Characterizing nurses' and pharmacists' role in addressing vaccine hesitancy and/or refusal: A scoping review protocol

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Funding
This study was funded by Dalhousie University's Nursing Research & Development Fund.

Abstract

Background Nurses and pharmacists are key in addressing vaccine hesitancy among patients. Little is known regarding the implementation of effective intervention into their practice, this has further implications with a need for a COVID-19 vaccine to have long-term control of the virus. The purpose of this study is to identify, characterize, and map the existing knowledge of nurses and pharmacists on vaccine hesitancy interventions/strategies and their perceived barriers and enablers to addressing vaccine hesitancy among patients.
Methods Our review will follow the Joanna Briggs Institute methodology for scoping reviews. We will include both published and unpublished grey literature and search the following databases from: MEDLINE, CINAHL, EMBASE, Web of Science, PsycInfo, ProQuest Dissertations & Theses Global databases, Google Scholar, and websites from professional bodies and other organizations. Two reviewers will independently screen and extract relevant sources with a third reviewer to resolve any discrepancies. We will narratively describe quantitative data and conduct a thematic analysis of qualitative data.
Presentation of results Data on barriers/enablers and strategies/interventions will be analyzed using the Behaviour Change Wheel (BCW). Extracted data will be presented in a tabular form that aligns with the objectives. Two reviewers will conduct the data classification using a pre-defined coding manual based on definitions and guidance from the BCW.
Ethics and Dissemination No ethical approval is required for this study. We will share the results in a peer-reviewed, open access publication. Data will be publicly available data repository located at Dalhousie University.

Keywords: Vaccine Hesitancy, Nurses, Pharmacists, Immunization, Barriers, Enablers, Behaviour Change Wheel

Strengths and Limitations

- This scoping review utilizes an established scoping review methodology described by the Joanna Briggs Institute
- We will report the review using the PRISMA-ScR checklist
- The study selection, data extraction and charting will be performed by two independent reviewers to minimize the risk of bias or errors
- Although comprehensive, this scoping review has limitations regarding the number of databases, the language and search terms used, and may limit research from low-income and middle-income countries
- Since the purpose of our scoping review is to map and characterize the evidence, we will not be conducting critically appraisals to determine the quality of individuals studies to assess the risk of bias

INTRODUCTION

Immunizations are one of the greatest public health achievements of the 20th century[1]. Vaccinations prevent two to three million deaths per year, and a further 1.5 million deaths could be avoided with improved vaccine coverage globally[2]. Though the success of immunization programs has contributed significantly to reduced infant mortality, reduction of co-morbid complications resulting from vaccine-preventable diseases (mumps, measles, polio etc.), and societal healthcare savings[3], vaccine resistance is also a product of vaccinations' success[4]. Particularly, anti-vaccination rhetoric may be fueled in part, by the idea that vaccine-preventable diseases are no longer a threat, as they are not widespread in Western countries anymore[5]. Inevitably, this logic is flawed, as vaccine-preventable diseases have only been minimized as a result of the success of immunization programs. Moreover, anti-vaccination practices threaten herd immunity (i.e., the protection of the overall population by the immunization of most individuals within the population)[6] and risk resurgence of vaccine-preventable diseases and consequential deaths[7].

Despite the impact on morbidity and mortality, rising doubts in vaccine safety and effectiveness threaten the success of immunization programmes[2]. Vaccine hesitancy, defined as the reluctance or refusal to vaccinate despite the availability of vaccines, is believed to be responsible for decreases in vaccine coverage and increased outbreaks of vaccine-preventable diseases[8]. The term 'vaccine hesitancy' is used to describe the continuum[9] of reluctance or refusal to receive recommended vaccines (i.e., routine childhood immunizations) due to concerns about safety and/or efficacy of vaccines, or for other personal reasons[10], where physical and/or financial barriers do not prevent access[11]. Furthermore, vaccine decisions are a process influenced by many factors; the decision to receive the vaccine is not an isolated event[6].

