

# **Mentoring and the Public Health Workforce: A Scoping Review**

**by**

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## **Abstract**

This study sought to better understand mentoring in the training of the public health workforce, and to identify key issues in the conceptualization and application of mentoring and its potential relevance to public health. Methods entailed a scoping review of literature in Medline, CINAHL, and Web of Science databases following guidelines in the PRISMA standards. A total of 1809 references between 2000 and June 2014 were identified, of which 27 met inclusion criteria. Very little research on the topic has been published. The main thematic areas were the models used in mentoring, the value of mentoring, mentors' and mentees' perceptions and needs, attributes of successful mentoring relationships, elements for the design and evaluation of mentoring programs, and authors' recommendations. The main conclusion is that mentoring is a growing interest in relation to developing the public health workforce. To improve mentoring models and practices, further research should be conducted.

**Keywords:** Mentoring; mentorship; public health workforce; public health education; public health career development; public health training

## **Dedication**

*I dedicate this work to my mother, Suad Al Edrisy,  
for her support throughout my life,  
and to my dear husband, Bassim Al Jazaeri.*

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## Chapter 1. Introduction

The public health sector continuously strives to improve its workforce to better respond to the health needs of diverse populations worldwide. The quality of this workforce contributes to the quality of public health policies and services for populations, communities, and individuals, as well as the engagement and empowerment of communities for dealing with public health issues. To improve the public health workforce, in addition to addressing staff shortages and organizational needs for appropriate resources and structures along with effective and efficient practices, new professionals must acquire the necessary competencies, i.e., the knowledge, skills, and attitudes needed for effective performance (Palermo & McCall 2008). Mentorship has been put forward as a promising approach to augment the competency development of public health students and new professionals seeking to advance their careers.

Mentoring has been defined in a variety of ways. One of the most common definitions in the scholarly literature, from a 1998 report by the Imperial College School of Medicine's Standing Committee on Postgraduate Medical and Dental Education (SCOPME) positions mentoring as, "A process whereby an experienced, highly regarded, empathetic person (the mentor) guides another (usually younger) individual (the mentee) in the development and re-examination of their own ideas, learning, and personal and professional development" page 15. Elaborating on the processes involved in mentoring, Blackwell defines mentoring as "a process of instructing, counseling, guiding and facilitating" (Mahayosnand & Stigler, 1999). The differences between the various definitions are often subtle, as Battams (2005) offers a similar definition but focuses to a greater extent on the characteristics of the mentee, regarding mentoring as "a voluntary and mutually beneficial relationship where an experienced and knowledgeable mentor supports the development of the mentee with leadership potential." While Battams (2005) claims the mentor-mentee relationship to be mutually beneficial, she focuses on the development of the mentee. Sambunjak, Straus and

Marusié (2006) offer another alternative, noting that both parties can benefit from the mentoring relationship in terms of their development; they define mentorship as “a dynamic, reciprocal relationship in a work environment between an advanced career incumbent (mentor) and a beginner (protégé), aimed at promoting the development of both” pages 1103,1104.. Like all relationships, mentoring relationships can come in various forms, depending on the context and its aims, as well as how different the mentor and mentee are in terms of their levels of experience. Similarly, programs that guide mentorships can also vary widely, as their definitions and program design will depend upon factors including the audience, the backgrounds of those involved, and the availability of resources (Battams, 2005).

Lengerich, Siedlecki, Brownson, Hedberg, Remington, et al.'s (2003) review article reported that mentoring has been practiced for many years in many professions, including education, entrepreneurship, and businesses run by corporations (Lengerich et al., 2003). As there has been a greater focus on professional development in numerous professions, mentoring has become increasingly common as part of professional training and thus career advancement among employees. Mentoring has become especially important as economic and employment environments in society have become increasingly complex. Today, employees are expected to continually develop their individual skill sets over the course of their careers, aware that they may have to apply these skills in various, and perhaps unexpected, places. Professional mentoring is quite common in business (Underhill, 2006) and educational institutions (Myers & Anderson, 2012) , A cursory scan of resources about mentoring and education of doctors and other health care professionals also shows a great many relevant programs and research articles ( Sambunjak et al., 2006). As Lengerich et al. (2003) noted, based on their review of the literature relevant to epidemiology, mentoring is noticeably less studied in the area of public health.

The benefits of mentoring are numerous. As an example of experiential learning, it has been shown to help reduce the gap between theory and practice in not only the area of health but also with regards to education and commercial endeavors (Palermo & McCall, 2008). Experiential learning involves gaining knowledge through practical experience, which can be very positive, but if this learning is undertaken without

appropriate supervision and support, then it may lead to the adoption of practices that are not safe or effective (Palermo & McCall, 2008). Thus, the mentor-mentee relationship is crucial to ensure that experienced professionals offer novices their knowledge and expertise (Battams, 2005). It is worth noting, however, that training for mentors is not normally delivered in a clear manner, with most mentors being trained in the field or simply gaining experience as mentors through educational practices (Zannini, L., Cattaneo, C., Brugnolli, A. & Sainai, L. 2011 ). Research has shown that for mentors to be successful they should have a high level of self-awareness and self-knowledge, characteristics that are more common among experienced individuals as compared to novices . When conducted in an effective manner, mentorships have been associated with various positive outcomes, including the sharing of knowledge, stimulation of both parties involved, professional development, improvement of interpersonal skills, and increased reflectivity and growth (Zannini et al., 2011).

Mentoring is valuable to public health students and new workers, as it allows them to experience the application of public health skills firsthand and witness others who play roles as public health leaders. A related need is for the public health sector to foster the development of potential and emerging leaders. Mentoring can be very useful for improving leadership throughout public health's diverse endeavors, as it helps public health professionals to develop the various competencies necessary to be effective, including collaborative teamwork, communication, management, and administrative skills (Ontario Public Health Association, n.d.).

To succeed in efforts to improve the public health workforce, public health schools, programs, agencies, and associations focus on building students' and new public health workers' competencies, fostering their professional development, linking experienced professionals with up and coming generations, and developing leadership. However, it has been found a lack of mentorship skills among the senior public health mentors whose focus is on training new graduates and beginning workers. These mentors are important for providing less experienced individuals with the knowledge and skills that are essential to effectively practice public health in various public health settings, but in reality there is limited follow up and guidance in this regard.

Considering how very multi-faceted public health is as a field, it is clear that mentoring could be developed and used to deal with a number of the most significant issues in the area of public health (Nelson, B.T., Kasper, J., Hibberd, P.L., Thea, D.M., & Herlihy, J.M, 2012). These issues include a lack of leadership in public health, shortages of personnel in practically all areas of public health, and the lack of consistently updated skills among public health professionals. Furthermore, with regards to more specialized areas of research, additional specific skills must be developed. These specialized areas include epidemiology, environmental health, occupational health, health education, health promotion and disease prevention, biostatistics, and ethics. Coursework at the graduate level as well as a combination of mentorships along with experience in the field could help individuals develop the skills required to succeed in these areas of research (Nelson et al., 2012). New graduates may find that mentoring helps facilitate their transition into a place of employment by helping them to develop more quickly as a professional (Furgeson, D., George, M., Nesbit, S., Peterson, C., Peterson, D., & Wilder, R.S., 2008). This review is based on the assertion in the broader mentorship literature that, generally, mentoring is a highly important and productive strategy that allows experienced professionals to share their knowledge and expertise with novice professionals. As part of the mentor-mentee relationship, mentoring is able to generate passion and commitment in individuals, helping to inspire these individuals to move in new directions and develop new opportunities within their field of practice. Despite the very limited number of research studies and other publications on mentorship in public health education and training, it appears that the public health workforce might benefit substantially from the contributions that mentoring could make to its development (Palermo & McCall, 2008).

There is significant demand in the area of public health for more highly trained workers. One organization, the Association of Schools of Public Health, has estimated that an additional 250,000 public health workers will need to be recruited by the year 2020, in order for this field to adequately meet population demands ( Drehobl, P.A., Roush, S.W., Stover, B.H. & Koo, D. , 2012) . Shortages of public health workers are particularly evident in developing countries. In Sub-Saharan Africa, for example, where 11% of the global population resides, they have 24% of the world's disease burden, yet only 3% of the world's health employees ( Rosenstock, L., Silver, G.B. & Sumaya,

C.,2008). In response, scholars are calling for multifaceted efforts to improve the public health workforce's capacity on a global scale, and it is arguable that mentorships could serve as a critical aspect of these efforts (Rosenstock et al., 2008). While more public health workers are needed throughout the world, it is also important that they receive suitable training, as it has been noted that, in many regards, the education of today's health professionals is inadequate. Reasons for this include outdated curricula and a lack of bridging the theory-practice gap (Drehobl et al., 2012). This issue has led the Institute of Medicine (IOM) to recommend that public health professional training involve a greater amount of real world experience, specifying that practicum experiences could enable public health students to gain more hands-on training from instructors (Drehobl et al., 2012). It could also be noted that mentorship programs provide students with excellent real world experience and important insights into their field, and that mentorships could be implemented as a beneficial aspect of any practicum. As Jung (2014) has noted, mentoring is generally accepted to be an excellent means of improving practice competencies related to communication and for sharing information and experiences more generally. The Public Health Practice Program Office also supports the use of mentorships to benefit the public health system and its workforce, noting that various aspects of professional development, which are necessary to ensure that a competent workforce is able to provide public health services in a sustainable manner, could be facilitated via mentorships (Jung, 2014). These necessary elements for the development of a strong and stable public health workforce include focusing on key competencies, offering more lifelong learning opportunities, and incentivizing competency development at the institutional and individual levels (Jung, 2014). However, public health educators and employers should be made more aware of the extent to which mentorship programs can benefit public health workers' professional development and, as a result, the quality of public health service that is provided (Jung, 2014).

In case the importance of the public health workforce might be overlooked or misjudged, it is worth noting that this workforce is a significant determinant of how well a population is able to deal with public health issues. At the international level, the public health workforce faces major challenges, as it attempts to address various public health issues that exist now or will in the future (Sidibé & Campbell, 2015). Among the various strategies that might be used to enhance the public health workforce, in order to make it more capable of addressing public health issues, is mentoring, which could enhance workforce practices and competencies in addition to helping develop organizational capacity (Palermo & McCall, 2008).

A variety of factors impact workforce capacity, including the size of the workforce, how well prepared the workforce is, if they are exposed to continued professional development, the organizations that they are part of and the support provided (Palermo, Hughes & McCall, 2011). Thus, a range of strategies is necessary to help a workforce develop its capacity. Competency development is a particularly important aspect of workforce development, concerned with how individuals develop knowledge, skills and attitudes that help them to be effective workers within their chosen field (Palermo & McCall, 2008).

Competency development is necessary as it helps workers to meet competency standards, which outline the roles that an individuals should be able to complete at their work and are an important factor in relation to credentialing, which is a system whereby it is ensured that individuals have the appropriate credentials and competencies to practice within their field (Palermo & McCall, 2008). In public health, it is understood that many competencies only develop after an individual has entered the workforce. Consequently, focusing on how well prepared individuals are prior to their entering the workforce may miss some key aspects of competency development. The development of professionals both as they study for university credentials and also for professional development of individuals in their postgraduate years are important areas to focus on in terms of workforce development in public health. Mentoring holds promise as a strategy to achieve these ends.

## **1.1. Why a Scoping Literature Review? Aim and Scope**

In order to develop a better understanding of mentoring in the training of the public health workforce, and to identify key issues in the conceptualization and application of mentoring and its potential relevance to public health, a scoping review of the scientific literature was carried out. Scoping reviews, otherwise known as scoping studies, have become very popular as a means of reviewing the relevant research concerning a specific topic. There is not yet a definition of scoping reviews that has been universally agreed upon. However, the existing definitions tend to regard the scoping review as mapping the evidence related to a particular area of concern, whereby the spectrum of evidence is summarized in an effort to present the breadth as well as the depth of research that has been conducted regarding a topic (Arksey & O' Malley 2005).

Thus, the difference between a scoping review and a more traditional literature review is that the former examines relevant literature with the aim of justifying further research on a specific problem or topic, while the latter examines what contribution a particular study makes in relation to the literature on a particular topic or issue (Thomson, 2013).

Although a systematic review or meta-analysis would include evaluating the strength or quality of the empirical evidence, a scoping study is a useful assessment when the initial concern is discovering the variety and amount of literature that is available on a topic of interest, e.g., mentorship, or its application to a specific area of concern, e.g., education and training of the public health workforce.

## **1.2. Research Questions**

The overall research questions for this scoping review are:

1. From the existing literature, what is known about the models, practices, and values of mentoring in the training of the public health workforce?
2. What can be done to help facilitate more and better mentorships in the field of

public health?

3. How do public health mentors perceive the mentoring experience?
4. How do public health mentees perceive the mentoring experience?
5. What are the needs of public health mentors?
6. What are the needs of public health mentees?

### **1.3. Research Objectives**

This study's specific objectives are to:

1. Map the key concepts underpinning mentoring in the training of the public health workforce.
2. Describe mentoring programs that have been reported in peer reviewed journals.
3. Identify research gaps in the current literature.
4. Develop recommendations regarding the potential utility and effectiveness of mentoring, as well as recommendations for improving mentoring in public health and maximizing opportunities for the person being mentored to better apply knowledge.

### **1.4. Organization of the Thesis**

This thesis is organized as follows. Chapter Two describes the methodology used for this review. Chapter Three describes the included articles and the results of the data analysis. Chapter Four discusses the themes identified from the data analysis. Chapter Five concludes the study, and provides recommendations for better public health mentoring.

