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ORIGINAL ARTICLE

Socio-demographic parameters in screening for breast cancer: Lessons from a population-based women's Health Project held in a province in Turkey

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Summary

Purpose: *To inform healthy women about breast cancer and screen them, as well as to look for any relationship between demographic and clinical findings and breast cancer.*

Methods: *Thirty-five health teams were created prior to the study. The teams were primarily trained for breast examination and for screening methods to detect breast cancer.*

Results: *A total of 77,934 subjects were evaluated. Clinical breast examination (CBE) was performed in 66% (n=51,706) of the participants. The characteristics of the subjects in the examined group were similar to those in the group refusing examination. The percentage of the subjects who declined examination was 2-fold higher in the ≥ 60 year age group compared to younger women. A breast mass was detected in 2,838 (6%) subjects who had undergone breast examination. Lower educational level and urban dwellers showed higher incidence of suspicious mass in CBE. Fifty-eight women were diagnosed with breast cancer. The cumulative incidence of breast cancer was 7.5/10.000 for all of the study population and 10.1/10.000 for women with CBE.*

Conclusion: *Elderly subjects, those living in rural areas and women with low educational and lower socio-economic levels should be convinced to undergo screening for breast cancer.*

Key words: breast cancer, clinical breast examination, screening

Introduction

Cancer is a major public health problem in Turkey [1]. Informing the public and raising awareness about the symptoms and early diagnosis of cancer is of great importance, since it is a disease that would affect a considerable proportion of the population in the future. Screening methods are needed due to the probability of cure with early diagnosis, particularly for certain cancers which are frequently encountered among the population such as breast cancer.

Breast cancer is the most common cancer in females and is also the second most common cause of death in the world. In the early stages of disease treatment is likely to be more effective. Larger tumors have a poorer prognosis than smaller ones [2]. It may be more cost-effective to treat it in early stages compared to more advanced ones. Therefore, it is extremely important to inform and raise the awareness of the public about breast cancer, and to direct the target group towards breast cancer screening methods.

Breast cancer is the most common cancer among Turkish women, as well as worldwide and represents 26.5% of all cancers in females in Turkey [3]. Although CBE is recommended for subjects >40 years old, there have been no large-scale studies carried out in Turkey involving CBE and mammography.

The aim of this cross-sectional, population-based study was to inform healthy women about breast cancer and screen them, as well as to look for any relationship between demographic and clinical findings and breast cancer.

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Methods

Health teams and study population

This cross-sectional, population-based study was carried out between 1 January 2006 and 30 June 2008 in Mersin, a city in south Turkey, with about 1,595,938 inhabitants. Thirty-five health teams were created prior to the study onset, each consisting of a physician and nurse-midwife under the supervision of the local health authority, and were dispersed in 111 health care centers located in the Mersin province and its counties. Thirty-four physicians and 348 nurses participated in these health teams. Teams, physicians and nurses were trained about breast cancer, clinical and self breast examination, and mammography as screening method to detect breast cancer.

The teams interviewed women aged 15 year or older living in the region. All the invited subjects were informed about the study. Their verbal informed consent about their participation was obtained by the health team personnel. Age, marital status, educational level, income level, and family history for breast cancer of the participants were recorded. The subjects were informed about breast cancer, its clinical findings, screening, and other diagnostic methods. The importance of screening and early diagnosis was stressed. Education was performed by audio-visual methods. A short video clip was also presented, demonstrating breast-self examination. Subsequent to the dissemination of the information, each subject was offered a detailed CBE and a general examination as a screening method by the authorized health personnel, which was voluntary. Women with abnormal CBE, like a suspected mass, were advised to apply to clinical centers for further evaluation with specialist's examination, mammography and breast ultrasound.

Statistical analysis

Data were analyzed using the Statistical Package for Social Sciences (SPSS 15.0). Socio-demographic factors of the populations (women that performed breast examination vs. those who did not) were compared. For dichotomous variables, chi-square test was used to determine the difference between the groups, and for continuous variables Student's t-test was used for independent groups. Statistical significance was set at $p<0.05$.