It is evident that vaccine hesitancy is a complicated phenomenon with many contributing factors. The causes for vaccine hesitancy for any individual, group, or community vary widely. Contributing factors often include unscientific claims about vaccine dangers (e.g., false beliefs about an alleged link between MMR and autism)[11], low trust in the medical/pharmaceutical institutions[12], myths about vaccines[8], anti-vaccine rhetoric in popular media[13], religious and cultural beliefs[14, 15], and poor communication and transparency about the importance and safety of vaccines[9].

Remarkably, the World Health Organization (WHO) named vaccine hesitancy as one of the greatest public health threats in 2019[2]. The threat that global vaccine hesitancy has on herd immunity is significant enough to cause great negative public health impacts[2]. Vaccine uptake must be high enough to prevent transmission of a disease within a population for the effort to be effective[7]. This is particularly concerning given the current COVID-19 pandemic; mass immunization of the general public will be needed to prevent future spread of COVID-19. Studies have highlighted vaccine hesitancy as a significant barrier to COVID-19 immunization. A recent Statistics Canada survey found that 12% of respondents were somewhat unlikely or very unlikely to get a COVID-19 vaccine and 4.6% remained unsure[16]. In an Italian study[17] measuring vaccine hesitant behaviours, individuals became more hesitant as the pandemic went from "phase 1" (initial lockdown) into "phase 2" (re-

opening). This study found, that proportionate to the population, there were not enough individuals who were willing to get vaccinated in order to create “herd immunity” [17]. Although the current COVID-19 preventive measures (distancing, mask-wearing, etc.) are key to preventing the spread of the virus, long-term control of the virus will hinge on the creation and uptake of a safe and reliable vaccine[18]. In order to properly inoculate the population, a better understanding of vaccine hesitancy and how to address it is crucial.

Role of Health Care Providers

Healthcare providers play an important role in addressing vaccine hesitancy. In particular, nurses and pharmacists often have more dedicated time to discuss parents’ concerns prior to vaccine administration than physicians and other care providers[6]. Hoekstra and Margolis[19] note that parents generally have more trust for nurses as compared to other healthcare professionals. Furthermore, it has been shown that better vaccination outcomes result from nurses spending more time counselling vaccine-hesitant parents[19]. Pharmacists also provide a convenient and accessible option for patients to access immunizations in their own communities[20, 21]. Similar to nurses, pharmacists are a highly trusted healthcare provider, and are intimately involved in counselling vaccine-hesitant patients in community and hospital settings[22, 23].

Many strategies and interventions have been used to address vaccine hesitancy and enhance vaccine acceptance, including interventions intended to increase community demand for vaccines; interventions used to increase vaccination access; and provider-based interventions[24]. Of the provider-based interventions, informative conversations about vaccines with patients,[25,26] the use of prevalence statistics to educate parents and patients,[27] and empathetic communication[28] from healthcare providers have been shown to be the most important and influential techniques in shifting vaccine hesitancy to acceptance.

Implementing Provider-based Interventions

Although many evidence-based interventions exist for addressing vaccine hesitancy, little is known about the implementation of these interventions into nurses’ and pharmacists’ practice. Studies have shown that barriers at the individual, interpersonal, organization, and system levels can significantly hinder the implementation of effective interventions into practice.[29] For nurses and pharmacists specifically, it is unclear what barriers and enablers exist for addressing vaccine hesitancy and/or refusal among their patients. Efforts are needed to clearly understand these barriers and enablers in order to support the implementation of effective interventions into nursing and pharmacy practice to promote vaccine acceptance.

