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Scoping Review Protocol: Instruments to Measure Information Searching Strategies of Health Professions Education Students

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ABSTRACT

Introduction: Health professionals are expected to be lifelong independent learners. Evidence-based medicine underlines the importance of directed and logical reasoning for every decision making. Some of the characteristics of an independent learner is the ability to decide their own learning needs, to access the proper learning resources, and to monitor and evaluate the result. Besides higher order of thinking, enough knowledge and proper information is a basis for good clinical reasoning. Knowledge and information nowadays can be obtained online from various sources despite their quality. To avoid dis- and misinformation, healthcare professionals should maintain a good information habit. Hence, the importance of information literacy.

The first and most affected by ICT technology in the education sector is gen Z because they will enter the job market in the 'information era' which requires them to be able to handle Big Data in almost every sector. Therefore, ICT competence and digital literacy will be a basic survival kit. It is interesting to note that they are the first generation to be exposed to ICT technology at a very young age. They are often referred to as digital natives for their strong bonds with ICT gadgets and increasing daily time spent with gadgets. Logically follows, the demand for ICT-based service, including education forms and content, heightens in the generation. However, studies indicated that these generations often fail to show the required degree of information literacy to cope with their learning needs.

These phenomena pose challenges to educational institutions in two folds, i.e., providing the suitable education format and preparing the students for the ever-increasing digital information challenges. Studies aiming to define how the shift in human-computer interaction in this generation shapes their learning has been done in different educational contexts. Health professions education is unique in

Keywords: Information literacy, information seeking behavior, online searching, evidence-based practice, medical education, health professions education

their context for the demand of lifelong learning and fast changing knowledge in the scientific realm. Not to mention the disruption in learning format and health care services due to the recent event of COVID-19. Telehealth and e-learning are two examples of many facets in future health care that are already becoming current practices and should be embraced. Information behavior related to digital learning in health grows even more complex.

Understanding how the difference in online searching strategies maturity could bring different academic outcomes requires an understanding of how the online searching process takes place and the factors affecting it. Studies measuring an individual's online searching strategies have been done in various approaches and instruments in different settings. The variability in the study generates questions about what instruments are available in literature to measure online searching strategies and what parameters/aspects each instrument is focusing on. For these reasons, a scoping review is proposed to systematically map the research done in this area, especially the instrument and measurement focus, as well as to identify any existing gaps in knowledge about healthcare students' online searching strategies as a single construct apart from the general information literacy. The following questions are formulated: what is known from the literature about healthcare professions students' online information searching strategies? How do they measure online information searching strategies and what aspects are focused on the measurement?

To the end of that, it is expected that we are able to identify what is considered as important factors affecting online searching behavior for students in the healthcare education sector. Healthcare professions students face a context specific learning environment in different stages of their learning. Therefore, different focus of measurement is expected in the literature. Hopefully, the result of this review could give insight about the different kinds of the recent instruments in assessing online searching strategies. If applicable, the result could also be used as an initial guide to decide which instrument is more suitable to use in a certain educational setting, whether in its original form; an adaptation; or even a reason to build a completely different set of instruments.

Purpose: Information literacy is important for the modern learner. Online information searching strategies might be a part of key competencies to be a successful lifelong learner in the digital era. The aim of this study is to map the currently available instruments and their focus of measurement in online searching strategies.

Method: A scoping review is performed. Studies with any type of design published between 2016 and 2021 in English were included. The literature search was conducted in EBSCOHost, Proquest, and Scopus, including a small number of hand search and backward-forward citations tracking studies. This scoping

review is informed by the framework proposed by Arksey and O'Malley (2005) incorporating a six-step framework that includes: identifying the research question; identifying relevant studies; study selection; charting the data (data extraction); collating, summarizing, and reporting the results (analysis of the evidence and reporting); consulting and translating knowledge.

