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Research Article

General Practitioners' Use of Risk Prediction Tools and their Application to Barrett's Oesophagus: A Qualitative Study

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Abstract

Background: Risk prediction tools are widely used for the early identification of disease and expediting referrals to medical specialists for further assessment. This study provides an understanding of general practitioners preferences for using some prediction tools over others. The recent development of a risk prediction model for Barrett's oesophagus prompted our investigation of General Practitioners perspectives of the barriers and enablers to its use and screening tools perse.

Method: Individual semi-structured interviews explored the use of risk prediction tools in the general practice setting. A case scenario was used to create a schema that described the risk assessment process for Barrett's oesophagus. A content analysis of verbatim transcripts was coded for barriers and enablers to tool use and linked to explanatory themes.

Results: Data was collected from five general practitioners and one gastroenterologist. Barriers to regular use of risk prediction tools were identified and grouped using five themes; time poverty, tool format style, remembering to use, relevance of questions, and reduced autonomy in clinical decision making. Five key reasons for regular use were also identified; simple to use, memory prompt, provides a clear guide, aids in keeping me focused, and easy to access. All participants acknowledged the need for identifying Barrett's oesophagus, the precursor to oesophageal adenocarcinoma, and viewed our tool as a significant contribution to risk assessment of this condition.

Conclusion: Identifying barriers and enablers is essential to wide implementation of risk prediction tools. Participants provided information crucial to the translation of our risk prediction model for Barrett's oesophagus into clinical practice. They also confirmed that the developed model would be useful in the clinical setting.

Keywords: Clinical decision support tools, Early detection of cancer, General practitioner, Primary health care, Qualitative research, Barrett's oesophagus

Introduction

The incidence of adenocarcinoma of the oesophagus has been increasing for some time [1-3], particularly in the United States, Europe and Australia [4]. Most oesophageal cancers are discovered late in their development, with spread to the lymph nodes and have a poor five year survival rate [5]. Gastroesophageal reflux disease (GORD), obesity and male gender have been consistently shown to be associated with increased risk of adenocarcinoma of the oesophagus [6], however, Barrett's oesophagus is the only known precursor [7].

Barrett's oesophagus is a 'silent condition' and estimated to affect between one and two percent of the general population [8]; therefore screening could represent an important step to early identification and intervention. There is no proven cost effective population screening tool developed for Barrett's Oesophagus [7,9]. Some guidelines recommend once off screening of men who are of white race, over 50 years of age and suffer from GORD [8,9]. The implementation of this guideline would stretch the resources that are available [10], especially in the Australian public health system. Targeted screening directed at individuals more likely to have Barrett's oesophagus may improve cost efficacy [10,11].

We developed a well-calibrated risk prediction model with good discrimination to identify those at higher risk of having Barrett's oesophagus who should undergo further investigation. The model achieves a sensitivity of 85% and a specificity of 66%

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[12]. This risk prediction tool can now be considered for wide spread use in clinical practice. Endoscopic surveillance of those diagnosed with Barrett's oesophagus can then occur, aiming to facilitate timely detection and treatment of adenocarcinoma potentially improving survival rates [9]. While the risk prediction tool has been developed, further research is still required to ensure that it is taken up in general practice.

In general, risk prediction tools are developed as an aid to help predict various disease states and conditions. However, their use in clinical practice has not been consistent [13], and they remain underutilised within primary care practice for a range of reasons [14]. Understanding what prompts General Practitioners (GPs) to use a particular risk prediction tool over another will guide the development of strategies aimed at increasing the translation of research into clinical practice gains. Previous research exploring the perceptions of GPs has mainly been undertaken within risk assessment for cardiovascular disease, although there has been a widening of the scope in recent times including conditions such as diabetes, osteoporosis, dementia, depression [14,15] and cancer [16].

Methods

This study sought the opinions and experiences of GPs concerning their current and projected use of risk prediction tools. Clinical scenarios pertaining to GORD and Barrett's oesophagus were then used to explore the clinicians' perceived utility of our risk prediction tool within the primary health care setting.

