

Breast and Cervical Cancer Screening Among Women in Jordan: Findings from the Behavioural Risk Factor Surveillance System - 2007

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Abstract: *Introduction:* Breast cancer is the most common cancer among women in Jordan. Age standardized incidence rate for cervical cancer has been estimated at 3.6 per 100,000 women. This report presents the results of breast and cervical cancer screening practices among a nationally representative sample of Jordanian women aged 35 years or above.

Method: We used data from the third Jordan Behavioural Risk Factor Surveillance System (2007) among a nationally representative sample of Jordanian women aged ≥ 35 years ($n=1,157$). Logistic regression was used to examine the associations between each of breast and cervical cancer screening practices and selected socio-demographic characteristics.

Results: Only 12.4% of women aged 35 years or older reported ever having a mammography. One fifth reported ever having a clinical breast examination at least once in their life time. Over one quarter (27.1%) of the women reported that they perform self-breast examination on monthly basis, and 41.7% reported ever having performed a self-breast examination. Among ever-married women aged 35 years or more, Pap smear test was performed by 27.8% during their life. The reported low practices have shown substantial differences across regions, age groups, level of education, family income, marital status, and source of medical services.

Conclusion: The low reported cancer screening activities among women in Jordan calls for action. Data on current screening practices is a primary step to provide health professionals, and policy-makers with the information necessary to identify priorities and to facilitate cancer control, policy development, and planning.

Keywords: Breast self-examination, clinical breast examination, Jordan, mammography, population-based study, screening cancer, women.

INTRODUCTION

Worldwide, breast cancer is a major public health problem with an estimated 1.38 million women diagnosed with breast cancer each year and more than half a million cases of deaths [1]. Breast cancer is the most common cancer among women in Jordan, accounting for more than a third of all female cancers. In 2008, the median age at diagnosis of breast cancer among women was 51 years, and the age-standardized incidence of breast cancer among women was 50.4 per 100,000. The incidence of female breast cancer is increasing; in 2008 the crude incidence rate was 30.2 per 100,000 compared to 22.9 per 100,000 in 2001 [2].

Cervical cancer is the third most common cancer in women worldwide with nearly 500,000 new cases each year and more than 250,000 deaths annually [1]. More than 80% of cervical cases occurred in developing countries [3]. Information from low and middle-income countries has shown a growing burden of the disease as an important cause of premature death among women with substantial negative

implications for quality of life [4, 5]. In Jordan, it has been estimated that each year 61 women (age standardized incidence rate 3.6 per 100,000 women) are diagnosed with cervical cancer and 35 women (age standardized death rate 1.9 per 100,000 women) die from the disease [6].

Despite their importance, breast and cervical cancer screening programmes in Jordan are not well established and do not effectively reach the majority of women throughout the country. Data collection on current screening practices is an important step to demonstrate current gaps in service utilization, and to provide health professionals, researchers and policy-makers with the information necessary to identify priorities and to facilitate cancer control, policy development, and planning in Jordan. In this study, we aim to report on the prevalence of practicing mammography, clinical breast examination, self-breast examination and Papanicolaou testing among Jordanian women aged 35 years or older. In addition, we examine associations between these cancer screening practices and selected socio-demographic characteristics.

METHODS

Since 2002, the Jordan Ministry of Health in collaboration with the World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC)

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has established a Behavioural Risk Factor Surveillance System (BRFSS) to collect data on many of the behaviours and conditions that place adults (age ≥ 18 y) at risk for non-communicable diseases. The latest (third survey) survey was conducted in 2007 among a nationally representative sample of Jordanian adults aged ≥ 18 years. The sampling frame was stratified by governorate and urbanity ending up with 30 strata that fit within three regions: North, Middle, and South. A sample of 461 blocks was selected systematically with probability proportional to size. Eight random households were selected from each block. From each sampled household, one respondent aged 18 years or older was selected randomly and interviewed face to face using a validated Arabic closed ended questionnaire, which was tested on a pilot sample. All reported estimates were weighted to account for the sample design. Of the total 3,688 sampled households that were selected, 3654 adults were successfully interviewed, resulting in a response rate of 99.1%. In this survey (2007), only women aged 35 years or above were asked about cancer screening practices. Moreover, for cultural reasons, only married women aged 35 years or above were asked how long it had been since their last Papanicolaou test. Women with a past history of hysterectomy were excluded from the analysis. As a result, 1,157 women were included in the study analysis for breast cancer screening practices, and 1,018 for Papanicolaou test.

