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Incidence of stress among emergency nurses
A systematic review and meta-analysis

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Abstract

Background: This study's main purpose is to evaluate the stress level among emergency nurses systematically.

Methods: Adhering to the preferred reporting items for systematic reviews and meta-analyses guidelines, nine databases, including PubMed, Cochrane, web of science, Scopus, ScienceDirect, Embase, China National Knowledge Infrastructure, Wanfang, and China biomedical literature service system, were searched to collect cross-sectional studies on emergency nurses. Two researchers independently screened the literature, extracted the data, and evaluated the risk of bias in the included studies.

Results: From 2655 studies, 21 cross-sectional studies were included, including 4293 subjects. Meta-analysis showed that the incidence of low-level stress was 0.21% (95% CI [0.18–0.24]), the incidence of middle-level stress was 0.46% (95% CI [0.33–0.58]), and the incidence of high-level stress was 0.32% (95% CI [0.22–0.41]), which is mainly at the medium level.

Conclusion: This review identified the stress level of emergency nurses mainly at the medium level. This result makes nursing administrators pay more attention to the mental health problems of emergency nurses and actively take measures to promote the physical and mental health of emergency nurses and further promote the development of the nursing profession.

Keywords: emergency nurses, meta-analysis, pressure, stress, stressor

1. Introduction

Stress is mainly a psychological change subjectively or objectively under certain occupational conditions, primarily manifested as negative emotions and psychological imbalance, to produce corresponding functional changes in the body or mind.[1] Excessive occupational stress can cause coronary heart disease, cancers, and depression, affecting nurses' longevity and quality of life.[2–5]

The emergency department is characterized by a concentration of severe patients, multiple diseases, and heavy rescue tasks. Therefore, emergency nurses often work in a high state of tension under great psychological stress.[6] If left unchecked, nurses' deterioration of health status will affect the overall quality of patient care.[7]

However, the prevalence of stress among emergency nurses has shown international variation due to inconsistencies in collection tools and cultural differences. A study at Rutgers used the Expanded Nurse Work Stress Scale showed that 73% of emergency nurses have low-level stress.[8] A study conducted in Iran used The Hospital Stress Scale showed that 80.3% of emergency nurses have moderate-level pressure.[9] Literature conducted in China used the Chinese Perceived Stress Scales showed that 51.73% of emergency nurses have high-level stress.[10]

Most studies focused on nurse stress in the emergency department in one country, with no data from across cultures or countries. Therefore, it is necessary to identify emergency nurses' stress in different countries. No pooled data is available to assess the stress level of emergency nurses. Hence, this meta-analysis was conducted. The results of this study can help nursing managers understand the stress levels of emergency nurses in different countries and take measures to minimize stress.

2. Materials and methods

2.1. Eligibility criteria

To collect data on emergency nurse stress, quantitative cross-sectional studies were included which met the following criteria: Published in the English or Chinese language; Analyzed the incidence of stress among emergency nurses with sufficient statistical information; Based on a sample of emergency nurses or on a mixed sample in which the results for emergency nurses are provided separately; Utilized standardized validated instruments for assessing the incidence; and Peer-reviewed studies were available in full text.

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2.2. Exclusion criteria

Studies were excluded if they: Published in other than English or Chinese and could not be translated by any of the two researchers; Non-cross-sectional studies; Insufficient data were provided to calculate the overall prevalence of stress; The lack of access to the full text prevented a full review; and Published repeatedly by the same author or by the same research group.

2.3. Literature retrieval strategy

To ensure the comprehensiveness of the literature, nine databases, including PubMed, Cochrane, Web of Science, Scopus, ScienceDirect, EMBASE, CNKI, Wanfang, and China biomedical literature service system, were searched to collect cross-sectional studies on emergency nurses' stress. The retrieval time was from the establishment of the database to February 2022. The retrieval methods are based on the combination of subject and free words and are adjusted according to the specific database. English keywords included emergency room nurse, emergency nurse, emergency nursing, stress, strain, and pressure. The foreign language retrieval strategy was ("emergency room nurse OR emergency nurse OR emergency nursing") AND (stress OR strain OR pressure). Taking PubMed as an example, the specific search strategy is shown in Figure 1.

2.4. Literature screening and data extraction

Two researchers (JJR and ZYX) independently screened literature, extracted data, and cross-checked. In case of disagreement, it was settled through discussion or negotiation with the third party (HWN). When selecting the articles, the researchers first read the title. After excluding the unrelated articles, they read the abstract and full text to determine whether they should be included. Data extraction included: Basic information about the included studies: first author, year of publication, total sample size, survey period and stress rate, etc. Outcome indicators: incidence of stress levels among emergency nurses. The related elements of bias risk assessment.

