

Relationships between Family Levels of Socioeconomic Status and Distribution of Breast Cancer Risk Factors

Pegah Mohaghegh^{1,2}, Parvin Yavari^{1,2}, Mohammad Esmaeil Akbari², Alireza Abadi¹, Farzaneh Ahmadi³, Zeinab Shormeij²

Abstract

Background: Not only the expand development of knowledge for reducing risk factors, but also the improvement in early diagnosis and treatment of cancer, and socioeconomic inequalities could affect cancer incidence, diagnosis stage, and mortality. The aim of this study was investigation the relationships between family levels of socioeconomic status and distribution of breast cancer risk factors.

Methods: This descriptive cross-sectional study has conducted on 526 patients who were suffering from breast cancer, and have registered in Cancer Research Center of Shahid Beheshti University of Medical Sciences from March 2008 to December 2013. A reliable and valid questionnaire about family levels of socioeconomic status has filled by interviewing the patients via phone. For analyzing the data, Multinomial logistic regression, Kendal tau-b correlation coefficient and Contingency Coefficient tests have executed by SPSS₁₉.

Results: The mean age of the patients was 48.30 (SD=11.41). According to the results of this study, there was a significant relationship between family socioeconomic status and patient's age at diagnosis of breast cancer (p value<0.001). Also, the relationships between socioeconomic status and number of pregnancies, and duration of breast feeding were significant (p value <0.001). In the multiple logistic regressions, the relationship between excellent socioeconomic status and number of abortions was significant (p value <0.007). Furthermore, the relationships between moderate and good socioeconomic statuses and smoking were significant (p value=0.05 and p value=0.02, respectively).

Conclusion: The results have indicated that among those patients having better socioeconomic status, age at cancer diagnosis, number of pregnancies and duration of breast feeding was lower, and then number of abortions was more than the others. According to the results of this study, it was really important to focus on family socioeconomic status as a critical and effective variable on breast cancer risk factors among the Iranian women.

Keywords: Socioeconomic status; Risk factors; Breast cancer

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Introduction

In the last years, studies in the field of socioeconomic status have been growing and there were increasing evidences showing that socioeconomic status was one of the strong predictors of health status [1]. Socioeconomic inequalities in the context of health have defined as differences between populations with high and low socioeconomic situations in outbreak or prevalence

of health problems [2, 3]. Indeed, socioeconomic situation was an important predictor of people's mortality and morbidity [4, 5]. Socioeconomic inequalities have affected stage of diagnosis, patient's survival and mortality of cancer in spite of increasing knowledge of reducing cancer risk factors and improvement of sooner cancer diagnosis and treatment [6]. Breast cancer was the aim of preventive medicine since many years ago [7].

1. Dept. of Health and Community Medicine, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
2. Cancer Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran
3. Dept. of Biostatistics, School of Paramedical, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Corresponding Author:

Parvin Yavari, Ph.D;
Professor of Epidemiology
Tel: (+98) 2122439936
Email: p.yavari-grc@sbmu.ac.ir
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Breast cancer would be a really important subject in women's public health whole over the world. All over the Middle East, including Iran, breast cancer would be the most common malignancy among women [8]. According to the 2009 Iranian annual cancer registration report, 7582 cases of breast cancers have been detected among Iranian women between the 50 to 55 years [9]. Various studies have shown the effect of different variables such as family history of breast cancer, age, reproductive factors, race, socioeconomic status, diet, and life style on cancer risk factors [10-15]. The aim of this study was investigation the relationships between family levels of socioeconomic status and breast cancer risk factors. Age at cancer diagnosis, marital status, family history of breast cancer, smoking, fatty diet, and reproductive risk factors (number of pregnancies, and abortions, duration of breast feeding) have studied as risk factors.

Materials and Methods

In this descriptive cross-sectional study, the relationships between family levels of socioeconomic status and breast cancer risk factors have studied. The study has conducted on 526 patients who were suffering from breast cancer and have registered in Cancer Research Center of Shahid Beheshti University of Medical Sciences from March 2008 to December 2013. The data about family socioeconomic status has gathered by interviewing the patients via phone, and then by completing a questionnaire related to socioeconomic status. The questionnaire was the result of a study named "Socio-Economic Status in Iran: A study of measurement index"[16] for measuring family socioeconomic status and its relationship with various health outcomes that its reliability and validity has measured.