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GUIDELINES

PRISMA Extension for Scoping Reviews (PRISMA-ScR) Checklist

CITATION

Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, Moher D, Peters MDJ, Horsley T, Weeks L, Hempel S, Akl EA, Chang C, McGowan J, Stewart L, Hartling L, Aldcroft A, Wilson MG, Garritty C, Lewin S, Godfrey CM, Macdonald MT, Langlois EV, Soares-Weiser K, Moriarty J, Clifford T, Tunçalp Ö, Straus SE (2018). PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. Ann Intern Med.

LINK

10.7326/M18-0850

JBI Guide for Scoping Review

CITATION

Pollock, D, Davies, EL, Peters, MDJ, et al (2021). Undertaking a scoping review: A practical guide for nursing and midwifery students, clinicians, researchers, and academics. J Adv Nurs.

LINK

https://doi.org/10.1111/jan.14743

Arksey and O'Malley Scoping Review Framework

CITATION

Hilary Arksey & Lisa O'Malley (2005). Scoping studies: towards a methodological framework. International Journal of Social Research Methodology.

LINK

DOI: 10.1080/1364557032000119616

MATERIALS

Computers, Internet Connection, MS Word, MS Excel, Mendeley Reference Manager/End Note

SAFETY WARNINGS

There is no specific warning for this protocol.

Protocol and Registration

1 Author develops protocols and made it public by registering it in protocols.io.

Identifying the Research Question

2 The author identifies the research questions as follows:

1. What is known from the literature about healthcare professions students' online information searching strategies?
2. How do they measure healthcare professions students' online information searching strategies?
3. In what educational settings are these measurements performed?
4. What are the parameters and the instruments used to measure the online information searching strategies?
5. What are the strengths and weaknesses of each measurement and/or instrument?
6. What are the results of the measurements performed?

Identifying Relevant Studies

3 Author determined the eligibility criteria for study selection. Eligibility criteria were based on study population, concept, context, language, and time frame.

4 **Study population:** Healthcare professions students in any stage of education. The authors of this study acknowledge that healthcare professions is a broad term overarching different occupations. However, for study feasibility in the limited time and resources, the term healthcare professions students will be limited to medicine, nursing, midwifery, nutrition, dentistry, pharmacy, physiotherapist, and public health students.

5 **Concept:** Assessment or measurement of online information searching strategies, whether as a single construct or as a part of information literacy concept. Publications that measure students' online information searching strategies or information literacy focusing on the searching

strategies will be included. Studies about instrument development/adaptation/validation will be included as well if the instrument was intended to measure online searching strategies in health professions education.

The concept we would like to obtain from the literatures includes but not limited to the following: the theoretical basis, research methodologies/approach, data collection methods, types of the instruments used, the format of the instruments (e.g. paper or web-based), contents (i.e. assessment domains) of the included instruments, data analysis, the validity and reliability (i.e. if and how they have been psychometrically tested). The educational interventions based on the test result in the same study might be included as secondary interest, as well as the outcome of the interventions.

Studies to be excluded are literature on online searching behavior undertaken not for educational purposes (e.g., commercial information searching or daily information searching), studies performed in educational settings other than health professions education settings (e.g. computer school, elementary education, junior and middle school, etc.). We will also exclude the studies where the measurements are ill-defined, studies without any specific context, literature based on opinions, studies that do not specifically include online components in information searching strategies.

6 **Context:** The studies are conducted in educational settings or an environment set to measure students' effort to search online information for their education purpose. Geographical and cultural aspects are not limited to certain areas in the hope of finding important information.

7 **Language:** Only studies written in English will be reviewed.

8 **Time frame:** Only studies published between 2016 and 2021 will be reviewed.

Study Selection

9 The first step is an initial limited search of two major platforms, i.e. EBSCOHost and Proquest, to test and enrich the keywords and phrases. The initial search terms were determined by the main author and expanded in the limited search using synonyms and/or hyponyms.

