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Factors of hospital ethical climate among hospital nurses in Korea: A protocol for systematic review and meta-analysis

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Factors of hospital ethical climate among hospital nurses in Korea: A protocol for systematic review and meta-analysis

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Abbreviations:

- KoreaMed = Korean Association of Medical Journal Editors
- KMBase = Korean Medical Database
- KISS = Korean Studies Information Service System
- KISTI = Korea Institute of Science and Technology Information
- RISS = Research Information Sharing Service
- Embase = Excerpta Medica Database
- CINAHL = Cumulative Index to Nursing and Allied Health Literature

Abstract

Background: ethical hospital climate refers to the ethical work environment within a hospital, which may positively or negatively impact individual nurses, nursing organizations, and patient care. The ethical climate of an organization varies depending on the culture and characteristics of each organization. Therefore, this systematic review aims to determine the effect size of factors related to hospital ethical climates among nurses in Korea.

Method and analysis: A systematic literature review will be conducted using 10 electronic databases, including KoreaMed, KMBase, KISS, ScienceON, KISTI, RISS, PubMed, Cochrane Library, Embase, and CINAHL, for studies on hospital ethical climate among Korean nurses. Two reviewers will independently review and screened each article based on the inclusion and exclusion criteria, and any differences in opinion will be resolved through discussion and consensus. The study selection process will be reported using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses flow diagram. A methodological quality assessment of the selected literature will be performed using the Quality Assessment and Validity Tool for Correlation Studies. Effect size statistics will be analyzed using Comprehensive Meta-Analysis software version 2.0. The results of this study will identify factors related to the hospital ethical climate among nurses in Korea and the effect size of these factors.

Discussion: This study is possibly the first to integrate the effect size of factors related to hospital ethical climate among nurses in Korea, and its results will help understand the relationship between hospital ethical climate and its relevant factors among nurses in Korea. Additionally, this study aims to suggest directions for future studies and contribute to the preparation of a foundation for appropriate interventions.

Ethics and dissemination: Ethical assessment was not required. Findings will be disseminated through peer reviewed publication and will be presented at conferences related to this field.

PROSPERO registration number CRD42022379812

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ This systematic review will be the first to integrate the effect size of factors related to hospital ethical climate among nurses in Korea.

⇒ This study will help understand the relationship between hospital ethical climate and its relevant factors and suggest directions for future studies for appropriate interventions from existing literature.

⇒ Potential limitations include a limited number of studies that may influence the certainty of the evidence.

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INTRODUCTION

In the rapidly changing healthcare environment, nurses who care for patients face various ethical issues, including the commercialization and competition of healthcare, accessibility to medical services based on economic disparities, organ donation, and euthanasia.^{1,2} In nursing research, interest in ethical climate, which refers to an ethical working environment has increased.¹ In studies on the ethical climate among nurses in Korea, Victor and Cullen identified 9 sub-factors; furthermore,³ Olson determined the level of hospital ethical climate by the relationships between nurses and colleagues, bosses, hospitals, doctors, and patients.⁴

The hospital ethical climate refers to the working environment and is defined as the common perception of what righteous behavior is, how ethical problems should be addressed in organizations, and how it affects ethical decision-making and behavior.^{1,3-6} Nurses' perceptions of the work environment can influence their attitudes, behaviors, and ethical decision-making regarding ethical issues.⁴ Although individuals are the agents of ethical decision-making and behavior, the ethical behavior of constituents in an organization is strongly influenced by the organizational system that restricts individuals' decision-making and behavioral patterns rather than by the personality and personal morality of an individual.⁷ In other words, unethical behaviors of members can be tolerated or facilitated depending on the ethical climate of the organization. Practicing ethical behavior is important for nurses facing various ethical dilemmas. Therefore, the significance of an ethical climate, in which ethical perception is shared and ethical decision-making and behavior are allowed, has been increasing.

The ethical climate of organizations can affect nurses' occupational satisfaction, commitment to an organization, maintenance of a nursing job, and cooperation with doctors.² A literature review of ethical climate among nurses reported that ethical climate affected organizational performance, individual work mistakes, and psychological well-being.^{1,8} Indeed, ethical climate is an important factor that affects nurses' ethical practices.⁵ Thus, understanding factors related to hospital ethical climate that positively affect individual nurses, organizations, and patient care is of paramount importance.

The ethical climate of organizations reflects sociocultural characteristics and varies depending on organizational culture and work properties.⁹ Therefore, it is necessary to investigate factors related to hospital ethical climate, which reflects the sociocultural characteristics of Korea. Studies on ethical climate among nurses in Korea have been primarily conducted based on Victor and Cullen's Ethical Climate Questionnaire (ECQ)³ and Olson's Hospital Ethical Climate Survey.⁴ Victor and Cullen's ethical climate have been systematically reviewed,³ allowing for an understanding of the characteristics of the related factors.¹⁰ Olson's hospital ethical climate has been greatly covered in studies on nurses in Korea.⁴ However, no systematic reviews or meta-analyses have been conducted on the related factors, thereby limiting an integrated understanding of the factors related to hospital ethical climate. Therefore, it is necessary to identify and integrate factors related to the hospital ethical climate among nurses, which reflect the sociocultural characteristics of Korea. This study presents a protocol for a systematic review and meta-analysis to determine the factors related to hospital ethical climate among nurses in

Korea and identify the effect size of factors related to hospital ethical climate. The results of this review provide evidence for improvements in nursing quality, nursing organizations, and individual nurses.

METHODS

A literature review based on this protocol will be reported based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 checklist.¹¹

Protocol registration

The development of this protocol conforms to the basic reporting items in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Protocol (PRISMA-P) guidelines.¹² The protocol was registered with the International Prospective Register of Systematic Reviews (PROSPERO) (registration number CRD42022379812).

Search strategy

The literature published in both Korean and English will be searched. Korean studies will be searched in KoreaMed, KMBase, KISS, ScienceON, KISTI, and RISS, while English studies will be searched comprehensively in PubMed, the Cochrane Library, Embase, and CINAHL. These core search databases are recommended for systematic literature review by the National Evidence-Based Healthcare Collaborating Agency, based on the COSI (COre, Standard, Ideal) model of the National Library of Medicine.¹³ Additional searches will be conducted through the websites of the Korean Society of Nursing Science and the Korean Society of Nursing Administration. The reference lists of relevant papers will be manually searched.

Medical Subject Headings (MeSH) of PubMed will be used for systematic and comprehensive searches. Primary search keywords are “ethical climate,” “hospital ethical climate,” “ethical environment,” “ethical working environment,” “nurse,” and “Korea,” as well as Boolean operators and symbols of exploding terms (*, +). Titles, abstracts, and MeSH/synonyms (Thesaurus) will be searched for in all cases. Table 1 shows the preliminary search strategy used in PubMed. The search will be conducted between June 15 and August 31.

Table 1. The search strategy in PubMed.

Search terms	
1	Ethical climate
2	Hospital ethical climate
3	Ethical environment
4	Ethical work environment

- 1
- 2
- 3
- 4567891011121314151617
- 18192021222324252627282930313233343536373839404142434445464748495051525354555657585960
- 51 OR 2 OR 3 OR 4
- nurse[Mesh]
- Korea*
- 6 AND 7
- 5 AND 8

Inclusion and exclusion criteria

The research questions are identified based on PICO-SD (Participants, Intervention, Comparisons, Outcomes, Study Design) according to the National Evidence-Based Healthcare Collaborating Agency Manual.¹³ The study participants (P) are nurses working in hospitals in Korea, and intervention (I) is the hospital ethical climate, which is the concept of interest in this study. A control group (C) was not set, outcomes (O) are factors related to hospital ethical climate among nurses in Korea, and the study design (SD) is a quantitative or mixed-method study. The inclusion criteria are primary literature published in Korean or English that studied factors related to hospital ethical climates among nurses in Korea. Quantitative and mixed-methods studies can be included in the SD process. Studies can be included if they provide “sample size (*n*),” which can be converted to effect size for the related factors, “correlation coefficient (*r*),” mean and standard deviation, and odds ratio. The publication period is until May 2023. Table 2 lists the specific inclusion and exclusion criteria.

Table 2. Inclusion and exclusion criteria of studies.

Inclusion criteria	Exclusion criteria
Research targeting Korean nurses	
Primary quantitative or mixed studies on the hospital ethical climate	
Research published in peer-reviewed journals	Qualitative research using open-ended questions
Studies evaluating the relationship between hospital ethical climate and related variables	Not Korean or English studies
Studies published by May 2023 in Korean or English	Non-primary research: reports, dissertations, reviews, case studies, editorial articles, and so on
Hospital ethical climate measured by the Hospital Ethical Climate Survey (HECS)	

Outcomes

The primary outcomes of this study are factors related to hospital ethical climate among nurses in Korea, as a result of a systematic literature review. The secondary outcome are the effect sizes of these factors.

Study selection

The literature identified through the literature search will be organized using Zotero, a literature management program that allows for the identification and removal of redundant studies. The literature search will be independently conducted by two researchers (Y.G. and S.Y.), who will primarily remove redundant articles. The researchers read the titles and abstracts and independently reviewed their eligibility. The original articles will be examined to check whether they meet the inclusion criteria, and any discrepancies in the review process will be resolved by discussion. If an agreement cannot be reached, an external reviewer will be consulted. In cases of missing data, the original authors will be contacted to obtain relevant information. The literature selection and exclusion process will be reported using the PRISMA 2020 flow diagram, and all reasons for exclusion will be recorded (Fig. 1).¹¹

Figure 1. PRISMA flowchart of study selection.

