Time as a barrier to evidence uptake – A qualitative exploration of the concept of time for clinical practice guideline uptake by physiotherapists

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Abstract

Background: Lack of time has consistently been reported as a major barrier to effective research evidence-uptake into clinical practice. There has been no research to our knowledge that explores time as a barrier within the Transtheoretical model of Stages of Change (SoC), to better understand the processes of physiotherapists' uptake of clinical practice guidelines (CPG). This paper explores the concept of lack of time as a barrier for CPG uptake for physiotherapists at different SoC. Methods: A 6-step process is presented to determine the best-fit SoC for 31 physiotherapy interviewees. This process used an amalgamation of interview findings and socio-demographic data, which was layered onto the SoC and previously identified time-barriers to CPG uptake (few staff; high workload; access to CPGs; evidence-based practice as priority in clinical practice; "time is money" attitude; and knowledge on the use of CPGs). Results: The analysis process highlighted the complexities of assigning individuals to a SoC. A model of time management for better CPG uptake is proposed which is a novel approach to assist evidence implementalists and clinicians alike to determine how to progress through the SoC and barriers to improve CPG uptake. Conclusions: To the authors' knowledge, this is the first attempt at exploring the construct of (lack of) time for CPG-uptake in relation to the physiotherapists' readiness to behaviour change. This study shows that 'lack of time' is a euphemism for quite different barriers, which map to different stages of readiness to embrace current best evidence into physiotherapy practice. By understanding what is meant by 'lack of time', it may indicate specific support required by physiotherapists at different stages of changing these behaviours.

Background

Lack of time has consistently been reported as a major barrier to effective uptake of research evidence into clinical practice[1–5]. Despite this body of evidence, the concept of a "lack of time" is not well understood, as there are few effective strategies available for clinicians to assist them to decrease time-use barriers to evidence uptake [5,6].

Clinical practice guidelines (CPGs) are defined as "a convenient way of packaging evidence and presenting recommendations to healthcare decision makers" (p.6) [7]. Thus CPGs, in theory, should provide busy physiotherapists (PTs) with easy-to-use tools that support efficient access to current best evidence in ways that inform their daily clinical practice decisions. However, CPG uptake rarely occurs at the speed of evidence production [8]. Knowledge translation strategies, specifically training programmes about evidence-based practice (EBP) and CPGs, aim to support PTs' evidence-uptake behaviours and their use of CPGs to leverage effective and efficient practices [9,10]. This aligns with the six domains of healthcare quality: safe, effective, patient-centred, timely, efficient and equitable [11]. These six domains ensure optimal patient management.

Prochaska and DiClemente's Transtheoretical Model (TTM) of Stages of Change (SoC) is one of the oldest behaviour change frameworks, developed to describe health choices and stages of health behaviour change

(Figure 1) [12]. The TTM was initially developed for managing substance abuse, specifically smoking cessation [13], and it has since been applied to changing dietary behaviours[14] and physical activity [15]. The TTM has more recently been applied to investigations into the effectiveness of interventions into healthcare professionals' (physicians, nurses, allied health practitioners) uptake of evidence into practice (in this case healthcare worker's hand hygiene), with greater compliance with uptake of evidence being related to higher levels of SoC[16].The authors indicated that to understand the complexity of behaviour change related to CPG uptake, the healthcare professionals' readiness to change needs to be considered, as it cannot be assumed that all healthcare providers are similarly motivated to embrace EBP [16]. SoC comprise pre-contemplation (no recognition of need for or interest in change); contemplation (thinking of changing); preparation (intention and first steps towards taking action to change); action (adopting new behaviours); and maintenance (ongoing practice of new behaviours) [17]. There is also a "termination" phase that is used in substance abuse literature that is usually not referred to in implementation science, as it is not relevant due to the focus of continual quality improvement in EBP uptake practices [13,16].

>>Figure 1: Prochaska & DiClemente's Stages of Change (adapted with permission) about here>>

There has been no research to our knowledge that explores time as a barrier within the SoC framework, to better understand the processes of PTs' uptake of CPGs. We postulate that understanding barriers to CPG uptake within the context of changing EBP behaviours is a 'chicken and egg' situation, where barriers to behaviour change, and PTs' SoC are related to their understanding of CPGs. If the PTs understand how to use CPGs in practice, they may be more inclined to overcome barriers to CPG uptake. This paper explores the concept of lack of time as a barrier for CPG uptake for PTs at different SoC.

Methods

Detailed descriptions of the methods underpinning this qualitative study were published previously [18]. These methods are summarised below.

