Improving uptake of breast screening in multiethnic populations: a randomised controlled trial using practice reception staff to contact non-attenders

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Abstract

Objectives: To determine whether a two hour training programme for general practice reception staff could improve uptake in patients who had failed to attend for breast screening, and whether women from different ethnic groups benefited equally.

Design: Controlled trial, randomised by general practice.

Setting: Inner London borough of Newham.

Subjects: 2064 women aged 50-64 years who had failed to attend for breast screening. Women came from 26 of 37 eligible practices. 31% were white, 17% were Indian, 10% Pakistani, 14% black, 6% Bangladeshi, 1% Chinese, 4% were from other ethnic groups, and in 16% the ethnic group was not reported.

Main outcome measures: Attendance for breast screening in relation to ethnic group in women who had not taken up their original invitation.

Results: Attendance in the intervention group was significantly better than in the control group (9% v 4%). The response was best in Indian women—it was 19% in the intervention group and 5% in the control group.

Conclusions: This simple, low cost intervention improved breast screening rates modestly. Improvement was greatest in Indian women—probably because many practice staff shared their cultural and linguistic background. This intervention could be effective as part of a multifaceted strategy to improve uptake in areas with low rates.

Introduction

Uptake of breast screening has ranged from 81% in East Anglia Health Region to 58% in North East Thames and is even more variable within regions.¹ Social status, ethnic minority status, area of residence, accuracy of general practice registers, and other recently reviewed factors affect uptake.¹⁻⁶ These factors coexist in deprived urban areas, and inequitable delivery of breast screening in minority ethnic groups is of particular concern.^{7,8} In one recent study, breast screening was the only preventive activity recorded by general practitioners that showed appreciable inequality in relation to ethnic group, and it was the only activity the practices did not support by active recruitment or follow up.⁹ In another study, fewer than 20% of general practitioners reported that they checked non-

attenders, and a minority followed them up.¹⁰ Circumstantial evidence exists that screening rates are better in well organised practices or those with strategies to increase uptake.³⁻¹⁵ However, randomised trials have shown that interventions in general practice to improve the initial response, or to target women who fail to attend, have variable success.^{4,16-18}

General practice is an influential part of the national breast screening programme. It has been argued that general practitioners could improve poor uptake of breast screening if they were given adequate resources and evidence based strategies for doing so.^{2,3,19-21} We investigated whether a two hour training programme for general practice reception staff could improve uptake in women who had failed to attend for breast screening, and whether women from different ethnic groups benefited equally.

Methods

We calculated that if there were 1800 women in each group, the power to detect a 10% to 20% difference in extra uptake of screening among non-attenders would be greater than 95%. For a 5% difference (10% to 15%), the power would be greater than 80% at a significance level of 5%. No estimate of variability between practices was available and no adjustment was made for this. Therefore, randomising by practice, with 15 practices each in the control and intervention groups, resulted in some loss of power (depending on variability between practices).

Practices

All general practitioners in the east London borough of Newham, whose patients were to be invited for breast screening between January and August 1995 as part of the national breast screening programme, were asked to participate in the trial. Approval of the local ethics committee was obtained. Participating practices were randomly allocated to either the control or intervention group. A minimisation procedure was used for stratification. Practices were matched on the following: the number of full time principals in the practice, the previous uptake of breast screening, the percentage of women aged 50-64 years in minority ethnic groups in the wards within a radius of 0.5 km from the practice, and the invitation batch in which women were

grouped. As a contribution to the costs of the trial and the time spent by reception staff, practices in the control and intervention groups received £90 or £125 respectively if the general practitioner worked alone and an additional £50 or £60 respectively per general practitioner for other practices.

Practices in this screening round were grouped geographically into nine batches. They were called sequentially for screening by the Central and East London Breast Screening Service, the local service of the national programme.

