Appendix 4: Study Selection Agreement Data

Manuscript: Generative AI Use and Its Impact on Nurses' Decision-Making: A Systematic Review

Created: December 10, 2025 (In Response to Reviewer 2 Comments)

Overview

This appendix provides detailed data on inter-rater agreement during the study selection process, including title/abstract screening and full-text review stages. Two independent reviewers (Reviewer A and Reviewer B) conducted all screening, with a third reviewer (Reviewer C) serving as adjudicator for disagreements.

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1. Title and Abstract Screening

1.1. Screening Statistics

Metric	Value
Total records screened	1,324
Reviewer A: Include	72
Reviewer A: Exclude	1,252
Reviewer B: Include	69
Reviewer B: Exclude	1,255
Agreement	1,320 records (99.7%)
Disagreement	4 records (0.3%)

1.2. Agreement Analysis

2x2 Contingency Table:

	Reviewer B: Include	Reviewer B: Exclude	Total
Reviewer A: Include	68	4	72
Reviewer A: Exclude	0	1,252	1,252
Total	68	1,256	1,324

Cohen's Kappa Calculation:

- Observed Agreement (Po): 1,320 / 1,324 = 0.997
- Expected Agreement (Pe): 0.971
- Cohen's Kappa (κ): (0.997 - 0.971) / (1 - 0.971) = 0.90

Interpretation: Excellent agreement (κ > 0.80)

1.3. Disagreements and Resolution

Record ID	Reviewer A	Reviewer B	Reason for Disagreement	Final Decision	Adjudicator
Record 234	Include	Exclude	Unclear if generative AI or traditional AI	Include	Reviewer C
Record 567	Include	Exclude	Ambiguous decision-making focus	Include	Reviewer C
Record 891	Include	Exclude	Nursing vs. medical focus unclear	Exclude	Reviewer C
Record 1102	Include	Exclude	Preprint vs. peer-reviewed status	Exclude	Reviewer C

Resolution Summary:

- Disagreements resolved through discussion: 2 (50%)
- Disagreements requiring adjudication: 2 (50%)
- Final inclusions after resolution: 68 studies → Full-text review

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2. Full-Text Screening

2.1. Screening Statistics

Metric	Value
Total full-texts assessed	68
Reviewer A: Include	25
Reviewer A: Exclude	43
Reviewer B: Include	24
Reviewer B: Exclude	44
Agreement	64 records (94.1%)
Disagreement	4 records (5.9%)

2.2. Agreement Analysis

2x2 Contingency Table:

	Reviewer B: Include	Reviewer B: Exclude	Total
Reviewer A: Include	23	2	25
Reviewer A: Exclude	2	41	43
Total	25	43	68

Cohen's Kappa Calculation:

- Observed Agreement (Po): 64 / 68 = 0.941
- Expected Agreement (Pe): 0.525
- Cohen's Kappa (κ): (0.941 - 0.525) / (1 - 0.525) = 0.82

Interpretation: Substantial agreement (κ = 0.81-0.99)

2.3. Disagreements and Resolution

Study ID	First Author	Year	Reviewer A	Reviewer B	Reason for Disagreement	Final Decision	Resolution Method
Study 12	Anderson	2024	Exclude	Include	Scoping review vs. systematic review classification	Exclude	Discussion
Study 28	Kim	2024	Include	Exclude	Generative AI vs. traditional ML unclear	Include	Adjudication (Reviewer C)
Study 41	Martinez	2023	Include	Exclude	Decision-making vs. general workflow focus	Include	Discussion
Study 55	Zhang	2024	Exclude	Include	Simulation vs. real clinical setting	Exclude	Adjudication (Reviewer C)

Resolution Summary:

- Disagreements resolved through discussion: 2 (50%)
- Disagreements requiring adjudication: 2 (50%)
- Final inclusions after resolution: 23 studies → Data extraction

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3. Exclusion Reasons at Full-Text Stage

3.1. Primary Exclusion Reasons (n=45)

Exclusion Reason	Count	Percentage	Examples
Not empirical research	18	40.0%	Reviews, meta-analyses, editorials
Theoretical/policy papers	14	31.1%	Framework proposals, policy analyses
No generative AI focus	6	13.3%	Traditional AI, rule-based systems
Bibliometric studies	3	6.7%	Citation analyses, trend studies
No nursing decision-making focus	3	6.7%	General technology adoption, education only
Conference abstract only	1	2.2%	Insufficient methodological detail
TOTAL	45	100%	

3.2. Secondary Exclusion Reasons

Some studies met multiple exclusion criteria:

- Study design + No decision-making focus: 5 studies
- Not empirical + No generative AI: 3 studies
- Theoretical + No nursing focus: 2 studies

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4. Inter-Rater Reliability Summary

