Conducting oral examinations for cancer in general practice: what are the barriers?

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Background. The incidence of oral (mouth) cancer in the UK is continuing to rise. Individuals who are at greatest risk rarely visit a dentist but do consult general medical practitioners (GMPs). Therefore, GMPs could have an important role in the early detection of oral cancer. Research has shown that GMPs do not opportunistically screen high-risk individuals; however, the barriers to screening are poorly understood.

Objectives. To understand the reasons why GMPs may not screen for oral cancer.

Methods. A questionnaire was developed, using the Theory of Planned Behaviour (TPB), to measure GMPs attitudes to and screening for oral cancer. The questionnaire was designed using all the key theoretical constructs of the TPB and incorporating the themes identified in a qualitative elicitation study. The questionnaire was posted to 499 GPs in Surrey Primary Care trust.

Results. Two hundred and twenty-eight completed questionnaires were returned (46%). Two TPB constructs [subjective norm (e.g. peer pressure) and perceived external control factors (e.g. adequate equipment, time constraints)] were identified as significant predictors of 'intention' to perform oral screening. Intention and perceived internal control factors (e.g. self-efficacy) were predictive of actually performing oral screening with patients.

Conclusions. The results of the study suggest that there is considerable potential for improving intention to perform oral cancer screening in general practice. Theory-based interventions could include further training to enhance confidence, expertise, knowledge and ease of examination, the provision of adequate equipment in the surgery and increasing the motivation to comply with significant others by introducing guidelines on opportunistic screening.

Keywords. Barriers, cancer, general practice, oral, screening.

Introduction

Oral cancer has seen minimal improvement in overall 5-year survival rates (50%) over the last few decades.[1] This is mainly due to the advanced stage of the disease at diagnosis. Early detection has been shown to improve survival rates,[2] but despite the accessibility of the oral cavity for examination, only one-third of oral cancer cases are diagnosed in the localized state.[3] There are often pre-cancerous changes in the mouth before cancer develops. Clinical examination can be carried out through direct visualization, examination with a mirror or by manual palpation. It is estimated that early treatment can improve survival rates by up to 90%,[3] as well as reducing the morbidity associated with debilitating treatment.[2]

Improving outcomes in oral cancer

Dental practitioners have been identified as important in the early detection of oral cancer, with patients who present in the early stages of disease more likely to visit their dentist regularly.[4] One preventative approach might be screening by dental practitioners, but unfortunately, the most vulnerable and high-risk patients, such as those from low socio-economic groups, certain ethnic groups, heavy smokers, those who have a high alcohol intake and the elderly, have difficulty in accessing free dental treatment and are less likely to visit the dentist.[5] However, these groups are more likely to visit the general medical practitioner (GMP)[5] for other reasons. In the UK, General Medical Practice could potentially play an important role in the primary prevention and early diagnosis of oral cancer.

Screening policy
Although one of the main recommendations of the Cancer Reform Strategy 2007 was to diagnose cancer at an earlier stage,[6] the implementation of a population-wide screening programme for oral cancer would not be acceptable or cost-effective in the UK[7] and is not currently recommended,[8] because oral cancer is rare, the natural history of the disease is poorly understood and there is no benefit to the population as a whole.[9] However, opportunistic screening by all health professionals is 'encouraged'[10] and there are convincing arguments based on decision models[7] and research from outside the UK,[11] for the opportunistic screening of high-risk individuals in primary medical care as well as dental settings.

Known barriers to screening
A Cochrane systematic review evaluating programmed screening strategies highlighted a number of reasons why opportunistic oral cancer screening may not be performed by health care professionals. Reasons include the lack of understanding of the epidemiology and natural course of the disease.[12] It also addressed the psychological disadvantages of screening for oral cancer,[5,8] such as increasing levels of anxiety in patients, and the potential trauma and unnecessary investigations resulting from false-positives, considerations which may deter primary health care providers from undertaking screening.

