

## Family Physicians' Initiative to Increase Compliance with Screening Mammography – An Innovative Community Project

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**Key words:** mammography, screening, cancer, compliance, prevention

### Abstract

**Background:** Breast cancer is the most common malignancy among women in Israel and throughout the world. Israeli women aged 50–75 years are advised to undergo a mammographic screening examination every 2 years. However, the lack of a structured referral system is reflected in the low utilization rate of mammography.

**Objectives:** To describe an innovative program in which family physicians in an urban clinic developed a model framework for referrals, coordinated with radiologists and surgeons, aimed at increasing compliance among women referred for mammography.

**Methods:** A community-based study was conducted, outside of the regular reception hours, in a neighborhood practice with a population of 527 women aged 50–75. A referral system under the supervision of family physicians was designed, and the women received appointments for mammography at specified days and hours. The results of the examination were sent to the physician who used dedicated time to continue the diagnostic and/or therapeutic process, as appropriate. At the physician's instructions a research assistant contacted the women who did not keep their appointments, and scheduled a second appointment.

**Results:** In 1993, the year prior to the study, when women referred themselves for mammography, the utilization rate was 9%. During the study year the utilization rate was 77%. Women born in Europe or America had higher compliance rates than women born in Asia or Africa (81% vs. 72%, respectively). Married women were more compliant than unmarried women (81% vs. 70%, respectively). No correlation was found between compliance and age, family history of cancer in general, or breast cancer in particular. Six new cases of breast cancer were detected.

**Conclusions:** The initiative of family physicians increased the utilization of mammography among women under their care. Family physicians allocated time outside of their regular reception hours for the program. A relatively large number of new malignancies were found, but this impression should be confirmed or negated by a large-scale study using the same methods.

*IMAJ 2001;3:920–924*

Breast cancer is the most common malignancy among women both in Israel and worldwide [1,2]. Early detection of breast cancer by mammography reduces mortality [3–6]. In 1987, the World Health Organization recommended bi-annual screening mammography for women aged 50–75 years [7].

In studies designed to identify factors that affect compliance with mammography screening it was shown that the health system, physicians and patients all contribute to the low compliance rates. Patient factors that are positively correlated with compliance include higher socioeconomic status, knowledge of the importance of mammography for the early detection of breast cancer, and a general awareness of and propensity for self-care [8–11]. A family history of breast cancer has been reported to have varying association with utilization of screening mammography [11,12]. A major contribution to compliance rates is the physician's attitude, and the most frequent reason given for not having a screening mammogram is the absence of counseling from the physician [9,11,13–16].

Physician factors correlating with low compliance rates are misinformation about early detection of breast cancer and lack of knowledge on guidelines and referral protocols [13]. In successful intervention programs [10,11] physicians used various methods including personal invitation, reminder systems [17–20], and health-promotion activities. The provision of dedicated time for these activities in Britain, where family physicians made a major contribution alongside the central invitation system, led to a compliance rate of 98% [8].

Four health maintenance organizations provide healthcare services in Israel. The Clalit Health Services serve 65% of the total population and close to 78% of the elderly population of the country. Since 1992 Clalit has included bi-annual mammography in its "basket" of health services, initially for a small fee and since 1993 free of charge. In 1994, when the present study was initiated, there was no structured referral system for mammography in Israel. Various healthcare providers, including family physicians, gynecologists and surgeons, referred patients for the examination. The utilization rate for screening mammography in Israel is 20% [21].

We describe a pilot intervention study at the community level for the referral of women to screening mammography, which was designed to evaluate a model in which the

responsibility for referral is delegated to the family physician. The study hypothesis was that the involvement of family physicians, who are perceived as authorities by their patients, would increase compliance rates. The target project compliance rate was at least 70%, which was defined as the target rate for population screening [22]. The aims of the study were: a) to determine whether this initiative leads to increased compliance rates for screening mammography; b) to analyze causes of non-compliance, and c) to generate a protocol for a larger study in the community setting.

## Materials and Methods

This study was conducted at the Health Center in Migdal HaEmek, a development town in northern Israel. Most of the town's residents are of low to middle socioeconomic status. The Health Center provides services to about 15,000 local residents including primary medical services and counseling by medical specialists. Laboratory services, radiology, emergency medicine and hospitalization services are provided at HaEmek Medical Center, which is located 20 kilometers away. A breast clinic is held at the hospital, where mammography and all surgical procedures are performed.

The study was performed by three board-certified family physicians with a total clinic roster of 5,000 adults. The target population comprised 527 women aged 50–75 years. In 1992 the physicians attended a workshop on early detection of breast cancer, where the effectiveness and benefit of tests were discussed and guidelines and protocols for referral were determined. It was decided that all women of appropriate age who visited the health center would be referred for mammography. The results of quality assurance testing for the year 1993 showed that 47 women underwent screening mammography, a utilization rate of 9%. The program for 1994 involved all stages of the screening examination. Its base was in the community clinic and the family physicians were responsible for its implementation.

