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Mapping of modifiable barriers and facilitators with interdisciplinary chronic obstructive pulmonary disease (COPD) guideline concordance in the Emergency Departments to the Theoretical Domains Framework: a mixed method systematic review protocol

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Abstract

Introduction

Multifarious COPD guidelines has been published by local, national and global respiratory societies. These guidelines subsume holistic evidence based recommendations to diagnose, treat, prevent and manage acute exacerbation with COPD. Despite the existing comprehensive recommendations, readmission rates and hospitalisations have increased in the last decade. Evidence to date has reported suboptimal clinical guidelines concordance. Acute exacerbations of COPD (AECOPD) is a common presentation in ED due to varied causes such as infective exacerbations, worsening disease condition, medication non adherence, lack of education and incomprehensive discharge planning. AECOPD directly and indirectly causes economic burden, disrupt health related quality of life (HRQol), hasten lung function decline and increases overall morbidity and mortality. COPD being a multi modal chronic disease, consistent interdisciplinary interventions from the time of admission in the emergency department may reduce re admissions and enhance HRQol amongst these patients and their families.

Methods and analysis

This protocol adheres to the Joanna Briggs Institute methodology for mixed methods systematic reviews and the PRISMA ScR reporting guidelines. Qualitative, quantitative and mixed method studies will append this study to explore determinants of COPD guidelines concordance. Comprehensive three tier search strategies will be utilised to search nine databases (COCHRANE, EBSCO HOST, MEDLINE, SCIENCE DIRECT, JBI, SCOPUS, WEB OF SCIENCE, WILEY, DARE). Two independent reviewers will screen abstracts and full text articles in consonance with inclusion criteria. The convergent integrative method narrative review will contribute deeper understanding of any discrepancies found in existing evidence. Quality of the studies will be reported and Theoretical domains framework (TDF) will be utilised as a priori to synthesis data. Identified barriers, facilitators and corresponding solutions will be categorised using TDF indicators to provide future research and implementation recommendations

Ethics and dissemination

Ethical approval is not required and results dissemination will occur through peer reviewed publication.

Article Summary

Strengths and limitations of this study

- First systematic review to explore barriers within interdisciplinary clinical practice and concordance with global COPD X guidelines in the emergency department
- Theoretical Domains Framework (TDF) utilisation facilitates understanding of existing barriers and probable solutions to improve concordance
- Inter disciplinary perspective to improve collaboration and concordance may lead to multifaceted implementation strategies
- Paucity of existing good quality data and reporting may confine our ability to report true barriers of lack of concordance

KEYWORDS

COPD guidelines; chronic obstructive pulmonary disease guidelines; Concordance; Compliance; adherence; emergency department

Background

COPD is a preventable, treatable, irreversible lung disease characterized by chronic airflow obstruction that impedes a normal breathing pattern (1, 2). COPD being a debilitating multisystem disease often leads to a steady decline, in terms of illness trajectory and heavily impacts health related quality of life(3, 4) The World Health Organisation has predicted COPD to become the third leading cause of death by 2030 considering its increase in prevalence and morbidity rate (5, 6). COPD is the second leading cause of preventable hospitalisation in Australia and accounted for more than two by third of global respiratory fatal incidences (7, 8). Acute exacerbation of chronic obstructive pulmonary disease (AECOPD) is defined as acute variation in patient's stable state with both respiratory and non-respiratory symptoms that demand medication changes or hospitalisation(9). Australasian research reports, 5% of all ED presentations included shortness of breath and 14% of these presentations were COPD (10)

Exacerbation episodes have significant and prolonged impact on health status, health related quality of life, patient outcomes, and the negative effects on pulmonary function decline(9). AECOPD is a common presentation in ED due to a variety of causes such as infective exacerbations, worsening disease condition, medication non adherence, inefficient care planning, lack of education, and discharge without comprehensive support plan (11). AECOPD directly and indirectly are associated with an increased economic burden to the health industry by hastening lung function decline, negatively affecting patients and families and increasing overall morbidity and mortality (6). Major causal factors of exacerbations includes smoking, environmental and genetic factors, airway hyper reactivity, chronic bronchitis and infection(1). Breathlessness, reduced activity level, malnutrition, social isolation, loss of independence, reduced health related quality of life and depression are some of the issues these patients tackle in their daily lives(12). COPD is a multi-modal chronic disease that requires consistent interdisciplinary interventions from admission to discharge. The importance of the care and interventions provided in the emergency department may reduce re admissions and enhance health related quality of life in these patients and their families(13)

The Global Initiative for Chronic Obstructive Lung Disease (GOLD), originally launched and mould by international leading experts in 1997 aims to improve health related quality of life and medical management around the globe(1). COPD X plan guidelines, originally derived from GOLD, published in 2003 by Thoracic Society of Australia and New Zealand (TSANZ) and the Australian Lung Foundation (LFA) had the intention to promote consistent evidence based changes in clinical practice (14). A primary aim of publishing these guidelines was an anticipated shift from the pre dominant emphasis of pharmacological treatment to a more holistic multi-disciplinary interventions approach (14). A range of interventions recommended through the published COPD guidelines such as pulmonary rehabilitation, smoking cessation, self-management of exacerbations, palliative care, psychological support or counselling for patients and families have proven to improve health related quality of life factors in patients with COPD (15). Advances in the management of COPD is updated quarterly in the national COPD guidelines by LFA and TSANZ (15). The prime emphasis of these guidelines is around accurate case diagnosis, functional optimisation, preventing deterioration, developing a plan of care and managing exacerbation (14). Despite the existing comprehensive recommendations, readmission rates and hospitalisations have increased in the last decade (12, 13)

The publication of global (GOLD) and national clinical practice guidelines (COPD X plan) is only the first step in a process that ends with an actual change in clinician behaviour, hence effective guideline dissemination methods cannot be overlooked (16). An Australian retrospective observational study conducted on 381 patients in the Gold Coast Emergency Department (GCED), Australia, explored compliance with a patients COPD bundle of care, the results revealed 49 % adherence to the established plan. This study suggested further research is required to improve guidelines and adherence plans for patients with COPD (17). A qualitative Australian study, using semi-structured interviews of nine hospital-based registrars or interns, and seven GPs found that, barriers to implementation of evidence-based recommendations for COPD plans included a lack of supportive enablers and a complexity of the behavioural change needed in patients (18, 19). An identified barrier was the lack of guidelines in a readily, user friendly and easy accessible manner with checkpoints, cues and time intervals of when they are required at point-of-care (18). The studies suggest that improvement in guideline adherence can be translated into improved patient care and health related quality of life (Hrqol) in COPD patients.

Overington et al., (2014) study in Australia reports implementation of a COPD checklist and the resultant adherence was conducted among respiratory ward staff where two groups of patient admissions were studied (pre-checklist implementation and post checklist-implementation). Adherence to the checklist used by ward medical staff in a respiratory ward identified a compliance of 51% (18). Concordance with COPD guideline recommendations was high overall for patient assessment and initial treatment; however, concordance was lower for longer-term issues such as referral to pulmonary rehabilitation programs (36%) (18). Patients discharged from ED had not been included in this study nor was the interdisciplinary perspective explored. This study suggested further research was required to determine the most effective ways to translate the evidence into everyday clinical practice for AECOPD. The Asia, Australia and New Zealand dyspnoea in emergency departments (AANZDEM) cohort study was conducted in 46 ED's in Australia, New Zealand, Singapore, Hong Kong and Malaysia to explore epidemiology, clinical features, treatment outcomes, hospital length of stay and in-hospital mortality (11). Findings of this study identified most acute exacerbation patients with COPD arrive in ED by ambulance, have increased hospitalisations' and significant in-hospital mortality (11). A planned sub-study of AANZDEM concluded compliance with COPD evidence based guidelines is suboptimal in ED's and suggested further research is required to improve compliance with care based on published guidelines (10).

Mc Carthy et al., (2013) conducted a prospective before and after study in an Ireland ED exploring COPD exacerbations and their management. Following the education of ED staff and the implementation of a COPD care bundle, the outcome for 51 consecutive patients was analysed. Bundle of care improved the delivery of care for COPD patients. However, care indicators did not suggest or assess interdisciplinary services (pulmonary rehabilitation, smoking cessation, self-management education, dietician or psychosocial support) (20). Spirometry and non-invasive ventilation are two other variables identified in the treatment plan by another retrospective audit of frequent patients with COPD presenting in the GCED, Australia(21). Imperative evidence collectively resulting from these studies have suggested exploring barriers and enablers of holistic COPD assessment and management could be beneficial in providing holistic care options for patients with COPD. Decreased awareness, familiarity, low concordance, sub-optimal primary, secondary and tertiary care provided by health professionals have immensely affected health related quality of life in patients with COPD (10, 13, 18).

COPD is a multimodal disease, where interdisciplinary care holds a pivotal role in reducing COPD exacerbations (22-24). Current evidence reports doctors, nurses and interdisciplinary health professionals in Australia, do not consistently adhere to COPD guidelines (11, 15, 25, 26). Bartels, Adamson, Leung, Sin & Eden (2018) postulates from their one-year retrospective study in Canada that patients with COPD discharged from ED have a significantly higher risk of readmission due to variability in treatment as less than 50 % of patients with AECOPD in their study, who presented to ED received recommended COPD therapy (27). Exploring the barriers and enablers for interdisciplinary team members to provide holistic care as per COPD guidelines (medical, physical, psychological, social, spiritual & palliation) is crucial in the emergency department (10, 28). Interdisciplinary care has proven to significantly optimise functionality and prevent deterioration in patients with COPD, which subsequently reduces hospital admissions and hospital days per person (18, 22). Initiation of consistent interdisciplinary health care interventions for patients with COPD presenting in emergency departments will extrude any implementation gap and prevent readmissions (22).

According to an observational study in Australia, COPD guidelines developed with detailed processes and plethora of international evidence is not well adhered to, where the study also reports a lack in clinician knowledge nationally and internationally (18). Low concordance is indubitably associated with low awareness of clinical guidelines and role confusion that may subsequently lead to sub-optimal clinical care for patients in primary, secondary and tertiary care (18, 26). Nationally and internationally, the results of this review with implementation recommendations will avail interdisciplinary clinicians treating patients with COPD and clinical decision makers. Existence of the guidelines alone do not often aid patients with better health outcomes; hence, exploration of contributing factors to the already established lack of concordance through this review is in need. Existing evidence and reviews have ascertained that a lack of COPD guideline concordance will increase ED readmissions, imploring the need to better examine contributing factors inhibiting recommended clinical practice.

Theoretical Domains Framework (TDF) had aimed to deliver a comprehensive and theory-informed advanced methodology to help identify fundamentals of non-concordance behaviour among interdisciplinary professional(29). Integrating theoretical framework will assist cross-disciplinary implementation and research synthesis to create specific recommendations for local, national and

international health systems (29, 30). This theoretical scaffolding allows identification and accumulation of salient determinants from existing evidence towards 14 domains(31). The fourteen domains according to Cane et al, 2012 are, (1) Knowledge, (2) Skills, (3) Social Influences, (4) Memory, Attention and Decision Processes, (5) Behavioural Regulation, (6) Professional/Social Role and Identity, (7) Beliefs about Capabilities, (8) Belief about Consequences, (9) Optimism, (10) Intentions, (11) Goals, (12) Emotion, (13) Environmental Context and Resources and (14) Reinforcement. Any determinants that do not fit within the existing domains will be organised into an 'Others' domain. Framework synthesis of data allows robust filtration of evidence from multiple sources to provide better implementation strategies to COPD guideline concordance(31). A further benefit of TDF is its linkage to behaviour change techniques which may provide an early identification of implementation issues associated with clinician behaviour [29]. This systematic review will identify the contributing factors to the lack of COPD guidelines concordance from the time of admission in the emergency department to discharge. Given the scarcity of research in interdisciplinary guidelines concordance with COPD, the proposed mixed method approach will enable all available evidence to be incorporated into the review.

