

Readiness for lifestyle advice: self-assessments of coronary risk prior to screening in the British family heart study

THERESA M MARTEAU

ANN-LOUISE KINMONTH

STEPHEN PYKE

SIMON G THOMPSON

FAMILY HEART STUDY GROUP

SUMMARY

Background. Where health professionals and patients hold similar views of a problem, health outcomes may be better.

Aim. The aims of this paper were to document how attenders at primary care cardiovascular screening clinics perceived their risks of coronary heart disease prior to screening; the degree of similarity between perceived level of risk and an epidemiologically derived risk score; and the relative importance assigned to individual risk factors by subjects compared with those assigned by the risk score.

Method. These issues were investigated in 3725 middle aged men and women who accepted an invitation to attend health screening as part of the British family heart study.

Results. Overall, there was a tendency for subjects to be optimistic (37%) rather than pessimistic (21%) when judging their risk of coronary heart disease. Nevertheless, there were strong significant associations between perceived risk and the levels of individual risk factors, particularly personal and family medical history and body mass index. There was also a strong association with the overall risk score though a large minority (31%) held views of their risk of coronary heart disease that were quite different from those based upon the epidemiologically derived index of risk. Respondents accorded greater importance to smoking and parental death from coronary heart disease and less importance to cholesterol level and blood pressure than did the risk score.

Conclusion. Possible explanations for the observed disagreement are over-optimism or the relative importance given to individual risk factors. The relationships between patients' perceptions of risk and the epidemiological indices likely to be espoused by health professionals are important in understanding the difficulties in communication that might arise in offering lifestyle advice after screening for cardiovascular risk.

Keywords: coronary risk factors; lifestyle; patient health beliefs; screening; general practice clinics.

T M Marteau, BSc, MSc, PhD, senior lecturer, Psychology Unit, United Medical and Dental Schools of Guy's and St Thomas' Hospitals, London. A-L Kinmonth, MD, MSc, FRCP, FRCGP, professor, Primary Medical Care, University of Southampton. S Pyke, MSc, lecturer and S G Thompson, MA, reader, Medical Statistics Unit, London School of Hygiene and Tropical Medicine.

Submitted: 18 February 1994; accepted: 15 July 1994.

© British Journal of General Practice, 1995, 45, 5-8.

Introduction

THERE is a large body of evidence to show that people do not necessarily change their lifestyles when health professionals advise them to.¹ Yet an annual budget in the United Kingdom of £65 million is now committed primarily to this activity in relation to reducing coronary heart disease and stroke in general practice. The way people behave in the face of a risk to their health is affected by their perceptions of that risk, of the advice or treatments offered, and of the health professionals offering the advice. Several studies suggest that where health professionals and patients hold similar views on a problem, health outcomes are better.^{2,3} Little is known about the ways in which people attending for cardiovascular risk factor screening in primary care assess their health prior to screening. Nor is it known how such self-assessments compare with epidemiologically-defined indices of risk, nor whether they influence responses to consequent lifestyle advice.

The paper reports how attenders at primary care cardiovascular screening clinics assessed their risk of coronary heart disease prior to screening, and assesses the extent to which their views coincided with an epidemiologically-derived index of risk.

Method

The British family heart study is a randomized controlled trial of nurse-led coronary risk factor screening and lifestyle intervention in men and their partners in general practices in 13 towns in England, Wales and Scotland.⁴ It quantifies the extent of coronary risk factor reduction that may be obtained in one year by such a practice based strategy. The study was conducted between June 1990 and March 1993. This paper reports only on those individuals recruited to the intervention arm of the study.

Invitation to attend for health screening was by random selection from prepared practice lists of all men aged 40 to 59 years, stratified by five year age bands, in one general practice from each of the 13 towns. The partners of selected men and their families were also invited to attend. The nurses made appointments for a family by telephone and confirmed them in writing. When an appointment was not kept only one further appointment was offered. Families not contacted by telephone received up to two postal invitations addressed to the man. If a man and his partner declined to be screened they were not approached again.