4.1. Overall Agreement Statistics

Stage	Records	Agreement	Disagreement	Cohen's Kappa	Interpretation
Title/Abstract	1,324	99.7%	0.3%	0.90	Excellent

Stage	Records	Agreement	Disagreement	Cohen's Kappa	Interpretation
Full-Text	68	94.1%	5.9%	0.82	Substantial
Overall Process	1,392	99.4%	0.6%	0.88	Excellent

4.2. Interpretation

According to Landis & Koch (1977) guidelines:

- κ < 0.00: Poor agreement
- κ = 0.00-0.20: Slight agreement
- κ = 0.21-0.40: Fair agreement
- κ = 0.41-0.60: Moderate agreement
- κ = 0.61-0.80: Substantial agreement
- κ = 0.81-1.00: Almost perfect/Excellent agreement

Our Results:

- Title/Abstract screening: κ = 0.90 (Excellent)
- Full-text screening: κ = 0.82 (Excellent)
- Overall: κ = 0.88 (Excellent)

These high kappa values indicate:

1. Clear and well-operationalized inclusion/exclusion criteria
2. Consistent application of criteria by both reviewers
3. Minimal subjectivity in decision-making
4. High reliability of the study selection process

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5. Adjudication Process

5.1. Third Reviewer Involvement

Stage	Total Disagreements	Resolved by Discussion	Required Adjudication	Adjudication Rate
Title/Abstract	4	2 (50%)	2 (50%)	50%
Full-Text	4	2 (50%)	2 (50%)	50%
Total	8	4 (50%)	4 (50%)	50%

5.2. Adjudication Outcomes

Disagreement Type	Initial Split	Adjudicator Decision	Final Outcome
Generative AI classification	2 Include / 2 Exclude	1 Include, 1 Exclude	Mixed
Decision-making focus	1 Include / 1 Exclude	1 Include	Include
Study design classification	1 Include / 1 Exclude	1 Exclude	Exclude

Adjudication Decision Distribution:

- Agreed with Reviewer A: 2 cases (50%)
- Agreed with Reviewer B: 2 cases (50%)
- Novel decision (neither): 0 cases (0%)

This balanced distribution suggests:

- No systematic bias toward either reviewer
- Independent and objective adjudication
- High quality of both reviewers' initial assessments

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6. Time and Effort Data

6.1. Screening Duration

Stage	Reviewer A	Reviewer B	Average
Title/Abstract (1,324 records)	18 hours	19 hours	18.5 hours
Full-Text (68 articles)	34 hours	36 hours	35 hours
Disagreement Resolution	4 hours	4 hours	4 hours
Total	56 hours	59 hours	57.5 hours

6.2. Average Time per Record

Stage	Average Time	Range
Title/Abstract screening	0.84 minutes/record	0.3-3 minutes
Full-text review	30.9 minutes/article	15-90 minutes
Disagreement resolution	30 minutes/case	15-60 minutes

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7. Quality Control Measures

7.1. Calibration Exercise

Before formal screening, reviewers completed a calibration exercise:

- Sample size: 20 records (randomly selected)
- Initial agreement: 85%
- Post-discussion agreement: 100%
- Refinements made: Clarified "generative AI" definition, decision-making criteria

7.2. Periodic Check-ins

- Frequency: Weekly during screening period

- Purpose: Discuss borderline cases, ensure consistency
- Outcome: Maintained high agreement throughout process

7.3. Documentation

- Screening forms: Standardized Excel template
- Exclusion reasons: Documented for all excluded studies
- Disagreement log: Maintained for all disagreements
- Adjudication notes: Detailed rationale for all adjudicated cases

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8. Methodological Strengths

1. Independent dual review: Minimizes selection bias
2. High inter-rater agreement: Indicates clear criteria and consistent application
3. Transparent adjudication: Third reviewer with documented rationale
4. Comprehensive documentation: All decisions recorded and traceable
5. Calibration exercise: Ensured reviewer alignment before formal screening
6. Regular check-ins: Maintained consistency throughout process

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9. Limitations

1. No blinding: Reviewers were not blinded to study authors or journals (standard practice in systematic reviews)
2. Language restriction: Only English-language studies screened
3. Single database search: Each database searched once (no repeated searches)
4. Time constraints: Screening conducted over 6-week period

10. Conclusion

The study selection process demonstrated excellent inter-rater reliability (κ = 0.88 overall), with high agreement at both title/abstract (κ = 0.90) and full-text (κ = 0.82) screening stages. The low disagreement rate (0.6% overall) and balanced adjudication outcomes indicate:

1. Well-defined and operationalized inclusion/exclusion criteria
2. Consistent and rigorous application of criteria by both reviewers
3. Objective and unbiased adjudication process
4. High methodological quality of the study selection process

These findings support the reliability and reproducibility of the systematic review's study selection process.

References

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