With regards to the opportunistic screening of 'high-risk' individuals, there is a paucity of information regarding the role of the GMP in improving detection rates in the UK and particularly the reasons which may deter implementation. Research has shown that a lack of confidence among health care professionals in detecting oral cancer may be an important barrier, while recognizing the importance of the GMP in its detection.[5,13] Lack of knowledge of risk factors and specific signs is also common among primary care physicians.[14] The length of time practising medicine has, however, been shown to be positively associated with performing oral cancer examinations and enquiring about patients' tobacco and alcohol consumption.[14] It has been suggested that training is inadequate and not comprehensive for medical practitioners,[15] and further research has demonstrated that a large proportion of GMPs claim they have never received any specific tuition for examining for oral cancer.[5] This shows no sign of improving, with the new generation of recently qualified medical practitioners continuing to show poor levels of awareness of oral cancer.[16]

This study aims to identify potentially modifiable barriers to screening for oral cancer in UK general practice, with the objective of providing recommendations for a theory-based intervention.

Methods

A postal survey of GPs was conducted using a questionnaire whose development was guided by the Theory of Planned Behaviour (TPB)[17] and data from a qualitative elicitation study.

Applying a theoretical framework to this study
The TPB[17] was identified as the most appropriate tool to determine a GP's intent to perform screening for oral cancer. This theoretical framework is widely used to predict health behaviour. The behaviour, in this case, to perform oral examinations to screen for cancerous lesions can be predicted by the strength of an individual's intention to perform the behaviour (Fig. 1). Behavioural intention is based on three variables: 'attitude' towards the behaviour (an individual's salient behavioural beliefs as to whether the outcome will be positive or negative), 'subjective norm' (the social pressures which an individual feels to perform or not perform the behaviour, combined with their individual motivation to comply) and 'perceived behavioural control' (whether the behaviour is easy or difficult and whether the individual has control over the behaviour, which may be influenced by both 'external control factors and internal control factors'. Internal control factors are an individual's belief about their ability to perform behaviour for reasons such as self-efficacy, knowledge and training, whereas external control factors are those environmental factors that may prevent or facilitate the behaviour (such as inadequate equipment or time constraints etc.). Perceived behavioural control also directly influences behaviour (see Fig. 1 for examples).

This model has been widely used in health care research to understand patient behaviours such as smoking initiation and cessation,[18] binge-drinking behaviour[19] and uptake of screening for breast cancer.[20] More recently, it has been applied to the study of health professional behaviour, for example, identifying key barriers for low compliance with national guidelines for screening for post-stroke depression.[21]

Procedure

Phase 1: qualitative elicitation study
A qualitative elicitation study was conducted using a focus group of 10 GPs to develop belief-based measures for all the predictor variables of the TPB (attitude, subjective norm and perceived behavioural control). The participants were informed that the research being undertaken was to determine why GPs do or do not examine patients' mouths for signs of cancer (without being explicitly asked by the patient) and no reference to 'barriers' were made in case this
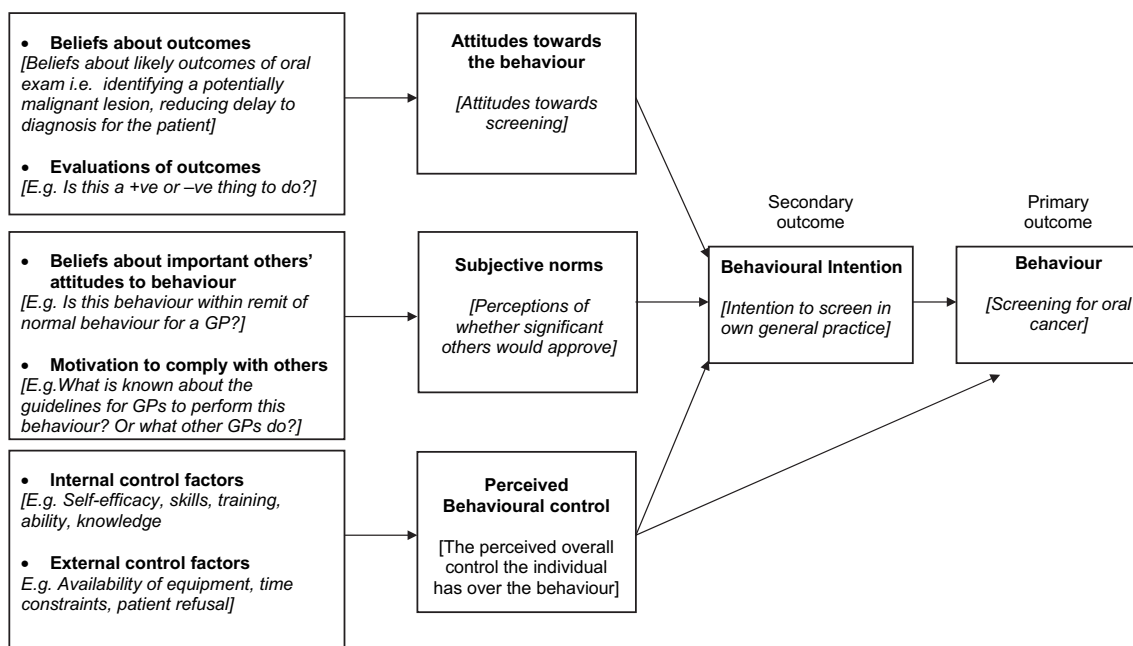
FIGURE 1   *Applying the TPB to oral cancer screening behaviour of GPs (screening refers to conducting an oral examination for the identification of cancerous lesions).*

