

COMPREHENSIVE SYSTEMATIC REVIEW PROTOCOL

TITLE: A comprehensive systematic review of the nurses' perceptions of risk from exposure to emerging acute respiratory infectious diseases and the effectiveness of strategies used to facilitate healthy coping in acute hospital and community healthcare settings.

Centre conducting review:

National University Health System, Singapore

Primary reviewer/contact:

Koh Yiwen, 4th year nursing student, Alice Lee Centre for Nursing Studies, Yong Loo Lin School of Medicine, National University of Singapore

Second reviewer:

Professor Desley Hegney, Alice Lee Centre for Nursing Studies, Yong Loo Lin School of Medicine, National University of Singapore

Co-author:

Dr. Vicki Drury, Alice Lee Centre for Nursing Studies, Yong Loo Lin School of Medicine, National University of Singapore.

BACKGROUND

Emerging infectious diseases, defined as diseases that have “newly appeared in a population or have existed previously but are rapidly increasing in incidence or geographic range”,¹ have always been a threat to nations worldwide and are the second leading cause of death worldwide.² More specifically, the World Health Organization listed acute respiratory tract infections as the infectious disease with the highest mortality rate worldwide.² Significant acute respiratory tract infections which have emerged in the 21st century include – Severe Acute Respiratory Syndrome (SARS) in 2003, the Avian Influenza A/H5N1 virus in early 2004 and the Influenza A/H1N1 virus in 2009. SARS and the Influenza A viruses share the same modes of transmission, which is via respiratory droplets and person-to-person contact.³ They are also contagious and can spread rapidly within populations worldwide, leading quickly to a global pandemic. Additionally, these viruses are virulent with high morbidity and mortality rates.⁴ They are also predisposed to rapid and efficient mutations which may increase their virulence and resistance to current drug regimens.^{5,6}

These features of the emerging respiratory infectious diseases pose a problem for health authorities and healthcare professionals,⁷ especially nurses who are in constant close contact with affected patients and their body fluids – primarily respiratory droplets – through which respiratory viruses are transmitted.⁴ For example, the attack rates on health care workers during nosocomial influenza outbreaks were estimated to be as high as 60%.⁴ Apart from personal health risks⁸ from emerging respiratory infectious diseases, nurses are also at risk of social isolation and stigmatization because of the social basis of disease transmission.^{9,10} In addition, they face risks of spreading the diseases to friends and family, resulting in emotional conflict and guilt.⁹

According to the Health Belief Model, a person’s risk perceptions are instrumental in influencing their behavior.⁸ Very high risk perceptions may hinder the retention of qualified nurses¹¹ as they

fear for the health and safety of themselves and their loved ones. Some may also be less devoted in the care provided to patients due to an internal conflict between professional conduct in caring for patients and the innate sense of self-preservation.¹² On the other end of the spectrum, nurses with very low risk perceptions may be non-compliant to protective behavior such as vaccinations⁴ and facial protection,¹³ increasing both their risk and propagation of nosocomial transmission within the hospital and community. In short, it is evident that nurses' workplace behaviors in response to their risk perceptions have a major impact on themselves, the workforce, individual patient care as well as the wider community.

Many factors play a part in one's risk perceptions and may vary between individuals. Hence there needs to be a greater understanding on how individual nurses perceive such risks, including how these are influenced by their associated socio-cultural, psychological and attitudinal factors and how such perceptions affect their workplace behavior. This knowledge can inform the creation of strategies to acknowledge and manage the personal risks to nurses from these emerging respiratory infectious diseases and maximize the quality of care delivered. Some strategies suggested in the literature include the implementation of social, emotional and psychological coping mechanisms to address nurses' distress and fears in relation to their exposure (i.e. the provision of psychosocial support by nursing administrators and educational interventions to keep nurses up-to-date with current developments^{10, 14}). Another suggested strategy is the usage of verbal approval or monetary rewards to reinforce proper behavior (i.e. adoption of facial protection and vaccinations) and attitudes.¹⁴ Examination and evaluation of this wide repertoire of strategies in primary research, namely, its effectiveness and applicability to the hospital and community settings will inform policy development that will hopefully not only protect nurses but also minimize the disruption of healthcare provision during such crises.

