

LEADERSHIP AT THE INTERSECTION OF HEALTHCARE AND CONSTRUCTIVE DEVELOPMENTAL THEORY: A SCOPING REVIEW

Shannon Richards-Green, Suzanne Gough, Sharon Mickan

Faculty of Health Sciences and Medicine, Bond University, Gold Coast, Australia

Correspondence: shannon.richards-green@student.bond.edu.au

ABSTRACT

OBJECTIVE:

The purpose of this scoping review was to examine the nature and extent of the evidence for the use of a stage theory of adult development, Constructive Developmental Theory (CDT) within healthcare leadership.

DESIGN:

A systematic methodology was employed, utilising inclusion and exclusion criteria and searching across seven databases.

MAIN OUTCOME MEASURES:

Summary of literature in response to three key questions.

RESULTS:

A Preferred Reporting Items for Systematic Reviews and Meta-Analyses – Scoping Reviews (PRISMA-ScR) flow diagram illustrates the study selection process with 154 records screened, 35 full-text articles assessed for eligibility and 7 studies included in the final analysis. Three themes emerged from the data: (1) healthcare as a complex system, (2) complexity of leadership in healthcare, (3) developmental leadership progression in healthcare.

CONCLUSIONS:

This review highlighted that CDT could provide a roadmap for individual change and adult developmental growth, thereby supporting the opportunity for more complex thinking and perspective taking within healthcare leadership. For the healthcare leader, the benefit of an awareness, understanding and application of CDT, is the potential for an increased capacity for recognising and dealing with complex challenges both personally and professionally.

The study protocol is registered with Open Science Framework (OSF).

KEYWORDS

constructive developmental, leadership, nursing supervisory, subject-object interview, WUSCT, healthcare leadership

INTRODUCTION

Healthcare and healthcare systems are becoming increasingly complex [1]. Clinical expertise may once have been considered sufficient for a leadership role in healthcare. The development of more skills, while valuable in allowing for additional professional coping capacity [2], does not address the core issue of leading through complexity. Healthcare leaders now require a much broader perspective to adequately contend with the multiplicity of competing systemic demands and complicated leadership challenges [3]. Support for a healthcare leader's adult developmental growth and

attendant broadening of their perspective taking capacity, can assist the individual healthcare leader to meet the challenges of a complex environment and the demands of their role.

Human development extends beyond adolescence, continuing throughout the lifespan, through recognisable stages of growth [4]. Constructive developmental theory's (CDT) focus on expanding perspective taking capacity can provide healthcare leaders with a greater understanding of themselves, others, and the broader perspective necessary to engage with complex healthcare leadership responsibilities. Box 1 summarises seven basic propositions of CDT [5].

BOX 1. SEVEN BASIC PROPOSITIONS OF CONSTRUCTIVE-DEVELOPMENTAL THEORY

1. People actively construct ways of understanding and making sense of themselves and their world
2. There are identifiable patterns of meaning making that people share with one another; these are variously referred to as stages, orders of consciousness, ways of knowing, levels of development, organizing principles, or orders of development.
3. Orders of development unfold in a specific invariant sequence, with each successive order transcending and including the previous order.
4. In general, people do not regress; once an order of development has been constructed, the previous order loses its organizing function, but remains as a perspective that can now be reflected upon.
5. Because subsequent orders include all earlier orders as special cases, later orders are more complex (they support more comprehensive understanding) than earlier orders; later orders are not better in any absolute sense.
6. Developmental movement from one order to the next is driven by limitations in the current way of constructing meaning; this can happen when a person faces increased complexity in the environment that requires a more complex way of understanding themselves and the world.
7. People's order of development influences what they notice or can become aware of, and therefore, what they can describe, reflect on, and change

Research on leadership and CDT to date has primarily focused on leadership within the educational and business sectors. The findings show that individuals with a more advanced adult developmental level have an increased ability to understand and influence others [6], are more able to self-regulate, and have a strong self-identity. Individual work-based performance associated with the ability to handle complexity was also associated with adult developmental levels, where leaders with more advanced developmental stages were comfortable with handling higher degrees of complexity and successful transformational change [2, 5, 7-11].

In healthcare, there is a significant amount of leadership research on identifying contributing factors to leadership, including specific competencies, skillset acquisition and types of leadership [12, 13]. Surprisingly, there is limited research focusing on the application of adult developmental, and specifically, constructive developmental theory to healthcare leadership. A scoping review was therefore the ideal instrument to provide a thorough overview of the current knowledge in the field of healthcare leadership and an identification of the gaps within the literature [14, 15].

OBJECTIVES

The aim of this systematic scoping review was to examine the extent and nature of the evidence for the use of constructive development theory within the context of healthcare leadership. The three research questions asked considering this aim included: (1) What does the existing literature say about the use of constructive developmental theory in the context of healthcare leadership? (2) How is healthcare leadership experienced by the individual leader operating at different stages of adult development? (3) How is the organisation affected (if at all), by leadership at different levels of adult development?

METHODOLOGY

FRAMEWORK

An evidence-based scoping review checklist, the Preferred Reporting Items for Systematic Reviews and Meta-Analyses – Scoping Reviews (PRISMA-ScR), [16, 17] was used to provide guidance on the framework for the key criteria included in the review (Appendix A).

ELIGIBILITY CRITERIA.