Data extraction

Two researchers (Y.G. and S.Y.) thoroughly discussed the data to be extracted while planning this study. Specific data items included author, year of publication, country of publication, sample selection methods, sample size, analysis methods, reliability of a tool for hospital ethical climate, related factors, and analysis results. The data will be arranged in Excel (Supplemental Digital Content 1). The data will be arranged primarily in order of years of publication. Researchers will make efforts to reach an agreement through regular meetings in the literature review process to maintain consistency between researchers. If necessary, contact will be made with the authors of the studies to request for missing or additional data.

Risk of bias and quality assessment

Quality assessment will be performed using the Quality Assessment and Validity Tool for Correlational Studies,¹⁴ developed by Cummings and Estabrooks in 2003 and updated by Cummings et al. in 2018 (Supplemental Digital Content 2). This tool is appropriate to assess the quality and validity of correlational studies. It consists of 13 items, including 2 for SD, 4 for sampling, 5 for measurement, and 2 for statistical analysis. Of the 13 items, 11 were assessed using “Yes” and “No,” and “Yes” was scored as 1 point.

Among the measuring items, ‘Was a theoretical model/foundation used for guidance?’ is scored 1 point only if researchers used the traditional theoretical models and foundation, while 0 points were given if they

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established a hypothetical model based on previous studies. The item “Was the outcome measured rather than self-reported?” is scored as 1 point if the outcome is self-reported (No) and 2 points if the outcome is measured (Yes). The tool yielded a score of 14 points. Based on the calculation, 0–4 points were evaluated as low, 5–9 points as medium, and 10–14 points as high.¹⁴

Two reviewers will independently conduct the quality assessment. Efforts will be made to reach an agreement through discussion when there is a disagreement between the reviewers.

Data synthesis

The effect sizes of factors related to hospital ethical climate among nurses in Korea will be analyzed. The effect size statistics of the related variables will be analyzed using Comprehensive Meta-Analysis software (Biostat, Englewood, NJ, USA) to determine the effect size of individual studies. Factors with less than two or more studies that cannot be statistically analyzed due to different criteria in the sub-items will be excluded from the analysis.

For heterogeneity between individual literature articles, Higgins *I*² heterogeneity will be evaluated with a significance level of less than 5%. If *I*² exhibited a moderate or higher level of heterogeneity and exceeds 50%, it will be considered as heterogeneous.¹⁵

Effect models will be selected based on whether they are heterogeneous and whether each study shares the effect size of the same population.^{16,17}

The effect sizes of the related factors will be calculated by determining the effect size of the correlation coefficient. The effect size of the overall average of the variables related to hospital ethical climate among nurses in Korea will be calculated. To calculate the effect size, Fisher’s formula will be used to standardize the *r* value to calculate the standardized *Zr*. Studies with larger samples are more precise than those with smaller sample sizes. Thus, the overall effect size will be calculated by imposing the weight values.¹⁷

Additionally, if the effect sizes of individual studies are heterogeneous, they will be categorized as sub-factors, depending on the characteristics of the related factors, to calculate each effect size. For the calculated effect size, effect sizes of less than .10 will be explained as a “small effect,” about .30 as a “medium effect,” and .50 or higher as a “big effect” based on Cohen’s effect size interpretation standard.¹⁸

Publication bias

Publication bias will be determined using visual and statistical methods to determine funnel plot symmetry. The symmetrical levels of the effect sizes of individual studies are visually determined. If both sides are relatively symmetric based on the effect size, it will be judged to have no publication bias. Statistically, if the significance probability of the initial value (intercept) for the regression equation is less than .05 in Egger’s regression test, it is statistically significant and will be judged as publication bias.¹⁷

If judged as publication bias, trim and fill analysis will be conducted to determine the effects of the bias

on the outcomes.^{17,19} This analysis corrects asymmetry to symmetry through exclusion and restoration of studies to compare the studies before and after effect size. This sensitivity analysis method is used to assess the validity of the results regarding bias.

Ethics and dissemination

Given the inherent characteristics of the study design, ethical evaluation was waived as per the established guidelines. The outcomes of this systematic review will be communicated through publication in peer-reviewed journals and presented at relevant international conferences in the respective domain. Furthermore, any potential revisions to the research protocol will be thoroughly documented, with explicit reference to the saved search strategies and analytical techniques.

DISCUSSION

Recently, various ethical issues have emerged in the medical environment. The hospital ethical climate, which is the working environment of nurses, has attracted increasing interest. The ethical climate varies depending on the culture and characteristics of the organization. Thus, it is necessary to identify factors related to the hospital ethical climate covered by studies on hospital ethical climate among nurses, in which sociocultural characteristics in Korea are reflected. An ethical climate can affect nurses' ethical behavior, job satisfaction, commitment to an organization, and maintenance of a nursing job. Thus, it is important to identify factors related to the hospital ethical climate to achieve positive results for individuals and organizations.

Many studies have been conducted on nurses in Korea according to Olson's hospital ethical climate. Therefore, it is time to conduct systematic reviews and meta-analyses to reach an integrated understanding of the factors related to hospital ethical climate among nurses in Korea.

This systematic review and meta-analysis will provide scientific evidence for the relationship between hospital ethical climates among nurses in Korea and related factors. Ultimately, this study suggests measures to improve the quality of nurses, nursing organizations, and nursing services.

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Author Contributions

Conceptualization: Yoon Goo Noh.
Data curation: Yoon Goo Noh, Se Young Kim.
Funding acquisition: Se Young Kim.
Methodology: Yoon Goo Noh, Se Young Kim.
Software: Yoon Goo Noh, Se Young Kim.
Writing – original draft: Yoon Goo Noh.
Writing – review & editing: Yoon Goo Noh, Se Young Kim.

Acknowledgements

Not applicable.

Funding Sources

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Data Availability Statement

Data sharing is not applicable to this article, as no datasets were generated or analyzed during the current study.

Ethics Approval

Ethical review and approval were waived for this study because it was a systematic review protocol.

Patient Consent

Patient consent was waived, as this study is a systematic review protocol.

Conflict of Interest

The authors of this work have nothing to disclose.

Supplemental Digital Content

Supplemental Digital Content is available for this article.

References

1. Koskenvuori J, Numminen O, Suhonen R. Ethical climate in nursing environment: a scoping review. *Nurs Ethics*. 2019;26(2):327-345.
2. Lemmenes D, Valentine P, Gwizdalski P, et al. Nurses' perception of ethical climate at a large academic medical center. *Nurs Ethics*. 2018;25(6):724-733.
3. Victor B, Cullen JB. The organizational bases of ethical work climates. *Adm Sci Q*. 1988;33(1):101-125.
4. Olson LL. Hospital nurses' perceptions of the ethical climate of their work setting. *Image J Nurs Sch*. 1998;30(4):345-349.
5. Numminen O, Leino-Kilpi H, Isoaho H, et al. Ethical climate and nurse competence—newly graduated nurses' perceptions. *Nurs Ethics*. 2015;22(8):845-859.
6. Humphries A, Woods M. A study of nurses' ethical climate perceptions: compromising in an uncompromising environment. *Nurs Ethics*. 2016;23(3):265-276.
7. Reilly BJ, Kyj MJ. Economics and ethics. *J Bus Ethics*. 1990;9(9):691-698.
8. Martin KD, Cullen JB. Continuities and extensions of ethical climate theory: a meta-analytic review. *J Bus Ethics*. 2006;69(2):175-194.
9. Victor B, Cullen JB. A theory and measure of ethical climate in organizations. In: Frederick WC, editor. *Research in Corporate Social Performance and Policy*. Vol 9. Greenwich: JAI Press; 1987.
10. Noh YG, Lee OS. Factors related to ethical climate of nurses in Korea: A systematic review. *J Health Info Stat*. 2020;45(3):261-272.
11. Page MJ, McKenzie JE, Bossuyt PM, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *Syst Rev*. 2021;10(89):1-11.
12. Moher D, Shamseer L, Clarke M, et al. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Syst Rev*. 2015;4(1):1-9.
13. Kim SY, Park JE, Seo HJ, et al. NECA's guidance for undertaking systematic reviews and meta-analyses for intervention; National Evidence-based Healthcare Collaborating Agency: Seoul, Republic of Korea, 2011.
14. Cummings GG, Tate K, Lee S, et al. Leadership styles and outcome patterns for the nursing workforce and work environment: A systematic review. *Int J Nurs Stud*. 2018;85:19-60.
15. Mullen B, Hu L-t. Perceptions of ingroup and outgroup variability: A meta-analytic integration. *Basic Appl Soc Psych*. 1989;10(3):233-252.
16. Borenstein M, Hedges LV, Higgins JPT, et al. *Introduction to meta-analysis*. West Sussex: John Wiley & Sons; 2009.
17. Hwang SD. *Meta-analysis 4th*. Seoul: HAKJISA; 2019.

18. Cohen J. Statistical power analysis for the behavioral sciences. 2nd ed. Hillsdale, N.J.: L. Erlbaum Associates; 1988.

19. Duval S, Tweedie R. Trim and fill: A simple funnel-plot based method of testing and adjusting for publication bias in meta-analysis. *Biometrics*. 2000;56(2):455-463.

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Figure Legends

Figure 1. PRISMA flowchart of study selection.

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Supplemental Digital Contents

Supplemental Digital Content 1. Data extraction.

Supplemental Digital Content 2. Table S2. Quality Assessment and Validity Tool for Correlational Studies.