AIM

The overall aim of this systematic review is to critically appraise, synthesize and present the best available evidence in relation to the risk perceptions and behaviors of nurses to emerging acute respiratory infectious diseases in acute hospital and community healthcare settings; and to make recommendation for practice that will protect both nurses and their patients/clients.

REVIEW QUESTION(S)/OBJECTIVES

More specifically, the qualitative component of the review seeks to determine:

- How do nurses practicing in hospitals and community healthcare settings perceive the meaning of being exposed to recently emerging acute respiratory infectious diseases?
- What are the socio-cultural, psychological, attitudinal and environmental factors influencing the nurses' risk perceptions?

The quantitative component of the review seeks to determine:

- What is the effectiveness of the strategies used to manage the nurses' risk perceptions and therefore their perceptions of workplace safety and quality of life?
- How effective are current directives in ensuring the adherence of nurses to recommended hospital and government protocols?
- What are the behaviors evident in nurses when exposed to emerging acute respiratory infectious diseases?
- What are the other key organizational, environmental and individual factors influencing their behavior?

REVIEW METHOD

Inclusion criteria

Participants

The review will consider publications that include male and female nurses practicing in acute hospital and community health care settings. If there are insufficient studies which specifically focus on nurses, the review will also consider studies that address all health personnel.

Interventions (Phenomena of interest)

The qualitative component of this review will consider studies that investigate the meaning of being exposed to recently emerging acute respiratory infectious diseases and the strategies used to protect nurses and patients.

The quantitative component of the review will consider studies that investigate the effectiveness of strategies used to protect nurses and patients. Additionally studies that examine the workplace behaviors of nurses and the associated factors in response to recently emerging acute respiratory infectious diseases will be included.

Context

This review will consider studies which focus on acute hospital and community health care settings in both developing and developed countries.

Outcome measures

The main focus of the qualitative component of the SR is the nurse's perceived meaningfulness of the experience to the disease/s and the strategies used to protect them.

The outcomes of interest for the quantitative component of the SR consider the objective or subjective measures of the following:

- Compliance and adherence to hospital infection control policies and precautionary measures (i.e. use of personal protective equipment (PPE))
- feelings of wellbeing (incorporating anxiety and quality of life)

Secondary outcome measures of interest may include:

- Availability of personal protective equipment (PPE)
- key organisational, environmental and individual factors influencing their behaviour

The outcome measures used, as reported in the studies, should also meet the following criteria of reliability, validity and feasibility.

Types of studies

The qualitative component of the review will consider any interpretive studies that draw on the experiences of being exposed to emerging acute respiratory infectious diseases in male and female nurses practicing in acute hospital and community healthcare settings including, but not limited to, designs such as phenomenology, grounded theory, ethnography, action research and feminist research.

The quantitative component of the review will consider any meta-analyses and randomised controlled trials (RCTs); in the absence of meta-analyses and RCTs, other research designs of a quantitative nature, such as non-randomised controlled trials, before and after studies, cohort studies, case control studies, descriptive studies, case series/reports will be considered for inclusion in a narrative summary to enable the identification of current best evidence regarding male and

female nurses' exposure to emerging acute respiratory infectious diseases in acute hospital and community healthcare settings.

Exclusion criteria

This review will exclude the following:

- Studies involving expert opinions & secondary research papers unless there is a lack of primary research studies
- Studies written in any languages other than English
- Studies which were conducted before the year 1997. This time frame is chosen first, to ensure that the findings are contemporary and relevant and second, because the year 1997 marked the emergence of a novel respiratory communicable disease of pandemic potential – avian H5N1 influenza virus – in Hong Kong, the first in two decades since the 1977 Russian Flu (H1N1) pandemic.¹⁵

SEARCH STRATEGY FOR IDENTIFICATION OF STUDIES

Prior to the commencement of this systematic review, the Cochrane Library, Joanna Briggs Institute (JBI) database and CINAHL database were searched and no previous systematic reviews on this specific topic were identified.