Results

Of 439,955 screened subjects, data of 77,934 subjects could be analyzed. The demographic characteristics of all of the subjects are presented in Table 1. Nearly one-half of the participants (46%) were evaluated in Mersin, the biggest city in the province, followed by Tarsus (24%), and Erdemli (13%) counties. Of the study subjects, 80% (n=61,923) were in the 15-49 years age group. The great majority of the subjects were married (73%; n=57,192). Nearly one-half of the population (46%) was primary school graduates. Only 6% of the subjects were university graduates, whereas 9% were illiterate. When evaluated according to economic level, 44% of the participants had a total monthly household income between 501 and 1,000 Turkish liras (TL). Generally, about 77% of the participants belonged to the low income group (≤1,000 TL). When classified according to the yearly seasons, it was observed that the subjects were most frequently contacted during the autumn and winter (46 and 37%, respectively). CBE and general health examina-

Table 1. Demographic characteristics of all subjects

Characteristics	*n=77,934 (%)*
Age group (years)	
<15	0.2
15-49	79.5
50-59	11.2
60+	8.7
Unknown	0.4
Marital status	
Single	18.4
Married	73.4
Widowed	4.2
Divorced	0.4
Unknown	3.7
Educational level	
Illiterate	9.3
Literate	5.6
Primary school	45.9
Secondary school	12.6
High school	16.9
University	5.7
Unknown	4.1
Monthly income (TL*)	
<500	33.0
501-1,000	43.7
1,001-3,000	8.5
>3,000	0.6
Unknown	14.2
City of residence	
Anamur	1.0
Aydincik	1.3
Bozyazi	1.0
Camliyayla	0.3
Erdemli	12.9
Gulnar	10.7
Mersin	46.2
Mut	0.9
Silifke	1.3
Tarsus	24.3
Unknown	0.3

*Turkish lira

tions were performed in 66% (n=51,706) of the participants after they had been given information. The demographic characteristics of the participants according to their examination status are shown in Table 2. Of the subjects, 26% refused to have breast examination. An abnormal mass was detected in 3.6% of the study population (n=77,934), but the ratio was 6% in women who performed CBE (n=51,706).

The mean age of the participants living in rural areas was higher compared to those living in the city center (36.6 and 36.1 years, respectively, p<0.001). Subjects ≥ 60 years of age accounted for 4.6% of the participants examined at the city center, but participants who had been followed-up outside the city center accounted for 12.2% (p<0.001). The rate of high school and university graduates among the subjects from rural areas was 19.8%, whereas it was 25.7% for those living in the city center (p<0.001). Of the subjects, 33% living outside the city center and 18% living in the city center declined examination (p<0.001).

The mean age, education and income characteristics of the subjects in the examined group were similar to those in the group refusing examination. Distributions of willingness to undergo examination according to age group, marital status, and place of residence are illustrated in Figure 1. The attendance rate of CBE

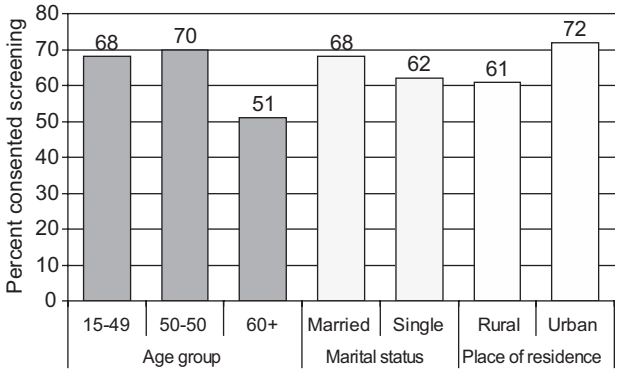

Figure 1. Distribution of willingness to undergo examination according to age, marital status, and place of residence groups (p<0.001 for all groups).

