Exploring clinical acceptability of a new quality improvement program aiming to reduce cardiovascular disease risk in people with chronic kidney disease in Australian general practice: qualitative study

Caroline McBride, Barbara Hunter, Natalie Lumsden, Kaleswari Somasundaram, Rita McMorrow, Douglas Boyle, Jon Emery, Craig Nelson, Jo-Anne Manski-Nankervis

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Abstract

Background: Future Health Today (FHT) is a technology program that integrates with general practice (GP) clinical software to provide point of care (PoC) clinical decision support and a quality improvement dashboard. This qualitative study looks at the use of FHT in the context of cardiovascular disease risk in chronic kidney disease (CKD).

Objective: To explore factors influencing clinical implementation of the FHT module focusing on cardiovascular risk in CKD, from the perspectives of participating GP staff.

Methods: Practices in Victoria were recruited to participate in a pragmatic cluster randomised control trial using FHT, of which 19 practices were randomly assigned to use FHT's cardiovascular risk in CKD program. 13 semi-structured interviews were undertaken with a nominated GP (n =7) or practice nurse (n=6) from 10 participating practices. Interview questions focused on clinical usefulness of the tool and its place in clinical workflows. Qualitative data were coded by two researchers and analysed using Framework Analysis and Clinical Performance Feedback Intervention Theory (CP-FIT).

Results: All 13 interviewees had used the FHT point of care tool, and feedback was largely positive. Overall, clinicians described engaging with the tool as a 'prompt' or 'reminder' system. Themes reflected that the tool's goals and clinical content were aligned with clinician's existing priorities and knowledge, and the tool's design facilitated easy integration into existing workflows. The main barrier to implementation identified by two clinicians was notification fatigue. 7 interviewees had used the FHT dashboard tool. The main barriers to use were its limited integration into clinical workflows such that some participants did not know of its existence, and clinicians' competing clinical priorities and limited time to learn and use the tool.

Conclusions: This study identified many facilitators for successful use of the FHT point of care program in the context of cardiovascular risk in CKD, and barriers to use of the dashboard program. This work will be used to inform wider implementation of FHT, as well as development of future modules of FHT for other risk or disease states. Clinical Trial: Australian New Zealand Clinical Trial Registry ACTRN12620000993998

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Trial registration: Australian New Zealand Clinical Trial Registry ACTRN12620000993998

Keywords: Clinical decision support; General Practice; Implementation Science; Chronic Kidney Disease; Cardiovascular risk; Quality Improvement

Introduction

Background

The 2011-12 Australian Health Survey revealed 10% of Australian adults had biochemical signs of

chronic kidney disease (CKD) [1]. CKD is a significant risk factor for cardiovascular disease [2], which is Australia's leading cause of death [3]. Early intervention can slow the deterioration in kidney function and reduce the risk of cardiovascular complications [4]. Australian CKD guidelines recommend the use of ACE inhibitors (ACEi) or Angiotensin-receptor blockers (ARB) in the presence of albuminuria and/or hypertension (defined as blood pressure above 130/80), and statins are recommended for everyone with CKD over the age of 50, or younger in the presence of comorbidities [5].

CKD is under-recognised and under-treated in Australian general practice. One study found that 76.8% of people with biochemical results consistent with CKD did not have the diagnosis recorded in their medical file [6], and another found that only 65% of people with a formal diagnosis of CKD were prescribed an ACEi/ARB while 56% were prescribed a statin [7]. A known barrier to achieving quality improvement in chronic disease is lack of timely and straightforward access to clinical guidelines [8,9]. Electronic clinical decision support tools aim to address this barrier by integrating with clinical records to automatically provide key information from appropriate clinical guidelines.

Prior work

The Future Health Today (FHT) program is a general practice quality improvement technology platform developed by the University of Melbourne and Western Health. FHT integrates with the electronic medical record to provide two components; a clinical decision support tool active at the point of care (PoC), and a web-based dashboard that facilitates practice-wide audit. Screenshots of FHT are available in a supplementary file. FHT was developed using a service design approach, whereby clinicians were involved throughout an iterative technical development process [11]. It underwent optimisation at 12 general practice clinics, using guidelines for CKD, cardiovascular disease and cancer prevention. A qualitative optimisation study for the cancer recommendations has been described elsewhere [12]. A cluster randomised controlled trial was completed in 2022 (trial registration: ACTRN12620000993998) with the aim of exploring whether the FHT platform increased prescription of ACEi /ARB and statins in people with CKD at high cardiovascular disease risk[13]. This paper reports on barriers and facilitators of clinical performance improvement as reported by clinicians themselves.

Methods

Study Setting

General practice provides primary care to more than eight in ten Australians each year [14], and operates on a fee for service model with rebates available through Medicare, the healthcare insurance scheme funded by the Australian Government Department of Health and Aged Care. General practices may bulkbill (payment covered in full by Medicare), privately bill (patients pay a fee in excess of the Medicare rebate) or mixed bill (variably bulkbill or privately bill patients).

The FHT trial was conducted in 39 general practices in Victoria and one general practice in Tasmania, Australia. In summary, clinics were randomised to two arms: cardiovascular risk reduction in people with CKD, or identification of cancer risk; with each group acting as the control for the other [13]. Twenty-one general practices were allocated to the CKD arm, with 19 practices completing the trial. The trial ran from October 2021 to September 2022. The CKD algorithm was deactivated in December 2021 after errors in algorithm deployment were noted, and was reactivated

in February 2022. The interviews analysed in this paper occurred between May and July 2022. The state of Victoria was subject to a COVID-19 pandemic declaration throughout the duration of the trial.

