

Influence of patient characteristics on doctors' questioning and lifestyle advice for coronary heart disease: a UK/US video experiment

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SUMMARY

Background: Risk factors for coronary heart disease (CHD) vary with patient characteristics but we do not know how this influences doctors' questioning and advice giving.

Aims: To find out whether four patient characteristics — age (55 versus 75 years), sex, class, and race — influence primary care doctors' questioning style and advice giving in the United Kingdom (UK) and United States (US).

Design of study: A factorial experiment using video simulation of a patient consulting with CHD symptoms, designed to systematically alter their age, sex, class, and race.

Setting: Surrey, south east London and the West Midlands in the UK, and Massachusetts in the US.

Method: A stratified random sample of 128 general practitioners (GPs) in the UK and 128 primary care doctors in the US were shown video vignettes in their practices of patient consultations, and interviewed about patient management strategies.

Results: Sex and age influence doctors' questioning of patients presenting with CHD. Men are asked more questions overall, particularly about smoking and drinking. Middle-aged patients are asked more about their lifestyle. Advice about smoking is given to more men than women, and to more mid-life than older patients. Women doctors question patients about their lifestyle more often, and give more advice to patients about their diet.

Conclusion: Doctors' questioning strategies are influenced by patients' sex and age, suggesting that doctors may miss smoking- and alcohol-related factors among women and older patients with CHD. Doctors give more advice about smoking to men, despite sex equality in smoking prevalence. Therefore, doctors' information seeking and advice giving do not match known patient risk factors.

Keywords: coronary heart disease; primary health care; risk factors; smoking.

Introduction

PRIMARY care doctors may hold stereotypical views about what types of patients are more likely to smoke, consume alcohol, or have a poor quality diet, which may influence the questions asked and lifestyle advice offered. If these practices were aligned with sociodemographic differences in risk factors, they could represent appropriate targeting of questions and advice. If not, doctors may miss important diagnostic information among groups who are not asked such questions or mistarget advice giving.

Why coronary heart disease?

Coronary heart disease (CHD) is appropriate for this video simulation experiment for several reasons. First, research has found sex differences in doctors' treatment of patients with CHD; women are less likely to undergo non-invasive investigations than men and receive less surgical treatment.¹⁻³ These studies predominantly relate to secondary care, with little research on how sex influences primary care doctors' diagnostic or treatment strategies. Second, primary care doctors frequently treat patients with heart disease. Third, CHD is closely associated with lifestyle risk factors, including smoking, alcohol consumption, diet, and physical exercise. Fourth, CHD among middle-aged and older patients is of policy relevance, following the publication of National Service Frameworks on CHD and on older people.^{4,5}

Risk factors for CHD

Evidence abounds that sociodemographic characteristics of patients are associated with health-related behaviours that are risk factors for CHD.⁶⁻⁸ Smoking differences between socioeconomic groups are profound in most developed societies.^{9,10} In Britain, working-class patients are more likely to smoke cigarettes than middle-class patients; 33% and 21%, respectively, in 2000.¹¹ The class gap in smoking has widened over the last 25 years, whereas sex differences have narrowed.⁹ Among older age groups, there is no longer a sex difference in smoking rates, with 27% of British men and 28% of British women in their fifties smoking, and 16% of men and 15% of women over 60 years of age smoking in 2000.¹¹

Alcohol consumption is substantially higher among men than women, and for people in their fifties than seventies, whereas class differences are less clear cut.^{11,12} Women and middle-class people consume a healthier diet than men and those from the working class,^{12,13} and following

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HOW THIS FITS IN*What do we know?*

Risk factors for coronary heart disease (CHD) vary with patient characteristics, but we do not know whether these variations influence how doctors seek information or their subsequent advice giving.

What does this paper add?

Doctors' information seeking and advice giving do not match known patient risk factors, with sex and age influencing doctors' behaviour disproportionately. Women and older patients presenting with CHD are less likely to be asked about smoking and alcohol consumption, suggesting that doctors may potentially miss these risk factors. More advice about smoking is given to men than women, despite current sex equality in smoking levels.



retirement, middle-class people are more likely than working-class people to take health-promoting exercise.¹⁴

These class, sex, and age differences in health-related behaviours may be expected to influence the ways that primary care doctors ask questions and give advice to patients. We expect doctors' behaviour to match what is known about risk factors. Where there are discrepancies, it is important that they are identified and understood as they may undermine the quality and nature of diagnostic decision making and advice.