The determiner variables for family socioeconomic status in this questionnaire were the head of household's education, patient's education, residential property, housing area per person, welfare convenience such as owning personal car

and computer and so on that have scored according to the people answers. The maximum score for the questionnaire was 48, considering the median, the first and, the third quartiles; family socioeconomic status has categorized into 4 levels: poor, moderate, good, and excellent. Clinical data including Number of Pregnancy, Number of Abortion, duration of Breast feeding, Fatty diet and Smoking also have extracted from patients' medical records.

Multinomial logistic regression, Kendal tau-b correlation coefficient, contingency coefficient have used for analyzing the data. Statistical analyses have performed by SPSS₁₉ software. Patients' names were secret and their satisfactions for cooperating have gathered before commencing the study.

Results

Generally, 970 patients with breast cancer have registered in Cancer Research Center of Shahid Beheshti University of Medical Sciences from March 2008 to December 2013. Of these, 14 patients who were men and 15 patients who weren't Iranian have excluded according to the inclusion criteria of the study. Among the others, 526 patients have assisted the researchers, and then have answered the questions about family levels of socioeconomic status.

The mean age of patients was 48.30 (SD=11.41). The lowest age was 21 and the highest one was 90 and the median age was 48. Of the patients, 480 (91.3%) have married, 30 (5.7%) were single and 16 (2.1%) were widow or have got divorced. 165 patients (31.7%) had breast cancer in their close relatives. The characteristics of patients have shown in Table 1. By considering the median and the first and third quartiles, family socioeconomic status has categorized into 4 categories (poor: ≤ 17 , moderate: 18 to 21, good: 22 to 27 and excellent: ≥ 28).

Univariate Analysis has shown that socioeconomic status has related to age at diagnosis, number of pregnancies and duration of breast feeding (Table 2).

Table 1. The characteristics of breast cancer patients

Variable	Classification	Frequency	Percent
Age groups (years)	< 30	20	3.8
	30–40	101	19.2
	41–50	209	39.7
	51–60	124	23.6
	> 60	72	13.7
Marital status	Single	30	5.7
	Married	480	91.3
	Widowed/divorced	16	2.1
Education levels	Illiterate/Primary	82	15.6
	secondary / High school	271	51.5
	Academic	173	32.9
Family history	yes	167	31.7
	no	359	68.3
SES	Weak	129	24.5
	Moderate	107	20.3
	Good	142	27.2
	Excellent	147	28
Number of Pregnancy	Mean (SD)	3.16	1.96
Number of Abortion	Mean (SD)	0.57	0.95
Breast feeding (duration)	Mean (SD)	36.17	33.78
Fatty diet	Yes	192	36.5
	No	334	63.5
Smoking	Yes	22	4.2
	No	504	95.8

The associations between family socioeconomic status and age at diagnosis regarding to different socioeconomic levels would be as below: The odds of good socioeconomic status in those patients below the age of 40 years was 3.82 times greater than those patients above 60 years (CI=1.58-2.25). The odds of good socioeconomic status in those patients who were in the age of 41 to 50 years were 2.93 times greater than those patients above 60 years. The odds of excellent socioeconomic status in those patients below the age of 40 were 3.50 times greater than those patients above 60 years. The odds of excellent

socioeconomic status in those patients in the age of 41 to 50 years were 2.73 times greater than those patients above 60 years.

Duration of breast feeding has associated with family socioeconomic levels, significantly. By increasing socioeconomic status, duration of breast feeding has decreased. It has meant that the odds of good socioeconomic status by increasing 1 month to the duration of breast feeding has decreased 2% in patients (CI=0.97-0.99). Also, the odds of excellent socioeconomic status has decreased 2% by increasing 1 month in the duration of breast feeding (CI=0.97-0.98). The number of pregnancies has

Table 2. Multinomial Logistic Regression test result in relationship between family levels of socioeconomic status and breast cancer risk factors; Univariate analysis

