

ORGANIZE

Journal of Economics, Management and Finance

Vol. 2 No. 3 (2023) ISSN: 2963-0576

Journal website: <https://organize.pdfaii.org/>

Research Article

Leadership Style Affects Nursing Quality Improvement: Meta-Analysis Study

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Received : July 21, 2023

Revised : August 26, 2023

Accepted : September 09, 2023

Available online : October 17, 2023

How to Cite: Nurjaman, I., & Saparlina, I. Leadership Style Affects Nursing Quality Improvement: Meta-Analysis Study. *ORGANIZE: Journal of Economics, Management and Finance*, 2(3), 119-134. <https://doi.org/10.58355/organize.v2i3.54>

Abstrak. Background: Leadership style can have a significant influence on improving the quality of nursing in various nursing service contexts. Improving the quality of nursing is important to improve the standard of nursing services so that it can provide more effective, efficient, safe, and quality care to clients. There have been many studies that examine the influence of leadership style on improving the quality of nursing. **Aim:** Based on existing research, it is necessary to conduct a meta-analysis study to obtain a summary effect size between leadership style and nursing quality improvement. **Design:** Meta-analysis. **Method:** The protocol in this study uses review and dissemination and the Joanna Briggs Institute (JBI) Guidelines as guidelines in assessing the quality of correlation meta-analysis research. Article sources are collected through Scopus, Science Direct, PubMed, and Google Scholar, according to predetermined criteria. Data analysis using the help of the JASP 0.18 application. **Results:** A total of 12 research artifacts obtained a positive and significant influence on leadership style and improving nursing quality, summary effect size ($rRE = 0.662$) is the maximum size in the high category. **Conclusion:** This research, of course, has proven consistency and strengthened the theory or findings

of previous researchers that with meta-analysis studies can provide convincing and effective information about the influence of these two variables. Quality or relationship between leadership styles to improve nursing quality on an ongoing basis through commitment, teamwork, and strong leadership.

Keywords: leadership (kepemimpinan), nursing quality (mutu keperawatan), nurses (perawat), meta-analysis (meta analisis).

INTRODUCTION

Leadership style can have a significant influence on improving the quality of nursing in various nursing service contexts as well as the way a leader leads and manages a team or organization.¹ In addition, a good leader must also be able to understand and respond to individual preferences and needs in his team, because each team member can respond differently to different leadership styles.² There are various leadership styles including: authoritarian leadership, democratic leadership, transformational leadership, servant leadership, laissez-faire leadership, transactional leadership, and situational leadership.⁽¹⁾ The selection of the most suitable leadership style depends on a variety of factors, including the situation, team, goals, and personality of the leader himself. No one leadership style works best in all situations.⁽²⁾ A leader's success often depends on his or her ability to recognize the situation at hand and choose the most appropriate leadership style to achieve the goal of improving nursing.

Nursing quality is a measure or evaluation of the extent to which health care provided to patients or clients meets established quality standards.⁽³⁾ The concept of nursing quality includes several elements and factors that must be considered in the care process and important aspects related to nursing quality including patient safety, effectiveness, efficiency, suitability, communication team, quality, patient satisfaction, leadership and management, professional development, and compliance with standards.⁽⁴⁾ It is important to remember that quality nursing is an ongoing commitment to improving health services and providing the best care to patients.⁽⁵⁾ Continuous efforts to monitor, evaluate, and improve the quality of care are essential to achieve this goal.

Improving the quality of nursing is an effort that aims to improve the standard of nursing services so that it can provide more effective, efficient, safe, and quality care to clients.⁽⁶⁾ Nursing quality improvement aims to ensure that the care provided to clients or patients is following established standards and can achieve the expected results. This includes selecting the intervention that best suits the patient's condition and the use of the latest scientific evidence in care practice. To improve quality, nurses work to optimize the use of available resources, such as time, personnel, and equipment.⁽⁷⁾ It aims to provide quality care without waste. Improving nursing quality also focuses on preventing care errors that can harm patients.⁽⁸⁾ This includes the identification and reduction of potential risks, such as treatment-related infections or medication errors. Higher-quality nursing includes aspects such as attention to patient needs holistically, effective communication with patients and their families, and the provision of appropriate emotional support.⁽⁹⁾ Nurses must also continue to develop their skills and knowledge to stay relevant to the development

of science and technology in healthcare Nurses must also continue to develop their skills and knowledge to stay relevant to the development of science and technology in healthcare.(10) Quality improvement efforts also include ensuring that care practices are following applicable regulations and standards.