Aims

This paper examines:

- whether doctors use different questioning strategies for patients with CHD according to sex or other patient characteristics,
- whether the nature of lifestyle advice provided by doctors is influenced by the sociodemographic characteristics of patients, and
- whether the doctors' sex influences questioning strategies or advice giving.

It is difficult to study whether doctors' actions vary with the characteristics of patients, since any differences in doctors' questioning and advice giving found in studies of 'naturally occurring' consultations (for example, patient surveys, analysis of audio or videotapes of actual consultations) may be confounded because different social groups of patients express themselves in varying ways, are more or less assertive, or offer alternative types of information during the consultation.¹⁵

Our research overcame these methodological difficulties by designing a novel experiment that involved showing primary care doctors a videotape of a scripted doctor-patient consultation in which a patient presented with symptoms of CHD in a standardised way. The videotapes were identical apart from a systematic variation in the patients' sex, age (55 versus 75 years), class, and race.

Methods*Video simulation factorial experiment*

A 2⁴ experimental design¹⁶ was conducted simultaneously in the United Kingdom (UK) and United States (US) to estimate the unconfounded effects of patient characteristics on doctors' diagnostic and treatment decisions. 'Patients' in the video vignette presented with seven signs and symptoms strongly suggestive of CHD including: chest pressure; pressure worsened with exertion, stress, and eating; relief after resting; discomfort for more than 3 months; pain through the back between the shoulder blades; elevated blood pressure; and family history of heart disease. In addition, a key non verbal cue was incorporated, demonstrated by the 'Levine fist' (clenched fist to the sternum). The 'patient' was portrayed as consulting for the first time with this doctor. No information was given in the scripted video consultation about smoking, alcohol consumption, or other lifestyle risk factors.

The videotaped scenarios each contained four dichotomised patient factors, requiring 16 videotaped scenarios for each country. Patients were aged 55 or 75 years, male or female, white or black (African American in the US and Afro Caribbean in the UK), and middle class (school teacher) or working class (cleaner in the UK and janitor in the US). Class was also expressed by style of dress and accent. The patient's age and (previous) occupation were stated in the introduction to the video vignette. This randomised experimental design allowed the evaluation, individually and simultaneously, of a large number of factors that may influence primary care doctors' behaviour and advice giving, and achieved optimal statistical power in a cost-effective way. The research team had considerable experience in the conduct of such studies.¹⁷⁻¹⁹

Vignettes were scripted to run for 7-8 minutes' duration, reflecting average consultation length with primary care doctors in the UK and US. The script was reviewed by a panel of experienced GPs and cardiologists to ensure the vignette was clinically authentic and realistically depicted a case of CHD. Actors, using US and UK accents, portrayed all 32 types of 'patients'. Doctor advisers practicing in the UK and US were on site for the first day of filming to ensure clinical accuracy, especially of non-verbal cues. All subsequent vignettes were modelled on this 'master'. One actor portrayed both US and UK patients (with appropriate accent), and middle- and working-class patients. Thus, eight actors were required to represent age, sex, and race.

Sample of doctors

The study comprised 256 doctors in the UK and US. General practitioners (GPs) were selected from health authority lists for two contrasting areas of the UK: West Midlands, and Surrey and south east London (Sutton, Merton and Wandsworth). In the US, internists and family practitioners were identified through the Massachusetts Medical Society. Doctors were randomly selected following stratification by country (UK/US), sex, and medical graduation year (1965-1979 and after 1989).

Screening telephone calls identified eligible doctors, that is UK- or US-trained and practising at least half-time. All participating doctors signed a written consent form specifying the research objectives and nature of their involvement in the study. This consent form was approved as required by the US Institutional Review Board and conformed to requirements of UK ethics committees. Between May 2001 and March 2002, 128 interviews were conducted in person in Massachusetts, US; and 64 in the West Midlands and 64 in Surrey and south east London. The response rate was 65% in the US and 60% in the UK.

Instruments

Participating doctors were randomly allocated to view one videotape. In each country, doctors were stratified by sex and year of graduation (four groups), with two doctors in each group (32 x 4 = 128 doctors per country). Each of the 16 video simulations (varying patients' sex, age, class, and race) were seen by two doctors in each group. After showing the video-simulated consultation, the doctor was asked about their management of the patient. This paper examines responses to, 'Would you ask the patient any additional questions before you decide what's going on? What? Anything else?', and 'Based on the information provided in this case, would you advise the patient about his/her lifestyle or behaviour today? What would you advise? Anything else?'. The interviewer recorded the doctors' responses in full.

