

ORIGINAL ARTICLES

Accuracy of patient recall of opportunistic smoking cessation advice in general practice

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Abstract

Objective – To determine the accuracy of patient recall of a question about smoking in a specified consultation in general practice; the accuracy of smokers' recall of advice to stop smoking; and predictors of accurate recall.

Design – Analysis of 1075 audiotapes was compared blind with matching patient questionnaires administered after the consultation to calculate sensitivity and specificity for patient recall as a dichotomous variable. Predictors of recall were determined by logistic regression.

Setting – General practitioner training practices, New South Wales, Australia.

Subjects – Thirty-four trainees and consecutive samples of their patients 16–65 years of age

Results – Patient recall of a question about smoking had a high false positive rate of 21% but a sensitivity of 93%. Smokers over-reported advice to stop smoking (specificity 82%; sensitivity 92%). Predictors of accuracy of a question about smoking included patient sex (women 1.58 times more likely than men to be accurate); smoking status (smokers 1.7 times as likely as non-smokers to be accurate); and interval since consultation (those who completed their questionnaires within a week were 1.84 times more likely to be accurate).

Conclusions – Patient recall is systematically biased towards over-reporting of a question about smoking status and, among smokers, of advice to quit. Although we recommend its continued application in health services evaluation, findings should be interpreted with caution, particularly if subjects are male or the interval between recall of smoking cessation advice and the occasion of service in which it might have occurred is considerably delayed.

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Key words: smoking cessation advice; patient recall; sensitivity; specificity

Introduction

Smoking cessation counselling by healthcare providers represents an important element in any comprehensive tobacco control strategy.¹

In particular, general practitioners are well placed to identify large numbers of smokers in their daily work and to counsel them to quit.² When this is done, quit rates are significantly better for individuals³ and communities,⁴ particularly if the advice is individualised and reinforced.⁵ Readiness to quit, as measured by a patient's stage-of-change, also can shift as a result of such advice.⁶

Patient recall by means of a self-administered survey or interview is a feasible way to measure general practitioners' provision of smoking cessation advice. Rates based on patient recall have been used to determine the prevalence and predictors of smoking cessation advice by primary care providers at practice and population levels.^{7–10} as well as the effectiveness of training programmes and other strategies to increase the frequency and effectiveness of such advice.^{11–13} In contrast to the relative abundance of such publications, however, few studies to validate patient recall have been published.

As part of the Stanford Five-City Project, all adult household residents of randomly selected households were asked to recall if 'they had ever received physician advice to stop smoking'. Of those stating in 1978 that they had ever been advised by a physician to quit smoking, 25% reversed that answer in 1986 and stated that they had never been counselled to quit smoking.¹⁴ No 'gold standard' corroborating physician advice was used in this study, however. Another study that used patient recall to evaluate residency training in smoking cessation counselling demonstrated no correlation between patient recall and resident self-report, although the latter was thought unlikely to represent a 'true' gold standard.¹⁵ In a study conducted in a tertiary-care hospital,¹⁶ videotaped consultations of outpatients with chronic obstructive airways disease were analysed and results compared with patient recall, elicited by interview 15 minutes after the consultation. Smoking cessation advice was observed in 55% of the videotapes although recalled by 89% of patients as having occurred. In a community study,¹⁷ smokers were randomly allocated to either an intervention or control group and telephoned three months later by researchers blind to group status. Only 60% of the intervention group recalled receiving advice from the physicians and only 51% recalled it as a message to quit. However, provision of smoking cessation advice to all smok-

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ers in the intervention group was not corroborated in this study.