## **Chapter 2. Methods**

### **2.1. Review Methods**

This scoping study is based on published guidelines that outline a five-stage methodological framework (Arksey & O' Malley 2005):

1. Identify the research questions
2. Search for relevant citations
3. Select citations
4. Chart the data
5. Collate, summarize, and report the results.

For the search of literature, the study also drew on methods guidelines set forth in the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) standards (Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group, 2009).

### **2.2. Search Strategy**

Preliminary literature searches helped formulate a search strategy that encompassed the main concepts, appropriate terms, and the most relevant databases. Multiple strategies have been employed to search for relevant studies and materials that focus on mentoring in the education and the training of public health workforce. The search strategy was piloted and refined during consultations with an information specialist, and tested in various databases to insure that relevant results were appearing. Three electronic databases were searched, Medline, CINAHL, and Web of

Science, following PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. The databases were chosen for their multidisciplinary focus and relevance to the research questions. Citations that included any of the following subject terms, and MeSH headings in the case of Medline and CINAHL databases, were identified: "Mentor\*," "Public health," "Health promotion," "Public health workforce," "Public health education," "Public health competencies," "Public health career development," "Epidemiology," "Occupational health," "Environmental health," "Public health training," "Health education," and "Public health schools." Since Web of Science has no subject headings, the strategy focused on keyword searches.

**Table 1 Search Strategy**

Medline	CINAHL	Web of Science
#1: mentor*	#1: mentor*	#1: (mentor*)
#2: "public health"	#2: "public health"	#2: ("public health")
#3: "health promotion"	#3: "health promotion"	#3: ("health promotion")
#4: "public health workforce"	#4: "public health workforce"	#4: ("public health workforce")
#5: "public health education"	#5: "public health education"	#5: ("public health education")
#6: "public health competences"	#6: "public health competences"	#6: ("public health competences")
#7: "public health career development"	#7: epidemiology	#7: (epidemiology)
#8 : epidemiology	#8: "occupational health"	#8: ("occupational health")
#9: "occupational health"	#9: "environmental health"	#9: ("environmental health")
#10: "environmental health"	#10: "public health training"	#10: ("public health training")
#11: "public health training"	#11: "health education"	#11: ("health education")
#12: "health education"	#12: "public health schools"	#12: ("public health schools")
#13: "public health schools"	#13: (MH "Mentorship")	#13: #12 OR #11 OR #10 OR #9 OR #8 OR #7 OR #6 OR #5 OR #4 OR #3 OR #2]
#14: (MH "Mentors")	#14: (MH "Public Health")	#14: #13 AND #1
#15: (MH "Public Health")	#15: (MH "Health Promotion")	
#1 : (MH "Health Promotion")	#16: (MH "Society for Public Health Education")	
#17: (MH "Public Health Practice)	#17: (MH "Career Planning and Development")	
#18: (MH "Education,Public Health Professional")	#18: (MH "Epidemiology")	
#19: (MH "Epidemiology")	#19: (MH "Occupational Health")	

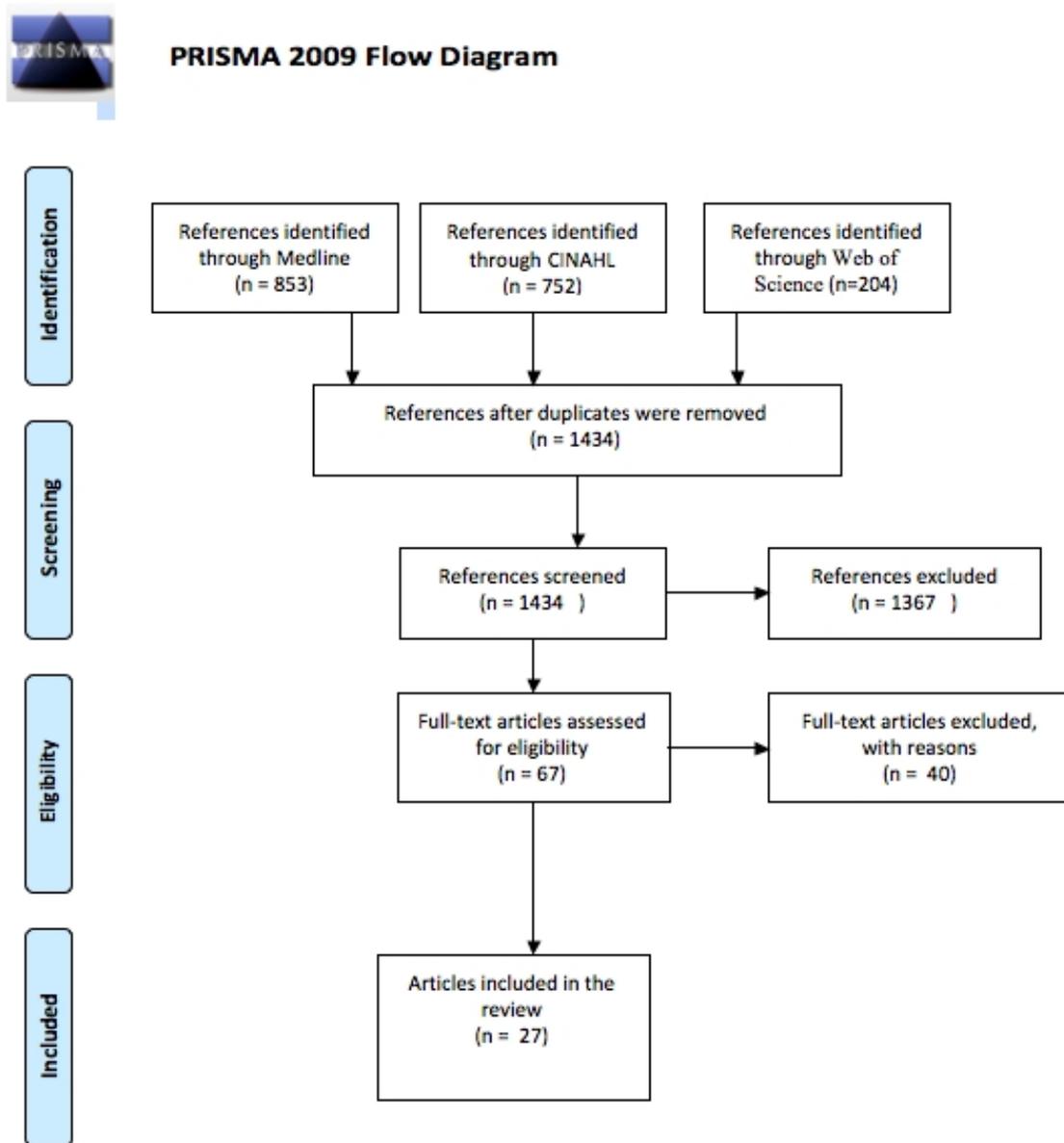
---

#20: (MH "Occupational Health")	#20: (MH "Environmental Health")
#21: (MH "Environmental Health")	#21: (MH "School Health Education")
#22: (MH "Health Education")	#22: #1 OR #13
#23: (MH "Schools, Public Health") OR (MH "Students, Public Health")	#23: #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12
#24: #1 OR #14	#24: #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21
#25: #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13	#25: #23 OR #24
#26: #15 OR #16 OR #18 OR #19 OR #20 OR #21 OR #22 OR #22 OR #23	#26: #22 AND #25
#27: #25 OR #26	
#28: #24 AND #27	

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Some 1809 references were obtained, of which 375 were eliminated as duplicates. A process of discrimination was then carried out by means of assessing the titles and abstracts of the remaining 1434 citations. This led to the further exclusion of 1367 references for a variety of reasons, including that they focused on mentoring patients, K-12 students and teachers, adolescents, physicians and health care providers in areas other than public health. The 67 documents that passed this filter were then further screened based on a reading of the complete texts, which led to the elimination of an additional 40 papers because the titles and abstracts were not found to reflect the content of the documents or the documents mentioned very little about mentoring in public health. In the end, 27 articles were found to meet the inclusion criteria and were included in the review.

Figure 1 PRISMA Flow Diagram



From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *PLoS Med* 6(6): e1000097. doi:10.1371/journal.pmed1000097

For more information, visit [www.prisma-statement.org](http://www.prisma-statement.org).

Notably, in the introduction and discussion section of the review, additional articles beyond the 27 that met the inclusion criteria are also referred to. These articles were mainly excluded because they did not discuss mentoring in relation to public health specifically. Nonetheless, they offered interesting insights into mentoring more generally, which is why they are referred to in the discussion. Others drawn upon were published before the dates of inclusion of reviewed publications, or were sources from grey literature.

### **2.3. Criteria for Reference Inclusion**

Citations focused on mentoring in public health, health education, health promotion, public health nursing, public health nutrition, epidemiology, global health or any other public health areas. All citations were published between 2000 and June, 2014.

### **2.4. Criteria for Reference Exclusion**

Citations focused on mentoring patients, K-12 students and teachers, adolescents, physicians, and other health care providers in areas other than public health were excluded.

### **2.5. Data Extraction**

A standardized data extraction form was designed to improve the reliability and validity of the review. Data extracted from relevant references were: the source, the title, author/s, year of publication, settings, type of references, the field of practice, the purpose of the references, target population, the focus of the mentorship program/activity, study design, methods, results, model of mentoring, practice of mentoring, the value of mentoring, mentor's perception, mentee's perception, characteristics of mentors, attributes of mentees, mentor's needs, mentee's needs, attributes of successful mentoring relationship, elements for the design of mentoring programs, and authors' recommendations. Notably, Microsoft Excel was utilized in order

to organize the extracted data and facilitate analysis. Each variable is defined as it is shown in the standardized extraction form (See Appendix A).

## **Chapter 3. Results**

This chapter first describes the types of articles in the scoping review, followed by definitions of mentoring, information about mentoring in different public health fields, and types of mentoring models that were included in the articles. Other sections address how public health mentors and mentees perceived the mentoring experience (e.g., benefits, facilitators, challenges, and needs), what the authors of the publications discovered or put forth as attributes of successful mentoring relationships and programs, and the recommendations in the articles about what might be done to help facilitate more and better mentorships in the field of public health.

### **3.1. Types of Articles and Mentoring Programs in the Scoping Review**

Within the identified period of 2000 to June, 2014, among the 27 articles that met the inclusion criteria, the publication rate was the highest in 2009 and 2013, with 5 papers from the sample published each year. From 2001 to 2003 and in 2006, one paper was published each year. A total of 2 papers were published in 2010 and 2014, and 3 papers from the sample were published in 2006, 2008, and 2011. Out of the total of 27 articles in the sample, in terms of setting, 16 were situated in the United States, five in Australia, two in Puerto Rico, one in Guatemala, one in Switzerland, one in Uganda, and one in the United Kingdom.

The articles in this scoping review are divided into three main types, which are research studies (n=4), reviews (n=3), and commentaries (n=20); the last category includes 12 program descriptions, 6 editorials, and 2 letters. The first type in this scoping review concerns research reports that explore, investigate, or evaluate the role and utility

of mentoring in improving the knowledge, skills, or competences of the public health workforce. The second type is reviews that aim to describe key findings or lessons from others' studies on mentoring, while the commentaries that include program descriptions, editorials, and letters offer descriptions of how mentorships work in practice and describe, often in a journalistic style, what mentoring should or could involve.

Although these references are different in their types and the quality of data they provide, they share some common themes. The data revealed several thematic groupings and a number of interrelated subthemes. The main themes that appeared are the models used in mentoring, the value of mentoring, mentors' and mentees' perceptions and needs, attributes of successful mentoring relationships, elements for the design of mentoring programs, and the author's recommendations. Table 2 displays the findings by type of article.