10 Initial keywords determined by author are: "Online searching", "Health professions students", and

“Strategies”.

11 The keywords used in the initial search are as follows:
1. Online: web, internet, virtual, digital, cyber-
2. Information
3. Searching/seeking
4.Strategies/behavior/methods
5. Information Literacy
6. Health professions: medicine, nursing, midwifery, nutrition, dentistry, pharmacy, physiotherapist, public health
7. Students: residents, clerkship

12 Author did an initial limited search in EBSCOHost with the following keywords:

12.1 “Information search*” OR “information seek*” OR “information literacy”

12.2 online OR web* OR internet OR virtual OR digital OR cyber*

12.3 1 AND 2

12.4 "online search*" OR "web brows*" OR "internet search*" OR "virtual search*" OR "internet look*" OR "internet brows*" OR "digital brows*" OR "digital look*"

12.5 3 OR 4

12.6 strategy OR behavio?r OR method*

12.7 5 AND 6

12.8 health OR medic* OR nurs* OR midwife* OR nutrition* OR dentist* OR dental OR pharmac* OR physiotherap* OR "public health" OR "health profession*" OR "healthcare profession*" OR "clinic* clerkship" OR "residen* training"

12.9 student OR education OR school OR training

12.10 8 AND 9

12.11 Limit 10 to: Full text, publication date January 2016 - December 2021, language English. Expanders: ""Also search within the full text of the articles", "Apply equivalent subjects"

13 Analyzed the text words contained in the title and abstract of retrieved papers in EBSCOHost, and of the index terms used to describe the articles.

14 Author also did an initial limited search in Proquest with the following keywords:

1. "Information search*" OR "information seek*" OR "information literacy"
2. online OR web* OR internet OR virtual OR digital OR cyber*
3. 1 AND 2
4. "online search*" OR "web brows*" OR "internet search*" OR "virtual search*" OR "internet look*"

OR "internet brows*" OR "digital brows*" OR "digital look*"
5. 3 OR 4
6. strategy OR behavio?r OR method*
7. 5 AND 6
8. health OR medic* OR nurs* OR midwife* OR nutrition* OR dentist* OR dental OR pharmac* OR physiotherap* OR "public health" OR "health profession*" OR "healthcare profession*" OR "clinic* clerkship" OR "residen* training"
9. student OR education OR school OR training
10. 8 AND 9
11. Limit 10 to: Full text, publication date January 2016 - December 2021, language English. Expanders: ""Also search within the full text of the articles", "Apply equivalent subjects"

15 Analyzed the text words contained in the title and abstract of retrieved papers in Proquest, and of the index terms used to describe the articles.

16 Author did a second search across all included databases as follows:

1. Academic Search Complete (EBSCO Host)
2. Library, Information Science & Technology Abstracts (EBSCO Host)
3. MEDLINE (EBSCO Host)
4. ABI/INFORM Collection (Proquest)
5. Coronavirus Research Database (Proquest)
6. Proquest Ebook Central (Proquest)
7. Proquest Publicly Available Content Database (Proquest)
8. Proquest Research Library (Proquest)
9. Scopus

The initial keywords, additional keywords and index terms obtained from the limited search will be used across databases with modifications as required in each platform. During the search process, the initial keywords might expand or shrink due to the iterative nature of scoping review.

17 Author did a second search in EBSCO Host with the following keywords:

1. **[Field: Title TI]** "Information search*" OR "information seek*" OR "information literacy" OR "information need*" OR "information retriev*" OR "online information search*" OR "online information seek*" OR "digital information search*" OR "digital information seek*" OR "online information retriev*" OR "cyber brows*" OR "information seeking behavior" OR "online information behavior" OR "information use" OR ""online search* strategy" OR "online search* method*" OR "online search* behavio?r" OR "online search* pattern" **OR[Field: Abstract AB]** "Information search*" OR "information seek*" OR "information literacy" OR "information need*" OR "information retriev*" OR "online information search*" OR "online information seek*" OR "digital information search*" OR "digital information seek*" OR "online information retriev*" OR "cyber brows*" OR "information seeking behavior" OR "online information

behavior” OR “information use” OR ““online search* strategy” OR “online search* method*” OR “online search* behavio?r” OR “online search* pattern”