REVIEW QUESTIONS

What core elements of the COPD guidelines are adhered to by interdisciplinary health professionals?

What are the contributing factors to the lack of COPD guideline concordance amongst interdisciplinary health professionals in the emergency department?

INCLUSION CRITERIA

Studies and reports published in English including interdisciplinary COPD guidelines concordance, compliance, or adherence in the emergency departments will be utilised for this review.

Exclusion criteria

Studies not reported in English and studies which had not measured emergency department COPD guideline concordance

Population

This review will consider studies that involve doctors, nurses, and allied health reports on COPD guidelines concordance

Context

This review will consider studies that investigate COPD guidelines concordance in the emergency department

Types of studies

This review will consider quantitative, qualitative and mixed methods studies. Quantitative studies will include experimental, quasi experimental and non-experimental studies including descriptive studies, co-relational studies, randomized controlled trials, non-randomized controlled trials, before and after studies and interrupted time-series studies. Mixed method studies will only be considered if data from the quantitative or qualitative components can be clearly extracted. In order to ensure all reports on COPD guidelines are included any studies that mention COPD guidelines concordance, adherence or compliance will be included for potential inclusion. Studies published in English will be

included. Studies published from 1997 from nine data bases (COCHRANE, EBSCO HOST, MEDLINE, SCIENCE DIRECT, JBI, SCOPUS, WEB OF SCIENCE, WILEY, DARE) to the present will be included as international guidelines have been in circulation since 1997. In addition, analytical observational studies including prospective and retrospective cohort studies, case-control studies and analytical cross-sectional studies will be considered for inclusion. This review will also consider observational study designs including case series, individual case reports and descriptive cross-sectional studies for inclusion. Studies that focus on qualitative data including, but not limited to, designs such as phenomenology, grounded theory, ethnography, action research and feminist research will also be included for review.

METHODS

The proposed systematic review will be conducted in accordance with the Joanna Briggs Institute methodology for mixed methods systematic reviews and the PRISMA ScR reporting guidelines (See Appendix.1) (32, 33). A mixed method review provides a comprehensive synthesis compared to a single method review as it combines quantitative and qualitative evidence to assist clinical decision and policy makers to adopt appropriate implementation strategy (34). A convergent integrative method where quantitative evidence is qualitized to provide a narrative review will deepen better understanding of any discrepancies noted in the evidence(34).

Search strategy

A preliminary search of databases has been undertaken and no existing or ongoing mixed method or individual systematic reviews on the topic have been identified. A comprehensive three tier search will be aimed to locate both published and unpublished studies. An initial search of MEDLINE and CINAHL will commence the review followed by the identification of keywords found in each title and abstract and a match to the subject terms used in articles on the topic. This will enable the development of an extensive full search strategy for a second search in databases (COCHRANE, EBSCO HOST, MEDLINE, SCIENCE DIRECT, JBI, SCOPUS, WEB OF SCIENCE, WILEY, DARE) (See Appendix 2. Electronic search strategy). Reference lists from all included studies will be examined to screen any additional studies relevant to the review question.

Study selection

All identified studies following the search will be collated and retrieved into Endnote Version X8.1 and duplicates will be removed. Covidence systematic review management software will be utilised to assist with further data management (35). Two independent reviewers will screen Titles and Abstracts in phase one assessment towards the inclusion criteria for the selection of articles. Phase two will include full text screening by two independent reviewers where inclusion and exclusion process is performed. Exclusion of full text studies will be recorded and reported in the systematic review. Authors of papers will be contacted to request missing or additional data for clarification, where required. Disagreements that arise between the reviewers at each stage of the study selection process will be resolved through discussion, or with a third reviewer. The results of the search will be reported in the final review and presented in a Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) flow diagram (See Appendix. 3) (32).

Assessment of methodological quality

Eligible studies will undergo critical appraisal to establish the internal validity and risk of bias by two independent reviewers. Any disputes will be settled through discussion or third reviewer opinion. Specific standardized critical appraisal instruments from JBI SUMARI will be used separately for quantitative studies (including quantitative component of mixed methods studies) and qualitative studies (including qualitative component of mixed methods studies), that are selected for retrieval (34). Regardless of the methodological quality all studies will undergo extraction and synthesis (where possible)(34). Critical appraisal results will be appended to the review using ConQual approach in Summary of findings table (SOF) (see Table. 1)(34, 36)

Data extraction

Mixed methods data extraction tool designed for Convergent integrated approach (integration of qualitative data and 'qualitized' data following data transformation) will be utilised to extract data in this study (See Table. 2) (33). This extraction tool includes type of the study, methodology, number and characteristics of participants, phenomena of interest, cultural and geographic context and outcomes relevant to review objectives. Two independent reviewers will extract data from articles and any disagreements will be settled using third reviewer. Applying Computer software program Nvivo V.1236 a second extraction of data and mapping of modifiable determinants of COPD guideline adherence to the domains of the TDF will be performed (29, 30, 37).

Data transformation

Quantitative data will be converted to 'qualitized data' following extraction according to the JBI Convergent Integrated Approach (33, 34). Quantitative numerical data will be transfigured to textual or narrative interpretations to answer the overarching review question

Data Synthesis and integration

Extracted data in shape of qualitized textual description from quantitative studies and themes and subthemes from qualitative studies will be collated and categorized in congruence to 14 domains of theoretical domains framework (See Table.3) (29). Factors contributing to lack of concordance with the guideline will be integrated based on similarity in meaning. Using TDF will assist in organising literature identified determinants of lack of COPD guidelines concordance. This review will adhere to the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) reporting guidelines (32).

Ethics and dissemination

Ethics approval is not required for this study as all data is obtained from publicly available studies. Knowledge and interpretations from this review will provide recommendations towards prominent implementation strategies to increase COPD guideline concordance. Results of this study will be presented before industry stakeholders, interdisciplinary clinicians and appropriate future conferences to develop and assist with implementation initiatives.

Patient and Public Involvement: No patient involved

Funding : No funding has been received for the completion of the review.

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Contributors

HI led the design and conceptualisation of this protocol. CM, MT & JL have made intellectual contributions and worked collaboratively in the development and editing of this protocol. All authors have read and approved the protocol for publication.

CONFLICTS OF INTEREST

There is no conflict of interest in this project.

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CONQual Summary of Findings Table

Systematic review title: **Population:** **Phenomena of interest:** **Context:**					
Synthesised Finding	**Type of research**	**Dependability**	**Credibility**	**ConQual Score**	**Comments**
Insert each synthesized finding, and complete the columns per synthesized finding, keeping the rows aligned					

Table.1

Summary of findings table to depict assessment of methodological quality of eligible studies. (Adapted from Aromataris et al. 2017; Munn et al. 2014)

Data extraction table for Convergent Integrated approach mixed methods systematic review

Reviewer: _____ **Date:** _____

Author(s) of the publication: _____ **Year** _____

Journal _____ **Record Number** _____

Type of study

- Quantitative study
- Qualitative study
- Mixed methods study

Methodology: (e.g. randomized controlled trial, phenomenology)

Number of participants:
Characteristics of participants

Phenomena of interest

Setting and other context-related information (e.g. cultural, geographical)

Outcomes or findings of significance to the review objectives

For a quantitative study, for example

Results

· 29% of survey participants reported feeling embarrassed having an asthma attack with friends; only 39% disclosed their asthma to friends

· 32% were embarrassed about taking asthma medication in front of friends; only 38% reported taking asthma pump when going out

Reference: (Cohen et al., 2003)

For a qualitative study, for example:

Themes or Subtheme	Illustration (a direct quotation from a participant, an observation or other supporting data from the paper)
Parental support	'I can take my medicines by myself, but my parents remind me of taking the medicines and they fill prescriptions at the pharmacy. I always talk to the pediatrician or asthma nurse

together with my parents.' (page 834, Koster et al., 2015)
Author's conclusion
Reviewer's Comments

Table.2
Data Extraction table for convergent integrated approach mixed methods systematic review (Adapted from Lizarando et al. 2017)

Theoretical domains framework

Theoretical domain	Definition
Knowledge	An awareness of the existence of something

Skills	An ability or proficiency acquired through practice
Social/professional role and identity	A coherent set of behaviours and displayed personal qualities of an individual in a social or work setting
Beliefs about capabilities	Acceptance of the truth, reality, or validity about an ability, talent, or facility that a person can put to constructive use
Optimism	The confidence that things will happen for the best or that desired goals will be attained
Beliefs about consequences	Acceptance of the truth, reality, or validity about outcomes of a behaviour in a given situation
Reinforcement	Increasing the probability of a response by arranging a dependent relationship, or contingency, between the response and a given stimulus
Intentions	A conscious decision to perform a behaviour or a resolve to act in a certain way
Goals	Mental representations of outcomes or end states that an individual wants to achieve
Memory, attention and decision processes	The ability to retain information, focus selectively on aspects of the environment and choose between two or more alternatives
Environmental context and resources	Any circumstance of a person's situation or environment that discourages or encourages the development of skills and abilities, independence, social competence, and adaptive behaviour
Social influences	Those interpersonal processes that can cause individuals to change their thoughts, feelings, or behaviours
Emotion	A complex reaction pattern, involving experiential, behavioural, and physiological elements, by which the individual attempts to deal with a personally significant matter or event
Behavioural regulation	Anything aimed at managing or changing objectively observed or measured actions

Table.3 Theoretical domains framework for data synthesis (adapted from Cane et al. 2012)

CONQual Summary of Findings Table

Systematic review title: **Population:** **Phenomena of interest:** **Context:**					
Synthesised Finding	**Type of research**	**Dependability**	**Credibility**	**ConQual Score**	**Comments**
Insert each synthesized finding, and complete the columns per synthesized finding, keeping the rows aligned					

Table.1

Summary of findings table to depict assessment of methodological quality of eligible studies. (Adapted from Aromataris et al. 2017; Munn et al. 2014)

Data extraction table for Convergent Integrated approach mixed methods systematic review

Reviewer: _____ **Date:** _____

_____

Author(s) of the publication: _____ **Year** _____

Journal _____ **Record Number** _____

Type of study

- Quantitative study
- Qualitative study
- Mixed methods study

Methodology: (e.g. randomized controlled trial, phenomenology)

Number of participants:

Characteristics of participants

Phenomena of interest

Setting and other context-related information (e.g. cultural, geographical)

Outcomes or findings of significance to the review objectives

For a quantitative study, for example

Results

· 29% of survey participants reported feeling embarrassed having an asthma attack with friends; only 39% disclosed their asthma to friends

· 32% were embarrassed about taking asthma medication in front of friends; only 38% reported taking asthma pump when going out

Reference: (Cohen et al., 2003)

For a qualitative study, for example:

Themes or Subtheme	Illustration (a direct quotation from a participant, an observation or other supporting data from the paper)
Parental support	'I can take my medicines by myself, but my parents remind me of taking the medicines and they fill prescriptions at the pharmacy. I always talk to the pediatrician or asthma nurse together with my parents.' (page 834, Koster et al., 2015)

Author's conclusion

Reviewer's Comments

Table.2
Data Extraction table for convergent integrated approach mixed methods systematic review (Adapted from Lizarando et al. 2017)

Theoretical domains framework

Theoretical domain	Definition
Knowledge	An awareness of the existence of something
Skills	An ability or proficiency acquired through practice
Social/professional role and identity	A coherent set of behaviours and displayed personal qualities of an individual in a social or work setting
Beliefs about capabilities	Acceptance of the truth, reality, or validity about an ability, talent, or facility that a person can put to constructive use
Optimism	The confidence that things will happen for the best or that desired goals will be attained
Beliefs about consequences	Acceptance of the truth, reality, or validity about outcomes of a behaviour in a given situation
Reinforcement	Increasing the probability of a response by arranging a dependent relationship, or contingency, between the response and a given stimulus
Intentions	A conscious decision to perform a behaviour or a resolve to act in a certain way
Goals	Mental representations of outcomes or end states that an individual wants to achieve
Memory, attention and decision processes	The ability to retain information, focus selectively on aspects of the environment and choose between two or more alternatives
Environmental context and resources	Any circumstance of a person's situation or environment that discourages or encourages the development of skills and abilities, independence, social competence, and adaptive behaviour
Social influences	Those interpersonal processes that can cause individuals to change their thoughts, feelings, or behaviours
Emotion	A complex reaction pattern, involving experiential, behavioural, and physiological elements, by which the individual attempts to deal with a personally significant matter or event
Behavioural regulation	Anything aimed at managing or changing objectively observed or measured actions

Table.3 Theoretical domains framework for data synthesis (adapted from Cane et al. 2012)

APPENDIX 1.

Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
TITLE			
Title	1	Mapping of modifiable barriers and facilitators with interdisciplinary chronic obstructive pulmonary disease (COPD) guideline concordance in the Emergency Departments to the Theoretical Domains Framework: a mixed systematic review protocol	1
ABSTRACT			
Structured summary	2	Abstract includes introduction, methods and analysis, ethics, dissemination	1
INTRODUCTION			
Rationale	3	Background, significance and review questions of this systematic review explained	2,3,4
Objectives	4	Population, Context, Inclusion criteria , exclusion criteria explained .	5
METHODS			
Protocol and registration	5	Preliminary search details, PROSPERO registration assessment in progress as it takes three months for non UK protocols. They have advised to continue with publication	6
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	5
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	5
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	11
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	6
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	7
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	n/a
Critical appraisal of individual sources of evidence§	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this	6,7 13,16

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
		information was used in any data synthesis (if appropriate).	
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	16
RESULTS			
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	Click here to enter text.
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	Click here to enter text.
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	Click here to enter text.
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	Click here to enter text.
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	Click here to enter text.
DISCUSSION			
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	Click here to enter text.
Limitations	20	Discuss the limitations of the scoping review process.	Click here to enter text.
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	Click here to enter text.
FUNDING			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	Click here to enter text.

Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist (adapted from Moher et al. 2009)

Appendix 2. Electronic search strategy

MEDLINE SEARCH STRATEGY

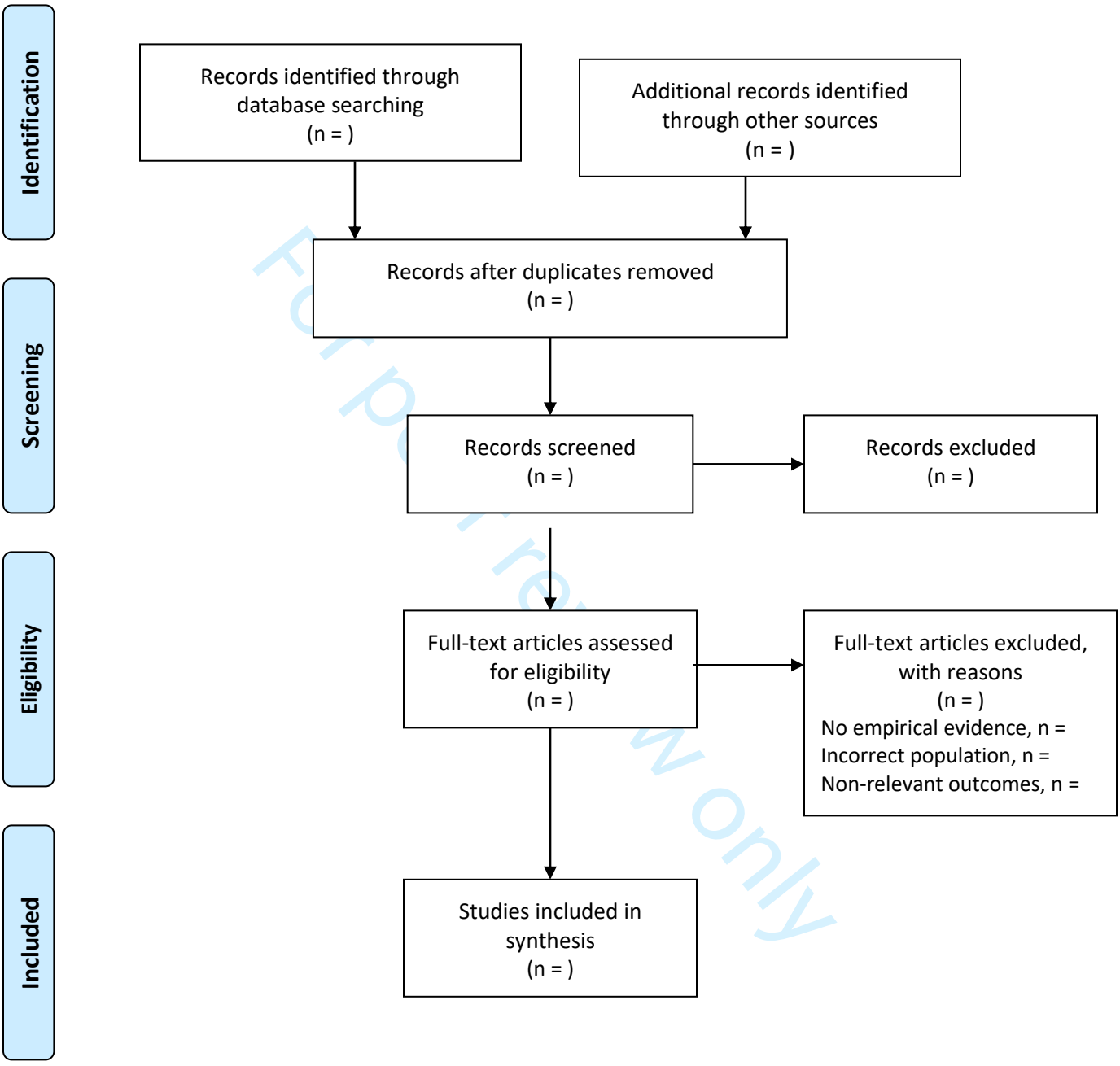
(("COPD guidelines"[All Fields] OR (Chronic[All Fields] AND obstructive[All Fields] AND ("lung diseases"[MeSH Terms] OR ("lung"[All Fields] AND "diseases"[All Fields]) OR "lung diseases"[All Fields] OR ("pulmonary"[All Fields] AND "disorder"[All Fields]) OR "pulmonary disorder"[All Fields]) AND ("guideline"[Publication Type] OR "guidelines as topic"[MeSH Terms] OR "guidelines"[All Fields])))) AND (Concordance[All Fields] OR ("patient compliance"[MeSH Terms] OR ("patient"[All Fields] AND "compliance"[All Fields]) OR "patient compliance"[All Fields] OR "compliance"[All Fields] OR "compliance"[MeSH Terms]) OR Adherence[All Fields] OR barriers[All Fields] OR enablers[All Fields])) AND ("Emergency department"[All Fields] OR "accident and emergency"[All Fields] OR ("Expert Rev Mol Med"[Journal] OR "Educ Res"[Journal] OR "Econ Rec"[Journal] OR "er"[All Fields]))

Search	Add to builder	Query	Items found	Time
#1	Add	Search **(((“COPD guidelines” OR “Chronic obstructive pulmonary disorder guidelines”)) AND (Concordance OR Compliance OR Adherence OR barriers OR enablers)) AND (“Emergency department” OR “accident and emergency” OR ER)**	24	20:40:06

CINAHL SEARCH STRATEGY

#	Query	Limiters/Expanders	Last Run Via	Results
S1	(“COPD guidelines” OR “Chronic obstructive pulmonary disorder guidelines”) AND (Concordance OR Compliance OR Adherence OR barriers OR enablers) AND (“Emergency department” OR “accident and emergency” OR ER)	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text	1

Appendix 3. PRISMA FLOW DIAGRAM



PRISMA Schematic tabular of review of search

Flow diagram illustrates the phases of article selection, Title and abstracts screening for initial eligibility, Eligible Full text articles in consonance to inclusion criteria, Studies included in data extraction and synthesis (Adapted from Moher et al. 2009) (34)

BMJ Open

Mapping of modifiable barriers and facilitators with interdisciplinary chronic obstructive pulmonary disease (COPD) guidelines concordance within hospitals to the Theoretical Domains Framework: a mixed method systematic review protocol

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2019-036060.R1
Article Type:	Protocol
Date Submitted by the Author:	21-Feb-2020
Complete List of Authors:	Issac, Hancy ; University of Southern Queensland, Nursing and Midwifery Moloney, Clint; University of Southern Queensland, School of Nursing and Midwifery Taylor, Melissa; University of Southern Queensland, School of nursing and midwifery Lea, Jackie; University of Southern Queensland, School of nursing and midwifery
Primary Subject Heading:	Respiratory medicine
Secondary Subject Heading:	Health services research
Keywords:	Protocols & guidelines < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, Chronic airways disease < THORACIC MEDICINE, Emphysema < THORACIC MEDICINE, Quality in health care < HEALTH SERVICES ADMINISTRATION & MANAGEMENT

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Mapping of modifiable barriers and facilitators with interdisciplinary chronic obstructive pulmonary disease (COPD) guidelines concordance within hospitals to the Theoretical Domains Framework: a mixed method systematic review protocol

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Word count - 3432

Abstract

Introduction

Multifarious COPD guidelines has been published by local, national and global respiratory societies. These guidelines subsume holistic evidence based on recommendations to diagnose, treat, prevent and manage acute exacerbation with COPD. Despite the existing comprehensive recommendations, readmission rates and hospitalisations have increased in the last decade. Evidence to date has reported suboptimal clinical guidelines concordance. Acute exacerbations of COPD (AECOPD) is a common hospital presentation due to varied causes such as infective exacerbations, worsening disease condition, medication non adherence, lack of education and incomprehensive discharge planning. AECOPD directly and indirectly causes economic burden, disrupt health related quality of life (HRQol), hasten lung function decline and increases overall morbidity and mortality. COPD being a multi modal chronic disease, consistent interdisciplinary interventions from the time of admission to discharge may reduce re-admissions and enhance HRQol amongst these patients and their families.

Methods and analysis

This protocol adheres to the Joanna Briggs Institute methodology for mixed methods systematic reviews and the PRISMA ScR reporting guidelines. Qualitative, quantitative and mixed method studies will append this study to explore determinants of COPD guidelines concordance. Comprehensive three tier search strategies will be utilised to search nine databases (COCHRANE, EBSCO HOST, MEDLINE, SCIENCE DIRECT, JBI, SCOPUS, WEB OF SCIENCE, WILEY, DARE). Two independent reviewers will screen abstracts and full text articles in consonance with inclusion criteria. The convergent integrative method narrative review will contribute deeper understanding of any discrepancies found in existing evidence. Quality of the studies will be reported and theoretical domains framework (TDF) will be utilised as a priori to synthesis data. Identified barriers, facilitators and corresponding clinical behavioural change solutions will be categorised using TDF indicators to provide future research and implementation recommendations.

Ethics and dissemination

Ethical approval is not required and results dissemination will occur through peer reviewed publication.

Article Summary

Strengths and limitations of this study

- First systematic review to explore barriers within interdisciplinary clinical practice and concordance with global COPD guidelines.
- Theoretical Domains Framework (TDF) utilisation facilitates understanding of existing barriers and probable clinical behaviour change solutions to improve concordance.
- Inter disciplinary perspective to improve collaboration and concordance may lead to multifaceted implementation strategies.
- Paucity of existing good quality data and reporting may confine our ability to report true barriers of lack of concordance.