Of 4158 families invited, 2373 accepted (57%) and were represented by one or more members in the study. A proportion of the non-attenders were patients who had died or who were no longer living in the area, and the true response rate was estimated to be 68%.⁴ As part of the initial screening assessment, before clinical measurement or advice, respondents were asked a range of sociodemographic and health-related questions, including questions relating to their perceptions of health and risks of disease. Data were complete except for 125 individuals who were recruited at the beginning of the study before the self-assessed measures of health risk had been incorporated into the screening interview.

As part of a study to evaluate reasons for non-attendance,⁵ 106 families (141 individuals) out of 340 who initially did not attend

when invited also completed these questionnaires. These responses were compared with those of the main study group.

Measures

Self-assessed risk was assessed by the following question: 'What do you think is your risk of having a heart attack in the next 15 years, compared with other people of your age and sex: lower than average, slightly lower than average, average, slightly higher than average, or higher than average?'

For the epidemiologically-assessed risk the British regional heart study provides a risk score based on both mutable and immutable risk factors for calculating overall level of coronary risk in middle-aged men in a primary health setting.⁶ It is calculated as a weighted sum of the following risk factors: years smoking cigarettes, systolic blood pressure, serum cholesterol level, diagnosis of coronary heart disease, diagnosis of diabetes, current angina (indicated by reported chest pain on exercise), and parental death from coronary heart disease before the age of 65 years. This score was adapted to estimate risk-for-age using data collected for the British family heart study.⁷ A similarly age-adjusted risk score for women was also constructed, based on the same risk factors. By dividing the risk score distributions into equal fifths it is possible to define quintiles of the risk score distribution which denote those at lowest risk as one, through to those at highest risk at five. Those in quintile five are estimated to have about 20 times the risk of subsequent coronary events compared with those in quintile one.

In order to determine whether subjects' own weighting of risk factors was in accord with those from the epidemiologically derived index, perception of risk was regressed on risk score and individual risk factors together. If weightings were found to be in accord, then no association with individual risk factors would be present after adjustment for risk score.

Results

In all, 2246 men and 1604 women attended. At the time of randomization into the study, all men were (by definition) aged 40–59 years. Their partners were in general slightly younger, with 94.6% of them aged between 35 and 59 years. Mean ages in men and women were 50.1 years and 47.8 years, respectively.

Self-assessed risk of coronary heart disease

Of the 3725 subjects assessing their risk, 37.2% perceived their risk of having a heart attack over the next 15 years as lower (1013 subjects) or slightly lower (373 subjects) than average, with 41.5% feeling their risk to be average, while 21.3% viewed their risk as above average (546 slightly higher, and 247 higher than average). Among those 141 non-attenders recruited to the non-attender study, the distribution of responses was similar to that of the main study group: 34.8% of subjects said that they viewed their risk as below average while 19.1% saw their risk as being above average.

Tests for association between perceived risk of a heart attack and known cardiovascular risk factors assessed in the study are shown in Table 1. The most strongly associated of these risk factors were (in order): current angina; having a first degree relative aged less than 65 years who suffered from coronary heart disease; parental death from coronary heart disease; smoking habit; and having symptoms of coronary heart disease.

Self-assessed risk and epidemiologically-based risk of coronary heart disease

Self-assessed risk of coronary heart disease was strongly positively associated with quintile of risk ($P < 0.001$) (Table 2), with

Table 1. Percentage of subjects perceiving risk of heart attack as lower or slightly lower than average, by presence of known risk factors for coronary heart disease, presented in order of strength of association.

Risk factor	% of subjects perceiving risk as lower than average
Current angina ^a	
Yes ($n = 142$)	10.6
No ($n = 3583$)	38.2***
1st degree relative with CHD aged <65 years	
Yes ($n = 964$)	25.0
No ($n = 2756$)	41.5***
Parental death from CHD ^a	
Yes ($n = 1071$)	27.4
No ($n = 2649$)	41.2***
Cigarette smoking ^a	
Current ($n = 872$)	22.9
Ex-smoker ($n = 1180$)	37.6
Never ($n = 1670$)	44.4***
Diagnosis of CHD ^a	
Yes ($n = 132$)	12.1
No ($n = 3593$)	38.1***
Body mass index (kg m^{-2}) ^b	
30+ ($n = 488$)	25.8
25–29 ($n = 1553$)	35.4
<25 ($n = 1684$)	42.2***
Cholesterol level (mmol l^{-1}) ^{a,b}	
6.50+ ($n = 665$)	32.5
5.20–6.49 ($n = 1362$)	34.9
<5.20 ($n = 1281$)	43.0***
Systolic blood pressure (mmHg) ^{a,b}	
160+ ($n = 430$)	30.9
130–159 ($n = 1679$)	36.5
<130 ($n = 1616$)	39.7***
Diagnosis of diabetes ^a	
Yes ($n = 58$)	20.7
No ($n = 3667$)	37.5***
Age ^{a,b}	
50+ ($n = 1772$)	36.1
<50 ($n = 1953$)	38.2
Sex ^a	
Male ($n = 2173$)	37.4
Female ($n = 1552$)	36.9