2.5. Bias risk assessment of included studies

Two reviewers (JJR and ZYX) in the form of mutual blindness independently evaluated the included literature using the AHRQ tool (Agency for Healthcare Research and Quality,[11] which consists of 11 items. If the answer was "no" or "unclear," the item score was "0"; If the answer was "yes," the item score was "1." A score of 8 to 11 was considered high quality, 4 to 7 moderate quality, and below 4 poor quality. After the independent evaluation, two researchers discussed and reached a consensus. If there was any disagreement, the third researcher arbitrated, or the research group discussed.

2.6. Statistical analysis

Endnote X9 was used to summarize the literature. Excel software was used for data extraction management, statistics, and descriptive analysis of outcome indicators. RevMan 5.4 software was used for all statistical analyses. The I^2 value low (25%), moderate (50%), or high (75%) heterogeneity. The analysis results in this study were highly heterogeneous, so it was appropriate to consider the random effect model. The definitions of low, medium and high-stress levels were based on the stress assessment tools used in the articles. For example, the stress grading criteria of the Nurse Stressor Scale (LX) were 35 to 70 for low-level stress, 71 to 105 for moderate-level stress, and 106 to 140 for high-level stress[12]; each item of Expanded nursing work stress scale (ENSS) had a score of 0 to 1 indicating low-level stress, a score of 1 to 3 indicating moderate-level stress, and a score of 3 to 4 indicating high-level stress.[13]

2.7. Ethical consideration

Ethical approval was not required based on the use of already published secondary data and the meta-analysis nature.

3. Results

3.1. Summary of article selection and data extraction

A total of 21 studies[8–10,12,14–30] met the inclusion criteria, as shown in Figure 2. The 21 articles used cross-sectional studies, and all quantitative studies used validated scales for data collection. The included literature was published from 2004 to 2021. The sample size of the study subjects was 709 at most and 44 at least, and the findings of these studies are based on a total of 4293 participants. The primary characteristics of the included studies are shown in Table 1.

#1"emergency room nurse"[All Fields] OR "emergency nurse"[All Fields] OR "emergency nursing"[All Fields]

#2"stress"[All Fields] OR "stressed"[All Fields] OR "stresses"[All Fields] OR "stressful"[All Fields] OR "stressfulness"[All Fields] OR "stressing"[All Fields] OR ("sprains and strains"[MeSH Terms] OR ("sprains"[All Fields] AND "strains"[All Fields]) OR "sprains and strains"[All Fields] OR "strain"[All Fields] OR "strains"[All Fields] OR "strain s"[All Fields]) OR ("pressure"[MeSH Terms] OR "pressure"[All Fields] OR "pressures"[All Fields] OR "pressure s"[All Fields] OR "pressurisation"[All Fields] OR "pressurised"[All Fields] OR "pressuriser"[All Fields] OR "pressurization"[All Fields] OR "pressurizations"[All Fields] OR "pressurize"[All Fields] OR "pressurized"[All Fields] OR "pressurizer"[All Fields] OR "pressurizes"[All Fields] OR "pressurizing"[All Fields]) OR ("stressor"[All Fields] OR "stressor s"[All Fields] OR "stressors"[All Fields])
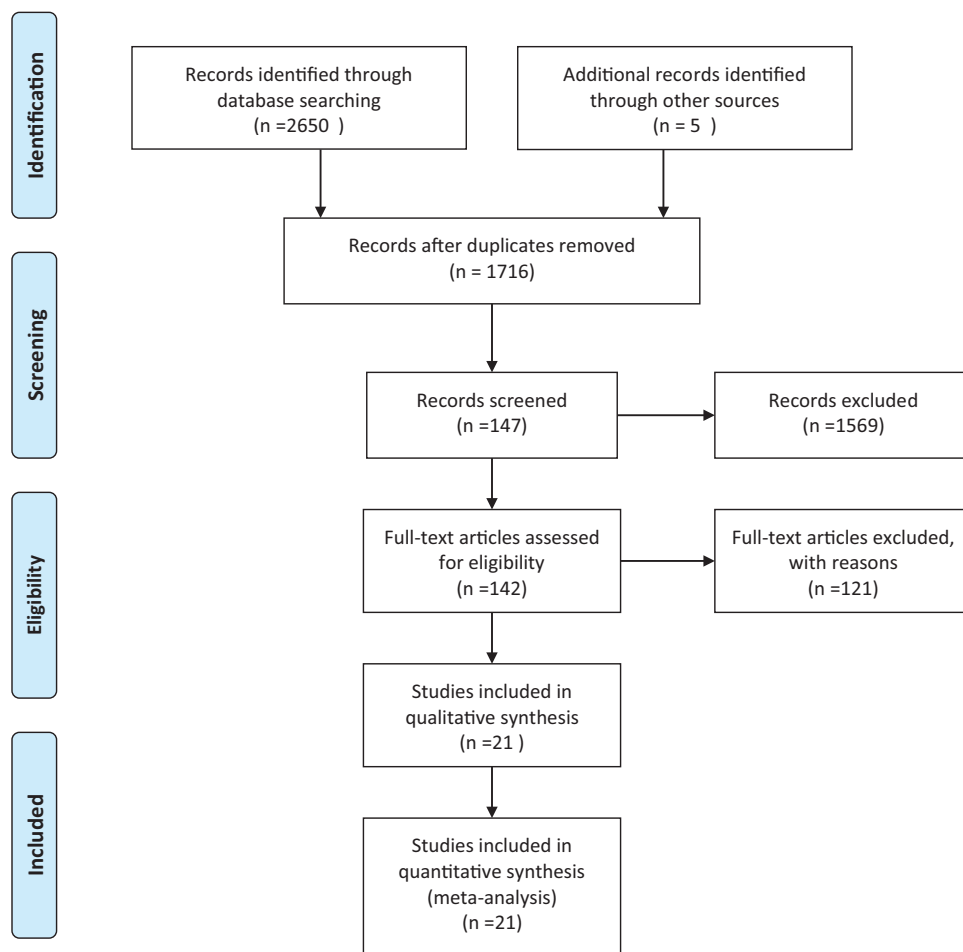
Figure 1. Search strategy.