Inclusion Criteria. Studies selected for inclusion in the review (see PICO table Appendix B) (1) Population: the study focused on leaders, or individuals with formal or informal leadership roles, or those preparing for leadership, executives, or managers (2) phenomena of Interest: constructive developmental theory measures were used to assess levels of adult development (3) Context: healthcare settings either public and/or private, (4) Outcomes: The review outcomes explore how in the context of healthcare leadership, the adult developmental stage of the study participants may be manifested. (5) Studies were only included which were published in English. (6) Qualitative, quantitative, and mixed methods studies were eligible for inclusion with no limitations on the study design or year of publication. (7) To provide further coverage, discussion papers were eligible for inclusion, in addition to unpublished theses which met the inclusion criteria.

Exclusion Criteria. Book reviews, letters, commentaries, and conference proceedings were excluded from the review. A PICO table (Appendix B) 'Population, Phenomenon of interest, Context, Outcomes' was used to develop the relevant research questions and preliminary search terms.

INFORMATION SOURCES

An initial search of the electronic databases PsycINFO, PubMed and CINAHL was followed by an analysis of keywords contained in the retrieved article's title, abstract, and the index terms. These keywords were then used to generate a subsequent search which was carried out using all identified key words and index terms (see Appendix C). Additional databases searched included, Business Source Complete, ERIC, EMBASE, ProQuest Health and Medical. In addition, hand searches of reference lists and citations and forwards and backwards citation searching were also undertaken. Table 1 outlines search terms.

SEARCH TERMS

Constructive Development Theory	Measurement	Healthcare Leadership
Constructive development theory	Subject-Object Interview (SOI)	healthcare leadership
constructive development	Washington University	leader health
constructive developmental	Sentence Completion Test	manager healthcare
ego development stage	(WUSCT) action-logics	executive leadership
development	Maturity Assessment Profile (SCTi-MAP)	manager physician executive nursing
	Global Leadership Profile (GLP)	leadership allied health supervisor
	Leadership Development Profile (LDP)	

SELECTION OF SOURCES OF EVIDENCE

After de-duplication, identified studies were imported to Endnote. Two reviewers independently screened titles, abstracts and full texts. Differences of opinion were resolved through discussion and re-evaluation of the studies with a third reviewer.

DATA CHARTING PROCESS

Study data was extracted using a bespoke data charting form (Table 5) which was developed by the first author and refined in consultation with the other two researchers.

DATA ITEMS

The data extracted included, author/s, date of publication, study design, participants, study aim, CDT measurement tool, results and key findings [15]. Descriptions of each of the CDT measurements are included in the measurement tool key Appendix D.

CRITICAL APPRAISAL OF INDIVIDUAL SOURCES OF EVIDENCE

A critical appraisal assessment (Table 3) was conducted separately by two reviewers following the approach outlined in the Mixed Methods Appraisal Tool (MMAT) [18].

SYNTHESIS OF RESULTS

Data charting was completed on each included study. One reviewer extracted the key findings from each article, primarily from the results section. In line with recommendations for the data analysis of a scoping study [17], basic coding of the data was performed to identify major themes or characteristics relevant to the research questions.

THEMATIC ANALYSIS

Thematic analysis was selected as an analytical qualitative research tool to provide a rich and comprehensive rendition of the data, while allowing for the flexibility to cope with disparate approaches in the text [19]. The six phases of thematic analysis were adapted to provide a guide to the process of analysis (Table 2).

TABLE 2. PHASES OF THEMATIC ANALYSIS

Phase	Description of the process
Becoming familiar with the selected studies	Reading and re-reading the data noting key elements from each study.
Generating initial codes	Key elements are mapped against the 7 propositions of CDT, plus other category and the 3 research questions in a matrix format. Initial codes are developed from this data.
Searching for themes	Collating codes into potential themes by concept mapping the codes and examining potential linkages and patterns to form an initial synthesis.
Reviewing themes	Checking if the themes work in relation to the coded extracts and the entire data set. Creation of an overall thematic map.
Defining and naming the themes	Further refinement and discussion between researchers concerning the themes.
Producing the report	Final analysis and selection of extracts, relating back to the research question. Production of a scholarly report of the analysis.