n = number of subjects in group. CHD = coronary heart disease. ^aFactor contributes to risk score. ^bTreated as continuous in regression analysis. *** $P < 0.001$, derived from ordinal polytomous logistic regression assuming proportional odds.⁸

Table 2. Percentage of subjects in each quintile of epidemiologically-defined coronary heart disease risk score, by self-assessed level of risk.

Self-assessed level of risk compared with average	% of subjects in quintile of risk perceiving own level of risk ^a				
	1 ($n=710$)	2 ($n=810$)	3 ($n=828$)	4 ($n=656$)	5 ($n=718$)
Lower	37.7 ^a	35.3 ^a	26.1	22.0 ^b	13.8 ^b
Slightly lower	13.5 ^a	11.9 ^a	8.9	8.4 ^b	7.2 ^b
Same	37.7	39.4	44.9	46.3	39.1
Slightly higher	9.3 ^c	10.2 ^c	13.8	16.2 ^a	24.5 ^a
Higher	1.7 ^c	3.2 ^c	6.3	7.2 ^a	15.3 ^a

n = number of subjects in quintile. ^aRealists. ^bOptimists. ^cPessimists.

individuals increasingly likely to take a pessimistic view of their risk as scores increased. Those in quintile one were more than twice as likely as those in quintile five to perceive their risk as lower than average. Similarly, those in quintile five were more than nine times as likely as those in quintile one to perceive their risk as higher than average.

Individual respondents were categorized according to whether their perceived risk of heart attack was concordant or discordant with their risk score ranking. Three categories were identified: optimists, pessimists, and realists (Table 2). The optimists were those individuals whose risk score put them in quintiles four or five, but who assessed their own level of risk as lower or slightly lower than average. The pessimists were those individuals in quintiles one or two who assessed their level of risk as higher or slightly higher than average. The realists were those individuals assessed to be at low risk (quintiles one or two) who perceived their level of risk as lower or slightly lower than average, and those assessed to be at high risk (quintiles four or five) and who perceived their level of risk as higher or slightly higher than average.

The prevalence of personal and family related risk factors among subjects identified as realists, optimists and pessimists is shown in Table 3. There were significant differences between groups on all of the measures shown except diabetes. The differences were most marked for smoking and family history of coronary heart disease. Pessimists in quintiles one and two were more than three times as likely to smoke as the realists in these quintiles. They were also more than twice as likely to have a first degree relative with premature coronary heart disease, and a parent who had died of coronary heart disease. They were also more likely than realists to be overweight. Optimists in quintiles four and five were less likely than the realists to have a relative with coronary heart disease aged less than 65 years or a parent who had died of coronary heart disease. They were also less likely than realists to be smokers or to be overweight.

Discussion

In this large, national study of cardiovascular risk factor screening and intervention there was strong overall agreement between the way in which attenders rated their future risk of heart attack, and that defined by quintile of risk according to an epidemiologically-derived risk score. This suggests that, on the whole, people attending for cardiovascular screening have a realistic idea of their risk of coronary heart disease before screening occurs. This is compatible with ethnographic research on public perceptions of risk factors for coronary heart disease, which demonstrate a large overlap between epidemiologists' and the general population's views of the meaning of these risk factors.⁹

Despite this overall agreement, it was evident that many of those attending for screening held views of their future risk of heart attack that differed, in varying degrees, from those based on the index of risk which provided a measure of risk relative to others of the same age and sex in the population. The extent of these differences is similar to that found in other studies that have considered perceptions of some risk factors for coronary heart disease.^{10,11} There are a number of possible explanations for these differences. They include unrealistic optimism, the weighting of different risk factors according to prior knowledge and familiarity, and the possibility that individuals can rate their own risk more effectively than a risk score.