**Table 2 Findings by Type of Article**

<b>THE PUBLICATION'S YEAR</b>	<b>Research studies (n=4)</b>	<b>Reviews (n=3)</b>	<b>Program descriptions (n=12)</b>	<b>Editorials (n=6)</b>	<b>Letters (n=2)</b>	<b>N</b>
2001				1		1
2002		1				1
2003		1				1
2004			3			3
2006	1					1
2008	1		1		1	3
2009			1	4		5
2010	1				1	2
2011			3			3
2013	1	1	2	1		5

2014			2			2
<b>SETTING</b>						
Australia	3	1			1	5
USA	1	1	8	5	1	16
Puerto Rico			1	1		2
Guatemala			1			1
Switzerland			1			1
Uganda			1			1
UK		1				1
<b>THE FIELD OF PRACTICE</b>						
Epidemiology		1	1	1		3
Public health nutrition	3					3
Public health nursing	1		3	1		5
Health promotion		1	1			2
Environmental health			2		1	3

Mental health				1		1
Rural health		1				1
Research and practice			4	3		7
Injury prevention					1	1
General public health			1			1
<b>Target population</b>						
Undergraduates		1	2			3
Graduate			2			2
Workers	3	1	4	3		11
Others	1	1	4	3	2	11
<b>THE FOCUS OF MENTORSHIP PROGRAM/ACTIVITY</b>						
To improve the delivery of knowledge	1		4	1	1	7
To increase public health research capacity			3	1	1	5
To enhance public health and health promotion practices, support the development of competencies	1	3	2	1		7
To enhance epidemiological skills			4			4

To develop public health workforce	2		2			4
To support scholars				1		2
Others	1			2		3
Not mentioned				2		2
<b>MODEL OF MENTORING</b>						
One to one mentoring			1		1	2
Peer mentoring	1		2			3
Mentoring circles	1					1
Mentoring partnerships	1		1			2
Online mentoring			2			2
Apprenticeship mentoring			3			3
Trans model/cis model			1			1
Multiple models (some references cover many models)	1	2	1	2		6
Mentoring during the field experience			1			1
Conceptual model		1				1

Multifaceted mentoring model				1		1
Not specified				3	1	4
<b>MENTORS' PERCEPTION: BENEFITS</b>						
Recognition from the mentors' organization		2	1			3
Sense of reward or credits, professional growth	2	2	2	1		7
Cultural competence training, improve awareness of cultural and community issues	1			1		2
Building social networking	1	1				2
Reduce isolation		1				1
Refresh knowledge and skills, reinforce learning	2	1				3
Personal growth or satisfaction		2	2	1		5
Others		2	2			4
Not mentioned	2		8	4	2	16
<b>MENTORS' PERCEPTION: FACILITATORS</b>						
Supportive workplace environment			1			1
Supportive program coordinator	1					1

Having a specific health promotion project to work towards	1					1
Work based or experiential learning	1					1
Initial meetings	1		1			2
Competency self assessment	1					1
Cost effectiveness	1					1
Affordability and availability of the recourses	1					1
Supportive technology that support the program		1				1
Friendliness, and collegiality	1		1			2
Not mentioned	2	2	9	6	2	21
<b>MENTORS' PERCEPTION: CHALLENGES</b>						
Dearth of mentors		1		2		3
Lack of long term institutional support for mentoring	3			1		4
Lack of fanatical incentives to mentoring		1		1		2
High workload, time constraints	2	1	1			4
Large number of students participating			1			1

Others			2	1		3
Not mentioned	1	1	6	4	2	14
<b>MENTEES' PERCEPTION: BENEFITS</b>						
Training, improving knowledge, improve research skills, competency development	1		3	1		5
Understanding of and appreciation for public health			2			2
Personal growth	2	1	2	1		6
Contribution to peers learning	1					1
Strong socialization	1			1		2
Facilitate smooth transition to professional life			2			2
Focus goal, career development, develop professional identity		1	2	1		4
Improve commitment to work, increase motivation			1			1
Others	1		2	1		4
Not mentioned	2	2		4	2	10
<b>MENTEES' PERCEPTION: FACILITATORS</b>						
Supportive learning environment	2					2

Multiple mentors			1			1
Workshop series			2	1		3
Interacting as peers	1					1
Frequency of contact with mentors	1		1			2
Sit visits	1		1	1		3
Combing mentoring with practical on the job experience, tailored mentoring				1		1
Establishing expectation or learning plan early	1		1			2
Qualitative portfolios Periodicity or continuity of the activities	1					1
Accesses to free website learning resources and materials			1			1
periodicity or continuity of the activities	1			1		2
Not mentioned	2	3	6	4	2	17
<b>MENTEES' PERCEPTION: CHALLENGES</b>						
Novelty of mentorship concepts			1			1
Time constraints	2					2

Challenges of working with others, e.g. personalities	1		1			2
Poor mentors skills	1		1			2
Inadequate communication with mentors			1			1
Low level of commitment	1					1
A lack of clearly articulated outcomes for relationship	1					1
Others				1		1
Not mentioned	2	3	7	5	2	19
<b>MENTORS' NEEDS</b>						
Further training	1		1	1		3
Having a specific health promotion project or event to work towards	1		1			2
Structuring the process of work based learning	1			1		2
More input and follow up from the project coordinator	1			1		2
Having adequate time to sustain an ongoing relationship with the mentee			1			1
Others	1			1		1
Not mentioned	3	3	9	4	2	21

<b>MENTEES' NEEDS</b>						
Tailoring to meet the needs of earlier trainees or advanced trainees				1		1
The mentees need to feel inspired and empowered				1		1
The mentees need challenging assignments to encourage learning and development of skills			1			1
Appropriate match of the mentors and mentees				1	1	2
Others	2			1	1	2
Not mentioned	2	3	11	2		18
<b>ATTRIBUTES OF SUCCESSFUL MENTORING RELATIONSHIP</b>						
Good communication			2	1		3
Considering the mentees mentoring style				1		1
Training the mentors	1		1	1		3
Minimize time constraints				1		1
Developing a mentoring philosophy, clear articulation of the mentoring structure, expectations , and outcomes	1	2		3		6
Periodic evaluations by mentors	1			1		2

Resolving difficulties				1		1
Formalizing the relationship	1			1		2
Organizational support	1					1
A policy framework		1				1
Acknowledging cultural differences				1		1
Others	2	2		2		6
Not mentioned	2		10	2	2	16
<b>ELEMENTS FOR THE DESIGN OF MENTORING PROGRAM</b>						
Focusing on mentor recruitment, training, availability and retention	1	1	2	1		5
Communicating with the mentee before formal training		1	1	1		3
Providing a thorough orientation to the work setting			1	1		2
Supportive environment for both the mentee and the mentor		2	2	2		6
Formal preparation	1			1		2
Clear identification of the mentoring objectives, having a well defined set of competencies		1	1	1		3
A framework for evaluating mentoring relationships		2		2		4

Careful matching the mentors to mentees		1		1		2
Others		1	3	2		6
Not mentioned	2		8	1	2	13
<b>AUTHOR'S RECOMMENDATIONS</b>						
Development of operational definition of mentoring		1				1
Working on specific objectives		2		1		3
More extensive and extended mentoring support	2	2	1	1		6
More mentoring programs	1			3		4
Encourage retention			2	1		3
Match mentors and mentees from similar context		2		1		3
Encourage E mentoring		1	2			3
Improve mentoring program					1	1
Involve stakeholders				1		1
Evaluate mentoring program		1		2		2
Others	1	1	5		1	8

Not mentioned	1		6			7
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### 3.2. Definitions of Mentoring

Definitions of mentoring used in mentorship programs and by authors of the articles showed considerable variation. Table 3 lists definitions in the 9 articles that provided one.

**Table 2 Definitions of Mentoring in the Reviewed Articles**

No.	The source	The definition
1	Palermo et al. (2011). A qualitative evaluation of an Australian public health nutrition workforce development intervention involving mentoring circles.	"A key determinant of competence development among advanced -level public health nutritionists and is a common framework used for professional development in health professional." (page 1459)
2	Palermo & McCall. (2008). The role of mentoring in public health nutrition workforce Development. Perspectives of advanced-level practitioners.	"Mentoring is defined as a reciprocal, mutual and supportive learning relationship." (page 802)
3	Browne et al. (2013). A qualitative evaluation of a mentoring program for aboriginal health workers and allied health professionals.	"Mentoring is a reciprocal relationship between colleagues of personal and professional development focused on support, guidance, advice, feedback and challenge". (pages 457-458)  According to the authors, reciprocal relationship provides both parties the chance to play the role of mentor and mentee rather than one participant being seen as a senior to the other.
4	Bourke et al. (2014). Mentoring is a retention strategy to sustain the rural and remote health workforce	"Intimate learning alliances that happen naturally" (page 3)
5	Lengerich et al. (2003). Mentorship and competencies for applied chronic disease epidemiology	"Mentoring, a deliberate process that pairs senior with junior colleagues to develop the professional competency of the junior colleague, may be a method to further develop the specific competencies of chronic disease epidemiologists." (page 276)

6	Forsyth & Stoff. (2009). Key issues in mentoring in HIV prevention and mental health for new investigators from underrepresented racial/ethnic groups.	"A lengthy developmental process leading students and trainees to become productive agents to innovation capable of assuming key leadership roles in their respective field." (page s88)
7	Barnoya et al. (2013). Increasing Chronic Disease Research Capacity in Guatemala Through a Mentoring Program	"Mentorship, the dynamic, reciprocal relationship in a work environment between an advanced career incumbent (mentor) and a beginner (mentee), aimed at promoting the development of both, is recognized as a catalyst for career, facilitating career selection, advancement, and productivity." (page 428)
8	Sowan et al. (2004). Creating a Mentoring Partnership Model A University-Department of Health Experience	"Collaborative mentoring was defined as working together to provide public health preceptor experiences for BSN students by mutually coaching and facilitating the personal/professional growth and development of all members of the partnership." (page 331)

### 3.3. Mentoring in Different Public Health Fields

This scoping review identified 27 articles that focus on mentoring in the training of public health workforce, and investigate how mentoring is used in specific public health domains or fields. The articles were identified as pertaining to the following fields: research and practice (n=7), public health nursing (n=5) epidemiology (n=3), public health nutrition (n=3), environmental health (n=3), health promotion (n=2), mental health (n=1), rural health (n=1), injury prevention (n=1) and general public health (n=1).

#### 3.3.1. Mentoring & Research

Most of the articles gave attention to mentoring in terms of mentors' and mentees' research activities. Kahn and Greenblatt (2009) expressed that mentoring can help create bridges within projects involving multiple disciplines, create a more diverse group of investigators, and help senior investigators to recognize the value of the mentoring process. Among early-career HIV researchers, Kahn and Greenblatt (2009)

believe that mentoring is key for work satisfaction, productivity, workforce diversity, and retention of investigators in a variety of research settings. Moreover, mentoring is fundamental component to establish multidisciplinary research projects. Also, they believe that mentoring can help create bridges within projects involving multiple disciplines, create a more diverse group of investigators, and help senior investigators to recognize the value of the mentoring process. Sing (2011) highlights the positive impact of mentoring among early career researchers and abstract submitters in resource-limited developing countries as they received online help from experienced mentors. Through mentoring, the abstract submitters were able to share their work at international conferences on the issues of preventing and managing HIV and AIDS. Among American Indian/Alaska Native (AI/AN), James, R. D., McGlone West, K., & Madrid, T. M. (2013) report that mentorship helps the mentees to share perspectives and express their excitement over minority health research presentations and experiences that reinforce their academic ambitions. In addition, mentoring enables the participants to gain a positive perspective on research. James et al. believe that mentorship programs create a foundation for college retention and recruitment into health and research careers. Barnoya, J., Monzon, J. C., & Colditz, G. A. (2013) have perceived mentoring as an approach to flexible teaching and learning to achieve learning objectives. They mentioned that mentoring with additional research training methods can build research capacity successfully and facilitate positioning the mentees in clinical or research careers.

Rabionet, S. E., Santiago, L. E., & Zorrilla, C. D. (2009) point out that becoming involved in research projects can also provide young researchers with opportunities to engage in hands-on learning and mentorships. In this case, mentors are expected to actively participate throughout the research process, by sharing skills and offering guidance during both early and later stages in the research process, from conceptualization through to dissemination. They stated that mentoring in the area of research is regarded as able to encourage systematic engagement while at the same time offering inspiration and empowerment to mentees as well as mentors. In addition, mentoring can help researchers to improve their understanding of what they have to share and what exists beyond their own discipline, as it can move across disciplines.

### **3.3.2. Mentoring and Public Health Nursing**

Articles that addressed mentoring for public health nurses advocated persuasively for its benefits. Among public health nurses, who tend to work in various roles (including providing health care, which is outside the focus of this scoping review) in an independent manner, Smith, L.S, McAllister, L.E., & Snype Crawford, C. (2001) indicated that mentoring can offer a variety of benefits, including the enhancement of clinical competencies, increased personal satisfaction, empowerment, greater political savvy, and greater satisfaction with their employment. They felt that, considering the quickly changing health care environment, mentoring can help develop a nursing workforce that will be able to respond to change creatively (Smith, McAllister, & Crawford, 2001).

Miller, L. C., Devaney, S. W., Kelly, G. L., & Kuehn, A. F. (2008) pointed out that a public health nurse requires multiple skills and a high degree of internal motivation, and mentoring can contribute to the development of these skills and attitudes. They put forth that the future of the public health care system depends greatly on how mentoring can benefit public health nurses, as mentoring can help individuals develop leadership skills, collaboration skills, as well as making them more adept at engaging in decision making, political activism and policy analysis.

According to Smith and colleagues, mentorships can be beneficial to public health nurses as they create coalitions, a public identity, and various prevention programs (Smith et al., 2001). Sowan and colleagues concluded that, overall, mentoring can provide the public health nurse workforce with the skills, knowledge and attitudes that will help them to improve population health and create a healthy future for everyone (Sowan, Moffatt, & Canales, 2004).

According to Zahner (2001), further research is necessary in order to comprehend the processes of mentoring and related outcomes. Furthermore, research should be conducted to ascertain the impact that mentorships have on mentees and mentors, and how improved mentee learning can be supported, especially for public health nursing that is population-based.

### **3.3.3. Mentoring and Epidemiology**

Chronic disease epidemiology capacity, according to Lengerich et al.'s literature review (2003), can benefit substantially from mentoring, especially in cases where this capacity needs to be built up, such as public health agencies with constrained resources and personnel systems, which results in a limited ability to recruit and employ new employees. Among senior epidemiologists, it has been noted that having the support of an effective mentor was one of the main factors leading to a successful career in epidemiology.

Chronic disease epidemiologists may also be able to develop particular competencies through the mentoring process, supporting the idea that mentorship opportunities should be increasingly developed. According to this review, mentoring has the potential to have a significant impact on the public health workforce, specifically regarding the practice of applied chronic disease epidemiology, through the role it can play in the development of particular competencies (Lengerich et al., 2003).

According to Davis (2013), like all sub-fields in public health, epidemiology is a very multidisciplinary area. It involves a range of research skills, from qualitative to quantitative methods, and from behavioral observations to laboratory work, all in the context of trying to improve population health. In response to this diversity, mentoring programs in epidemiology (and the methods used to evaluate them) should consider the variety of elements within this discipline. In some epidemiology mentorship programs, a mentee is matched with a number of mentors, with the mentee learning about a specific area of interest from a mentor specializing in that area. This is just one of a number of possible alternative approaches.

