

Can health screening damage your health?

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SUMMARY. *This study set out to determine whether screening can be psychologically harmful to healthy adults. A prospective controlled study was carried out on 215 healthy adults attending a by-invitation coronary heart disease screening clinic in general practice. The general health questionnaire was used as an indicator of recent psychological distress. Patients attending the screening clinic had significantly lower subjective psychological distress than an unscreened group of 225 age-matched controls, indicating that we may well be screening an already psychologically healthy sub-group. The main finding was that patients' own assessment of their psychological distress was significantly increased three months after screening compared with that of controls, who showed a non-significant decrease.*

It is concluded that there is a real risk of causing distress by screening healthy adults and that this possibility has largely been ignored by previous studies. Possible explanations and implications of these findings are discussed, particularly in the light of increased pressure from many quarters for more screening services to be set up in general practice.

Introduction

ADULT screening for coronary risk factors in general practice is widely advocated on the grounds that it can save lives or at least reduce morbidity. Furthermore, it is believed that making people aware of risk factors will enable them to exert greater control over their own health. Advocates of screening tend to assume that there are only two possible outcomes of screening: benefit or no effect. A third possibility, harm, is frequently ignored. It can be argued that the debate about who to screen and for what conditions should be widened to take more account of its effect on a person's mental state and subsequent behaviour.

In order for screening to be of benefit it must be capable of detecting disease or potential disease not only before its usual clinical presentation but also before the point at which intervention becomes ineffective, sometimes called the 'critical point'.¹ Unfortunately, relatively few medical conditions satisfy these criteria,² and this may be one reason why many studies of adult health screening have had disappointing results. The Kaiser Permanente study³ failed to prove the case for multiphasic screening as opposed to conventional care. The authors of the south east London screening study found no good evidence of the usefulness of screening in middle-aged adults. Their conclusions were unequivocal: 'We believe that the use of general practice based multiphasic screening in the middle-aged can no longer be advocated on scientific, ethical or economic grounds as a desirable public health measure'.⁴ The World Health Organization's European heart study showed no clear effect of screening on coronary heart disease end-points.⁵ Even the multiple risk factor intervention trial which looked at high risk men aged between 25–57 years, found no difference between 'special intervention care' and the usual community care over a seven-year period.⁶

These trials all looked at hard end-points such as death or

non-fatal myocardial infarction. None looked at the effect of screening programmes on the psychological state and behaviour of the participants. It has been shown by Haynes and colleagues⁷ that the labelling of previously undiagnosed hypertensives, detected by screening in the work place, results in increased absenteeism from work. It is therefore known that detecting abnormalities may have significant costs to the patient. What has not been studied is whether there are similar costs to people who do not have risk factors for disease.

This longitudinal controlled study in general practice looked at the effect of a by-invitation screening clinic on the psychological wellbeing of people found to have no detected abnormality, and thus labelled 'normal'. It was hypothesized that screening may make people more aware of illness thus increasing their psychological distress.

Method

The study was carried out in a new purpose-built six-handed practice in Bexleyheath, Kent. The practice employs a full-time preventive health worker who runs a by-invitation coronary risk screening clinic for men and women aged between 35 and 65 years. All patients in year of birth cohorts from the age–sex register were invited to make an appointment for a free health check.

The indicator of subjective psychological wellbeing used in this study was the 30 item version of Goldberg's general health questionnaire, a self-administered instrument which measures recent psychological distress, largely ignoring stable personality traits.⁸ It is ideal for general practice use,⁹ is simple to score¹⁰ and has been shown to be sensitive to change over time.¹¹ Subjects are usually considered to be minor psychiatric 'cases' if they score above the cut-off score of 5.¹² Although the instrument is designed to measure psychological distress, it has been shown to correlate with perceived health status.¹³

Housing tenure was used as an indicator of social class.¹⁴ People were classified as living in owner-occupied, council rented or private rented accommodation. This information is obtained with a single question and is particularly useful in postal questionnaires.¹⁵ Previous studies have compared it favourably with the Registrar General's classification, and with socioeconomic group.¹⁶

Between September 1987 and April 1988 attenders at the screening clinic were handed a general health questionnaire on arrival and asked to complete it before screening. Patients were then screened by the nurse who took a history of smoking, drinking, diet and family history of ischaemic heart disease. Blood pressure, height and weight were measured and urinalysis was performed. Blood was taken for lipids or liver function tests if appropriate. Any risk factors detected were discussed and advice and leaflets given if necessary. To look at the effect of screening on 'healthy' adults, patients found to have any of the following were excluded from the study: previously undetected blood pressure above 160/95 mmHg, newly detected glycosuria, fasting total cholesterol above 6.5 mM, or any other previously undetected abnormality which in the nurse's opinion required referral to the patient's doctor for further action.

Controls were randomly selected from the age–sex register using uninvited years of birth as close as possible to the study group, thus matching fairly closely for age. This group was sent a general health questionnaire by post with a letter asking for their help in a health survey. Reminders were sent after 10 days.