Reporting framework: The Standards for Reporting Qualitative Research (SRQR) were followed to ensure a rigorous reporting process of the study findings [19]. The SRQR checklist is provided in Additional file 1.

Ethics: Ethics approval was received from the Health Research Ethics Committee of Stellenbosch University (S17/05/100). Written informed consent was obtained from the participants via an online form. All research team members were familiar with the South African context in which this study took place and were experienced in the conducting and reporting of qualitative research.

Sample: The participants were South African PTs from private, public or educator sectors (considered for analysis purposes as three independent clusters). Participants needed to be registered with the Health Professions Council of South Africa (HPCSA), and be practicing PT for at least 25 hours per week in any field of PT. The email list obtained from the HPCSA, was randomized, and groups of 30 participants were contacted at a time.

Data collection and saturation: Semi-structured individual interviews were conducted, audiotaped, and independently transcribed[18]. The question relevant to this paper was: "When considering your workload, is it easy or difficult to integrate CPG into your clinical load?" This question explored whether the participants perceived CPG utilisation in practice as adding to or decreasing their clinical workload. In the previously published paper[18], the main theme that emerged from this questions was "lack of time", with the subthemes being: few staff; high workload; access to CPGs; EBP as priority in clinical practice; "time is money" attitude; and knowledge on the use of CPGs. Interviews continued with PTs in each cluster until no new information was obtained in consecutive interviews.

Data analysis: For the purposes of this paper, an inductive thematic content analysis approach was taken where the transcript content was analysed by hand, and the themes emerged from the analysis of the relevant question [20]. Data analysis followed an iterative process of data immersion and familiarization; theme identification; creating a codebook, data coding and categorizing; data mapping and interpretation, and then checking the findings against the original transcripts [20].

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Establishing credibility: Member checking of transcriptions were performed by 28 of the 31 participants (three participants did not respond to requests to do this) [21].

Researcher bias : The interviewer was a practicing PT clinician and educator. She could relate to the participants and analyse the data within her understanding of South African PT practice. She brought a recognized bias to the process of analysis of the interviews in that she is enthusiastic about providing best-evidence PT care, and teaching PTs about CPGs.

Determining SoC classification: There is currently no way of establishing participant's SoC for evidence uptake, thus the need arose to categorise in the following manner. The best-fit SoC for each interviewee was determined using an amalgamation of interview findings and socio-demographic data, which was layered onto the Transtheoretical model of the SoC [17].

The following steps were followed (See Figure 2):

1. JS assessed whether the participants could provide a definition of CPGs that aligns with recognised and published definitions and whether they believed that CPGs were of benefit to the PT profession. This was achieved by comparing the definition of CPGs according to Treweek et al. [7] with the definition that each participant provided. The participants' answers were divided into Clear or Unclear understanding of CPGs;
2. Participants' views (positive or negative) were explored to determine whether the use of CPGs added to, or reduced, their workload, and whether PTs perceived CPGs in their clinical practice as beneficial (or not), and overall to the PT profession.
3. A preliminary allocation into a SoC category was made for each participant, by comparing participants' understanding of CPGs, and their views on benefits, with the definition for each level of the SoC model.
4. Exemplar quotations from the full interview transcript on understanding, uptake and benefits of CPGs were identified as an independent source of evidence for the preliminary categorisation;
5. Differences in socio-demographic data (sectors of employment, years since graduation, and gender) were then determined for each SoC.
6. The authors discussed and agreed on the final SoC categorisation for each participant.

>>Figure 2: Process of Stages of Change allocation about here>>

Results

Participants: Thirty-one PTs participated in the study: 10 participants in private and public practices each, and 11 participants from the education sector.

SoC classification: Table 1 outlines the classification of study participants into their appropriate SoC and includes illustrative quotations in relation to their appropriate SoC. Some participants did not have a clear understanding of CPGs, and of those that did, not all were ready to implement CPGs into practice. Conversely, of those individuals who were unclear about CPGs, there were some who wanted to apply best evidence to their practice and were unsure about doing this. Years in practice were not an indicator to whether the person was more or less likely to implement CPGs in their practice.

>>Table 1: Classification of study participants into Stages of Change about here>>

To be classified at the Pre-contemplation stage, participants must have provided evidence that they were not ready to explore the use of CPGs in clinical practice. If participants provided evidence that they were considering the possibilities of implementing CPGs, then they were classified as in the Contemplation stage. If participants noted the benefits of using CPGs in clinical practice, or if they understood what CPGs entailed, or had previously used them, they were assigned into the Action stage. P6 and P11 did not see accessing of CPGs as a barrier to CPG uptake, but rather assisting them due to it being readily available to them via online sources. They may be classified at the Action stage of the SoC, as they can already see ways to incorporate CPGs as part of their clinical load. They will need assistance with choosing a CPG and prioritising conditions seen in practice for application of CPGs.