A nurse is a professional within the health care field who has the knowledge, skills, and responsibility to provide physical, emotional, and psychosocial care to their patients or clients.(11) Nurses play a role in various aspects of health care, including patient health monitoring, wound care, medication administration, patient education, and care coordination.(12) Some of the important characteristics and responsibilities of a nurse are carrying out nursing procedures that consider various aspects ranging from patient safety, education and counseling, care coordination, drug administration, case management, evaluation and documentation, and disease prevention.(13) Nurses have a very important role in prevention, curative, and rehabilitation efforts in the health care system.

The nursing profession works closely with other healthcare teams to achieve various goals.(14) Nurses play a role in all three aspects above to provide holistic and comprehensive care to patients. Nurses also play a key role in managing patient information, coordinating care, and providing necessary support during the patient's journey to recovery and better health.(15)

There have been many research results that examine the influence of leadership style with improving nursing quality. Research conducted by (16–21). Based on the results of these studies, it is known that there is a positive and significant relationship between leadership style and improving nursing quality. Although it is known that there is an influence between leadership style and improving nursing quality, there has not been a single research result that reveals the effect size or summary effect size of the relationship between leadership style and nursing quality improvement, so research needs to be done. Research is useful for health facility leaders and nurses in policy-making to improve the quality of nursing. The approach used to obtain information on the magnitude of the effect size or summary effect is a meta-analysis study.(22)

The meta-analysis approach uses statistics to analyze quantitative data to obtain effect size and summary effect size. Using meta-analysis obtained more convincing and effective information.(23) Meta-analyses can be used to coherently and consistently combine the findings of different research results on the same topic.(24) Meta-analyses of previous studies were conducted to provide stronger answers and synthesize relationships between several variables.(25) The main purpose of meta-analysis is to analyze accuracy in estimating effects and evaluating effects.(26) Meta-analysis studies can be carried out by collecting artifacts from research that examine the influence of leadership style on improving nursing quality so that the magnitude of the effect size and summary effect size produced [Table 1] are obtained.

Table 1. Effect Size and Category

Effect Size	Category
0 - 0,20	Weak effect
0,21 - 0,50	Enough effect
0,51 - 1,00	Medium Effect
> 1,00	Powerful Effects

AIMS

To examine the results of research on the influence of leadership style with improving nursing quality, through a meta-analysis approach so that a summary effect size is obtained.