Study Design

This qualitative implementation study focuses on the clinical experience and use of FHT for medication management to reduce cardiovascular risk in people with CKD. Semi-structured interviews were conducted with general practitioners (GPs) and practice nurses participating in the CKD intervention arm of the FHT trial.

Participants

Participating clinics were recruited via the VicREN practice-based research and education network at the Department of General Practice and Primary Care, The University of Melbourne and The University of Tasmania's Northern Tasmania General Practice-based research network. Each practice was asked to nominate a practice champion at the beginning of the trial; this tended to be a practice nurse or practice manager. The practice champion was requested to assist with the recruitment of GPs and practices nurses to participate in one-on-one interviews held between 8 to 10 months into the trial. Recruitment was also facilitated by the FHT trial coordinator. Potential participants were emailed a plain language statement and consent form to complete if they were interested in participating. Participants were reimbursed with a $50 debit card voucher.

Data Collection

Interviews occurred over the phone and were recorded for transcription. There were three interviewers; CM, NL and KS. CM is an academic GP registrar, NL is a research fellow and KS is a research assistant. All are female and are affiliated with the University of Melbourne. NL acted in a liaison role for practices during the trial. An interview guide (see supplementary file) was developed to focus on questions regarding the clinical usefulness of the recommendations, impact on clinical workflows and perceived change in clinical performance.

Data Analysis

Interview data were analysed using Clinical Performance Intervention Theory (CP-FIT), a theory for designing, implementing and evaluating feedback specifically in the healthcare context [15]. The theory proposes 42 variables that influence a feedback cycle via seven mechanisms. Each step in the cycle is vital for successful feedback to occur. Each interview was independently coded by CM and BH (a qualitative researcher) using a combination of NVivo and Microsoft Excel. Any discrepancies in coding were discussed and consensus reached.

Ethics

The overall FHT trial protocol was approved by the Department of General Practice University of Melbourne Human Ethics Advisory Group (HEAG) and the Faculty of Medicine, Dentistry and Health Sciences Human Ethics Sub-Committee (HESC). The Ethics ID is 2056564.

Results

A total of 13 interviews were held, with staff from 10 clinics. The demographic and clinic details of the seven GP and six practice nurse (PN) participants are summarised in Table 1 (Table 1). Participants were assigned a code based on their role (GP or practice nurse) and their clinic's allocated number within the trial. All 10 clinics were located in the state of Victoria, and varied in their location (regional Victoria or metropolitan Melbourne) and billing policy (mixed or bulk billing). The sample size aimed to gather perspectives from as many staff at the 19 intervention practices as possible, but was limited by the response rate. Five practices did not respond to request for interview, one cancelled citing personal reasons, and one cancelled citing lack of use of FHT. Duration of interviews ranged from 14 to 39 minutes (average 21 minutes).

Table 1: Interview participant characteristics

Participant	Gender	Location	Billing policy	Use of FHT
GP7A	M	Regional	Mixed	PoC
GP7B	M	Regional	Mixed	PoC
GP9	M	Metro	Bulk billing	PoC and dashboard
GP22	F	Metro	Mixed	PoC
GP23	M	Regional	Mixed	PoC
GP31	F	Metro	Bulk billing	PoC and dashboard
GP38	M	Metro	Mixed	PoC
PN5	F	Metro	Mixed	PoC and dashboard
PN6	F	Metro	Mixed	PoC and dashboard
PN18	M	Metro	Bulk billing	PoC
PN19	F	Metro	Bulk billing	PoC and dashboard
PN22	F	Metro	Mixed	PoC and dashboard
PN23	F	Regional	Mixed	PoC and dashboard

All interviewees had used the FHT PoC tool (N=13), with only seven interviewees having experience using the FHT dashboard. The five GPs not using the dashboard were not aware of it, were not able to access it due to technological issues, or had not had time to use it. Five of the practice nurses had used the dashboard, but none had used it to recall patients.