The search strategy aims to find both published and unpublished primary research studies printed during the last 12 years (between years 1997-2009) in the English Language. A three-step search strategy will be utilised in each component of this review. An initial limited search of PubMed (MEDLINE) and CINAHL will be undertaken followed by analysis of the text words contained in the title and abstract, and of the index terms used to describe article. A second extensive search

using all identified keywords and index terms will then be undertaken across all included databases. Thirdly, the reference list and bibliographies of all identified reports and articles will be searched for additional studies. A hand search of relevant key journals not indexed in the databases will not be conducted due to time and resources constraints.

The electronic databases to be searched include:

- CINAHL
- PubMed (MEDLINE)
- SCOPUS
- ScienceDirect
- Sociological Abstracts
- PsycINFO
- Web of Science (Social Sciences Citation Index)

Because of economic and time limitations databases such as MEDNAR and Dissertation Abstracts International will not be searched. Additionally conference proceedings and any grey literature will not be included in this review.

A list of initial keywords used in the search strategy can be found in Appendix I.

ASSESSMENT OF METHODOLOGICAL QUALITY

Qualitative papers selected for retrieval will be assessed by two independent reviewers for methodological validity prior to inclusion in the review using standardised critical appraisal

instruments from the Joanna Briggs Institute Qualitative Assessment and Review Instrument (JBI-QARI).*

Quantitative papers selected for retrieval will be assessed by two independent reviewers for methodological validity prior to inclusion in the review using standardised critical appraisal instruments from the Joanna Briggs Institute Meta Analysis of Statistics Assessment and Review Instrument (JBI-MAStARI).*

*Any disagreements that arise between the reviewers will be resolved through discussion, or with a third reviewer (Dr. Vicki Drury).

The checklists used to aid in the determination of eligibility for inclusion of reviewed articles can be found in Appendix II.

DATA EXTRACTION

Qualitative data will be extracted from papers included in the review using the standardised data extraction tool from the Joanna Briggs Institute Qualitative Assessment and Review Instrument JBI-QARI.*

Quantitative data will be extracted from papers included in the review using the standardised data extraction tool from JBI-MAStARI.*

*The data extracted will include specific details about the interventions, populations, study methods and outcomes of significance to the review question and specific objectives.

The checklists used to aid in the extraction of data from papers included in the review can be found in Appendix III.

DATA SYNTHESIS

Data will be extracted by two independent reviewers. Qualitative research findings will, where possible be pooled using the Qualitative Assessment and Review Instrument (JBI-QARI). This will involve the aggregation or synthesis of findings to generate a set of statements that represent that aggregation, through assembling the findings (Level 1 findings) rates according to their quality, and categorising these findings on the basis of similarity in meaning (Level 2 findings). These categories are then subjected to a metasynthesis in order to produce a single comprehensive set of synthesised findings (Level 3 findings) that can be used as a basis for evidence-based practice. Where textual pooling is not possible the findings will be presented in narrative form.

Quantitative papers will, where possible be pooled in statistical meta-analysis using the Joanna Briggs Institute Meta Analysis of Statistics Assessment and Review Instrument (JBI-MASARI). All results will be subject to double data entry. Odds ratio (for categorical data) and weighted mean differences (for continuous data) and their 95% confidence intervals will be calculated for analysis. Heterogeneity will be assessed using the standard Chi-square. Where statistical pooling is not possible the findings will be presented in narrative form.

ACKNOWLEDGEMENTS

We would like to thank the National Medical Research Council (NMRC) of Singapore for their support and funding to the study.

POTENTIAL CONFLICT OF INTEREST

No potential conflict of interest is anticipated.