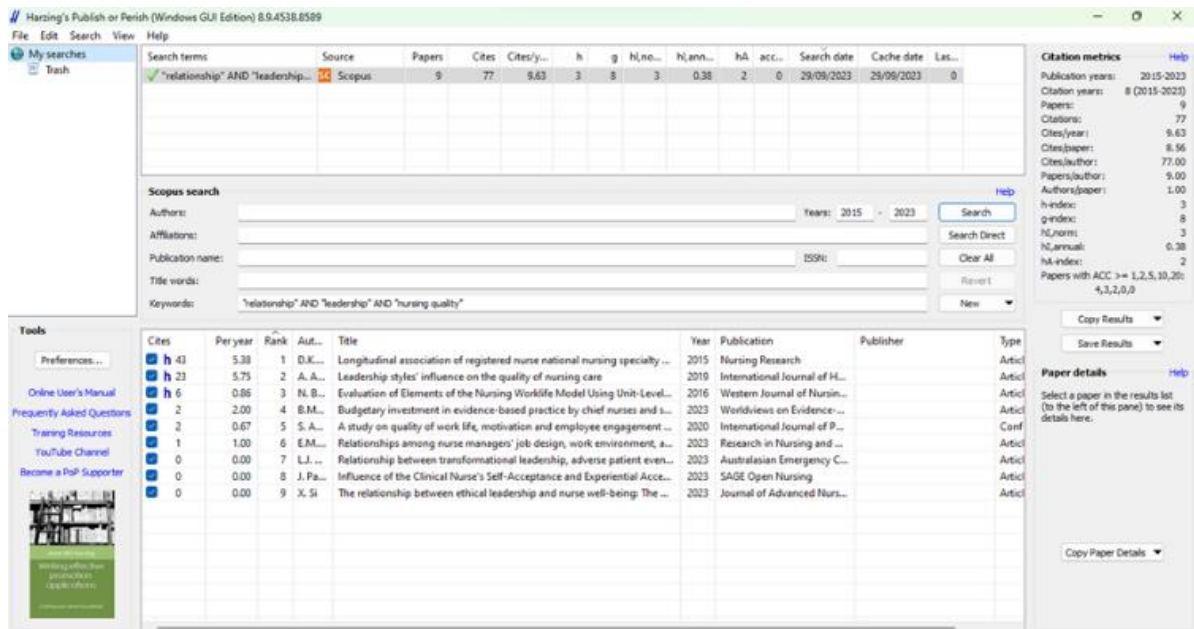
METHODS

Ethical approval

There is no ethical approval because the data used in this study came from individually published and ethically approved research.