Variable	SES II vs. SES I			SES III vs. SES I			SES IV vs. SES I		
	OR	95% confidence interval	p-value	OR	95% confidence interval	p-value	OR	95% confidence interval	p-value
Age									
<40	1.09	0.48, 2.46	0.842	3.82	1.58, 9.25	0.003*	3.50	1.50, 8.17	0.004*
41-50	1.01	0.50, 2.05	0.968	2.93	1.30, 6.58	0.009*	2.73	1.26, 5.91	0.011*
51-60	0.59	0.27, 1.29	0.184	2.27	0.98, 5.28	0.056	1.56	0.68, 3.56	0.291
>60	1.00	Referent		1.00	Referent		1.00	Referent	
Marital Status									
Single	2.49	0.61, 10.22	0.204	3.50	0.95, 12.84	0.059	3.07	0.82, 11.39	0.094
Married	1.00	Referent		1.00	Referent		1.00	Referent	
Family history									
Yes	0.97	0.56, 1.68	0.919	0.70	0.41, 1.18	0.178	1.09	0.67, 1.80	0.722
No	1.00	Referent		1.00	Referent		1.00	Referent	
No. Pregnancy									
No. Abortion	1.09	0.83, 1.42	0.540	0.89	0.68, 1.18	0.433	1.07	0.83, 1.38	0.594
Breast feeding (duration)									
Yes	1.00	0.99, 1.01	0.326	0.98	0.97, 0.99	<0.001*	0.98	0.97, 0.99	<0.001*
Fatty diet									
Yes	0.78	0.46, 1.31	0.348	0.77	0.47, 1.25	0.286	0.54	0.33, 0.89	0.015
No	1.00	Referent		1.00	Referent		1.00	Referent	
Smoking									
Yes	0.25	0.05, 1.20	0.084	0.29	0.08, 1.08	0.065	0.77	0.29, 2.05	0.598
No	1.00	Referent		1.00	Referent		1.00	Referent	

Poor socioeconomic status has regarded as the base. Significant variables have indicated with *.

decreased by improving socioeconomic status. It has meant that the odds of good socioeconomic status have decreased 23% by increasing 1 number in counting the pregnancies (CI=0.67-0.87). Also, the odds of excellent socioeconomic status has decreased 28% by increasing 1 number in counting the pregnancies (0.63-0.82).

According to table 3, the associations between socioeconomic status and number of pregnancies, number of abortions and smoking were significant. To obtain this clearly, the results of Multiple Logistic Regression have stated:

- The odds of moderate socioeconomic status have decreased 22% by increasing one number in counting the pregnancies (CI=0.60- 0.99).
- The odds of good socioeconomic status have decreased 21% by increasing one number in counting the pregnancies (CI=0.63-1.00).
- The odds of excellent socioeconomic status have decreased 31% by increasing one

number in counting the pregnancies (CI=0.54-0.88).

- The odds of excellent socioeconomic status have increased 65% by increasing one number in counting the abortions (CI=1.14-2.39).
- The odds of moderate socioeconomic status in smokers have decreased 80% in comparison with nonsmoker people (CI=0.04-1.04).

The odds of good socioeconomic status in smokers have decreased 80% in comparison with nonsmoker people (CI=0.05-0.81).

Discussion

Based on the results of this study, the mean age of patients was 48.30 years (±11.41) and 3.8% of the patients were younger than 30 years. In the study of Yavari et al., the mean age of patients was 48.8 (±9.8) that would be comparable to this research [17]. The mean age of patients was 49.8 years

Table 3. Multinomial Logistic Regression test result in relationship between family levels of socioeconomic status and breast cancer risk factors; multiple analyses

Variable	SES II vs. SES I			SES III vs. SES I			SES IV vs. SES I		
	OR	95% confidence interval	p-value	OR	95% confidence interval	p-value	OR	95% confidence interval	p-value
Age									
<40	0.57	0.21, 1.55	0.273	1.53	0.55, 5.31	0.416	1.15	0.42, 3.16	0.784
41-50	0.67	0.29, 1.52	0.333	1.55	0.63, 3.83	0.344	1.28	0.53, 3.10	0.57
51-60	0.51	0.22, 1.17	0.111	1.64	0.67, 4.00	0.278	1.09	0.45, 2.67	0.844
>60	1.00	Referent		1.00	Referent		1.00	Referent	
Marital Status									
Single	1.43	0.32, 6.50	0.640	1.07	0.26, 4.34	0.924	0.86	0.21, 3.52	0.830
Married	1.00	Referent		1.00	Referent		1.00	Referent	
Family history									
Yes	1.00	0.57, 1.75	>0.999	0.70	0.40, 1.21	0.203	1.11	0.65, 1.89	0.698
No	1.00	Referent		1.00	Referent		1.00	Referent	
No. Pregnancy	0.78	0.61, 0.99	0.046	0.80	0.63, 1.01	0.057*	0.69	0.54, 0.88	0.003*
No. Abortion	1.38	0.96, 2.00	0.083	1.20	0.82, 1.76	0.335	1.66	1.15, 1.39	0.007*
Breast feeding (duration)	1.00	0.99, 1.01	0.622	0.99	0.98, 1.00	0.097	0.99	0.98, 1.00	0.107
Fatty diet									
Yes	0.91	0.53, 1.58	0.748	0.97	0.58, 1.63	0.919	0.68	0.40, 1.15	0.147
No	1.00	Referent		1.00	Referent		1.00	Referent	
Smoking									
Yes	0.21	0.04, 1.05	0.057*	0.20	0.05, 0.82	0.025*	0.54	0.18, 1.55	0.251
No	1.00	Referent		1.00	Referent		1.00	Referent	