KEYWORDS

COPD guidelines; chronic obstructive pulmonary disease guidelines; Concordance; Compliance; adherence

Background

COPD is a preventable, treatable, irreversible lung disease characterized by chronic airflow obstruction that impedes a normal breathing pattern [1, 2]. COPD, being a debilitating multisystem disease often leads to a steady decline, in terms of illness trajectory and heavily impacts health related quality of life[3, 4]. The World Health Organisation has predicted COPD to become the third leading cause of death by 2030 considering its increase in prevalence and morbidity rate [5, 6]. COPD is the second leading cause of preventable hospitalisation in Australia and accounted for more than two by third of global respiratory fatal incidences [7, 8]. Australasian research reports, 5% of all emergency department presentations included shortness of breath and 14% of these presentations were COPD[9]. Acute exacerbation of chronic obstructive pulmonary disease (AECOPD) is defined as acute variation in patient's stable state with both respiratory and non-respiratory symptoms that demand medication changes or hospitalisation[10].

Exacerbation episodes have significant and prolonged impact on health status, health related quality of life, patient outcomes, and the negative effects on pulmonary function decline[10]. AECOPD is a common hospital presentation due to a variety of causes such as infective exacerbations, worsening disease condition, medication non adherence, inefficient care planning, lack of education, and discharge without comprehensive support plan [9]. AECOPD directly and indirectly are associated with an increased economic burden to the health industry by hastening lung function decline, negatively affecting patients and families and increasing overall morbidity and mortality [6]. Major causal factors of exacerbations includes smoking, environmental and genetic factors, airway hyper reactivity, chronic bronchitis and infection[1]. Breathlessness, reduced activity level, malnutrition, social isolation, loss of independence, reduced health related quality of life and depression are some of the issues these patients tackle in their daily lives[11]. COPD is a multi-modal chronic disease that requires consistent interdisciplinary interventions from admission to discharge. The importance of

the care and interventions provided in the hospitals may reduce readmissions and enhance health related quality of life in these patients and their families[12].

Primary intent of publishing COPD guidelines were to facilitate an anticipated shift from the predominant emphasis of pharmacological treatment to a more holistic multi-disciplinary interventions approach (14). The Global Initiative for Chronic Obstructive Lung Disease (GOLD), originally launched and developed by international leading experts in 1997 aims to improve health related quality of life and medical management around the globe[1]. COPD X plan guidelines, originally derived from GOLD, published in 2003 by Thoracic Society of Australia and New Zealand (TSANZ) and the Lung Foundation Australia (LFA) aims to promote consistent evidence based changes in clinical practice [13]. A range of interventions recommended through the published COPD guidelines such as pulmonary rehabilitation, smoking cessation, self-management of exacerbations, palliative care, psychological support or counselling for patients and families have proven to improve health related quality of life factors in patients with COPD [14]. Advances in the management of COPD is updated quarterly in the national COPD guidelines by LFA and TSANZ [14]. The prime emphasis of these guidelines is around accurate case diagnosis, functional optimisation, preventing deterioration, developing a plan of care and managing exacerbation [13]. Despite the existing comprehensive recommendations, readmission rates and hospitalisations have increased in the last decade [11, 12].

The publication of global initiative for chronic obstructive lung disease (GOLD) and national clinical practice guidelines (COPD X plan) is only the first step in a process that ends with an actual change in clinician behaviour, hence effective guideline dissemination methods cannot be overlooked [15]. An Australian retrospective observational study conducted on 381 patients explored compliance with a patients COPD bundle of care, the results revealed 49% adherence to the established plan. This study suggested further research is required to improve guidelines and adherence plans for patients with COPD [16]. A qualitative Australian study, using semi-structured interviews of nine hospital-based registrars or interns, and seven GPs found that, barriers to implementation of evidence-based recommendations for COPD plans included a lack of supportive enablers and a complexity of the behavioural change needed in patients [17, 18]. An identified barrier was the lack of guidelines in a readily, user friendly and easy accessible manner with checkpoints, cues and time intervals of when they are required at point-of-care [17]. The studies suggest that improvement in guideline adherence can be translated into improved patient care and health related quality of life (Hrqol) in COPD patients.

Prospective research in knowledge translation and effective ways to implement evidence into everyday clinical practice for AECOPD is imperative. Implementation of a COPD checklist and the resultant adherence conducted amongst respiratory ward staff in Australia had two groups of patient admissions, pre-checklist implementation and post checklist-implementation[19]. Adherence to the checklist used by ward medical staff in the respiratory ward identified a compliance of 51% [17]. Concordance with COPD guideline recommendations was high overall for patient assessment and initial treatment; however, concordance was lower for longer-term issues such as referral to pulmonary rehabilitation programs (36%) [17]. Patients discharged from the emergency department had not been included in this study nor was the interdisciplinary perspective explored. The Asia, Australia and New Zealand dyspnoea in emergency departments (AANZDEM) cohort study was conducted in 46 ED's in Australia, New Zealand, Singapore, Hong Kong and Malaysia to explore epidemiology, clinical features, treatment outcomes, hospital length of stay and in-hospital mortality [9]. Findings of this study identified most acute exacerbation patients with COPD arrive in ED by ambulance, have increased hospitalisations' and significant in-hospital mortality [9]. A planned sub-

study of AANZDEM concluded compliance with COPD evidence based guidelines is suboptimal in ED's and suggested further research is required to improve compliance with care based on published guidelines [20].

COPD exacerbations and their management was explored in an Ireland hospital through a prospective before and after study. Following the education of staff and the implementation of a COPD care bundle, the outcome for 51 consecutive patients was analysed. Bundle of care improved the delivery of care for COPD patients. However, care indicators did not suggest or assess interdisciplinary services (pulmonary rehabilitation, smoking cessation, self-management education, dietician or psychosocial support) [21]. Spirometry and non-invasive ventilation are two other variables identified in the treatment plan by another retrospective audit of frequent patients with COPD presenting in an Australian emergency department [22]. Imperative evidence collectively resulting from these studies have suggested exploring barriers and enablers of holistic COPD assessment and management could be beneficial in providing holistic care options for patients with COPD. Decreased awareness, familiarity, low concordance, sub-optimal primary, secondary and tertiary care provided by health professionals have immensely affected health related quality of life in patients with COPD [12, 17, 20].

COPD is a multimodal disease, where interdisciplinary care holds a pivotal role in reducing COPD exacerbations [23-25]. Current evidence reports doctors, nurses and interdisciplinary health professionals in Australia, do not consistently adhere to COPD guidelines [9, 14, 26, 27]. Bartels, Adamson, Leung, Sin & Eden (2018) postulates from their one-year retrospective study in Canada that patients with COPD discharged from emergency departments have a significantly higher risk of readmission due to variability in treatment as less than 50 % of patients with AECOPD in their study, who presented to ED received recommended COPD therapy [28]. Exploring the barriers and enablers for interdisciplinary team members to provide holistic care as per COPD guidelines (medical, physical, psychological, social, spiritual & palliation) is crucial [20, 29]. Interdisciplinary care has proven to significantly optimise functionality and prevent deterioration in patients with COPD, which subsequently reduces hospital admissions and hospital days per person [17, 23]. Initiation of consistent interdisciplinary health care interventions for patients with COPD will extrude any implementation gap and prevent readmissions [23].

Low concordance is indubitably associated with low awareness of clinical guidelines and role confusion that may subsequently lead to sub-optimal clinical care for patients in primary, secondary and tertiary care (18, 27). According to an observational study in Australia, COPD guidelines developed with detailed processes and plethora of international evidence is not well adhered to, where the study also reports a lack in clinician knowledge nationally and internationally [17]. Globally the results of this review with implementation recommendations will avail interdisciplinary clinicians treating patients with COPD and clinical decision makers. Existence of the guidelines alone do not often aid patients with better health outcomes; hence, exploration of the contributing factors to the already established lack of concordance through this review is in need. Existing evidence and reviews have ascertained that a lack of COPD guideline concordance will increase ED readmissions, imploring the need to better examine contributing factors inhibiting recommended clinical practice.

Implementation research suggest better implementation of guidelines demand interdisciplinary clinical behavioural change in an individual and collective manner[30]. Theoretical Domains

Framework (TDF) had aimed to deliver a comprehensive and theory-informed advanced methodology to help identify fundamentals of non-concordance behaviour among interdisciplinary professional[30]. Integrating theoretical framework will assist cross-disciplinary implementation and research synthesis to create specific recommendations for local, national and international health systems [30, 31]. A preliminary search of the topic showed lack of knowledge, skills, environmental and beliefs of health professionals contribute to lack of concordance. TDF allows researchers to explore, understand and target clinician behaviour change interventions to provide recommendations to improve concordance[32]. This theoretical scaffolding allows identification and accumulation of salient determinants from existing evidence towards lack of COPD guidelines adherence to 14 domains[33]. The fourteen domains according to Cane et al, 2012 are, (1) Knowledge, (2) Skills, (3) Social Influences, (4) Memory, Attention and Decision Processes, (5) Behavioural Regulation, (6) Professional/Social Role and Identity, (7) Beliefs about Capabilities, (8) Belief about Consequences, (9) Optimism, (10) Intentions, (11) Goals, (12) Emotion, (13) Environmental Context and Resources and (14) Reinforcement (see table. 3) [31]. Any determinants that do not fit within the existing domains will be organised into an 'Others' domain.

Framework synthesis of data allows robust filtration of evidence from multiple sources to provide better implementation strategies and clinical behaviour change solutions to COPD guideline concordance [32, 33].TDF was originally developed to identify determinants and influences on health professionals behaviour to inform better implementation efforts [30, 31]. A further benefit of TDF is its linkage to behaviour change techniques (BCT) which may provide an early identification of implementation issues associated with clinician behaviour to recommend intervention designs (see table.1) [30, 31]. This systematic review will identify the contributing factors to the lack of COPD guidelines concordance from the time of admission in the hospital to discharge. Given the scarcity of research in interdisciplinary guidelines concordance with COPD, the proposed mixed method approach will enable all available evidence to be incorporated into the review.

REVIEW QUESTIONS

What core elements of the COPD guidelines are adhered to by interdisciplinary health professionals?

What are the contributing factors to the lack of COPD guideline concordance amongst interdisciplinary health professionals in hospitals?

INCLUSION CRITERIA

Studies and reports published in English including interdisciplinary COPD guidelines concordance, compliance, or adherence in the hospital setting will be utilised for this review. GOLD guidelines and COPD X plan guidelines reviews will be included in this study

Exclusion criteria

Studies not reported in English and studies which had not measured COPD guideline concordance will be excluded from this study. Primary health care and community based COPD guidelines concordance studies will not be included in this study

Population

This review will consider studies that involve doctors, nurses, and allied health reports on COPD guidelines concordance

Context

This review will consider studies that involve doctors, nurses, and allied health reports on COPD guidelines concordance. Data from emergency departments, inpatient hospital units and hospital based rehabilitation will be utilised in this review

Types of studies

This review will consider quantitative, qualitative and mixed methods studies. Quantitative studies will include experimental, quasi experimental and non-experimental studies including descriptive studies, co-relational studies, randomized controlled trials, non-randomized controlled trials, before and after studies and interrupted time-series studies. Mixed method studies will only be considered if data from the quantitative or qualitative components can be clearly extracted. In order to ensure all reports on COPD guidelines are included any studies that mention COPD guidelines concordance, adherence or compliance will be included for potential inclusion. Studies published in English will be included. Studies published from 1997 from nine data bases (COCHRANE, EBSCO HOST, MEDLINE, SCIENCE DIRECT, JBI, SCOPUS, WEB OF SCIENCE, WILEY, DARE) to the present will be included as international guidelines have been in circulation since 1997. In addition, analytical observational studies including prospective and retrospective cohort studies, case-control studies and analytical cross-sectional studies will be considered for inclusion. This review will also consider observational study designs including case series, individual case reports and descriptive cross-sectional studies for inclusion. Studies that focus on qualitative data including, but not limited to, designs such as phenomenology, grounded theory, ethnography, action research and feminist research will also be included for review.