The survey questionnaire was adapted from the WHO Stepwise Surveys and United States Behavioural Risk Factor Surveillance System (BRFSS) survey instrument. The questionnaire included questions on demographics (e.g., age, gender, and educational status), health care access, non-communicable diseases, various behavioural risk factors, and use of medical services. In addition, the 2007 survey included questions about cancer screening practices among women based on the country need. These questions were asked for women aged 35 years or above. Female respondents were asked the following questions, "How long has it been since you last had a mammogram?" with a possible response set of "Less than 6 months", "6 months to less than 12 months", "12 months to less than 2 years", "2 years to less than 3 years", "5 or more years", "Never", "Don't Know/Not sure". An indicator variable was then created for whether women had ever had a mammogram (yes/no). Similarly, questions were asked for ever having a CBE (yes/no), ever conducting a SBE (yes/no), and ever having a Pap smear (yes/no). The reliability of breast cancer screening questions and their construct validity are described elsewhere [7, 8].

Fieldwork was conducted between June 1 and August 23, 2007. All field teams included trained female interviewers and a local health official to facilitate communication. Consents were obtained either verbally or by signing a written statement.

Stata/SE version 10 was used in the analysis and accounted for the complex sampling design of the BRFSS. Logistic regression was used to examine the associations between each of these screening practices (as a result, four logistic regression models were created) and selected socio-demographic characteristics. A relative standard error of

greater than 30% was used to exclude estimates that were unstable (due to small sample size). A formal consent from the Primary Health Care Administration of the Jordanian Ministry of Health was obtained to use the data.

RESULTS

The sample characteristics of women aged 35 years or older are shown in Table 1. The mean age of participants was 50 years (SD 12.0). Overall, nearly two thirds of women (61.8%) resided in the middle region of the country, two thirds of women were aged less than 55 years, 42% had no or low levels of education, almost 60% reported middle income levels (100-299 JDs), the majority of women were unemployed (91.1%), and three quarters were currently married. Three quarters of women reported general good health status. Two thirds (67.0%) reported having health insurance, and 54% reported receiving their medical care in Ministry of Health facilities (Table 1). The lifetime prevalence of mammography among women aged 35 or older in Jordan was 12%. Women with high levels of education (23.8%), higher levels of income (19.2%) as well as those who worked (20.9%) and who received health care from teaching hospitals (41.1%) were more likely to have received a mammogram than their respective counterparts. Differences in mammography practices were observed across regions of the country being highest in the Middle (13.5%) compared to the North (11.9%) and South (7.1%).

A quarter of women reported having had clinical breast examination at least once during their lifetime. Women with levels of income greater than 300 JD per month were more likely to have clinical breast examinations (37.6%), as were women whose primary source of health care was a teaching hospitals or the private sector; (56.7%) and (36.3%) respectively. Clinical breast examination was low in the southern region (14.9%) compared to the northern region (25.1%) and middle region (26.8%).

About one quarter (27.1%) of women reported performing self-breast examination on a monthly basis, and 41.7% reported performing a self-breast exam at least once during their lifetime. Self-breast examination was less common among older women, while self-breast examinations were more common among women with higher levels of education, high income, and women who worked. A greater prevalence of self-breast examination was observed among women without health insurance (48.9%) compared to women with health insurance (38.1%). The prevalence of self breast examination was more common among women residing in the Middle (45.1%) and North (39.2%) regions than in the South (27.8%).

Among ever-married women aged 35 years or more in Jordan, the lifetime prevalence of Pap smear was 27.8%. The highest prevalence (35.8%) was reported among women aged 35-44 years old while the lowest (11.0%) was reported among women aged 65 years or older. The prevalence of at least one Pap smear (lifetime prevalence) was greater among women with high levels of education, women who worked, and women with high levels of income. The prevalence was also greater among women whose primary source of health care was the private sector compared to those receiving health care from other sources (Table 2).

Table 1. Sample Characteristics of Jordanian Women Aged 35 Years or Older (n=1,157), Behavioral Risk Factor Surveillance Survey – Jordan, 2007

Variable	Number (%)	SE*
Region		
North	319 (28.1)	1.3
Middle	672 (61.8)	1.4
South	166 (10.1)	0.8
Age (years)		
35-44	470 (40.0)	1.5
45-54	297 (25.8)	1.3
55-64	221 (19.5)	1.2
65+	169 (14.7)	1.1
Education		
Never attended school	325 (28.0)	1.3
Primary school	403 (34.8)	1.4
Secondary/tech school	374 (32.3)	1.4
Higher education	55 (4.7)	0.6
Family Income (JD)		
<100	162 (14.4)	1.1
100–299	662 (59.8)	1.5
300 and above	287 (25.8)	1.3
Working status		
Yes	95 (8.1)	0.8
No	1062 (91.9)	0.8
Marital status		
Married	873 (75.4)	1.3
Not married	284 (24.6)	1.3
General health status		
Good conditions	879 (76.1)	1.3
Fair or poor	277 (23.9)	1.3
Health insurance		
Yes	793 (67.0)	1.4
No	364 (33.0)	1.4
Source of medical service		
Ministry of Health	628 (54.3)	1.5
Royal Medical Services	213 (17.6)	1.1
UNRWA**	81 (7.5)	0.8
Private Sector	230 (20.4)	1.2

Some categories do not total 100% because of rounding.