Interview findings: The CP-FIT feedback cycle

Results were mapped to the CP-FIT feedback cycle. An adapted version of CP-FIT is shown in Figure 1, with variables and mechanisms relevant to this study included in the diagram. In total, 10 explanatory variables and 5 mechanisms were identified as influencing how clinicians used FHT.
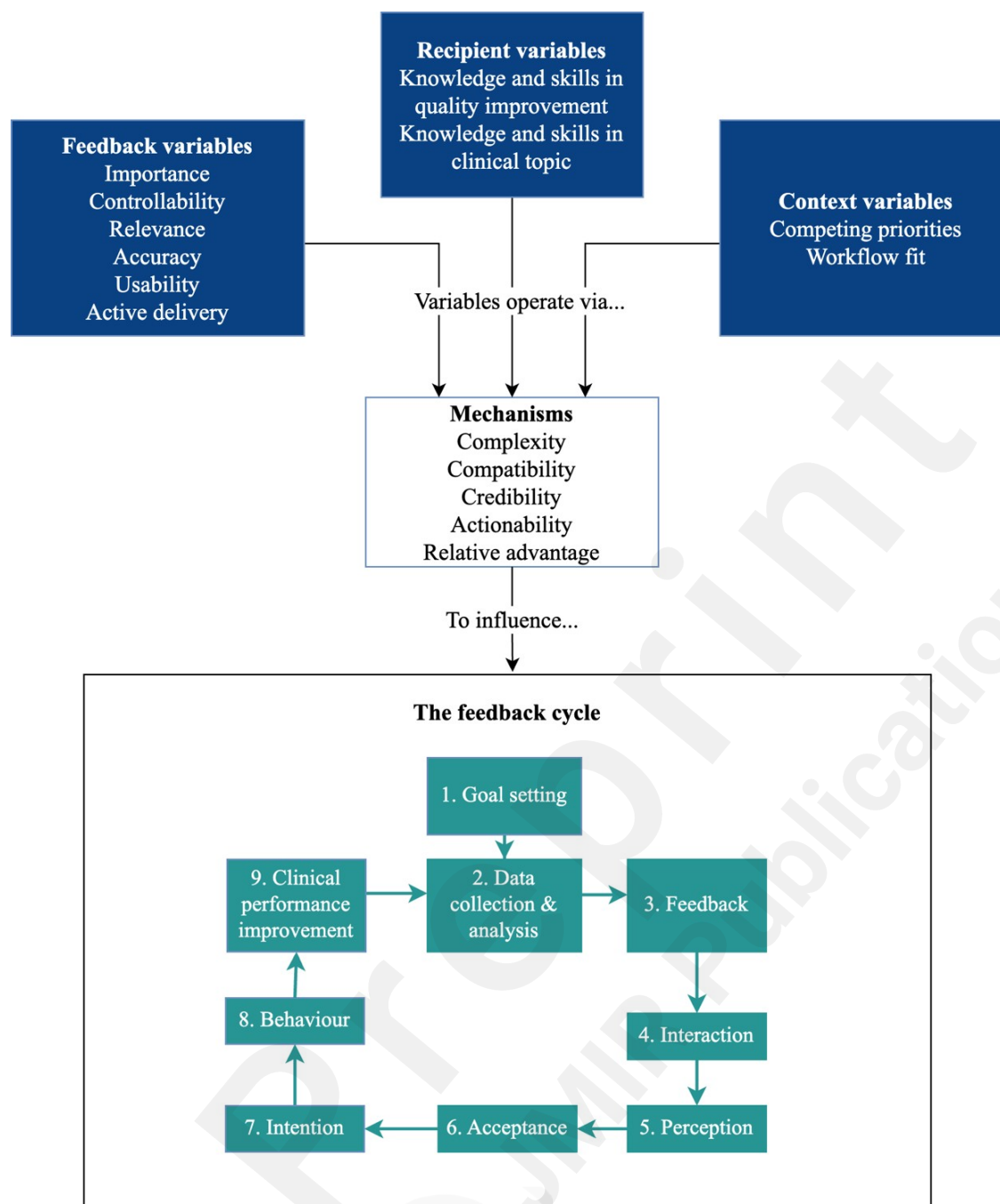
Figure 1: CP-FIT variables, explanatory mechanisms and feedback cycle (adapted from [15])

Interview findings: the point of care tool

Results for the point of care tool are presented in sequential order following the CP-FIT feedback cycle as shown in Figure 2, with key quotes to illustrate themes. Some steps of the feedback cycle are presented concurrently, reflecting that participants described these processes occurring simultaneously.
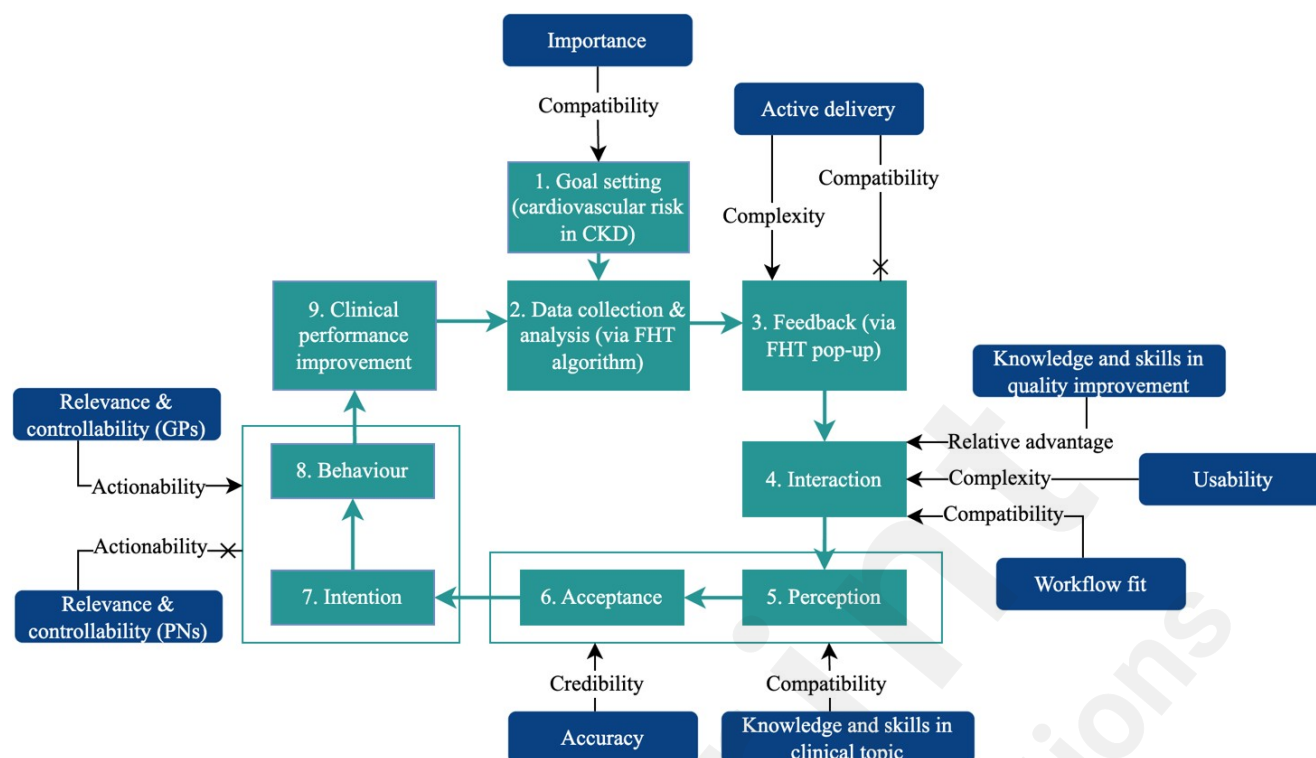
Figure 2: the CP-FIT feedback cycle when using the point of care tool

1. Goal setting: importance

It was universally agreed that CKD is an area of importance in general practice. Clinicians reflected on how CKD is under-recognised and under-treated.