2. **[Field: Title TI]** “medical student” OR “medical school” OR “medical faculty” OR ”school of medicine” OR “faculty of medicine” OR “medical curriculum” OR “medical education” OR “medical training” OR “nurs* student” OR “nursing school” OR “nursing faculty” OR ”school of nurs*” OR “faculty of nurs*” OR “nursing curriculum” OR “nursing education” OR “nursing training” OR “health profession* student” OR “health profession* school” OR ”school of health profession*” OR “faculty of health profession*” OR “health profession* curriculum” OR “health profession* education” OR “health profession* training” OR “healthcare profession* student” OR “healthcare profession* school” OR ”school of healthcare profession*” OR “faculty of healthcare profession*” OR “healthcare profession* curriculum” OR “healthcare profession* education” OR “healthcare profession* training” OR “nutrition student” OR “nutrition school” OR ”school of nutrition” OR “faculty of nutrition” OR “nutrition curriculum” OR “nutrition education” OR “nutrition training” OR “dental student” OR “dental school” OR “dental faculty” OR ”school of dentistry” OR “faculty of dentistry” OR “dentistry curriculum” OR “dental education” OR “dental training” OR “dentistry student” OR “dentistry school” OR “dental curriculum” OR “public health student” OR “public health school” OR “public health faculty” OR ”school of public health” OR “faculty of public health” OR “public health curriculum” OR “public health education” OR “public health training” OR “midwifery student” OR “midwifery school” OR “midwifery faculty” OR ”school of midwifery” OR “faculty of midwifery” OR “midwifery curriculum” OR “midwifery education” OR “midwifery training” OR “clinical training” OR clerkship OR "clinical clerkship" OR "residen* training" OR “pharmacy student” OR “pharmacy school” OR “pharmacy faculty” OR ”school of pharmacy” OR “faculty of pharmacy” OR “pharmacy curriculum” OR “pharmacy education” OR “pharmacy training” **OR[Field: Abstract AB]** “medical student” OR “medical school” OR “medical faculty” OR ”school of medicine” OR “faculty of medicine” OR “medical curriculum” OR “medical education” OR “medical training” OR “nurs* student” OR “nursing school” OR “nursing faculty” OR ”school of nurs*” OR “faculty of nurs*” OR “nursing curriculum” OR “nursing education” OR “nursing training” OR “health profession* student” OR “health profession* school” OR ”school of health profession*” OR “faculty of health profession*” OR “health profession* curriculum” OR “health profession* education” OR “health profession* training” OR “healthcare profession* student” OR “healthcare profession* school” OR ”school of healthcare profession*” OR “faculty of healthcare profession*” OR “healthcare profession* curriculum” OR “healthcare profession* education” OR “healthcare profession* training” OR “nutrition student” OR “nutrition school” OR ”school of nutrition” OR “faculty of nutrition” OR “nutrition curriculum” OR “nutrition education” OR “nutrition training” OR “dental student” OR “dental school” OR “dental faculty” OR ”school of dentistry” OR “faculty of dentistry” OR “dentistry curriculum” OR “dental education” OR “dental training” OR “dentistry student” OR “dentistry school” OR “dental curriculum” OR “public health student” OR “public health school” OR “public health faculty” OR ”school of public health” OR “faculty of public health” OR “public health curriculum” OR “public health education” OR “public health training” OR “midwifery student” OR “midwifery school” OR “midwifery faculty” OR ”school of midwifery” OR “faculty of midwifery” OR “midwifery curriculum” OR “midwifery education” OR “midwifery training” OR “clinical training” OR clerkship OR "clinical clerkship" OR "residen* training" OR “pharmacy student” OR “pharmacy

school” OR “pharmacy faculty” OR ”school of pharmacy” OR “faculty of pharmacy” OR “pharmacy curriculum” OR “pharmacy education” OR “pharmacy training”
3. 1 AND 2
4. Limit 4 to: Boolean/phrase, Full text, publication date January 2016 - December 2021, language English. Expanders: ““Also search within the full text of the articles”, “Apply equivalent subjects”.