Interviewers in the UK and US underwent comparable intensive training and quality-control procedures to ensure standardisation of all aspects of interviewers' behaviour. Detailed coding frames were developed in consultation with medical advisers in both countries. The coding frame was finalised after achieving over 90% inter-coder reliability

between US and UK coders. The final coding was undertaken by one coder in the US.

ANOVA (analysis of variance) was used to compare the proportion of doctors asking different types of questions and giving different types of advice. No significant interaction effects were found. The main findings reported in the paper are significant at the 1% probability level.

Results

Doctors' questioning of patients

Doctors would have asked the simulated patients with symptoms of CHD an average of 6.4 additional questions to help their decision making. Sex was the only patient characteristic that significantly influenced the amount of questioning; on average men were asked 7 questions and women were asked 5.7 questions ($P = 0.011$).

The majority of questions asked by primary care doctors related to indicators of pathology, medical and risk factor history, or symptoms of pain and discomfort (Table 1). Patient characteristics have little influence on the likelihood of asking these questions.

Lifestyle behaviours were the major area showing statistically significant differences in questioning linked to patient characteristics. Irrespective of identical information being presented in the video vignettes, two-thirds of doctors would have asked men about smoking, compared with 38% who would have asked women (Table 1). Similarly, more men (41%) would have been asked about alcohol consumption than women (25%). Men were also more likely to be asked about stress and their psychological state; 42% of men and 26% of women.

Middle-aged patients were more likely than older patients to be asked about both smoking and alcohol consumption (Table 1). There were no significant differences in types of

Table 1. Percentage of primary care doctors that would ask a patient presenting with coronary heart disease different types of additional questions^a by sex and age of patient.

| Topics of additional questions | Percentage of doctors who would ask additional questions (95% CI) | | | | | | | |
|--|---|-------------------|---------------------|--------|------------------|-----------------------|-----------------------|---------|
| | All doctors ^b | Sex of patient | | | P-value | Age of patient | | P-value |
| | | Male ^c | Female ^c | | | 55 years ^c | 75 years ^c | |
| Indicators of pathology | 74 (68 to 79) | 76 (68 to 84) | 72 (64 to 80) | 0.501 | 69 (61 to 77) | 79 (71 to 87) | 0.082 | |
| Medical or risk factor history | 72 (67 to 78) | 69 (61 to 76) | 76 (68 to 83) | 0.191 | 79 (71 to 86) | 66 (58 to 73) | 0.014 | |
| Symptoms of pain/discomfort | 60 (54 to 66) | 62 (54 to 71) | 57 (48 to 66) | 0.380 | 53 (44 to 62) | 66 (58 to 75) | 0.034 | |
| Current or past history of smoking | 53 (47 to 58) | 68 (60 to 76) | 38 (30 to 45) | <0.001 | 62 (54 to 69) | 44 (36 to 51) | 0.001 | |
| Current or past history of alcohol consumption | 33 (27 to 38) | 41 (33 to 48) | 25 (17 to 33) | 0.005 | 42 (34 to 50) | 23 (16 to 31) | <0.001 | |
| Stress and psychological state | 34 (28 to 40) | 42 (34 to 51) | 26 (17 to 34) | 0.007 | 39 (31 to 47) | 29 (21 to 37) | 0.093 | |
| Social milieu, work or relationships | 20 (14 to 25) | 23 (15 to 30) | 16 (9 to 24) | 0.230 | 25 (18 to 32) | 14 (7 to 21) | 0.037 | |

^aBased on detailed coding of the responses given by primary care doctors to the question: 'Would you ask this patient any additional questions before you decide what's going on? What? Anything else?' ^b(n = 256). ^c(n = 128). Social class and race of patient were not significantly related to any of the above at the $P < 0.05$ level (see Supplementary table 1).

questions asked according to the patient's class or race (see Supplementary table 1). Women doctors were more likely than men to question patients about lifestyle factors, asking more questions about both smoking and alcohol consumption (Table 2).

Despite these differences in questioning strategies by patient's age and sex, there was no significant difference in the proportions suggesting CHD as a possible diagnosis (92%) in relation to the four patient characteristics or the doctors' sex.