Figure 2. Literature screening process and result.

3.2. Basic risk assessment results of included studies

The bias risk assessment results of the included studies are shown in Table 2. Among the 21 articles, the quality assessment grade of 4 literature was high, and that of 17 was medium.

3.3. Meta-analysis results

A total of 20 studies[8–10,12,14–16,18–30] were included, including 4166 patients. The results of meta-analysis showed that the incidence of low-level stress was 0.21% (95% CI [0.18–0.24]), the incidence of medium-level stress was 0.46% (95% CI [0.33–0.58]), and the incidence of high-level stress was 0.32% (95% CI [0.22–0.41]). As shown in Figures 3–5.

4. Discussion

As the first systematic review and meta-analysis to investigate the stress level of emergency nurses across countries, this paper reports that the incidence rate of the low, medium and high-stress levels was 0.21%, 0.46%, and 0.32%, respectively. This implies that the overall stress level of emergency nurses is mainly at the medium level, which is consistent with the research results of Park.[31] Due to the limitation of this study, only 5 countries were included in 21 studies: China, the USA, Iran, India, and Egypt. India and China are developing countries with many emergency patients and a shortage of emergency nurses.[32] Throughout Egypt's COVID-19 pandemic, nurses are experiencing fear, pressure, tiredness, ongoing emotional trauma, and isolation.[33] This study was published during this period.[30] According to a census, Iran (with a population of 75 million) requires about 240,000 nursing staff; however, the number of nursing staff in Iran now is about 100,000.[34] The shortage of nursing staff resulted in increased stress on emergency nurses in Iran.

The emergency department is a department that integrates critically ill patients with multiple types of diseases, and the task of patient rescue and management is heavy. It is the first defensive line for the hospital to save the patient's lives, and it is also a place prone to nurse-patient disputes, complaints, and other adverse events.[35,36] So, among high-dependency nursing specialties, emergency nursing is at the vanguard of being affected by negative psychosocial work stressors.[37] Adib-Hajbaghery et al[38] showed that emergency nurses' primary sources of stress were low social status, the attitude of nurses' managers, and constant vigilance. Yuwanich et al[39] provided that job variability, limited decision-making power, and insufficient social support were major stressors for emergency nurses. The treatment of special patients, stimulation of death, workplace violence, and other traumatic events are the direct causes of post-traumatic stress disorder in emergency nurses.[40] Park indicates that violence in the workplace Is a serious stressor for emergency nurses. Such stress may undermine nurses' morale and affect the quality of care.[31] Abdul et al[41] showed that emergency nurses were four times more likely to experience violent incidents and 2.8 times more likely to experience chronic fatigue than intensive care nurses. Nursing managers should pay attention to the mental health of emergency nurses and take personalized

Table 1

Basic characteristics of included studies.