The study stages were:

- Preparation of an updated list of women aged 50–75, and completion of a questionnaire for each woman that included country of birth, age at menopause, chronic co-morbidity, and a family history of breast cancer.
- First appointment: every woman was given an appointment for mammography, by day and hour. Women received personal letters signed by the family physician that included an explanation of the importance and significance of the procedure
- Mammography: two-view mammography was performed in the radiology department. The examination was interpreted by a specialist in radiology and the results were sent to the family physician within a few days.
- Women with normal examinations received the result with a recommendation to repeat the examination in 3 years.
- Women with pathological examinations were invited by the family physician for a check-up and were referred to the

breast clinic where surgeons determined the need for clinical follow-up or additional diagnostic procedures such as aspiration or biopsy.

- In the event of non-compliance with the mammography appointment, the radiology department notified the research assistant who then contacted the non-compliant participant by telephone at the family physician's instruction. The research assistant elicited the reason for non-compliance and offered the opportunity for a new appointment in the name of the family physician. The reasons for non-compliance were entered into the structured data form.
- Mammography results were reported in detail (masses, calcifications, intramammary lymph nodes) and the results were classified into six categories [23]:
  - i) findings that necessitate another X-ray – focused or with pressure, or by ultrasound
  - ii) normal examination – no abnormal findings
  - iii) a negative examination with benign findings – no evidence of cancer but evidence of benign lesions
  - iv) findings that are most probably benign, but necessitate an earlier follow-up examination than is routinely recommended
  - v) a lesion suspected of being malignant
  - vi) a malignant lesion.

Doctor appointments relating to the study took place during a dedicated hour each week. This was done because of the inherent difficulty in integrating curative medicine and early-detection activities. During this hour the physician monitored mammography results, and met with women who requested more information and/or women with pathological mammographic findings.

Statistical analysis was performed using the SPSS statistical package. Student's *t*-tests were used for continuous variables and the chi-square statistic was used for categorical variables. A multivariate logistic regression analysis was conducted to identify factors that affect compliance with mammography. The model included variables that were statistically significant in the univariate analyses.

## Results

A total of 527 women aged 50–75 participated in the 3 month study. Nine women who were previously diagnosed with breast cancer and 47 who had mammographic examinations in 1993 were excluded from the study. Altogether, 471 women who met the criteria for screening mammography were sent initial appointments by mail [Table 1]. Twelve women were not located.

The mean age of the women in the study was 62 years. Eight women (1.7%) were born in Israel, 250 (54.5%) in Europe or America, and 201 (43.7%) in Asia or Africa. Of the women, 297 (64.7%) were married and 162 (35.3%) were unmarried; 190 women had chronic co-morbidity, and a family history of breast cancer was elicited in 21 women.

With regard to compliance, 254 women (53.9%) kept their

**Table 1.** Association between country of origin and marital status and compliance with mammography appointments

	Patients (N)	Compliance rate [N (%)]	P
<b>Country of birth</b>			<0.005
Europe/America	258	211 (81.6)	
Asia/Africa	201	143 (71.5)	
<b>Marital status</b>			=0.0127
Married	297	241 (81.0)	
Unmarried	162	133 (69.7)	

**Table 2.** Reasons given for non-compliance by women who did not keep appointments

Reason	N (%)
Did not receive the letter	52 (26.8)
Did not understand the letter	6 (3.1)
Appointment date was not convenient	59 (30.4)
Forgot to go	16 (8.2)
The distance made compliance difficult	15 (7.7)
Refusal	46 (23.7)
Afraid of results	28
Prefers not to know	6
Afraid of the "evil eye"	1
Does not believe in the examination	1
Prefers a surgeon's examination	1

appointments. Twelve women were not located so the adjusted compliance rate was 55.3%. The research assistant elicited the reasons for non-compliance. The explanations given by women who did not keep appointments were classified into six categories, based on responses to an open question relating to this issue. The distribution of reasons is shown in Table 2. The research assistant offered these women the opportunity for a new appointment in the name of the family physician. Altogether, 152 women requested a second appointment, and 100 kept it (65.8%). The overall compliance rate for mammography was 75%. The rate, adjusted for women who were not located, was 77%. If women who underwent mammography prior to the study were included, the utilization rate for this population of women in 1994 would be 87.3%.