Table 2. Percentage of primary care doctors who would ask a patient presenting with coronary heart disease different types of additional questions^a by sex of doctor.

| Topics of additional questions | Percentage of doctors who would ask additional questions (95% CI) | | | P-value |
|--|---|---------------------------|-----------------------------|---------|
| | All doctors ^b | Male doctors ^c | Female doctors ^c | |
| Indicators of pathology | 74 (68 to 79) | 73 (65 to 82) | 74 (66 to 82) | 0.893 |
| Medical or risk factor history | 72 (67 to 78) | 70 (62 to 77) | 75 (68 to 82) | 0.309 |
| Symptoms of pain/discomfort | 60 (54 to 66) | 57 (48 to 66) | 62 (54 to 71) | 0.380 |
| Current or past history of smoking | 53 (47 to 58) | 45 (37 to 52) | 61 (53 to 69) | 0.003 |
| Current or past history of alcohol consumption | 33 (27 to 38) | 27 (19 to 34) | 39 (31 to 47) | 0.025 |
| Stress and psychological state | 34 (28 to 40) | 35 (27 to 44) | 33 (24 to 41) | 0.697 |
| Social milieu, work or relationships | 20 (14 to 25) | 21 (14 to 28) | 18 (11 to 25) | 0.548 |

^aBased on detailed coding of the responses given by primary care doctors to the question: 'Would you ask this patient any additional questions before you decide what's going on? What? Anything else?'
^b(n = 256). ^c(n = 128).

Table 3. Percentage of primary care doctors who would give different types of advice^a at the first consultation to a patient presenting with coronary heart disease by sex and age of patient.

| Types of advice | Percentage of doctors who would give advice (95% CI) | | | | | | |
|---------------------|--|-------------------|---------------------|---------|-----------------------|-----------------------|---------|
| | All doctors ^b | Sex of patient | | P-value | Age of patient | | P-value |
| | | Male ^c | Female ^c | | 55 years ^c | 75 years ^c | |
| Diet | 54 (48 to 60) | 52 (44 to 61) | 56 (48 to 65) | 0.530 | 52 (43 to 60) | 57 (48 to 66) | 0.380 |
| Smoking | 43 (38 to 49) | 51 (43 to 59) | 36 (28 to 44) | 0.013 | 52 (43 to 60) | 35 (27 to 43) | 0.006 |
| Alcohol consumption | 27 (22 to 32) | 28 (21 to 36) | 26 (18 to 33) | 0.662 | 32 (25 to 40) | 22 (14 to 29) | 0.060 |
| Relaxation | 8 (5 to 11) | 8 (3 to 12) | 8 (3 to 12) | 1.00 | 7 (2 to 12) | 9 (4 to 13) | 0.638 |
| Physical exercise | 7 (4 to 11) | 7 (3 to 12) | 8 (3 to 12) | 0.809 | 9 (4 to 13) | 6 (2 to 11) | 0.468 |

^aBased on detailed coding of the responses given by primary care doctors to the question: 'Based on the information presented in this case, would you advise the patient about his/her lifestyle or behaviour today? What would you advise? Anything else?' ^b(n = 256). ^c(n = 128). Social class of patient was only significantly related at the P<0.05 level in the case of advice about diet and physical exercise (see Supplementary table 2).

Advice giving by doctors

On average, doctors would give the patient two items of advice about their lifestyle or behaviour. Over half (54%) of the doctors said that they would give advice about the patients' diet (Table 3). Advice about smoking would be given by 43% of doctors, with more given to male (51%) than female patients (36%), and to middle-aged than older patients. There were no other significant differences in advice giving by patients' age or sex. Only 7–8% of doctors would give information about relaxation or physical exercise.

Advice about diet was more likely to be given to working-class than middle-class patients (62% and 46%, respectively), and likewise physical exercise (11% and 4%, respectively, P = 0.031) (see Supplementary table 2).

Women doctors were more likely than men to give dietary advice (63% and 45%, respectively) (Table 4). Women doctors were also more likely to give advice about smoking, alcohol consumption, and physical exercise, but only dietary advice reached statistical significance.

Discussion

Summary of main findings

Doctors' information-seeking strategies vary with the patient's sex. Women were asked fewer questions, resulting in the possibility that women presenting with symptoms of CHD would be less likely to receive appropriate treatment than men. Fewer women were asked about their smoking or alcohol consumption. This is potentially problematic, since there is no longer any sex difference in smoking prevalence among people over the age of 50 years in Britain.

Older patients were less likely to be asked about smoking and alcohol consumption than middle-aged patients. However, there was no evidence of stereotyped questioning in relation to patients' class or race, despite the strong class gradient in smoking.