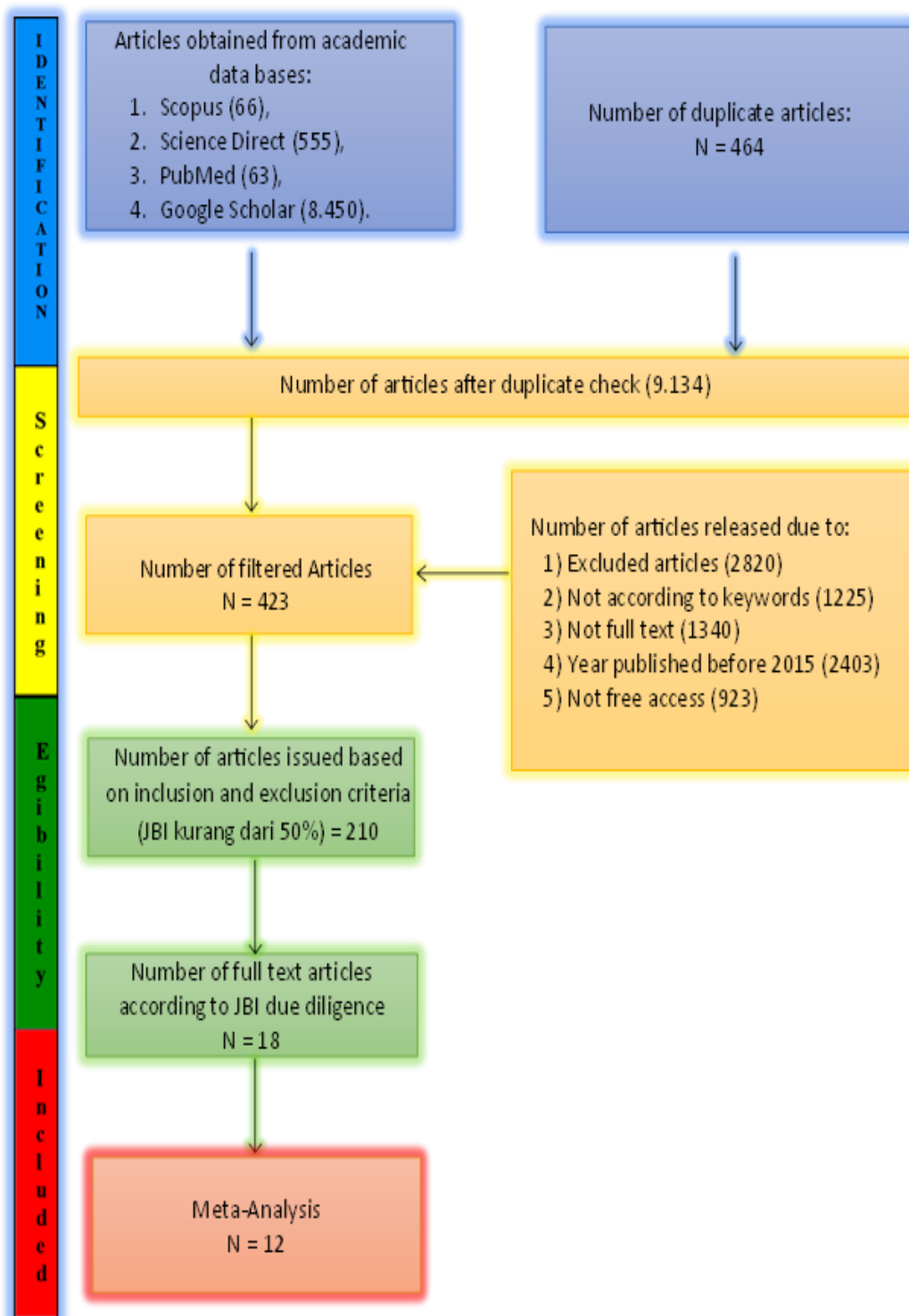
Search process

The source of information from the systematic review article search uses an electronic database consisting of Scopus, Science Direct, PubMed, and Google Scholar to identify studies relevant to the open access category with the help of Harzing's Publish or Perish (Windows GUI Edition) 8.9.4538.8589 [Figure 1].



Each search is restricted to peer-reviewed, articles published in English during the years 2015-2023. The use of keywords and boolean operators (AND, OR NOT, or AND NOT) is carried out in searching for journals or articles to determine or expand livelihoods so that it is easier to determine which journal or article to use. The search

strategy was defined as: ("leadership style" OR "leadership" AND "nursing quality improvement" AND "nursing quality" OR nursing OR "quality improvement" AND "influence of leadership style", during 2015-2023. In this systematic review, keyword usage was aligned with the Medical Subject Heading (MeSH).(27) It is described more fully and accurately in PRISMA [Figure 2].



The following inclusion and exclusion criteria were applied to this study: Inclusion criteria include (a) influence of leadership style; (b) analysis of the relationship of leadership style with nursing quality; (c) measure relationships between variables using validated instruments and questionnaires; (d) articles published in English. We exclude studies with the following characteristics (a) studies that do not report correlation coefficient values even after contacting the appropriate authors, (b) qualitative studies, systematic reviews, meta-analyses, case reports, case series, and inaccessible full-text articles; (b) studies with small sample sizes ($N < 60$); (c) year published before 2015.

Study selection and data extraction

Two authors (IM, IN) independently review the title, and abstract of the retrieved article in various databases for notability. Eligible full-text studies are reviewed after manually removing duplicates by individual reviewers. Finally, full-text studies are included after a joint discussion between reviewers. The following information is taken from all included studies: author, month and year of publication, country, population, tools used, design, setting, sample size, and correlation coefficient values. Encoding sample size (N), correlation (r). Collected artifacts are analyzed using the help of the JASP 0.18 application [Figure 3].



Appraisal of study quality

The protocol in this study uses review and dissemination and the Joanna Briggs Institute (JBI) Guidelines as guidelines in assessing the quality of research to be summarized. (28) Critical appraisal assessment or literature quality is the process of examining or assessing an article from research results systematically and carefully to measure its elevation and validity in certain contexts so that it is worthy of reference (29) The criteria evaluating studies use eight criteria: (1) random sample or entire population (2) unbiased sampling framework (3) adequate sample size (4) standard

size (5) results measured by unbiased raters (6) adequate response rate and refusers described (7) research subjects described. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist will be used in the evaluation of systematic reviews to determine the selection of studies that have been found and adjusted for systematic review purposes.(30)

Systematic review is considered a form of evidence-based practice. Evidence-based practice (EBP) is the process of integrating the best available evidentiary information with clinical expertise and client value.(30) The term evolved into EBP because it attracted the attention of people who helped professions such as social work and psychology.(31)