The majority of people attending for screening saw their risk of a heart attack over the next 15 years as average or lower than average. Such a bias towards optimism is a well documented phenomenon. When asked to judge a range of characteristics including their health, people habitually judge themselves more favourably in comparison with others.¹² Such relentless optimism can be seen as a barrier to acknowledging risks and adopting behaviours to reduce them.¹³

Another factor that may have influenced the degree of agreement between self-assessments of risk and epidemiologically-derived risk scores was the perceived importance of different risk factors in contributing to overall risk of coronary heart disease.

Table 3. Risk factor prevalence among those subjects whose perception of coronary heart disease risk was concordant or discordant with their quintile of risk.

Risk factor ^a	% of subjects with risk factor whose perception of CHD risk was concordant or discordant with quintile of risk			
	Quintiles 1 and 2		Quintiles 4 and 5	
	Pessimists ^b (n = 187)	Realists ^c (n = 746)	Optimists ^c (n = 350)	Realists ^b (n = 439)
<i>More weight than risk score</i>				
Current cigarette smoker**	11.2	3.4	37.4	45.6
Parental death from CHD***	32.1	13.0	34.3	48.5
Current angina***	— ^d	— ^d	4.3	20.3
Diagnosis of CHD***	— ^d	— ^d	4.6	17.5
<i>Similar weight to risk score</i>				
Diabetes	1.1	0.1	3.1	4.3
<i>Less weight than risk score</i>				
Cholesterol level 6.5+ mmol l ⁻¹ ****	3.8	5.5	42.7	36.5
Systolic blood pressure 160+ mmHg***	0.5	1.7	23.4	22.1
<i>Not included in risk score</i>				
1st degree relative with CHD aged <65 years***	34.8	13.0	24.9	43.5
Body mass index 30+***	13.4	5.8	15.1	22.1

n = number of patients in group in quintile. CHD = coronary heart disease. ^aWhere a risk factor contributes to the epidemiologically derived risk score, the relative weight accorded by individuals compared with that accorded by the risk score, is indicated. ^bPerception of heart attack risk was that it was higher or slightly higher than average. ^cPerception of heart attack risk was that it was lower or slightly lower than average. ^dPresence of angina or CHD puts individual into quintile five. ^eCholesterol level not measured for 31 pessimists, 97 realists (quintiles one and two) and 20 optimists and 34 realists (quintiles four and five). **P<0.01, ***P<0.001, for risk factor indicated from regression on that risk factor and risk score.

The results of the current study suggest that the weighting of these risk factors differs between the objective data of epidemiologists and the perceptions of the lay public: smoking and family history of coronary heart disease were accorded more weight by the subjects than by epidemiologically-derived indices of risk. Such indices are only one of several sources of information upon which patients' views may be based and there are several possible explanations for these discrepant weightings. They may represent a tendency to weight visible risk factors, such as family history or weight, as opposed to such 'hidden' ones as cholesterol level or blood pressure. In the case of smoking, they may represent the emphasis of health education campaigns upon the dangers of smoking on other diseases as well as on coronary heart disease.

While some clinicians may be tempted to try to realign patients' views with epidemiologically-based risk estimates, both the interpretation of risk scores and recent research would caution against this. An epidemiological risk score of this kind, derived for the purpose of defining groups of subjects at high risk, is a crude instrument for making predictions of risk for individuals, since it cannot take into account a range of personal factors which may be important in defining that risk. In a review of six large prospective studies, Idler provides evidence that after controlling for clinically defined parameters of health, self-assessed health remains an independent and important predictor of mortality.¹⁴ The mediators of this relationship have yet to be delineated. Hence self-assessed health may be a stronger predictor of mortality than objectively defined health using currently available criteria.

The present study has documented significant differences between the ways that patients view their risks of coronary heart disease and their risks based upon an epidemiologically-derived index of risk. After screening, patients are usually offered lifestyle advice which relates to their epidemiologically-derived risk but takes little or no account of how this may differ from self-assessed risk. Effective management is likely to involve the health professional in using both self-assessed and epidemiologically-derived risk scores as the basis for a dialogue with patients on what factors are contributing to their risks of coronary heart disease. Factors potentially amenable to modification can then be identified and readiness to consider changes explored. What is clear is that advice based on population risks is unlikely to be effective in negotiating behaviour change with an individual patient.