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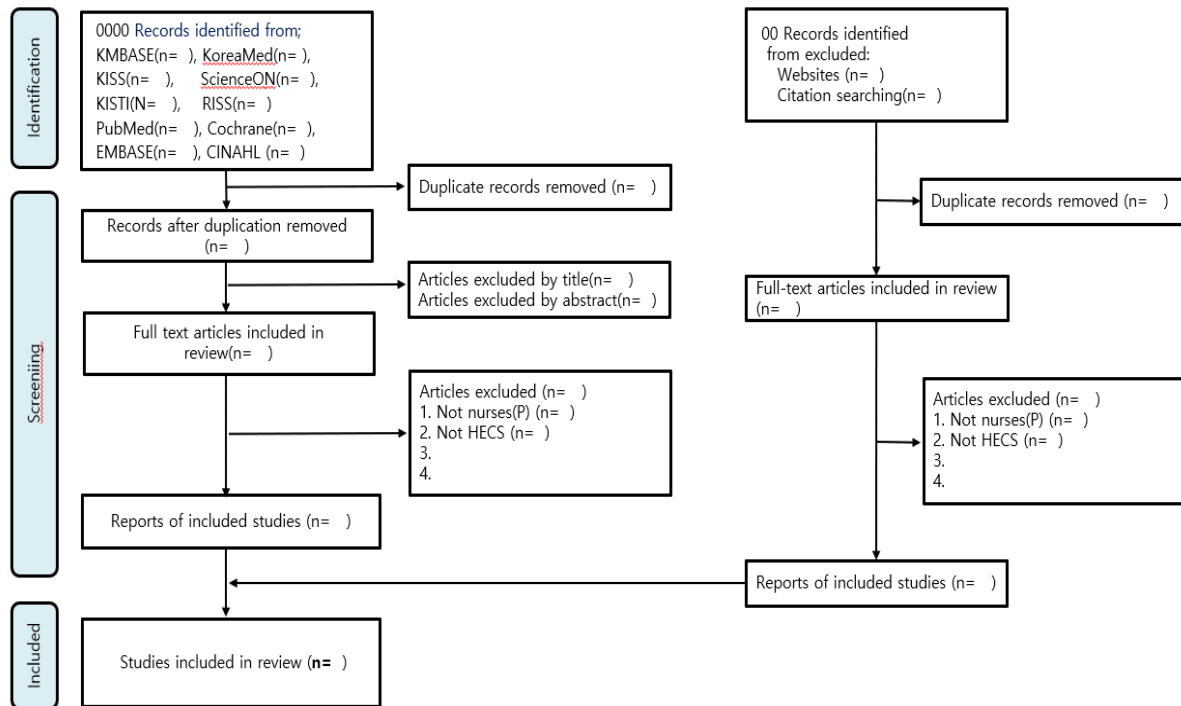


Figure 1. PRISMA Flow chart of study selection

PRISMA-P (Preferred Reporting Items for Systematic review and Meta-Analysis Protocols) 2015 checklist: recommended items to address in a systematic review protocol*

Section and topic	Item No	Checklist item	Reported on Page #
ADMINISTRATIVE INFORMATION			
Title:			
Identification	1a	Identify the report as a protocol of a systematic review	1#
Update	1b	If the protocol is for an update of a previous systematic review, identify as such	N/A
Registration	2	If registered, provide the name of the registry (such as PROSPERO) and registration number	1#
Authors:			
Contact	3a	Provide name, institutional affiliation, e-mail address of all protocol authors; provide physical mailing address of corresponding author	1#
Contributions	3b	Describe contributions of protocol authors and identify the guarantor of the review	8#
Amendments	4	If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments	N/A
Support:			
Sources	5a	Indicate sources of financial or other support for the review	8#
Sponsor	5b	Provide name for the review funder and/or sponsor	8#
Role of sponsor or funder	5c	Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol	N/A
INTRODUCTION			
Rationale	6	Describe the rationale for the review in the context of what is already known	3#
Objectives	7	Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)	4-5#
METHODS			
Eligibility criteria	8	Specify the study characteristics (such as PICO, study design, setting, time frame) and report characteristics (such as years considered, language, publication status) to be used as criteria for eligibility for the review	4-5#
Information sources	9	Describe all intended information sources (such as electronic databases, contact with study authors, trial registers or other grey literature sources) with planned dates of coverage	4#
Search strategy	10	Present draft of search strategy to be used for at least one electronic database, including planned limits such that it could be repeated	4#

Study records:			
Data management	11a	Describe the mechanism(s) that will be used to manage records and data throughout the review	4#
Selection process	11b	State the process that will be used for selecting studies (such as two independent reviewers) through each phase of the review (that is, screening, eligibility and inclusion in meta-analysis)	4#
Data collection process	11c	Describe planned method of extracting data from reports (such as piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators	4#
Data items	12	List and define all variables for which data will be sought (such as PICO items, funding sources), any pre-planned data assumptions and simplifications	4#
Outcomes and prioritization	13	List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale	5#
Risk of bias in individual studies	14	Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis	5-6#
Data synthesis	15a	Describe criteria under which study data will be quantitatively synthesised	6#
	15b	If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data and methods of combining data from studies, including any planned exploration of consistency (such as I^2 , Kendall's τ)	6#
	15c	Describe any proposed additional analyses (such as sensitivity or subgroup analyses, meta-regression)	7#
	15d	If quantitative synthesis is not appropriate, describe the type of summary planned	N/A
Meta-bias(es)	16	Specify any planned assessment of meta-bias(es) (such as publication bias across studies, selective reporting within studies)	7#
Confidence in cumulative evidence	17	Describe how the strength of the body of evidence will be assessed (such as GRADE)	6#

*** It is strongly recommended that this checklist be read in conjunction with the PRISMA-P Explanation and Elaboration (cite when available) for important clarification on the items. Amendments to a review protocol should be tracked and dated. The copyright for PRISMA-P (including checklist) is held by the PRISMA-P Group and is distributed under a Creative Commons Attribution Licence 4.0.**

From: Shamseer L, Moher D, Clarke M, Ghersi D, Liberati A, Petticrew M, Shekelle P, Stewart L, PRISMA-P Group. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation. BMJ. 2015 Jan 2;349(jan02 1):g7647.

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Supplemental Digital Content 1.

Data extraction

1. Identification of studies

Authors

Year of Publication

Publication journals (Domestic, Abroad)

Study Design

Sampling

Sample size

Analysis method

HECS Reliability (Cronbach's α)

2. Variables related to Hospital Ethical Climate

Related variables

Main findings: Correlation

Main findings: Effect

Main findings: Etc

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Supplemental Digital Content 2.

Table S2. Quality Assessment and Validity Tool for Correlational studies

The Outcomes of Leadership: A systematic review		
Quality Assessment and Validity Tool for Correlation studies; 13 item		
Study:	First Author:	
Publication information: Date:	Journal:	
Design:	No	Yes
1. Was the study prospective?	<input type="checkbox"/>	<input type="checkbox"/>
2. Was probability sampling used?	<input type="checkbox"/>	<input type="checkbox"/>
Sampling:		
1. Was sampling size justified?	<input type="checkbox"/>	<input type="checkbox"/>
2. Was sampling drawn from more than one site?	<input type="checkbox"/>	<input type="checkbox"/>
3. Was anonymity protected?	<input type="checkbox"/>	<input type="checkbox"/>
4. Response rate more than 60%.	<input type="checkbox"/>	<input type="checkbox"/>

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Factors of hospital ethical climate among hospital nurses in Korea: A protocol for systematic review and meta-analysis

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Factors of hospital ethical climate among hospital nurses in Korea: A protocol for systematic review and meta-analysis

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Abbreviations:

- KoreaMed = Korean Association of Medical Journal Editors
- KMBase = Korean Medical Database
- KISS = Korean Studies Information Service System
- KISTI = Korea Institute of Science and Technology Information
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Abstract

Introduction The hospital ethical climate refers to the ethical work environment within a hospital, which may positively or negatively impact individual nurses, nursing organizations, and patient care. Most of studies investigating the hospital ethical climate among Korean nurses have been published in Korean. However, papers addressing the hospital ethical climate in Korean were excluded from the systematic review. To enhance our comprehension of the hospital ethical climate, a systematic review specifically focusing on Korean nurses is imperative. Additionally, it is crucial to ascertain the factors associated with the hospital ethical climate and their respective effect sizes through meta-analyses.

Methods and analysis The systematic search will be conducted for papers published in both Korean and English, encompassing the hospital ethics climate of Korean nurses from 10 database inception to May 2023. Two reviewers will independently review each article based on the inclusion and exclusion criteria, and any differences in opinion will be resolved through discussion and consensus. The study selection process will be reported using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses flow diagram. Quality assessment will be conducted using the Checklist for Analytical Cross-Sectional Studies provided by JBI. Effect size will be analyzed using Comprehensive Meta-Analysis software version 2.0. The results of this study will identify factors related to the hospital ethical climate and the effect size of these factors among nurses in Korea.

Ethics and dissemination Ethical approval is not required, as the data will be collected from existing literature. Findings will be disseminated through peer-reviewed journal.

PROSPERO registration number CRD42022379812

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ This systematic review adheres to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol.
- ⇒ This study has language limitations as it exclusively included papers in Korean and English related to the hospital ethical climate of Korean nurses.
- ⇒ The certainty of evidence in this systematic review may be limited, depending on the availability and quality of the evidence found.

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INTRODUCTION

In the rapidly changing healthcare environment, nurses who care for patients face various ethical issues, including the commercialization and competition of healthcare, accessibility to medical services based on economic disparities, organ donation, and euthanasia [1,2]. In nursing research, interest in ethical climate, which refers to an ethical working environment has increased [1]. In studies on the hospital ethical climate among nurses in Korea, Victor and Cullen identified 9 sub-factors; furthermore [3], Olson determined the level of hospital ethical climate by the relationships between nurses and colleagues, bosses, hospitals, doctors, and patients [4].