One way to streamline and improve the research process for nurses and researchers from all backgrounds is to utilize the PICOS search strategy. These form the five elements of the PICOS model: Patient/Problems, Intervention, Comparison, Outcomes, and Study design.(32)

Statistical analysis

PICOS (Patient/ Problems, Intervention, Comparison, Outcomes, and Study Design) is used during the formulation of research questions. The limitations of the review question are clearly defined by the development of exclusion and inclusion criteria based on the PICOS format.(32)

Application in the meta-analysis three steps need to be done, namely among them:(33)

1. Determine the problem formulation of research in PICOST

In this step, the formulation of meta-analysis research problems is carried out by determining PICOST (population, intervention, comparison, and outcome). The PICOST in this study is:

- a) Population is the population used for meta-analysis studies. The population in this study is child survivors after the earthquake.
- b) An indicator is something that functions as a standard or basic guide to become the basis for measuring the influence of leadership style with improving nursing quality as an indicator in this study.
- c) Comparison is a treatment or action that is used to determine comparisons in conducting meta-analysis. If it is not found then it can use the control group contained in the selected article. This study has no limitations in terms of comparison.
- d) Results or output outputs that have conformity with the research topic. The output of this study is on the influence of leadership style on improving nursing quality.
- e) A study is a type of research design that will later be used in meta-analysis. The type of study used in journal search is the quantitative method.
- f) Time is the publication time of the journal used in the meta-analysis. Journals to be analyzed from 2015 to 2023.

RESULTS AND DISCUSSION

Artifact characteristics

There have been many research results that examine the influence of leadership style on improving the quality of nursing. The artifacts used in this study were sourced from journals (N = 6 or 100%). Artifact issue year 2015 (N=1 or 16.67%), 2018 (N=1 or 16.67%), 2019 (N=1 or 16.67%), 2023 (N=3 or 50. Scopus quartile indexed artifacts (Q1=2 or 33.33%), (Q2=3 or 50%), and (EBSCO's=1 or 16.67%) internationally. The research sample of the artifact is nurses. The success of leadership styles that affect the improvement of nursing quality. Each artifact has a varying sample size. The minimum sample size is 100 and the maximum sample size is 7583. The correlation value of artifacts also varies each artifact has r, z, Vz, and SEz values. Sample size data and correlation of each artifact can be seen in Table 3. Each artifact has a positive correlation value. Artifacts that already have a correlation value are used in the analysis. The characteristics of each [Table 2].

Table 2. Artifact Characteristics

Author	Publication	Index	Characteristic	Variable	
				Independent	Dependent
J. Park & Shin, (2023)	Journal	Q2	Nursing	Clinical Nurse's Self-Acceptance and Experiential Acceptance	Leadership Versatility
Si et al., (2023) (1)	Journal	Q1	Nursing	Ethical leadership	Workplace mindfulness, and Well-being
Si et al., (2023) (2)	Journal	Q1	Nursing	Ethical leadership	Workplace mindfulness, and Well-being
Sandelands, (2019) (1)	Journal	Q2	Nursing	Nurse Managers	Quality of Nursing Care

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Si et al., (2023) (2)	Journal	Q1	Nursing	Ethical leadership	Workplace mindfulness, and Well-being
Sandelands, (2019) (1)	Journal	Q2	Nursing	Nurse Managers	Quality of Nursing Care
Sandelands, (2019) (2)	Journal	Q2	Nursing	Leadership Styles	Quality of Nursing Care
Sandelands, (2019) (3)	Journal	Q2	Nursing	Private	Quality of Nursing Care
Sandelands, (2019) (4)	Journal	Q2	Nursing	Public Healthcare Sectors	Quality of Nursing Care
Boyle et al., (2015)	Journal	Q2	Nursing	5) Certification 6) Multilevel models 7) Patient falls 8) Patient safety	Quality improvement
Suratno et al., (2018)	Journal	EBSCO's	Nursing	Transformational Leadership and	Quality of Nursing Work Life in Hospital
H. J. Park & Kim, (2023) (1)	Journal	Q1	Nursing	Nursing students	2) Super-leadership
H. J. Park & Kim, (2023) (2)	Journal	Q1	Nursing	Nursing students	2) Self-leadership
H. J. Park & Kim, (2023) (3)	Journal	Q1	Nursing	Nursing students	3) Self-efficacy 4) Self-directed learning