REFERENCES

1. Morens DM, Folkers GK, Fauci AS. The challenge of emerging and re-emerging infectious diseases. *Nature* 2004 Jul 8;430(6996):242-9.
2. Fauci AS. Infectious diseases: considerations for the 21st century. *Clinical Infectious Diseases* 2001 Mar 1;32(5):675-85.
3. Cutter J. Preparing for an influenza pandemic in Singapore. *ANNALS Academy of Medicine Singapore* 2008 Jun;37(6):497-503.
4. Low JG, Wilder-Smith A. Infectious respiratory illnesses and their impact on healthcare workers: a review. *ANNALS Academy of Medicine Singapore* 2005 Jan;34(1):105-10.
5. Maines TR, Chen LM, Matsuoka Y, Chen H, Rowe T, Ortin J, et al. Lack of transmission of H5N1 avian-human reassortant influenza viruses in a ferret model. *Proceedings of the National Academy of Sciences U S A* 2006 Aug 8;103(32):12121-6.
6. Moscona A. Medical management of influenza infection. *Annual Review of Medicine* 2008;59:397-413.
7. Blendon RJ, DesRoches CM, Cetron MS, Benson JM, Meinhardt T, Pollard W. Attitudes toward the use of quarantine in a public health emergency in four countries. *Health Affairs (Millwood)* 2006 Mar-Apr;25(2):w15-25.
8. Leppin A, Aro AR. Risk perceptions related to SARS and avian influenza: theoretical foundations of current empirical research. *International Journal of Behavioral Medicine* 2009;16(1):7-29.
9. Maunder R, Hunter J, Vincent L, Bennett J, Peladeau N, Leszcz M, et al. The immediate psychological and occupational impact of the 2003 SARS outbreak in a teaching hospital. *Canadian Medical Association Journal* 2003 May 13;168(10):1245-51.
10. Nickell LA, Crighton EJ, Tracy CS, Al-Enazy H, Bolaji Y, Hanjrah S, et al. Psychosocial effects of SARS on hospital staff: survey of a large tertiary care institution. *Canadian Medical Association Journal* 2004 Mar 2;170(5):793-8.
11. Stone PW, Clarke SP, Cimiotti J, Correa-de-Araujo R. Nurses' working conditions: implications for infectious disease. *Emerging Infectious Diseases* 2004 Nov;10(11):1984-9.
12. Masur H, Emanuel E, Lane HC. Severe acute respiratory syndrome: providing care in the face of uncertainty. *Journal of the American Medical Association* 2003 Jun 4;289(21):2861-3.
13. Nichol K, Bigelow P, O'Brien-Pallas L, McGeer A, Manno M, Holness DL. The individual, environmental, and organizational factors that influence nurses' use of facial protection to

prevent occupational transmission of communicable respiratory illness in acute care hospitals. *American Journal of Infection Control* 2008 Sep;36(7):481-7.

14. Ko NY, Feng MC, Chiu DY, Wu MH, Feng JY, Pan SM. Applying theory of planned behavior to predict nurses' intention and volunteering to care for SARS patients in southern Taiwan. *Kaohsiung Journal of Medical Sciences* 2004 Aug;20(8):389-98.
15. Snacken R, Kendal AP, Haaheim LR, Wood JM. The next influenza pandemic: lessons from Hong Kong, 1997. *Emerging Infectious Diseases* 1999 Mar-Apr;5(2):195-203.

APPENDIX I: Initial keywords or terms used in search strategy

DATABASES	KEYWORDS
CINAHL	<p><u>SEARCH #1</u></p> <p>(“Perception” OR MM “Perception” OR MH “Perception+”) AND</p> <p>(“Attitude to risk” OR MM “Attitude to risk” OR MH “Attitude to risk” OR “risk”) AND</p> <p>(“Communicable diseases” OR MM “Communicable diseases” OR MH “Communicable diseases”) AND</p> <p>(“Health personnel” OR MH “Health personnel+” OR MM “Health personnel”)</p> <p><u>SEARCH #2</u></p> <p>(“Perception” OR MM “Perception” OR MH “Perception+”) AND</p> <p>(“Attitude to risk” OR MM “Attitude to risk” OR MH “Attitude to risk” OR “risk”) AND</p> <p>(“Communicable diseases” OR MM “Communicable diseases” OR MH “Communicable diseases”)</p> <p><u>SEARCH #3</u></p> <p>((“Perception” OR MM “Perception” OR MH “Perception+”) OR (“Meaning” OR “Meaningfulness”) OR (“Life experience” OR MH “Life experience+” OR MM “Life experience”)) AND</p> <p>(“Attitude to risk” OR MM “Attitude to risk” OR MH “Attitude to risk” OR “Risk”) AND</p> <p>(“Communicable diseases” OR MM “Communicable diseases” OR MH “Communicable diseases”) AND</p> <p>(“Health personnel” OR MH “Health personnel+” OR MM “Health personnel”)</p> <p><u>SEARCH #4</u></p> <p>((“Perception” OR MM “Perception” OR MH “Perception+”) OR (“Meaning” OR “Meaningfulness”) OR (“Life experience” OR MM “Life experience” OR MH “Life experience+”)) AND</p> <p>(“Attitude to risk” OR MM “Attitude to risk” OR MH “Attitude to risk” OR “Risk”) AND</p> <p>(“Communicable diseases” OR MM “Communicable diseases” OR MH “Communicable diseases”)</p>