The hospital ethical climate refers to the working environment and is defined as the common perception of what righteous behavior is, how ethical problems should be addressed in organizations, and how it affects ethical decision-making and behavior [1,3-6]. Nurses' perceptions of the work environment can influence their attitudes, behaviors, and ethical decision-making regarding ethical issues [4]. Although individuals are the agents of ethical decision-making and behavior, the ethical behavior of constituents in an organization is strongly influenced by the organizational system that restricts individuals' decision-making and behavioral patterns rather than by the personality and personal morality of an individual [7]. In other words, unethical behaviors of members can be tolerated or facilitated depending on the ethical climate of the organization. Practicing ethical behavior is important for nurses facing various ethical dilemmas. Therefore, the significance of a hospital ethical climate, in which ethical perception is shared and ethical decision-making and behavior are allowed, has been increasing.

The hospital ethical climate can affect nurses' occupational satisfaction, commitment to an organization, maintenance of a nursing job, and cooperation with doctors [2]. A literature review of hospital ethical climate among nurses reported that hospital ethical climate affected organizational performance, individual work mistakes, and psychological well-being [1,8]. Indeed, hospital ethical climate is an important factor that affects nurses' ethical practices [5]. Thus, understanding factors related to hospital ethical climate that positively affect individual nurses, organizations, and patient care is of paramount importance.

The hospital ethical climate of organizations reflects sociocultural characteristics and varies depending on organizational culture and work properties [9]. Therefore, it is necessary to investigate factors related to hospital ethical climate, which reflects the sociocultural characteristics of Korea. Studies on ethical climate among nurses in Korea have been primarily conducted based on Victor and Cullen's Ethical Climate Questionnaire (ECQ) [3] and Olson's Hospital Ethical Climate Survey [4]. Victor and Cullen's ethical climate have been systematically reviewed [3], allowing for an understanding of the characteristics of the related factors [10]. Olson's hospital ethical climate has been greatly covered in studies on nurses in Korea [4]. Recently, a systematic review on the hospital ethical climate has been conducted, but it exclusively encompasses studies published in English [11]. This limitation impedes a comprehensive understanding of hospital ethical climate research among Korean nurses, given that most studies in this domain are presented in Korean. There is a crucial need to gain insight into

the hospital ethical climate of Korean nurses, considering social and cultural characteristics, through a systematic review. Furthermore, no reports on factors related to the hospital ethical climate were found in the systematic review and meta-analysis. Therefore, it is essential to identify and integrate factors associated with the hospital ethical climate among Korean nurses, reflecting the socio-cultural characteristics of Korea. Additionally, by confirming the effect size of related factors, evidence-based data can be provided to develop strategies aimed at improving the hospital ethical climate of Korean nurses.

Objectives and research questions

This systematic review aims to ascertain the factors associated with the hospital ethical climate among Korean nurses and to identify the effect size of these factors. The following two research questions are proposed:

1. What variables are associated with the hospital ethical climate of Korean nurses?
2. What is the effect size of variables related to the hospital ethical climate?

METHODS

A literature review based on this protocol will be reported based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 checklist [12].

Protocol registration

The development of this protocol conforms to the basic reporting items in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Protocol (PRISMA-P) guidelines [13]. The protocol was registered with the International Prospective Register of Systematic Reviews (PROSPERO) (registration number CRD42022379812).

Search strategy

The literature published in both Korean and English inception to May 2023 will be searched. Korean studies will be searched in KoreaMed, KMBase, KISS, ScienceON, KISTI, and RISS, while English studies will be searched comprehensively in PubMed, the Cochrane Library, Embase, and CINAHL. These core search databases are recommended for systematic literature review by the National Evidence-Based Healthcare Collaborating Agency, based on the COSI (COre, Standard, Ideal) model of the National Library of Medicine [14]. Additional searches will be conducted through the websites of the Korean Society of Nursing Science and the Korean Society of Nursing Administration. The reference lists of relevant papers will be manually searched.

Medical Subject Headings (MeSH) of PubMed will be used for systematic and comprehensive searches. Primary

search keywords are “ethical climate,” “hospital ethical climate,” “ethical environment,” “ethical working environment,” “nurse,” and “Korea,” as well as Boolean operators and symbols of exploding terms (*, +). Titles, abstracts, and MeSH/synonyms (Thesaurus) will be searched for in all cases. Online supplemental file 1 displays the search strategy employed across 10 electronic databases, including KoreaMed, KMBase, KISS, ScienceON, KISTI, PubMed/Medline, Cochrane Library, CINAHL, and Embase.

Inclusion and exclusion criteria

The research question are identified based on PICO-SD (Participants, Intervention, Comparisons, Outcomes, Study Design) according to the National Evidence-Based Healthcare Collaborating Agency Manual [13]. The study participants (P) are nurses working in hospitals in Korea, and intervention (I) is the hospital ethical climate, which is the concept of interest in this study. A control group (C) was not set, outcomes (O) are factors related to hospital ethical climate among nurses in Korea, and the study design (SD) is a quantitative or mixed-method study. The inclusion criteria consist of primary literature published in Korean or English that investigates factors associated with hospital ethical climates among Korean nurses. Quantitative and mixed-methods studies are eligible for inclusion in the systematic data (SD) process. Studies meeting the criteria should provide key metrics such as 'sample size (n)', 'correlation coefficient (r),' mean and standard deviation, and odds ratio. The publication period considered extends up to May 2023. To calculate the effect size of related variables, qualitative studies will be excluded from the analysis. Specific details outlining the inclusion and exclusion criteria are provided in Table 1.

Table 1. Inclusion and exclusion criteria of studies.

Inclusion criteria	Exclusion criteria
Research targeting Korean nurses	
Primary quantitative or mixed studies on the hospital ethical climate	
Research published in peer-reviewed journals	Qualitative research using open-ended questions
Studies evaluating the relationship between hospital ethical climate and related variables	Not Korean or English studies
Studies published by May 2023 in Korean or English	Non-primary research: reports, dissertations, reviews, case studies, editorial articles, and so on
Hospital ethical climate measured by the Hospital Ethical Climate Survey (HECS)	

Outcomes

The primary outcomes of this study are factors related to hospital ethical climate among nurses in Korea, as a

result of a systematic literature review. The secondary outcome are the effect sizes of these factors.

Study selection

The literature identified through the literature search will be organized using Zotero, a literature management program that allows for the identification and removal of redundant studies. The literature search will be independently conducted by two researchers (NYG and KSY), who will primarily remove redundant articles. The researchers read the titles and abstracts and independently reviewed their eligibility. The original articles will be examined to check whether they meet the inclusion criteria, and any discrepancies in the review process will be resolved by discussion. If an agreement cannot be reached, an external reviewer will be consulted. In cases of missing data, the original authors will be contacted to obtain relevant information. The literature selection and exclusion process will be reported using the PRISMA 2020 flow diagram¹², and all reasons for exclusion will be recorded (Fig. 1).

Figure 1. PRISMA flowchart of study selection.

Data extraction

Two researchers (NYG and KSY) thoroughly discussed the data to be extracted while planning this study. Specific data items included author, year of publication, country of publication, sample selection methods, sample size, analysis methods, reliability of a tool for hospital ethical climate, related factors, and analysis results. The data will be arranged primarily in order of years of publication. Researchers will make efforts to reach an agreement through regular meetings in the literature review process to maintain consistency between researchers. If necessary, contact will be made with the authors of the studies to request for missing or additional data.

Risk of bias and quality assessment

To assess the quality of the papers, two reviewers (NYG and KSY) will independently perform the quality assessment using the Checklist for Analytical Cross-Sectional Studies from the Joanna Briggs Institute (JBI) [15]. The JBI checklist comprises eight criteria: clarity of inclusion for research subjects, location and time of data collection, content of subjects, information on exposure to risk factors for the disease, information on disease diagnosis, definition of confounding variables, control of confounding variables, and measurement of outcome variables. Each criterion will be evaluated with responses of Yes, No, Unclear, or Not applicable. Efforts will be made to reach an agreement through discussion when there is a disagreement between the reviewers.

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Data synthesis

The effect sizes of factors related to hospital ethical climate among Korean nurses will be analyzed. The effect size statistics of the related variables will be analyzed using Comprehensive Meta-Analysis software to determine the effect size of individual studies. Factors with fewer than two studies that cannot be statistically analyzed due to different criteria in the sub-items will be excluded from the analysis.

For heterogeneity between individual literature articles, Higgins I^2 heterogeneity will be evaluated with a significance level of less than 5%. If I^2 exhibited a moderate or higher level of heterogeneity and exceeds 50%, it will be considered as heterogeneous [16].

Effect models will be selected based on whether they are heterogeneous and whether each study shares the effect size of the same population [17,18]. The effect sizes of the related factors will be calculated by determining the effect size of the correlation coefficient. The effect size of the overall average of the variables related to hospital ethical climate among nurses in Korea will be calculated. To calculate the effect size, Fisher’s formula will be used to standardize the r value to calculate the standardized Zr . Studies with larger samples are more precise than those with smaller sample sizes. Thus, the overall effect size will be calculated by imposing the weight values [18].

Additionally, if the effect sizes of individual studies are heterogeneous, they will be categorized as sub-factors, depending on the characteristics of the related factors, to calculate each effect size. For the calculated effect size, effect sizes of less than .10 will be explained as a “small effect,” about .30 as a “medium effect,” and .50 or higher as a “big effect” based on Cohen’s effect size interpretation standard [19].