METHODS

The proposed systematic review will be conducted in accordance with the Joanna Briggs Institute methodology for mixed methods systematic reviews and the PRISMA ScR reporting guidelines (See Appendix.1) [34, 35]. A mixed method review provides a comprehensive synthesis compared to a single method review as it combines quantitative and qualitative evidence to assist clinical decision and policy makers to adopt appropriate implementation strategy [36]. A convergent integrative method where quantitative evidence is qualitized to provide a narrative review will deepen better understanding of any discrepancies noted in the evidence[36].

Search strategy

A preliminary search of databases has been undertaken and no existing or ongoing mixed method or individual systematic reviews on the topic have been identified. A comprehensive three tier search will be aimed to locate both published and unpublished studies. An initial search of MEDLINE and CINAHL will commence the review followed by the identification of keywords found in each title and abstract and a match to the subject terms used in articles on the topic. This will enable the development of an extensive full search strategy for a second search in databases (COCHRANE, EBSCO HOST, MEDLINE, SCIENCE DIRECT, JBI, SCOPUS, WEB OF SCIENCE, WILEY, DARE) (See Appendix 2. Electronic search strategy). Reference lists from all included studies will be examined to screen any additional studies relevant to the review question.

Study selection

All identified studies following the search will be collated and retrieved into Endnote Version X8.1 and duplicates will be removed. Covidence systematic review management software will be utilised to assist with further data management [37]. Two independent reviewers will screen Titles and Abstracts in phase one assessment towards the inclusion criteria for the selection of articles. Phase two will include full text screening by two independent reviewers where inclusion and exclusion process is performed. Exclusion of full text studies will be recorded and reported in the systematic review. Authors of papers will be contacted to request missing or additional data for clarification, where required. Disagreements that arise between the reviewers at each stage of the study selection process will be resolved through discussion, or with a third reviewer. The results of the search will be reported in the final review and presented in a Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) flow diagram (See Appendix. 3) [34].

Assessment of methodological quality

Eligible studies will undergo critical appraisal to establish the internal validity and risk of bias by two independent reviewers. Any disputes will be settled through discussion or third reviewer opinion. Specific standardized critical appraisal instruments from JBI SUMARI will be used separately for quantitative studies (including quantitative component of mixed methods studies) and qualitative studies (including qualitative component of mixed methods studies), that are selected for retrieval [36]. Regardless of the methodological quality all studies will undergo extraction and synthesis (where possible)[36]. Critical appraisal results will be appended to the review using ConQual approach in Summary of findings table (SOF) (see Table. 2)[36, 38].

Data extraction

Mixed methods data extraction tool designed for Convergent integrated approach (integration of qualitative data and 'qualitized' data following data transformation) will be utilised to extract data in this study (See Table. 3) [14, 35]. This extraction tool includes type of the study, methodology, number and characteristics of participants, phenomenon to lack of concordance, guideline type, context (cultural and geographic), setting (hospitals, emergency departments and inpatient units), concordance with main recommendations of COPD guideline, implementation method, evaluation and sustainability of implementation, Remissions within 30 days of hospital discharge. Two independent reviewers will extract data from articles and any disagreements will be settled using third reviewer. Applying Computer software program Nvivo V.1236 a second extraction of data and mapping of modifiable determinants of COPD guideline adherence to the domains of the TDF will be performed [30, 31, 39].

Data transformation

Quantitative data will be converted to 'qualitized data' following extraction according to the JBI Convergent Integrated Approach [35, 36]. Quantitative numerical data will be transfigured to textual or narrative interpretations to answer the overarching review question.

Data Synthesis and integration

Extracted data in shape of qualitized textual description from quantitative studies and themes and subthemes from qualitative studies will be collated and categorized in congruence to 14 domains of

theoretical domains framework (See Table.3) [30]. Factors contributing to lack of concordance with the guideline will be integrated based on similarity in meaning. Using TDF will assist in organising literature identified determinants of lack of COPD guidelines concordance. Identified barriers and enablers in guideline uptake will be aligned with standard taxonomy of behavioural change technique to report existing and future recommendations of implementation strategies [32, 33]. This review will adhere to the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) reporting guidelines [34].

Ethics and dissemination

Ethics approval is not required for this study as all data is obtained from publicly available studies. Knowledge and interpretations from this review will provide recommendations towards prominent implementation strategies to increase COPD guideline concordance. Results of this study will be presented before industry stakeholders, interdisciplinary clinicians and appropriate future conferences to develop and assist with implementation initiatives.

Patient and Public Involvement: No patient involved

Funding: No funding has been received for the completion of the review.

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Contributors

HI led the design and conceptualisation of this protocol. CM, MT & JL have made intellectual contributions and worked collaboratively in the development and editing of this protocol. All authors have read and approved the protocol for publication.

CONFLICTS OF INTEREST

There is no conflict of interest in this project.

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Theoretical domains framework for data synthesis

Interdisciplinary Clinical non-concordance behavior	TDF domain	Guidelines uptake barrier	Guidelines uptake Enablers	Behavior change technique	Reported implementation & results
Lack of knowledge of guidelines, scientific rationale	Knowledge				
Lack of skills to care for COPD patients, lack of inter professional communication skills and assessment skills	Skills				
Professional identity, inter professional boundaries, organizational identity	Social/professional role and identity				
Lack of self or confidence in clinical decision making	Beliefs about capabilities				
Clinician and interdisciplinary staff attitude about COPD prognosis	Optimism				

Nihilistic views on causes, prognosis and management of COPD	Beliefs about consequences				
Clinician knowledge utilization and provision	Reinforcement				
lack of awareness, motivation and initiative to change and better care	Intentions				
Lack of goals to improve COPD care	Goals				
Difficulty recalling all treatment and management modality from COPD guidelines	Memory, attention and decision processes				
Lack of cues from COPD Guidelines in workplace	Environmental context and resources				
Lack of clinician and multidisciplinary	Social influences				

team co operation					
Nihilistic views of treating staff (Smoking causes COPD)	Emotion				
Failure to abide COPD guidelines or related quality initiative	Behavioral regulation				

Table.1
Data synthesis table for using theoretical domains framework (Adapted from Cane et al.2012, Atkins et al. 2017)

CONQual Summary of Findings Table

Systematic review title: **Population:** **Phenomena of interest:** **Context:**					
Synthesised Finding	**Type of research**	**Dependability**	**Credibility**	**ConQual Score**	**Comments**
Insert each synthesized finding, and complete the columns per synthesized finding					

Table.2

Summary of findings table to depict assessment of methodological quality of eligible studies. (Adapted from Aromataris et al. 2017; Munn et al. 2014)

Data extraction table for Convergent Integrated approach mixed methods systematic review

Domain / Subdomain	Description
Reviewer name: Date :	Name of reviewer and date of review
Authors	Authors of article
Journal Year, number, record	Name of journal and its details
Type of study & Aims	(Quantitative, Qualitative, Mixed) Aims and objectives of the selected study
Geographical and cultural context	Country of study
Methodology & results	Study design Results of study Recommendations from the study Future research recommendations
Number and characteristics of participants	(Clinicians, nurses, allied health)
Phenomenon to lack of concordance (barriers and enablers)	TDF domains: (1) lack of knowledge of COPD X guidelines (2) Lack of skills caring for COPD patients (3) Social Influences, (4) Memory, Attention and Decision Processes, (5) Behavioural Regulation, (6) Professional/Social Role and Identity, (7) Beliefs about Capabilities, (8) Belief about Consequences, (9) Optimism, (10) Intentions, (11) Goals, (12) Emotion, (13) Environmental Context and Resources and (14) Reinforcement (see table. 3)
Guideline type	GOLD, COPD X plan
Context and setting	Acute care, ED, Inpatient care
COPD guidelines recommendations adherence	Studies reporting on Spirometry, Non-pharmacological and pharmacological, Pulmonary rehabilitation, Short- and long-acting inhaled bronchodilators, anti-inflammatory agents, inhaled corticosteroids use, inhaler technique and adherence ,Smoking cessation, influenza and pneumococcal vaccinations, COPD action, Exacerbations promptly with bronchodilators, corticosteroids and antibiotics, co morbidities identification and management, palliative and end-of-life care, Self-management education and primary and tertiary partnership care
Implementation method (ED and inpatient units)	Clinical pathways, proformas, bundle of care
Evaluation of implementation	Audits, reviews, reports
Readmissions, remissions or exacerbation within 30 days	Remission or readmission of disease due to inadequate care or discharge planning

Implications of guidelines	Implications of guideline in healthcare setting, patients and interdisciplinary staff
Sustainability measures	Frequency of audits, educational sessions, staff recruitment, change champions
Authors conclusion	Study conclusion by the author
Reviewer comments	Study conclusion and comments by reviewer

Table.3

Data Extraction table for convergent integrated approach mixed methods systematic review (Adapted from Lizarando et al. 2017)

APPENDIX.1

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	Page
ADMINISTRATIVE INFORMATION			
Title:			
Identification	1a	Identify the report as a protocol of a systematic review	2
Update	1b	If the protocol is for an update of a previous systematic review, identify as such	NA
Registration	2	If registered, provide the name of the registry (such as PROSPERO) and registration number	Application submitted. Non UK protocols take longer period for review. PROSPERO team advised to progress to peer review. Copy of email added in supplementary file to editors
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	9
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	Recommended revisions requested by reviewers See response to reviewers document

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	
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	2
Objectives	7	Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)	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	5,7
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	6
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	6 Supplemental File Appendix 2
Study records:			
Data management	11a	Describe the mechanism(s) that will be used to manage records and data throughout the review	7
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)	6,7
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	7, 8,15
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	7, 8
Outcomes and prioritization	13	List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale	14
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	7,14
Data synthesis	15a	Describe criteria under which study data will be quantitatively synthesised	7

			Data transformation will occur to qualitize quantitative data)
	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)	NA
	15c	Describe any proposed additional analyses (such as sensitivity or subgroup analyses, meta-regression)	NA
	15d	If quantitative synthesis is not appropriate, describe the type of summary planned	7, 12,13,14
Meta-bias(es)	16	Specify any planned assessment of meta-bias(es) (such as publication bias across studies, selective reporting within studies)	NA
Confidence in cumulative evidence	17	Describe how the strength of the body of evidence will be assessed (such as GRADE)	14 CONQual scoring will be used to grade studies