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To be classified at the Maintenance stage, the participants must have provided evidence that they have successfully used CPGs and are continuing to use it.

However, when assigning participants into the TTM SoCs, there were complexities in the classification process. Considering the quotations related to whether "time due to workload" was an issue for CPG uptake, the answers were initially divided into "yes ", "no" and "do not know" groups. In the "yes" group there were five private, two public and two educators that indicated time as a barrier. These participants were classified in the lower SoC (Pre-contemplation (n=5) and Contemplation (n=3)), except one participant who was classified as Maintenance. One private PT, two public PTs and five educators did not think that time was a barrier to CPG uptake. All but one of the PTs that did not identify time as a barrier were classified in the higher SoC, Action (n=6) or Maintenance (n=1). The one participant (P07) that was ultimately classified as "Preparation" reflected more on the view of the public sector PT than their own position. In the "do not know" group four private, six public and four educators were identified.

When comparing the different SoC levels to the subthemes relating to the concept of "lack of time" (Figure 2), all participants identified "EBP as priority in practice" as a factor, while certain SoC levels were more likely to identify other subthemes of the "lack of time". For example, the participants in the pre-contemplation stage, were more likely to identify "Few staff, high workload" as barriers to CPG uptake. In addition to above, participants in the contemplation stage identified "accessing CPGs" as another barrier. Whereas, participants in the preparation stage, identified "Time is money" as barrier to CPG uptake. Participants in the action stage identified "knowledge on CPG use" as a barrier. The maintenance stage had no barriers apart from "EBP as priority in practice", being cited more as a factor influencing rather than a barrier to CPG uptake.

The authors conceptualised a model of time management for better CPG uptake (Figure 3). This model combines the barriers of time, the different SoC [17] and the six domains of healthcare quality [11]. This model gives researchers a way of categorising individuals into different SoC to assist clinicians in CPG uptake to ultimately align clinical practice to evidence-informed practice. Central to the model is the barrier of time, with the first circle providing underlying challenges to the concept of "lack of time" for evidence uptake. The following circle deals with a clinician moving through the different SoC (from Pre-contemplation to Maintenance) to reaching the criteria for healthcare quality. The model is encompassed by the clinician determining the importance of the outer circle, "EBP as priority", to their own clinical decision-making process. Each circle within the wheel model is a moving part, with the circles' parts aligning and interacting with each other at different stages of their process toward optimum usage of evidence as part of their decision-making process.

The authors mapped the constructs of the wheel model (Figure 3) to the Theoretical Domains Framework of behaviour change (TDF) (Table 2) to support its design and applicability to addressing the lack-of-time barrier to CPG uptake [22]. The updated TDF "*provides a method for theoretically assessing implementation problems, as well as professional and other health-related behaviours as a basis for intervention development* " [23]. The TDF has previously been used to investigate influences on health and clinical behaviours, developing and evaluating implementation intervention designs and guiding appropriate behaviour change technique identification [22].

>>Figure 3: Wheel model of time management for better CPG-uptake about here>>

>>Table 2: Mapping of wheel model to Theoretical Domains Framework [22] about here>>

Discussion

The complexity of classifying individuals into different levels of readiness to change, indicated the importance of understanding each participant at their level of readiness to "hear" about CPGs. This understanding may lead to more targeted interventions to train PTs about EBP and using CPGs as an efficient source of information, which may in turn lead to sustainable long-term behaviour change in CPG uptake[16]. The importance of EBP in clinical practice was echoed by all the SoC, showing that this is may be a strong

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motivator for CPG uptake, if the underlying reasons for a "lack of time" can be effectively addressed. The fact that both the Pre-contemplation and Contemplation participants identified logistical issues ("few staff, high workload", "accessing CPGs"), links to a limited understanding of the function and benefit of using CPGs in practice. It is interesting that the Preparation participants were focused on what the monetary effect would be to CPG-uptake, possibly indicating that they may benefit from understanding the domains of healthcare quality to support its use to improve healthcare outputs [11]. The Action participants may benefit from a deeper understanding to determining the quality of the CPGs, including the strength of the underlying research that the CPGs drew from. The Maintenance participants are in a unique position to become change agents to increase the use of CPGs among colleagues and the greater healthcare community, as they already interact with and use CPGs in their daily practice. The five educators that did not perceive time as a barrier, may think that they are able to use CPGs easier because they are used to working with research documents. Conversely, this may also indicate that the educators do not understand what is expected of clinicians in a daily workload.