	<p><u>LEGEND</u></p> <ul style="list-style-type: none"> • MM – major concept (a search query that finds only records for which the subject heading is a major point of the article) • MH – MeSH term • + - expand search
<p>PubMed (MEDLINE)</p>	<p><u>SEARCH #1</u></p> <p>("Attitude"[Majr] OR "Attitude"[Mesh] OR "Attitude") OR ("Perception"[Majr] OR "Perception"[Mesh] OR "Perception") AND ("Risk"[Majr] OR "Risk"[Mesh] OR Risk) AND ("Communicable Diseases"[Majr] OR "Communicable Diseases"[Mesh] OR "Communicable diseases") AND ("Health Personnel"[Majr] OR "Health Personnel"[Mesh] OR "Health personnel")</p> <p><u>SEARCH #2</u></p> <p>("Attitude of Health Personnel"[Majr] OR "Attitude of Health Personnel"[Mesh] OR Attitude of health personnel) OR ("Attitude"[Majr] OR "Attitude"[Mesh] OR "Attitude") OR ("Perception"[Majr] OR "Perception"[Mesh] OR "Perception") AND ("Risk"[Majr] OR "Risk"[Mesh] OR Risk) AND ("Communicable Diseases"[Majr] OR "Communicable Diseases"[Mesh] OR Communicable diseases) AND ("Health Personnel"[Majr] OR "Health Personnel"[Mesh] OR Health personnel)</p> <p><u>SEARCH #3</u></p> <p>("Attitude of Health Personnel"[Majr] OR "Attitude of Health Personnel"[Mesh] OR attitude of health personnel) OR ("Attitude"[Majr] OR "Attitude"[Mesh] OR "Attitude") OR ("Perception"[Majr] OR "Perception"[Mesh] OR "Perception") AND ("Risk"[Majr] OR "Risk"[Mesh] OR Risk) AND ("Communicable Diseases"[Majr] OR "Communicable Diseases"[Mesh] OR Communicable diseases)</p> <p><u>LEGEND</u></p> <ul style="list-style-type: none"> • [Mesh] – Mesh term and explode • [Majr] – Major headings
<p>SCOPUS</p>	<p><u>SEARCH #1</u></p> <p>"Perception" AND "Risk" AND ("Communicable diseases" OR</p>

	<p>(Communicable disease) OR Communicable disease) AND ("Health personnel" OR (Health personnel) OR Health personnel) <u>SEARCH #2</u> "Perception" AND "Risk" AND ("Communicable diseases" OR (Communicable disease) OR Communicable disease) <u>SEARCH #3</u> (("Lived experience" OR (Lived experience) OR (Perception) OR (Mean*)) AND (Risk) AND ("Communicable diseases" OR (communicable diseases) OR communicable diseases) AND ("Health personnel" OR (Health personnel))</p> <p><u>LEGEND</u></p> <ul style="list-style-type: none"> • "Communicable diseases" – To find documents where your search terms appear adjacent to each other • (Communicable diseases) – To find only those documents that contain that exact phrase • Communicable diseases – Interpreted as Communicable AND Diseases. To find documents containing both terms appearing separately or together • * - Added to the end of the root word to find the root word plus all the words made by adding letters to the end of it
ScienceDirect	<p><u>Search #1</u> (Perception) AND (Risk) AND (Communicable PRE/3 diseases) AND (Health PRE/3 personnel) <u>Search #2</u> (Perception) AND (Risk) AND (Communicable diseases) AND (Healthcare personnel) <u>SEARCH #3</u> ((Lived PRE/3 experience) OR (Lived experience) OR (Mean*) OR (Perception)) AND (Risk) AND (Communicable PRE/3 diseases) AND (nurses) <u>SEARCH #4</u> ((Lived PRE/3 experience) OR (Lived experience) OR (Mean*) OR (Perception)) AND (Risk) AND (Communicable PRE/3 diseases) AND (health care personnel) <u>SEARCH #5</u></p>