influenced the direction of the discussion (see Table 1). The questions were based upon each of the constructs identified in the TPB model and developed in accordance with recommendations.[22] The focus group was facilitated by JW and CL. Confidentiality was assured. The discussion was recorded, transcribed and content analysed for themes in order to elicit behavioural beliefs for use in the next phase.

Questionnaire design.   Statements representing each construct of the TPB were derived from the elicitation study. This resulted in 11 attitude items, 8 items about subjective norms, 13 behavioural control belief items (9 external control factors and 4 internal control factors) and 3 behavioural intention items. In order to reduce respondent repetition of responses, statements from each predictor variable were mixed up, as were positively and negatively worded statements.[23] The following is an example of a positively worded statement eliciting an attitude belief: 'if I screen for oral cancer (OC), it will raise the patient's awareness of OC'. All responses were made on a seven-point Likert-type scale, ranging from 'strongly agree' to 'strongly disagree'. Behavioural outcome was the estimated number of examinations specifically for oral cancer a GP undertook each month. Inclusion of a final open-ended question gave respondents the opportunity to raise any issues, which had not been covered elsewhere. Demographic and background questions were also included.

TABLE 1   *Open-ended questions used in the elicitation study*

1. What do you know about oral cancer signs and symptoms?
2. What do you know about the type of patient who is most at risk?

Attitudes towards screening

3. What do you think are the advantages of examining a patient for oral cancer?
4. What do you think are the disadvantages of examining a patient for oral cancer?

Subjective norms (social pressure)

5. Are there any individuals or groups who would approve of your screening for oral cancer in your practice?
6. Is there anybody in your practice who would disapprove of your conducting oral examinations for cancer?
7. Do you think conducting oral examinations is within your normal remit as a GP or do you think other professions are better placed to carry them out? Why, why not?

Perceived behavioural control

8. What factors or circumstances would enable you to carry out an oral examination for cancer?
9. What factors or circumstances would make it difficult or impossible for you to carry out an oral examination for cancer?
10. Are there any other issues that come to mind when you think about carrying out an oral examination?

Intention to conduct an oral examination for cancer

11. How likely are you to examine a patient for oral cancer if they haven't directly asked you to or consulted with a problem with their mouth or teeth?

Phase 2: GP survey

Four hundred and ninety-nine GPs in Surrey Primary Care Trust were sent the postal questionnaire in January 2008, together with a participant information sheet, brief details of a prize draw incentive and a postage-paid self-addressed envelope. A postal reminder was sent to

non-respondents 3 weeks later. Consent was implied by return of the questionnaire. Participants were assured of confidentiality. Approvals were obtained from Brighton West Research Ethics Committee and Sussex National Health Service (NHS) Research Consortium.

Power calculation.   For studies based on the TPB using a multiple regression approach, it is reasonable to assume at least an effect size (multiple R^2) of >0.3. With an effect size specified at 0.3, alpha of 0.05, power of 0.95 and three predictor variables (attitude, subjective norm and perceived behavioural control), the minimum number of participants needed was 62.

Statistical analysis.   Data were entered into SPSS. Internal reliability of each scale was assessed using Cronbach's alpha. Reliability was improved by dropping poorly performing items using an iterative approach. Each scale was then assessed for normal distribution. Bivariate relationships between each variable were assessed using Pearson's *r*. The relationships between each predictor variable (attitude, subjective norm, perceived behavioural control) and intention and outcome were investigated using multiple regression, with either intention or outcome specified as the dependent variable.