Davis also suggests that, in order to further improve mentorship programs in the field of epidemiology, it is important that the successes of other, related disciplines in this regard be investigated, so that the aspects of these programs that make them effective can be used to develop improved mentoring experiences in epidemiology. Developing a better understanding of what contributes to success or acts as a barrier to it, in terms of being a successful epidemiologist, could help clarify how these aspects of the profession should be addressed during the mentoring process .

### **3.3.4. Mentoring and Public Health Nutrition**

Mentoring has been shown to be beneficial in terms of the development of nutrition-related public health competencies (Palermo et al., 2011). Palermo's team asserts that mentoring may be developed as a means to help public health nutritionists gain various competencies, as research has shown that these competencies are best gained through experiential learning. A public health nutritionist must be able to engage in various nutrition-related activities, as well as management and administrative duties. The public health practitioners who offer mentoring to mentees should therefore be selected based on the mentees' career goals, and the mentoring process should be facilitated across a variety of settings. They believe that, overall, mentoring should be an integral part of a multi-strategy approach to the development of public health nutrition competencies, and future policies and plans related to the development of the public health nutrition workforce should include a focus on mentoring.

### **3.3.5. Mentoring and Environmental Health**

In the field of environmental health, Roberts (2010) found that novice professionals are influenced by mentoring and use the knowledge and experience they gain through the mentoring process in their environmental health careers. As such, mentoring is of importance to the development of the environmental health workforce. Mentors share their experiences with novices who are then able to use this knowledge as they develop their technical, management and leadership skills, making them better prepared to address environmental health problems.

### **3.3.6. Mentoring and Health Promotion**

Mentoring to aid individuals involved with health promotion in their development of competencies appears to have been discussed very little in the peer-reviewed literature in the time frame for this scoping review. Oliver and Aggleton (2002), drawing primarily on literature in the 1990s, discussed different models of mentoring and their potential relevance to those involved in health promotion. The authors recommended the development of a clear operational definition of mentoring, policy framework, good fit between the underlying ethos of health promotion and the model of mentoring adopted and prepare resources and administration. They also suggested that mentoring schemes need to be supported by senior managers. They stressed the importance of clear arrangements for the recruitment, training, and support of mentors, and the careful matching of mentors and mentees.

### **3.3.7. Mentoring and Rural Health**

The literature on mentoring in the context of rural health or remote health settings is also relatively small, as only a small number of mentoring programs have been reported in academic journals in recent years (Bourke, Waite, & Wright, 2014). However, Bourke and his team noted that exposing rural and remote health professionals to the mentoring process might contribute to their development, helping them to focus on the achievement of goals and providing support when they face particular difficulties. While programs targeting the rural and remote health workforce have not tended to focus on supporting distinct individuals, it is hoped that more mentorships will be implemented in this area to benefit individual practitioners.

## **3.4. Types and Models of Mentoring:**

There are different ways in which a mentoring system for the development of the public health workforce can operate. This review characterized these ways or models described in the articles as: one to one mentoring (n=2), peer mentoring (n=3), mentoring circles (n=1), mentoring partnerships (n= 2), on-line mentoring (n=2),

apprenticeship mentoring (n=3), trans model/cis model (n=1), multiple models (n=6), as some references cover many models), mentoring during the field experience (n=1), conceptual model (n=1), multifaceted mentoring model (n=1), and articles with unspecified models (n=4).

### **3.4.1. One to One Mentoring**

One-to-one mentoring is mentioned in numerous articles in the literature included in this review. Barnova, Monzon and Colditz (2013), who reported on a Guatemalan mentoring program, refer to it as a form of dyad mentoring, where a mentee is paired with a senior mentor. They specify that the purpose is for the mentor to provide the mentee with guidance concerning a particular project and that outcomes (such as publications) should be measurable. Finch and Poulos (2008) report on a mentorship program related to a grant, where a mentor from a different research group mentors the mentee in order to broaden the mentee's knowledge, skills, and experience in relation to public health over the course of the grant. Kreuter et al. (2011), reported on a public health mentorship program as well, noting that the one-to-one mentorship style was attractive to mentors as it provided them with a keen graduate student for their project team, as well as being free of cost and having salary support attached to it.

### **3.4.2. Peer Mentoring**

According to Thorpe, Tunny, Adams and Palermo (2013), peer mentoring is particularly valuable in situations where reciprocity and equality must be ensured. James, West and Madrid (2013) regarded peer mentoring as beneficial to groups of students, allowing them to discuss potential career opportunities while avoiding the possibility of cultural marginalization. In addition, this style was shown to lead to a reduction in cultural isolation and benefitted students when they engaged in later professional meetings. Forsyth and Stoff (2009) similarly reported that peer mentoring offers novice public health workers or students social support, socialization into the academic realm, clear role models, and new individuals to possibly collaborate with.

### **3.4.3. Mentoring Circles**

Palermo, Hughes and McCall (2010) reported on mentoring circles in the Australian public health context as involving a mentor and a small group of peers who gather to share feedback and advice that will be useful in terms of the mentees' professional development. The authors state that this mentorship style could help increase the number of mentees, allow for fewer mentors with fewer responsibilities, and broadly help promote a mentoring culture within public health and other disciplines.

### **3.4.4. Mentoring Partnerships**

Anderson, Richmond and Stanhope (2004) reported on a mentoring partnership program, whereby baccalaureate students were matched with a preceptor and a public health agency. Through their mentorship with a practicing public health nurse consultant, students gained the opportunity to be involved in practicum placements, and the experience benefitted both the college of nursing and health departments (Anderson et al., 2004). In terms of how this mentorship style is facilitated, Rube, K., Veatch, M., Huang, K., Sacks, R., Lent, M., Goldstein, G. P., (2014) reported that the program they focused on (a built environment mentoring program) involved group calls on a monthly basis, occasional individuals calls, webinars on a quarterly basis, and two face-to-face "Fit Nation" conferences. As Sowan, Moffatt and Canales (2004) explain, their mentoring partnership model considered both preceptor needs (roles, responsibilities, etc.) and how to offer students extra clinical opportunities. All members of the partnership are regarded as bringing valuable knowledge, skills and experience to this mentorship. While they act in various ways (directly participatory or supportive), each is a coach, helping the other to acquire new skills and abilities that will benefit their professional practice.

### **3.4.5. On-line Mentoring**

In the case of on-line mentoring, Singh (2011) notes that one such program simply involved mentors and mentees participating in two-way communication, through the exchange of emails concerning mentees' writing and topic choices, as well as how to develop abstracts (the focus of the program). James, West, and Madrid (2013) reported

on a similar program in which mentors and students, with the support of nursing faculty coordinators, worked on course assignments together, shared their experiences in relation to public health, and solved public health problems, all through e-mentoring channels.

### **3.4.6. Apprenticeship Mentoring**

Matovu, J. K. B., Wanyenze, R. K., Mawemuko, S., Wamuyu-Maina, G., Bazeyo, W., Olico-Okui, et al. (2011) reported on an apprenticeship mentoring program conducted in Uganda in relation to HIV/AIDS program leadership. Through a fellowship program, the fellows/mentees worked with host and academic mentors. The academic mentors provided the mentees with guidance in their writing of reports, scientific paper preparation, and proposal writing, as well as playing other roles. In the case of host mentors from host institutions, they offered mentees a supportive environment in the field, allowing the mentees to share ideas and experiences as well as challenges they faced. As the main source of everyday contact for the mentees/fellows, the host mentors provided support, encouragement, and supervision during the fellows' field attachment, ensuring that they learned about management and leadership, challenges faced, and career opportunities, assisting the fellow in integrating into the host institution.

### **3.4.7. Trans / Cis Model**

Kahn and Greenblatt (2009) reported on "trans mentoring" as a relatively new form of mentoring, where a mentee is paired with a mentor who comes from outside of the mentee's main research area, in contrast with "cis mentoring," where both mentor and mentee share the same main area of focus. In the case of trans mentoring, mentor-mentee matching is particularly important, to ensure that there is no conflict and that the mentor is willing to not focus exclusively on their discipline, but will benefit the mentee in their own discipline, in terms of stimulating networking and collaboration opportunities. The greater independence associated with this mentoring style, facilitated by the mentor and mentee focusing on different areas, is seen as a primary benefit, but more research is required to fully outline the differences between and relative advantages of trans and cis mentoring styles.

### **3.4.8. Mentoring During the Field Experience**

Hayes (2014) reported on a mentorship program that took place during field experience through Hawaii's Department of Health, whereby students (mentees) learned to apply skills developed in the classroom first-hand in a field setting. Hayes (2014) regarded this program as mutually beneficial to both mentor and mentee, as mentors tended to learn from students while providing them with guidance. This specific program led to various outcomes, including the production of fact sheets, reports, and conference presentations. Ronczkowski, Lafollette and Bellinger (2004) reported that communication between mentorship coordinators and mentees (in this case, through daily logs and weekly reflections emailed to the coordinator, thus an example of on-line mentoring as well to an extent) was essential to this form of mentoring.

### **3.4.9. Multifaceted Mentoring**

Rabionet, Santiago, and Zorrilla (2009) reported that multifaceted mentoring involves the establishment of multi-institutional collaborations. Through these arrangements, systematic and continuous training is provided to support competency development, in order to facilitate cross-disciplinary research teams involving both mentors and mentees. They held that this style of mentoring is appropriate to address health disparities, and ideally creates relatively long-lasting relationships between mentor and mentee.

### **3.4.10. Conceptual Model**

Lengerich et al. (2013) reported on a conceptual model for mentoring, wherein mentees employed by a public health agency were paired with a senior epidemiologist to work on specific competencies. Outcomes of this model included increasing public health capacity in relation to chronic disease epidemiology specifically, and improving the public health workforce more generally. Combined with other mentorship programs, this model could help in developing a mentorship program to be implemented among chronic disease epidemiologists in particular.

### **3.5. Mentors' Perceptions of Benefits**

This review found many benefits perceived by mentors, as reported in the articles reviewed. They include: recognition from the mentor's organization (n=3), sense of reward or credits (n=1), professional growth cultural competence training (n=2), improving awareness of cultural and community issues, building a social network (n=2), reduced isolation (n=1), refreshed knowledge and skills (n=3), reinforced learning ), personal growth or satisfaction (n=5), and others (n=4). Many articles did not mention what mentors found to be specific benefits (n=16).

#### **3.5.1. Sense of Reward or Credits, Professional Growth**

Zahner (2006) asserted that when mentors benefit from mentoring through rewards and recognition, in addition to being supported in their role as mentors, they are more committed mentors. These rewards could include status as adjunct faculty, access to library and computer services, recommendation letters, scholarly journal subscriptions, tuition waivers, opportunities for networking, celebrations of mentor appreciation in the form of special events, honorary certificates, and invitations to presentations or conferences. Zahner remarked on a general lack of appreciation of the benefits of being a mentor, and asserted that it is a good idea to emphasize incentives and benefits at the institutional level, in terms of how they can facilitate professional development and career advancement.

#### **3.5.2. Improving Awareness of Cultural and Community Issues**

Browne, Thorpe, Tunny, Adams and Palermo (2013) noted that mentors can gain cultural competence and become more aware of community issues through their mentorships, leading to increased confidence when working within communities. This is facilitated as mentors and mentees exchange information and gain a better appreciation of one another's respective roles and cultures.

### **3.5.3. Building a Social Network**

Browne et al. (2013) noted that mentorships can be professionally beneficial, as they facilitate the formation of mutually respectful, productive working relationships. Many of the mentorship participants referred to the same study felt that these strong relationships would endure beyond the limited scope of the mentorships, thus leading to a broadening of the social networks of both mentors and mentees.

### **3.5.4. Reinforcement of Knowledge and Skills**

Browne et al. (2013) also found that the mentorship experience benefitted mentors in terms of refreshing the knowledge and skills that they had developed during their own earlier training, thus reinforcing their previous learning. Miller et al. (2008) similarly found that mentorships led to improved skills and knowledge, which may have helped to facilitate various professional advancements in terms of taking on leadership positions and moving to more specialized practice areas.

### **3.5.5. 3.5.5 Personal Growth or Satisfaction**

Bourke et al. (2014), Lengerich et al. (2003), Miller et al. (2008), and Smith et al. (2001) reported that mentors may also benefit from mentorship involvement in terms of feeling more excited about their field of practice, more enthusiastic and satisfied in general, more creative, more positive about knowledge and skills sharing, and having a sense of being rewarded. In addition to this increased sense of satisfaction, mentors experienced personal growth.

## **3.6. Mentors' Perceptions of Facilitators**

This review found that some of the articles reviewed reported facilitators of mentoring, as perceived by mentors. These facilitators included: a supportive workplace

environment (n=1), supportive program coordinator (n=1), having a specific health promotion project to work towards (n=1), work based on experiential learning (n=1), initial meetings (n=1), competency self assessment (n=1), cost effectiveness (n=1), affordability and availability of resources (n=1), technology that supports the program (n=1), and friendliness and collegiality (n=2). Many articles did not report anything specifically in this regard (n=21).

### **3.6.1. Supportive Program Coordinator**

According to Browne et al. (2013), a key facilitator of a successful mentorship program is a supportive program coordinator, meaning a coordinator who facilitates mentorship-related activities, provides crucial input, and follows up with mentors and mentees to ensure that they are moving forward in a productive manner.

### **3.6.2. Having a Specific Health Promotion Project to Work Towards**

Browne and colleagues found that having a specific health promotion project to work towards can enhance the positive outcomes of the mentoring partnerships, since it provides a structure for professional development for the mentors and the mentees.