18 Author did a second search in Proquest with the following keywords:

1. “Information search*” OR “information seek*” OR “information literacy” OR “information need*” OR “information retriev*” OR “online information search*” OR “online information seek*” OR “digital information search*” OR “digital information seek*” OR “online information retriev*” OR “cyber brows*” OR “information seeking behavior” OR “online information behavior” OR “information use” OR “online search* strategy” OR “online search* method*” OR “online search* behavior” OR “online search* pattern”. [Limit to: Date: From 01 January 2000 to 31 December 2021. Source type: Blogs, Podcasts, & Websites, Books, Conference Papers & Proceedings, Dissertations & Theses, Reports, Scholarly Journals, Working Papers. Document type: Annual Report, Article, Blog, Book, Book Chapter, Conference Paper, Conference Proceeding, Dissertation/Thesis, Editorial, Essay, Evidence Based Healthcare, Letter To The Editor, Literature Review, Reference Document, Report, Review, Website/Webcast, Working Paper/Pre-Print. Language: English.]
2. “medical student” OR “medical school” OR “medical faculty” OR ”school of medicine” OR “faculty of medicine” OR “medical curriculum” OR “medical education” OR “medical training” OR “nurs* student” OR “nursing school” OR “nursing faculty” OR ”school of nurs*” OR “faculty of nurs*” OR “nursing curriculum” OR “nursing education” OR “nursing training” OR “health profession* student” OR “health profession* school” OR ”school of health profession*” OR “faculty of health profession*” OR “health profession* curriculum” OR “health profession* education” OR “health profession* training” OR “healthcare profession* student” OR “healthcare profession* school” OR ”school of healthcare profession*” OR “faculty of healthcare profession*” OR “healthcare profession* curriculum” OR “healthcare profession* education” OR “healthcare profession* training” OR “nutrition student” OR “nutrition school” OR ”school of nutrition” OR “faculty of nutrition” OR “nutrition curriculum” OR “nutrition education” OR “nutrition training” OR “dental student” OR “dental school” OR “dental faculty” OR ”school of dentistry” OR “faculty of dentistry” OR “dentistry curriculum” OR “dental education” OR “dental training” OR “dentistry student” OR “dentistry school” OR “dental curriculum” OR “public health student” OR “public health school” OR “public health faculty” OR ”school of public health” OR “faculty of public health” OR “public health curriculum” OR “public health education” OR “public health training” OR “midwifery student” OR “midwifery school” OR “midwifery faculty” OR ”school of midwifery” OR “faculty of midwifery” OR “midwifery curriculum” OR “midwifery education” OR “midwifery training” OR “pharmacy student” OR “pharmacy school” OR “pharmacy faculty” OR ”school of pharmacy” OR “faculty of pharmacy” OR “pharmacy curriculum” OR “pharmacy education” OR “pharmacy training” OR “clinical training” OR clerkship OR "clinical clerkship" OR "residen* training". [Limit to: Date: From 01 January 2000 to 31 December 2021. Source type: Blogs, Podcasts, & Websites, Books,

Conference Papers & Proceedings, Dissertations & Theses, Reports, Scholarly Journals, Working Papers. Document type: Annual Report, Article, Blog, Book, Book Chapter, Conference Paper, Conference Proceeding, Dissertation/Thesis, Editorial, Essay, Evidence Based Healthcare, Letter To The Editor, Literature Review, Reference Document, Report, Review, Website/Webcast, Working Paper/Pre-Print. Language: English.]