Results

Two hundred and twenty-eight completed questionnaires were returned (46% response rate). Five additional questionnaires were returned blank or incomplete. Characteristics of the respondents are shown in Table 2. GPs reported carrying out an average of 3.7 oral examinations for cancer each month. The majority (97%) claimed never to have had training in screening for oral cancer and 68% claimed never to have had training for ear, nose and throat.

Tables 3 and 4 summarize data obtained from the questionnaire. Mean scores were highest for attitude and subjective norm and lowest for internal control beliefs indicating that although GPs considered screening for oral cancer to be a worthwhile behaviour that peers would approve of, their confidence in providing screening was low. The distributions of scores for each variable were approximately normal. Behavioural outcome (defined as number of oral examinations for cancer undertaken each month) was positively skewed and subjected to logarithmic transformation resulting in a near-normal distribution.

There was a significant gender difference in perceived behavioural control [(external control factors: $t = 2.90$, d.f. = 200, $P = 0.004$); internal control factors: $t = 3.06$, d.f. = 203, $P = 0.003$], with male GPs scoring higher on average. Female GPs were more likely to report more barriers to screening related to their own

TABLE 2   *Characteristics of responders*

	n (%)	Mean (SD)	Range
Gender			
Male	133 (58)		
Female	95 (42)		
Partner			
Partner	213 (93)		
Salaried	14 (6)		
Locum	1 (1)		
No. of years qualified		23.90 (7.56)	1–45
No. of GP sessions per week		7.25 (1.82)	0.5–10
No. of GPs in practice		6.90 (3.64)	1–31
Estimated no. of oral examinations for cancer per month		3.73 (4.19)	0–15
Oral cancer training			
None	220 (97)		
Offered	0 (0)		
Attended	7 (3)		
Not stated	1(0)		
Ear, nose and throat training			
None	154 (68)		
GP training	45 (20)		
GPwSI	2 (0)		
Other	27 (12)		

internal control beliefs and factors outside of their control, such as patient refusal, time and equipment constraints. The number of years since qualification was not significantly related to either intention to examine mouths or actual behaviour.

Predicting intention to perform oral examinations for cancer

The results of the multiple regression indicated that 43% of the variance in intention could be explained by the TPB (attitude, subjective norm and behavioural control divided into: external and internal control factors). External control factors and subjective norm together explained 42% of variance ($R^2 = 0.424$; adjusted $R^2 = 0.419$; $F = 82.82$; d.f. = 2225; $P < 0.001$), with external control factors being the most powerful predictive factor of intention.

Predicting behaviour

Behaviour (the number of examinations for oral cancer undertaken per month) was then regressed on to behavioural intentions and perceived behavioural control, the two constructs that would be expected to predict behaviour, according to the TPB model. Behavioural intention was the best independent predictor of behaviour ($R^2 = 0.24$, $\beta = 0.49$, $P < 0.001$), although internal control was also predictive of behaviour ($R^2 = 0.10$, $\beta = 0.31$, $P < 0.001$). Together, these variables accounted for 26% of the variance in behaviour ($R^2 = 0.26$; adjusted $R^2 = 0.26$; $F = 39.28$; d.f. = 2220; $P < 0.001$).