Publication bias

Publication bias will be determined using visual and statistical methods to determine funnel plot symmetry. The symmetrical levels of the effect sizes of individual studies are visually determined. If both sides are relatively symmetric based on the effect size, it will be judged to have no publication bias. Statistically, if the significance probability of the initial value (intercept) for the regression equation is less than .05 in Egger’s regression test, it is statistically significant and will be judged as publication bias [18].

If judged as publication bias, trim and fill analysis will be conducted to determine the effects of the bias on the outcomes [18,20]. This analysis corrects asymmetry to symmetry through exclusion and restoration of studies to compare the studies before and after effect size. This sensitivity analysis method is used to assess the validity of the results regarding bias.

Patient and public involvement

Patients and/or the public were not involved in the design, conduct, reporting, or dissemination plans of our study.

Ethics and dissemination

Considering the inherent characteristics of the study design, ethical evaluation was waived in accordance with established guidelines. The findings of this systematic review will be disseminated through publication in peer-reviewed journals and presented at relevant international conferences in the respective domain. Additionally, any potential revisions to the research protocol will be meticulously documented, with explicit reference to the saved search strategies and analytical techniques.

Author Contributions

YGN, SYK conceptualized and designed the protocol, drafted the initial manuscript and reviewed the manuscript. YGN developed the search strategy. YGN, SYK defined the data extraction process and methodological appraisal of the studies. YGN planned statistical analysis. YGN is the guarantor of the work, with SYK as the corresponding author. The final version was approved by all authors with an agreement for submission to BMJ Open.

Acknowledgements

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Funding

Not applicable.

Data Availability Statement

Data sharing is not applicable to this article, as no datasets were generated or analyzed during the current study.

Ethics Approval

Ethical review and approval were waived for this study because it was a systematic review protocol.

Patient Consent for publication

Patient consent was waived, as this study is a systematic review protocol.

Conflict of Interest

The authors of this work have nothing to disclose.

Supplemental material

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References

1. Koskenvuo J, Numminen O, Suhonen R. Ethical climate in nursing environment: a scoping review. *Nurs Ethics*. 2019;26(2):327-345.
2. Lemmenes D, Valentine P, Gwizdalski P, et al. Nurses' perception of ethical climate at a large academic medical center. *Nurs Ethics*. 2018;25(6):724-733.
3. Victor B, Cullen JB. The organizational bases of ethical work climates. *Adm Sci Q*. 1988;33(1):101-125.
4. Olson LL. Hospital nurses' perceptions of the ethical climate of their work setting. *Image J Nurs Sch*. 1998;30(4):345-349.
5. Numminen O, Leino-Kilpi H, Isoaho H, et al. Ethical climate and nurse competence—newly graduated nurses' perceptions. *Nurs Ethics*. 2015;22(8):845-859.
6. Humphries A, Woods M. A study of nurses' ethical climate perceptions: compromising in an uncompromising environment. *Nurs Ethics*. 2016;23(3):265-276.
7. Reilly BJ, Kyj MJ. Economics and ethics. *J Bus Ethics*. 1990;9(9):691-698.
8. Martin KD, Cullen JB. Continuities and extensions of ethical climate theory: a meta-analytic review. *J Bus Ethics*. 2006;69(2):175-194.
9. Victor B, Cullen JB. A theory and measure of ethical climate in organizations. In: Frederick WC, editor. *Research in Corporate Social Performance and Policy*. Vol 9. Greenwich: JAI Press; 1987.
10. Noh YG, Lee OS. Factors related to ethical climate of nurses in Korea: A systematic review. *J Health Info Stat*. 2020;45(3):261-272.
11. Essex R, Thompson T, Evans TR, et al. Ethical climate in healthcare: A systematic review and meta-analysis. *Nurs Ethics*. 2023;09697330231177419.
12. Page MJ, McKenzie JE, Bossuyt PM, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *Syst Rev*. 2021;10(89):1-11.
13. Moher D, Shamseer L, Clarke M, et al. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Syst Rev*. 2015;4(1):1-9.
14. Kim SY, Park JE, Seo HJ, et al. NECA's guidance for undertaking systematic reviews and meta-an

- analyses for intervention; National Evidence-based Healthcare Collaborating Agency: Seoul, Republic of Korea, 2011.
15. Bell, S.G. Critical Appraisal Tools; The Joanna Briggs Institute: Adelaide, SA, Australia, 2020. Available online: <https://jbi.global/critical-appraisal-tools> (accessed on 1 August 2022).
16. Mullen B, Hu L-t. Perceptions of ingroup and outgroup variability: A meta-analytic integration. *Basic Appl Soc Psych*. 1989;10(3):233-252.
17. Borenstein M, Hedges LV, Higgins JPT, et al. Introduction to meta-analysis. West Sussex: John Wiley & Sons; 2009.
18. Hwang SD. Meta-analysis 4th. Seoul: HAKJISA; 2019.
19. Cohen J. Statistical power analysis for the behavioral sciences. 2nd ed. Hillsdale, N.J.: L. Erlbaum Associates; 1988.
20. Duval S, Tweedie R. Trim and fill: A simple funnel-plot based method of testing and adjusting for publication bias in meta-analysis. *Biometrics*. 2000;56(2):455-463.

Figure Legends

Figure 1. PRISMA flowchart of study selection.

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Online Supplemental file 1

SEARCH STRATEGY

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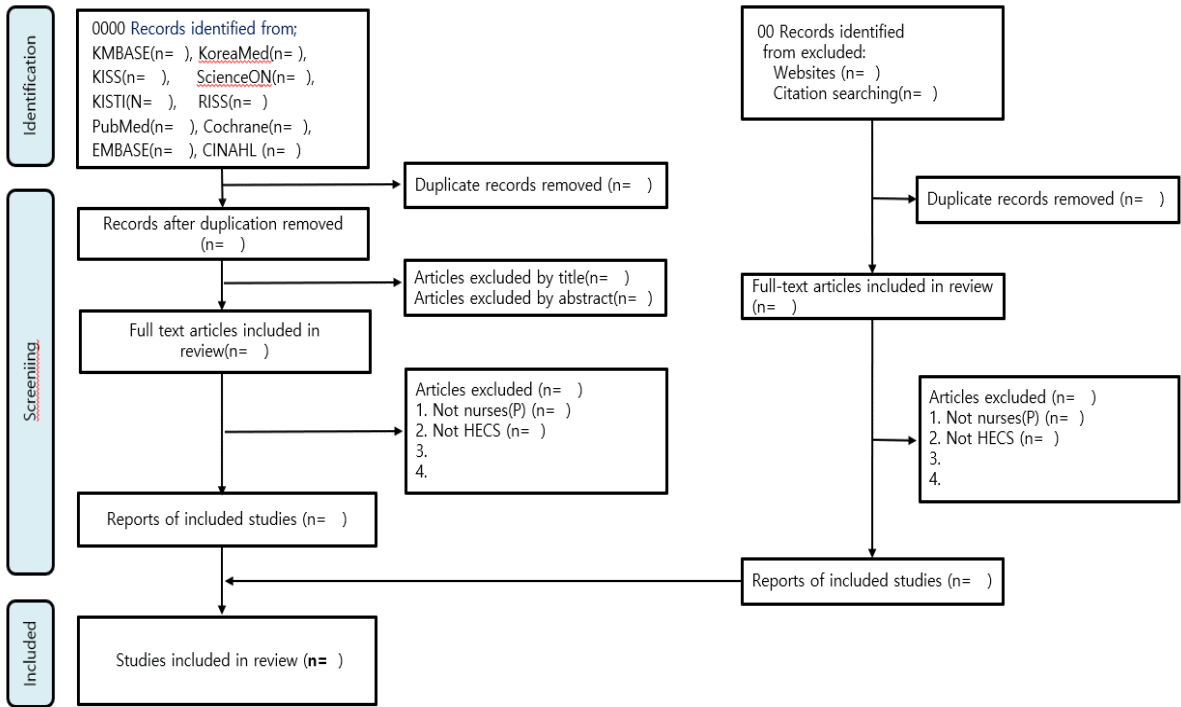


Figure 1. PRISMA Flow chart of study selection

Online Supplementary File 1.

Search strategies

1. Korean articles

RISS: <https://www.riss.kr/index.do>

ScienceON(=KISTI): <https://scienceon.kisti.re.kr/srch/selectPORSrchArticleList.do>

KISS: <https://kiss.kstudy.com/> KoreaMed, <https://www.koreamed.org/>

KMBASE: <https://kmbase.medic.or.kr/>

Database		No.	Search term
RISS	Korean	1	윤리풍토/병원윤리풍토/윤리적 환경/윤리적 근무환경/윤리적 업무환경
		2	간호/간호사
		3	윤리/윤리적
		4	1 AND 2 AND 3
	English	1	working conditions/work environment/ethical climate/ethical environment/ethical work environment
		2	nurses/nursing staff/registered nurses/nursing staff/nursing
		3	ethics/ethical
		4	1 AND 2 AND 3
Science On	Korean	1	윤리풍토/병원윤리풍토/윤리적 환경/윤리적 근무환경/윤리적 업무환경
		2	간호/간호사
		3	윤리/윤리적
		4	1 AND 2 AND 3
	English	1	working conditions/work environment/ethical climate/ethical environment/ethical work environment
		2	nurses/nursing staff/registered nurses/nursing staff/nursing
		3	ethics/ethical
		4	1 AND 2 AND 3