et al., (2018) N=543 r=0.280 Sufficient effect 0.043. H. J. Park & Kim, (2023) (1) N=150 r=0.470 Moderate effect 0.082. H. J. Park & Kim, (2023) (2) N=150 r=0.690 Moderate effect 0.082. H. J. Park & Kim, (2023) (3) N=150 r=0.290 Moderate effect 0.082. The highest SEz value is the J. Park & Shin study presented in [Table 3].

Table 3. Sample Size, r, z, Vz, and SEz Values for Each Artifact

Author	N	r	z	Vz	SEz
J. Park & Shin, (2023)	100	0,390	0,412	0,010	0,102
Si et al., (2023) (1)	1579	0,507	0,559	0,001	0,025
Si et al., (2023) (2)	1579	0,600	0,693	0,001	0,025
Sandelands, (2019) (1)	400	0,811	1,130	0,003	0,050
Sandelands, (2019) (2)	400	0,759	0,994	0,003	0,050
Sandelands, (2019) (3)	400	0,789	1,069	0,003	0,050
Sandelands, (2019) (4)	400	0,780	1,045	0,003	0,050
Boyle et al., (2015)	7583	0,080	0,080	0,000	0,011
Suratno et al., (2018)	543	0,280	0,288	0,002	0,043
H. J. Park & Kim, (2023) (1)	150	0,470	0,510	0,007	0,082
H. J. Park & Kim, (2023) (2)	150	0,690	0,848	0,007	0,082
H. J. Park & Kim, (2023) (3)	150	0,290	0,299	0,007	0,082

The next stage in the meta-analysis is the heterogeneity test to determine the right analysis in determining the amount of effect size, summary effect size, and publication bias. The heterogeneity test results of the artifacts are presented in [Table 4].

Heterogeneity Test

The results of the analysis showed that the 12 effect sizes of the studies analyzed were values ($Q = 1711.785$) with p-values of $0.001 < 0.05$, meaning that the artifacts used met the criteria of heterogeneity. Thus, the Random Effect model is more suitable to be used to estimate the average effect size of the 12 studies analyzed. The results of the analysis also indicate that there is potential to investigate moderator variables that influence the relationship between leadership style and nursing quality improvement [Table 4].

Table 4. Fixed and Random Effects

	Q	df	p
Omnibus test of Model Coefficients	41.167	1	< .001
Test of Residual Heterogeneity	1711.785	11	< .001

Note. p-values are approximate.

Note. The model was estimated using Restricted ML method.

Summary effect/ mean effect size analysis

The results of the analysis with the Random Effect model showed that there was a significant positive correlation between leadership and nursing quality ($z = 6.416$; $p < 0.001$; 95% CI [0.459-0.864]). The influence of leadership style on improving nursing quality is included in the high category* ($rRE = 0.662$). The two approaches above, provide a conclusion that artifacts meet the assumption of heterogeneity so that the analysis will be used in estimating the magnitude of effect size, summary effect size, and publication bias using random affect [Table 5].

Table 5. Summary Effect/ Mean Effect Size

	Estimate	Standard Error	z	p	95% Confidence Interval	
					Lower	Upper
intercept	0.662	0.103	6.416	<.001	0.459	0.864