	<p>((Lived PRE/3 experience) OR (Lived experience)) OR (Mean*) OR (Perception)) AND (Risk) AND (Communicable PRE/3 diseases)</p> <p><u>LEGEND</u></p> <ul style="list-style-type: none"> • *- Added to the end of the root word to find the root word plus all the words made by adding letters to the end of it • PRE/3 – used to find documents in which the first term precedes the second term within 3 words
Sociological Abstracts	<p><u>SEARCH #1</u> (Perception) AND (Risk) AND (Communicable diseases)</p> <p><u>SEARCH #2</u> (Perception) AND (Risk) AND (Communicable diseases) AND (Health personnel)</p> <p><u>SEARCH #3</u> (Perception OR (Lived experience)) AND (Risk) AND (Communicable diseases) AND (Health personnel)</p> <p><u>SEARCH #4</u> (Perception OR (Lived experience)) AND (Risk) AND (Communicable diseases)</p>
PsycINFO	<p><u>SEARCH #1</u> (Perception) AND (Risk) AND (Communicable diseases)</p> <p><u>SEARCH #2</u> (Perception) AND (Risk) AND (Communicable diseases) AND (Health personnel)</p> <p><u>SEARCH #3</u> (Perception OR Life experience OR Attitude) AND (Risk) AND (Communicable diseases)</p> <p><u>SEARCH #4</u> (Perception OR Life experience OR attitude to risk) AND (Risk) AND (Communicable diseases) AND (Health personnel)</p>
Web of Science (Social Sciences Citation Index)	<p><u>SEARCH #1</u> (Perception) AND (Risk) AND (Communicable diseases)</p> <p><u>SEARCH #2</u> (Perception) AND (Risk) AND (Communicable diseases) AND (Health personnel OR Nurses)</p> <p><u>SEARCH #3</u></p>

((Perception) OR (Attitude to risk) OR (Lived experience)) AND (Risk) AND (Communicable diseases) AND (Health personnel)

SEARCH #4

((Perception) OR (Attitude to risk) OR (Lived experience)) AND (Risk) AND (Communicable diseases) AND (Nurses)

APPENDIX II: Critical appraisal tools for MASTARI & QARI

JBI Critical Appraisal Checklist for Systematic Reviews

Reviewer _____ Date _____

Author _____ Year _____ Record Number _____

- | | Yes | No | Unclear |
|---|--------------------------|--------------------------|--------------------------|
| 1. Is the review question clearly and explicitly stated? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Was the search strategy appropriate? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Were the sources of studies adequate? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Were the inclusion criteria appropriate for the review question? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Were the criteria for appraising studies appropriate? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Was critical appraisal conducted by two or more reviewers independently? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Were there methods used to minimise error in data extraction? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Were the methods used to combine studies appropriate? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Were the recommendations supported by the reported data? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Were the specific directives for new research appropriate? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Overall appraisal: Include Exclude Seek further info.

Comments (Including reasons for exclusion)

JBI Critical Appraisal Checklist for Experimental Studies

Reviewer _____ Date _____

Author _____ Year _____ Record Number _____

	Yes	No	Unclear
1. Was the assignment to treatment groups random?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Were participants blinded to treatment allocation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Was allocation to treatment groups concealed from the allocator?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Were the outcomes of people who withdrew described and included in the analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Were those assessing outcomes blind to the treatment allocation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Were the control and treatment groups comparable at entry?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Were groups treated identically other than for the named interventions?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Were outcomes measured in the same way for all groups?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Were outcomes measured in a reliable way?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Was there adequate follow-up (>80%)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Was appropriate statistical analysis used?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Overall appraisal: Include Exclude Seek further info.