Since the video vignette was portrayed as the patient's first consultation, doctors may have preferred to give

Table 4. Percentage of primary care doctors who would give different types of advice^a at the first consultation to a patient presenting with coronary heart disease by sex of doctor.

| Types of advice | Percentage of doctors who would give advice (95% CI) | | | P-value |
|---------------------|--|---------------------------|-----------------------------|---------|
| | All doctors ^b | Male doctors ^c | Female doctors ^c | |
| Diet | 54 (48 to 60) | 45 (37 to 54) | 63 (55 to 72) | 0.004 |
| Smoking | 43 (38 to 49) | 40 (32 to 48) | 47 (39 to 55) | 0.235 |
| Alcohol consumption | 27 (22 to 32) | 23 (15 to 30) | 31 (24 to 39) | 0.111 |
| Relaxation | 8 (5 to 11) | 9 (4 to 13) | 7 (2 to 12) | 0.638 |
| Physical exercise | 7 (4 to 11) | 5 (0 to 9) | 10 (6 to 15) | 0.092 |

^aBased on detailed coding of the responses given by primary care doctors to the question: 'Based on the information presented in this case, would you advise the patient about his/her lifestyle or behaviour today? What would you advise? Anything else?' ^b(n = 256). ^c(n = 128).

lifestyle advice in subsequent consultations. However, any such preference about the timing of advice would not be expected to vary with patients' characteristics. More men would be given advice about smoking than women, despite the current lack of sex difference in smoking. It is known that men consume more alcohol and have a poorer quality diet than women, but there were no statistically significant sex differences in doctors' advice giving in these two areas. Working-class patients were more likely to be given advice about diet and physical exercise, but were not given more advice about smoking, despite the well-established correlation between smoking and social class.

Women doctors gave significantly more advice about diet, perhaps due to women's greater role in preparing food, and their recognition of the importance of healthy eating. They also tended to give more advice about other lifestyle behaviours, such as smoking, alcohol consumption, and physical exercise, but these sex differences did not reach statistical significance.

Strengths of the study

There are major methodological difficulties in studying whether doctors' questioning and advice giving is influenced by patients' characteristics. Our experiment overcame these problems by developing authentic video vignettes of consultations in which 'patients' presented with CHD symptoms and in which the patients' sex, age, class, and race were systematically varied. The study involved a novel randomised experiment within health services, allowing the estimation of the unconfounded effects of four patient characteristics on doctors' questioning and advice giving. A random sample of primary care doctors in the UK and US were studied, increasing the generalisability of the results.

Limitations of the study

Although our experimental design enhances internal validity, the use of hypothetical patients potentially threatens external validity (for example, whether a doctor's likely response to videotaped encounters reflects their usual behaviour in everyday real consultations). Four steps were taken to foster external validity. First, clinical realism of the videotaped presentation was achieved by using professional actors and by filming with experienced doctors present. Second, doctors were specifically asked how typical the videotaped 'patient' was compared with patients they encounter in everyday practice (92% considered them either 'very typical' or 'reasonably typical'). Third, doctors viewed the tapes in the context of their practice day, not at a professional meeting, a course update, or in their home. It was likely they saw real patients before and after they viewed the 'patient' in the videotape. Fourth, doctors were specifically asked to view the 'patient' as one of their own patients and respond as they would typically respond in their own practice.

Implications

The extensiveness of doctors' questioning, and the nature of questions asked and advice given, are influenced by the sex and age of patients. Both women and older patients may be disadvantaged through this process, with the possibility that this may lead to suboptimal care when presenting with CHD symptoms.

Doctors are more likely to question male patients about their smoking and give more male than female patients advice about smoking. This finding suggests that primary care doctors in the UK and US retain the stereotypical view that men are more likely to smoke than women, although this is no longer an accurate representation of reality. Because women are less likely to be asked such questions, information about key risk factors may be missing.

It is important to raise awareness among doctors of the possible adverse implications of stereotyping women or older people as unlikely to smoke or consume alcohol, and emphasise the value of giving lifestyle advice to women and older people about these major risk factors for heart disease.

Working-class people are known to be more likely to smoke, have a poorer diet, and take less exercise than those from the middle class. There was some evidence of doctors aligning lifestyle advice to these class differences, with more advice about diet and physical exercise offered to working-class people, but not advice in relation to smoking.

Our findings have implications for the medical education and continued professional training of primary care doctors, which should emphasise the potential consequences of doctors viewing particular groups of patients as more likely to undertake certain health-risk behaviours, such as smoking, drinking, and having a poor diet, and that they should consider how this influences their information seeking and advice giving strategies.

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Supplementary Information

Additional information accompanies this paper at:
<http://www.rcgp.org.uk/journal/index.asp>

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