Conducting a theory-based analysis of barriers and enablers to addressing vaccine hesitancy helps to understand the relationship between these factors and the mechanisms by which they influence behaviour.[30] Studies have found that the use of theory-based approaches to intervention design can lead to more successful implementation and intervention success.[31] As such, adopting a

systematic, theory-informed approach is needed to i) identify barriers and enablers to addressing vaccine hesitancy and/or refusal at multiple levels (i.e., individual, social, cultural, political, etc.) and (ii) design implementation strategies to overcome the barriers, and enhance the enablers to addressing vaccine hesitancy. Many implementation theories and frameworks exist to provide systematic guidance for designing, implementing, and evaluating interventions aimed at changing behaviour. The Behaviour Change Wheel (BCW) is a synthesis of 19 existing behaviour change frameworks that offers a comprehensive and systematic guide to intervention design.[32] The BCW includes an analysis of the nature of the behaviour, the mechanisms that need to be addressed in order to create behaviour change, and the interventions and policies required to change those mechanisms.[32] The BCW uses the COM-B model, which proposes that one needs Capability (C), Opportunity (O), and Motivation (M) to perform a Behaviour (-B) model, to obtain a better understanding of the behaviour in context, which is known as a behavioural analysis. 32] The BCW's behavioural analysis is an important first step in designing and implementing theory-informed interventions. To our knowledge, this type of behavioural analysis has not been conducted in the context of nurses' and pharmacists' role in addressing vaccine hesitancy and/or refusal among patients.

Research Purpose

The purpose of this scoping review is to identify, characterize, and map the existing knowledge on a) strategies or interventions for nurses and pharmacists to address vaccine hesitancy in their practice and b) nurses' and pharmacists' perceived barriers and enablers to addressing vaccine hesitancy among patients. Findings from this review will inform the design of behavioural interventions to support nurses' and pharmacists' practice in addressing vaccine hesitancy among their patients.

Review Question(s)

1. What strategies exist for nurses and pharmacists to address vaccine hesitancy and/or refusal among patients and/or the general public?
    a. How do the strategies map onto the Behaviour Change Wheel?
2. What are nurses' and pharmacists' perceived barriers and enablers to addressing vaccine hesitancy and/or refusal among patients and/or the general public?
    a. How do the barriers and enablers map onto the COM-B Model?

Inclusion Criteria

Participants

This review will consider literature that include nurses (licensed practical nurses, registered nurses, nurse practitioners, nursing students) and/or pharmacists, including pharmacy students and pharmacy technicians, as participants.

Concept

This review will consider strategies or interventions that have been implemented and/or evaluated to support nurses and/or pharmacists to address vaccine hesitancy and/or refusal among patients, families, or the general public. Strategies or interventions refer to processes, methods, or tools that were implemented or evaluated to promote or improve nurses' and pharmacists' ability to address vaccine hesitancy and/or refusal.

This review will also consider literature that explore perceived barriers and enablers for nurses and/or pharmacists to address vaccine hesitancy and/or refusal among patients, families, or the general public. For this review, an enabler is defined as "a person or thing that makes something possible."[33] whereas a barrier is defined as "a circumstance or obstacle that keeps people or things apart or prevents communication or progress"[34]

Context

This review will consider studies located in any care setting, including hospital, community, primary care, ambulatory care settings, and long-term care. Studies will be limited to the following countries: Canada, the United Kingdom, the United States of America, New Zealand, and Australlia. These countries were selected as they have similar approaches to healthcare and vaccine hesitancy.

Types of sources

This scoping review will consider both experimental and quasi-experimental study designs including randomized controlled trials, non-randomized controlled trials, before and after studies and interrupted time-series studies. 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 descriptive observational study designs including case series, individual case reports and descriptive cross-sectional studies for inclusion.

Qualitative studies will also be considered that focus on qualitative data including, but not limited to, designs such as phenomenology, grounded theory, ethnography, qualitative description, action research and feminist research.

Systematic reviews that report on aspects of nurses' and pharmacists' role in addressing vaccine hesitancy will be reviewed for primary studies that may meet the eligibility criteria.

Text and opinion papers, as well as other published materials including case studies and relevant academic publications, such as theses and dissertations, will also be considered for inclusion. Official websites of public health organizations in the aforementioned geographic regions and health care provider associations will be used, together with white papers, reports, position papers and policy papers, relevant to governmental guidance. Studies published in English will only be included. No date restriction will be implemented, to allow for the observation of any trends or changes in vaccine hesitancy over time to be captured.