Table 2. Demographic characteristics of the subjects according to their examination status

Characteristics	*Examination status***			*Rate of willingness to be examined****
	Yes (n=51,706) (%)	*No (n=20,249) (%)*	*p-value*	
Age group (years)		(%)	<0.001	
<15	0.2	0.3		
15-49	81.1	74.8		67.8
50-59	11.8	10.0		69.8
60+	6.6	14.8		50.7
Unknown	0.2	0.1		
Marital status			<0.001	
Single	17.2	23.3		62.0
Married	75.2	69.9		68.0
Widowed	3.6	6.1		57.5
Divorced	0.4	0.6		54.4
Unknown	3.7	0.1		67.6
Educational level			<0.001	
Illiterate	8.9	10.1		63.5
Literate	5.7	5.4		68.4
Primary school	46.2	48.2		66.8
Secondary school	13.1	12.5		68.8
High school	16.9	17.4		66.6
University	5.6	6.2		65.1
Unknown	3.6	0.3		59.1
Monthly income (TL*)			<0.001	
<500	31.9	40.5		64.1
501-1,000	45.5	45.6		69.1
1,001-3,000	8.7	9.7		67.8
>3,000	0.6	0.8		63.0
Unknown	13.4	3.4		
Place of residence			<0.001	
Urban	50.4	32.0		72.0
Country	49.6	62.0		61.0

*Turkish lira, **Distribution rate within groups, ***Attendance rate within groups

was lower in women who had low educational level, low income (<1,000 TL), were elderly (>60 years) and living in the country. Thirty-three percent of the single and 25% of the married subjects declined examination (p<0.001). With respect to the level of education, the group including university graduates had the lowest rate of declining examination (6.0%). The percentage of those refusing CBE was 2-fold higher in women aged 60 years or older than in younger women (14.8 vs. 6.6%; p<0.001). The rate of those willing to be examined was lower among the subjects who were living outside of the center than those living in the city center (33 vs. 18%; p<0.001).

A suspected mass in the breast was detected in 2,838 subjects who had undergone CBE (Table 3). The mean age of the subjects in whom CBE was suspicious and in whom a mass had been detected was 39.1 years and was higher than in those with a normal CBE (36.3; p<0.001). In women ≥40 years of age, the rate of an abnormal CBE was higher than in younger women (p<0.001). While 15.1% of the subjects with suspicious CBE findings were either high school or university graduates, this rate was higher in subjects with normal CBE findings (23.7%; p<0.001; Figure 2). Women in whom CBE was suspicious were referred to general surgeons for further investigation and biopsy. To date, 58 women were diagnosed with breast cancer. The cumulative incidence of breast cancer was 7.5/10,000 for all of the study population and 10.1/10,000 for women with CBE.

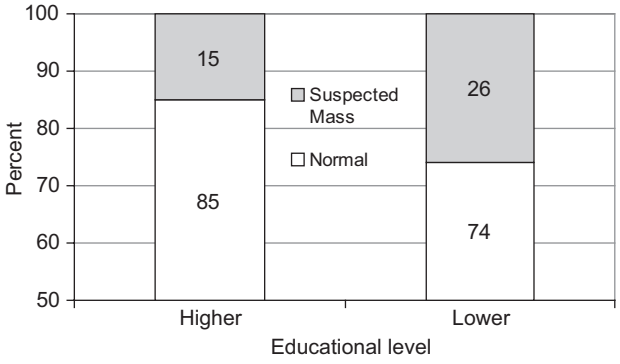

Figure 2. Distribution of women with a suspected mass according to educational level (p<0.001).

Table 3. Demographic characteristics of the subjects according to the presence of a mass

Characteristics	*Mass*			*Prevalence of mass (%)*
	Absent (n=75,096)	*Present (n=2,838)*	*p-value*	
Age group (years)			<0.001	
<15	0.2	0.0		0.0
15-49	79.5	79.4		3.6
50-59	11.1	13.7		4.5
60+	8.8	5.3		2.2
Unknown	0.4	1.7		13.9
Marital status			<0.001	
Single	18.9	2.6		0.5
Married	74.0	56.4		2.8
Widowed	4.2	1.9		1.7
Divorced	0.4	0.2		2.1
Unknown	2.3	38.8		38.6
Educational level			<0.001	
Illiterate	9.4	4.1		1.6
Literate	5.7	2.9		1.9
Primary school	46.4	31.0		2.5
Secondary school	12.8	6.3		1.8
High school	17.2	7.4		1.6
University	5.8	1.6		1.0
Unknown	2.5	46.8		41.2
Monthly income (TL)*			<0.001	
<500	33.7	14.7		1.6
501-1,000	44.5	22.0		1.8
1,001-3,000	8.7	3.6		1.5
>3,000	0.6	0.2		1.0
Unknown	12.5	59.5		15.3
Place of residence			<0.001	
Urban	45.4	65.0		5.1
Country	54.6	35.0		2.4