### **3.6.3. Initial Meetings**

One article noted that having initial meetings can help facilitate mentorships, as they provide structure to the mentorships, especially when the mentor and mentee are unfamiliar to one another (Browne et al., 2013).

### **3.6.4. Competency Self Assessment**

The article by Browne and colleagues reported that self-assessment regarding competencies helps facilitate effective mentorships, by helping to identify priority areas and assisting in the creation of a learning plan in response to these priorities (Browne et al., 2013).

### **3.6.5. Supportive Technology that Supports the Program**

Bourke and colleagues noted that technology can help facilitate mentorships especially in rural and remote areas, where mentors and mentees might not be in the same location. They suggested that use of technology-mediated communication in mentorships might lead to more reflective and truthful mentor-mentee relations (Bourke, Waite, & Wright, 2014).

### **3.6.6. Friendliness and Collegiality**

Lengerich et al. (2003) noted that when mentors establish a support network based on collegiality, this helped facilitate effective mentorship programs.

## **3.7. Mentors' Perceptions of Challenges**

This review found that many articles reported on challenges that were perceived by mentors. These included: a dearth of mentoring role models (n=3), lack of long-term institutional support for mentoring (n=4), lack of financial incentives for mentoring (n=2), heavy workload (n=4), time constraints, large number of students participating (n=1), and others (n= 3). Other articles did not mention anything in this regard (n=14).

### **3.7.1. Dearth of Mentors**

According to Forsyth & Stoff (2009), a key challenge for mentors is that, due to the lack of mentors generally available, they may feel obligated to commit themselves beyond their realistic capabilities, which could reduce the quality of their mentoring as well as their productivity.

### **3.7.2. Lack of Long Term Institutional Support for Mentoring**

Browne et al. (2013) noted that a lack of support from management and/or administrators can lead mentors to feel unappreciated and miss the benefits that mentorship programs offer. They suggested that mentors be supported by institutions sufficiently at every level of the organization, in terms of being given adequate time to

dedicate to mentoring. They held that it was important that institutions track the progress of mentorships, offer rewards to promote participation, and develop policies to integrate mentorships with other institutional processes (Browne et al., 2013).

### **3.7.3. Lack of Financial Incentives in Mentoring**

Jeste et al. noted an important challenge in the lack of compensation given to mentors and mentees, in the forms of either financial support or incentives, during the mentorship process (Jeste et al., 2009). This is arguably related to the issue of time constraints, as mentors have suggested that they do not have much time to meet due to being busy with their jobs (Browne et al., 2013). If rewarded financially for being mentors, the mentors would likely spend more time on mentoring, as it would not detract from their income to the same degree.

### **3.7.4. Time Constraints**

In Browne et al.' study, the mentors reported that they were very busy in their jobs, and found it difficult to find time to meet with each other on a regular basis.

## **3.8. Mentees' Perceptions of Benefits**

This review found that many articles reported on benefits of mentorship that were perceived by mentees. These benefits included: training (n=5);improved knowledge , improved research skills , competency development , understanding of and appreciation for public health (n=2);personal growth (n=6); contribution to peers' learning (n=1); strong socialization (n=2);facilitation of a smooth transition to professional life (n=2); focused goals , career development , development of professional identity (n= 4);improved commitment to work , increased motivation (n= 1);and others (n=4). Other articles did not mention anything in this regard (n=10).

As Smith et al.(2001) mentioned, mentoring provides mentees with opportunities for promotion, career development, personal and professional growth, and a strong socialization with colleagues. Other less tangible benefits, like the good feelings

associated with sharing knowledge, seeing increased confidence and skills in a student over the duration of the practicum, and seeing them grow in their public health careers, are some of the personally fulfilling benefits of mentoring and building the public health epidemiology workforce (Hayes, 2014).

Lengerich et al. noted that mentees develop a more robust professional identity, feel empowered, adjust to pressures, and formulate and implement changes in their professional lives. Through their work with mentors, mentees define goals, receive encouragement, and develop new or improve current skills or knowledge. They felt that mentees gain a bridge to professional maturity through the role modeling and increase visibility and opportunities provided by their mentor (Lengerich et al., 2003).

### **3.9. Mentees' Perceptions of Facilitators**

This review found that many articles noted facilitators of mentorship that were perceived by mentees. These facilitators included: a supportive learning environment (n=2), multiple mentors (n=1), workshop series (n=3), interacting as peers (n=1), frequency of contact with mentors (n=2), site visits (n=3), combining mentoring with practical on the job experience , tailored mentoring (n= 1), establishing expectations or a learning plan early (n=2), qualitative portfolios (n=1), periodicity or continuity of the activities (n=2), access to free websites with learning resources and materials (n=1). Other articles did not mention anything in this regard (n=17).

#### **3.9.1. Workshop Series**

A key facilitator of mentorship programs reported by Rabionet, Santiago and Zorrilla (2009) is the use of workshops that allow mentees to gain and offer feedback from their peers and mentors regarding project-related issues.

### **3.9.2. Site Visits**

Ronczkowski, Lafollette, & Bellingar (2004) reported that visiting various sites in the field can make mentorships more exciting, as site visits provide mentees with an opportunity to practice in the field, allowing them to emphasize their accomplishments, and provide mentors with an opportunity to offer feedback on mentee performance in this regard.

### **3.9.3. Establishing Expectations or Learning Plan Early in the Process**

Miller, Devaney, Kelly, & Kuehn (2008) noted that outlining expectations early in the mentoring process, for both mentors and mentees, can help create a basis for tracking progress and evaluating outcomes, and developing a set of competencies can help facilitate this. Mentors should outline their responsibilities as coaches, while mentees should focus on their goals, both professional and personal, in relation to the mentorship.

### **3.9.4. Periodicity or Continuity of the Activities**

The creation and sustaining of personal and professional relationships (including mentoring relationships) can benefit from the periodicity or continuity of mentorship activities (Rabionet et al., 2009).

## **3.10. Mentees' Perceptions of Challenges**

In number of the articles reviewed, specific challenges for mentees were noted including: novelty of mentorship concepts (n=1), time constraints (n=2), challenges of working with others, e.g. personalities (n=2), poor mentors' skills (n=2), inadequate communication with mentors (n=1), low level of commitment (n=1), lack of clearly articulated outcomes for relationship (n=1), and others (n=1). Other articles did not mention anything in this regard (n=19).

### **3.10.1. Challenges of Working with Others, e.g. Personality Conflicts**

In Matovu et al. (2011) article, fellows reported that they found it challenging to balance views and expectations from multiple stakeholders (i.e., academic and host mentors as well as the program), especially in the face of divergent views. To address this challenge, the program organized joint quarterly meetings attended by the academic and host mentors as well as the program staffs to ensure harmony in case of divergent views.

### **3.11. Mentors' Needs**

A number of needs have been identified by mentors in the literature reviewed, including: further training (n=3), having a specific health promotion project or event to work towards (n=2), structuring the process of work-based learning (n=2), having more input and follow-up from the project coordinator (n=2), having adequate time to sustain an ongoing relationship with the mentee (n=1), and others (n=1). Many of the included articles did not mention reports by mentors of their needs (n= 21).

#### **3.11.1. Further Training**

Browne et al. (2013) found that mentors felt that more training and support could help them in their mentoring, especially in terms of identifying best practices to follow.

#### **3.11.2. Having a Specific Health Promotion Project or Event to Work Towards**

Lengerich et al, (2003) noted that mentors can also benefit from having specific projects or other objectives to work on with their mentees, which should be established relatively early on in the mentorship. Moreover, the established objectives should be in line with the mentee's developmental needs in relation to their profession and their professional interests. Notably, these objectives can also include the development of specific competencies.

### **3.12. Public Health Mentees' Needs**

A number of needs have been identified by mentees in the literature reviewed, including: tailoring to meet the needs of earlier trainees or advanced trainees (n=1), mentees need to feel inspired and empowered (n=1), mentees need challenging assignments to encourage learning and development of skills (n=1), appropriate matching of the mentors and mentees (n=2), and others (n=2). Other articles did not mention anything in this regard (n=18).

#### **3.12.1. 3.12 .1 Tailoring to Meet the Needs of Earlier Trainees or Advanced Trainees**

Tailoring to meet the specific needs of mentees can be beneficial, as some mentees may need a significant amount of support while those who are more advanced may be capable of working with greater independence (Jeste et al., 2009).

#### **3.12.2. The Mentees Need to Feel Inspired and Empowered**

Rabionet et al. mentioned that when mentees feel inspired and empowered, it can offer them a great deal of self-confidence as they enter the intimidating research environment (Rabionet et al., 2009). Inspiration and empowerment can also help in mentee recruitment and retention.

#### **3.12.3. The Mentees Need Challenging Assignments to Encourage Learning and Development of Skills**

Forsyth and Stoff said that in order to make mentorships interesting and beneficial for mentees, it is worth giving them challenging assignments, such as teaching, and writing and reviewing manuscripts and grant applications (Forsyth & Stoff, 2009).

#### **3.12.4. Appropriate Matching of Mentors with Mentees**

According to Jest et al., (2009), mentors and mentees should be paired according to their area of interest, their experiences in relation to public health, and their professional characteristics and expectations.

#### **3.13. Authors' Findings of the Attributes of Successful Mentoring Relationship**

This scoping review has revealed a number of attributes that were purported to characterize successful mentoring relationships. These factors that are based on the research studies and/or the authors include: developing a mentoring philosophy, clear articulation of the mentoring structure, expectations, and outcomes (n=6), training the mentors (n=3), good communication (n=3), periodic evaluations by mentors (n=2), formalizing the relationship (n=2), considering the mentee's mentoring style (n=1), minimizing time constraints (n=1), resolving difficulties (n=1), organizational support (n=1), a policy framework (n=1), acknowledging cultural differences (n=1), and others (n=6). Other articles did not mention anything in this regard (n=16).

Although few evaluations and research projects have been published, the authors such as Palermo et al. (2011), Brown et al. (2013), Bourke et al.(2014), Hays(2014), Khan and Greenblatt (2009), Smith et al.( 2001), Forsyth and Stoff (2009) , Davis (2013), and Jeste et al. (2009) suggest factors that may significantly influence the success of mentoring relationships. Such factors include mentor training, developing a mentorship philosophy, strong communication skills, a well-articulated mentorship structure, clearly outlines expectations in terms of outcomes, considerations of mentoring technique, the recognition of cultural differences, meeting frequently, the minimization of time constraints, organizational support, mentors' evaluation of mentees, and the resolution of any difficulties that arise over the course of the mentorship. Furthermore, the mentor's personal attributes and their professional knowledge, skills and experience can have a major impact on the mentoring relationship's degree of success. When mentors motivate students by maintaining a close relationship with them,

a deeper professional bond develops between mentor and mentee, leading to a more successful relationship.

### **3.14. Authors' Findings of the Important Elements of Mentoring Programs**

Although evidence of what is and is not working in mentoring programs is needed, this review noted various key elements that the authors endorsed as characteristics of successful mentoring programs. These include focusing on mentor recruitment, training, availability and retention, communicating with the mentee before formal training, providing a thorough orientation to the work setting, providing a supportive environment for both the mentee and the mentor, formal preparation, clear identification of the mentoring objectives, having a well-defined set of competencies, establishing a framework for evaluating mentoring relationships, and carefully matching the mentors to mentees.

Bierema and Merriam (2002) argued that, since mentoring is more about process than product, certain key elements are important to be in place at the outset of a mentoring program. They include commitment by both mentor and mentee to the work of the relationship that is grounded in mutual respect, trust, and comfort. In addition to the individuals' commitments to the mentoring relationship, Akin and Hilbun (2007) indicated that support of the organization is critical, such as giving permission for the mentoring interaction to occur on work time and allowing the use of agency resources. Moreover, the ability for the pair to develop "just in time" strategies to answer questions and solve problems by e-mail or telephone is essential to accomplishing the agreed-upon outcomes, which in turn moves the relationship forward (Dahl, 2005).

Lengerich et al. wrote that using multiple mentors from diverse backgrounds, and tailoring mentorship programs to the specific gender and race/ethnicity characteristics of the mentees may also enhance effectiveness of mentoring programs (Lengerich et al., 2003).

Rabionet and colleagues asserted that a program needs to identify the best candidates through observing their interaction with others during specific workshops in which a project could be conceptualized. The selection of candidates with the social skills, attitude, training, and commitment will be key to the success of the program. However, a focus on recruitment, training, and the retention of participants is warranted more research (Rabionet, Santiago, & Zorrilla, 2009). According to Zahner (2006), methods used in mentors' preparation and development programs have included written manuals, monographs, courses, seminars, workshops, videotapes, and web modules.

### **3.15. Authors' Recommendations**

#### **3.15.1. Development of Operational Definition of Mentoring**

Although mentoring can be difficult to define, Oliver & Aggleton (2002), and James et al. (2013) have noted that there is a strong need for a working definition of mentoring, which should be arrived at by various stakeholders. This definition should include what defines mentoring, what it means to achieve, and a policy framework outlining how mentors and mentees can be made aware of the aims and expectations of mentorship programs. Such a definition would help facilitate the application and evaluation of mentorship programs.

#### **3.15.2. Working on Specific Objectives**

Lengerich et al. (2003) recommended that mentors and mentees establish specific objectives early in their relationship, to help provide the mentorship with necessary structure. They point out that objectives should be established while considering the mentee's professional interests and developmental needs in relation to their profession. Optionally, these objectives could include the development of specific competencies.