Reference	Study design	Date collection	Country	Instruments	Subjects	Stress level (incidence rate)		
						Low	**Medium**	**High**
Cai H (2019)	Cross-sectional	January 2019	China	Occupational stress source. Questionnaire (Li Xiaomei)	58	18.9%	62%	15.5%
Tan CQ (2015)	Cross-sectional	October to December 2014	China	Stress questionnaire Self-designed	59	8.47%	37.28%	54.23%
Liang TY (2015)	Cross-sectional	Not reported	China	Emergency nurses stress questionnaire Self-designed	514	6.8%	39.5%	45.9%
Su TT (2016)	Cross-sectional	March to May 2016	China	Occupational stress source Questionnaire (Li Xiaomei)	127	Medium-high: 61.42%		
Jin J (2019)	Cross-sectional	Not reported	China	Stress questionnaire self-designed	44	43.18%	22.7%	27.27%
Yan HM (2015)	Cross-sectional	Not reported	China	Stressors questionnaire self-designed	137	38.69%	29.23%	20.44%
Liu Y (2016)	Cross-sectional	October 2013 to December 2015	China	Stress Questionnaire self-designed	98	31.63%	48.98%	12.24%
Ma LJ (2012)	Cross-sectional	Not reported	China	Occupational stress source Questionnaire (Li Xiaomei)	136	36.03%	47.79%	16.17%
Yang Q (2008)	Cross-sectional	Not reported	China	Occupational stress source Questionnaire (Li Xiaomei)	120			36.7%
Wang JL (2008)	Cross-sectional	January, 2007	China	Occupational stress source Questionnaire (Li Xiaomei)	116		15.52%	
He LY (2004)	Cross-sectional	Not reported	China	Stress questionnaire self-designed	134		35%	
Zhang XY (2006)	Cross-sectional	July, 2005	China	Stress questionnaire self-designed	68	3.4%	6.5%	46.5%
Cao XX (2007)	Cross-sectional	December 2006 to February 2007	China	Stress questionnaire self-designed	124	16.1%	71%	13%
Yang J (2015)	Cross-sectional	November to December 2014	China	Occupational stress source Questionnaire (Li Xiaomei)	140	31%	69%	
Zhang YR (2021)	Cross-sectional	January 2018 to June 2019	China	Chinese nurses work Stressors Scale (Wang Shu)	262	15.27%	48.85%	35.88%
Xu YJ (2020)	Cross-sectional	March to April 2019	China	Occupational stress source Questionnaire (Li Xiaomei)	453	3.31%	52.1%	44.59%
Johansen ML (2016)	Cross-sectional study	2009 to 2010	USA	Expanded nursing work stress scale (ENSS)	222	73%		
Tavakoli N (2018)	Cross-sectional study	2017	Tehran, Iran	The hospital stress scale (HSS-35)	709	10.5%	80.3%	9.2%
Singh GP (2013)	Cross-sectional study	Not reported	India	Self-estimation scale Perceived stress scale	52	12.8%	65.11% 68.2%	20.93% 19%
Hendy A (2020)	Cross-sectional investigation	Not reported	Egypt	Nursing Stress Scale (NSS)	374	13.4%	52.1%	26.2%
Chao Wu (2020)	Cross-sectional	Between March and May 2019	China	Chinese Perceived Stress Scales	346	3.47%	44.8%	51.73%

decompression measures in time, such as organizing regular psychological counseling and job training and arranging rational shifts to relieve the fatigue caused by work stress. Nurses should take the initiative to increase resilience and self-adjust, such as practicing more to improve operational proficiency and enjoy recreation properly.

5. Limitations of this review

While this review adopts a systematic process and incorporates a global perspective on ongoing research, it has several limitations. First, only English and Chinese papers were included in the review, limiting the inclusion of other languages. Second, the review was based on seven English and three Chinese language databases and did not include gray literature sources. Finally, due to the limitations of the included studies, this review did not analyze factors affecting stress among emergency nurses.

6. Conclusion

This systematic review has reported that the stress level of emergency nurses was mainly at the medium level. Nursing managers should pay attention to the physical and mental condition of nurses and timely take effective measures to help nurses relieve stress, improve their physical and mental health levels and reduce the emergency department nurses' turnover rate.

Future studies should analyze differences in the incidence of stress measured on different diagnostic criteria, regions, and genders. Also, future studies should adopt corresponding emergency department stress scales to investigate the stress levels of emergency nurses.

Table 2

Bias risk assessment results of included studies.