*Turkish lira

Discussion

For early diagnosis and detection of breast cancer, a number of professional organizations recommend screening procedures including breast self-examination, CBE, and mammography [4-9]. While CBE is advised for women younger than 40 years, mammography is recommended for those older than 40 years. Screening mammography combined with CBE appears to give better results [10]. Mammography is only recommended in perimenopausal or postmenopausal women. Although guidelines about screening of breast cancer recommend CBE in women younger than 40 years as the sole modality, the effectiveness of CBE alone needs to be explored. A study advises examination of the breasts from the age of 40 years and on by a clinician, because while CBE only detects 50% of breast cancers present and screening mammography detects 90%, it is possible that CBE may pick up some of the 10% not detected by mammography [11]. Another study, however, suggested that CBE is more sensitive in women aged 40-49 years than in older ones, in contrast to mammography [12]. While recently the use of CBE has declined, mammography has been usually preferred for screening [13]. Although there are no adequate evidence-based data, CBE continues to be recommended as an integral part of screening programs for early diagnosis of breast cancer [10,14]. While the sensitivity for CBE is low (54%), its specificity is quite high (94%) [10]. Sensitivity varies between 17-88% and is affected by several factors such as patient age, tumor size, ethnicity, body weight, menopausal status and hormone use [15]. While screening mammography is less sensitive in younger women, the sensitivity of CBE is higher in women younger than 50 years.

Early detection of breast cancer by population-based screening programs would be a potentially useful approach for controlling the disease and reducing mortality [16]. The primary aim of this population-based study was to inform the subjects and to raise awareness about the early diagnosis and screening methods for breast cancer, and also to screen women by CBE.

In this population-based study, approximately 78,000 subjects were contacted in the Mersin province and its counties located at the south coast of Turkey, for 30 months. Experienced health teams invited women to have breast and general physical examination after having informed them about breast cancer and the significance of early disease diagnosis. Breast and general health examinations were performed on nearly 51,000 (66%) of these subjects by the health teams personnel. The great majority of subjects in the present study was in the 15-49 years age group. When all of the subjects were taken into account, the educational level of the great majority of the population was primary school graduates or lower. University graduates accounted for only about 6% of the population. A suspected breast mass was detected in 6% of the examined subjects and 3.6% of all subjects. The relationship between both clinical examination, detection of a breast mass and socio-demographic characteristics such as age, social status, and educational and income levels were evaluated.

Screening tests including mammography and CBE are affected by a number of factors such as age, geographic location, education, income, language, and migration [17-21]. The results of our study are similar to those of the above mentioned studies. In these studies some individual factors played a role for CBE. The rate of the subjects who declined CBE was higher among single subjects compared to those who were married (33 vs. 25%; $p<0.001$). The main reason for this finding might be the number of young subjects. However, beliefs, religion and other social factors may be responsible for these high rates. Our data also demonstrated that subjects living in rural areas were less willing to be examined, which might have resulted from the low educational and income levels in those areas. Therefore, when a screening program for cancer is being planned, developing a program which includes mobile screening teams would be more appropriate in order to reach subjects living in rural areas. The low rates of the subjects who had a high level of education and in whom the examination findings were suspicious may be due to the more frequent and conscious utilization of the health services by these subjects.

In summary, when screening for breast cancer is planned, the participation of the elderly women, women living in rural areas, and those with low educational and lower socio-economic levels should be convinced to undergo screening for breast cancer.

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