*SE, standard error.

** UNRWA: The United nations Relief Works Agency.

Table 3 displays associations between cancer screening practices among women in Jordan and selected socio-demographic variables. Women living in the south were less

likely (ranging from 44%-53%) to undergo any breast screening practices compared to women living in the other regions. Women aged 55 or older were about 50% less likely to perform self-breast examination (SBE) and have a Pap smear than women aged 35-44 years (P-value 0.001, and P-value=0.000, respectively). Women with secondary or higher level of education were twice as likely to receive a clinical breast examination (P-value= 0.001), and to perform self-breast examination compared to women with a primary level of education or less (P-value= 0.000). Women reporting an income of 100-299 JDs were 1.6 times more likely to undergo a mammogram than women having an income of less than 100 JDs (P-value= 0.017). Similar results were observed for women undergoing a Pap smear (OR=2; P-value 0.017). Women with an income of 300 JDs or more were 2 times more likely to perform self-breast examination (P-value= 0.043) and were 4 times more likely to undergo a Pap smear than women reporting less than 100 JDs (p-value 0.000). Unmarried women were less likely to perform self-breast examination than married women (P-value 0.04). Women utilizing private medical services were 1.6 time more likely to undergo a clinical breast examination (p-value 0.015) and were 1.5 times more likely to undergo Pap smear than women receiving their medical care from the Ministry of Health. Working status, general health status, and health insurance were not found to be related to undergoing any of the screening practices.

DISCUSSION

This report presents the results of the third Behavioural Risk Factor Surveillance System (BRFSS) (2007) among a nationally representative sample of Jordanian women aged ≥35 years and their breast and cervical cancer screening practices. In this population-based study, which allowed examination across regions and population subgroups of the Jordanian population, the prevalence of breast and cervical cancer screening practices among Jordanian women were low with substantial differences across geographic regions and selected socio-demographic characteristics. The population and behavioural characteristics of the sample were similar to those of other national surveys in Jordan [9, 10].

The low prevalence of using mammography could be partially attributed to a low knowledge or low level of awareness about the importance of mammography among Jordanian women (35%) [11]. According to Petro-Nustas, about one fourth of women do not believe in mammogram benefits [12]. Disparities in the use of mammography across regions in Jordan were observed and could be partly explained by differences in factors associated with utilization of screening services (e.g., education, income) [13-17] and inequalities in availability and affordability [18] as women with poor access to health facilities are much less likely to undergo mammography [16, 17].

A mammogram in Jordan is still an opportunistic healthcare service. Since 2008, the Ministry of Health started a program for providing the mammogram services for different regions in the country; nowadays, the mammogram services are available in fourteen health facilities in the middle, seven in the northern, and six in the southern parts of

Table 2. Mammography, CBE, SBE, Pap Smear Among Women Aged 35 Years or Older, Behavioral Risk Factor Surveillance Survey – Jordan, 2007