*** 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.

Appendix 2. Electronic search strategy

MEDLINE SEARCH STRATEGY

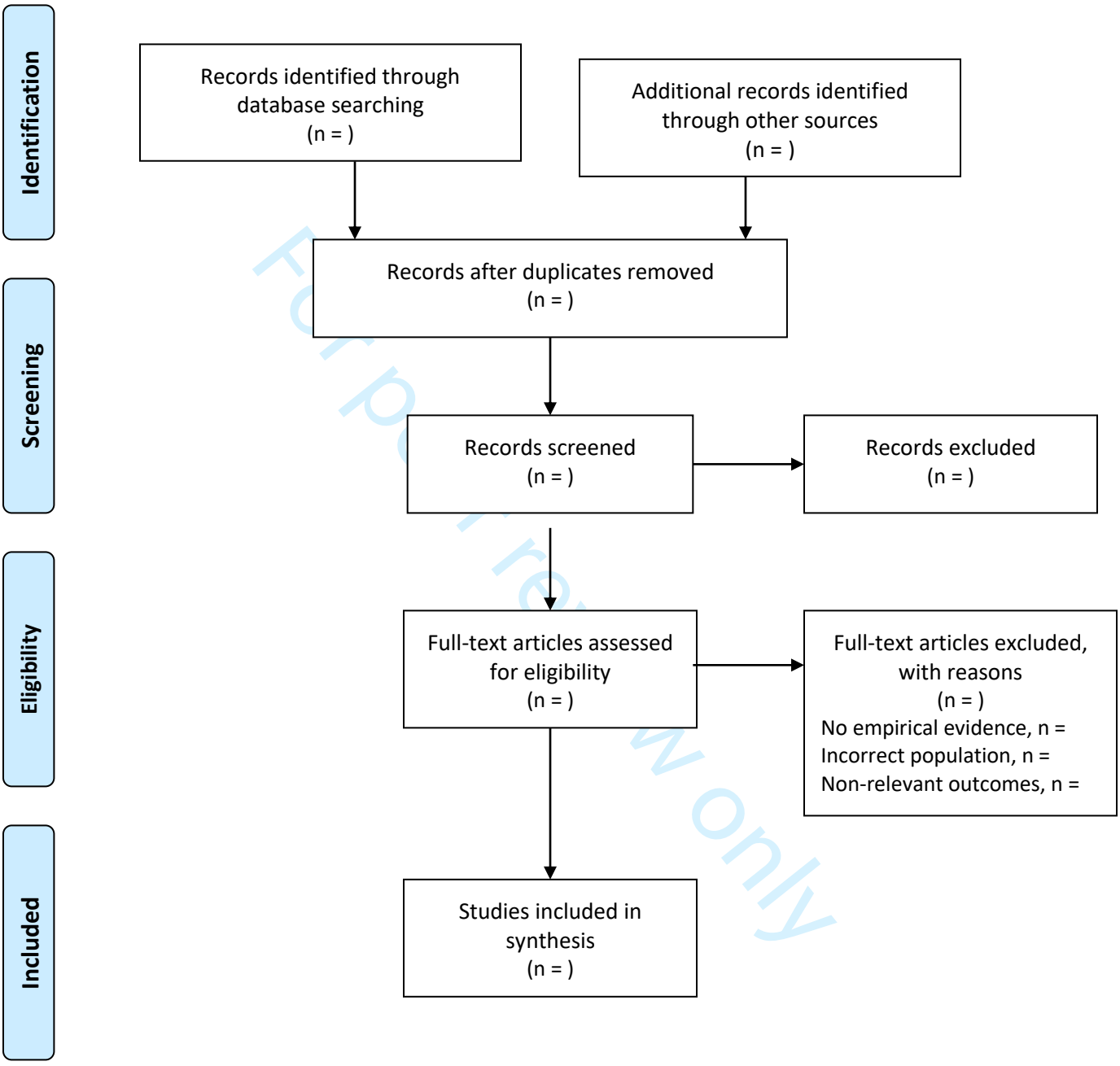
(("COPD guidelines"[All Fields] OR (Chronic[All Fields] AND obstructive[All Fields] AND ("lung diseases"[MeSH Terms] OR ("lung"[All Fields] AND "diseases"[All Fields]) OR "lung diseases"[All Fields] OR ("pulmonary"[All Fields] AND "disorder"[All Fields]) OR "pulmonary disorder"[All Fields]) AND ("guideline"[Publication Type] OR "guidelines as topic"[MeSH Terms] OR "guidelines"[All Fields])))) AND (Concordance[All Fields] OR ("patient compliance"[MeSH Terms] OR ("patient"[All Fields] AND "compliance"[All Fields]) OR "patient compliance"[All Fields] OR "compliance"[All Fields] OR "compliance"[MeSH Terms]) OR Adherence[All Fields] OR barriers[All Fields] OR enablers[All Fields]))

Search Actions Details	Query	Results	Time
#5			
Search: **(((“COPD guidelines” OR “Chronic obstructive pulmonary disorder guidelines”)) AND (Concordance OR Compliance OR Adherence OR barriers OR enablers))** Filters: **English**		590	09:58:35

CINAHL SEARCH STRATEGY

#	Query	Limiters/Expanders	Last Run Via	Results
S1	(“COPD guidelines” OR “Chronic obstructive pulmonary disorder guidelines”) AND (Concordance OR Compliance OR Adherence OR barriers OR enablers)	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text	14

Appendix 3. PRISMA FLOW DIAGRAM



PRISMA Schematic tabular of review of search

Flow diagram illustrates the phases of article selection, Title and abstracts screening for initial eligibility, Eligible Full text articles in consonance to inclusion criteria, Studies included in data extraction and synthesis (Adapted from Moher et al. 2009) (34)

BMJ Open

Mapping of modifiable barriers and facilitators with interdisciplinary chronic obstructive pulmonary disease (COPD) guidelines concordance within hospitals to the Theoretical Domains Framework: a mixed method systematic review protocol

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2019-036060.R2
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Primary Subject Heading:	Respiratory medicine
Secondary Subject Heading:	Health services research
Keywords:	Protocols & guidelines < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, Chronic airways disease < THORACIC MEDICINE, Emphysema < THORACIC MEDICINE, Quality in health care < HEALTH SERVICES ADMINISTRATION & MANAGEMENT

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Mapping of modifiable barriers and facilitators with interdisciplinary chronic obstructive pulmonary disease (COPD) guidelines concordance within hospitals to the Theoretical Domains Framework: a mixed method systematic review protocol

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Word count – 3436

Abstract

Introduction

Multifarious COPD guidelines have been published by local, national and global respiratory societies. These guidelines subsume holistic evidence based on recommendations to diagnose, treat, prevent and manage acute exacerbation with COPD. Despite the existing comprehensive recommendations, readmission rates and hospitalisations have increased in the last decade. Evidence to date has reported suboptimal clinical guidelines concordance. Acute exacerbations of COPD (AECOPD) is a common hospital presentation due to varied causes such as infective exacerbations, worsening disease condition, medication non-adherence, lack of education and incomprehensive discharge planning. AECOPD directly and indirectly causes economic burden, disrupts health related quality of life (HRQol), hasten lung function decline and increases overall morbidity and mortality. COPD being a multi-modal chronic disease, consistent interdisciplinary interventions from the time of admission to discharge may reduce re-admissions and enhance HRQol amongst these patients and their families.

Methods and analysis

This protocol adheres to the Joanna Briggs Institute methodology for mixed methods systematic reviews and the PRISMA ScR reporting guidelines. Qualitative, quantitative and mixed method studies will append this study to explore determinants of COPD guidelines concordance. Comprehensive three-tier search strategies will be utilised to search nine databases (COCHRANE, EBSCO HOST, MEDLINE, SCIENCE DIRECT, JBI, SCOPUS, WEB OF SCIENCE, WILEY, DARE) in May 2020. Two independent reviewers will screen abstracts and full text articles in consonance with inclusion criteria. The convergent integrative method narrative review will contribute a deeper understanding of any discrepancies found in existing evidence. Quality of the studies will be reported and theoretical domains framework (TDF) will be utilised as a priori to synthesis data. Identified barriers, facilitators and corresponding clinical behavioural change solutions will be categorised using TDF indicators to provide future research and implementation recommendations.

Ethics and dissemination

Ethical approval is not required and results dissemination will occur through peer-reviewed publication.

Article Summary

Strengths and limitations of this study

• First systematic review to explore barriers within interdisciplinary clinical practice and concordance with global COPD guidelines.

• Theoretical Domains Framework (TDF) utilisation facilitates understanding of existing barriers and probable clinical behaviour change solutions to improve concordance.

• Interdisciplinary perspective to improve collaboration and concordance may lead to multifaceted implementation strategies.

• Paucity of existing good quality data and reporting may confine our ability to report true barriers of lack of concordance.

KEYWORDS

COPD guidelines; chronic obstructive pulmonary disease guidelines; Concordance; Compliance; adherence

Background

COPD is a preventable, treatable, irreversible lung disease characterized by chronic airflow obstruction that impedes a normal breathing pattern [1, 2]. COPD, being a debilitating multisystem disease often leads to a steady decline, in terms of illness trajectory and heavily impacts health-related quality of life [3, 4]. The World Health Organisation has predicted COPD to become the third leading cause of death by 2030 considering its increase in prevalence and morbidity rate [5, 6]. COPD is the second leading cause of preventable hospitalisation in Australia and accounted for more than two by third of global respiratory fatal incidences [7, 8]. Australasian research reports, 5% of all emergency department presentations included shortness of breath and 14% of these presentations were COPD [9]. Acute exacerbation of chronic obstructive pulmonary disease (AECOPD) is defined as acute variation in patient's stable state with both respiratory and non-respiratory symptoms that demand medication changes or hospitalisation [10].

Exacerbation episodes have a significant and prolonged impact on health status, health-related quality of life, patient outcomes, and the negative effects on pulmonary function decline [10]. AECOPD is a common hospital presentation due to a variety of causes such as infective exacerbations, worsening disease condition, medication non-adherence, inefficient care planning, lack of education, and discharge without comprehensive support plan [9]. AECOPD, directly and indirectly, are associated with an increased economic burden to the health industry by hastening lung function decline, negatively affecting patients and families and increasing overall morbidity and mortality [6]. Major causal factors of exacerbations includes smoking, environmental and genetic factors, airway hyperactivity, chronic bronchitis and infection [1]. Breathlessness, reduced activity level, malnutrition, social isolation, loss of independence, reduced health related quality of life and depression are some of the issues these patients tackle in their daily lives [11]. COPD is a multi-modal chronic disease that requires consistent interdisciplinary interventions from admission to discharge. The importance of the care and interventions provided in the hospitals may reduce readmissions and enhance health related quality of life in these patients and their families [12].

The primary intent of publishing COPD guidelines was to facilitate an anticipated shift from the predominant emphasis of pharmacological treatment to a more holistic multi-disciplinary intervention approach (14). The Global Initiative for Chronic Obstructive Lung Disease (GOLD), originally launched and developed by international leading experts in 1997 aims to improve health related quality of life and medical management around the globe [1]. COPD X plan guidelines, originally derived from GOLD, published in 2003 by Thoracic Society of Australia and New Zealand (TSANZ) and the Lung Foundation Australia (LFA) aim to promote consistent evidence based changes in clinical practice [13]. A range of interventions recommended through the published COPD guidelines such as pulmonary rehabilitation, smoking cessation, self-management of exacerbations, palliative care, psychological support, or counselling for patients and families has proven to improve health related quality of life factors in patients with COPD [14]. Advances in the management of COPD is updated quarterly in the national COPD guidelines by LFA and TSANZ [14]. The prime emphasis of these guidelines is around accurate case diagnosis, functional optimisation, preventing deterioration, developing a plan of care and managing exacerbation [13]. Despite the existing comprehensive recommendations, readmission rates and hospitalisations have increased in the last decade [11, 12].

The publication of global initiative for chronic obstructive lung disease (GOLD) and national clinical practice guidelines (COPD- X plan) is only the first step in a process that ends with an actual change in clinician behaviour, hence effective guideline dissemination methods cannot be overlooked [15]. An Australian retrospective observational study conducted on 381 patients explored compliance with a patients COPD bundle of care, the results revealed 49% adherence to the established plan. This study suggested further research is required to improve guidelines and adherence plans for patients with COPD [16]. A qualitative Australian study, using semi-structured interviews of nine hospital-based registrars or interns, and seven GPs found that barriers to implementation of evidence-based recommendations for COPD plans included a lack of supportive enablers and a complexity of the behavioural change needed in patients [17, 18]. An identified barrier was the lack of guidelines in a readily, user-friendly, and easily accessible manner with checkpoints, cues, and time intervals of when they are required at point-of-care [17]. The studies suggest that improvement in guideline adherence can be translated into improved patient care and health-related quality of life (Hrqol) in COPD patients.