METHODS

The proposed scoping review will be conducted in accordance with the Joanna Briggs Institute methodology for scoping reviews.[35]. There were no patients or public involvement in the design, conduct, reporting or disseminations plans of this research.

Search strategy

The search strategy was developed with a JBI-trained medical research librarian scientist and aims to locate published empirical studies and grey literature. The proposed scoping review followed the three-step process in accordance with the JBI Scoping Review Methodology.[36] The search strategy aims to identify both published primary studies, reviews and text and opinion papers. An initial limited search of MEDLINE and CINAHL was undertaken to identify articles on the topic. The text words contained in the titles and abstracts of relevant articles, and the index terms used to describe the articles were used to develop a full search strategy for CINAHL. An iterative approach will be used, and further search terms may be revealed and utilized within the search strategy. The search strategy, including all identified keywords and index terms will be adapted for each included database (see Supplemental File 1). The reference lists of articles included in the review will be screened for additional relevant articles.

Information sources

The databases to be searched include MEDLINE, CINAHL, EMBASE, Web of Science, and PsycInfo. Sources of unpublished studies and grey literature to be searched include ProQuest Dissertations and Theses Global and the first 10 pages of Google Scholar. We will also search for grey literature using the Canadian Agency for Drugs and Technologies in Health grey literature checklist Grey Matters: a practical tool for searching health-related grey literature.[37] Relevant organizational, governmental and health care association websites will be reviewed including, but not limited to Children's Healthcare Canada, Canadian Nurses Association, Canadian Pharmacists Association, National Association of Pharmacy Regulatory Authorities, American Academy of Pediatrics, American Pharmacists Association, Canadian Paediatric Society, Immunize Canada, Canadian Immunization Research Network, Public Health Agency of Canada, Infection Prevention and Control, Royal College of Paediatrics and Child Health, National Institute for Health and Clinical Excellence American Nurses Association, American Pharmacists Association, Australian Nursing and Midwifery Association, Pharmacy Board of Australia, British Nursing Association.

Study selection

Following the search, all identified records will be collated and uploaded into Covidence,[38] a citation management software, and duplicates will be removed. Two independent reviewers will screen the titles and abstracts against the inclusion criteria for the review. Potentially relevant papers will be retrieved in full and their citation details imported into the Covidence software. Next, two independent reviewers will assess the full text of selected citations in detail against the inclusion criteria. Reasons for exclusion of full text papers will be recorded and reported. Any disagreements that arise between

the reviewers at each stage of the selection process will be resolved through discussion, or with a third reviewer. The results of the search will be reported in full in the final scoping review and presented in a Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) flow diagram.[39]

Data extraction

Data will be extracted from included studies by two independent reviewers using a data extraction tool developed by the research team. The data extracted will include specific details about the population, concept, context, study methods and key findings relevant to the scoping review objectives. A draft extraction tool is provided (see Supplemental file 2). Study information to be extracted includes author(s), year of publication, country of origin, study aim/purpose, study population, study setting, design, outcome measures, barriers, enablers, description of strategies/interventions, reported key findings, and implications. The draft data extraction tool will be piloted with 5 studies and modified as needed. Modifications will be detailed in the full scoping review. Any disagreements that arise between the reviewers will be resolved through discussion, or with a third reviewer. Authors of papers will be contacted to request missing or additional data, where required.

ANALAYSIS AND PRESENTATION OF RESULTS

Data on strategies/interventions and barriers/enablers will be analyzed using the BCW as a coding guide. First, we will conduct a behavioural analysis of nurses' and pharmacists' perceived enablers and barriers to addressing vaccine hesitancy. Enablers and barriers will be extracted as reported by the study authors and then categorized into the six subcomponents of the BCW's COM-B model of behaviour (psychological capability, physical capability, social opportunity, physical opportunity, automatic motivation, and reflective motivation). Second, we will classify the strategies/interventions aimed at addressing vaccine hesitancy according to the BCW's nine intervention functions (i.e., education, training, modelling, enablement, environmental restructuring, persuasion, restrictions, coercion, incentivization). An intervention function is defined as the function most likely to be effective in changing a particular target behaviour.[30] Two reviewers will conduct the data classification using a pre-defined coding manual based on definitions and guidance from the BCW.[32] Any discrepancies will be resolved by consensus or with a third reviewer. Final BCW categorizations will be reviewed and discussed with the entire research team. Given the focus of this scoping review on mapping existing literature, we will not be explicitly performing a risk of bias assessment.