> *It's certainly an area that seems to be pretty poorly documented in the patient's records and then consequently not always particularly well treated either (GP7A).*

> *It's actually really important, because it's – probably 10 per cent of the clinic patients have chronic kidney disease, according to the statistics and probably I don't have all of them already coded in my computer (GP31)*

2. Data collection and analysis

Step 2 occurred automatically via the FHT software program, without needing intervention by clinicians.

3. Feedback: active delivery

Active delivery of feedback via the point-of-care popup facilitated ease of use. Put simply:

> *It's just there. It just pops up. I read it. (PN5)*

The method of delivery was designed to not be intrusive, and this is consistent with how it was perceived.

> *It's quite a minimal popup. Well, it has to be big enough that you see it, but it's small enough that it doesn't just take over the whole of the screen. (GP7A)*

Two participants identified concerns about notification fatigue.

(Interviewer: have people been receptive to learning how to use it?) Yeah. But also… that's one more thing we have to deal with. There has been a little bit of reluctance. (PN5)

Any decision support software… you get notification fatigue (GP7B)

4. Interaction: knowledge and skills in quality improvement, usability and workflow fit

GPs demonstrated a keen interest in quality improvement, and proactively reviewed information from the PoC tool to facilitate this.

It's always good to review your management (GP31).

There will be a patient that they are not on what's recommended just because of an oversight there. So I think that it's a good double check. (GP23)

Clinicians found the PoC tool to be usable because of its information clarity and lack of complexity.

They are useful because they're clear, or clear-cut and they're not a big swath of information coming through, and that gives you an opportunity to go into the resources as you need to. (GP7A)

For GPs, the PoC tool was compatible with existing workflows. Most GPs reported reading and verifying the information in the PoC tool prior to bringing the patient into their consulting room, as part of their usual pre-consultation file review. This process was described as *very quick (GP23, GP31)* and the recommendations were able to be actioned within their standard consultation structure.

I usually familiarise myself with the patients before calling them, so I go through the history, recalls, results or whatever, including if there was any popups (GP31)

It's pretty straightforward. The discussion goes something like, 'so Mrs. Jones, just looking at your recent renal function, the current recommendations is that we add a statin or you should be on an ACE or ARB. what do you think about that?' They usually say, well, what do you think? And we go down that path of shared decision making. (GP7B)

Practice nurses described more variation in how they interacted with PoC tool and integrated it into their workflows. Two described using the program *opportunistically (PN5, PN19)* during consultations or when reviewing existing recalls. One reviewed the recommendations only when the patient was booked for a long appointment such as a care plan or health assessment. Practices nurses mostly acted on the recommendations by documenting in the patient file or directly discussing with the patient's GP.

It's for patients who have long appointments. For example, they're in for a care plan or a health assessment wherein we actually review and check the file for a longer period of time. Unlike those who are only here for, let's say, vaccinations where they will be in and out of the treatment room and we don't really have that much time to review and study. (PN22)

I usually will just alert the doctor and then… the doctor will, based on their own view and they would decide whether or not to follow the advice (PN6)

5. Perception and 6. Acceptance: knowledge and skills in clinical topic, accuracy

When asked directly, each GP reported a good pre-existing knowledge of CKD; none of the information in the PoC tool was new or surprising. They expressed confidence in interpreting and actioning the recommendations in the context of each patient.

> *Guidelines are guidelines. That's exactly what they are. They're not - they don't actually always - are not always appropriate for the person sitting in front of you.. we go down that path of shared decision making. (GP7B)*

> *Every patient that I have I have a look at the recommendations to see what their recommendations are and if it comes up in orange or that I consider their recommendations and follow them unless there's a reason not to. I review my medication and have a good think about it. (GP23)*

Most practice nurses reported less confidence with CKD management in general, but were empowered by the point-of-care tool to learn more.

> *I don't think I know that area so well, yeah, so it is quite useful to have this pop-up icon. (PN6)*

GPs largely found the recommendations to be accurate. The process for verifying information was straightforward and they felt comfortable discounting recommendations when appropriate. The format of clinical data storage and the way data was recorded in the electronic medical record was identified as a potential source of inaccuracy.

> *I think it seems to be pretty accurate most of the time… normally I will go having a look through the most recent result eGFR and any albumins that are there and just see if there is anything that does meet the criteria for a diagnosis. Then if not, then I'll leave it. (GP7A)*

> *I think a lot of them are on it. It just wasn't documented in the right place… one of the limitations in this clinic in particular is that [GP] handwrites scripts (PN19)*

7. Intention and 8. Behaviour: usability, relevance and controllability

Themes related to controllability and relevance diverged according to role, due to the recommendations having a focus on medication and prescribing. GPs found that the PoC recommendations were well within their scope and control, and most GPs found them relevant to their patient population.

> *Every time, if it came up with a recommendation, I would act on it to decide whether they should be on it or whether there's a reason not to. (GP23)*

In contrast, practice nurses described how the PoC had limited direct relevance to their role, which excludes prescribing.