Procedures

Practices were visited routinely by a facilitator from the breast screening service. She explained the programme and the importance of checking and amending the prior notification list which contained the addresses and identifying details of women aged 50-64 years registered with the practice. The screening service used this amended list to send appointments for breast screening on a specified date, batch by batch over the 8 month period. A second letter was sent to non-attenders 4 weeks after their initial appointment. As part of the trial, all practices received a list of women in their practice who had still not attended 8 weeks after the last appointment in that batch. The study researcher asked all general practitioners to note the ethnic group to which women on this list belonged as white, Indian, Pakistani, black (British, Caribbean, or African), Bangladeshi, Chinese, other minority ethnic group, or not known. The validity of this method of classification has been addressed previously.⁹

Intervention

A receptionist from each of the intervention practices took part in a single two hour group training session, using a standard schedule. The reception staff were informed about the breast screening programme and women's concerns and were asked to contact all women on their practice list of non-attenders by telephone, where possible, or by sending the women a standard letter from their general practitioner (in English with appropriate translation). They were asked to record letters sent, telephone calls made, and whether women had left the practice or were otherwise ineligible for screening. Control practices were given no training or advice.

Reports on attendance for breast screening were received, batch by batch, from the local breast screening service. The first report was produced 2 months after the appointment date of the last woman in that batch, at the same time as practices received their list of non-attenders. This report formed the baseline from which later comparisons were made between control and intervention practices. A final report was produced 6 months after the appointment date of the last woman in the last batch. The total duration of the trial from first to final report was 1 year. All practices had at least 4 months in which to contact non-attenders, though women in earlier batches had a longer period in which to attend than women in later batches. The location of the mobile breast screening unit remained the same throughout the study.

Women were eligible for the study if they had not attended—and were not known to the breast screening unit to have died, moved, opted out, gone missing, been

Table 1 Characteristics of control and intervention practices

	Control practices	Intervention practices
Mean (range) No of GPs per practice	2.1 (1-5)	2.3 (1-6)
No (%) of single handed GPs	7/14 (50)	5/12 (42)
% (interquartile range) uptake in preceding screening round	49 (46-54)	48 (41-54)
% (interquartile range) women in ethnic minority group*	50 (41-56)	48 (40-62)
No (%) of practices in later screening batches	6/14 (43%)	6/12 (50)

* Wards within a 0.5 km radius of practice.

screened recently, or under care—by the time the practice non-attendance list was generated. Eligible women who changed to another trial practice during the course of the study and those who as a result of the intervention were known by reception staff to be ineligible for screening, remained in the study and were analysed by original allocation.

Statistical analysis

Data on attendance for screening were imported from the breast screening service computer, and information on ethnic group, and telephone and letter contact obtained from the practices was added by the study researcher. SPSS 4.0 software was used for analysis. A logistic regression model, with women at level 1 nested within practice at level 2, was used to test the effect of the intervention on attendance for breast screening using MLN 1.0 (Rasbash J, Woodhouse G. Institute of Education, University of London, London). This model allowed for possible variation in attendance rates between practices. Effects of practice characteristics (practice size, previous uptake of breast screening, and batch number) and individual characteristics of women, such as ethnic group, were investigated.

Results

Of the 37 practices (75 general practitioners) included in the screening round, 26 (57 general practitioners) agreed to participate (response rate 70%). The mean numbers of general practitioners per practice and singlehanded practitioners, the proportion of women who had been screened during the preceding round, and the proportion of women in minority ethnic groups in local wards were similar in intervention and control practices (table 1).

In the control group, 2822 women were eligible for screening and 1069 of these had failed to attend. In the intervention group, 2672 women were eligible and 995 had failed to attend. One practice in the intervention group failed to report ethnic group, and more women were unreported in the intervention group than in the control group. Overall, though, reporting was high (80%).

One receptionist from nine of the 12 practices in the intervention group attended the group training course and the remaining three were trained at their surgery. In all but one intervention practice, women were contacted by a receptionist who could speak an Indian language. Sixteen of 29 (55%) general practitioners in the control group and 19 of 28 (68%) in the intervention group spoke an Indian language.