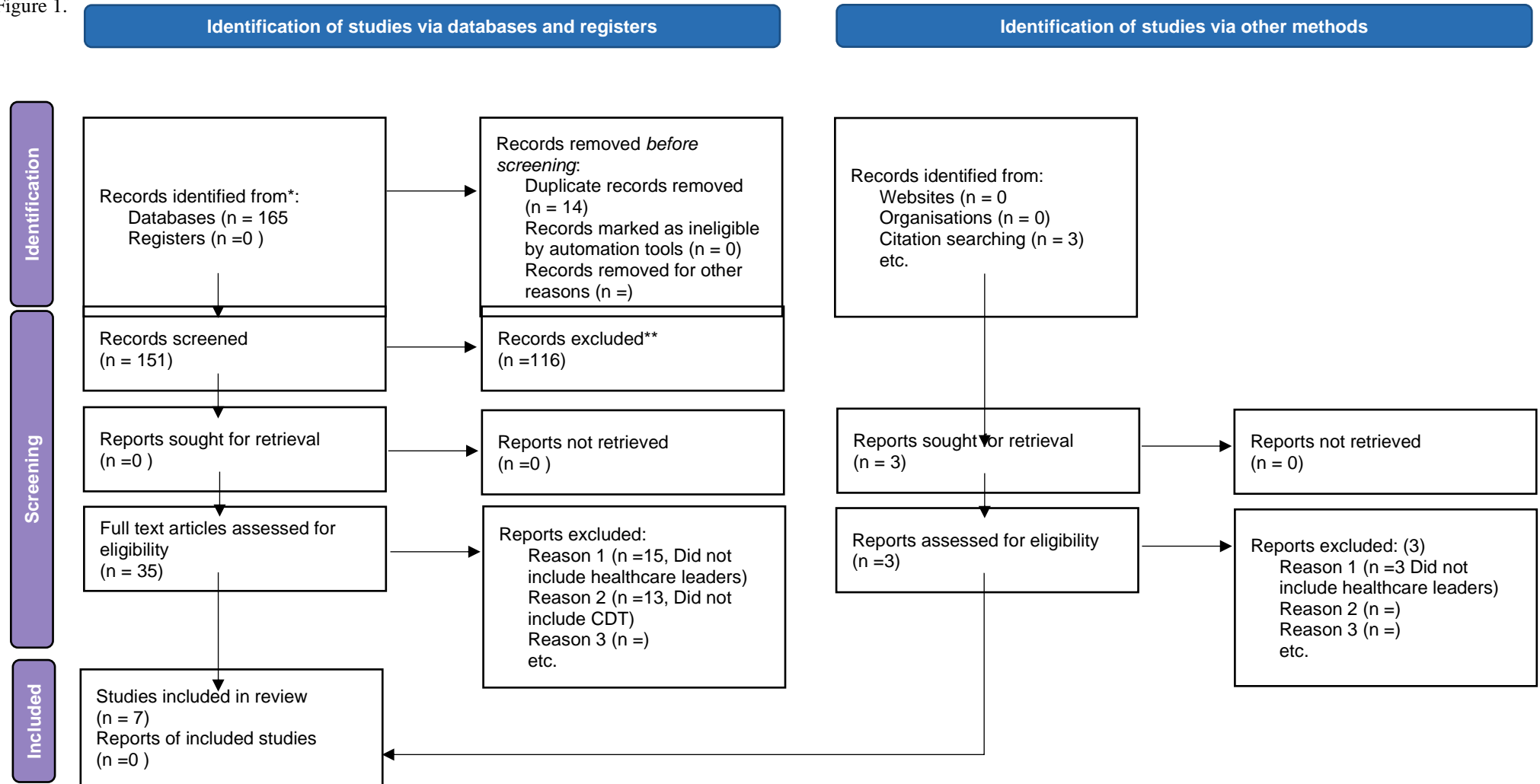
RESULTS

Selection of Sources of Evidence

Database searches between 06/07/2020 and 20/10/ 2020 yielded 165 articles with an additional three articles identified through hand searching. Following screening of title and abstract, 35 full-text articles were assessed for eligibility and consequently, seven studies were included for charting.

The PRISMA flow diagram [20], illustrates the study screening and selection process (Figure 1).

Figure 1.



CRITICAL APPRAISAL OF SOURCES OF EVIDENCE

A quality review was undertaken on the four empirical studies [21], (Table 3), and the three theoretical discussion papers [22], (Table 4). No aggregate numerical score was attached to the quality review. These included studies demonstrated an overall acceptable level of evidence.

TABLE 3. QUALITY REVIEW OF EMPIRICAL STUDIES

Study	Byers (2019 [26]	Hunter et al. (2014) [28]	Larson (2011) [25]	Philip et al. (2016) [29]
JBICritical Appraisal checklist for Qualitative Research				
Is there congruity between the stated philosophical perspective and the research methodology?	U	U	Y	U
Is there congruity between the research methodology and the research question or objectives?	Y	Y	Y	Y
Is there congruity between the research methodology and the methods used to collect data?	Y	Y	Y	Y
Is there congruity between the research methodology and the representation and analysis of data?	Y	Y	Y	Y
Is there congruity between the research methodology and the interpretation of results?	Y	Y	Y	Y
Is there a statement locating the researcher culturally or theoretically?	Y	N	Y	N
Is the influence of the researcher on the research, and vice-versa, addressed?	Y	N	Y	N
Are participants, and their voices, adequately represented?	Y	Y	Y	Y
Is the research ethical according to current criteria or, for recent studies, and is there evidence of ethical approval by an appropriate body?	Y	Y	Y	Y
Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data?	Y	Y	Y	Y
Yes = Y, No = N, U= Unclear, NA = Not Applicable				

TABLE 4. QUALITY REVIEW FOR DISCUSSION PAPERS

Study	Pesut and Thompson (2018) [24]	Petrie and Swanson (2018) [27]	Beaton and Amella (1990) [23]
JBICritical Appraisal Checklist for Text and Opinion papers.			
Is the source of the opinion clearly identified?	Y	Y	Y
Does the source of opinion have standing in the field of expertise?	Y	Y	Y
Are the interests of the relevant population the central focus of the opinion?	Y	Y	Y
Is the stated position the result of an analytical process, and is there logic in the opinion expressed?	Y	Y	Y
Is there reference to the extant literature?	Y	Y	Y
Is any incongruence with the literature/sources logically defended?	NA	NA	Y
Yes = Y, No = N, U= Unclear, NA = Not Applicable			