The PRISMA-ScR[39] reporting guidelines will be followed for this scoping review. The extracted data will be presented in a tabular form that aligns with the study's objective. In addition to the tables, a graphic image will be created of the barriers, enablers, and strategies found in the included studies.[36] A narrative summary will accompany these presentations and will describe how the findings relate to the review's objective and sub-questions. Results will be classified under main conceptual categories: study characteristics (including country of origin, study population, study

setting, design); outcome measures; barriers; enablers; strategies/interventions; reported key findings; and implications.

Conflicts of Interest: None declared

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Supplemental File 1: Search strategy CINAHL

Vaccine Hesitancy	Vaccine	Attitude	Nurse/pharmacist	Date Searched	# of Results
Keywords [EBSCO operators]					
(vaccin* OR immuni* OR inoculat*) N3 (refus* OR hesita* OR reluctan* OR reject* OR sceptic* OR skeptic*)) OR "anti vaccin*" OR "anti vax*"			Nurse* OR pharmacist*		
CINAHL [EBSCO]					
(MH "Anti-Vaccination Movement") OR (MH "Attitude to Vaccines")	(MH "Immunization") OR (MH "Vaccines+")	(MH "Attitude to Medical Treatment") OR (MH "Family Attitudes+") OR (MH "Caregiver Attitudes") OR (MH "Patient Attitudes")	((MH "Nurses+") OR (MH "Pharmacists") OR (MH "Pharmacy Technicians"))	04-May-20	284
PsycINFO [EBSCO]					

Keywords only	DE "Immunization"	((((((DE "Decision Making" OR DE "Choice Behavior") OR (DE "Client Attitudes")) AND (DE "Parental Attitudes" OR DE "Attitudes" OR DE "Childrearing Practices" OR DE "Child Care" OR DE "Child Discipline" OR DE "Physical Discipline" OR DE "Toilet Training" OR DE "Weaning")) OR (DE "Health Attitudes")) OR (DE "Health Behavior")) OR (DE "Trust (Social Behavior)")) OR (DE "Social Processes")	((DE "Nurses" OR DE "Psychiatric Nurses" OR DE "Public Health Service Nurses" OR DE "School Nurses") OR (DE "Pharmacists"))	04-May-20	48
		((DE "Treatment Refusal") OR (DE "Resistance")) AND (DE "Treatment Barriers" OR DE "Treatment Compliance")			
MEDLINE [Ovid]					
Vaccination Refusal/ or Anti-Vaccination Movement/	exp Vaccines/	attitude/ or exp attitude to health/	exp Nurses/	04-May-20	692
	exp Vaccination/	exp "Treatment Adherence and Compliance"/	exp Pharmacists/		
Embase [Elsevier]					
'anti-vaccination movement'/exp OR 'vaccine hesitancy'/exp	'vaccination'/exp OR 'vaccine'/exp	'patient attitude'/exp	'nurse'/exp OR 'pharmacist'/exp	04-May-20	685

Web Of Science					
Keywords only	Keywords only	Keywords only	Keywords only	04-May-20	125
Total found in databases: 1834					
Total imported into Covidence: 1240					
Duplicates removed: 594					

Supplemental File 2: Data extraction instrument

Author	Year	Country of origin	Aim/ Purpose	Population	Vaccine Type	Population to be vaccinated	Setting	Methods	Outcome measures	Barriers	Enablers	Strategy/ Intervention	Limitations	Key findings	Implications