	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	Score	level
Cai H (2019)	Y	Y	Y	Y	Y	N	N	Y	N	Y	N	7	Medium
Tan CQ (2015)	Y	N	Y	Y	Y	N	N	Y	N	Y	UN	6	Medium
Liang TY (2015)	Y	Y	N	N	Y	N	Y	Y	Y	Y	N	7	Medium
Su TT (2016)	Y	Y	N	Y	Y	N	Y	Y	N	Y	UN	7	Medium
Jin J (2019)	Y	N	N	Y	Y	N	N	Y	N	Y	N	5	Medium
Yan HM (2015)	Y	N	N	Y	Y	N	N	Y	N	Y	N	5	Medium
Liu Y (2016)	Y	N	Y	Y	Y	N	N	Y	N	Y	N	6	Medium
Ma LJ (2012)	Y	N	N	Y	Y	N	N	Y	UN	Y	UN	5	Medium
Yang Q (2008)	Y	N	N	N	Y	N	N	Y	Y	Y	N	5	Medium
Wang JL (2008)	Y	N	Y	Y	Y	N	N	Y	N	Y	UN	6	Medium
He LY (2004)	Y	N	N	N	Y	N	N	Y	Y	Y	N	5	Medium
Zhang XY (2006)	Y	N	Y	Y	Y	N	N	Y	Y	Y	N	7	Medium
Cao XX (2007)	Y	N	Y	N	Y	N	N	Y	Y	Y	N	6	Medium
Yang J (2015)	Y	Y	Y	Y	Y	N	N	Y	N	Y	UN	8	High
Zhang YR (2021)	Y	Y	Y	N	Y	N	Y	Y	Y	Y	N	8	High
Xu YJ (2020)	Y	Y	Y	N	Y	N	Y	Y	Y	Y	N	8	High
Johansen ML (2016)	Y	Y	Y	N	Y	N	Y	Y	Y	Y	N	8	High
Tavakoli N (2018)	Y	N	Y	N	Y	N	N	Y	Y	Y	UN	6	Medium
Singh GP (2013)	Y	N	N	Y	Y	N	N	Y	N	Y	N	5	Medium
Hendy A (2020)	Y	Y	N	Y	Y	N	N	Y	N	Y	N	6	Medium
Chao W (2020)	Y	N	Y	N	Y	N	N	Y	Y	Y	N	6	Medium

① Whether the source of the data is clear (investigation, literature review); ② Are the inclusion and exclusion criteria for exposure and no exposure groups (cases and controls) listed or referred to previous publications? ③ Is a time period given for identifying patients? ④If not from the population, are the subjects continuous? ⑤Does the subjective factor of the evaluator cover up other aspects of the research object? ⑥ Describe any assessment for quality assurance (e.g. testing/ retesting of primary outcome indicators); ⑦The reasons for excluding any patients from the analysis were explained; ⑧It describes how to evaluate and/ or control the confounding factors; ⑨ If possible, the explanation is that how to deal with the loss of data; ⑩ The response rate and data collection were summarized the integrity of the system; ⑪ If there is a follow-up, identify the percentage of expected incomplete data or follow-up results.
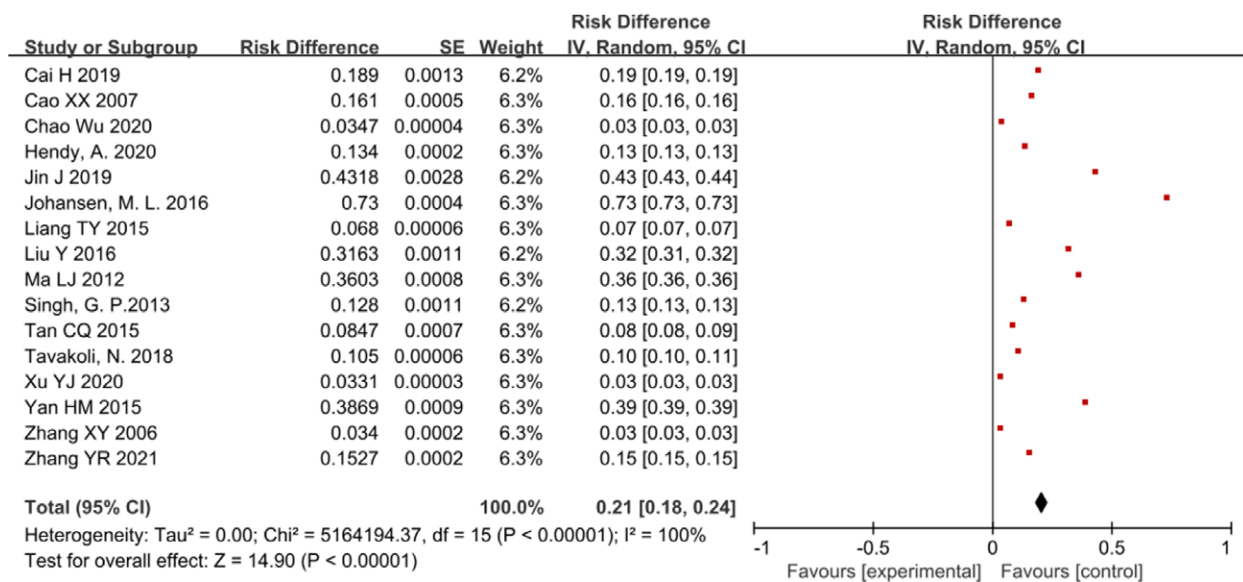