TABLE 3 *Final questionnaire items and individual mean values*

TPB construct	Questionnaire item	Mean (SD)
Attitude	If I screen for OC, I could detect a cancer at an earlier stage	4.44 (1.43)
	A negative screen for OC will reinforce negative behaviours in patients (i.e. smoking, consuming alcohol)[b]	3.37 (1.48)
	The patient will worry and be anxious as a result of screening for OC[b]	3.62 (1.36)
	I am more likely to focus on screening for more prevalent diseases than OC[b]	5.35 (1.23)
	If I screen for OC, the patient may subsequently develop symptoms and delay seeking help[b]	3.24 (1.42)
	If I screen for OC, it will raise the patients awareness of OC	5.56 (1.00)
	If I screen for OC, patients will feel that their consultation time is wasted[b]	3.73 (1.47)
	Patients will be less likely to consult me for their health problems if they think that routine OC screening is inappropriate[b]	3.13 (1.35)
	If I screen for OC, it will incentivize patients to stop their damaging behaviour	4.29 (1.37)
Subjective norms	Patients would approve of my screening for OC[a]	4.94 (1.07)
	Patients who smoke would resent my screening for OC[b]	2.82 (1.42)
	The PCT would approve of my screening for OC	4.21 (1.27)
	Having contact with the public, GPs are best placed to screen for OC	3.64 (1.70)
	Dentists would approve of my screening for OC	4.38 (1.35)
	If OC screening was a QOF target, I would be more likely to carry out an oral examination	5.53 (1.41)
Perceived behavioural control	I have the appropriate equipment for carrying out an oral examination	4.44 (1.62)
	There is enough time in the consultation to screen for OC	2.84 (1.67)
	Patients would be amenable to a routine oral examination[a]	5.11 (1.23)
External factors	The lighting in the consultation room is not suitable for an oral examination[b]	3.80 (1.75)
	Patients do not expect to undergo a routine oral examination[b]	5.60 (1.23)
	With limited resources, there are more important things to cover in the consultation[b]	5.45 (1.32)
	When I am short of time, I am less likely to carry out an oral examination[b]	5.92 (1.23)
	The time it takes to explain and undertake an oral examination makes it less likely I will screen for OC[b]	4.68 (1.45)
	The consultation room is not set up for oral examinations[b]	4.24 (1.75)
Internal factors	Dentists are more suitably qualified to screen for OC[b]	6.04 (1.09)
	I need more information regarding disease progression in order to screen for OC[b]	4.85 (1.59)
	I have the expertize to carry out screening for OC	3.42 (1.55)
Behavioural intention	I expect to screen a patient for oral cancer in the next month	2.86 (1.68)
	I want to screen patients for oral cancer	3.48 (1.55)
	I intend to screen patients for oral cancer in the future	3.41 (1.41)

[a]All items ranged from 1 to 7 excluding this item that ranged from 2 to 7.
[b]These items required reverse coding.

TABLE 4 *Descriptive statistics for each of the final TPB variables*

TPB construct	Final no. of items	Mean (SD)	Range	Cronbach's alpha
Attitude	9	4.40 (0.69)	2.2–6.3	0.63
Subjective norms	6	4.10 (0.78)	1.8–6.5	0.54
Perceived behavioural control	12	3.25 (0.76)	1.1–5.2	0.75
External factors	9	3.39 (0.81)	1.1–5.4	0.70
Internal factors	3	2.8 (1.0)	1.0–6.3	0.48
Behavioural intention	3	3.24 (1.25)	1.0–7.0	0.73

Response to the open-ended questionnaire item
Seventy-seven (34%) respondents completed this question. Their comments focused particularly on perceptions of whose responsibility it is to examine for oral cancer; the dentist was highlighted as the most appropriate health professional (although it was acknowledged that NHS dentistry is difficult to access). Perceived barriers were also frequently mentioned, including external control factors (lack of time, the need to prioritize) and perceived self-efficacy (lack of knowledge, training, confidence to perform examinations for oral cancer). A selection of comments is presented in Figure 2.

Discussion

Summary of main findings
The focus of this study was to understand the reasons why GPs may not screen for oral cancer. Based on the TPB model, two variables, subjective norm and external control factors, were found to be the key predictors of intention to perform examinations for oral cancer. This would suggest that interventions to address these two constructs, such as including oral examinations for cancer screening of high-risk adults into the quality and outcome framework and ensuring that GPs have the necessary resources (e.g. adequate equipment) for oral examinations, may make

"I do not have the expertise or equipment but would be prepared to learn more"

"Currently don't feel confident to screen or give the all clear following examination as not certain exactly what I'm looking for"

"If we are going to be asked to do this, we need equipment, training and money!"

"Most patients are amenable and would be happy to allow me to check them"

"Dentists are better placed and trained for this"

"It will encourage patients to think that GPs can deal with their dental problems"

"A targeted approach is probably better"

"I need to know if screening reduces mortality"

FIGURE 2   *Sample of comments in response to open-ended question to illustrate prevailing barriers.*

practitioners more likely to opportunistically screen. Importantly, behavioural intention was relatively low, which suggests there is potential for significant improvement.