Prospective research in knowledge translation and effective ways to implement evidence into everyday clinical practice for AECOPD is imperative. Implementation of a COPD checklist and the resultant adherence conducted amongst respiratory ward staff in Australia had two groups of patient admissions, pre-checklist implementation and post-checklist-implementation [19]. Adherence to the checklist used by ward medical staff in the respiratory ward identified a compliance of 51% [17]. Concordance with COPD guideline recommendations was high overall for patient assessment and initial treatment; however, concordance was lower for longer-term issues such as referral to pulmonary rehabilitation programs (36%) [17]. Patients discharged from the emergency department had not been included in this study nor was the interdisciplinary perspective explored. The Asia, Australia and New Zealand dyspnoea in emergency departments (AANZDEM) cohort study was conducted in 46 ED's in Australia, New Zealand, Singapore, Hong Kong and Malaysia to explore epidemiology, clinical features, treatment outcomes, hospital length of stay and in-hospital mortality [9]. The findings of this study identified most acute exacerbation patients with COPD arrive in the ED by ambulance, have increased hospitalisations' and significant in-hospital mortality [9]. A planned sub-study of AANZDEM concluded compliance with COPD evidence based guidelines is suboptimal in ED's and suggested further research is required to improve compliance with care based on published guidelines [20].

COPD exacerbations and their management were explored in an Ireland hospital through a prospective before and after study. Following the education of staff and the implementation of a COPD care bundle, the outcome for 51 consecutive patients was analysed. Bundle of care improved the delivery of care for COPD patients. However, care indicators did not suggest or assess interdisciplinary services (pulmonary rehabilitation, smoking cessation, self-management education, dietician, or psychosocial support) [21]. Spirometry and non-invasive ventilation are two other variables identified in the treatment plan by another retrospective audit of frequent patients with COPD presenting in an Australian emergency department [22]. Imperative evidence collectively resulting from these studies have suggested exploring barriers and enablers of holistic COPD assessment and management could be beneficial in providing holistic care options for patients with COPD. Decreased awareness, familiarity, low concordance, sub-optimal primary, secondary and tertiary care provided by health professionals have immensely affected health related quality of life in patients with COPD [12, 17,20].

COPD is a multimodal disease, where interdisciplinary care holds a pivotal role in reducing COPD exacerbations [23-25]. Current evidence reports doctors, nurses and interdisciplinary health professionals in Australia, do not consistently adhere to COPD guidelines [9, 14, 26, 27]. Bartels, Adamson, Leung, Sin & Eden (2018) postulates from their one-year retrospective study in Canada that patients with COPD discharged from emergency departments have a significantly higher risk of readmission due to variability in treatment as less than 50 % of patients with AECOPD in their study, who presented to ED received recommended COPD therapy [28]. Exploring the barriers and enablers for interdisciplinary team members to provide holistic care as per COPD guidelines (medical, physical, psychological, social, spiritual & palliation) is crucial [20, 29]. Interdisciplinary care has proven to significantly optimise functionality and prevent deterioration in patients with COPD, which subsequently reduces hospital admissions and hospital days per person [17, 23]. Initiation of consistent interdisciplinary health care interventions for patients with COPD will extrude any implementation gap and prevent readmissions [23].

Low concordance is indubitably associated with low awareness of clinical guidelines and role confusion that may subsequently lead to sub-optimal clinical care for patients in primary, secondary, and tertiary care (18, 27). According to an observational study in Australia, COPD guidelines developed with detailed processes and a plethora of international evidence are not well adhered to, where the study also reports a lack of clinician knowledge nationally and internationally [17]. Globally the results of this review with implementation recommendations will avail interdisciplinary clinicians treating patients with COPD and clinical decision makers. Existence of the guidelines alone do not often aid patients with better health outcomes; hence, exploration of the contributing factors to the already established lack of concordance through this review is in need. Existing evidence and reviews have ascertained that a lack of COPD guideline concordance will increase ED readmissions, imploring the need to better examine contributing factors inhibiting recommended clinical practice.

Implementation research suggest better implementation of guidelines demand interdisciplinary clinical behavioural change in an individual and collective manner [30]. Theoretical Domains Framework (TDF) had aimed to deliver a comprehensive and theory-informed advanced methodology to help identify the fundamentals of non-concordance behaviour among interdisciplinary professional [30]. Integrating theoretical framework will assist cross-disciplinary implementation and research synthesis to create specific recommendations for local, national, and international health systems [30, 31]. A preliminary search of the topic showed a lack of knowledge, skills, environmental, and beliefs of health professionals contribute to lack of concordance. TDF allows researchers to explore, understand and target clinician behaviour change interventions to

provide recommendations to improve concordance [32]. This theoretical scaffolding allows identification and accumulation of salient determinants from existing evidence towards a lack of COPD guidelines adherence to 14 domains [33]. The fourteen domains according to Cane et al, 2012 are, (1) Knowledge, (2) Skills, (3) Social Influences, (4) Memory, Attention and Decision Processes, (5) Behavioural Regulation, (6) Professional/Social Role and Identity, (7) Beliefs about Capabilities, (8) Belief about Consequences, (9) Optimism, (10) Intentions, (11) Goals, (12) Emotion, (13) Environmental Context and Resources and (14) Reinforcement (see table. 1) [31]. Any determinants that do not fit within the existing domains will be organised into an 'Others' domain.

Framework synthesis of data allows robust filtration of evidence from multiple sources to provide better implementation strategies and clinical behaviour change solutions to COPD guideline concordance [32, 33].TDF was originally developed to identify determinants and influences on health professionals behaviour to inform better implementation efforts [30, 31]. A further benefit of TDF is its linkage to behaviour change techniques (BCT) which may provide an early identification of implementation issues associated with clinician behaviour to recommend intervention designs (see table.1) [30, 31]. This systematic review will identify the contributing factors to the lack of COPD guidelines concordance from the time of admission in the hospital to discharge. Given the scarcity of research in interdisciplinary guidelines concordance with COPD, the proposed mixed method approach will enable all available evidence to be incorporated into the review.

Review questions

What core elements of the COPD guidelines are adhered to by interdisciplinary health professionals?

What are the contributing factors to the lack of COPD guideline concordance amongst interdisciplinary health professionals in hospitals?

Inclusion criteria

Studies and reports published in English including interdisciplinary COPD guidelines concordance, compliance, or adherence in the hospital setting will be utilised for this review. GOLD guidelines and COPD X plan guidelines reviews will be included in this study

Exclusion criteria

Studies not reported in English and studies which had not measured COPD guideline concordance will be excluded from this study. Primary health care and community based COPD guidelines concordance studies will not be included in this study

Population

This review will consider studies that involve doctors, nurses, and allied health reports on COPD guidelines concordance

Context

This review will consider studies that involve doctors, nurses, and allied health reports on COPD guidelines concordance. Data from emergency departments, inpatient hospital units, and hospital based rehabilitation will be utilised in this review

Types of studies

This review will consider quantitative, qualitative, and mixed methods studies. Quantitative studies will include experimental, quasi-experimental, and non-experimental studies including descriptive studies, co-relational studies, randomized controlled trials, non-randomized controlled trials, before and after studies, and interrupted time-series studies. Mixed method studies will only be considered if data from the quantitative or qualitative components can be extracted. In order to ensure all reports on COPD guidelines are included any studies that mention COPD guidelines concordance, adherence or compliance will be included for potential inclusion. Studies published in English will be included. Studies published from 1997 from nine databases (COCHRANE, EBSCO HOST, MEDLINE, SCIENCE DIRECT, JBI, SCOPUS, WEB OF SCIENCE, WILEY, DARE) to the present will be included as international guidelines have been in circulation since 1997. In addition, analytical observational studies including prospective and retrospective cohort studies, case-control studies, and analytical cross-sectional studies will be considered for inclusion. This review will also consider observational study designs including case series, individual case reports, and descriptive cross-sectional studies for inclusion. Studies that focus on qualitative data including, but not limited to, designs such as phenomenology, grounded theory, ethnography, action research, and feminist research will also be included for review.

Methods

The proposed systematic review will be conducted in accordance with the Joanna Briggs Institute methodology for mixed-methods systematic reviews and the PRISMA ScR reporting guidelines (See Appendix.1) [34, 35]. A mixed-method review provides a comprehensive synthesis compared to a single method review as it combines quantitative and qualitative evidence to assist clinical decision and policymakers to adopt an appropriate implementation strategy [36]. A convergent integrative method where quantitative evidence is qualitized to provide a narrative review will deepen a better understanding of any discrepancies noted in the evidence [36].

Search strategy

A preliminary search of databases has been undertaken and no existing or ongoing mixed method or individual systematic reviews on the topic have been identified in November 2019. A comprehensive three-tier search will be aimed to locate both published and unpublished studies in May 2020. An initial search of MEDLINE and CINAHL will commence the review followed by the identification of keywords found in each title and abstract and a match to the subject terms used in articles on the topic. This will enable the development of an extensive full search strategy for a second search in databases (COCHRANE, EBSCO HOST, MEDLINE, SCIENCE DIRECT, JBI, SCOPUS, WEB OF SCIENCE, WILEY, DARE) (See Appendix 2. Electronic search strategy). Reference lists from all included studies will be examined to screen any additional studies relevant to the review question.

Study selection

All identified studies following the search will be collated and retrieved into Endnote Version X8.1 and duplicates will be removed. Covidence systematic review management software will be utilised to assist with further data management [37]. Two independent reviewers will screen Titles and Abstracts in phase one assessment towards the inclusion criteria for the selection of articles. Phase two will include full text screening by two independent reviewers where the inclusion and exclusion process is performed. Exclusion of full text studies will be recorded and reported in the systematic review. Authors of papers will be contacted to request missing or additional data for clarification, where required. Disagreements that arise between the reviewers at each stage of the study

selection process will be resolved through discussion, or with a third reviewer. The results of the search will be reported in the final review and presented in a Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) flow diagram (See Appendix. 3) [34].

Assessment of methodological quality

Eligible studies will undergo critical appraisal to establish the internal validity and risk of bias by two independent reviewers. Any disputes will be settled through discussion or third reviewer opinion. Specific standardized critical appraisal instruments from JBI SUMARI will be used separately for quantitative studies (including the quantitative component of mixed methods studies) and qualitative studies (including qualitative component of mixed methods studies), that are selected for retrieval [36]. Regardless of the methodological quality all studies will undergo extraction and synthesis (where possible) [36]. Critical appraisal results will be appended to the review using ConQual approach in the Summary of findings table (SOF) (see Table. 2) [36, 38].

Data extraction

Mixed methods data extraction tool designed for Convergent integrated approach (integration of qualitative data and 'qualitized' data following data transformation) will be utilised to extract data in this study (See Table. 3) [14, 35]. This extraction tool includes the type of the study, methodology, number and characteristics of participants, phenomenon to lack of concordance, guideline type, context (cultural and geographic), setting (hospitals, emergency departments and inpatient units), concordance with main recommendations of COPD guideline, implementation method, evaluation and sustainability of implementation, Remissions within 30 days of hospital discharge. Two independent reviewers will extract data from articles and any disagreements will be settled using the third reviewer. Applying Computer software program Nvivo V.1236 a second extraction of data and mapping of modifiable determinants of COPD guideline adherence to the domains of the TDF will be performed [30, 31, 39].

Data transformation

Quantitative data will be converted to 'qualitized data' following extraction according to the JBI Convergent Integrated Approach [35, 36]. Quantitative numerical data will be transfigured to textual or narrative interpretations to answer the overarching review question.

Data Synthesis and integration

Extracted data in shape of qualitized textual description from quantitative studies and themes and subthemes from qualitative studies will be collated and categorized in congruence to 14 domains of theoretical domains framework (See Table.3) [30]. Factors contributing to the lack of concordance with the guideline will be integrated based on similarity in meaning. Using TDF will assist in organising literature identified determinants of lack of COPD guidelines concordance. Identified barriers and enablers in guideline uptake will be aligned with standard taxonomy of behavioural change technique to report existing and future recommendations of implementation strategies [32, 33]. This review will adhere to the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) reporting guidelines [34].