Comments (Including reasons for exclusion)

JBI Critical Appraisal Checklist for Comparable Cohort/ Case Control

Reviewer _____ Date _____

Author _____ Year _____

Record Number _____

	Yes	No	Unclear
1. Is sample representative of patients in the population as a whole?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Are the patients at a similar point in the course of their condition/illness?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Has bias been minimised in relation to selection of cases and of controls?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Are confounding factors identified and strategies to deal with them stated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Are outcomes assessed using objective criteria?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Was follow up carried out over a sufficient time period?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Were the outcomes of people who withdrew described and included in the analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Were outcomes measured in a reliable way?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Was appropriate statistical analysis used?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Overall appraisal: Include Exclude Seek further info

Comments (Including reason for exclusion)

JBI Critical Appraisal Checklist for Descriptive/ Case Series

Reviewer _____ Date _____

Author _____ Year _____

Record Number _____

	Yes	No	Unclear
1. Was study based on a random or pseudo-random sample?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Were the criteria for inclusion in the sample clearly defined?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Were confounding factors identified and strategies to deal with them stated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Were outcomes assessed using objective criteria?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. If comparisons are being made, was there sufficient descriptions of the groups?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Was follow up carried out over a sufficient time period?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Were the outcomes of people who withdrew described and included in the analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Were outcomes measured in a reliable way?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Was appropriate statistical analysis used?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Overall appraisal: Include Exclude Seek further info

Comments (Including reason for exclusion)

JBI QARI Critical Appraisal Checklist for Interpretive & Critical Research

Reviewer _____ Date _____

Author _____ Year _____ Record Number _____

	Yes	No	Unclear
1. Is there congruity between the stated philosophical perspective and the research methodology?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Is there congruity between the research methodology and the research question or objectives?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Is there congruity between the research methodology and the methods used to collect data?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Is there congruity between the research methodology and the representation and analysis of data?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Is there congruity between the research methodology and the interpretation of results?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Is there a statement locating the researcher culturally or theoretically?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Is the influence of the researcher on the research, and vice-versa, addressed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Are participants, and their voices, adequately represented?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Is the research ethical according to current criteria or, for recent studies, and is there evidence of ethical approval by an appropriate body?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Overall appraisal: Include Exclude Seek further info.

Comments (Including reasons for exclusion)

APPENDIX III: Data extraction tools from MASTARI & QARI

JBI Data Extraction Form for Experimental/Observational Studies

Reviewer _____ Date _____
 Author _____ Year _____
 Journal _____ Record Number _____

Study Method RCT Quasi-RCT Longitudinal
 Retrospective Observational Other _____

Participants

Setting _____
 Population _____
 Sample size _____
 Intervention 1 _____ Intervention 2 _____ Intervention 3 _____

Interventions

Intervention 1 _____

Intervention 2 _____

Intervention 3 _____

Clinical outcome measures

Outcome Description	Scale/measure

Results

Dichotomous Data

Outcome	Control Group number/total number	Treatment Group number/total number

Continuous Data

Outcome	Control Group mean & SD (number)	Treatment Group mean & SD (number)

Authors Conclusions

Comments

**JBI QARI Data Extraction Form
for Interpretive & Critical Research**

Reviewer _____ Date _____
Author _____ Year _____
Journal _____ Record Number _____

Study Description

Methodology _____

Method _____

Intervention _____

Setting _____

Geographical _____

Cultural _____

Participants _____

Data analysis _____

Authors Conclusions

Comments

Findings	Illustration from Publication (page number)	Evidence		
		Unequivocal	Credible	Unsupported

Extraction of findings complete YES

APPENDIX IV: Joanna Briggs Institute Levels of Evidence (new)

Level of Evidence	Effectiveness E(1-4)
1	SR (with homogeneity) of Experimental studies (eg. RCT with concealed allocation) Or 1 or more large experimental studies with narrow confidence intervals
2	Quasi-experimental studies (eg. without randomisation)
3	3a. Cohort studies (with control group) 3b. Case-controlled 3c. Observational studies without control groups
4	Expert opinion without explicit critical appraisal, or based on physiology, bench research or consensus