> *I can't prescribe anything, and a lot of it is about prescribing (PN5)*

9. Clinical performance improvement

Overall, these themes reflected the view that the PoC tool was seen as a 'prompt' or 'reminder' that reinforced pre-existing knowledge in a straightforward manner consistent with usual practice.

It's a nice little way of reminding people to do it really… I think just having it coming up is always reminding me to check what are the best practice principles, things like the ACE and ARB. (GP7A)

I think it's just a good prompt because it does pop up there, when you can get really busy. (PN19)

One GP reflected on how the presence of FHT had had the effect of encouraging more general clinical performance improvement.

It certainly does focus particularly in general consults on preventative health and flags that as an issue to discuss and might then prompt me to not only look at the CKD, but make sure they've had a recent blood pressure and height and weight and make sure their cancer screening is up to date; all of those sorts of things as well. (GP7A)

Interview findings: the dashboard tool

Results for the dashboard tool are shown in Figure 3. Feedback cycle steps 1 and 2 (goal setting and data collection) operated in the same manner as the point of care tool. However participants became 'stuck' at either step 3 or 4.
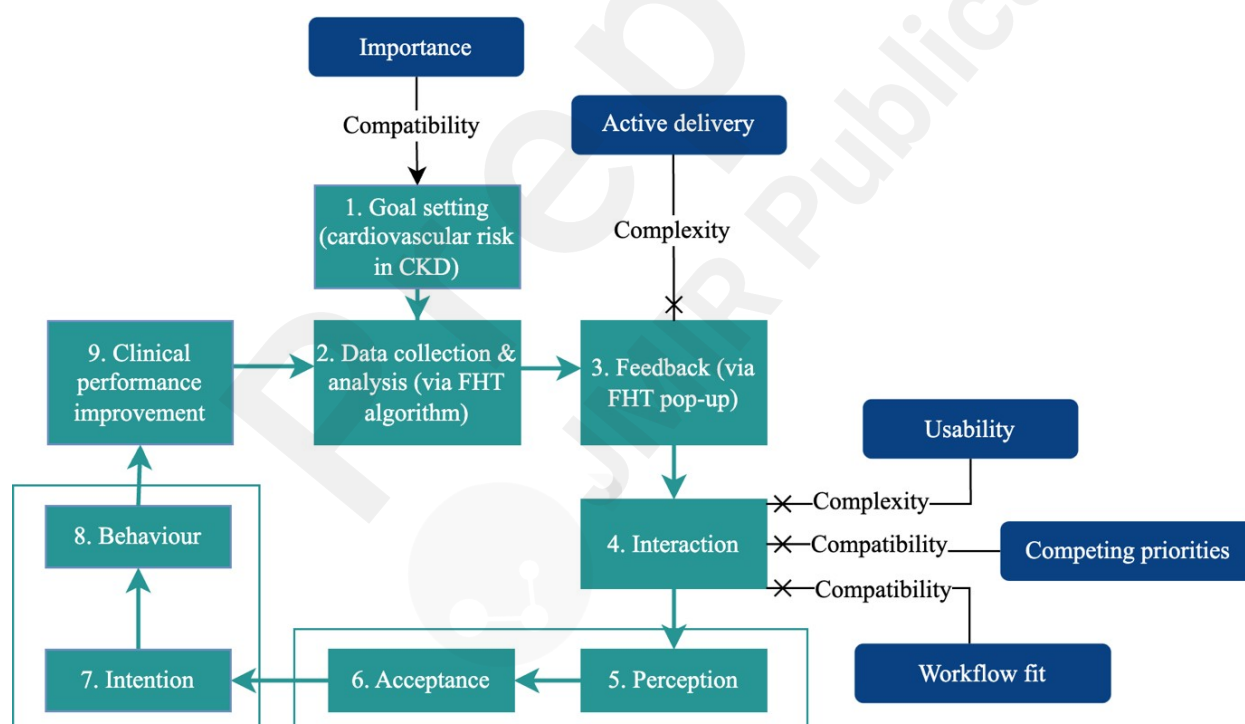

Figure 3: the CP-FIT feedback cycle when using the dashboard tool

3. Feedback: active delivery

Use of the dashboard was significantly limited by its lack of active delivery; multiple clinicians were not aware it existed.

4. Interaction: usability, competing priorities and workflow fit

Clinicians who had used the dashboard reported some difficulty learning how to navigate the tool, and use of the dashboard was largely incompatible with existing workflows. This was exacerbated by time constraints associated with additional clinical tasks and workforce pressures, particularly with impacts from the COVID-19 pandemic.

> *I get a little bit lost still in [the dashboard]. (PN19)*

> *A lot of it is just timing. We're still so busy. I would love to have a bit more time to sit down and just work through things. We're starting to do a little bit now but, really, it's just time. (PN5)*

> *With the Pfizer vaccines and all that we are inundated with work… COVID has really taken over (GP22)*

Discussion

Principle Results: the Point of Care tool

In this qualitative study exploring the implementation of FHT using the CP-FIT theory, we found that the FHT PoC tool was well received by clinicians and facilitated guideline-informed care. When mapped to the CP-FIT feedback cycle in figure 2, we could see that they were able to move rapidly through all steps of the process, facilitated by the variables identified. GPs found that the tool was compatible with their quality improvement goals and clinical workflows, was simple to use, and provided credible, clinically useful information. This was supported by their pre-existing confidence in managing CKD, so that the tool was seen as a quick reminder system that prompted further personalised review and discussion. Clinicians in our study worked across a range of location and billing styles, but all described similar workflows and clinical knowledge that supported uptake of the tool. This concept of a clinical decision support tool working most effectively as an 'aid-memoire' is supported by existing literature [16]. Practice nurses had a slightly different experience given their self-reported lesser knowledge in CKD and limited role in medication prescribing, but nonetheless they described the PoC tool as useful and simple to use.