### **3.15.3. More Extensive and Extended Mentoring Support and More Mentoring Programs**

Palermo et al. (2011), Browne et al. (2013), Singh (2011), and Finch & Poulos (2008) noted that organizations should support mentorships through formalizing them and offering training to mentors. With organizational support, it is possible to develop a greater number of mentorship programs as well as more extensive ones.

### **3.15.4. Encourage Retention**

Jeste et al. (2009), Sowan et al. (2004), and Barnoya et al. (2013) noted that one area of focus, in future planning, will be identifying strategies to ensure project sustainability.

### **3.15.5. Encourage E-Mentoring**

According to Miller et al. (2008), a greater number of mentorships could be provided through e-mentoring, as it allows conversations to take place on-line and gives the mentor-mentee relationship a higher degree of objectivity. also note that e-mentoring allows for significant flexibility, so that mentors and mentees can combine their normal work and their responsibilities with regards to the mentorship.

### **3.15.6. Involve Stakeholders**

Involving various stakeholders in mentorship programs is also important. The stakeholders who should be brought together to help develop national and local mentorship programs should include universities, medical schools, and funding agencies (Jeste et al. 2009) .

### **3.15.7. Evaluate Mentoring Programs**

Mentoring programs should also be evaluated regularly, to understand what successes and challenges exist. Evaluation should include both mentors and mentees, as well as any coordinators who are involved. The opinions of mentors and mentees can be collected through various methods, including questionnaires, web-surveys,

interviews, focus groups, attendance tracking and activity logs. It has also been suggested that multiple methods should be used in this regard. Key areas to focus on in these evaluations include process-related activities, the achievement of learning goals, and the mentors and mentees' perceptions of personal and professional growth that occurred as a result of their involvement in the mentorship program. Through such an evaluation, it can be determined if further mechanisms are necessary to further support the confidence and skill development of mentees (Forsyth & Stoff, 2009).

## Chapter 4. Discussion

This scoping review of the literature concerning mentoring in public health has shown mentoring to be an important concept in relation to public health, although some difficulties regarding this concept have also been recognized over the course of this research. The review found that although mentoring may be a common practice in medicine, nursing, and health sciences initiatives, mentoring appears less common at this time in relation to the field of public health, assuming that the paucity of publications since 2000 is a good indicator. There is a lack of documentation and discussion regarding the particular strategies and methodologies employed in public health mentoring, as well as their outcomes. While there is some discussion of the importance of pairing mentors and mentees in an effective manner, specifics of how this can be achieved are not often discussed and are rarely evidence-based.

A challenge concerning mentoring in public health is a general lack of conceptualization, as there is neither a generally accepted set of definitions nor a widely shared conceptual framework for undertaking mentoring in public health and evaluating its outcomes. A greater understanding of the factors that support successful mentoring, to aid in the creation of programs that lead to the development of effective mentors, is needed.

Mentoring has been described as an organized process linking a less skilled and experienced person with someone from whom they willingly accept advice, knowledge, analysis and feedback on how they can achieve their goals. While the definition of mentoring remains relatively open, it clearly involves certain elements, such as a relationship, contextualized by adult learning, through which professional development goals might be achieved, and reflecting on and re-examining these goals.

Mentorship has been put forward as a promising approach to augment the competency development of public health students and new professionals seeking to

advance their careers. As Lengerich et al. (2003) explain, in the area of public health mentoring has already been shown to help individuals develop competencies. For example, it has been found that when mentorships focus on building certain competencies, such as in the practice of applied chronic disease epidemiology, mentoring can have a significant positive impact on the capacity of the public health workforce in this regard. It is arguable that mentorships could also be used to make public health employees more effective at their jobs with regards to the various essential services that the public health sector offers populations.

#### **4.1. The Mentoring Process**

In the past, mentoring has mainly been regarded as a top-down approach to educating novices, where the mentor is in a higher position due to their wealth of experience (Miller et al., 2008). The literature reviewed here suggests that such an approach is still very common, and perhaps the typical arrangement.

The mentoring process has been elaborated in detail by the author of several books on mentoring and mentorship. Lois Zachary asserts that it is helpful to regard mentoring as passing through a number of stages, the first of which is preparation (Miller et al, 2008). This stage involves finding a suitable match between mentor and student in order to facilitate education. During this stage, if a mismatch occurs in the mentor-mentee relationship, a different mentor may be required. The second phase Zachary describes concerns an interactive negotiation of the relationship. This involves deciding on the responsibilities of both the mentor and the student with regards to the learning process, how the attainment of goals will be measured, and how to eventually arrive at the conclusion of the mentoring relationship. During phase 3, enabling occurs, as this is the stage during which learning occurs and the mentor-mentee relationship is at its strongest. This phase of the relationship between mentor and mentee should ideally be characterized by trust, respect, effective communication, the open sharing of ideas, and comfort. The final phase of the mentoring process, phase 4, concerns closure and the end of the relationship. The relationship should be concluded at a clearly established

endpoint, according to a previously planned exit strategy. When wrapping up the mentoring process, as Miller and colleagues recommend, mentor and mentee should assess the learning situation, reflect on the positive and negative elements of the mentoring process, and evaluate how well predetermined learning outcomes were or were not achieved (Miller et al, 2008).

Some authors have noted or advocate for newer conceptualizations of mentoring. For example, some endorse alternative forms of mentorship that call for mentor and mentee to share a more interdependent relationship, wherein co-learning takes place in a context of greater collaboration. In Darwin's version of the mentoring process, as the mentor and mentee develop their relationship, the mentor eventually provides a decreasing amount of input as the mentee takes an increasing amount of charge of their own self-directed learning (Darwin, 2000). Thus, the mentor becomes less responsible for facilitating the relationship and merely offers assistance when the mentee asks for it specifically, as the mentee spends an increasing amount of time practicing and working on their own. At the end of the relationship, the mentor should help the mentee to recognize what the latter has learned over the course of the process, and help them to become a more effective self-directed learner in the future.

Evidently, students agree that mentoring could be beneficial to them in terms of their future careers. As Furgeson et al. (2008) note, students feel that mentorships existing outside of the normal curriculum could offer them more concrete experiences, as opposed to abstract ones, as well as facilitate networking and the strengthening of their relationships with professional associations. Students are likely to graduate with a number of questions, and mentorships can provide them with important opportunities to learn, for example, what their professional practices will be like, what sorts of problems they may face in the workplace, how to deal with those problems, and how the students can find the employment position that is most appropriate for them. Offering mentorships to students outside of the standard curriculum provides them with the opportunity to emerge from their education more fully developed as professionals, and thus arguably more prepared to enter the workforce.

The positive impact of mentorships on students' careers has been affirmed by a number of studies conducted in this regard. As Furgeson et al. (2008) explain, investing in students' professional development is basically an investment in the future of the professions that those students will enter. Ensuring that students have been made familiar with both professional values and possible issues ensures that these students will be prepared for their future professions. In the area of public health, professional development opportunities already exist, but they tend to be implemented inconsistently, focus on group development as opposed to the individual, and lack adequate follow-up. While these opportunities may help individuals develop skills to a limited extent, they do not support the individual in developing the relevant expertise and becoming effective at using these skills in an employment setting. A mentoring relationship increase the likelihood that individuals not only develop skills but are also coached with regards to how to apply these skills in their professional lives (Risley & Cooper, 2011).

Moreover, mentorships could be especially valuable for public health organizations that depend upon a workforce that must be constantly developed as new research and practices come into effect. While mentorships offer benefits to mentees and the mentors, they are also likely to benefit public health agencies that offer these mentorship programs. Organizations with mentorship programs increase productivity in the areas of technical skills, individual performance, leadership, and motivation. Participants in mentorship programs exhibit increased loyalty and commitment to the organization, resulting in reduced turnover and improved retention of skilled staff. In addition, the presence of mentorship programs gives companies a competitive edge in their hiring and recruitment efforts. These organizational benefits may be important reasons that businesses develop mentorship programs (Lengerich et al., 2003).

In terms of where public health mentoring practices are most commonly used, an examination of the relevant literature suggests that they are most commonly used in research and practice as a broad category, as well as in public health nursing. Data on mentoring in the area of research and practice have demonstrated that it can have a significant positive influence on novice researchers. Specifically, it can help mentees become more engaged in their field and more empowered. This is facilitated in part through providing mentees with more access to opportunities to engage in hands-on

learning alongside their mentors. In public health nursing, mentoring has similarly been shown to have a positive influence, especially in terms of mentees gaining enhanced clinical competencies, being more personally satisfied, experiencing greater empowerment, being more savvy in relation to politics, and being more satisfied with their employment situation. Overall, mentoring can assist those in public health nursing to gain the skills, knowledge, and attitudes that will help them to effectively support public health. In addition, mentoring has been shown to benefit the professional development of individuals engaged in epidemiology, public health nutrition, environmental health, and rural health. Further research is required to determine whether mentoring also benefits individuals engaged in areas such as health promotion.

Regarding the various models of mentoring, there is a wide variety for public health organizations to choose from. The one that most people would likely be familiar with is the one-to-one model, where mentor-mentee dyads meet together so that the mentor can provide the mentee with assistance in building knowledge, skills, and related competencies through sharing on a one-to-one basis. With the advent of the Internet, this form of mentoring can also occur as on-line mentoring, where the same basic interaction takes place but via the Internet. Another model that has been discussed in this review involves multiple mentees, such as is the case with peer mentoring. In peer mentoring multiple mentees may join together, in order to be less isolated as a group (these individuals are often culturally marginalized or face some other form of marginalization) as they gain the benefit of their mentor's experience. The mentoring circle model is very similar to the peer-mentoring model, although the emphasis is on shared characteristics among the mentees in relation to professional development, rather than marginalization.

Other models focus to a greater extent on the context of the mentorship and how organizations might benefit more from the mentorships, as is the case with mentoring partnerships. In this model, public health agencies are an integral part of the mentoring relationship, whereby mentees are involved in practicum experiences that act as mentoring experiences for them while also providing health organizations with useful workers in the form of the mentees. The apprenticeship mentoring model is quite similar, as host institutions match mentors and mentees and the mentees' experience benefits

themselves as well as the host organization that provides them with the fellowship. Another model that is closely related to these is the mentoring during field experience model, which involves mentees being mentored as they undertake a practicum that involves field experience. A similar but different model is the multifaceted mentoring model. In this model, specific institutions also guide the mentorship experience, but a greater variety of institutions are involved, allowing mentees to gain experience in a wider variety of areas.

A different way of looking at mentoring is offered by the trans/cis mentoring model. The cis model is arguably more common, whereby mentees gain experience in their own field, but the trans model involves pairing mentees with mentors whose field is different from their own. The trans model would therefore work well in combination with the multifaceted mentoring model, where multiple institutions are involved that likely have different areas that they focus on. One example of the cis model is the conceptual model, whereby mentees are mentored in specific competencies by a senior epidemiologist. Overall, it is encouraging to see that mentoring models are being developed to meet various needs on the part of public health organizations as well as mentees, and it will be interesting to see what new additional models of mentoring are developed as this area of practice continues to progress as a field of study.

No matter what model of mentoring is employed, research has revealed that mentoring relationships are likely to be most productive when they are characterized by a number of positive attributes. Since the mentors in the relationship are the individuals with more experience and who likely have more influence on the directions that the relationship moves in, much of the discussion in this regard has focused on mentors. It has been suggested that training mentors can be valuable, as well as having a philosophy for the mentors to adopt that guides their mentoring work. The responsibility for the relationship is not only the mentors', however, as it is also beneficial when organizations develop a well-outlined mentorship structure to help mentors understand how they should implement the mentorship. Similarly, the evaluation of mentorship programs can offer useful insights into which aspects of the mentorship either are working or are not working, which can help in improving such programs in the future. The evaluation of mentees by mentors can play a similar role. Furthermore, since

mentoring largely involves the sharing of knowledge and skills between a mentor and a mentee, it has been suggested that mentors should have strong communication skills in order for the relationship to be more effective. This would arguably help facilitate the development of a deeper bond between mentor and mentee, which is another attribute of successful mentoring relationships, while a lack of time constraints and organizational support can also be beneficial in this regard, as a deeper bond takes longer to achieve and requires support. Another key attribute is to overcome any difficulties between mentor and mentee as quickly as possible. The recognition of cultural differences could also help some difficulties to be avoided. When mentorship programs and mentors take these various attributes into account, it becomes increasingly likely that the mentoring relationship will be positive and more productive for both mentor and mentee.

The elements that the literature suggests should be included in mentorship programs include basically all of the positive attributes of mentoring relationships discussed above. It is understandable that researchers suggest that mentorship programs include the various elements that will make mentoring relationships successful. One aspect of mentorship programs that is not noted above, however, is the careful matching of mentors with mentees. While it is important to recognize differences and to overcome difficulties, in some cases mentors and mentees might be so poorly matched that there are difficulties in this regard that cannot be overcome. Since individuals will not always be known personally before matches are made, it may be especially difficult for organizations to match mentors with mentees in a suitable manner all of the time. However, for the success of mentoring relationships and well as mentorship programs more generally, it is important that the matching of mentors with mentees be carefully considered.

Not surprisingly, many of the recommendations made in the literature regarding how to facilitate mentoring could also be mentioned as positive attributes of successful mentoring relationships or programs. In the literature, mentors suggested a number of factors that could help facilitate mentoring, such as having a supportive workplace and mentorship program personnel to offer the programs, making the program work-based and/or having a specific goal to work towards, and having access to useful technology to support the program as well. On the side of the mentees, they have suggested in the

literature that a supportive environment and work-based learning are also important, but they also focused more on the role of mentors. The mentees note, for example, that having a greater number of mentors and more meetings with mentors could help facilitate mentorships, as well as more tailored mentoring, and setting plans and goals for the mentorship early in the process. Paying greater attention to these factors could lead to the further development of other elements that might help facilitate mentoring, such as improving mentorship programs generally.