Subjects and controls were contacted in monthly batches of

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similar size in order to eliminate any seasonal effect on general health questionnaire score. This was achieved by selecting a larger control than subject group. It was reasoned that age-sex registers have a margin of error (10.5% in this case) and that response rates would be inevitably lower for a control group who gain no personal benefit from replying.

Subjects and controls both received a second general health questionnaire by post three months after the first, again with an explanatory covering letter. Reminders were sent to non-responders 10 days later.

Results

During the study period 234 people attended the screening clinic: 15 people (6.4%) were found to have previously undetected abnormalities and were therefore excluded from the study; two patients were in the process of moving house and two refused to take part; 215 patients were therefore enrolled. A total of 255 control patients were selected: three had been previously screened and 27 were unknown at their registered address; 225 controls were therefore included in the study. These were thus matched for age not sex. Interestingly, however, the groups had very similar sex ratios, indicating that there was no sex bias in attending for screening.

Response rates for the two questionnaires are shown in Table 1. The response rate of the control group to both questionnaires was lower than the study group. There was a close similarity in housing tenure between the study and control groups (Table 2). The sex ratios of the two groups were also similar with women comprising 56.6% of the study and 57.4% of control groups ($\chi^2 = 0.049$, not significant).

Table 1. Response rates for the two questionnaires.

	Number (%) of patients		
	Enrolled	Completed first questionnaire	Completed first and second questionnaire
Study group	215	215 (100.0)	189 (87.9)
Controls	225	185 (82.2)	155 (68.8)

Table 2. Housing tenure of respondents.

	Number (%) of respondents		
	Owner occupied	Council rented	Private rented
Study group (n = 189)	172 (91.0)	12 (6.3)	5 (2.6)
Control group (n = 155)	138 (89.0)	10 (6.4)	7 (4.5)

Owner occupied versus rented (private + council), $\chi^2 = 0.33$, $df = 1$, not significant.

When the general health questionnaire scores were compared for the two groups there were two important results. First, significantly fewer of those attending for screening had psychological distress on the first questionnaire than the control group (χ^2 with Yates' correction = 6.09, $df = 1$, $P < 0.05$). Secondly, significantly more of the screened group had a high general health questionnaire score three months after screening than before (Table 3). The control group showed a non-significant fall in general health questionnaire score during the three-month period.

Discussion

The study demonstrated a significant increase in psychological distress in healthy adults who have been screened for coronary

Table 3. Study and control group respondents with general health questionnaire (GHQ) scores of 5 or more.

	Percentage of respondents scoring >5 (95% confidence intervals)		Chi-squared test with Yates' correction
	First GHQ	Second GHQ	
Study group (n = 189)	21.7 (15.2–26.8)	35.4 (28.2–41.8)	$\chi^2 = 8.10$, $df = 1$, $P < 0.01$
Control group (n = 155)	34.1 (26.6–41.4)	25.8 (18.0–32.0)	$\chi^2 = 2.21$, $df = 1$, NS

heart disease risk factors. An association, however, does not prove causation — the effect may be due to selection or artefact — and it is important to address some of the weaknesses of the study design.

It is unfortunate that a smaller proportion of the control patients completed both questionnaires, despite a postal reminder, but it was felt to be important to avoid personal contact by telephone in case this influenced the scores. The fact that fewer of those attending for screening had high initial general health questionnaire scores than the control group needs to be considered. It might be argued that anxious people or those with real or imagined health problems will be more likely to accept an invitation for screening. If so, we could expect a higher proportion of patients with high initial general health questionnaire scores, rather than the reverse. Attenders for screening are self-selected and certainly likely to be different from a random group of patients with similar socioeconomic variables. The reasons why psychologically healthier people attend for screening is interesting and further work is planned to study this.

The decrease in scores for the control groups between the first and second questionnaires is the usual result seen with repeat administration of the general health questionnaire.⁸ What was totally unexpected was that significantly more of the study group had scores indicating psychological distress after screening than before. A study design can only eliminate known dependent variables and the higher general health questionnaire scores in the subject group may be a reflection of unknown variables. It is unlikely, however, that this could entirely explain significant differences between two fairly well matched groups. The possibility of a direct causal relationship between screening and increased stress cannot be ignored.

It is interesting to speculate about the nature of this relationship. The impression given by some patients was that receiving a letter warning them of risk factors for coronary disease and premature death made them feel that they had been negligent. This type of systematic screening may have made some people more aware of their mortality and, more hypochondriacal, leading to greater psychological distress. If patients become more dependent on health services to deal with their life problems this has serious implications, not only for patients themselves but for the health services. General practitioners are being encouraged to screen more but Kleinman¹⁷ warned that as 90% of episodes of illness are dealt with without resort to the doctor, a shift of only 10% in the proportion presenting to general practitioners would double our workload.

More work is needed in this area. Given that we have as yet no conclusive proof that screening alters the natural history of disease in a significant proportion of those screened,^{2,18} we must be cautious in our appraisal of measures which appear to

reduce risk factors by detection and intervention. As Rose and Barker put it,¹⁹ 'The outcome of screening must be judged in terms of its effect on mortality and illness and not in terms of its restoration of biochemical or other test results, to normal'. We must also address the possibility, previously largely ignored, that for some people at least, screening can do more harm than good.

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