*, *27*(6), 504–516. https://doi.org/10.1177/17449871211070981

Kakemam, E., Maassoumi, K., Azimi, S., Abbasi, M., Tahmasbi, F., & Alizadeh, M. (2024). Prevalence of depression, anxiety, and stress and associated reasons among Iranian primary healthcare workers: A mixed method study. *BMC Primary Care, 25*(1), 40. https://doi.org/10.1186/s12875-024-02268-w

Katsiroumpa, A., Moisoglou, I., Papathanasiou, I. V., Malliarou, M., Sarafis, P., Gallos, P., Konstantakopoulou, O., Rizos, F., & Galanis, P. (2025). Resilience and social support protect nurses from anxiety and depressive symptoms: Evidence from a cross-sectional study in the post-COVID-19 era. *Healthcare*, *13*(6), 582. https://doi.org/10.3390/healthcare13060582

Khani, M., Ahmadi, F., Rasekhi, A. A., & Mohammadpour, Y. (2025). Comparison of stress, anxiety, and depression levels in nurses in specialized and general wards. *Iranian Journal of Nursing and Midwifery Research*, *30*(1), 103. https://doi.org/10.4103/ijnmr.ijnmr_304_23

Larasari, A. (2015). *Uji validitas, uji reliabilitas, dan uji diagnostik instrumen Generalized Anxiety Disorder-7 (GAD-7) versi Bahasa Indonesia pada pasien epilepsi dewasa* [Validity, reliability, and diagnostic tests of generalized Anxiety Disorder-7 (GAD-7) instrument Indonesian version in adult epilepsy patients] (Thesis, Faculty of Medicine, Universitas Indonesia). https://lib.ui.ac.id/m/detail.jsp?id=20424638

Li, Y., Wang, Y., Lv, X., Li, R., Guan, X., Li, L., Li, J., & Cao, Y. (2022). Effects of factors related to shift work on depression and anxiety in nurses. *Frontiers in Public Health*, *10*, 926988. https://doi.org/10.3389/fpubh.2022.926988

Liu, D., Zhou, Y., Tao, X., Cheng, Y., & Tao, R. (2024). Mental health symptoms and associated factors among primary healthcare workers in China during the post-pandemic era. *Frontiers in Public Health*, *12*, 1374667. https://doi.org/10.3389/FPUBH.2024.1374667/BIBTEX

Löwe, B., Decker, O., Müller, S., Brähler, E., Schellberg, D., Herzog, W., & Herzberg, P. Y. (2008). Validation and standardization of the generalized anxiety disorder screener (GAD-7) in the general population. *Medical Care*, *46*(3), 266–274. https://doi.org/10.1097/MLR.0b013e318160d093

Maria, S., Ningombam, J. D., Sahu, M., & Banerjee, S. (2025). Psychological impact of night shifts: Prevalence of depression, anxiety, and stress among healthcare workers in a tertiary care hospital, Chennai, Tamil Nadu. *Indian Journal of Public Health Research & Development*, *16*(3), 315–322. https://doi.org/10.37506/y1re3h16

Ministry of Health of the Republic of Indonesia. (2024). *Profil kesehatan Indonesia 2023* [Indonesia health profile 2023]. https://kemkes.go.id/id/profil-kesehatan-indonesia-2023

Mondal, S., Anowar, M. N., Akter, M. K., & Khatun, S. (2025). Anxiety and sleep disturbances among nurses working at COVID-19 dedicated hospitals in Bangladesh. *Nurse Media Journal of Nursing*, *14*(3), 356–366. https://doi.org/10.14710/nmjn.v14i3.60744

Moudatsou, M., Stavropoulou, A., Philalithis, A., & Koukouli, S. (2020). The role of empathy in health and social care professionals. *Healthcare, 8*(1), 26. https://doi.org/10.3390/healthcare8010026

Nirgiz, C., Sarı, M. K., & Çaylı, N. (2026). The relationship between nurses' anxiety and attitudes towards artificial intelligence and examination of influencing factors. *BMC Nursing, 25*(1), 122. https://doi.org/10.1186/s12912-026-04293-9

Pachi, A., Sikaras, C., Melas, D., Alikanioti, S., Soultanis, N., Ivanidou, M., Ilias, I., & Tselebis, A. (2025). Stress, anxiety and depressive symptoms, burnout and insomnia among Greek nurses one year after the end of the pandemic: A moderated chain mediation model. *Journal of Clinical Medicine, 14*(4), 1145. https://doi.org/10.3390/jcm14041145

Sari, I. P., Hariyanti, T., Lestari, R., & Dradjat, R. S. (2025). Sleep quality and its associated factors in older adults: A systematic review of cross-sectional studies. *Nurse Media Journal of Nursing*, *15*(3), 406–422. https://doi.org/10.14710/nmjn.v15i3.72365

Selçuk Tosun, A., Akgül Gündoğdu, N., & Taş, F. (2021). Anxiety levels and solution-focused thinking skills of nurses and midwives working in primary care during the COVID-19

Copyright © 2026, e-ISSN 2406-8799, p-ISSN 2087-7811

pandemic: A descriptive correlational study. *Journal of Nursing Management*, *29*(7), 1946–1955. https://doi.org/10.1111/jonm.13334

Smallwood, N., Pascoe, A., Karimi, L., Bismark, M., & Willis, K. (2021). Occupational disruptions during the COVID-19 pandemic and their association with healthcare workers' mental health. *International Journal of Environmental Research and Public Health, 18*(17), 9263. https://doi.org/10.3390/ijerph18179263

Søvold, L. E., Naslund, J. A., Kousoulis, A. A., Saxena, S., Qoronfleh, M. W., Grobler, C., & Münter, L. (2021). Prioritizing the mental health and well-being of healthcare workers: An urgent global public health priority. *Frontiers in Public Health*, *9*, 679397. https://doi.org/10.3389/fpubh.2021.679397

Statistics of East Java Province. (2024). *Provinsi Jawa Timur dalam angka 2024* [East Java Province in figures 2024]. https://jatim.bps.go.id/id/publication/2024/02/28/53a51c3ca566561a72d10bde

World Health Organization. (2025). *Nursing and midwifery*. World Health Organization. https://www.who.int/news-room/fact-sheets/detail/nursing-and-midwifery

Wilandika, A., Pandin, M. G. R., & Yusuf, A. (2023). The roles of nurses in supporting health literacy: A scoping review. *Frontiers in Public Health*, *11*, 1022803. https://doi.org/10.3389/fpubh.2023.1022803

Yang, J., Chen, Y., Tian, Y., Li, X., Yu, Q., Huang, C., Chen, Z., Ning, M., Li, S., He, J., Du, J., Huang, B., & Li, Y. (2024). Risk factors and consequences of mental health problems in nurses: A scoping review of cohort studies. *International Journal of Mental Health Nursing, 33*(5), 1197–1211. https://doi.org/10.1111/inm.13337

Zheng, R., Zhou, Y., Fu, Y., Xiang, Q., Cheng, F., Chen, H., Xu, H., fu, L., Wu, X., Feng, M., Ye, L., Tian, Y., Deng, R., Liu, S., Jiang, Y., Yu, C., & Li, J. (2021). Prevalence and associated factors of depression and anxiety among nurses during the outbreak of COVID-19 in China: A cross-sectional study. *International Journal of Nursing Studies*, *114*(5), 103809. https://doi.org/10.1016/j.ijnurstu.2020.103809

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