The model of time management for better CPG uptake (Figure 3) proposes a novel approach to assist evidence implementalists and clinicians alike to determine how to progress through the SoC and barriers to improve CPG uptake. When clinicians can identify their level of readiness to use CPGs, then they are able to choose the strategy to enable moving forward and improve or maintain their CPG-uptake. The strength of the proposed model is that it provides guidance on how to move an individual through the different SoC by determining where their SoC lies in relation to their perceived barriers to CPG uptake, but also considering the criteria for healthcare quality. This ensures a growing ability of clinical decision-making in light of the best available research evidence. A weakness of this model is that it may still not address the fluidity of readiness to change with regards to individuals moving forward and backward between SoC, while experiencing different barriers to optimum CPG uptake.

Table 3 proposes different strategies that may be employed to assist each SoC level to improve their CPG uptake into clinical practice. Through the categorisation of clinicians into different SoC, strategies may be developed to reach each participant at their readiness to "hear" about CPGs and to start implementing CPGs in daily practice. The authors developed "framing quotations" as possible ways that future individuals may explain their experience with and uptake of CPGs. The authors postulate that, by determining an individual's SoC and employing individualised strategies to improve CPG uptake, it will lead to more efficient and effective patient care, due to better evidence utilisation through overcoming the barrier of time.

>>Table 3: Strategies for Stages of Change levels about here>>

Limitations of the study

Due to the richness of the interview data, the authors only determined during the data analysis phase, that connecting the participants' SoC to their perception of their use of CPGs, the authors were able to expand on the understanding of the barrier of time and how it relates to the daily implementation of CPGs. The proposed model has not been tested on a larger population and further validation of the model is needed.

Conclusion

To the authors' knowledge, this is the first attempt at exploring the construct of (lack of) time for CPG uptake in relation to the PTs' readiness to behaviour change. 'Lack of time' is a commonly reported barrier in research into improving evidence uptake in professional physiotherapy practice. This study shows that 'lack of time' is a euphemism for quite different barriers, which map to different stages of readiness to embrace current best evidence into physiotherapy practice. For people who are not ready to change their clinical practice behaviours, statements about 'lack of time' may relate to evidence uptake being a low priority, or with lack of awareness of the need to change, or incentives to make changes. For people who are contemplating making changes to their evidence-implementing behaviours, statements about 'lack of time' may relate to perceived lack of skills and/or knowledge, concerns about how to commence a change process in their local contexts, or perceived lack of support from colleagues or management. For people who are embracing behaviour change, 'lack of time' may relate to competing priorities of learning and doing or making enough inroads into current

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workload to establish and maintain changed practices. Embracing and actioning evidence-informed practice is essential to improve professional practice and maintain standards. By understanding what is meant by 'lack of time', it may indicate the specific support required by physiotherapists at different stages of changing their behaviours.

List of abbreviations

CPGs: Clinical practice guidelines

EBP: Evidence-based practice

PT: Physiotherapy/ Physiotherapists

SoC: Stages of Change

TTM: Transtheoretical Model

Declarations

Conflict of interest

The authors have no conflicts of interest to declare.

Authors' contributions

JS, YB, KG collaborated on the planning and conceptualisation of the study. JS performed the data collection. JS, YB and KG analysed the data. All authors read and approved the final manuscript.

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References

1. Scurlock-Evans L, Upton P, Upton D. Evidence-Based Practice in physiotherapy: a systematic review of barriers, enablers and interventions. *Physiotherapy* . 2014;100(3):208-219.

2. da Silva TM, Costa L da CM, Garcia AN, Costa LOP. What do physical therapists think about evidence-based practice? A systematic review.*Man Ther* . 2015;20(3):388-401.

3. Grimshaw JM, Eccles MP, Lavis JN, Hill SJ, Squires JE. Knowledge translation of research findings. *Implement Sci* . 2012;7:50. doi:10.1186/1748-5908-7-50 [doi]

4. Gray M, Joy E, Plath D, Webb SA. Implementing Evidence-Based Practice. *Res Soc Work Pract* . 2013;23(2):157-166. doi:10.1177/1049731512467072

5. Harding KE, Porter J, Horne-Thompson A, Donley E, Taylor NF. Not Enough Time or a Low Priority? Barriers to Evidence-Based Practice for Allied Health Clinicians. *J Contin Educ Health Prof* . 2014;34(4):224-231. doi:10.1002/chp.21255

6. Heiwe S, Kajermo KN, Tyni-Lenne R, et al. Evidence-based practice: attitudes, knowledge and behaviour among allied health care professionals. *Int J Qual Heal Care* . 2011;23(2):198-209. doi:10.1093/intqhc/mzq083

7. Treweek S, Oxman AD, Alderson P, et al. Developing and evaluating communication strategies to support informed decisions and practice based on evidence (DECIDE): protocol and preliminary results.*Implement Sci* . 2013;8(6).