Poor socioeconomic status has regarded as the base. Significant variables have indicated with *.

(SD=49.8) in Akbari et al. study [18] and in Ebrahimi et al. study the mean age of patients was 46.2 years and 7 percent of patients were younger than 30 years [19]. According to the results of this study in Univariate Analysis, a significant association between family socioeconomic status and age at cancer diagnosis among patients has detected (p value<0.001). It has meant that among those patients with poor socioeconomic status, age at diagnosis would be higher and those patients with good socioeconomic status had lower age at diagnosis. This association hasn't seen in Multiple Logistic Regression. Furthermore, in Univariate Multinomial Logistic Regression model the relationship between family socioeconomic status and number of pregnancies was significant (p value<0.001). This association has indicated in multiple models, too. It has meant that by improving the socioeconomic status, number of pregnancies have decreased. Based on the results of this study, in Univariate Multinomial Logistic Regression Model, there was a significant relationship between family

socioeconomic status and duration of breast feeding (p value<0.001). It has meant that by improving family socioeconomic status, the duration of breast feeding has decreased. This association wasn't significant in Multiple Logistic Regression Model. Akbari et al. has found that breast feeding was a protective factor in against of breast cancer and by breast feeding duration increasing; the chance of breast cancer would be decreased. Two years breast feeding had the most protective effect against breast cancer. Pregnancy and delivering up to three times could reduce the chance of breast cancer [20, 21]. In this study, although there wasn't any significant relationship between family socioeconomic status and number of abortions in Univariate Logistic Regression Model, Multiple Logistic Regression model has indicated that excellent socioeconomic status and number of abortions have related to each other significantly (p value=0.007). A systematic review on 6 studies between the Middle East women about the role of abortion for breast cancer incidence has stated that in 2 studies abortion was a risk factor

for breast cancer, in 3 studies it wasn't relevant and in the last study, it was a preventive element [10]. This study has indicated that there was no significant relationship between family socioeconomic status and smoking. But, the associations between moderate and good socioeconomic status and smoking were significant in Multiple Logistic Regression Model (p value=0.05 and p value=0.02, respectively). It has meant that among those patients with moderate and good socioeconomic status, the odds of being smoker were lower in comparison with those patients with poor socioeconomic status. In this study, there wasn't any significant relationship between family socioeconomic status and fatty diet. A meta-analysis by Nojumi et al. about breast cancer risk factors between the Middle East women has indicated that smoking and having BMI more than 25 would be breast cancer risk factors.

Conclusion

The results of this study have shown that among those patients with better socioeconomic status, age at diagnosis, number of pregnancies and duration of breast feeding were lower and number of abortions was more than the others. Among those patient with moderate and good socioeconomic status, the odds of being smoker were lower than the others. The results of this study has emphasized on the family levels of socioeconomic status as an effective critical risk factors on Iranian women breast cancer. There were some limitations in this study. The possibility of recall bias was an issue as some women might have wrongly estimation of socioeconomic status before diagnose of breast cancer. Additionally, this research has conducted at a university (teaching) hospital, so the results might not be expanded to all Iranian women. Further to this fact that asking the patients was our main criteria for measuring fatty diet, more accurate criterion for measuring fatty diet has been needed. It has seemed that Lack of information related to socioeconomic status, in surveillance system of cancer registry, has limited assessment of the role of this subject. Therefore, socioeconomic status should be focused to promote knowledge in relation to breast cancer stage at diagnosis in the general population.

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Conflict of Interest

The authors have no conflict of interest in this article.

Authors' Contribution

All authors participated in study design, data analysis, interpretation and manuscript writing.

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