Wilson and McDonald addressed some of the methodological weaknesses of these earlier studies.¹⁸ Patient recall of any discussion about smoking was elicited by self-completed questionnaire administered immediately after a consultation in general practice, which also had been audiotaped. Having demonstrated a sensitivity of patient recall of 74%, small sample sizes precluded further statistical testing of different false positive rates among smokers and non-smokers of 11% and 4%, respectively. Variables other than smoking status potentially influencing the accuracy of patient recall were not assessed. Nevertheless, they concluded that patient questionnaires remained the 'most feasible method' of assessing the provision of lifestyle advice in 'large scale research or audit studies'.¹⁸

Hence, we conducted this study with a larger sample size to determine the accuracy of patient recall of a question about smoking in a specified consultation and, for smokers, the accuracy of their recall not only of a question about smoking status but also of advice in that consultation to stop. Another aim of the study was to identify predictors of accurate recall of an opportunistic question about smoking status. Our 'gold standard' was an audiotape analysis of the consultation acquired as part of a larger project to evaluate postgraduate training.

Method

DATA COLLECTION

As described fully elsewhere¹⁹ consultations between consenting patients and postgraduate trainees were audiotaped at the beginning and end of their first-ever experience of three months in supervised general practice. As the distances separating these practices were large and the costs of face-to-face patient exit interviews excessive, self-administered questionnaires were mailed within two days of the consultation to adults aged 16–65 years to elicit patient recall. The questionnaire included questions about education, occupation, and marital status. Respondents were asked if, at the time of their consultation, they smoked more than 20 cigarettes a day, 1–20 cigarettes a day, were an occasional smoker, or smoked pipes or cigars. An affirmative answer to any of these options defined the patient as a smoker. All respondents were asked to recall if the trainee asked if they smoked and, for smokers only, whether the trainee had advised them to stop smoking. Three fixed responses were provided: 'yes', 'no', or 'can't remember'. To assist recall, the name of the trainee, day, and date of the relevant consultation were handwritten in a section before each question.

Four trained coders rated the audiotapes for a question about smoking or advice to stop smoking, using a detailed rating scale and coding manual, blind to patient report. Coders rated each behaviour as having either occurred or not occurred. The coder's ratings of the audiotape of the actual consultation represented the 'gold standard' against which

patient recall as elicited in the follow-up questionnaire was compared.

DATA ANALYSIS

Sensitivity and specificity of patient recall as a dichotomous variable were calculated from 2×2 tables by comparing responses from patient questionnaires against audiotapes.¹⁹ Responses for specific questions where patients indicated they 'couldn't remember' were treated as missing data. As no significant changes in preventive care were demonstrated over time irrespective of training,¹⁹ data from all time periods and trainees were used.

Using agreement as the outcome variable, predictors of accurate recall of an opportunistic question about smoking status for all adults and smokers were determined by logistic regression.²⁰

The κ values²¹ were calculated for inter-rater and intra-rater reliability of audiotape analysis.

Results

Thirty-four of 41 eligible trainees agreed to audiotape consultations at the beginning and end of their first three-month experience in general practice (80% consent rate). Trainees' ages ranged from 25 to 31 years (median = 27 years; mode = 26 and 28 years); 19 were men and 15 were women. There was no overt response bias among trainees although small numbers precluded meaningful statistical analysis. During data collection, 1500 adults aged 16–65 years attending these trainees agreed to audiotaping (72% consent rate), resulting in 1362 usable audiotaped consultations. Consenting patients did not differ from non-consenting patients on either age ($z = 0.25$, $p > 0.1$) or sex ($z = 0.78$, $p > 0.1$). Of 1491 consenting adults who also supplied a name and address on the consent form, 1209 (82%) returned follow-up questionnaires (750 females; 459 males). Almost two-thirds (756 (63%)) were aged less than 40 years; 381 (32%) were in full employment, and 153 (13%) had a university or college qualification. Compared with non-responders, those who returned questionnaires were more likely to be older ($z = 4.8$, $p < 0.05$) or women ($z = 2.12$, $p < 0.05$). Exactly half of the patients who returned the questionnaire had completed it within eight days of the consultation (range = 1–63 days; mode = 6 days). Of the 1209 returned questionnaires, 1075 (419 men; 656 women) had a matching audiotape, all of which were analysed. Of these, 451 audiotaped consultations had been conducted with patients who self-identified on the questionnaire as being smokers at the time of the consultation with the trainee (179 men; 272 women).