TABLE 5. DATA CHARTING OF INCLUDED STUDIES

Author/s Date of Publication	Study Design	Participants	Aim of Research Study or Theoretical Discussion paper	CDT measurement tool	Results and Key Findings
Byers (2019) [26]	PhD Thesis qualitative case study interviews	Hospital Healthcare leaders <i>n</i> = 14	To explore and contribute to academic knowledge on optimal practices for healthcare leaders engaged in leading improvement and change management within their organisations.	Action Logics	The primary action-logic used by healthcare leaders engaged in a change management project within the study, was Achiever. Leaders with higher levels of action-logics experienced more of the lean management strategic elements of learning, best practice, and complex system improvement. Depending on their stage of adult development, individual perspectives of the challenges of the project differed from outcome challenges (achiever action logic) to challenges with organizational principles (Defining action logic).
Philip et al (2016) [29]	Interviews using a structured questionnaire	Pharmacy leaders <i>n</i> = 14	To explore pharmacy leader development over time using the seven action logics.	Action Logics	All pharmacy leaders demonstrated progression from lower levels of adult development to successive levels. Ten leaders (71%) were diplomats during their early years. Six leaders (43%) were experts during their education years, and 4 (29%) were strategists or alchemists. During their work years, all leaders had a percentage of their answers coded as alchemist (range, 5-22%). Awareness of the adult developmental pathway may support and encourage the adult developmental growth of pharmacist leaders and enhance their ability to achieve their leadership goals.

Hunter, Lewis, and Ritter-Gooder (2014) [28]	Qualitative Questionnaire	Leaders of the American Dietetic Association n = 46	Exploring the awareness of adult development/leadership development stage of ADA leaders to give insight for leadership development programs.	SCTi-MAP	The majority (87%) of the ADA leaders were found to be in the conventional domain of adult development. (Kegan's stage 3/4, stage 4) This may indicate a comfort with and tolerance for, the current dietetics environment. 13% of the respondents registered as Individualist. A leader's awareness of their own action logic may be beneficial in supporting their leadership ability and tolerating complexity and ambiguity.
Larson, J.A. (2011) [25]	PhD Thesis autoethnographic case study	H/C manager n = 1	To provide insight and support to manager's experiencing transition within their work and personal lives, by exploring the author's experience as a healthcare manager going through a professional transition.	SCTi-MAP	Adult developmental growth was catalysed through challenging career transitions. Awareness of the terrain of adult development and how to learn and grow from challenging circumstances can help to support the individual on both a personal and professional level
Pesut and Thompson (2018) [24]	Theoretical Discussion Paper	HC Leaders: Nursing	"To discuss insights derived from adult cognitive developmental theories and relate the insights to vertical leadership development in academic nursing contexts." (p.122)	Action Logics	Leadership wisdom is a function of both horizontal skill acquisition and expertise, coupled with vertical consciousness development. Wise leaders demonstrating higher order cognitive sense-making are essential to adequately address the complexity of challenges facing the profession of nursing, nursing education and healthcare.
Petrie and Swanson (2018) [27]	Theoretical Discussion paper	HC Leaders	To explore and discuss how the intersection of adult development theory and the complex healthcare system, can see the emergence of new forms of leadership skills and frameworks.	Action Logics	Healthcare is a complex system where to effect meaningful transformation requires developing how we transform i.e. The focus is not only on <i>what</i> we know but <i>how</i> we know it. A focus on the adult development of the individual leader is an underemphasised key component of health system transformation. A systemic, purpose driven approach to healthcare leadership requires leaders who are supported to develop a mindset capable of engaging with complex problems.

Beaton and Amella (1990) [23]	Theoretical Discussion paper	HC Leaders Nursing	To introduce an integration of Benner's (1984) leadership framework and Loevinger's (1987) theory of ego development. To assist in developing teaching methods designed to increase perspective taking capacity in both professional practical applications and personal self-esteem enhancement.	Loevinger's sentence completion test WUSCT	As nurses develop to higher stages of adult development, they increase their ability to gain an enhanced perspective on their clinical practice. This can manifest in positive change through an awareness and appreciation of competing tensions, for example, in areas such as quality of care and resourcing availability.
Larson, J.A. (2011) [25]	PhD Thesis autoethnographic case study	H/C manager <i>n</i> = 1	To provide insight and support to manager's experiencing transition within their work and personal lives, by exploring the author's experience as a healthcare manager going through a professional transition.	SCTi-MAP	<ul style="list-style-type: none"> • Adult developmental growth was catalysed through challenging career transitions. • Awareness of the terrain of adult development and how to learn and grow from challenging circumstances can help to support the individual on both a personal and professional level
Pesut and Thompson (2018) [24]	Theoretical Discussion Paper	HC Leaders: Nursing	"To discuss insights derived from adult cognitive developmental theories and relate the insights to vertical leadership development in academic nursing contexts." (p.122)	Action Logics	<ul style="list-style-type: none"> • Leadership wisdom is a function of both horizontal skill acquisition and expertise, coupled with vertical consciousness development. • Wise leaders demonstrating higher order cognitive sense-making are essential to adequately address the complexity of challenges facing the profession of nursing, nursing education and healthcare.
Petrie and Swanson (2018) [27]	Theoretical Discussion paper	HC Leaders	To explore and discuss how the intersection of adult development theory and the complex healthcare system, can see the	Action Logics	<ul style="list-style-type: none"> • Healthcare is a complex system where to effect meaningful transformation requires developing how we transform i.e. The focus is not only on <i>what</i> we know but <i>how</i> we know it. • A focus on the adult development of the individual leader is an underemphasised key component of health system transformation.

			emergence of new forms of leadership skills and frameworks.		<ul style="list-style-type: none"> • A systemic, purpose driven approach to healthcare leadership requires leaders who are supported to develop a mindset capable of engaging with complex problems.
Beaton and Amella (1990) [23]	Theoretical Discussion paper	HC Leaders Nursing	To introduce an integration of Benner's (1984) leadership framework and Loevinger's (1987) theory of ego development. To assist in developing teaching methods designed to increase perspective taking capacity in both professional practical applications and personal self-esteem enhancement.	Loevinger's sentence completion test WUSCT	<ul style="list-style-type: none"> • As nurses develop to higher stages of adult development, they increase their ability to gain an enhanced perspective on their clinical practice. • This can manifest in positive change through an awareness and appreciation of competing tensions, for example, in areas such as quality of care and resourcing availability.