Sampling and recruitment

General practices in Adelaide, South Australia were approached between November 2016 and April 2017 to participate in the study. Recruitment efforts were centred on telephone contacts with practice managers. No financial reward was offered. Information regarding the study was provided to practice managers and GPs in the form of an introduction letter, participant information sheet, and consent form. In anticipation of low response rates attributed to busy practices snowball sampling was introduced. Sampling by referral from a participant to a potential participant is considered to be effective means of recruitment where populations are hard to reach [17]. We considered GPs to be in this category. Concerns about the effects of non-random sampling were deemed minimal; given the exploratory nature of the study and the singular aim of identifying any factors that might influence the implementation of our validated risk prediction model [18].

Matching sample size to the type of study, topic question and the purpose of the data is a complex process that remains in debate, as there are many considerations that need to be identified and weighted for importance [19]. The sample could be small in number yet produce highly relevant information for analysis as the interviewer was experienced, the topic was clearly defined and suitable for an exploratory approach, and the participants would be well-selected - homogeneous interviewees (with adequate exposure to or experience of the phenomenon) [20,21]. Sampling ceased when the researchers independently determined that the participants had provided sufficient data to capture the factors that promoted and impeded the use of a risk assessment tool [22]. The exploratory nature of this study was also considered when determining that sufficient data had been collected [23].

Setting

Consulting rooms were identified as the most appropriate place to conduct interviews given they offered privacy, a low risk of interruption, minimal disruption to GPs time during business hours, and a familiar environment. Where GPs geographical location was remote telephone interviews were used, allowing their opinions to be included within the study. A comparison of face-to-face interviews with telephone interviews has shown the quality of information obtained between the two approaches is similar [24].

Interviews

The depth of the interview guide was designed to meet the purpose of data collection: identification of barriers and enablers to using risk prediction tools [25]. The interview format consisted of semi-structured and open ended questions followed by a case scenario (Box 1). Preliminary questioning focused on risk prediction tools currently in use and what factors they considered had attracted them to use certain tools. Responses were also sought to determine what deterred participants from using a tool known to them, as well as any actual or perceived structural barriers. Interviews were conducted and audio-recorded by the researchers. Manual coding of transcribed content was carried out by the first author (CJI).

Box 1. Interview scenario

44 year old male presents complaining of a sour taste in his mouth when eating. He reports that generally this occurs 3 times a week but he has been using Quick-eze® to relieve the symptoms up to now. Quick-eze® have not appeared to work as effectively lately. He reports that his mother has suffered from reflux for years; he drinks 30 beers a week and has a Body Mass Index (BMI) of 28. Other observations are unremarkable and no other issues were found.

We recognised that our interest in promoting our risk prediction tool for Barrett's oesophagus may influence the way that we conducted the study and interpret the data generated. Therefore, a reflexive process was used to minimise researcher bias and improve conformability of the data. As far as possible the data and this work's findings are the result of the experiences and ideas of the participants, rather than the researchers assumptions [26].

Ethical considerations

The University of South Australia Human Research Ethics Committee approved this study (Protocol number 0000036222). Informed consent was obtained from the participants prior to the interview and all information was de-identified.

Data Analysis

Guidance has been taken from Sandelowski's [27] explanation of qualitative descriptive studies to gain an understanding of the participants responses. Minimal theoretical interpretation of the data was undertaken; this enabled the participants' information on decision making behaviour to be the forefront of the analysis and facilitating the establishment of content themes [28]. Further information was captured regarding the decision processes when provided with a case scenario. For example, what processes would be undertaken and the resulting disposition of the case?

Similarities in data were grouped into two broad categories: 1) enablers to using prediction tools; and 2) barriers to using prediction tools. A decision tree was created to illustrate key considerations undertaken by clinicians in screening for risk [29]. The transcripts were reviewed by a second author (TAL), to allow scrutiny of themes, to validate consistency and to promote trustworthiness. The resulting themes were then agreed upon and presented to the other authors for verification.