3. 1 AND 2

19 Author did a second search in Scopus with the following keywords:

TITLE-ABS(("medical student") OR ("medical school") OR ("medical faculty") OR ("school of medicine") OR ("faculty of medicine") OR ("medical curriculum") OR ("medical education") OR ("medical training") OR ("nurs* student") OR ("nursing school") OR ("nursing faculty") OR ("school of nurs*") OR ("faculty of nurs*") OR ("nursing curriculum") OR ("nursing education") OR ("nursing training") OR ("health profession* student") OR ("health profession* school") OR ("school of health profession*") OR ("faculty of health profession*") OR ("health profession* curriculum") OR ("health profession* education") OR ("health profession* training") OR ("healthcare profession* student") OR ("healthcare profession* school") OR ("school of healthcare profession*") OR ("faculty of healthcare profession*") OR ("healthcare profession* curriculum") OR ("healthcare profession* education") OR ("healthcare profession* training") OR ("nutrition student") OR ("nutrition school") OR ("school of nutrition") OR ("faculty of nutrition") OR ("nutrition curriculum") OR ("nutrition education") OR ("nutrition training") OR ("dental student") OR ("dental school") OR ("dental faculty") OR ("school of dentistry") OR ("faculty of dentistry") OR ("dentistry curriculum") OR ("dental education") OR ("dental training") OR ("dentistry student") OR ("dentistry school") OR ("dental curriculum") OR ("public health student") OR ("public health school") OR ("public health faculty") OR ("school of public health") OR ("faculty of public health") OR ("public health curriculum") OR ("public health education") OR ("public health training") OR ("midwifery student") OR ("midwifery school") OR ("midwifery faculty") OR ("school of midwifery") OR ("faculty of midwifery") OR ("midwifery curriculum") OR ("midwifery education") OR ("midwifery training") OR ("clinical training") OR clerkship OR ("clinical clerkship") OR ("residen* training") OR ("pharmacy student") OR ("pharmacy school") OR ("pharmacy faculty") OR ("school of pharmacy") OR ("faculty of pharmacy") OR ("pharmacy curriculum") OR ("pharmacy education") OR ("pharmacy training")) AND (("Information search*") OR ("information seek*") OR ("information literacy") OR ("information need*") OR ("information retriev*") OR ("online information search*") OR ("online information seek*") OR ("digital information search*") OR ("digital information seek*") OR ("online information retriev*") OR ("cyber brows*") OR ("information seeking behavior") OR ("online information behavior") OR ("information use") OR ("online search* strategy") OR ("online search* method*") OR ("online search* behavio?r") OR ("online search* pattern")) AND (LIMIT-TO (PUBYEAR , 2021) OR LIMIT-TO (PUBYEAR , 2020) OR LIMIT-TO (PUBYEAR , 2019) OR LIMIT-TO (PUBYEAR , 2018) OR LIMIT-TO (PUBYEAR , 2017) OR LIMIT-TO (PUBYEAR , 2016) OR LIMIT-TO (PUBYEAR , 2015) OR LIMIT-TO (PUBYEAR , 2014) OR LIMIT-TO (PUBYEAR , 2013) OR LIMIT-TO (PUBYEAR , 2012) OR LIMIT-TO (PUBYEAR , 2011) OR LIMIT-TO (