SUMMARY OF THE EVIDENCE

The included seven studies approached the concepts of CDT and healthcare leadership from several viewpoints. The viewpoints included: Expanding academic teaching methods to enhance vertical leadership development [23-26]; exploring optimal practices for healthcare leaders in leading change management initiatives [25, 26]; investigating the personal and professional transition of a manager using an adult developmental lens [25]; and exploring new ways of healthcare leadership in complex healthcare systems [27]. The data are described in the following sections as they address each research question.

RESEARCH QUESTION ONE

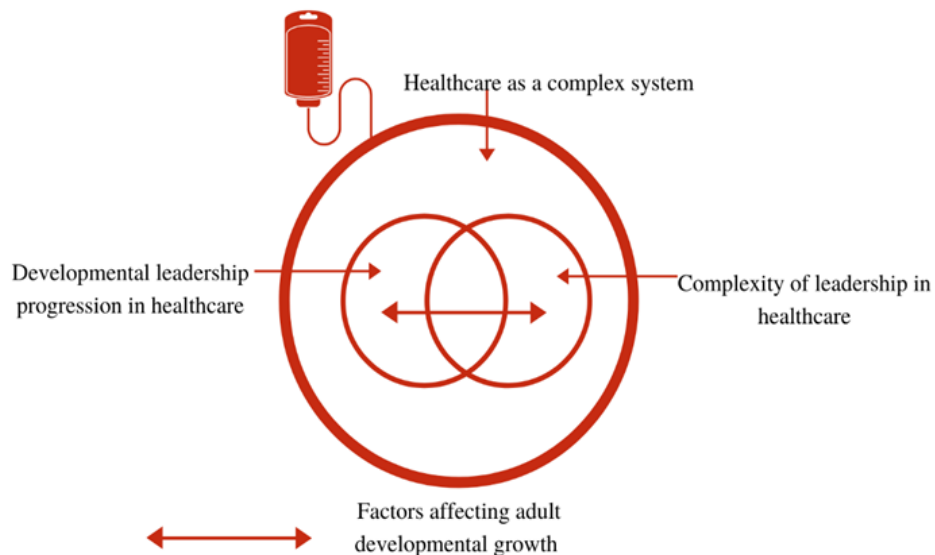
What does the existing literature say about the use of constructive developmental theory in the context of healthcare leadership?

Each of the studies makes the argument for developing the cognitive complexity of the individual healthcare leader. Specifically, the aim of developing the leader's cognitive complexity focussed on: enhancing their perspective in

clinical practice [23], facilitating distributive leadership and organisational change [26], supporting leadership abilities through increased tolerance for ambiguity and complexity [28], providing insight and support in personal and professional transitions [25], promoting vertical leadership development [24], exploring leadership development over time through CDT [29], and supporting the emergence of a new approach to leadership in complexity [27].

Following the exploration, identification, and coding of concepts within each paper, the studies revealed that when CDT was considered within the context of healthcare leadership, three main overarching themes were identified: Healthcare as a complex system (Theme 1), Complexity of leadership in healthcare (Theme 2) and Developmental leadership progression in healthcare (Theme 3). Figure 2 provides a graphical overview of the key themes and their relationship with each other in the context of healthcare leadership and constructive developmental theory. The themes are referenced within this scoping study as a common thread in the responses to each of the three research questions.

FIGURE 2. OVERVIEW OF KEY THEMES: HEALTHCARE AS A COMPLEX SYSTEM/ COMPLEXITY OF LEADERSHIP IN HEALTHCARE/DEVELOPMENTAL LEADERSHIP PROGRESSION IN HEALTHCARE



The studies maintain that in complex healthcare systems, having a healthcare leader with a level of adult development sufficient to engage with a more comprehensive understanding, and perspective taking, can be beneficial. The potential flow-on consequences of a healthcare leadership which does not recognise and accommodate the complexity and changing nature of the healthcare system, is an organisation which is more fragile,

more rigid, and less capable of agility and adaptability (Theme 1, Table 6). A health system which is restrictive and inhibited, shows symptoms of an immunity to change and manifests in suboptimal functioning [27], (Theme 1, Table 6). Table 6 presents samples, quotes, and codes for the thematic analysis of theme 1, Healthcare as a complex system.

TABLE 6, THEME 1. HEALTHCARE AS A COMPLEX SYSTEM

Codes	Sample Quotes from studies
Theme 1: Healthcare as a complex system	
Health system change	<p>“Health system transformation is not rocket science; it is far more complex than that”. “If we insist on applying machine models to complex system problems, we are doomed to fail” (Petrie & Swanson, 2018, p.207).</p> <p>“In health care focus areas such as patient population management, health outcomes, medical procedures, and the coordination of diagnoses, the healthcare field is complex, rife with inherent uncertainty and desires to change” [26].</p> <p>“Man-made systems become unstable, creating uncontrollable situations even when decision makers are well-skilled, have all the data and technology at their disposal, and do their best” [27].</p>
Volatility of the healthcare system	<p>The healthcare system faces many complex issues, “medical error, rapid change, rising costs, and uncertainty” [24].</p>
Complex issues in healthcare	
Healthcare system is linked to other systems	<p>“We built our strategies and success around the assumption of indefinitely generous healthcare benefits in a growing employer and patient base. As employers began laying off employees en masse or going out of business or leaving the state, these assumptions suddenly did not hold true” [25].</p>

In alignment with Theme 2 (Table 7), Complexity of leadership in healthcare, the studies emphasised that leaders within healthcare systems are faced with a multitude of problems every day, from: how to sponsor and integrate the latest change initiative across multiple disciplines and sites [26], to promoting intersectoral collaboration between siloed professions [25, 26], and ultimately how to deliver the best possible standard of healthcare to a wide variety of patients [26].