Results

In total six interviews were conducted with five GPs and one gastroenterologist, lasting between 20 and 30 minutes each. Three participants were females and three were males, with clinical experience ranging from 4 to 30 plus years. No participants were from the same practice; the sample represented both metropolitan and country practices.

Practitioners had used a variety of tools to assess the risk of disease states in the past year. The most common was for cardiovascular risk assessment. Others mentioned included screening tools for diabetes, mental health, bowel cancer, breast cancer, dementia, prostate cancer, post-natal depression, suicide and alcohol and drug dependence. Notably the respondents did not mention the use of an upper gastrointestinal (GI) risk assessment tool.

Barriers to using risk prediction tools

Participants identified five key barriers to using risk prediction tools, these being: time poverty, tool format style, remembering to use, relevance of questions and reduced autonomy in clinical decision making.

Time poverty: All participants identified that time poverty was the biggest factor influencing their decision to use or not use a risk prediction tool. Three sub-themes identified; i) difficulty in finding the appropriate tool, ii) completing and analysing the assessment, and iii) imparting information to the patient regarding the meaning of the risk score.

Practitioners commented that not being able to find the appropriate tool easily was a key barrier. GPs reported that utilising clinical software programs provided a way for practitioners to streamline practices. There are many prediction tools embedded into them; however, there are many more that are not embedded. Locating an appropriate tool, when not embedded into the software, put pressure on the time allocated to a patient consultation.

"I can tell you what the trouble is; it's finding them, access, got to be easy access" (P3)

"If you don't have to hop out of your clinical software and go to another website or go to another tool then in general practice that makes it the most effective." (P4)

Another consideration was the time to complete and analyse the results; there was a perception that if the tool increased their workload, then it probably would not be used. Practitioners were looking for efficiencies to allow them to provide the best possible outcomes without increasing their workload dramatically.

"so what you don't want is a tool that I would imagine that you go 'Oh I need this or I need that, we've got to arrange this, I've got to do this, I've got to do this before I can even work out your risk score', you know or apply the screening tool." (P4)

"…I sit there and say 'if it takes more than five minutes to do then really that's problematic for general practice'…" (P6)

The third pressure reported was that of counselling the patient prior to completing the prediction tool. Ensuring that patients are aware of reasons for completing the tool, the benefits and limitations of the tool; as well as discussion of results following completion of the tool.

"So it all takes time, educating the patients on the risks and benefits of these things all takes time. And to do it properly, so that you've got a fully informed patient who's actually understanding the process that you're going through. So that's probably the biggest negative of any screening test" (P4)

Tool format style: All the practitioners within this study reported they now utilised computer programs for recording their consultations. They indicated that tools should be in electronic form and preferably incorporated into clinical practice software. GPs identified that using paper based forms created issues for recording the results within the computer programs.

"…so these days it's becoming more computer orientated….. the younger GPs are more familiar with that. Try and put it on a piece of paper …..there not going to use it….. It has to be somehow software compatible….." (P6)

If it's delivered to most GPs in a paper format I would say they probably won't use it because they're used to doing apps and in-practice software. (P5)

"Paper based doesn't work, ….If you do it on a piece of paper it's OK but then it's got to go off and be scanned in, it's a document then that doesn't actually appear in the patients consultation notes…." (P1)

Remembering to use: Practitioners reported that they encounter many different risk prediction tools within their professional practice, and having them as part of the clinical software is beneficial in remembering to use them. Despite this, they reported that for less common diseases practitioners were not likely to remember the tool exists.

"So I mean that I think tools like these are great but like you said 'I probably would very rarely think about Barrett's oesophagus'…" (P2)

Relevance of questions: The information required to complete the screening tool needs to be relevant. Some GPs in this study reported that they became frustrated collecting information to complete a risk prediction tool, only to find out that it was not relevant, and would not change the result if not collected. They also reported that the tool needed to contribute to their decision making process, otherwise they would not use it. If it does not change management then they felt it was not relevant.