Database		Search term
KISS	Korean	윤리풍토 AND 간호 윤리풍토 AND 간호사 윤리적 환경 AND 간호 윤리적 환경 AND 간호사 윤리적 환경 AND (간호 OR 간호사) 윤리적 근무환경 AND (간호 OR 간호사)
	English	(ethical climate) AND nursing (ethical climate) AND nurses (ethical environment) AND nursing (ethical environment) AND nurses (ethical work environment) AND (nursing OR nurses)
KoreaMed	English	(ethical climate)[ALL] (ethical environment)[ALL] (work environment)[ALL] (ethical work environment)[ALL] ("nurse "[ALL]) ("nursing"[ALL])
KMBASE	English	ethical climate (work environment) AND (nurses OR nursing) (ethical climate) AND (nurses OR nursing) (ethical environment) AND (nurses OR nursing) (ethical work environment) AND (nurses OR nursing)

2. English articles: PubMed, Cochrane Library, Embase, and CINAHL

Database	No.	Search term
PubMed	1	"Ethics"[Mesh] OR Ethic*[TW]
	2	"Nurses"[Mesh] OR "Nursing Staff"[Mesh] OR "Registered Nurs*"[TW] OR Nurs*[TW] OR "Nursing Staff*"[TW]

	3	"Working Conditions"[Mesh] OR "Work* Environment*"[TW] OR "ethical climate"[TW] OR "ethical environment"[TW] OR "ethical work environment"[TW]
	4	"Korea"[Mesh] OR "Korea*"[TW]
	5	#1 AND #2 AND #3 AND #4
Cochrane Library	1	[mh "Ethics"] OR ethic*; ab,ti,kw
	2	[mh "Nurses"] OR [mh "Nursing Staff"] OR (registered nurs* OR nurs* OR nursing staff*); ab,ti,kw
	3	[mh "Working Conditions"] OR (work* environment* OR ethical climate OR ethical environment OR ethical work environment); ab,ti,kw
	4	[mh "Korea"] OR Korea*; ab,ti,kw
	5	#1 and #2 and #3
	6	#5 and #6
Ovid-EMBASE	1	'ethics'/exp OR ethic*; ab,ti,kw
	2	'nurses'/exp OR 'nursing staff'/exp OR (('registered nurs*' OR nurs* OR 'nursing staff*'); ab,ti,kw)
	3	'working conditions'/exp OR (('work* environment' OR 'ethical climate' OR 'ethical environment' OR 'ethical work environment'); ab,ti,kw)
	4	#1 AND #2 AND #3
	5	'Korea'/exp OR 'Korea*'; ab,ti,kw
	6	#4 AND #5
CINAHL	1	(MH "Ethics+") OR Ethic*
	2	(MH "Nurses") OR (MH "Staff Nurses") OR "Registered Nurs*" OR "Nursing Staff*" OR Nurs*
	3	(MH "Work Environment*") OR AB(Work* Environment* OR "ethical climate" OR "ethical environment" OR "ethical work environment")
	4	S1 AND S2 AND S3
	5	S1 AND S2 AND S3 Language: - korean Language: - english

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INTRODUCTION

In the rapidly changing healthcare environment, nurses who care for patients face various ethical issues, including the commercialization and competition of healthcare, accessibility to medical services based on economic disparities, organ donation, and euthanasia [1,2]. In nursing research, interest in ethical climate, which refers to an ethical working environment has increased [1]. In studies on the hospital ethical climate among nurses in Korea, Victor and Cullen identified 9 sub-factors; furthermore [3], Olson determined the level of hospital ethical climate by the relationships between nurses and colleagues, bosses, hospitals, doctors, and patients [4].

The hospital ethical climate refers to the working environment and is defined as the common perception of what righteous behavior is, how ethical problems should be addressed in organizations, and how it affects ethical decision-making and behavior [1,3-6]. Nurses' perceptions of the work environment can influence their attitudes, behaviors, and ethical decision-making regarding ethical issues [4]. Although individuals are the agents of ethical decision-making and behavior, the ethical behavior of constituents in an organization is strongly influenced by the organizational system that restricts individuals' decision-making and behavioral patterns rather than by the personality and personal morality of an individual [7]. In other words, unethical behaviors of members can be tolerated or facilitated depending on the ethical climate of the organization. Practicing ethical behavior is important for nurses facing various ethical dilemmas. Therefore, the significance of a hospital ethical climate, in which ethical perception is shared and ethical decision-making and behavior are allowed, has been increasing.

The hospital ethical climate can affect nurses' occupational satisfaction, commitment to an organization, maintenance of a nursing job, and cooperation with doctors [2]. A literature review of hospital ethical climate among nurses reported that hospital ethical climate affected organizational performance, individual work mistakes, and psychological well-being [1,8]. Indeed, hospital ethical climate is an important factor that affects nurses' ethical practices [5]. Thus, understanding factors related to hospital ethical climate that positively affect individual nurses, organizations, and patient care is of paramount importance.

The hospital ethical climate of organizations reflects sociocultural characteristics and varies depending on organizational culture and work properties [9]. Therefore, it is necessary to investigate factors related to hospital ethical climate, which reflects the sociocultural characteristics of Korea. Studies on ethical climate among nurses in Korea have been primarily conducted based on Victor and Cullen's Ethical Climate Questionnaire (ECQ) [3] and Olson's Hospital Ethical Climate Survey [4]. Victor and Cullen's ethical climate have been systematically reviewed [3], allowing for an understanding of the characteristics of the related factors [10]. Olson's hospital ethical climate has been greatly covered in studies on nurses in Korea [4]. Recently, a systematic review on the hospital ethical climate has been conducted, but it exclusively encompasses studies published in English [11]. This limitation impedes a comprehensive understanding of hospital ethical climate research among Korean nurses, given that most studies in this domain are presented in Korean. There is a crucial need to gain insight into the hospital ethical climate of Korean nurses, considering social and cultural characteristics, through a systematic

review. Furthermore, no reports on factors related to the hospital ethical climate were found in the systematic review and meta-analysis. Therefore, it is essential to identify and integrate factors associated with the hospital ethical climate among Korean nurses, reflecting the socio-cultural characteristics of Korea. Additionally, by confirming the effect size of related factors, evidence-based data can be provided to develop strategies aimed at improving the hospital ethical climate of Korean nurses.

Objectives and research questions

This systematic review aims to ascertain the factors associated with the hospital ethical climate among Korean nurses and to identify the effect size of these factors. The following two research questions are proposed:

1. What variables are associated with the hospital ethical climate of Korean nurses?
2. What is the effect size of variables related to the hospital ethical climate?

METHODS

A literature review based on this protocol will be reported based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 checklist [12].

Patient and public involvement

Patients and/or the public were not involved in the design, conduct, reporting, or dissemination plans of our study.

Protocol registration

The development of this protocol conforms to the basic reporting items in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Protocol (PRISMA-P) guidelines [13] (online supplemental file 1). The protocol was registered with the International Prospective Register of Systematic Reviews (PROSPERO) (registration number CRD42022379812).

Search strategy

The literature published in both Korean and English inception to May 2023 will be searched. Korean studies will be searched in KoreaMed, KMBase, KISS, ScienceON, KISTI, and RISS, while English studies will be searched comprehensively in PubMed, the Cochrane Library, Embase, and CINAHL. These core search databases are recommended for systematic literature review by the National Evidence-Based Healthcare Collaborating Agency, based on the COSI (COre, Standard, Ideal) model of the National Library of Medicine [14]. Additional searches

will be conducted through the websites of the Korean Society of Nursing Science and the Korean Society of Nursing Administration. The reference lists of relevant papers will be manually searched. Medical Subject Headings (MeSH) of PubMed will be used for systematic and comprehensive searches. Primary search keywords are “ethical climate,” “hospital ethical climate,” “ethical environment,” “ethical working environment,” “nurse,” and “Korea,” as well as Boolean operators and symbols of exploding terms (*, +). Titles, abstracts, and MeSH/synonyms (Thesaurus) will be searched for in all cases. Online supplemental file 2 displays the search strategy employed across 10 electronic databases, including KoreaMed, KMBase, KISS, ScienceON, KISTI, PubMed/Medline, Cochrane Library, CINAHL, and Embase.

Inclusion and exclusion criteria

The research question are identified based on PICO-SD (Participants, Intervention, Comparisons, Outcomes, Study Design) according to the National Evidence-Based Healthcare Collaborating Agency Manual [13]. The study participants (P) are nurses working in hospitals in Korea, and intervention (I) is the hospital ethical climate, which is the concept of interest in this study. A control group (C) was not set, outcomes (O) are factors related to hospital ethical climate among nurses in Korea, and the study design (SD) is a quantitative or mixed-method study. The inclusion criteria consist of primary literature published in Korean or English that investigates factors associated with hospital ethical climates among Korean nurses. Quantitative and mixed-methods studies are eligible for inclusion in the systematic data (SD) process. Studies meeting the criteria should provide key metrics such as 'sample size (n)', 'correlation coefficient (r),' mean and standard deviation, and odds ratio. The publication period considered extends up to May 2023. To calculate the effect size of related variables, qualitative studies will be excluded from the analysis. Specific details outlining the inclusion and exclusion criteria are provided in Table 1.

Table 1. Inclusion and exclusion criteria of studies.

Inclusion criteria	Exclusion criteria
Research targeting Korean nurses	
Primary quantitative or mixed studies on the hospital ethical climate	
Research published in peer-reviewed journals	Qualitative research using open-ended questions
Studies evaluating the relationship between hospital ethical climate and related variables	Not Korean or English studies
Studies published by May 2023 in Korean or English	Non-primary research: reports, dissertations, reviews, case studies, editorial articles, and so on
Hospital ethical climate measured by the Hospital Ethical Climate Survey (HECS)	

Outcomes

The primary outcomes of this study are factors related to hospital ethical climate among nurses in Korea, as a result of a systematic literature review. The secondary outcome are the effect sizes of these factors.