Study or Subgroup	Risk Difference	SE	Weight	Risk Difference IV, Random, 95% CI
Cai H 2019	0.189	0.0013	6.2%	0.19 [0.19, 0.19]
Cao XX 2007	0.161	0.0005	6.3%	0.16 [0.16, 0.16]
Chao Wu 2020	0.0347	0.00004	6.3%	0.03 [0.03, 0.03]
Hendy, A. 2020	0.134	0.0002	6.3%	0.13 [0.13, 0.13]
Jin J 2019	0.4318	0.0028	6.2%	0.43 [0.43, 0.44]
Johansen, M. L. 2016	0.73	0.0004	6.3%	0.73 [0.73, 0.73]
Liang TY 2015	0.068	0.00006	6.3%	0.07 [0.07, 0.07]
Liu Y 2016	0.3163	0.0011	6.2%	0.32 [0.31, 0.32]
Ma LJ 2012	0.3603	0.0008	6.3%	0.36 [0.36, 0.36]
Singh, G. P.2013	0.128	0.0011	6.2%	0.13 [0.13, 0.13]
Tan CQ 2015	0.0847	0.0007	6.3%	0.08 [0.08, 0.09]
Tavakoli, N. 2018	0.105	0.00006	6.3%	0.10 [0.10, 0.11]
Xu YJ 2020	0.0331	0.00003	6.3%	0.03 [0.03, 0.03]
Yan HM 2015	0.3869	0.0009	6.3%	0.39 [0.39, 0.39]
Zhang XY 2006	0.034	0.0002	6.3%	0.03 [0.03, 0.03]
Zhang YR 2021	0.1527	0.0002	6.3%	0.15 [0.15, 0.15]
Total (95% CI)			**100.0%**	**0.21 [0.18, 0.24]**

Heterogeneity: Tau² = 0.00; Chi² = 5164194.37, df = 15 (P < 0.00001); I² = 100%
Test for overall effect: Z = 14.90 (P < 0.00001)

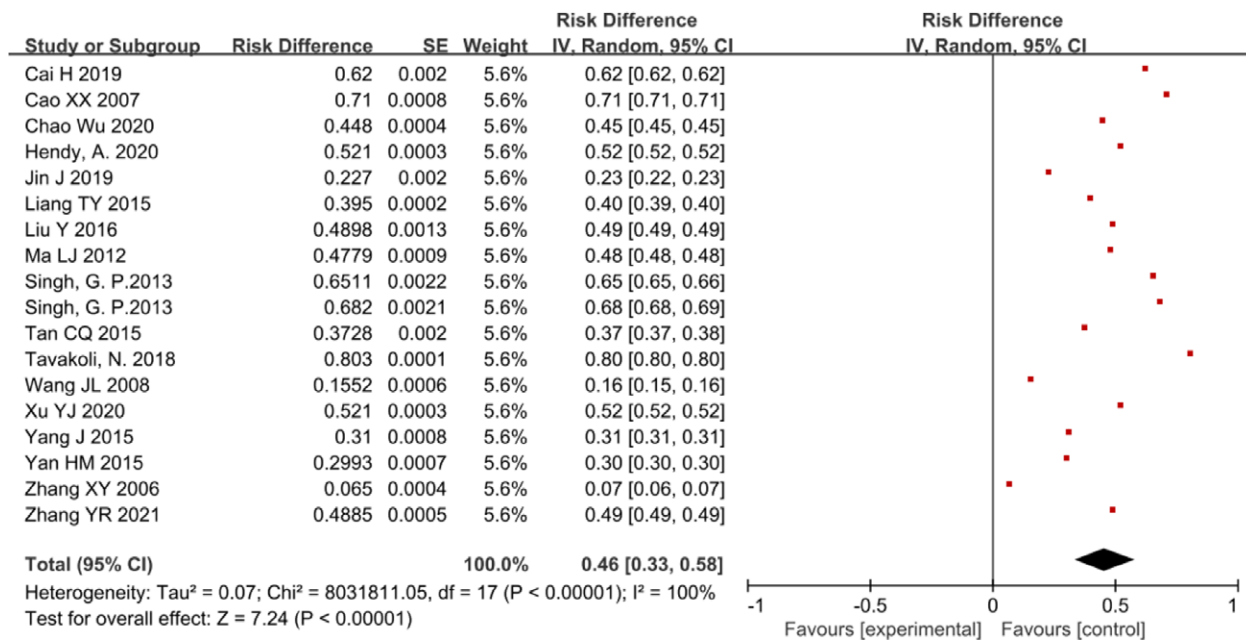**Figure 3.** A meta-analysis of low-level stress incidence.