PUBYEAR , 2010) OR LIMIT-TO (PUBYEAR , 2009) OR LIMIT-TO (PUBYEAR , 2008) OR LIMIT-TO (PUBYEAR , 2007) OR LIMIT-TO (PUBYEAR , 2006) OR LIMIT-TO (PUBYEAR , 2005) OR LIMIT-TO (PUBYEAR , 2004) OR LIMIT-TO (PUBYEAR , 2003) OR LIMIT-TO (PUBYEAR , 2002) OR LIMIT-TO (PUBYEAR , 2001) OR LIMIT-TO (PUBYEAR , 2000)) AND (LIMIT-TO (DOCTYPE , "ar") OR LIMIT-TO (DOCTYPE , "re") OR LIMIT-TO (DOCTYPE , "cp") OR LIMIT-TO (DOCTYPE , "ed") OR LIMIT-TO (DOCTYPE , "sh") OR LIMIT-TO (DOCTYPE , "dp") OR LIMIT-TO (DOCTYPE , "Undefined")) AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (SUBJAREA , "MEDI") OR LIMIT-TO (SUBJAREA , "SOCI") OR LIMIT-TO (SUBJAREA , "NURS") OR LIMIT-TO (SUBJAREA , "COMP") OR LIMIT-TO (SUBJAREA , "BIOC") OR LIMIT-TO (SUBJAREA , "HEAL") OR LIMIT-TO (SUBJAREA , "PSYC") OR LIMIT-TO (SUBJAREA , "PHAR") OR LIMIT-TO (SUBJAREA , "NEUR") OR LIMIT-TO (SUBJAREA , "MULT") OR LIMIT-TO (SUBJAREA , "IMMU") OR LIMIT-TO (SUBJAREA , "DENT") OR LIMIT-TO (SUBJAREA , "Undefined"))

20 Beside searching from the platforms, ancestral search from the reference list of the eligible studies will be done to identify the studies not included in the platform search. Citation searching will also be done using Google Scholar and Microsoft Academic to look for additional eligible studies.

21 This process will be carried out by two reviewers independently. Any disagreements regarding publication inclusion will be resolved through discussion between the two reviewers or third party advocacy. The process of study selection will be reported using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses for Scoping Reviews (PRISMA-ScR).

Charting the Data (Data Extraction)

22 Appropriate data from the eligible studies will be extracted in a data extraction table using spreadsheet as a means. The tabular format will follow a scoping review reporting template by Joanna-Briggs Institute (JBI) evidence synthesis guidelines. The data extraction table will be piloted prior to execution. If necessary, the aspects will be modified and the data extraction table revised.

23 Author made a data extraction table using a spreadsheet with the following aspects to be noted:

1. Details of publication

a. Citation
b. Type of study
c. Source of study
d. Author(s)
e. Year of publication

2. Study characteristics:

a. Study design
b. Aims/purpose

c. Theoretical basis
d. Research methodologies
e. Origin/country of origin (where the study was published or conducted)

3. Characteristics of the participants:
a. Population
b. Sample size (if applicable)
c. Types of health professions education
d. Education setting (e.g. library, classroom, clinical, community, etc.)

4. Details of the measurement
a. Data collection methods
b. Types of the instruments used
c. Format of the instruments (e.g. paper or web-based)
d. Contents (i.e. assessment domains) of the included instruments
e. The validity and reliability of the instrument used
f. Technical details of the measurement (i.e. when, where, how, how long, how many repetitions)
g. Data analysis
h. Result of the measurement

5. Key findings related to the scoping review questions
a. Factors influencing the measurement
b. Limitations
c. Study notes
d. Education intervention taken based on the measurement outcome

24 Aspects in the step above go to step #23 will be the initial guide for extraction. However, the iterative process of data extraction allows for the possibility of change or additional categories in each aspect.

Collating, Summarizing and Reporting Results (Data Analys...

25 Tabular presentation depicting the extracted data will be used. A table for instrument valuation will be developed as well describing the focus of measurement, strengths and weaknesses of the instrument as perceived by the reviewers. Geographical distribution and other demographic parameters will be outlined, keeping in mind the possibility of cultural difference in play.

The qualitative descriptive of content analysis might be done limited to the intervention and outcome without thematic coding. There will be no assessment of quality as it is beyond the scope of the review. A narrative summary discussing how the result contributed to the review's objectives and questions will be composed.