Principle Results: dashboard tool

Use of the FHT dashboard tool was limited. Most GPs did not get to the 'feedback' stage of accessing the dashboard, and most practice nurses did not progress past initial interactions with the software. During the codesign phase clinicians had expressed a desire for FHT to facilitate both planned and spontaneous interactions[11], but in practice most interactions occurred spontaneously. The functions available in the dashboard did align with the goals described by clinicians in both the codesign phase and this implementation study, but this was insufficient to overcome competing clinical priorities, particularly lack of time and staff resources in the context of the COVID-19 pandemic.

The barriers to use of the dashboard tool stood in clear contrast to the facilitators for the PoC tool. Whereas the PoC tool was simple to access by virtue of being a 'pop-up', the dashboard required clicking away from the patient file. The visual design of the PoC tool and wording of the recommendations were designed with simplicity and conciseness as a priority. By contrast, the

dashboard tool has multiple aspects of functionality, allowing for extensive customisation (see supplementary file 1). The few clinicians who reached the tool described being overwhelmed or not having enough time to learn how to use the tool.

The nature of Australian general practice funding tends to incentivise opportunistic rather than systematic preventative health activities [17]. Medicare uses a 'fee for service model', whereby patients receive a rebate for attendance either in person or via telehealth/telephone. Alternative payment mechanisms have been proposed that allow for more of a focus on proactive, coordinated care that includes funding 'non-face to face care' such as is required to interact with tools such as the FHT dashboard in any meaningful way [17].

Limitations

All clinicians we interviewed had used FHT in their workplace; by nature of agreeing to be interviewed they were able to describe the enablers that led them to progress along the CP-FIT feedback pathway. Respondent bias is a limitation of our study, as those who feel most strongly are most likely to speak with us. We also acknowledge that the sample size may not encompass the experiences within the diverse general practice context. However, given the impact of the COVID-19 pandemic in primary care, we are grateful to the thirteen participants that took the time to speak with us. The barriers remain unknown for clinicians who did not use FHT, although can be hypothesized as discussed below.

While this study focused on the implementation of FHT from the clinical perspective, there are of course other important considerations. In particular, other studies have identified concerns related to financial costs of staff time and the software itself [18].

Comparison with Prior Work

Many electronic quality improvement programs in current use in Australian general practice have not been evaluated in a research context, and as such there is a lack of data exploring implementation factors for these programs. The Australian Government Department of Health has recognised the need for clearer policy around governance of general practice data and the development of clinical decision support tools. In particular, concerns have been raised about the variable quality of existing clinical decision support tools and lack of implementation considerations, which may create general distrust in electronic clinical decision support by GPs [19].

A commonly reported barrier to use of clinical decision support systems is that of 'too much information', either in the content of a prompt or in the total volume of prompts [21][20]. This notification fatigue is an important consideration for any clinical decision support tool that activates automatically. There is a delicate balance between 'active delivery' to facilitate easy interaction with a tool, and unobtrusiveness to the extent that clinicians are not aware of a tool, such as occurred with the FHT dashboard. Clinicians in our study praised the physical size and placement of the point-of-care pop-up on the screen, as well as the simplicity of wording of the recommendations. Only one GP brought up concerns about notification fatigue, although did not report it as a barrier for their own use of the PoC tool. As more FHT modules are developed in the future, it will be vital to account for potential alert fatigue in how the pop-ups are deployed and displayed.

Lack of time has similarly been cited as a widespread barrier to clinical care for both GPs and nurses [9] [18], however clinicians in our study did not describe time as a barrier to use of the PoC tool.

This is likely due to the speed at which they interacted with the tool, which itself was due to usability of the tool and knowledge of the GPs. The marginal time required to interact with the tool, however, will inevitably become more significant as more FHT modules are added. It will be important for sustainability of the FHT program to take this account, to reduce the risk that lack of time becomes a barrier to use of the entire PoC tool.

A study in 2015 in the USA reported barriers to implementation of a clinical decision support tool specific to CKD included limited knowledge of CKD guidelines, lack of interest or confidence in technology, concerns about patient engagement, and time and competing demands [22]. In our study, clinicians' knowledge of CKD and interest in technology for quality improvement were strong facilitators for FHT, and they were confident in discussing recommendations with their patients. Lack of knowledge in identification and management of CKD has been cited as a general barrier to care [9]. Overall it appears that our group of clinicians were particularly knowledgeable and proactive, and this greatly facilitated their engagement with FHT. The PoC tool had been designed with usability and clarity in mind, but these health professional characteristics were vital for uptake.

Acknowledgements

Conflicts of Interest

FHT software was developed by The University of Melbourne in collaboration with Western Health. Intellectual property related to FHT is owned by The University of Melbourne.