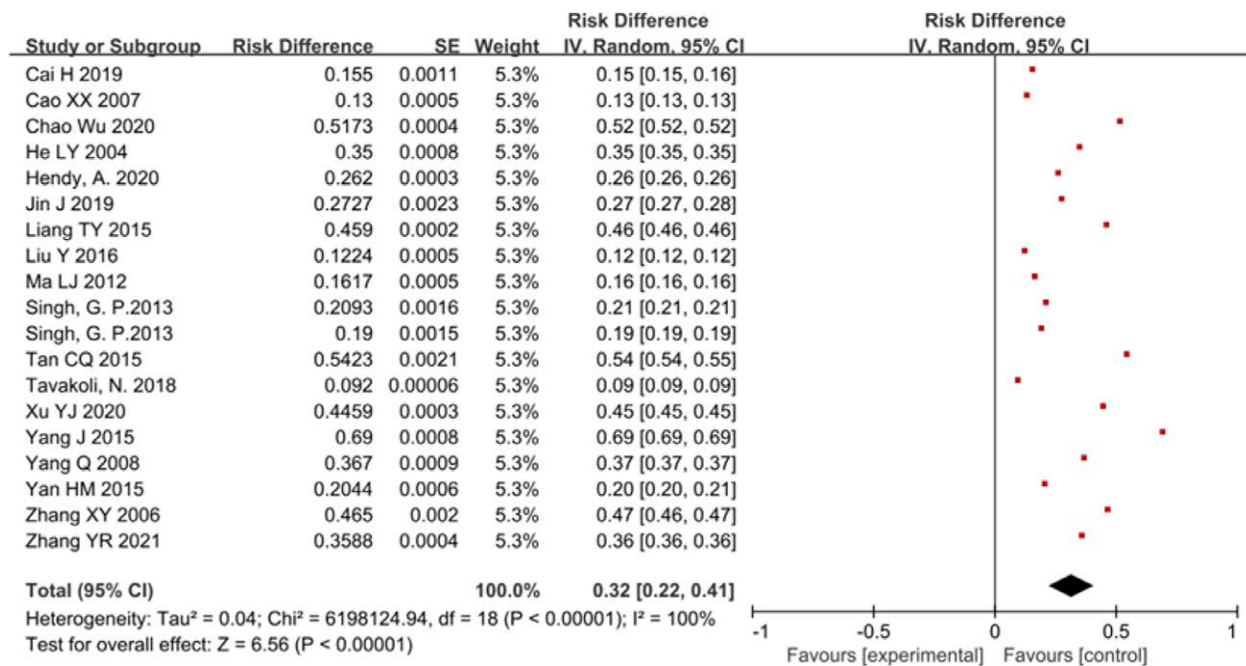**Figure 4.** A meta-analysis of medium-level stress incidence.

Figure 5. A Meta-analysis of high-level stress incidence.

References

[1] Silen M, Svantesson M, Kjellstrom S, et al. Moral distress and ethical climate in a Swedish nursing context: perceptions and instrument usability. J Clin Nurs. 2011;20:3483–93.

[2] Lambert VA, Lambert CE, Ito M. Workplace stressors, ways of coping and demographic characteristics as predictors of physical and mental health of Japanese hospital nurses. Int J Nurs Stud. 2004;41:85–97.

[3] Lambert VA, Lambert CE, Petrini M, et al. Workplace and personal factors associated with physical and mental health in hospital nurses in China. Nurs Health Sci. 2007;9:120–6.

[4] Bourbonnais R, Mondor M. Job strain and sickness absence among nurse in the province of Quebec. Am J Ind Med. 2001;39:194–202.

[5] Laposa JM, Alden LE, Fullerton LM. Work stress and posttraumatic stress disorder in ED nurses/personnel. J Emerg Nurs. 2003;29:23–8.

[6] Yin SH. Analysis of occupational stress status of 76 nurses in emergency department. Qilu J Nurs. 2011;17:21–2.

[7] Gao Y-Q, Pan B-C, Sun W, et al. Anxiety symptoms among Chinese nurses and the associated factors: a cross sectional study. BMC Psychol. 2012;12:141.

[8] Johansen ML, Cadmus E. Conflict management style, supportive work environments and the experience of work stress in emergency nurses. J Nurs Manag. 2016;24:211–8.

[9] Tavakoli N, Shaker SH, Soltani S, et al. Job burnout, stress, and satisfaction among emergency nursing staff after health system transformation plan in Iran. Emerg (Tehran). 2018;6:e41.

[10] Wu C, Ge Y, Xu C, et al. A correlation study of emergency department nurses' fatigue, perceived stress, social support and self-efficacy in grade III A hospitals of Xi'an. Medicine (Baltimore). 2020;99:e21052.

[11] Owens DK, Lohr KN, Atkins D, et al. AHRQ series paper 5: grading the strength of a body of evidence when comparing medical interventions – agency for healthcare research and quality and the effective health-care program. J Clin Epidemiol. 2010;63:513–23.

[12] Ma LJ, Qiu Y, Zhou AN, et al. Study on fatigue status and stress sources of nurses in emergency department. Chin J Hospital Manag. 2012;32:85–7.