Advocating for an increased awareness and support for adult developmental growth was a core component of some studies [23-26, 28, 29]. Beaton (1990) partly attributes the display of increased clinical proficiency in specialist nurse leaders to more advanced levels of adult development, where a broader perspective can manifest in increased empathy for the client population. Pharmacist leaders reported increased perspective taking and associated adult development growth over the course of their careers [29] (Theme 3, Table 8). The connection between more advanced levels of adult development and leadership effectiveness was also demonstrated [25].

In summary, all seven studies described ways in which the development of individual perspective taking, was both useful and valuable as a component of healthcare leadership. CDT was inherent in both highlighting the prospect of continued growth in perspective taking and marking its occurrence.

RESEARCH QUESTION TWO

How is healthcare leadership experienced by the individual leader operating at different stages of adult development?

Within the studies, it was noted that healthcare leaders at different stages of adult development experienced their role and responsibilities in a variety of ways. In the following table (Table 7), quotes extracted from the included studies illustrate the thematic analysis addressing the question of healthcare leadership experience at various stages of adult development. The adjacent codes are grouped under two of the three overarching themes and encapsulate the information relevant to the research question.

TABLE 7. RESEARCH QUESTION 2. HOW IS HEALTHCARE LEADERSHIP EXPERIENCED BY THE INDIVIDUAL LEADER OPERATING AT DIFFERENT STAGES OF ADULT DEVELOPMENT?

Codes	Sample Quotes from studies
Theme 2: Complexity of leadership in healthcare	
Ethical decision making	“Nurses at higher levels of ego development appreciate the often-conflicting tensions when the need for autonomy opposes safety or when resource utilization issues are pitted against the right to quality care” [23].
Organisational change facilitation	At earlier stages of adult development, “The implications of this theory are that the action logic of the leader may be challenged by the complexity systems thinking required for large-scale change... this is a major factor in why transformational change is often difficult for individuals and organizations” [27].
Dealing with ambiguity and complexity	“Participants assessed at redefining and transforming action-logics tended to recount organizational principles, values, and ambiguity associated with improvement work, whereas participants assessed at the achiever action-logic recounted learning from goals, lean management tools and outcomes” [26].
Theme 3: Developmental Leadership progression in healthcare	
Tolerance for differences	“When I first became a pharmacy director...I tried to hire people that were like me, but over time realized it might not be the best idea to have so many people that think the same way. I then transitioned to making it a goal of getting the most out of people, regardless of the way that they think and having them share a common goal.” [29].
Getting the best out of people	
Capability for collaboration	Healthcare Leaders at higher levels of adult development, “... described their applications of LM (Lean Management) more systemically and collaboratively” [26].
Self-Awareness and Insight	“Self-knowledge helps leaders where they are on the vertical leadership development paths. Blind spots, a leader’s biases, and assumptions, if not exposed, will impede an openness to learn and embrace diverse opinions and perspectives” [24].
Transition Personal and Professional	“It seems that life is a spiral of transition, giving us every opportunity, should we choose to do so, to develop and grow every day. Life is a series of problems to be solved that are felt as pain. But once we accept this fact, we can transcend it and welcome these problems as an opportunity to grow” [25].
Movement away from black and white thinking	“An appreciation that there are grey areas is a sign of growth” [23].
Professional and clinical proficiency	“A portion of the variance in proficiency can be explained by the ego developmental levels of individual nurses” [23].
Capacity for reflective practice	“The findings identified that leaders with greater capacities for reflection and meaning-making are those with later action-logics” [26].

How healthcare leader’s experience their role, is both unique to themselves, and has elements in common with their stage of adult development, as this influences what they can be aware of, and how they see the world. As the leader progressed in their level of adult development, they began to experience a movement away from black and white thinking to a greater degree of flexibility and nuance in their perspective [23, 28, 29].

It was noted that leaders at the post stage four level of adult development, can have an increased awareness and appreciation for differences between individuals. [24, 30] In contrast, earlier developmental stages are more focused on similarities and maintaining the status quo [23, 28, 29]. In a similar vein, collaboration is a key component of change, and the ability to engage effectively with others is mediated by the leader’s level of adult development.

In relation to the healthcare leader's experience of change, Byers (2019) reports that healthcare leaders with the ability to reflect, which is further advanced at higher levels of adult development, are better placed to cope with change strategies. The gap between the meaning making inherent in the adult developmental level of the leader, and the cognitive complexity required of their role, can also lead to a demonstrated lack of insight or an immunity or reluctance to change [27]. The ability for a healthcare leader to change and reorient with the advent of updated information through technological change or altered circumstances is vital in a volatile, complex and uncertain healthcare world [25].

In summary, the studies described how healthcare leadership was experienced at different levels of adult development. Leaders were reported to engage with nuanced perspectives and responses, appreciate conflicting tensions, show capability for personal reflectivity, capacity for collaboration, tolerance for differences, self-awareness and insight, and the ability to

deal with change, ambiguity and complexity. These insights describe the value of factoring in adult developmental growth in both the academic and professional contexts of healthcare leadership.