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8. Morris ZS, Wooding S, Grant J. The answer is 17 years, what is the question: understanding time lags in translational research. *J R Soc Med* . 2011;104(12):510-520. doi:10.1258/jrsm.2011.110180 [doi]

9. Stander J, Grimmer K, Brink Y. Training programmes to improve evidence uptake and utilisation by physiotherapists: a systematic scoping review. *BMC Med Educ* . 2018;18(1):14. doi:10.1186/s12909-018-1121-6

10. Committee on Quality of Health Care in America I of M. Crossing the quality chasm: a new health system for the 21st century. 2001.

11. Plsek P. Institute of Medicine. Crossing the Quality Chasm: A New Health System for the 21st Century. 2001.

12. Prochaska JO, DiClemente CC. Transtheoretical therapy: Toward a more integrative model of change. *Psychother Theory, Res Pract* . 1982;19(3):276-288. doi:10.1037/h0088437

13. DiClemente CC, Prochaska JO. Self-change and therapy change of smoking behavior: a comparison of processes of change in cessation and maintenance. *Addict Behav* . 1982;7(2):133-142. http://www.ncbi.nlm.nih.gov/pubmed/7102444.

14. Di Noia J. Dietary Stages of Change and Decisional Balance: A Meta-Analytic Review. *Am J Health Behav* . 2010;34(5). doi:10.5993/AJHB.34.5.11

15. Hutchison AJ, Breckon JD, Johnston LH. Physical Activity Behavior Change Interventions Based on the Transtheoretical Model: A Systematic Review. *Heal Educ Behav* . 2009;36(5):829-845. doi:10.1177/1090198108318491

16. Srigley JA, Corace K, Hargadon DP, et al. Applying psychological frameworks of behaviour change to improve healthcare worker hand hygiene: a systematic review. *J Hosp Infect* . 2015;91(3):202-210. doi:10.1016/j.jhin.2015.06.019

17. Prochaska JO, Redding CA, Evers KE. The Transtheoretical model and Stages of Change. In: *Health Behaviour and Health Education* . Fourth. San Francisco: Jossey-Bass; 2008:97-121.

18. Stander J, Grimmer K, Brink Y. Factors influencing clinical practice guideline uptake by South African physiotherapists: A qualitative investigation of barriers and facilitators. *J Eval Clin Pract* . June 2019:jep.13182. doi:10.1111/jep.13182

19. O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. Standards for Reporting Qualitative Research. *Acad Med* . 2014;89(9):1245-1251. doi:10.1097/ACM.0000000000000388

20. Mays N, Pope C, Ziebland S. Analysing qualitative data. 2006.

21. Frambach JM, van der Vleuten C, Durning SJ. AM last page: Quality criteria in qualitative and quantitative research. *Acad Med* . 2013;88(4):552.

22. Atkins L, Francis J, Islam R, et al. A guide to using the Theoretical Domains Framework of behaviour change to investigate implementation problems. *Implement Sci* . 2017;12(1):77. doi:10.1186/s13012-017-0605-9

23. Cane J, O'Connor D, Michie S. Validation of the theoretical domains framework for use in behaviour change and implementation research.*Implement Sci* . 2012;7(1):37. doi:10.1186/1748-5908-7-37

Figure legends

Figure 1: Prochaska's Stages of Change (adapted with permission[17])

Figure 2: Process of Stages of Change allocation

Figure 3: Wheel model of time management for better CPG uptake

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Table 1: Classification of study participants into Stages of Change

ID
P01
P02
P03
P04
P05
P06
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P31

Key: ID=Participant identifier; Yrs=Years in practice; CPG-K=CPG knowledge; SOC=Stage of change; Pub=Public; Pvt=
Yrs in practice: 0-10=1; 11-20=2; 21+=3. CPG knowledge: 1=Understand concept of CPGs; 2=Does not understand conce

Table 2: Mapping of wheel model to Theoretical Domains Framework[21)]

TDF Domains (Definition)	Wheel circle(s)	Circle construct(s)	Rationale
1. Knowledge (An awareness of the existence of something)	Time subthemes	CPG knowledge	Level of knowledge on what are CPGs will influence their CPG-uptake in practice.