Study selection

The literature identified through the literature search will be organized using Zotero, a literature management program that allows for the identification and removal of redundant studies. The literature search will be independently conducted by two researchers (NYG and KSY), who will primarily remove redundant articles. The researchers read the titles and abstracts and independently reviewed their eligibility. The original articles will be examined to check whether they meet the inclusion criteria, and any discrepancies in the review process will be resolved by discussion. If an agreement cannot be reached, an external reviewer will be consulted. In cases of missing data, the original authors will be contacted to obtain relevant information. The literature selection and exclusion process will be reported using the PRISMA 2020 flow diagram [12], and all reasons for exclusion will be recorded (Fig. 1).

Figure 1. PRISMA flowchart of study selection.

Data extraction

Two researchers (NYG and KSY) thoroughly discussed the data to be extracted while planning this study. Specific data items included author, year of publication, country of publication, sample selection methods, sample size, analysis methods, reliability of a tool for hospital ethical climate, related factors, and analysis results. The data will be arranged primarily in order of years of publication. Researchers will make efforts to reach an agreement through regular meetings in the literature review process to maintain consistency between researchers. If necessary, contact will be made with the authors of the studies to request for missing or additional data.

Risk of bias and quality assessment

To assess the quality of the papers, two reviewers (NYG and KSY) will independently perform the quality assessment using the Checklist for Analytical Cross-Sectional Studies from the Joanna Briggs Institute (JBI) [15]. The JBI checklist comprises eight criteria: clarity of inclusion for research subjects, location and time of data collection, content of subjects, information on exposure to risk factors for the disease, information on disease diagnosis, definition of confounding variables, control of confounding variables, and measurement of outcome variables. Each criterion will be evaluated with responses of Yes, No, Unclear, or Not applicable. Efforts will be made to reach an agreement through discussion when there is a disagreement between the reviewers.

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Data synthesis

The effect sizes of factors related to hospital ethical climate among Korean nurses will be analyzed. The effect size statistics of the related variables will be analyzed using Comprehensive Meta-Analysis software to determine the effect size of individual studies. Factors with fewer than two studies that cannot be statistically analyzed due to different criteria in the sub-items will be excluded from the analysis.

For heterogeneity between individual literature articles, Higgins I^2 heterogeneity will be evaluated with a significance level of less than 5%. If I^2 exhibited a moderate or higher level of heterogeneity and exceeds 50%, it will be considered as heterogeneous [16].

Effect models will be selected based on whether they are heterogeneous and whether each study shares the effect size of the same population [17,18]. The effect sizes of the related factors will be calculated by determining the effect size of the correlation coefficient. The effect size of the overall average of the variables related to hospital ethical climate among nurses in Korea will be calculated. To calculate the effect size, Fisher’s formula will be used to standardize the r value to calculate the standardized Zr . Studies with larger samples are more precise than those with smaller sample sizes. Thus, the overall effect size will be calculated by imposing the weight values [18].

Additionally, if the effect sizes of individual studies are heterogeneous, they will be categorized as sub-factors, depending on the characteristics of the related factors, to calculate each effect size. For the calculated effect size, effect sizes of less than .10 will be explained as a “small effect,” about .30 as a “medium effect,” and .50 or higher as a “big effect” based on Cohen’s effect size interpretation standard [19].

Publication bias

Publication bias will be determined using visual and statistical methods to determine funnel plot symmetry. The symmetrical levels of the effect sizes of individual studies are visually determined. If both sides are relatively symmetric based on the effect size, it will be judged to have no publication bias. Statistically, if the significance probability of the initial value (intercept) for the regression equation is less than .05 in Egger’s regression test, it is statistically significant and will be judged as publication bias [18].

If judged as publication bias, trim and fill analysis will be conducted to determine the effects of the bias on the outcomes [18,20]. This analysis corrects asymmetry to symmetry through exclusion and restoration of studies to compare the studies before and after effect size. This sensitivity analysis method is used to assess the validity of the results regarding bias.

Ethics and dissemination

Considering the inherent characteristics of the study design, ethical evaluation was waived in accordance with established guidelines. The findings of this systematic review will be disseminated through publication in peer-

reviewed journals and presented at relevant international conferences in the respective domain. Additionally, any potential revisions to the research protocol will be meticulously documented, with explicit reference to the saved search strategies and analytical techniques.

Author Contributions

YGN, SYK conceptualized and designed the protocol, drafted the initial manuscript and reviewed the manuscript. YGN developed the search strategy. YGN, SYK defined the data extraction process and methodological appraisal of the studies. YGN planned statistical analysis. YGN is the guarantor of the work, with SYK as the corresponding author. The final version was approved by all authors with an agreement for submission to BMJ Open.

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Data Availability Statement

Data sharing is not applicable to this article, as no datasets were generated or analyzed during the current study.

Patient Consent for publication

Patient consent was waived, as this study is a systematic review protocol.

Conflict of Interest

The authors of this work have nothing to disclose.

Supplemental material

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References

1. Koskenvuori J, Numminen O, Suhonen R. Ethical climate in nursing environment: a scoping review. *Nurs Ethics*. 2019;26(2):327-345.

2. Lemmenes D, Valentine P, Gwizdalski P, et al. Nurses' perception of ethical climate at a large academic medical center. *Nurs Ethics*. 2018;25(6):724-733.

3. Victor B, Cullen JB. The organizational bases of ethical work climates. *Adm Sci Q*. 1988;33(1):101-125.

4. Olson LL. Hospital nurses' perceptions of the ethical climate of their work setting. *Image J Nurs Sch*. 1998;30(4):345-349.

5. Numminen O, Leino-Kilpi H, Isoaho H, et al. Ethical climate and nurse competence—newly graduated nurses' perceptions. *Nurs Ethics*. 2015;22(8):845-859.

6. Humphries A, Woods M. A study of nurses' ethical climate perceptions: compromising in an unpromising environment. *Nurs Ethics*. 2016;23(3):265-276.

7. Reilly BJ, Kyj MJ. Economics and ethics. *J Bus Ethics*. 1990;9(9):691-698.

8. Martin KD, Cullen JB. Continuities and extensions of ethical climate theory: a meta-analytic review. *J Bus Ethics*. 2006;69(2):175-194.

9. Victor B, Cullen JB. A theory and measure of ethical climate in organizations. In: Frederick WC, editor. *Research in Corporate Social Performance and Policy*. Vol 9. Greenwich: JAI Press; 1987.

10. Noh YG, Lee OS. Factors related to ethical climate of nurses in Korea: A systematic review. *J Health Info Stat*. 2020;45(3):261-272.

11. Essex R, Thompson T, Evans TR, et al. Ethical climate in healthcare: A systematic review and meta-analysis. *Nurs Ethics*. 2023;09697330231177419.

12. Page MJ, McKenzie JE, Bossuyt PM, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *Syst Rev*. 2021;10(89):1-11.

13. Moher D, Shamseer L, Clarke M, et al. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Syst Rev*. 2015;4(1):1-9.

14. Kim SY, Park JE, Seo HJ, et al. NECA's guidance for undertaking systematic reviews and meta-analyses for intervention; National Evidence-based Healthcare Collaborating Agency: Seoul, Republic of Korea, 2011.

15. Bell, S.G. *Critical Appraisal Tools*; The Joanna Briggs Institute: Adelaide, SA, Australia, 2020. Available online: <https://jbi.global/critical-appraisal-tools> (accessed on 1 August 2022).

16. Mullen B, Hu L-t. Perceptions of ingroup and outgroup variability: A meta-analytic integration. *Basic Appl Soc Psych*. 1989;10(3):233-252.

17. Borenstein M, Hedges LV, Higgins JPT, et al. *Introduction to meta-analysis*. West Sussex: John Wiley & Sons; 2009.

- ley & Sons; 2009.
18. Hwang SD. Meta-analysis 4th. Seoul: HAKJISA; 2019.
19. Cohen J. Statistical power analysis for the behavioral sciences. 2nd ed. Hillsdale, N.J.: L. Erlbaum Associates; 1988.
20. Duval S, Tweedie R. Trim and fill: A simple funnel-plot based method of testing and adjusting for publication bias in meta-analysis. *Biometrics*. 2000;56(2):455-463.

For peer review only

Figure Legends

Figure 1. PRISMA flowchart of study selection.