Abbreviations

ACEi: angiotensin-converting enzyme inhibitor
ARB: angiotensin-receptor blocker
CKD: chronic kidney disease
FHT: Future Health Today
GP: general practitioner
PN: practice nurse
PoC: point of care

Multimedia appendix 1

Screenshots of Future Health Today software

Multimedia appendix 2

Interview guide

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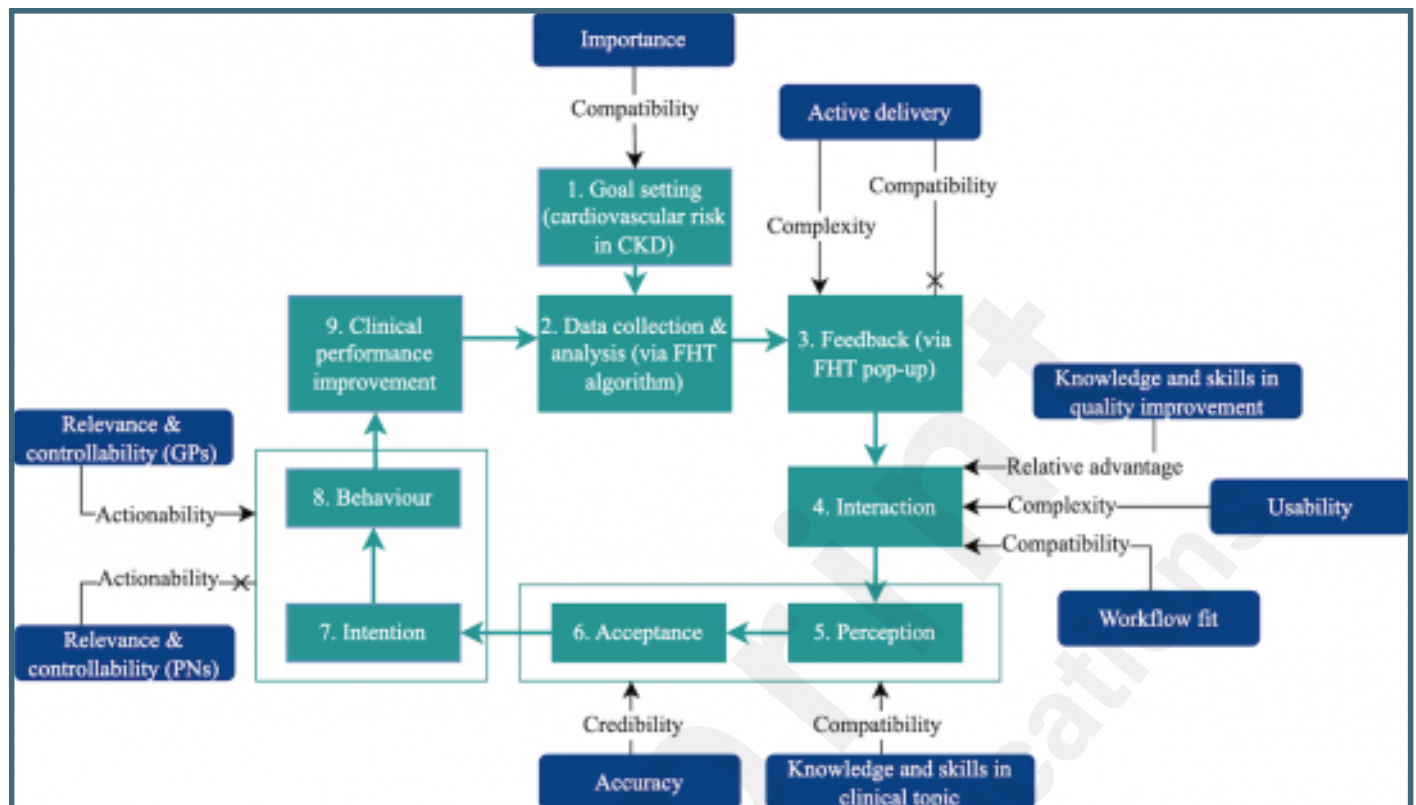# Supplementary Files