"yeah and if it's not going to contribute too much to what my suspicions are already and change how I'm going to manage then, yeah I might not go down that path…" (P2)

"…it's quite frustrating once you're using them for a while and find some of it's not relevant." (P3)

Reduced autonomy in clinical decision making: GPs reported becoming frustrated when they felt that risk prediction tools diminished or negated their clinical autonomy within their scope of practice. There was an impression among the participants that some risk prediction tools and guidelines dictate what they can and cannot do, reducing the involvement of their own clinical skills and knowledge. There was a feeling that they did not need more guidelines, but simply more prompts.

"some GPs get a bit cross about them and go 'where getting told left right and centre, we've got to do that and that risk assessment and this and that and guidelines' and some GPs get upset…." (P4)

Enablers to using risk prediction tools

With regard to identifying what entices clinicians to use risk prediction tools, five enablers were identified; simple to use, memory prompt, provides a clear guide, aids in keeping me focused, and easy to access.

Simple to use: Providing a tool that is simple and did not require additional training was seen as a key factor for GPs when deciding whether or not to use a risk prediction tool. There was also a consensus that it also needed to be simple for the patient to understand.

"it's got to have nice flow, that it would ask questions that the GP would or the physician would see meaning in asking in some sort of understanding" (P5)

"…. They're easy for consumers to understand as well, so up comes the percentage risk score, your risk of having a heart attack or stroke in the next five years is that percent." (P4)

Memory prompts: Risk prediction tools are valued by practitioners as they are an aid to memory and facilitate decisions on whether further investigations are required. GPs see a multitude of different disease states throughout their consultations, and remembering every nuance of each condition can be challenging. GPs identified that a memory jogger kept them focussed in identifying those who are at higher risk.

"For me it's a good memory jogger, if I'm not doing anything and I know I haven't missed anything, the patient hasn't gone down the road I won't miss anything important…" (P3)

"I guess the questions; they remind us of things that we might not have thought about so it's good to have a bit of a system and some written questions to go through"(P2)

Provides a clear guide: Whilst GPs identified that feeling a reduction of clinical autonomy was a barrier to using risk prediction tools, paradoxically it was also identified that this was a reason to use them. It was seen that risk prediction tools could provide a guide for the ongoing management of a disease, as well as discussing the management of disease states with patients.

"It's very helpful if any doctor can say, look this is not just me saying that you know… this is actually a guideline and that's very helpful." (P5)

"… it's also allowing you to cajole the patient to getting onto needing to look at this by having something, rather than subjectively it's theoretically objectively, to say 'look this tool tells you you've got a problem'". (P6)

Aids in keeping me focused: Most participants claimed they had benefited from a risk prediction tool that kept them focused on identifying those who were at greater risk and needing referral. This focus was particularly beneficial when screening for diseases that would use resource intense diagnostic procedures, as in the example of Barrett's oesophagus which utilises endoscopy.

"Just to help us just funnel a little bit closer to the higher risk ones…." (P4)

"..the positivity of them is that they are made to …pick people you may not have asked the questions anyway, ….picking people out of the multitude of people you see that, gee I need to think about this one or I need to do more on this one …" (P6)

Easy to access: GPs reported that having easy access to risk prediction tools was a prime consideration in their decision to locate and use a tool. Most respondents had a strong preference for the tool to be incorporated into their practice software, or at least a computer application that could be completed and provide the results instantaneously.

"…in general practice quickly accessible is critical. So you need to be able to get to it very quickly, have your link on the desk and just click on it and have it come up straight away." (P4)

Completing paper based tools was not ideal as most GPs are now familiar with and utilise apps and computer programs regularly, supporting the notion that tools needed to be computerised for increased usage. It was also suggested that having patients complete tools electronically prior to the consultation could also be an advantage.

"Paper based is really doesn't work, so if it could be incorporated it into something you can either have on either an app on your phone or something based within the computer system." (P1)

"…everyone's now quite happy with doing apps and you might even want to think about patients filling things out in the waiting room on an IPad or tablet or whatever." (P5)

Schema for Barrett's oesophagus risk assessment

Following the general discussion about risk prediction tools, GPs considered the scenario (Box 1) and provided comment as to how they would respond to the presenting complaint. The information obtained was used to develop a decision tree to identify commonalities between participants' responses (Figure 1).