For peer review only

Online Supplemental file 1

PRISMA-P guidelines

Online Supplemental file 2

SEARCH STRATEGY

For peer review only

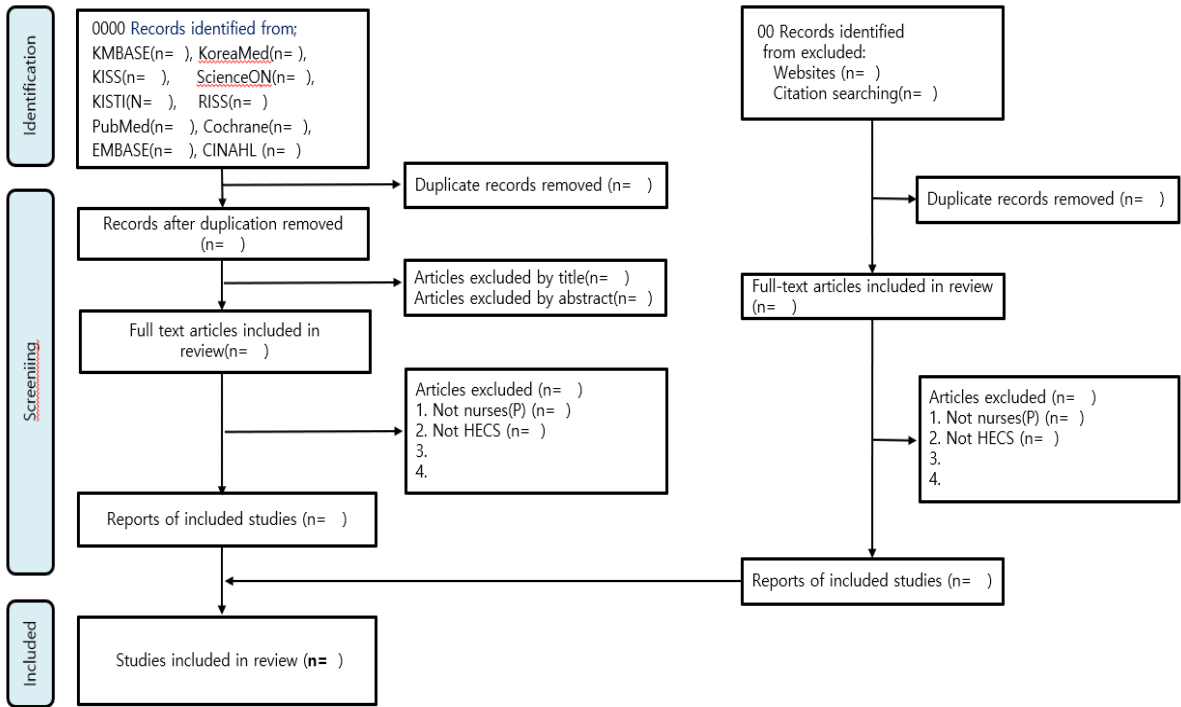


Figure 1. PRISMA Flow chart of study selection

PRISMA-P (Preferred Reporting Items for Systematic review and Meta-Analysis Protocols) 2015 checklist: recommended items to address in a systematic review protocol*

Section and topic	Item No	Checklist item	Reported on Page #
ADMINISTRATIVE INFORMATION			
Title:			
Identification	1a	Identify the report as a protocol of a systematic review	Page 1
Update	1b	If the protocol is for an update of a previous systematic review, identify as such	N/A
Registration	2	If registered, provide the name of the registry (such as PROSPERO) and registration number	Page 2
Authors:			
Contact	3a	Provide name, institutional affiliation, e-mail address of all protocol authors; provide physical mailing address of corresponding author	Page 1
Contributions	3b	Describe contributions of protocol authors and identify the guarantor of the review	Page 8
Amendments	4	If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments	N/A
Support:			
Sources	5a	Indicate sources of financial or other support for the review	Page 8
Sponsor	5b	Provide name for the review funder and/or sponsor	N/A
Role of sponsor or funder	5c	Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol	N/A
INTRODUCTION			
Rationale	6	Describe the rationale for the review in the context of what is already known	Page 3
Objectives	7	Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)	Page 5
METHODS			
Eligibility criteria	8	Specify the study characteristics (such as PICO, study design, setting, time frame) and report characteristics (such as years considered, language, publication status) to be used as criteria for eligibility for the review	Page 5
Information sources	9	Describe all intended information sources (such as electronic databases, contact with study authors, trial registers or other grey literature sources) with planned dates of coverage	Page 4-5
Search strategy	10	Present draft of search strategy to be used for at least one electronic database, including planned limits such that it could be repeated	Page 4-5

Study records:			
Data management	11a	Describe the mechanism(s) that will be used to manage records and data throughout the review	Page 6
Selection process	11b	State the process that will be used for selecting studies (such as two independent reviewers) through each phase of the review (that is, screening, eligibility and inclusion in meta-analysis)	Page 6
Data collection process	11c	Describe planned method of extracting data from reports (such as piloting forms, done independently in duplicate), any processes for obtaining and confirming data from investigators	Page 6
Data items	12	List and define all variables for which data will be sought (such as PICO items, funding sources), any pre-planned data assumptions and simplifications	Page 6
Outcomes and prioritization	13	List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale	Page 6
Risk of bias in individual studies	14	Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis	Page 6
Data synthesis	15a	Describe criteria under which study data will be quantitatively synthesised	Page 7
	15b	If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data and methods of combining data from studies, including any planned exploration of consistency (such as I ² , Kendall's)	Page 7
	15c	Describe any proposed additional analyses (such as sensitivity or subgroup analyses, meta-regression)	Page 7
	15d	If quantitative synthesis is not appropriate, describe the type of summary planned	N/A
Meta-bias(es)	16	Specify any planned assessment of meta-bias(es) (such as publication bias across studies, selective reporting within studies)	Page 7
Confidence in cumulative evidence	17	Describe how the strength of the body of evidence will be assessed (such as GRADE)	Page 6

*** It is strongly recommended that this checklist be read in conjunction with the PRISMA-P Explanation and Elaboration (note when available) for important clarification on the items. Amendments to a review protocol should be tracked and dated. The copyright for PRISMA-P (including checklist) is held by the PRISMA-P Group and is distributed under a Creative Commons Attribution Licence 4.0.**

From: Shamseer L, Moher D, Clarke M, Ghersi D, Liberati A, Petticrew M, Shekelle P, Stewart L, PRISMA-P Group. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation. BMJ. 2015 Jan 2;349(jan02 1):g7647.

SEARCH STRATEGY

1. Korean articles

RISS: <https://www.riss.kr/index.do>

ScienceON(=KISTI): <https://scienceon.kisti.re.kr/srch/selectPORSrchArticleList.do>

KISS: <https://kiss.kstudy.com/> KoreaMed, <https://www.koreamed.org/>

KMBASE: <https://kmbase.medric.or.kr/>

Database		No.	Search term
RISS	Korean	1	윤리풍토/병원윤리풍토/윤리적 환경/윤리적 근무환경/윤리적 업무환경
		2	간호/간호사
		3	윤리/윤리적
		4	1 AND 2 AND 3
	English	1	working conditions/work environment/ethical climate/ethical environment/ethical work environment
		2	nurses/nursing staff/registered nurses/nursing staff/nursing
		3	ethics/ethical
		4	1 AND 2 AND 3
Science On	Korean	1	윤리풍토/병원윤리풍토/윤리적 환경/윤리적 근무환경/윤리적 업무환경
		2	간호/간호사
		3	윤리/윤리적
		4	1 AND 2 AND 3
	English	1	working conditions/work environment/ethical climate/ethical environment/ethical work environment
		2	nurses/nursing staff/registered nurses/nursing staff/nursing
		3	ethics/ethical
		4	1 AND 2 AND 3

Database		Search term
KISS	Korean	윤리풍토 AND 간호 윤리풍토 AND 간호사 윤리적 환경 AND 간호 윤리적 환경 AND 간호사 윤리적 환경 AND (간호 OR 간호사) 윤리적 근무환경 AND (간호 OR 간호사)
	English	(ethical climate) AND nursing (ethical climate) AND nurses (ethical environment) AND nursing (ethical environment) AND nurses (ethical work environment) AND (nursing OR nurses)
KoreaMed	English	(ethical climate)[ALL] (ethical environment)[ALL] (work environment)[ALL] (ethical work environment)[ALL] ("nurse "[ALL]) ("nursing"[ALL])
KMBASE	English	ethical climate (work environment) AND (nurses OR nursing) (ethical climate) AND (nurses OR nursing) (ethical environment) AND (nurses OR nursing) (ethical work environment) AND (nurses OR nursing)

2. English articles: PubMed, Cochrane Library, Embase, and CINAHL

Database	No.	Search term
PubMed	1	"Ethics"[Mesh] OR Ethic*[TW]
	2	"Nurses"[Mesh] OR "Nursing Staff"[Mesh] OR "Registered Nurs*"[TW] OR Nurs*[TW] OR "Nursing Staff*"[TW]
	3	"Working Conditions"[Mesh] OR "Work* Environment*"[TW] OR "ethical climate"[TW] OR "ethical environment"[TW] OR "ethical work environment"[TW]

	4	"Korea"[Mesh] OR "Korea*"[TW]
	5	#1 AND #2 AND #3 AND #4
Cochrane Library	1	[mh "Ethics"] OR ethic*; ab,ti,kw
	2	[mh "Nurses"] OR [mh "Nursing Staff"] OR (registered nurs* OR nurs* OR nursing staff*); ab,ti,kw
	3	[mh "Working Conditions"] OR (work* environment* OR ethical climate OR ethical environment OR ethical work environment); ab,ti,kw
	4	[mh "Korea"] OR Korea*; ab,ti,kw
	5	#1 and #2 and #3
	6	#5 and #6
Ovid-EMBASE	1	'ethics'/exp OR ethic*; ab,ti,kw
	2	'nurses'/exp OR 'nursing staff'/exp OR (('registered nurs*' OR nurs* OR 'nursing staff*'); ab,ti,kw)
	3	'working conditions'/exp OR (('work* environment' OR 'ethical climate' OR 'ethical environment' OR 'ethical work environment'); ab,ti,kw)
	4	#1 AND #2 AND #3
	5	'Korea'/exp OR 'Korea*'; ab,ti,kw
	6	#4 AND #5
CINAHL	1	(MH "Ethics+") OR Ethic*
	2	(MH "Nurses") OR (MH "Staff Nurses") OR "Registered Nurs*" OR "Nursing Staff*" OR Nurs*
	3	(MH "Work Environment*") OR AB(Work* Environment* OR "ethical climate" OR "ethical environment" OR "ethical work environment")
	4	S1 AND S2 AND S3
	5	S1 AND S2 AND S3 Language: - korean Language: - english