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TDF Domains (Definition)	Wheel circle(s)	Circle construct(s)	Rationale
2. Skills (An ability or proficiency acquired through practice)	Time subthemes	Accessing CPGs	The ability to access CPGs directly influences the individual's willingness to use CPGs in practice
3. Social/professional role and identity (A coherent set of behaviours and displayed personal qualities of an individual in a social or work setting)	Time subthemes	Few staff, high load	If the individual feels limited in their time availability to use CPGs, due to limited staff and high workload, it will affect their willingness for CPG-uptake.
4. Beliefs about capabilities (Acceptance of the truth, reality or validity about an ability, talent or facility that a person can put to constructive use)	Time subthemes	CPG knowledge & accessing of CPG	Changing perceptions about CPG knowledge and accessing CPGs, may change CPG-uptake behaviour in practice.
5. Optimism (The confidence that things will happen for the best or that desired goals will be attained) Optimism/ Pessimism/ Unrealistic optimism/ Identity	EBP as priority		Observing EBP as priority in practice may be related to an optimism towards its use in practice but need to be facilitated to prevent a negative (pessimistic) outlook towards the seeming "burden" of more to do in practice.
6. Beliefs about Consequences (Acceptance of the truth, reality, or validity about outcomes of a behaviour in a given situation)	Quality criteria		The quality criteria of healthcare are directly affected by the (dis)use of CPGs to inform clinical decision-making.
7. Reinforcement (Increasing the probability of a response by arranging a dependent relationship, or contingency, between the response and a given stimulus)	Stages of change		Moving through the stages of change, particularly advancing through it, contributes to reinforcement of the use and applicability of CPGs in practice.

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TDF Domains (Definition)	Wheel circle(s)	Circle construct(s)	Rationale
8. Intentions (A conscious decision to perform a behaviour or a resolve to act in a certain way)	Stages of change		Moving through the stages of change will be both a conscious and unconscious process.
9. Goals (Mental representations of outcomes or end states that an individual wants to achieve)	Quality criteria; Time subthemes	Time is money	The quality criteria of healthcare are directly affected by the (dis)use of CPGs to inform clinical decision-making. CPG-use can affect monetary compensation
10. Memory, attention and decision processes (The ability to retain information, focus selectively on aspects of the environment and choose between two/ more alternatives)	Quality criteria; Time subthemes	CPG knowledge & accessing of CPG	Changing abilities of CPG knowledge and accessing CPGs, may change CPG-uptake behaviour in practice, affecting adherence to quality criteria of healthcare.
11. Environmental context and resources (Any circumstance of a person's situation or environment that discourages or encourages the development of skills and abilities, independence, social competence and adaptive behaviour)	Whole wheel model		The wheel model relates directly to the context of the individual's process of time management to address and overcome lack of time subthemes and moving through stages of change to conform to quality criteria of healthcare.
12. Social influences (Those interpersonal processes that can cause individuals to change their thoughts, feelings, or behaviours)	Stages of change; Time subthemes	Time is money; Few staff, high load	The two-time subthemes relate to how an individual perceives the usefulness of CPG-uptake in their working environment and the perception may influence their ability to move through the stages of change to change their CPG-uptake behaviour.

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TDF Domains (Definition)	Wheel circle(s)	Circle construct(s)	Rationale
13. Emotion (A complex reaction pattern, involving experiential, behavioural, and physiological elements, by which the individual attempts to deal with a personally significant matter or event)	EBP as priority; Quality criteria		Adhering to the quality criteria of healthcare and delivering patient-centred care through evidence-informed practice behaviours affects how the individual perceive their role as a healthcare professional.
14. Behavioural regulation (Anything aimed at managing or changing objectively observed or measured actions)	Stages of change		Moving through the stages of change will be both a conscious and unconscious process.