References

- Turk DC, Meichenbaum D. Adherence to self care regimens: the patient's perspective. In: Sweet JJ, Rozensky RH, Tovian SM (eds). *Handbook of clinical psychology in medical settings*. New York, NY: Plenum Press, 1991.
- Rosengren WR. Some social psychological aspects of delivery room difficulties. *J Nerv Ment Dis* 1961; **132**: 515-521.
- Gillespie CR, Bradley C. Causal attributions of doctor and patients in a diabetes clinic. *Br J Clin Psychol* 1988; **27**: 67-76.
- Family heart study group. A randomised controlled trial evaluating cardiovascular screening and intervention in general practice. Principal results of the British family heart study. *BMJ* 1994; **308**: 313-320.
- Davies G, Pyke S, Kinmonth A-L. Impact of non-attenders on the potential of a primary care programme to reduce cardiovascular risk in the population. *BMJ* (in press).
- Shaper AG, Pocock SJ, Philips AN, Walker M. A scoring system to identify men at high risk of a heart attack. *Health Trends* 1987; **19**: 37-39.
- Family heart study group. British family heart study: its design and method, and prevalence of cardiovascular risk factors. *Br J Gen Pract* 1994; **44**: 62-67.
- McCullagh P. Regression models for ordinal data. *J R Statist Soc B* 1980; **42**: 109-142.
- Davison C, Davey-Smith G, Frankel S. Lay epidemiology and the prevention paradox: the implications of coronary candidacy for health education. *Sociol Health Illness* 1991; **13**: 1-19.
- Avis NE, Smith KW, McKinlay JB. Accuracy of perceptions and can they be changed? *Am J Public Health* 1989; **79**: 1608-1612.
- Silagy C, Muir J, Coulter A, et al. Cardiovascular risk and attitudes to lifestyle: what do patients think? *BMJ* 1993; **306**: 1657-1660.
- Weinstein ND. Why it won't happen to me: perceptions of risk factors and susceptibility. *Health Psychol* 1984; **3**: 431-457.
- Weinstein ND, Sandman PM. Evidence from home radon testing. *Health Psychol* 1992; **11**: 170-180.
- Idler EL. Self assessed health and mortality: a review of studies. In: Meas S, Leventhal H, Johnston M (eds). *International review of health psychology*. Chichester: John Wiley, 1992.

Acknowledgements

The study was funded by the Family Heart Association with an educational grant from Merck Sharp and Dohme, the family health services authorities and Fife Health Board, Boehringer Mannheim UK, Wessex Regional Health Authority, the Health Education Authority, the Scottish Home and Health Department, and the Department of Health. T M is supported by the Wellcome Trust.

Address for correspondence

Dr T M Marteau, Psychology Unit, United Medical and Dental Schools of Guy's and St Thomas' Hospitals, Guy's Campus, London SE1 9RT.



MRCGP EXAMINATION – 1995

The dates and venues of the next two examinations for Membership are as follows:

May/July 1995

Written papers: Wednesday 3 May 1995 at centres in London, Manchester, Glasgow, Edinburgh, Newcastle, Cardiff, Belfast, Liverpool, Ripon, Birmingham, Bristol, Sennelager and Riyadh.

Oral Examinations: In Edinburgh from Monday 19 to Wednesday 21 June and in London from Thursday 22 June to Saturday 1 July inclusive. The closing date for the receipt of applications is Friday 24 February 1995.

October/December 1995

Written papers: Tuesday 24 October 1995 at those centres listed above.

Oral Examinations: In Edinburgh on Monday 4 and Tuesday 5 December and in London from Wednesday 6 to Monday 11 December inclusive. The closing date for the receipt of applications is Friday 1 September 1995.

MRCGP is an additional registrable qualification and provides evidence of competence in child health surveillance for accreditation.

For further information and an application form please write to The Examination Department, Royal College of General Practitioners, 14 Princes Gate, Hyde Park, London SW7 1PU, or telephone: 0171-581 3232. (Fax 0171 225 3047).