Contacting non-attenders

Three of the 12 intervention practices made no attempt to write to or telephone women who had not

attended for screening, and one practice got in touch with fewer than 10 women. A letter was sent or telephone contact was attempted for 646 (65%) of the 995 intervention women. Altogether 314 were contacted by letter alone, 219 by telephone alone, and 113 by both letter and telephone. No contact was made with 349 women. Of the 332 women who were telephoned, there was no reply in 96; 175 were spoken to personally, and in 61 another household member was spoken to.

Eligibility and exclusions

There were no exclusions after randomisation, and analysis was carried out on an "intention to intervene" basis. Reception staff in the intervention practices reported that 40 women had moved or left the area, 8 had died, 15 were abroad or likely to be away for some time, and 15 had recently had a mammogram. Thus, in 78 of the 995 non-attenders (8%), the practices, but not the breast screening unit, knew the women were no longer eligible for screening. These women were retained in the analysis. The breast screening unit was aware of eight women who had changed practices during the study. These women were reported from their original practice.

Attendance in relation to ethnic group

Table 2 shows non-attenders in relation to ethnic group and subsequent attendance for breast screening. The odds ratios of attendance in relation to ethnic group derived from the multilevel logistic regression model and 95% confidence intervals are given for ethnic groups with at least 20 attenders (table 2). The model included the following variables: practice size, previous uptake of breast screening, inclusion in earlier batches (1-5) or later batches (6-9) called for screening, and the ethnic group of non-attenders (there was a category for women whose ethnic group was not reported). Intervention and ethnic group were the only two significant factors in this model; no other practice factors showed any significant association with attendance for screening after adjusting for the effects of intervention and ethnic group. None of the interaction terms was significant. Adjusting for ethnic group made little difference to the association between intervention and attendance.

Table 2 Initial non-attendance and subsequent attendance for breast screening in control and intervention practices in relation to ethnic group. Values are numbers (percentages) unless specified otherwise

Ethnic group	Proportion of subjects (%)	Control practice		Intervention practices		Odds ratio (95% CI*)
		Non-attenders	Subsequent attendance	Non-attenders	Subsequent attendance	
All	100	1069	40 (4)	995	90 (9)	2.3 (1.1 to 5.3)
White	31	372	14 (5)	259	22 (8)	1.0
Indian	17	149	8 (5)	206	40 (19)	2.2 (1.3 to 3.8)
Pakistani	10	86	3 (3)	128	6 (5)	0.7
Black	14	150	6 (4)	137	11 (8)	0.9
Bangladeshi	6	112	2 (2)	20	2 (10)	0.8
Chinese	1	12	1 (8)	14	1 (7)	1.0
Other	4	55	3 (5)	31	2 (6)	1.1
Not reported	16	133	3 (2)	200	6 (3)	0.4

*Confidence intervals not given for groups in which numbers of attenders were small.

Table 3 Weighted estimate of percentage (95% confidence interval) of women attending for breast screening in relation to ethnic group

Ethnic group	Control practices	Intervention practices
White	4.8 (2.2 to 7.5)	5.3 (2.4 to 8.3)
Indian	7.6 (2.0 to 13.2)	13.7 (9.0 to 18.5)
Other (excluding not reported)	4.3 (2.0 to 6.6)	6.6 (3.7 to 9.6)

Improvement in attendance

The intervention resulted in a 5% improvement in attendance. Of women who had failed initially to attend for screening, 40 of 1069 (4%) in the control group and 90 of 995 (9%) in the intervention group now did so. Using the multilevel logistic regression model to adjust for ethnic group and allowing for variability between practices gave an odds ratio of 2.3 (95% confidence interval 1.1 to 5.3, $P=0.04$) for screening attendance in the intervention compared with the control group. The unadjusted odds ratio was 2.4 (1.1 to 5.9, $P=0.04$). Ethnic group had a P value of 0.005 based on a χ^2 statistic ($df=7$) with the same model.