Table 3: Strategies for SoC levels

SoC	Fra
Pre-con	"I d
Con	"I'v
Prep	"I'v
Action	"I h
Main	"I a
Key: SoC=Stage of Change; P-con=Pre-contemplation; Con=Contemplation; Prep=Preparation; Main=Maintenance	Key

Additional File 1: Standards for Reporting Qualitative Research (SRQR) checklist

	Standards for Reporting Qualitative Research (SRQR) – From O'Brien et al (2014)	
	http://www.equator-network.org/reporting-guidelines/srqr/	P./line
Title and abstract	**Title and abstract**	

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	Standards for Reporting Qualitative Research (SRQR) – From O'Brien et al (2014)	
	Title - Concise description of the nature and topic of the study Identifying the study as qualitative or indicating the approach (e.g., ethnography, grounded theory) or data collection methods (e.g., interview, focus group) is recommended	Y/1
	Abstract - Summary of key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results, and conclusions	Y/2
Introduction	**Introduction**	
	Problem formulation - Description and significance of the problem/phenomenon studied; review of relevant theory and empirical work; problem statement	Y/3-4
	Purpose or research question - Purpose of the study and specific objectives or questions	Y/4-5
Methods	**Methods**	
	Qualitative approach and research paradigm - Qualitative approach (e.g., ethnography, grounded theory, case study, phenomenology, narrative research) & guiding theory if appropriate; identifying research paradigm (e.g., postpositivist, constructivist/ interpretivist) is also recommended; rationale	Y/5-6

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	Standards for Reporting Qualitative Research (SRQR) – From O'Brien et al (2014)	
	Researcher characteristics and reflexivity - Researchers' characteristics that may influence the research, including personal attributes, qualifications/experience, relationship with participants, assumptions, and/or presuppositions; potential or actual interaction between researchers' characteristics and the research questions, approach, methods, results, and/or transferability	Y/6
	Context - Setting/site and salient contextual factors; rationale**	Y/6-8
	Sampling strategy - How and why research participants, documents, or events were selected; criteria for deciding when no further sampling was necessary (e.g., sampling saturation); rationale	Y/5
	Ethical issues pertaining to human subjects - Documentation of approval by an appropriate ethics review board and participant consent, or explanation for lack thereof; other confidentiality and data security issues	Y/5
	Data collection methods - Types of data collected; details of data collection procedures including (as appropriate) start and stop dates of data collection and analysis, iterative process, triangulation of sources/methods, and modification of procedures in response to evolving study findings; rationale**	Y/5

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	Standards for Reporting Qualitative Research (SRQR) – From O'Brien et al (2014)	
	Data collection instruments and technologies - Description of instruments (e.g., interview guides, questionnaires) & devices used for data collection; if/how instrument(s) changed over course of study	Y/5
	Units of study - Number and relevant characteristics of participants, documents, or events included in the study; level of participation (could be reported in results)	Y/5-6
	Data processing - Methods for processing data prior to and during analysis, including transcription, data entry, data management and security, verification of data integrity, data coding, and anonymization/de-identification of excerpts	Y/5
	Data analysis - Process by which inferences, themes, etc., were identified and developed, including the researchers involved in data analysis; usually references a specific paradigm/ approach; rationale	Y/6-7
	Techniques to enhance trustworthiness - Techniques to enhance trustworthiness and credibility of data analysis (e.g., member checking, audit trail, triangulation); rationale**	Y/6
Results/findings	**Results/findings**	
	Synthesis and interpretation - Main findings (e.g., interpretations, inferences, and themes); might include development of a theory or model, or integration with prior research or theory	Y/7-9

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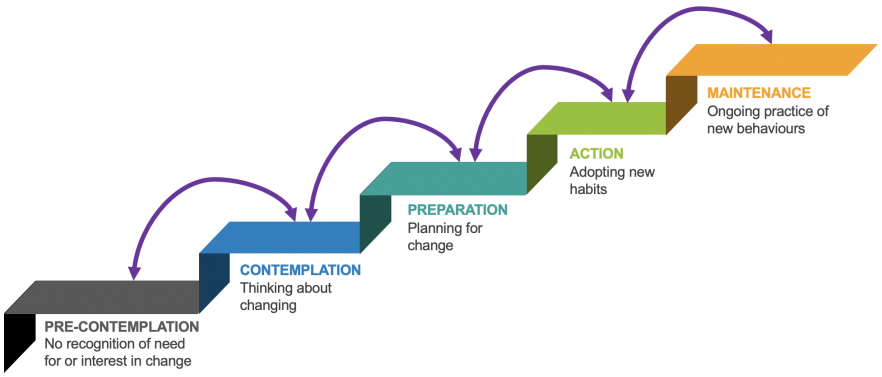
	Standards for Reporting Qualitative Research (SRQR) – From O'Brien et al (2014)	
	Links to empirical data - Evidence (e.g., quotations, field notes, text excerpts, photographs) to substantiate analytic findings	Y/ Table1
Discussion	**Discussion**	
	Integration with prior work, implications, transferability, and contribution(s) to the field - Short summary of main findings; explanation of how findings and conclusions connect to, support, elaborate on, or challenge conclusions of earlier scholarship; discussion of scope of application/generalizability; identification of unique contribution(s) to scholarship in a discipline or field	Y/9-11
	Limitations - Trustworthiness and limitations of findings	Y/11
Other	**Other**	
	Conflicts of interest - Potential sources of influence or perceived influence on study conduct and conclusions; how these were managed	Y/12
	Funding - Sources of funding/ support; funders role in data collection, interpretation, and reporting	Y/12