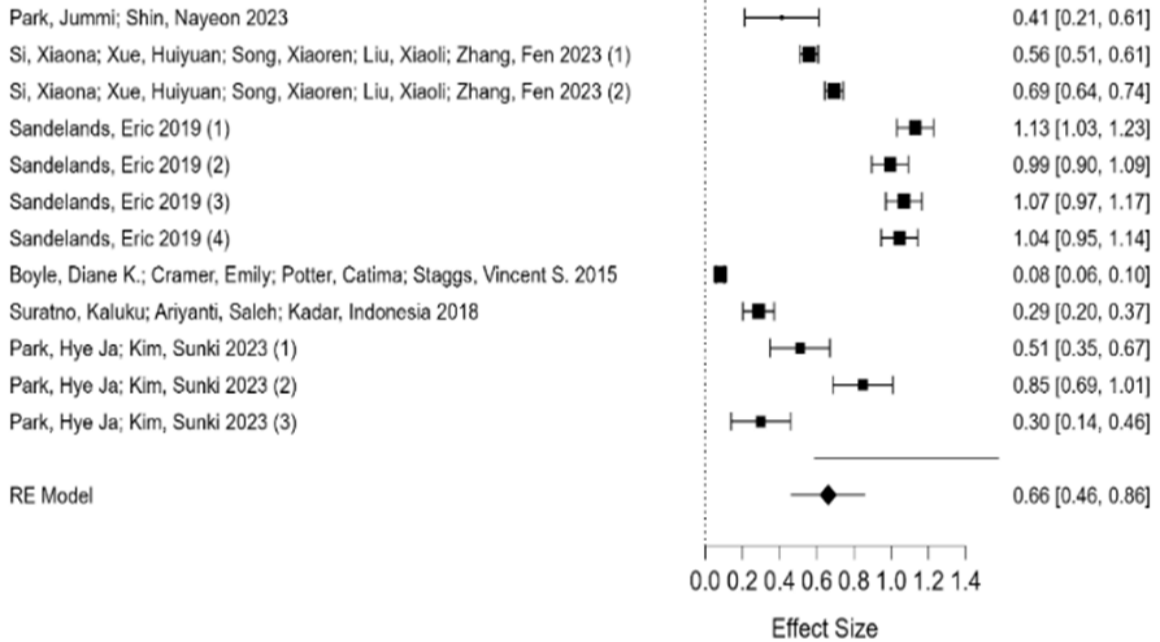
Note. Wald test.

The effect size and summary effect of each effect are presented in the following forest plot [Figure 4].

Forest plot model random effect analysis

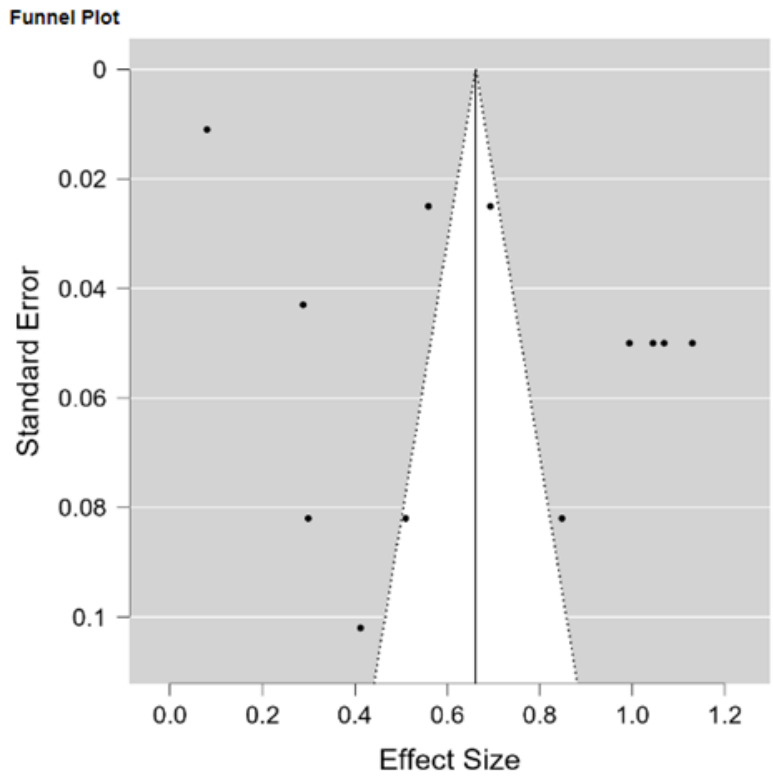
The forest plot view shows the size of each artifact. 3 artifacts have an effect size value greater than 1. 9 artifacts have an effect size value of less than 1. Each effect size value is located within the interval. Based on the theory of Choen et al. (2007) there is an effect size value with a weak category of 1 artifact. The effect size is in the moderate, medium, and strong effect categories. In addition, the summary effect size was produced (0.66) at intervals of 0.08 – 0.99, with a medium effect category [Figure 4].