Eight of 149 (5%) Indian women in the control group and 40 of 206 (19%) in the intervention group attended. In white women who attended, 14 of 372 (5%) were in the control group and 22 of 259 (8%) were in the intervention groups respectively. Multiple regression analysis, in which attendance by white women formed the baseline (odds ratio 1.0), yielded an odds ratio for attendance by Indian women of 2.2 (95% confidence interval 1.3 to 3.8).

Further estimates were made of the proportions of attenders in the control and intervention groups in relation to ethnic group. These estimates, obtained using a random effects method, were based on proportions pooled over practices, with greatest weight given to those practices which provided most information when the inverse of the variance was used.²² Because there were few respondents in individual ethnic groups, women were grouped into three categories: white, Indian, and all other ethnic groups (excluding the non-reported category). Table 3 shows the effect of intervention in relation to these ethnic groups. For Indian women the odds ratio for attendance in the intervention group compared with the control group was 2.5 (1.0 to 6.2, $P=0.05$). Finally, multilevel modelling that took account of ethnic group was used to estimate the intervention effect on the basis of "intervention received" by excluding the three practices which failed to participate fully. This gave an odds ratio of 3.5 (1.7 to 7.1, $P<0.001$).

Discussion

Among women who had failed to attend for breast screening after an initial invitation, 5% more from intervention practices subsequently attended than from control practices. When the effect of the intervention was estimated in relation to ethnic groups, improvement in attendance was most noticeable in Indian women, the largest minority ethnic group. The fact that most of the receptionists and general practitioners spoke Indian languages fluently was probably influential, and there was nothing to suggest that the intervention disadvantaged other non-white ethnic groups.

Screening rates in the control and intervention groups represented overall increases of 1.4% and 3.4% respectively, with a difference between groups of 2%. This intervention is not sufficient in itself to produce acceptable breast screening rates, but it would form a useful component of a multifaceted strategy.

The programme was acceptable to 70% of local practices, who contacted 65% of non-respondents. Analysis based on an "intention to intervene" gave more conservative estimates of effect than analysis based on "intervention received," showing that the effect of the intervention might have been greater if compliance by practices had been better. Reception staff knew of only 8% of women who were unavailable for screening, and adjustment of the denominator after notification would have made little difference to the result.

The estimate of effect in relation to ethnic group shown in table 3, yielded smaller differences and wider confidence intervals than the unadjusted estimate, because the latter takes no account of variability between practices. This method gave conservative results of reduced statistical significance as some small practices had no women who attended for screening and therefore provided no data.

The modest improvements described were obtained with a simple, low cost intervention. Intervention practices were paid a total of £690 more than controls to cover the costs of receptionists' time and administration (based on what seemed reasonable for trial purposes rather than any economic assessment). Thus, an additional 50 women attended at a cost of £25 per general practitioner or £13 per additional woman screened. This may be contrasted (though is not simply comparable) with the £805 per general practitioner that is paid on reaching the lower target for uptake of cervical screening—50%.

In national terms, the breast screening programme has got off to a good start. However, locally, in deprived and multiethnic communities, uptake is not good enough. The expertise, language skills, and cultural knowledge of practice teams are useful forces for change, but they require resources. When these resources are costed, the value placed on equitable delivery and its importance need to be considered.²³ Contacting non-attenders is one of a number of strategies used by general practitioners to improve uptake. Like cervical cytology and immunisation, the issue is no longer whether general practice teams influence uptake, but whether purchasers are prepared to pay them to do so in areas where the programme is inequitably failing to reach all women.

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Key messages

- The uptake of breast screening is inadequate and inequitable in some deprived areas—often those with large minority ethnic populations
- Training general practice receptionists to contact women who had not responded to an initial invitation for breast screening made a small but important improvement in attendance
- Improvement was most pronounced among Indian women—perhaps because most practices employed staff who spoke an Indian language
- Resources of local general practices could be used as part of multifaceted programmes to increase screening rates in areas of low uptake.

Conflict of interest: None.

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