RESEARCH QUESTION THREE

How is the organisation affected (if at all), by leadership at different levels of adult development?

This question was not addressed explicitly across the included studies, however, leaders at post-conventional adult developmental stages may provide industry wide change through an ability to see and imagine different pathways and futures (Table 8, Theme 2). Successful collaboration between multiple and diverse key stakeholders is integral to successfully drafting and implementing an innovative and transformative organisational strategy (Table 8, Theme 2). Table 8 presents a sample of the codes aligned with research question three, grouped under the theme, Complexity of leadership in healthcare.

TABLE 8. RESEARCH QUESTION THREE HOW IS THE ORGANISATION AFFECTED (IF AT ALL) BY LEADERSHIP AT DIFFERENT LEVELS OF ADULT DEVELOPMENT?

Codes	Sample Quotes from studies
Theme 2: Complexity of leadership in healthcare	
Ethical decision making	"Nurses at higher levels of ego development appreciate the often-conflicting tensions when the need for autonomy opposes safety or when resource utilization issues are pitted against the right to quality care" [23].
Organisational change facilitation	At earlier stages of adult development, "The implications of this theory are that the action logic of the leader may be challenged by the complexity systems thinking required for large-scale change... this is a major factor in why transformational change is often difficult for individuals and organizations" [27].
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Getting the best out of people	
Capability for collaboration	Healthcare Leaders at higher levels of adult development, "... described their applications of LM (Lean Management) more systemically and collaboratively" [26].
Self-Awareness and Insight	"Self-knowledge helps leaders where they are on the vertical leadership development paths. Blind spots, a leader's biases, and assumptions, if not exposed,

Transition Personal and Professional	will impede an openness to learn and embrace diverse opinions and perspectives" [24].
Movement away from black and white thinking	"It seems that life is a spiral of transition, giving us every opportunity, should we choose to do so, to develop and grow every day. Life is a series of problems to be solved that are felt as pain. But once we accept this fact, we can transcend it and welcome these problems as an opportunity to grow" [25].
Professional and clinical proficiency	"An appreciation that there are grey areas is a sign of growth" [23].
Capacity for reflective practice	"A portion of the variance in proficiency can be explained by the ego developmental levels of individual nurses" [23]. "The findings identified that leaders with greater capacities for reflection and meaning-making are those with later action-logics" [26].

Matching the organisation's demands to the healthcare leader's level of adult development can assist in creating an environment conducive to productivity, [26] and creating a dynamic, flexible and healthy workplace [24, 26-28].

DISCUSSION

This scoping review provides additional insight into the extent and nature of the current evidence for the use of constructive development theory within the context of healthcare leadership. The review answered the three research questions. In addition, three overarching themes were identified from the data: 1) healthcare as a complex system, 2) complexity of leadership in healthcare and 3) developmental leadership progression in healthcare.

This scoping review emphasises the need for healthcare leaders operating within highly complex and rapidly changing environments to have the perspective taking capacity to meet the challenges of their role. The alignment between mental complexity level and performance expectations is integral to their performance capacity [26]. These findings are consistent with research from outside the healthcare field, where a contributing factor of leadership efficacy was found to be increased cognitive complexity [6, 31-34]. In other studies, stage development was found to be predictive of leadership effectiveness [7, 35]. Research has also found that the nature and extent of an individual leader's successes and challenges were related to their level of adult development [36].

The included studies highlighted the value of an awareness and support for adult developmental growth as part of a

healthcare leader's personal and professional leadership development [25, 26, 28]. This finding is consistent with the extant literature, in a community leadership development program with integrated support for adult developmental growth a positive association existed between level of cognitive complexity and improved leadership and organisational performance [37].

Increased flexibility, emotional agility and adult developmental growth can be developed through engaging in reflective practice [25]. A key differentiating factor in adult developmental levels in CDT, is the ability for the individual to engage in reflective practice on both intrapersonal and interpersonal levels [38]. Being an effective leader in a complex and rapidly changing environment requires an ability to continually challenge personal perspectives and assumptions. CDT's focus on expanding cognitive capacity and perspective taking [39] provides the individual healthcare leader with a greater understanding of themselves, of others and complex healthcare leadership responsibilities [25].

LIMITATIONS AND FUTURE RESEARCH

There are limitations of this scoping review that are acknowledged. The criterion that studies must be published in English could have overlooked potentially relevant papers published in a language other than English. In addition, the variability in the measurement tools used to determine the participant's adult developmental stage, could limit the transferability and trustworthiness of the results.

Key areas for future research could include benchmarking the healthcare leader's level of adult development and exploring how they experience their leadership role. Further research could explore the healthcare leader's

effectiveness from the perspective of other stakeholders using constructive developmental theory. Research could also explore the performance outcomes of both healthcare leaders and/or healthcare organisations which deliberately incorporate an adult developmental approach.

MEANING OF THE STUDY AND IMPLICATIONS FOR HEALTHCARE LEADERS AND MANAGERS

For healthcare leaders to adequately wrestle with new and legacy complex challenges, the leader requires an ability for complex understanding and integration of both themselves and the situation [5]. A leader's developmental mindset impacts on their leadership ability by influencing what they can perceive as important and how they choose to frame problems. What a leader chooses to pay attention to is influenced by the complexity of their mindset [39]. Without a complexity of understanding, complex problems can be interpreted from a rigid, black and white, simplistic perspective, thereby putting at risk a more comprehensive examination and solution building [40].