ACCURACY OF RECALL

Table 1 compares patient recall of a question about smoking status for all adults, male patients, female patients, smokers, and non-smokers against the 'gold standard' of audiotape analysis using a 2×2 format. Overall prevalence of smoking cessation behaviour was low: a question about smoking occurred in

Table 1 Accuracy of patient recall of a question from the trainee about smoking status*

Patient recall		Audiotape			
		Heard		Not heard	
		n	%	n	%
"Did the trainee ask you if you smoke?"					
All adults	Yes	187	93†	148	
	No	15		547	79‡
Male patients	Yes	82	90†	60	
	No	9		178	75‡
Female patients	Yes	105	95†	88	
	No	6		369	81‡
Smokers	Yes	90	98†	49	
	No	2		198	80‡
Non-smokers	Yes	98	89†	93	
	No	12		343	79‡

* Responses for specific questions where patients indicated they "couldn't remember" were treated as missing data.

† Sensitivity.

‡ Specificity.

only 29% of consultations in the sample and advice given to quit occurred in only 14% of those with smokers.

The specificity of 79% of patient recall of a question about smoking produced a false positive rate of 21%. Sensitivity (90%) of recall by male patients of an opportunistic question about smoking status was not significantly different from sensitivity (95%) of female patient recall ($z = 1.36, p > 0.2$). Specificity values of 75% and 81% for male and female patients, respectively, also were not significantly different ($z = 1.82, p = 0.069$). Smokers' recall of a trainee question about smoking status had a high sensitivity (98%) but lower specificity (80%). Sensitivity (89%) of non-smokers' recall of a question about smoking status was significantly lower than that of smokers' recall ($z = 2.69, p < 0.001$). Table 2 compares smokers' recall of advice from the trainee to 'quit' with the audiotape finding. Smokers' recall had a sensitivity of 92% and a specificity of 82%.

PREDICTORS OF ACCURATE RECALL

Logistic regression was performed to ascertain predictors of accurate recall among adults of an opportunistic question about smoking status, using agreement as the primary variable. Eight variables included in the model were patient sex, age, education, smoking status, duration of the consultation (<15 minutes or ≥ 15 minutes), delay time between consultation and completion of the questionnaire (< 7 days or ≥ 7 days), trainee sex, and trainee stage of training. Table 3 shows that patients' sex, smoking status, and the delay between day of the consultation and completion of the questionnaire were significant predictors of accuracy. Specifically, patients who answered the questionnaire

Table 2 Accuracy of smokers' recall of the trainee advising to stop smoking

Patient recall		Audiotape			
		Heard		Not heard	
		n	%	n	%
"Did the trainee advise you to quit?"					
Smokers	Yes	38	92†	53	
	No	3		237	82‡

† Sensitivity.

‡ Specificity.

within seven days of the consultation were nearly twice as likely to recall accurately whether the trainee had asked if they smoked. Smokers also were nearly twice as likely as non-smokers to recall accurately a question about smoking status. Women were just over 1.5 times more likely than men to recall a question about smoking status accurately. Patient age, patient education level, trainee sex, and trainee stage of training were not significant predictors. The Mantel-Haenzel goodness-of-fit test ($\chi^2 = 7.11, df = 8, p = 0.525$) indicated that the model fitted the data well.

RELIABILITY OF AUDIOTAPE ANALYSIS

The κ values for inter-rater reliability of audiotape analysis for a question about smoking status and advice to stop smoking were 0.94 and 0.71, respectively. The κ values also were high for intrarater reliability for each of the four coders for a question about smoking status (0.98, 0.98, 1, 1) and advice to stop (0.74, 1, 1, 1).