There is an argument that attitude, although not predictive of intention to perform oral examinations for cancer, may influence intention, due to its strong correlation with the other predictor constructs (and partial correlation with intention). Attitude therefore cannot be ignored. However, changing attitudes is complex and may be influenced instead by addressing subjective norms and perceived behavioural control variables.

Comparison with existing literature
As would be expected from the TPB model, the best predictor of behaviour was intention and internal control factors made a significant contribution to behavioural outcome. This is consistent with the literature that highlights lack of confidence, lack of knowledge and inadequate training[16,23,24] among GMPs and GDPs as potential barriers to performing oral examinations for cancer. As this study demonstrates, these beliefs, associated with internal control beliefs, may have a significant relationship with actual behaviour. It is not surprising, with 97% of respondents claiming to have never had training for oral cancer, that feeling confident about conducting oral examinations for cancer might improve screening rates. As it would appear that training is not improving,[23,24] interventions that address this deficit in undergraduate education and continuing professional development are a priority.

Recent research regarding the TPB has suggested that it is important to measure internal and external control factors separately,[25] as a behaviour, may, for example, not be impaired by external factors but may be difficult to perform. By separating these variables in this study, the importance of internal control as a predictor of actual behaviour has emerged, as well as the influence of external factors on the intention to perform the behaviour. As internal and external control factors are also correlated, interventions to increase perceptions of internal control (such as self-efficacy) may not only lead to a direct change in behaviour but also an indirect change, via external control factors and intention. There are often early warning signs in the mouth, such as solitary ulcers or unexplained red or white patches, before later stage oral cancer develops. A doctor or dentist could clinically observe these signs if they looked in the mouth. As oral cancer is one of the easiest cancers to detect clinically,[26] improving skills and knowledge may, for example, reduce those barriers associated with external control, such as time.

This study supports the findings of previous research with regards to barriers associated with subjective norms. GMPs have previously identified dentists as more suited to the role of oral cancer prevention and detection.[23] The content of the responses to the open-ended question in our survey reinforced this view. The length of time practising medicine was not found to be related to intention to perform or behavioural outcome, contrary to previous research.[14] The relative importance of specific barriers to both intention to perform oral examinations for cancer and actual behaviour has not been investigated in previous studies.

Strengths and limitations of the study
A number of studies have suggested potential impediments to carrying out oral examinations for cancer in general practice, but no study has explored these in detail. This study has examined these barriers using a validated theoretical framework and has identified specific components within the TPB model, which have the potential to form the basis for any future interventions.

One strength of this study is that the beliefs tested in this study were not derived wholly from the

literature but were based on an elicitation study of GPs and are therefore likely to be valid salient behavioural beliefs in determining the intention to perform oral examinations for cancer.

This study, as all previous research to explore barriers to conducting oral examinations for cancer, used postal questionnaires and therefore all have the potential for bias, as responses are more likely from those practitioners who believe the research to be professionally relevant. We also have no information regarding non-responders with which to compare the respondent sample. While this study is sufficiently powered and the response rate adequate given the nature of the study, the findings may not be representative of all GPs. The instrument used in this study was purpose derived and therefore has not been previously used, tested or validated outside of this study. We acknowledge the limitations of the psychometric properties of the tool, in particular the internal consistency of some of the constructs were not very high. In addition, the cross-sectional design makes any inferences about direction of causation tentative.

This study was carried out in Southern England where the incidence of oral cancer is significantly lower than other regions, for example, the north of England and Scotland. Practitioners in regions of higher prevalence may respond differently and before developing any national interventions to improve oral cancer screening in general practice, further studies are warranted.

Implications for future research or clinical practice
Within the context of an already overburdened general practice, future interventions could be developed in clinical practice to target the key barriers identified in this study. For example, to facilitate perceptions of internal control, further training could be conducted online (for example, Cancer Research UK has designed online resources and courses aimed at GMP's to help doctors identify signs and symptoms of oral cancer and discover more about its risk factors, prevention and detection of the disease). The equipment needed is minimal and inexpensive (a torch or lamp if natural light is not adequate and one or two dental mirrors to examine the oral mucosa). Perhaps more importantly, GMPs could be trained in effectively approaching high-risk patients (for example, those over 45 years old, who smoke and/or drink alcohol over the recommended limits or chew betel or areca nut[27,28]) in order to carry out opportunistic screening within the time of a consultation.

Acknowledgements

Declaration

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