Another way of approaching the issue of how to facilitate more mentorships is to focus on the challenges that mentors and mentees face in this regard, according to their own perceptions, with the purpose of overcoming or ridding programs of these challenges. Among mentors, a number of challenges are mentioned in the literature. These include a lack of role models, the relatively small number of mentors, which likely contributes to the heavy workload that mentors bear and increases their time constraints, as well as the lack of institutional support and financial reward for mentoring. Among the mentees, a lack of familiarity with mentorship concepts was also mentioned, suggesting that both mentors and mentees could benefit from knowing more about the mentorship process. A lack of skill on the part of mentors is also noted as a challenge by mentees, suggesting that both mentors and mentees could benefit from mentors having better role models and training. Other challenges mentees mention in the literature include the challenge of working with others, or the potential for personality conflicts, a lack of communication with their mentors, and a lack of clearly stated goals for the mentorship. As noted above, overcoming or ridding mentorship programs of these challenges could also help in the facilitation of more effective mentorship programs.

Overcoming the challenges noted above is worthwhile, as both mentors and mentees in the articles have noted valuable benefits that they derive from the mentorship experience. Mentees have noted that mentorships play an important role in their professional/career development as well as positive feelings surrounding knowledge sharing, increased confidence, being encouraged in their work, and the clearer definition of goals. Among mentors, it has been noted that mentorships are beneficial in terms of gaining recognition from the mentor's home organization or institution, the personal feeling that the experience was rewarding or the gaining of

extrinsic credit for mentoring work, and the growth within one's profession that mentoring facilitates, including increased familiarity with current cultural and community-related issues, and the creation of a stronger social network. In addition, mentoring has been noted to be beneficial by mentors in terms of its ability to refresh their knowledge and skills as well as being able to reinforce what they had previously learned, as they pass this knowledge or these skills along to their mentees.

When designing mentorship programs, in addition to considering the positive attributes and facilitators of successful programs, and the challenges that should be overcome to make them more effective, it is also worth considering the specific needs that have been noted by mentors and mentees in the literature. Mentors feel that they need more training, which should be a major priority for mentorship program administrators. Many would benefit from having specific project goals to work towards, which could be related to another need, which is for more input and follow-up from the program coordinator. Workplace support could also be beneficial in terms of ensuring that mentors are given adequate time to dedicate to their mentorship responsibilities. Among mentees, it has been noted that they need more tailored mentorships, especially to meet the needs of early versus advanced trainees. The mentees, according to the literature, also feel that they need to feel more inspired and empowered, more challenging assignments that better encourage them to learn and develop new skills under their mentor's guidance, and appropriate matching with mentors. It could be argued, of course, that meeting mentors and mentees needs in a more effective manner could also help facilitate the creation of more effective mentorship programs.

## **4.2. Recommendations Based on this Scoping Review**

This study had as a research objective the intention to develop recommendations about the potential utility of mentoring and factors to improve mentorship programs. However, since there are so few research studies to draw from, generating recommendations for mentorship programs and practice based on the evidence is fraught with methodological weaknesses. Nevertheless, I believe that the preponderance of expert opinion or the commonsensical nature of certain comments, as expressed in the body of literature that was reviewed, supports a set of recommendations.

In terms of how to improve, support, and advocate for mentoring in training the public health workforce, the author of this review calls for developing an operational definition of mentoring, working on specific objectives, encouraging retention, matching mentors and mentees from similar contexts, encouraging e-mentoring, involving stakeholders to a greater extent, and carefully evaluating mentoring programs to determine possible areas for improvement. The evaluation of mentorship programs is one of the most powerful tools to improve mentoring and encourage retention. It is important to determine where the successes and challenges occur regarding the program, to inform the design of future mentoring initiatives and knowledge translation regarding evidence-based mentorships. The evaluation components should focus on process-related activities in order to improve the program processes and materials. The evaluation should also assess the satisfaction of those directly involved. Participants should be encouraged to self-reflect or self-evaluate in order to identify areas for professional development using a recognized competency framework relevant to their practice. These frameworks help focus partnerships and areas for learning. As a result, the evaluation might reveal what, if any, additional mechanisms need to be put in place to foster mentee confidence, support and skill development. It is important to use multiple methods to evaluate mentorship programs, such as web-surveys, focus groups, attendance tracking, and activity logs.

In addition to the importance of evaluating mentorship programs, various stakeholders need to come together to develop an agreed-upon and clear operational definition of what mentoring is and what it is expected to achieve, along with a policy framework, so that those in mentoring relationships are aware of the mentorship program's aims and expectations. Also, they need to come together to develop national and local mentorship programs. Universities, medical schools, and funding agencies need to cooperate and implement national- and local-level programs to help develop and reward mentors. In order to create a public health workforce that is part of a broader community of learners, it can be useful to move beyond the traditional mentoring model involving the mentor and mentee in one-to-one relations. E-mentoring, or on-line mentoring, can help connect mentees in various public health disciplines to a broad learning community regardless of various barriers, such as physical distance, organizational isolation, and conflicting timetables (Miller et al., 2008).

future research on mentoring might address whether findings from one academic or practice domain, such as public health, apply to others, such as education, counseling, and medical professions.

### **4.3. Gray Literature**

Although this scoping review focused on a review of articles in peer reviewed journals, a more comprehensive review would benefit from greater attention to the grey literature. The gray literature introduces many programs, models, practical examples, and tools about mentoring to enhance workforce development in public health. Although these materials appear to support findings that mentoring in the public health field creates opportunities for networking and access to resources, improves career and personal satisfaction, increases professional and interpersonal skills, increases confidence, and develops reflection for both the mentee and mentor, most mentorship programs have not been formally evaluated (to my knowledge) and descriptions and reports have not been published. However, a glance at the many hits turned up through online searches indicates the growing interest in mentoring among public health practitioners and educators. Gray literature would be important to include in future scoping exercises.

**Table 3 Examples of Public Health Monitoring Programs from Gray Literature**

No.	Program Name	Location	The program overview	The program goals/benefits
1	<p>The Colorado Public Health Mentoring Program</p> <p><a href="http://www.coloradopublichealth.org/mentorprogram.php">http://www.coloradopublichealth.org/mentorprogram.php</a></p>	USA	<ul style="list-style-type: none"> <li>• "The Colorado Public Health Mentoring Program is a collaboration among the Colorado Public Health Association(CPHA), Public Health Nurses Association of Colorado (PHNAC), and the Colorado Environmental Health Association (CEHA).</li> <li>• The vision of the Program is to contribute to an engaged, connected, competent public health workforce in Colorado that effectively prevents, promotes, and protects the health of Coloradans".</li> </ul>	<ul style="list-style-type: none"> <li>• "To provide opportunities for mentors to enrich their contributions to public health and further develop as leaders;</li> <li>• To enhance the professional development of the public health mentee;</li> <li>• And to strengthen the public health professional workforce network in Colorado".</li> </ul>
2	<p>The Florida Public Health Training Center Online Mentor Program</p> <p><a href="http://health.usf.edu/publichealth/clphp/programs/mentorship/about.html">http://health.usf.edu/publichealth/clphp/programs/mentorship/about.html</a></p>	USA	<ul style="list-style-type: none"> <li>• "It is funded by a federal grant awarded to the University of South Florida, Center for Leadership in Public Health Practice (CLPHP) by the Health Resources and Services Administration (HRSA) to develop the technical, scientific, managerial, and leadership competencies and capabilities of the current and future public health workforce in Florida and nationally".</li> </ul>	<ul style="list-style-type: none"> <li>• "Assure a competent and diverse public health workforce in Florida that is capable of adapting to the rapidly changing workplace environment.</li> <li>• Develop the Core Competencies for Public Health Professionals.</li> <li>• Expand the knowledge, skills, and abilities of Florida Department of Health employees and USF College of Public Health students participating in the Online Mentoring Program.</li> <li>• Broaden and/or enhance the understanding of the Florida Department of Health and its missions and programs".</li> </ul>

3	<p>Yale School of Public Health Mentorship Program</p> <p><a href="http://publichealth.yale.edu/alumni/mentoring/index.aspx">http://publichealth.yale.edu/alumni/mentoring/index.aspx</a></p>	USA	"The program connects students to alumni who share common interests and have relevant professional experience. Students benefit from a network of accomplished alumni and in turn alumni can give back to their alma mater by contributing to the professional development of the next generation of health care leaders"	"Alumni meet and guide dynamic and interesting students and help them prepare for careers in health policy and management. Students learn about career paths of successful alumni, improve leadership and management skills, stay informed about the latest trends in the industry, and establish connections with YSPH alumni".
4	<p>National Mentoring Program (NMP)</p> <p><a href="http://www.aphastudents.org/nmp.php">http://www.aphastudents.org/nmp.php</a></p>	USA	"The National Mentoring Program in Public Health (NMP) is a project of the APHA Student Assembly (APHA-SA), which is in official relations with the American Public Health Association (APHA)".	<ul style="list-style-type: none"> <li>• "To improve the relevance of the academic training that public health students receive;</li> <li>• To increase the professional success and productivity of public health students and professionals;</li> <li>• To help strengthen the field of public health through the retention and growth of strong and committed members.</li> <li>• To help strengthen the field of public health through the retention and growth of strong and committed members".</li> </ul>
5	<p>Mentoring Program at Public Health Advocacy Institution in Western Australia</p> <p><a href="http://www.phaiwa.org.au/2012-06-07-12-59-25/mentoring-program">http://www.phaiwa.org.au/2012-06-07-12-59-25/mentoring-program</a></p>	Australia	"PHAIWA established an e-mentoring program in November 2011. For the pilot program, eighteen mentees were paired with senior public health professionals with experience in advocacy as their mentor".	"The e-mentoring program aims to promote and transfer advocacy skills to public and allied health professionals in WA. PHAIWA is keen to develop and nurture the expertise of individuals and groups working within health promotion, public health and sectors external to health, to ensure that high quality, innovative and effective advocacy leadership continues in WA".

6	<p>Public Health Expertise Network of Mentors (PHENOM)</p> <p><a href="http://www.healthysouthernnevada.org/index.php?controller=index&amp;module=PromisePractice&amp;action=view&amp;pid=824">http://www.healthysouthernnevada.org/index.php?controller=index&amp;module=PromisePractice&amp;action=view&amp;pid=824</a></p>	USA	<p>"The Public Health Expertise Network of Mentors (PHENOM) is an online public health mentoring program that is now in its 20th year. Formally an offering of Southern Connecticut State University's Public Health Alumni Chapter, providing mentoring services to students on campus, it is now completely online, and hosted by its founder's".</p>	<p>"To provide a freely-available source of public health expertise in which seasoned professionals can share their wealth of professional expertise with those interested in learning about Public Health and potential career options".</p>
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#### **4.4. Limitations**

Assessing mentorship programs and mentoring through a scoping review only of publications in peer-reviewed journals is a serious limitation; many assessments of mentoring may not have been published and thus would not be included in this review. Inclusion of gray literature (pieces such as the online report by Battams, 2005, which is discussed in the introduction but not included in the sample) could turn up additional research and reports that would enhance understanding of the present status and value of mentorship programs. As well, restricting the dates of included articles to publications between 2000 and mid-year 2014 is a limitation on the time frame of studies examined. Although this review did not assess the methodological quality of the studies, it appeared that most had methodological limitations such as small sample sizes, no comparison group, or no outcomes reported. Another limitation is that the search terms and strategy may not have discovered some relevant articles. For example, pearling (looking for additional items through, e.g., reading reference lists in articles and doing Google searches) turned up potentially relevant articles that were not retrieved in the search (Palamountain et al. 2010; Cho et al., 2013; Gagliardi et al, 2014). Other articles published outside the time frame for inclusion were not included but appear relevant (Gagliardi AR, Webster F, Straus SE 2015). Finally, the selection of articles for inclusion and coding for themes were carried out by only one researcher; reliability would be strengthened by inclusion of an additional reviewer-analyst.

## Chapter 5. Conclusion

This review provides resources and evidence for public health leaders, institutions, and programs that are seeking to support and formalize mentorship programs. While the literature on mentoring, especially in the field of public health, is relatively limited, this review has arrived at a number of potentially useful findings. Generally, mentoring is recognized as an effective way to share information and enhance the skills of current and future professionals with regards to public health practice, allowing mentees (and mentors) to benefit from mentorships professionally. This review suggests that there is very little research-based evidence to support a conclusion that mentoring is actually effective or contributes to positive outcomes, even if it seems self-evident. At a minimum, the many expressions of endorsement and the growing number of mentorship programs support a conclusion that it appears very promising as a strategy to build workforce capacity, and more research is clearly warranted.

The literature suggests several recommendations for mentoring programs of the future. To enhance their effectiveness, programs should ensure that their mentors have the necessary teaching and learning skills, as well as the required experience and skills that will make them effective mentors. There are certainly barriers to mentoring, such as poorly qualified mentors, and these barriers should be investigated further in an effort to devise strategies to overcome them. Formally evaluating mentorship programs could be useful in this regard. Arguably, public health practitioners should be encouraged to be involved in mentorship, as it in itself is often viewed as a practice competency in public health. If public health professionals are given mentorship opportunities, this will likely help enhance their proficiency, benefitting both mentors and mentees. Employers of public health practitioners should therefore be taught the value of mentorships in the workplace.