None of the respondents had indicated that they had used a risk assessment tool for the GI system, and when questioned if they were aware of such a tool, none could recall ever encountering such an aid.

"…to my knowledge I haven't heard of a GIT screening tool…. Yeah, no I haven't heard of one, clearly we tend to go along the guidelines, you know bowel cancer screening etc, etc. But that's not a screening tool really." (P6)

The GPs indicated that they would refer the person for an endoscopy if there were any red flags (particularly malaena, haematemesis, anaemia or dysphagia). As there were no red flags within the scenario, most GPs indicated that they would consider doing blood tests (Liver Function Tests (LFT's), Haemoglobin

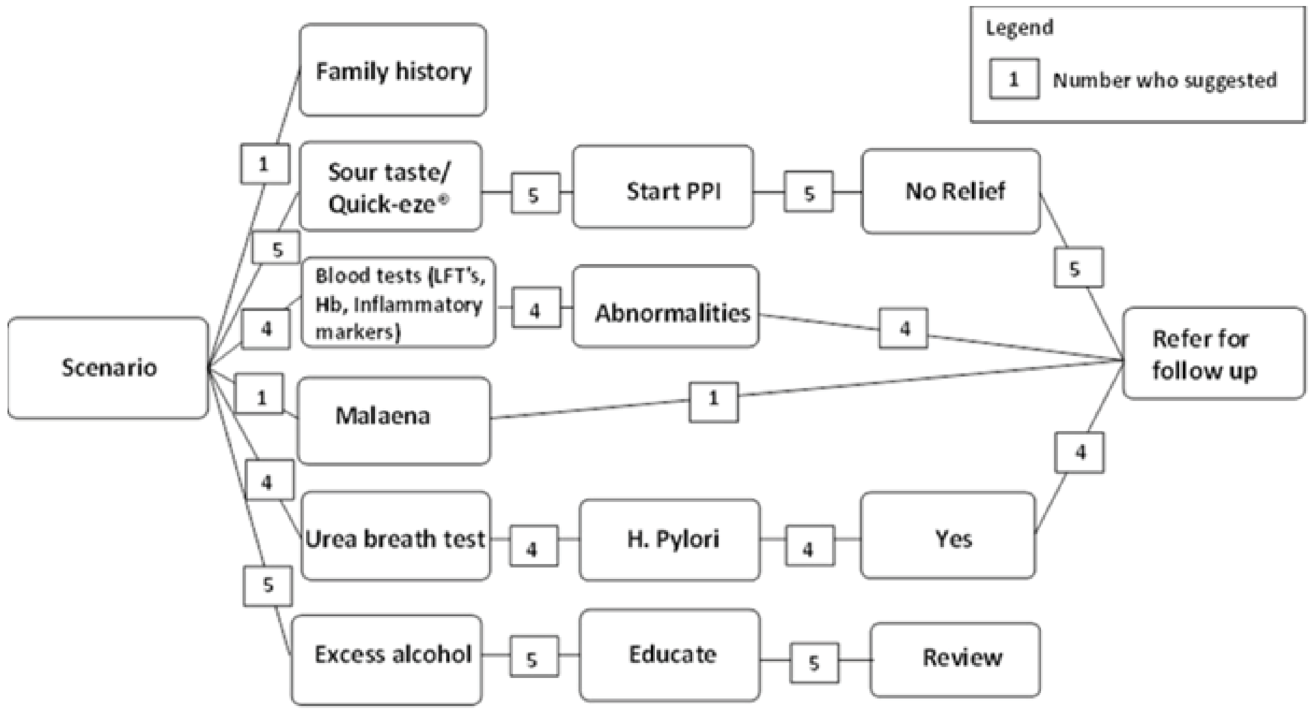

Figure 1: Decision tree for scenario.