[13] Liu Y, Wu MD. Job satisfaction and coping style of nursing staff under occupational stress. J Jining Med College. 2015;38:430–3.

[14] Cai H, Lei LF, Huang CY, et al. Investigation and analysis of the influence of stressors on physical and mental health of 58 emergency nurses. Famous Doctors. 2019;09:285.

[15] Tan CQ. Investigation of emergency nurses' stress in Enshi City Tertiary General Hospital. Your Health. 2015;9:285.

[16] Liang TY, Wang YQ, Chen H. Investigation on working stress and influencing factors of nurses in emergency department in Fuzhou city. Nurs Res. 2015;29:1740–3.

[17] Su TT. Emergency nurses job stress, coping styles and social support survey analysis. Chin Foreign Med. 2016;35:167–9.

[18] Jin J, Wei YY. Investigation on current situation and coping strategies of emergency nurses' work stress. Nurs Int Trad Western Med. 2019;5:151–4.

[19] Yan HM. Analysis and countermeasures of work stress sources for emergency nurses. Heilongjiang Med J. 2015;39:1177–8.

[20] Liu Y, Miao F, Cao D. Emergency department nurses work pressure source and corresponding measures. J Henan Surg J. 2016;22:151–2.

[21] Yang Q. A Study on Work Stress, Coping Style and Mental Health Status of Emergency Nurses [D]. Shihezi University; 2008.

[22] Wang JL. Study on work stress and related factors of nurses in emergency Department. J Shanxi Med College Staff Workers. 2008;02:69–71.

[23] He LY. Investigation and analysis of working stress of nurses in emergency Department and countermeasures. Guangxi Med Sci. 2004;09:1387.

[24] Zhang XY, Liu YG. Analysis and countermeasures of nurses' stress in emergency department. Contemp Nurse. 2006;04:26–7.

[25] Cao XX. Research on Stressors, Stress and Coping of Nurses in Emergency Department, [D]. Central South University; 2007.

[26] Yang J, Yang MY, Wu LQ. The relationship between stressors and coping styles of nurses in emergency Department. J Kunming Med Univ. 2015;36.

[27] Zhang YR, Li L, Wang HY, et al. A survey of nurses' attitudes toward professional psychological support for seeking help in emergency department. Chin J Social Med. 2021;6.

[28] Xu YJ. Research on the Relationship Between Psychological Capital and Empathic Fatigue of Nurses in Emergency Department, [D]. Qingdao University; 2020.

[29] Singh GP. Job stress among emergency nursing staff: a preliminary study. Indian J Psychiatry. 2013;55:407–8.

[30] Hendy A, Abozeid A, Sallam G, et al. Predictive factors affecting stress among nurses providing care at COVID-19 isolation hospitals at Egypt. Nurs Open. 2020;8:498–505.

[31] Park JH, Lee EN, Kong KR, et al. Hardiness mediates stress and impact level in ED nurses who experienced a violent event. J Emerg Nurs. 2017;43:539–44.

[32] Wu H, Sun W, Wang L. Factors associated with occupational stress among Chinese female emergency nurses. Emerg Med J. 2012;29:554–8.

[33] Maben J, Bridges J. Covid-19: supporting nurses' psychological and mental health. J Clin Nurs. 2020;29:2742–50.

[34] Valizadeh L, Zamanzadeh V, Habibzadeh H, et al. Experiences of Iranian nurses that intent to leave the clinical nursing: a content analysis. J Caring Sci. 2016;5:169–78.

[35] Richard J, Peter E. Stressors, burnout and social support: Nurses in acute mental health settings. J Adv Nurs. 2004;48:622–31.

[36] Popa F, Arafat R, Purcărea VL, et al. Occupational burnout levels in emergency medicine–a nationwide study and analysis. J Med Life. 2010;3:207.

[37] Browning L, Ryan CS, Thomas S, et al. Nursing specialty and burnout. Psychol Health Med. 2007;12:148148e154.

[38] Adib-Hajbaghery M, Khamechian M, Alavi NM. Nurses' perception of occupational stress and its influencing factors: a qualitative study. Iran J Nurs Midwifery Res. 2012;17:352–9.

[39] Yuwanich N, Sandmark H, Akhavan S. Emergency department nurses' experiences of occupational stress: a qualitative study from a public hospital in Bangkok, Thailand. Work. 2015;53:885–97.

[40] Lin L. Study on Post-traumatic Stress Disorder Among Emergency Nurses in Changsha Tertiary General Hospital [D]. Central South University; 2008.

[41] Abdul RH, Abdul-Mumin K, Naing L. Psychosocial work stressors, work fatigue, and musculoskeletal disorders: comparison between emergency and critical care nurses in Brunei Public Hospitals. Asian Nurs Res. 2017;11:13–8.