Discussion

Within the context of care provided by a trainee in a specified consultation, patient recall of components of opportunistic smoking cessation advice has high sensitivity. Specificity is lower and also differs for patient subgroups, producing a substantial false positive rate of at least one in five. In contrast to the preliminary findings of McDonald and Wilson,¹⁸ smokers were more likely than non-smokers to be accurate in recalling a question about smoking status. Nonetheless, their recall of advice to 'quit' remained prone to over-reporting. If used to evaluate clinical behaviour, patient recall may create an inflated sense of competence in smoking cessation activities.

Reasons to explain the high false positive rate might include the patient's eagerness to convey a good impression of the trainee's performance, an acquiescence bias, or bias derived from respondents' perceptions of the socially desirable response.²² We did, however, emphasise in the questionnaire that it was important for the patient to think back carefully to the consultation and to be honest in answering the questions. In contrast, it might be argued that under-reporting could be expected, given the recognised limitations to patient recall of information about drugs and treatment options.²³

The phenomenon of over-reporting appears to be attenuated if respondents are recalling

Table 3 Predictors of accuracy of patient recall of a question about smoking

Variable	Coefficient	OR	95% CI	p
Patient sex	0.457	1.58	1.16-2.14	0.0027*
Trainee stage	0.028	1.03	0.90-1.18	0.6873
Sex of trainee	-0.173	0.84	0.62-1.15	0.2648
Patient age	0.004	1.00	0.99-1.02	0.4828
Education level	0.206	1.23	0.86-1.75	0.2459
Smoker	0.529	1.70	1.25-2.30	0.0005*
Delay	0.610	1.84	1.30-2.61	0.0005*
Duration	0.222	1.25	0.91-1.71	0.1571

OR = odds ratio.

* Significant at 0.05 level.

trainees' provision of smoking cessation advice some time after the consultation in question. It is surprising, however, that the duration of the consultation was not significantly associated with accuracy. Longer consultations are likely to involve more complex medical problems, extensive history-taking and exchange of information, possibly reducing the likelihood that patients will remember any one specific element of the consultation. This hypothesis was not borne out by the data. As this study shows that the patient's educational level is not significantly associated with accuracy, it is reassuring that patient recall has no more systematic bias if it is to be used to monitor the provision of smoking cessation advice to those socially and educationally disadvantaged.

Our study has its own potential methodological weaknesses. First, it may not be a representative assessment of patient recall due to unmeasured response bias among those returning questionnaires. Although an 82% response rate was achieved, patients who returned questionnaires were disproportionately older and over-representative of women. It is possible also that more educated patients returned the somewhat lengthy questionnaire, falsely inflating the accuracy of recall for the reference population. No data about the socioeconomic status of non-respondents were collected, however. Second, the potential to generalise the findings beyond the study setting of vocational training could be limited. Young trainees may be tentative about smoking cessation advice specifically and patient communication in general. Experienced general practitioners have an established relationship with their patients and may use different non-verbal and verbal cues to reinforce their preventive messages.²⁴ There is some evidence to suggest that trainees see fewer patients and a different clinical population compared with supervisors.²⁵ To explore the potential influence of communication style and the patient's presenting problem, we recommend further studies to examine the accuracy of patient recall among patients of more experienced general practitioners. Further, our treatment of patient recall as a dichotomous variable by classifying responses of 'can't remember' as missing data may have introduced a potential bias if these patients receive different levels of smoking cessation advice. Although we found no evidence of such bias in our data, this may need examination in future research.

In summary, this study has confirmed that patient recall of opportunistic smoking cessation advice in the context of a recent consultation with a trainee is biased towards over-reporting. In the absence of an alternative validated measure, patient recall likely will continue as an important measure of smoking cessation advice by medical practitioners but should be interpreted cautiously when the subjects are male or the time period between consultation and recall exceeds one week. We recommend further research to examine the

accuracy of patient recall in non-training contexts to determine the relationships between accuracy of recall and variables unmeasured in this study. Studies to evaluate the effect of alternative question constructions and different formats such as face-to-face or telephone surveys, especially those conducted immediately after the consultation, also are needed.

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