(Hb) and Inflammatory markers) and a urea breath test; if there were any concerns with any of the results, the patient would be referred for review and an endoscopy. All GPs identified that having a sour taste when eating relieved with Quick-eze indicated that the patient in the scenario probably had reflux and therefore warranted a trial of proton pump inhibitors (PPI) for four to six weeks, followed by a review. If symptoms settled, PPIs would be continued, and if not, then a referral to a gastroenterologist was warranted for further investigation. At the same time there were concerns about the excessive alcohol consumption, and all indicated that they would institute counselling.

"...probably try and see if we can make any improvement with his alcohol use and just relieve symptoms with PPI for the time being." (P2)

"if hadn't settled by six weeks with that, with PPI and obviously high dose PPI ...then he gets a tube down" (P6)

Introducing our risk prediction tool [12] provided an opportunity to determine the likelihood of its use within a general practice setting. Applying the risk prediction model to the patient in the scenario, the risk of Barrett's oesophagus was 68% (the scenario was for a person who had previously been diagnosed with Barrett's oesophagus). GPs commented that this was a person who could be easily missed.

"I think it's great (referring to the risk prediction model) because you know it's showing the benefit of this sort of approach, because it's one easily missed." (P1)

The risk prediction tool provided the clinicians with an objective assessment of the patient, which removed a portion of the subjective observation.

"...we have a lot of people coming in with reflux and it's always that concept in the back of the mind, you know... yes if you miss that oesophageal cancer or gastric cancer there not going to like you for it so any tool that puts us a little bit more objectively able to say 'yes we should be doing this' rather than subjectively doing it, is of great benefit." (P6)

Our risk prediction tool for Barrett's oesophagus was viewed positively by the practitioners.

" I think the screening tool itself is excellent..." (P2)

"...for Barrett's, something like that would definitely be good" (P3)

"...that's a model that could work quite well potentially." (P4)

While risk prediction tools are designed to identify those at greater risk of a particular disease, benefit was identified in being able to identify those patients at low risk and not requiring endoscopic investigation. Clinicians identified that reassuring those who are well and require no further investigations is where our tool should focus, due to the low prevalence of Barrett's oesophagus.

"...the most useful thing clinically in terms of educating and effectively directing resources is the negative predictive value of a test, ... Who can be popped out of this? And these tests we find can be hugely helpful, particularly and I'm calling this a test, ... we find hugely helpful if we can say to a group of people, your risk of this is relevant to you and your risk of this is vanishingly small. We already know for most women, who aren't overweight, their risk of oesophageal cancer is vanishingly small....If we can additionally show them the number that's very helpful because what we do know is that women, on average in Australia, have more endoscopic procedures than men. Now that's crazy, because they have less colon cancer; less oesophageal cancer and less gastric cancer." (P5)

While our tool provides an overall risk and assists in identifying those who are at higher risk of having Barrett's oesophagus and needing further investigations, it also assists in providing opportunistic teaching and counselling moments, which was seen as a positive.

"there's absolutely no point, from a public health point of view identifying that someone's got risk factors and then failing to manage…, and that's where I think it can be very helpful – is to say look, these are your risks and here's your score and it's pretty high, now we can do an endoscopy and check you but in terms of reducing your risk over time, why don't we talk about your BMI, your alcohol,…" (P5)

Discussion

This study identified barriers and enablers perceived by GPs when utilising risk prediction tools to predict disease states, and to obtain their assessment of the utility of our Barrett's oesophagus screening tool. Participants identified five salient barriers to using risk prediction tools; time poverty, tool format style, remembering to use, relevance of questions and reduced autonomy in clinical decision making. Five enablers were also identified; simple to use, memory prompt, provides a clear guide, aids in keeping me focused and easy to access. Previous research has highlighted that identification and subsequent adjustment of barriers and enablers can assist in increasing GP's up-take of these tools in general practice [13].