A wide variety of mentorship models are available for use, from one-to-one relationships to those involving multiple participants, either face-to-face or through on-line communications. In order to improve our understanding of the best mentoring models to use, further research should be conducted in this regard. Furthermore, the

benefits of mentoring at different career stages should be investigated, as well as the different approaches that might be most suitable to these various stages. In addition, if future researchers develop increasingly transdisciplinary approaches and methods, new mentoring models may be required to help novice researchers adapt to these new models.

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\* Articles marked with an asterisk were part of the sample of 27 articles reviewed.

## Appendix A.

### Standardized Extraction Form

No.	Item	Identification
1	ID	Serial number of the reference included in the final review
2	The source	The name of the journal that has published the references
3	Title	The title of the references
4	Author	The name of the author
5	Year	The publication's year
6	Setting	Includes the country, and the location of the mentoring program or activity.
7	Type of reference	Includes the types of the available materials
8	The field of practice	The field of the mentoring program or the activity
9	The purpose	The purpose or the objectives of the references
10	Is clinical care involved in the mentor's work?	This question to exclude any reference about mentoring in clinical care or patient's treatment
11	Is clinical care involved in the mentee's work?	This question to exclude any reference about mentoring in clinical care or patient's treatment
12	Target population	This includes who has practiced the mentoring activity
13	The focus of the mentorship program/activity	This include the aim of the mentoring activity in specific , and this is deferent from the purpose of the references. This to identify clearly the aim of the mentoring activity and not mix it with the general purpose of the references because not all the references are mainly about the mentoring activity. However, the mentoring in those references is an integral or important part of the references and has a specific focus.
14	Study design	This is limited to the original research and the reviews
15	Methods	This is limited to the original research and the reviews
16	Results	This is limited to the original research and the reviews
17	Model of mentoring, terms used	This includes the model of the mentoring being mentioned in the references
18	Practice of the mentoring	This variable describes the practice of mentoring being discussed in the references
19	The value of the mentoring	This includes the outcomes or the benefits of the mentoring part in the references

20	Mentor's perception	This includes what the mentors reported as the benefits, facilitators, and challenges associated with mentoring.
21	Mentee's perception	This includes what the mentees reported as the benefits, facilitators, and challenges associated with mentoring.
22	Characteristics of mentors	This includes the characteristics of the mentors
23	Characteristics of mentees	This includes the characteristics of the mentees
24	Mentors' needs	This includes what the mentors need for the success of the mentorship
25	Mentee's needs	This includes what the mentees need for the success of the mentorship
26	Attributes of successful mentoring relationship	This includes what has been reported about the attributes of successful mentoring relationship
27	Elements for the design of mentoring program	This includes what has been reported about the elements for the design of mentorship activity or program
28	Authors' recommendations	This includes what has been recommended about the mentorship activity or program

## Appendix B.

### Code Book

No.	Item	How it will be coded	Options/ subthemes
1	ID #	It will be numerated	27 references
2	The source	It will be numerated	<ol style="list-style-type: none"><li>1. Canadian Journal of Public Health</li><li>2. Family and Community Health</li><li>3. America Journal of Public Health</li><li>4. Injury Prevention</li><li>5. Annals of Epidemiology</li><li>6. Public Health Nutrition</li><li>7. Australian and new Zealand Journal of Public Health</li><li>8. Public Health nursing</li><li>9. The Journal of Health Education</li><li>10. Journal of Environmental Health</li><li>11. Journal of Public Health Management and Practice</li><li>12. Framing Health Matters</li><li>13. The journal of Distance Education</li><li>14. The Journal of Continuing Education in Nursing</li><li>15. Australian Journal of Rural health</li><li>16. Global Health Action</li><li>17. Hawaii Journal of Medicine and Public Health</li></ol>
3	Title	It will be stated	From the extraction forms
4	Author	It will be stated	Last name, the initial of the first author + et al (for more the one author)

<b>5</b>	Year	It will be selected	<ol style="list-style-type: none"> <li>1) 2001</li> <li>2) 2002</li> <li>3) 2003</li> <li>4) 2004</li> <li>5) 2006</li> <li>6) 2007</li> <li>7) 2008</li> <li>8) 2009</li> <li>9) 2010</li> <li>10) 2011</li> <li>11) 2013</li> <li>12) 2014</li> </ol>
<b>6</b>	Setting	It will be selected	<ol style="list-style-type: none"> <li>1. Australia</li> <li>2. USA</li> <li>3. Puerto Rico</li> <li>4. Guatemala</li> <li>5. Switzerland</li> <li>6. Uganda</li> <li>7. UK</li> </ol>
<b>7</b>	Type of reference	It will be selected	<ol style="list-style-type: none"> <li>1. Research report</li> <li>2. Review</li> <li>3. Program description, commentary</li> <li>4. Commentary, editorial</li> <li>5. Commentary, letter</li> </ol>
<b>8</b>	The field of practice	It will be selected	<ol style="list-style-type: none"> <li>1. Epidemiology</li> <li>2. Public health nursing</li> <li>3. Public health nutrition</li> <li>4. Health promotion</li> <li>5. Environmental health</li> <li>6. Mental health</li> <li>7. Rural health</li> <li>8. Research and practice</li> <li>9. Injury prevention</li> <li>10. General Public health</li> </ol>
<b>9</b>	The purpose	.....	Will not be coded, it will be copied and pasted from the source
<b>10</b>	Is clinical care involved in the mentor's work?	It will be selected	<ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>

<b>11</b>	Is clinical care involved in the mentee's work?	It will be selected	<ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>
<b>12</b>	Target population	It will be selected	<ol style="list-style-type: none"> <li>1. Undergraduate</li> <li>2. Graduate</li> <li>3. Workers</li> <li>4. Others</li> </ol>
<b>13</b>	The focus of the mentorship program/activity	Each statement will be coded with yes/no	<ul style="list-style-type: none"> <li>· To improve the delivery of knowledge</li> <li>· To increase public health research capacity</li> <li>· To enhance public health and health promotion practices, support the development of competences</li> <li>· To enhance epidemiological skills</li> <li>· To develop public health workforce</li> <li>· To support scholars</li> </ul>
<b>14</b>	Study design	It will be selected	<ol style="list-style-type: none"> <li>1. Qualitative</li> <li>2. Quantitative</li> <li>3. Mixed</li> <li>4. Literature review</li> <li>5. N/A</li> </ol>
<b>15</b>	Methods	It will be selected	<ol style="list-style-type: none"> <li>1. Interviews</li> <li>2. Survey</li> <li>3. Focus group</li> <li>4. N/A</li> </ol>
<b>16</b>	Results		Will not be coded, the results will be copied and pasted from the references
<b>17</b>	Model of mentoring, terms used	It will be selected	<ol style="list-style-type: none"> <li>1. One to one mentoring</li> <li>2. Peer mentoring</li> <li>3. Mentoring circles</li> <li>4. Mentoring partnerships</li> <li>5. Online mentoring</li> <li>6. Apprenticeship mentoring</li> <li>7. Trans model/ cis model</li> <li>8. Multiple models</li> <li>9. Mentoring during the field experience</li> <li>10. conceptual model</li> <li>11. Multifaceted mentoring model</li> <li>12. Not specified</li> </ol>
<b>18</b>	Practice of the mentoring		This will not be coded, the description of each model will be copied and pasted from the references

19	The value of the mentoring		This will not be coded, the description of each model will be copied and pasted from the references
20	Mentor's perception	Each statement will be coded with yes/no	<ul style="list-style-type: none"> <li>• Benefits: <ul style="list-style-type: none"> <li>· Recognition from the mentor's organization</li> <li>· Sense of reward or credits, professional growth</li> <li>· Cultural competence training, improve awareness of cultural and community issues</li> <li>· Building a social networking,</li> <li>· Reduce isolation</li> <li>· Refresh the knowledge and skills, reinforce learning</li> <li>· Personal growth or satisfaction</li> <li>· Others</li> <li>· Not mentioned</li> </ul> </li> <li>• Facilitators: <ul style="list-style-type: none"> <li>· Educational seminars</li> <li>· Supportive workplace environment,</li> <li>· Supportive program coordinator</li> <li>· Having a specific health promotion project to work towards,</li> <li>· Work based or experiential learning</li> <li>· Initial meetings</li> <li>· Competency self assessment</li> <li>· Cost effectiveness,</li> <li>· Affordability and availability of the recourses</li> <li>· Supportive technology that support the program</li> <li>· Others</li> <li>· friendliness, and collegiality</li> <li>· Not mentioned</li> </ul> </li> <li>• Challenges: <ul style="list-style-type: none"> <li>· Dearth of mentoring role model</li> <li>· few mentors</li> <li>· Lack of long term institutional support for mentoring,</li> <li>· Lack of fanatical incentives to mentoring</li> <li>· High Workload, Time constraints</li> <li>· large Number of students participating</li> <li>· others</li> <li>· Not mentioned</li> </ul> </li> </ul>

21	Mentee's perception	Each statement will be coded with yes/no	<ul style="list-style-type: none"> <li>• Benefits: <ul style="list-style-type: none"> <li>· Training, Improving knowledge, Improve research skills, Competency development</li> <li>· Understanding of and appreciation for public health,</li> <li>· Personal growth</li> <li>· Contribution to peers learning, strong socialization</li> <li>· facilitate smooth transition to professional life</li> <li>· Focus goals, career development, Develop professional identity</li> <li>· Improve commitment to work, Increase motivation</li> <li>· Others</li> <li>· Not mentioned</li> </ul> </li> <li>• Facilitators: <ul style="list-style-type: none"> <li>· Supportive learning environment,</li> <li>· Multiple mentors,</li> <li>· Workshop series,</li> <li>· Interacting as peers</li> <li>· Frequency of contact with mentors,</li> <li>· Site visits</li> <li>· Combing mentoring with practical on the job experience, tailored mentoring</li> <li>· Establishing expectation or learning plan early</li> <li>· Qualitative portfolios</li> <li>· Access to free website learning resources and materials</li> <li>· periodicity or continuity of the activities</li> <li>· others</li> <li>· Not mentioned</li> </ul> </li> <li>• Challenges: <ul style="list-style-type: none"> <li>· Novelty of mentorship concepts</li> <li>· Time constraints</li> <li>· Challenges of working with others, e.g. personalities</li> <li>· Poor mentors skills,</li> <li>· Inadequate communication with mentors</li> <li>· Matching ethnic , cultural or economic background of mentees and mentors)</li> <li>· Low level of commitment</li> <li>· A lack of clearly articulated outcomes for relationship</li> </ul> </li> </ul>
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			<ul style="list-style-type: none"> <li>· Isolation in the academic environment</li> <li>· others</li> <li>· Not mentioned</li> </ul>
<b>22</b>	Characteristics of mentors	It will be selected	0 Not mentioned 1 Yes clearly 2 small mention
<b>23</b>	Attributes of mentees	It will be selected	0 Not mentioned 1 Yes clearly 2 small mention
<b>24</b>	Mentor's needs	Each statement will be coded with yes/no	<ul style="list-style-type: none"> <li>· Further training</li> <li>· Having a specific health promotion project or event to work towards</li> <li>· Structuring the process of work-based learning</li> <li>· More input and follow-up from the project coordinator</li> <li>· Having adequate time to sustain an ongoing relationship with the mentee</li> <li>· others</li> <li>· Not mentioned</li> </ul>
<b>25</b>	Mentee's needs	Each statement will be coded with yes/no	<ul style="list-style-type: none"> <li>· Tailoring to meet the needs of earlier trainees or advanced trainees</li> <li>· The mentees need to feel inspired and empowered</li> <li>· The mentees need challenging assignments to encourage learning and development of skills</li> <li>· appropriate match of the mentors and mentees</li> <li>· others</li> <li>· Not mentioned</li> </ul>

26	Attributes of successful mentoring relationship	Each statement will be coded with yes/no	<ul style="list-style-type: none"> <li>· Good Communication</li> <li>· Considering the mentees mentoring style</li> <li>· Training the mentors</li> <li>· Minimize time constrains</li> <li>· Developing a mentoring philosophy, clear articulation of the mentoring structure , expectations, and outcomes.</li> <li>· Frequent meetings</li> <li>· Periodic evaluations by mentors</li> <li>· Resolving difficulties</li> <li>· Formalizing the relationship</li> <li>· Organizational support</li> <li>· A policy framework</li> <li>· Acknowledging cultural differences</li> <li>· others</li> <li>· Not mentioned</li> </ul>
27	Elements for the design of mentoring program	Each statement will be coded with yes/no	<p>Focusing on mentor recruitment, training, availability and retention</p> <ul style="list-style-type: none"> <li>· Communicating with the mentee before formal training</li> <li>· Providing a thorough orientation to the work setting</li> <li>· Supportive environment for both the mentee and the mentor,</li> <li>· Formal preparation</li> <li>· Clear identification of the mentoring objectives, having a well-defined set of competencies</li> <li>· A framework for evaluating mentoring relationships</li> <li>· Careful matching the mentors to mentees</li> <li>· Others</li> <li>· Not mentioned</li> </ul>

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28	Author's recommendations	Each statement will be coded with yes/no	<ul style="list-style-type: none"> <li>· Development of operational definition of mentoring</li> <li>· Working on specific objectives</li> <li>· More extensive and extended mentoring support</li> <li>· More mentoring programs</li> <li>· Encourage retention</li> <li>· Match mentors and mentees from similar context</li> <li>· Encourage e mentoring</li> <li>· Improve mentoring program</li> <li>· Involve stakeholders</li> <li>· Evaluate mentoring program</li> <li>· Others</li> <li>· Not mentioned</li> </ul>
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