Figures

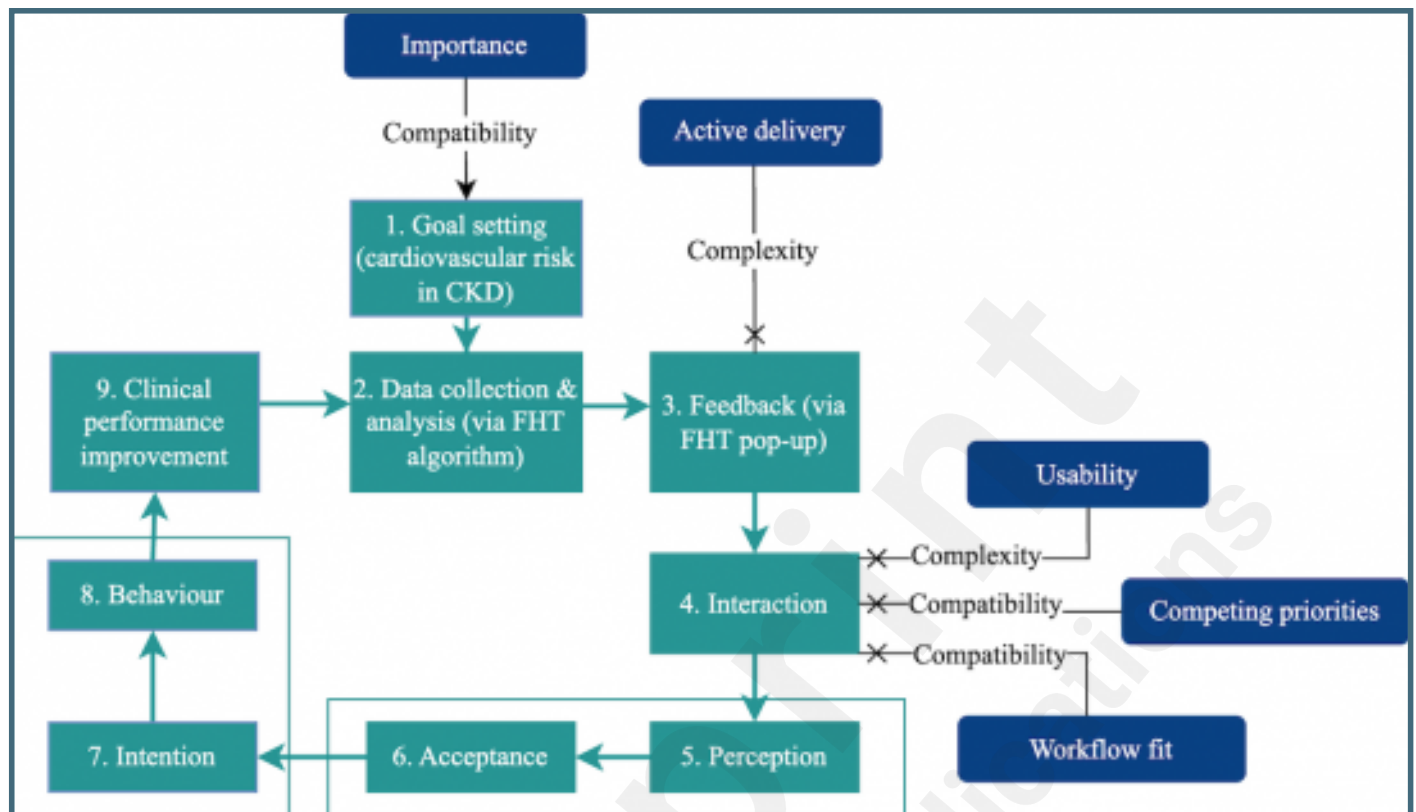CP-FIT variables, explanatory mechanisms and feedback cycle (adapted from [15]).
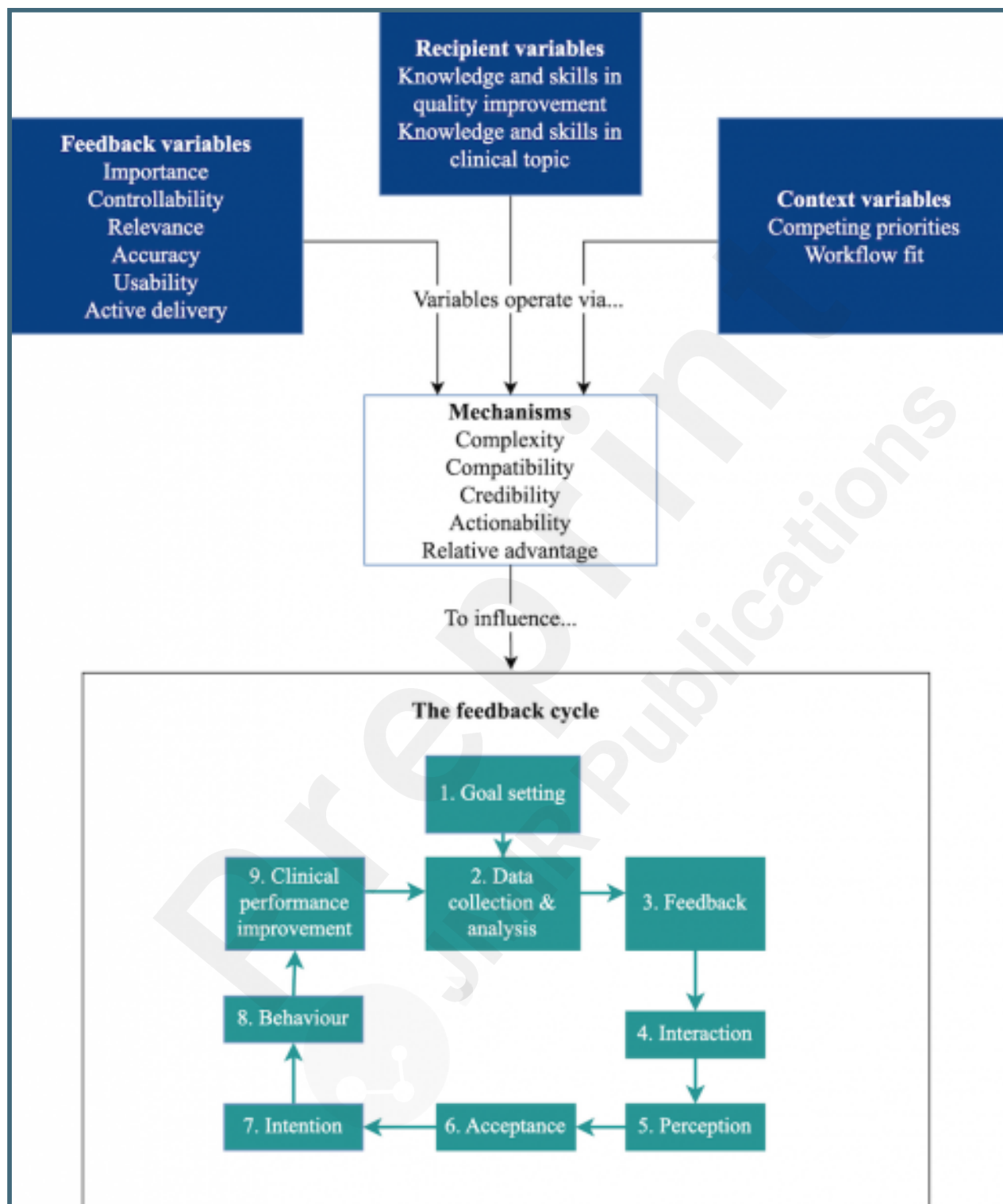
The CP-FIT feedback cycle when using the point of care tool.

The CP-FIT feedback cycle when using the dashboard tool.

Multimedia Appendixes

FHT software display components.
URL: http://asset.jmir.pub/assets/2ca5abb7bc2a5be89fa38d367bbe4755.docx

Interview guide.
URL: http://asset.jmir.pub/assets/83d6a9cb74fa8359fa6db3226bba8d0a.docx