The literature identified time pressure as a substantial barrier to using risk prediction tools, with particular emphasis on the time taken to complete a tool and discuss the identified risk with the patient [13,15,30]. GPs work in time poor environments; in Australia the mean consultation time is approximately 14 minutes [31]. There is an opportunity cost whereby the time taken to complete the tool detracted from the time afforded to interact with the patient [32]. Our research established that time pressure is generated from three different activities; initially finding the tool, completing it, and ensuring the patients is aware of the results and implications, the latter two consistent with previous research [13,15,30]. Our research revealed that the GPs were not aware of any gastrointestinal tract risk prediction tool and we were unable to identify any within the literature.

Our findings concur with previous literature that, providing an appropriate format is a key to the initial uptake and continued use of risk prediction tools [13]. Secondly incorporating the tool into existing computer software and making it easy to locate (desk top icon) promotes usage. The integration within software packages allows for prompts to be provided to GPs, particularly for diseases not commonly seen; combining this with automatic calculation of risk scores has been shown to increase utilisation [15]. These enablers, when combined, may alleviate some of the time pressures in the practice setting [14,33].

One enabler that does not appear to have been identified within previous literature is 'aids in keeping me focussed'. Our participants identified that they find risk prediction tools can assist in directing high risk patients to limited resources. The literature identified a barrier being the potential overtreatment of patients when using risk scores [15], whereas participants within this research encouraged their use to minimise this.

A perceived reduction in autonomy when using risk prediction tools was seen as a potential barrier. This phenomena is not unique to our study, participants within previous studies raised the same issue [15,34]. Practitioners do not always readily accept new evidence based practices and often prefer to rely on their judgement and experience [32]. Ensuring that the tool is perceived as a supplement, rather than replace, a GPs clinical skills and experience can improve utilisation [16] The literature also supports the finding that GPs view risk prediction tools useful to guide treatment and facilitates a common language in support of forward referral [13,15,32].

The use of a scenario provided an insight into the GPs decision making processes. For a person presenting with reflux symptoms, with no 'red flags' or concern for other medical issues, a treatment trial of PPI's is recommended; where symptoms are relieved no further investigations are required. Where symptoms continue, a referral for further investigations is considered necessary [8,35]. This is in line with what the GPs within this study indicated. However, some participants opted to do additional tests to rule out other problems. Lifestyle changes are an important factor when managing people with reflux and it is recommended that these be incorporated into the treatment plan [35]. This was consistent with reports from the GPs who indicated that counselling regarding the excessive alcohol consumption would be appropriate. The introduction of the risk prediction model to the scenario also highlighted that it would have provided GPs with further evidence to consider referral for further investigations.

This study explored reasons why GPs choose to use or not use risk prediction tools, and whether they would use our new risk prediction tool. Our research identified generic barriers and enablers, giving an insight into the potential issues when developing risk prediction tools. The information obtained can be combined with other studies to assist researchers in the transformation of risk prediction models into tools that can be used within the primary care setting. It also identified the decision processes of GPs when presented with a scenario and introduced a potential risk prediction model for Barrett's oesophagus; these processes need to be influenced by reducing barriers and promoting enablers.

A strength of the study is the participants varying experience and geographical location, as this provided a cross section of GPs from urban and rural areas, and from different practice settings. A potential limitation of the study is the small sample size, which may not lend to generalisation of the findings within all areas. However, the purpose of this study was not to generalise the information gained but to identify factors that promote or impede the use of risk prediction tools for the benefit of translating our model to a useful tool.

Continuing with the status quo will result in minimal impact on survival and morbidity associated with adenocarcinoma of the oesophagus [10]. A logical first step in reducing the lethality of this cancer is identifying those at greater risk of having Barrett's oesophagus, its precursor. Further work is needed to refine our risk prediction model for Barrett's oesophagus, and disseminate this tool to practitioners within the primary health care sector.

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Conflict of interest

None declared

Contributions

CJI, TAL, SKT, and AE conceived the project; ALG assisted with further project refinement. CJI obtained and managed data collection. CJI undertook manual transcription and coding. TAL assisted to guide the study and validated the themes identified. ALG, SKT and AE reviewed the results and provided feedback. CJI drafted the manuscript. TAL, ALG, SKT, and AE reviewed and suggested manuscript modifications. All authors read and approved the final version of the manuscript.

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