Ethics and dissemination

Ethics approval is not required for this study as all data is obtained from publicly available studies. Knowledge and interpretations from this review will provide recommendations towards prominent implementation strategies to increase COPD guideline concordance. The results of this study will be

presented before industry stakeholders, interdisciplinary clinicians, and appropriate future conferences to develop and assist with implementation initiatives.

Patient and Public Involvement: No patient involved

Funding: No funding has been received for the completion of the review.

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Contributors

HI led the design and conceptualisation of this protocol. CM, MT & JL have made intellectual contributions and worked collaboratively in the development and editing of this protocol. All authors have read and approved the protocol for publication.

Conflicts of interest

There is no conflict of interest in this project.

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Theoretical domains framework for data synthesis

Interdisciplinary Clinical non-concordance behavior	TDF domain	Guidelines uptake barrier	Guidelines uptake Enablers	Behavior change technique	Reported implementation & results
Lack of knowledge of guidelines, scientific rationale	Knowledge				
Lack of skills to care for COPD patients, lack of inter professional communication skills and assessment skills	Skills				
Professional identity, inter professional boundaries, organizational identity	Social/professional role and identity				
Lack of self or confidence in clinical decision making	Beliefs about capabilities				
Clinician and interdisciplinary staff attitude about COPD prognosis	Optimism				

Nihilistic views on causes, prognosis and management of COPD	Beliefs about consequences				
Clinician knowledge utilization and provision	Reinforcement				
lack of awareness, motivation and initiative to change and better care	Intentions				
Lack of goals to improve COPD care	Goals				
Difficulty recalling all treatment and management modality from COPD guidelines	Memory, attention and decision processes				
Lack of cues from COPD Guidelines in workplace	Environmental context and resources				
Lack of clinician and	Social influences				

multidisciplinary team co operation					
Nihilistic views of treating staff (Smoking causes COPD)	Emotion				
Failure to abide COPD guidelines or related quality initiative	Behavioral regulation				

Table.1
Data synthesis table for using theoretical domains framework (Adapted from Cane et al.2012, Atkins et al. 2017)

Data extraction table for Convergent Integrated approach mixed methods systematic review

Domain / Subdomain	Description
Reviewer name: Date :	Name of reviewer and date of review
Authors	Authors of article
Journal Year, number, record	Name of journal and its details
Type of study & Aims	(Quantitative, Qualitative, Mixed) Aims and objectives of the selected study
Geographical and cultural context	Country of study
Methodology & results	Study design Results of study Recommendations from the study Future research recommendations
Number and characteristics of participants	(Clinicians, nurses, allied health)
Phenomenon to lack of concordance (barriers and enablers)	TDF domains: (1) lack of knowledge of COPD X guidelines (2) Lack of skills caring for COPD patients (3) Social Influences, (4) Memory, Attention and Decision Processes, (5) Behavioural Regulation, (6)

CONQual Summary of Findings Table

Systematic review title:
Population:
Phenomena of interest:
Context:

Synthesised Finding	Type of research	Dependability	Credibility	ConQual Score	Comments
Insert each synthesized finding, and complete the columns per synthesized finding					

Table.2

Summary of findings table to depict assessment of methodological quality of eligible studies. (Adapted from Aromataris et al. 2017; Munn et al. 2014)

	Professional/Social Role and Identity, (7) Beliefs about Capabilities, (8) Belief about Consequences, (9) Optimism, (10) Intentions, (11) Goals, (12) Emotion, (13) Environmental Context and Resources and (14) Reinforcement (see table. 3)
Guideline type	GOLD, COPD X plan
Context and setting	Acute care, ED, Inpatient care
COPD guidelines recommendations adherence	Studies reporting on Spirometry, Non-pharmacological and pharmacological, Pulmonary rehabilitation, Short- and long-acting inhaled bronchodilators, anti-inflammatory agents, inhaled corticosteroids use, inhaler technique and adherence ,Smoking cessation, influenza and pneumococcal vaccinations, COPD action, Exacerbations promptly with bronchodilators, corticosteroids and antibiotics, co morbidities identification and management, palliative and end-of-life care, Self-management education and primary and tertiary partnership care
Implementation method (ED and inpatient units)	Clinical pathways, Proforma, bundle of care
Evaluation of implementation	Audits, reviews, reports
Readmissions, remissions or exacerbation within 30 days	Remission or readmission of disease due to inadequate care or discharge planning
Implications of guidelines	Implications of guideline in healthcare setting, patients and interdisciplinary staff
Sustainability measures	Frequency of audits, educational sessions, staff recruitment, change champions
Authors conclusion	Study conclusion by the author
Reviewer comments	Study conclusion and comments by reviewer

Table.3

Data Extraction table for convergent integrated approach mixed methods systematic review (Adapted from Lizarando et al. 2017)

APPENDIX.1

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	Page
ADMINISTRATIVE INFORMATION			
Title:			
Identification	1a	Identify the report as a protocol of a systematic review	2
Update	1b	If the protocol is for an update of a previous systematic review, identify as such	NA
Registration	2	If registered, provide the name of the registry (such as PROSPERO) and registration number	Application submitted. Non UK protocols take longer period for review. PROSPERO team advised to progress to peer review. Copy of email added in supplementary file to editors
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	9
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	Recommended revisions requested by reviewers See response to reviewers document

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	
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	2
Objectives	7	Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)	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	5,7
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	6
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	6 Supplemental File Appendix 2
Study records:			
Data management	11a	Describe the mechanism(s) that will be used to manage records and data throughout the review	7
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)	6,7
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	7, 8,15
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	7, 8
Outcomes and prioritization	13	List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale	14
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	7,14
Data synthesis	15a	Describe criteria under which study data will be quantitatively synthesised	7

			Data transformation will occur to qualitize quantitative data)
	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)	NA
	15c	Describe any proposed additional analyses (such as sensitivity or subgroup analyses, meta-regression)	NA
	15d	If quantitative synthesis is not appropriate, describe the type of summary planned	7, 12,13,14
Meta-bias(es)	16	Specify any planned assessment of meta-bias(es) (such as publication bias across studies, selective reporting within studies)	NA
Confidence in cumulative evidence	17	Describe how the strength of the body of evidence will be assessed (such as GRADE)	14 CONQual scoring will be used to grade studies

*** 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.

Appendix 2. Electronic search strategy

MEDLINE SEARCH STRATEGY

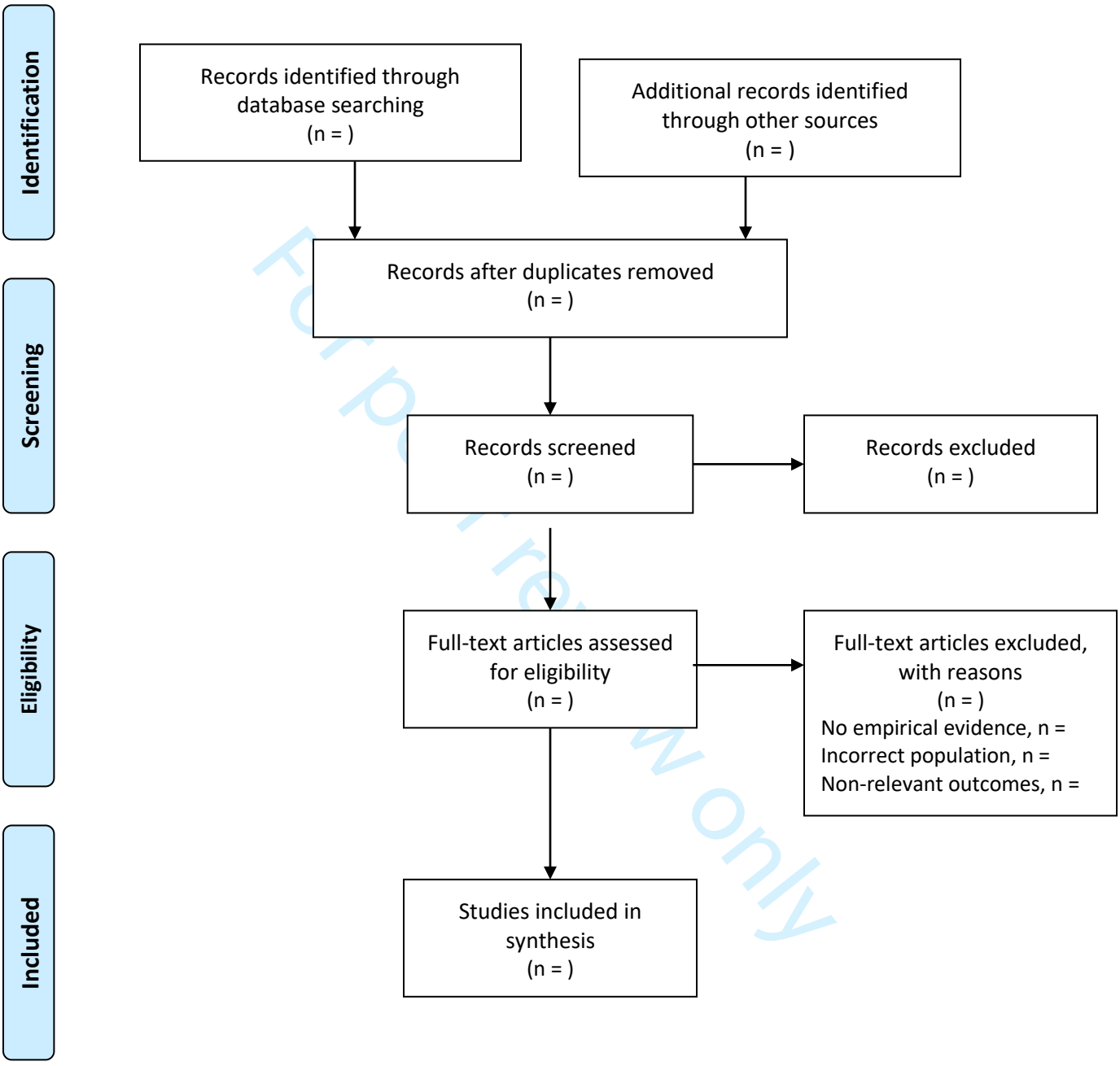
(("COPD guidelines"[All Fields] OR (Chronic[All Fields] AND obstructive[All Fields] AND ("lung diseases"[MeSH Terms] OR ("lung"[All Fields] AND "diseases"[All Fields]) OR "lung diseases"[All Fields] OR ("pulmonary"[All Fields] AND "disorder"[All Fields]) OR "pulmonary disorder"[All Fields]) AND ("guideline"[Publication Type] OR "guidelines as topic"[MeSH Terms] OR "guidelines"[All Fields])))) AND (Concordance[All Fields] OR ("patient compliance"[MeSH Terms] OR ("patient"[All Fields] AND "compliance"[All Fields]) OR "patient compliance"[All Fields] OR "compliance"[All Fields] OR "compliance"[MeSH Terms]) OR Adherence[All Fields] OR barriers[All Fields] OR enablers[All Fields]))

Search	Actions	Details	Query	Results	Time
#5			Search: **(((“COPD guidelines” OR “Chronic obstructive pulmonary disorder guidelines”)) AND (Concordance OR Compliance OR Adherence OR barriers OR enablers))** Filters: **English**	590	09:58:35

CINAHL SEARCH STRATEGY

#	Query	Limiters/Expanders	Last Run Via	Results
S1	(“COPD guidelines” OR “Chronic obstructive pulmonary disorder guidelines”) AND (Concordance OR Compliance OR Adherence OR barriers OR enablers)	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text	14

Appendix 3. PRISMA FLOW DIAGRAM



PRISMA Schematic tabular of review of search

Flow diagram illustrates the phases of article selection, Title and abstracts screening for initial eligibility, Eligible Full text articles in consonance to inclusion criteria, Studies included in data extraction and synthesis (Adapted from Moher et al. 2009) (34)