Forest Plot



The effect size of the artifact can also be presented in the form of the following funnel plot [Figure 5].

Funnel model random effect analysis



The funnel plot random effect display in [Figure 5] shows that in this study, the artifacts used were of medium size. The black spots found in the funnel plot show that the standard error generated from each is still very small. The results of the funnel plot are difficult to conclude whether they are symmetrical or not, so an Egger test is needed to test whether the funnel plot is symmetrical or not, presented in [Table 6] below.

Regression test for funnel plot asymmetry ("Egger's test") analysis

The results of the Egger test showed p-values of $0.881 > 0.05$, confirming that the funnel plot is symmetric. Thus, it can be concluded that there is no problem of publication bias in the meta-analysis study of the influence of leadership style on improving nursing quality. The standard measure of error produced did not affect the summary size of the relationship between leadership style and nursing quality. The next stage of analysis is testing hypothesis research which is presented below. Ho: There is no positive and significant relationship between leadership style and nursing improvement. Ha: There is a positive and significant relationship between leadership style and nursing quality improvement. Based on the estimated results, a Z value is obtained (6.416). The obtained Z value is used in the calculation of the p-value. The Z value is translated into the formula $p\text{-value} = 1 - \text{NORMSDIST}(Z)$, so that the p-value ($0.001 < 0.05$) is obtained at a 95% confidence interval). Because of the p-value.

Table 6. Regression test for Funnel plot asymmetry ("Egger's test")

	z	p
sei	0.150	0.881

In the correlation meta-analysis, it is necessary to check publication bias with the Egger test on artifacts [Table 6]. To ensure there is no bias in the study, the second stage of testing can be carried out to check publication bias, namely Drawer file analysis. Based on the following Fail/Safe N estimation results [Table 7].

Table 7. File Drawer Analysis

	Fail-safe N	Target Significance	Observed Significance
Rosenthal	11058.000	0.050	< .001

CONCLUSION

Leadership style can have a significant influence on improving the quality of nursing with the application and monitoring of nursing service standards to provide more effective, efficient, safe, and quality care to clients. This meta-analysis study has provided reliable and effective information through 12 artifacts involving the nursing profession (N = 10355). Based on the results of this study, health facility leaders and

nurses in policy-making to improve the quality of nursing. Quality or relationship between leadership styles to improve nursing quality on an ongoing basis through commitment, teamwork, and strong leadership character. Strengths and Limitations This study has been conducted following PRISMA guidelines with the utmost scientific rigor. Comprehensive analysis of the influence of leadership style on nursing quality improvement. The heterogeneity that exists across studies needs to be taken into account.

RELEVANCE TO CLINICAL PRACTICE

The findings have hinted that a good leader must also be able to understand and respond to the preferences and needs of individuals within his or her team, as each team member may respond differently to different leadership styles. No one leadership style works best in all situations. A leader's success often depends on his or her ability to recognize the situation at hand and choose the most appropriate leadership style to achieve the goal of improving nursing.

Author contributions

All registered authors meet the writing criteria following applicable guidelines. All authors agree with the manuscript.

- a) Nurjaman I: Conceptualization, methodology, formal analysis, data curation, writing-original draft
- b) Saparlina I: Conceptualization, data curation, visualization, investigation, methodology, writing-original draft
- c) Nurjaman I: Review and editing, methodology, supervision, data curation

Acknowledgments

The authors acknowledge the assistance offered by the head of the nursing master's study program at Jenderal Ahmad Yani University, Cimahi. Mrs. Dr. Iin Inayah, M. Kep in selecting potential articles. in meta-analysis research.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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