CONCLUSIONS

This scoping study examined the extent and nature of the evidence for the use of constructive development theory in the context of healthcare leadership. From the included studies, there are strong indications to support the importance of healthcare leaders and managers having an understanding and consciousness of the impact of adult developmental growth. The evidence also suggests the benefits of actively incorporating and promoting the concepts of CDT within an integrated healthcare leadership development program. This development involves expanding the perspective taking and meaning making of the individual such that they have more capacity to engage with, operate in, and understand complex healthcare leadership environments.

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STUDY REGISTRATION

The study protocol is registered with Open Science Framework:

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OSF | Leadership at the Intersection of Healthcare and Constructive Developmental Theory: A Scoping Review

CONFLICTS OF INTEREST

Conflicts of Interest: None

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APPENDIX A

PREFERRED REPORTING ITEMS OF SYSTEMATIC REVIEW AND META-ANALYSES EXTENSION FOR SCOPING REVIEWS (PRISMA-SCR) CHECKLIST [16]

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
TITLE			
Title	1	Identify the report as a scoping review.	1
ABSTRACT			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	1
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	2,3
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	3
METHODS			
Protocol registration	and 5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	18
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	3
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	4
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	25
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	4
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	4
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	5
Critical appraisal of individual sources of evidence§	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	5
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	5
RESULTS			

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	6
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	7,10
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	8,9
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	10,11
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	12
DISCUSSION			
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	12-17
Limitations	20	Discuss the limitations of the scoping review process.	18
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	19
FUNDING			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	19

JBI = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.

* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.

† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).

‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JBI guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.

§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

From: Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. *Ann Intern Med.* 2018;169:467–473. doi: 10.7326/M18-0850.

APPENDIX B: PICO TABLE

Review Questions	<ul style="list-style-type: none"> ➤ What does the existing literature say about the use of constructive development theory in the context of healthcare leadership? ➤ How is healthcare leadership experienced by the individual leader operating at different stages of adult development? ➤ How is the organisation affected (if at all), by leadership at different levels of adult development?
Population	<ul style="list-style-type: none"> ➤ This review will consider studies in the field of healthcare, which includes leaders in formal or informal leadership positions and those who are preparing for leadership roles within the sector. ➤ Participants do not have to have a health or allied health degree. ➤ No limits are placed on their time in the role
phenomena of Interest	<ul style="list-style-type: none"> ➤ The adult developmental stage of the healthcare leader measured by a constructive developmental theory measurement.
Context	Healthcare settings both public and private
Outcomes	<ul style="list-style-type: none"> ➤ The review outcomes explore how, in the context of healthcare leadership, the adult developmental stage of the study participants may be manifested. ➤ Exploring evidence for how the healthcare leader experiences their leadership role. This may include their levels of self-awareness or understanding, increased confidence, leadership developmental capacity and capability, resilience, agility, sense of empowerment, understanding and capacity for leadership in complexity, improved stakeholder communication, seeking feedback, increased perspective taking, job performance and engagement, vision and purpose. These may be some (not necessarily all) of the outcomes of interest in this review. ➤ Leaders operating at different levels of adult development may have implications for the healthcare organisation. Outcomes could manifest in performance. Measures will be dependent on the study population and location.

APPENDIX C: SEARCH STRATEGY: PUBMED

Pub Med Search with MeSH
("constructive development"[tiab] OR constructive-development*[tiab] OR "constructive developmental"[tiab] OR "constructive development theory"[tiab] OR "ego development"[tiab] OR "stage development* theories")
AND
("subject-object interview"[tiab] OR "SOI"[tiab] OR "WUSCT"[tiab] OR "washington university sentence completion test"[tiab] OR loevinger[tiab] OR torbert[tiab] OR "action logic*" [tiab] OR action-logic[tiab] OR "mature adult profile"[tiab] OR "global leadership profile"[tiab] OR "leadership development profile"[tiab])
AND
("healthcare leadership"[Title/Abstract] OR "healthcare leader"[Title/Abstract] OR "health manager"[Title/Abstract] OR "healthcare executive"[Title/Abstract] OR "Leadership"[Mesh] OR "leader development"[Title/Abstract] OR management[Title/Abstract] OR manager[Title/Abstract] OR "first-line manager"[Title/Abstract] OR physician[Title/Abstract] OR "Physicians"[Mesh] OR "Physician Assistants"[Mesh] OR "Physician Executives"[Mesh] OR "Anesthesiologists"[Mesh] OR "Medical Staff, Hospital"[Mesh] OR medical[Title/Abstract] OR nursing[Title/Abstract] OR "nursing leadership"[Title/Abstract] OR "Nursing, Supervisory"[Mesh] OR "Nurses"[Mesh] OR "Nursing Administration Research"[Mesh] OR hospital[Title/Abstract] OR "Hospitals"[Mesh] OR "allied health"[Title/Abstract] OR dietitian[Title/Abstract] OR "Nutritionists"[Mesh] OR physiotherapist[Title/Abstract] OR "Physical Therapists"[Mesh] OR "social worker"[Title/Abstract] OR "Social Workers"[Mesh] OR therapist[Title/Abstract] OR "Counselors"[Mesh] OR "Psychology"[Mesh] OR "occupational therap*" [Title/Abstract] OR "speech therapist"[Title/Abstract] OR "Health Personnel"[Mesh] OR "Pharmacists"[Mesh] OR "health worker"[Title/Abstract] OR "Allied Health Personnel"[Mesh])