

BMJ Open Concepts and metrics of clinician attention: a scoping review protocol

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ABSTRACT

Introduction There is growing emphasis on the importance of both the cognitive and behavioural phenomenon of attention for clinicians engaged in patient care. Aspects of attention such as cognitive load, distraction and task switching have been studied in various settings with different methodologies. Using the protocol described here, we aim to systematically review the medical literature in order to map the concept of attention and to synthesise diverse concepts and methods under the broader category of research focused on ‘attention’.

Methods and analysis Following the methodology described by the Joanna Briggs Institute and Arksey and O’Malley, our scoping review conducts an iterative search of Cumulative Index of Nursing and Allied Health Literature (CINAHL), Medline (PubMed) and EMBASE (Ovid). An initial limited search based on key concepts and terminology will generate relevant articles which in turn will be mined for additional keywords and index terms to guide a formal literature search. Our multidisciplinary team will extract data into a matrix, including a small random sample of the same studies (to ensure concordance), and present the results in a descriptive narrative format.

Ethics and dissemination As a secondary analysis, our study does not require ethics approval, and we will ensure that included studies have appropriate approval. We anticipate results will identify diverse ways of conceptualising clinician attention and will provide a foundation for developing additional metrics and study methods to optimise attention in the clinical environment. We will disseminate results through journals and conferences and coordinate with colleagues doing work in adjacent fields.

INTRODUCTION

Attention can be defined as a state of concentrated focus. It has been studied from many perspectives: cognitive and behavioural scientists, psychologists, economists, philosophers and artists have all contributed to our understanding of attention. It is both intuitive—and a physical or cognitive task requires it to some degree—and difficult to characterise exhaustively. High levels of attention have been tied to increased creativity, improved work satisfaction and higher quality of work.¹ Some propose that attention is a limited resource, and that environments and practices might

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ Strengths of this study include the use of scoping review methods to conduct a comprehensive literature of multiple electronic databases and the grey literature in order to gather diverse concepts under a common framework.
- ⇒ The search methods are robust in use of an iterative search strategy that will uncover additional terms and concepts that were not apparent at the outset of the study period.
- ⇒ This protocol is limited by the wide breadth of articles available, and the diverse terminology used by researchers to describe the phenomenon of health-care clinician attention.
- ⇒ The sample is anticipated to be heterogeneous, requiring post-hoc narrative analysis by the research team rather than homogenous enough to conduct statistical analyses.

be designed in order to maximise the attention of practitioners within them.^{2–4}

Clinicians (here defined as any healthcare professional engaged in direct patient care) have a particular stake in fostering attention. The work of healing requires attention to a range of complex data, interconnected systems and most importantly, to persons who are in some way suffering illness or change. In fact, the practice of medicine could be thought of as a paradigmatic case of a human activity that requires attention.⁵ Certain aspects of attention have been addressed in the medical literature; however, medicine has had relatively little explicit discussion of attention as a whole phenomenon.^{3,6}

The purpose of this scoping review is to better understand those aspects of healthcare clinician attention that have been well-studied including task switching,⁷ interruption^{7,8} and cognitive load,^{9–11} to identify other terms and concepts that pertain to clinician attention, in order to gather them under the common concept of attention. We will also gain a better understanding of the relationships between the terms to one another, and to selected research from the cognitive and behavioural

sciences. This will allow us to discuss potential gaps in the understanding of clinician attention, and opportunities for next steps for research.

METHODS AND ANALYSIS

Protocol

The scoping review protocol was compiled following the methodology described by the Joanna Briggs Institute¹² and Arksey and O'Malley.¹³ The scoping review methodology was selected to comprehensively examine the broad topic of healthcare clinician attention in the context of direct patient care. The goal of this review is to broadly map the literature to identify key concepts, theories, evidence and research gaps consistent with the scoping review methodology.¹⁴ The multidisciplinary review team includes a medical humanities expert, nurse–scientist, quality improvement expert, hospitalist division head and a data/analytics specialist.

Research question

How is the cognitive and behavioural concept of *attention* defined and measured for the population of healthcare clinicians in the context of direct patient care?

Subquestions

- ▶ What terms and ideas have been used to describe clinician attention in the medical literature?
- ▶ How are these terms and ideas related to key concepts in the behavioural and cognitive sciences?
- ▶ What are the main qualitative and quantitative methods that have been used to study attention in the clinical environment?
- ▶ How do these quantitative and qualitative methods compare to methods used in the cognitive and behavioural sciences?
- ▶ Which disciplines of medicine in which care settings (inpatient, outpatient, operating room, radiology reading room, alternative care settings, public/private, etc) have attention been studied?

Search strategy

In order to broadly capture concepts and terminology related to attention, we will search with an iterative strategy. The search will be conducted in three stages in consultation with a health sciences research librarian following the Joanna Briggs Institute guidelines.¹² First, a limited search via Medline (PubMed) and CINAHL will be conducted with the initial search terms:

- ▶ Attention
- ▶ Cognitive Load
- ▶ Task Switching
- ▶ Interruption
- ▶ Distraction
- ▶ Workload
- ▶ Task load
- ▶ Flow.