Associations between demographic variables and compliance were tested using the chi-square statistic [Table 1]. Country of origin was significantly correlated with compliance. For statistical purposes, the small group of women born in Israel was added to women born in Europe and America. The compliance rate for women born in Europe or America was 81.6% compared with 71.5% for women born in Asia or Africa ( $P = 0.005$ ). A second appointment made a larger contribution to compliance among women born in Asia or Africa. Among women born in Europe or America, 61.6% complied with the first appointment (compared with 47.2% among women born in Asia or Africa) and an additional 19.7% complied with the second appointment (compared with 24.3%). Family status also

**Table 3.** Results of logistic regression analysis

	Odds ratio	95% CI	P
<b>Country of birth</b>		1.4; 3.6	0.001
Europe/America	1		
Asia/Africa	22		
<b>Marital status</b>		0.96; 2.5	0.076
Married	1		
Unmarried	1.6		
<b>Chronic disease</b>		1.0; 2.8	0.037
Yes			
No			

**Table 4.** Results of mammography

Result	N (%)
Further evaluation required	6 (2)
Negative	261 (73)
Benign lesion	31 (9)
Follow-up required	49 (14)
Suspected cancer	4 (1)
Cancer	3 (1)

affected compliance rates. Among married women, 81% underwent mammography compared with 69.7% among the unmarried ( $P = 0.0127$ ), without any association between marital status and country of origin. No association was found between compliance and age, years since menopause, or family history of breast cancer. There was a statistically significant association with chronic co-morbidity. Women who cited a chronic disease had lower compliance rates than those without (73.4% vs. 82%, respectively;  $P = 0.037$ ). The results of the logistic regression analysis showed that married women and women born in Europe or America had higher compliance rates [Table 3].

The result in 261 of the 354 mammograms performed was normal, while lesions were found in 93. Of these, a repeat mammogram or ultrasound examination was required in 6 cases, 31 were diagnosed as benign, 49 necessitated follow-up mammograms 6 months later, 4 had findings with suspicion of malignancy, and 3 were diagnosed as cancer [Table 4].

Forty-one women were referred to surgeons; 38 kept their appointments and 3 refused to go. Four fine-needle aspirations and eight biopsies of breast masses were performed. In all, 6 cases of breast cancer were detected in the 354 mammograms. Four women were diagnosed with stage 1 and two women with stage 2 cancer.

## Discussion

Breast cancer represents a real threat to the lives of women. Mammography is the most reliable method for early detection of the disease [9]. As in all screening procedures, the success of mammography is largely dependent on the target population's compliance with the examination. Avoidance of screening tests for the early detection of cancer is a common phenomenon. The reasons stem from healthcare utilization habits and patients'

health belief models [16]. Our study was aimed at helping our patients overcome the barriers to undergoing the recommended procedure by strengthening the effect of the doctor's advice. Many intervention programs have demonstrated that physicians' advice plays an important role in increasing compliance [17–20].

The compliance rate of 77% obtained with this initiative was much better than the rate of 9% recorded in the previous year (1994) when there was no special intervention. These results are also better than those achieved in our clinic in the framework of a nationwide program that was designed to increase compliance without physician intervention. That program was initiated in 1996 using a central mammography referral system in which women received postcards from the central administration of the sick fund to their homes with the date and hour for a mammographic examination. Prior to the year 2000 the compliance rate of women in our clinic, as reported by the central referral system, did not reach 30%. These figures support the contention that the increase in mammography utilization in our study was due to the intervention program. The availability of regular secretarial assistance and dedicated physician time in our present study contributed to the close monitoring of compliance and other study outcomes.

In our patient population, women of Asian and African origin were less likely to undergo the test than women of European and American descent. In other studies, conducted in populations with varied ethnic origins, differences among the ethnic groups were also reported [16]. We do not have a definitive explanation for this finding. A study conducted in the women treated in the health center in Migdal HaEmek reported a lower education level among women of Asian and African origin compared with those from Europe and America (Y. Hofman and S. Eilat-Tsanani, unpublished data). The percentage of uneducated women in these populations was 26% and 10%, respectively. As previously reported in the literature, education levels may affect compliance rates with screening mammography [10, 11]. It should be noted that even though the relative compliance rate of women of Asian and African origin was low, it was still above the recommended level of 70%, and a second appointment raised the compliance rate significantly from 47% to 71%.

Married women are more inclined to undergo the procedure than unmarried women. This may reflect a higher concern for health, or spouses may contribute to increased compliance by encouraging their wives to undergo the test.

Age and family history of breast cancer did not affect compliance rates in our population. These factors may be important, as reported in the past [7,13,16], but could not be demonstrated in our small sample of women. Unexpectedly, chronic disease had a negative effect on compliance rates. We have no explanation for this finding.

The rate of cancer detection was relatively high in comparison with the rate of 6 per 1,000 procedures reported previously [22]. It is premature to draw conclusions because of

the sample size, but the results of the present study indicate the need for a similar study in larger populations.

We believe that the results of this study provide support for the contention that physician initiative in inviting women for mammography contributes to higher compliance rates. We recommend that physicians be involved in all community health-promotion initiatives.

**Acknowledgement.** This study was supported by a grant from the Israel Cancer Association. The authors would like to acknowledge the following individuals and groups who made important contributions to this study: Zmira Stollar of the Department of Epidemiology at the Carmel Medical Center for help with statistical analyses, the Israel Cancer Association that supported the study, and the staff of the Radiology Department of HaEmek Medical Center.

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