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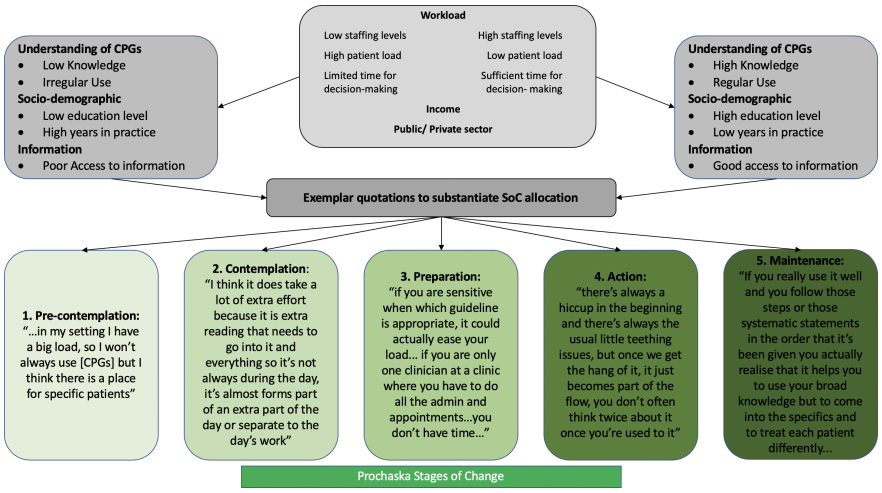

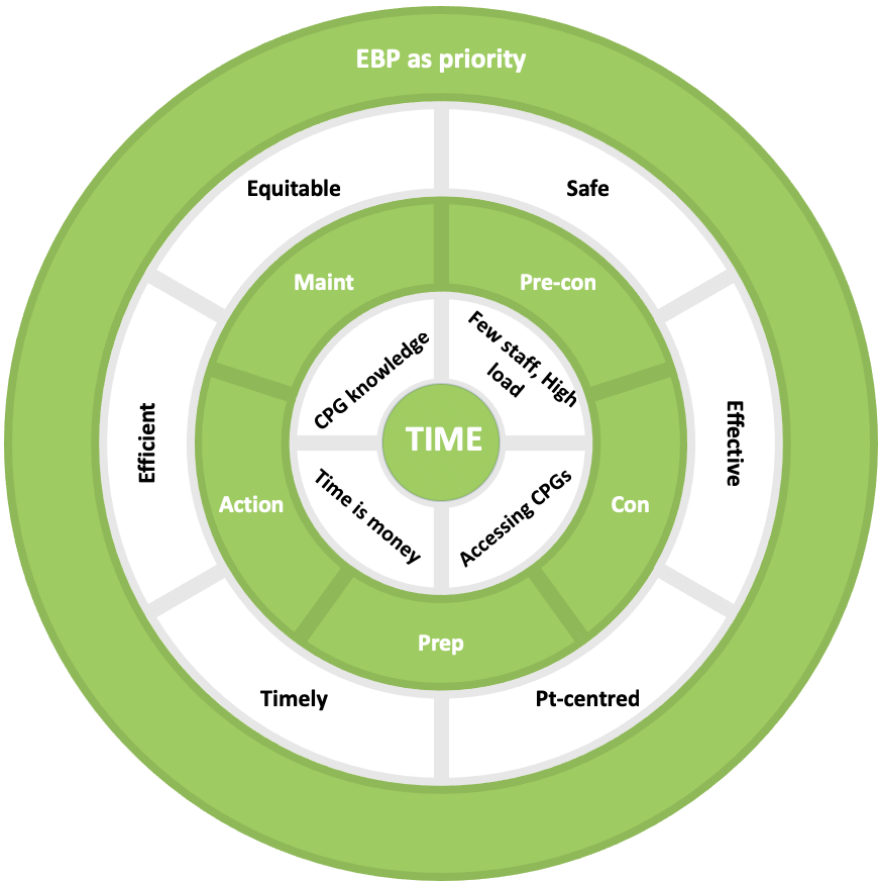

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