Table 1 Inclusion and exclusion criteria

Category	Inclusion criteria	Exclusion criteria
Population	Clinicians (inclusive of nurses, physician assistants, advance practice registered nurses, physicians, pharmacists)	Patients, non-health care personnel (eg, athletes, computer programmers, aeroplane pilots)
Context	Healthcare settings (inclusive of inpatient and outpatient settings)	
Situation	Care activities (inclusive of medication preparation, evaluating imaging and labs, triage, diagnosis, management, multidisciplinary care teams, rounding, procedures, patient education, emergency care, etc)	Non-care activities (eg, billing, research, teaching)
Concept	Behavioural or cognitive experience of attention among clinicians	Patient's cognitive/behavioural experience of attention
Types of evidence source	Peer-reviewed literature inclusive of: theoretical, conceptual, reviews, perspectives/philosophy of medicine papers, primary data, dissertations, quality improvement projects, presentation abstracts, quality improvement project 'brief reports', fully published quality improvement projects, policy position papers	Books
Publication year	2001 and later, inclusive of older seminal works	Over 20 years old
Language	English	All other languages
Ethics approval	Appropriate ethics approval reported	

The text words in the titles, abstracts and index terms of relevant studies, identified using our conceptual frame, will be analysed for additional keywords and index terms which will be added to the search terms. A final search strategy will be developed with the help of a health

sciences research librarian to include key conceptual (ie, cognitive load, attention, interruption), population (ie, physicians, nurses, advanced practice providers) and exclusion terms (ie, excluding literature on attention deficit disorder, delirium) to optimise search results.

Second, using this refined list of search terms, we will perform a complete search of CINAHL, Medline (PubMed) and Embase (Ovid) using the refined search strategy. Initially, two of the researchers will develop an instruction document to standardise the screening of articles. This document includes examples of included and excluded studies with rationale. Then, each of the titles and abstracts of the articles obtained through the search will be screened independently by at least two of the researchers on the team for inclusion using Rayyan (Qatar Computing Research Institute). Inter-rater agreement will be reported, if agreement is less than 75%, the review strategy will be adapted and conducted again to ensure rigour and replication. The primary two researchers will resolve any conflicts and will review full article texts to determine final eligibility.

Third, the references of the studies that are included will be hand searched for additional relevant articles. The search strategy will be iterative to be as comprehensive as possible incorporating a developing familiarity with the evidence base and additional search terms that emerge from the review. A careful audit of the search strategy will be kept for transparency and replication including the number of studies excluded and the reason for exclusion.¹⁵

Inclusion/exclusion criteria

Studies written in English published in peer-reviewed or grey literature in the last 20 years will be included along with any seminal works. The review will include studies that describe clinician attention, as opposed to patient or non-health care personnel attention, in healthcare settings inclusive of inpatient and outpatient settings, while performing care activities. Studies that are not available in English will be excluded due as translation is not feasible in this scoping review. Studies greater than 20 years old will be excluded with an exception made for seminal works to ensure that the included studies are relevant and timely. Studies will be included that meet the full inclusion criteria (table 1).

Data extraction

Data will be extracted using the matrix method of scientific literature review¹⁶ to record key information of the sources including the authors, year of publication, country of origin, study design, population and sample size. During review of each included publication, the conceptualisation of clinician attention, the terms used to describe clinician attention and their definitions, metrics used to measure clinician attention and antecedents, interventions and outcomes of clinician attention that were measured will be extracted and recorded in the matrix (see online supplemental appendix 1). Each

reviewer will abstract data from a small random sample of the same studies to ensure concordance between reviewers.

Analysis of the evidence

After extracting the data into the literature review matrix, conceptualisations of clinician attention will be analysed for content in the context of the population, study objective and metrics used. Terms used to describe clinician attention and their definitions will be mapped descriptively. An inventory of metrics will be created, inclusive of both research measures and quality improvement measures, including both qualitative and quantitative measures. Quality of the metrics used to measure clinician attention will be evaluated based on appraisal of the literature using the relevant Joanna Briggs Institute appraisal guidelines with specific attention on the relevance, validity and reliability established for the metrics.¹² Best practices, opportunities and gaps in the existing evidence for metrics of clinician attention will be identified.

Presentation of the results

The results will be presented in a descriptive narrative format. Terms describing clinician attention and their definitions will be tabulated. Conceptualisations of clinician attention will be displayed diagrammatically depicting the context of each to depict how conceptualisations are linked and distinct. Key metrics that are identified will be tabulated along with evidence of validity and reliability. The final review will include the full Preferred Reporting Items for Systematic Reviews and Meta-Analyses-ScR checklist of essential reporting items.¹⁷

ETHICS AND DISSEMINATION

Findings will contribute to a development of a suite of metrics used to evaluate clinician attention in research, quality improvement projects and through practice changes in operational work. The review will be submitted for publication in peer-reviewed journals and presented at academic conferences. Ethics approval not required for this scoping review of the literature as no human or animal participation occurred; all included studies will be screened for appropriate ethics approval prior to inclusion.

Contributors Collaboratively, MJK, KK, SCP, AK and MB planned and designed this scoping review protocol. MJK, KK and SCP developed and drafted the article. The first and second authors (MJK and KK) contributed equally to the drafting of the primary text. AK, KJ and MB revised the scoping review protocol. All authors will participate in the conduct of screening and article evaluation/selection. All authors reviewed and approved the final article.

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Respiratory Distress Syndrome (SiVent)' and received honoraria for reviewing Patient Centered Outcomes Research Translation Center research summaries.

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