Variable	Mammogram Ever (n=1,157)		CBE Ever (n=1,157)		SBE Ever (n=1,157)		Pap Smear Ever (n=1,018)	
	Number (%)	SE	Number (%)	SE	Number (%)	SE	Number (%)	SE
Total	137 (12.4)	1.0	277 (25.1)	1.3	461 (41.7)	1.5	280 (27.8)	1.4
Region								
North	37 (11.9)	1.8	78 (25.1)	2.5	121 (39.2)	2.8	82 (28.6)	2.7
Middle	89 (13.5)	1.3	176 (26.8)	1.7	295 (45.1)	1.9	170 (28.0)	1.9
South	11 (7.1)	2.1	23 (14.9)	2.9	45 (27.8)	3.6	28 (18.6)	3.2
Age (years)								
35-44	50 (11.3)	1.5	138 (30.7)	2.2	235 (51.2)	2.3	149 (35.8)	2.4
45-54	40 (14.1)	2.1	72 (25.4)	2.6	138 (49.3)	3.0	76 (29.8)	2.9
55-64	35 (15.9)	2.5	44 (20.4)	2.8	63 (29.7)	3.2	40 (20.7)	2.9
65+	12 (7.6)	2.1	23 (15.0)	2.9	25 (16.5)	3.0	15 (11.0)	2.7
Education								
Never attended school	19 (6.0)	1.4	39 (12.8)	1.9	35 (11.9)	1.9	33 (11.8)	2.0
Primary school	51 (13.4)	1.7	84 (21.8)	2.1	170 (43.7)	2.5	111 (31.6)	2.5
Secondary/tech school	54 (14.8)	1.9	131 (36.0)	2.5	220 (59.3)	2.6	117 (34.6)	2.6
Higher education	13 (23.8)	5.9	23 (43.4)	6.9	36 (67.4)	6.6	19 (46.1)	7.8
Family Income (JD)								
<100	10 (6.5)	2.0	23 (15.3)	3.0	31 (20.6)	3.3	12 (9.6)	2.7
100–299	67 (10.6)	1.2	142 (22.4)	1.7	247 (39.2)	1.9	153 (25.9)	1.8
300 and above	53 (19.2)	2.4	104 (37.6)	2.9	162 (57.7)	2.9	103 (41.4)	3.2
Working status								
Yes	20 (20.9)	4.2	36 (37.7)	5.1	58 (59.9)	5.1	29 (37.7)	5.7
No	117 (11.6)	1.0	241 (23.9)	1.3	403 (40.1)	1.5	251 (27.0)	1.5
Marital status								
Married	108 (12.9)	1.2	229 (27.4)	1.5	391 (46.5)	1.7	-----	-----
Not married	29 (10.9)	1.9	48 (17.9)	2.4	70 (26.7)	2.7	-----	-----
General health status								
Good conditions	107 (12.7)	1.1	231 (27.3)	1.5	390 (46.0)	1.7	239 (30.9)	1.7
Fair or poor	30 (11.5)	2.0	46 (17.9)	2.4	71 (28.2)	2.8	41 (17.8)	2.5
Health insurance								
Yes	83 (10.9)	1.1	179 (23.9)	1.6	288 (38.1)	1.8	181 (26.0)	1.7
No	54 (15.2)	1.9	98 (27.6)	2.4	173 (48.9)	2.7	99 (31.4)	2.6
Source of medical service								
Ministry of Health	66 (10.9)	1.3	133 (22.2)	1.7	233 (39.4)	2.0	148 (27.0)	1.9
Royal Medical Services	20 (10.3)	2.2	42 (21.1)	2.9	69 (33.7)	3.3	45 (23.6)	3.1
UNRWA*	9 (11.4)	3.6	18 (22.5)	4.7	34 (43.7)	5.6	11 (14.8)	4.1
Teaching Hospitals	5 (41.1)	14.2	79 (56.7)	14.4	8 (65.3)	13.9	3 (27.3)	13.8
Private Sector	37 (17.8)	2.6	77 (36.3)	3.3	117 (53.7)	3.4	72 (39.6)	3.6

SE, standard error.

Breast screening practices were performed among women aged 35 years or older (n=1,157).

Pap smear was performed among ever-married women only aged 35 years or older, women with previous history of having hysterectomy were excluded from the analysis of Pap smear (n=1,018).

* UNRWA: The United Nations Relief Works Agency.

Table 3. Determinants of Undergoing Cancer Screening Practices Among Women Aged 35 Years or Older, Behavioral Risk Factor Surveillance Survey – Jordan, 2007

Determinants	Mammogram Ever		CBE Ever		SBE Ever		Pap smear Ever	
	OR	P-Value	OR	P-Value	OR	P-Value	OR	P-Value
Region								
North	1		1		1		1	
Middle	0.90	0.653	0.99	0.986	1.1	0.508	0.78	0.168
South	0.45	0.042*	0.44	0.003*	0.53	0.005*	0.43	0.002*
Age (years)								
35-44	1		1		1		1	
45-54	1.35	0.222	0.88	0.508	1.2	0.474	0.76	0.159
55 or above	1.40	0.242	0.78	0.239	0.51	0.001*	0.45	0.000*
Education								
Primary school or less	1		1		1		1	
Secondary or higher	1.2	0.198	1.8	0.001*	2.3	0.000*	0.97	0.866
Family Income (JD)								
<100	1		1		1		1	
100–299	1.6	0.017*	1.02	0.927	1.2	0.501	2.2	0.017*
300 and above	2.8	0.487	1.6	0.153	1.8	0.043*	4.1	0.000*
Marital status							-----	-----
Married	1		1		1		-----	-----
Not married	0.95	0.850	0.78	0.228	0.68	0.040*	-----	-----
Working status								
Yes	1		1		1		1	
No	0.55	0.061	0.82	0.438	0.87	0.570	0.88	0.672
General health status								
Good conditions	1		1		1		1	
Fair or poor	1.2	0.850	0.92	0.704	0.85	0.570	0.80	
Health insurance								
Yes	1		1		1		1	0.619
No	1.5	0.107	0.95	0.664	1.3	0.110	1.1	
Source of medical service								
Ministry of Health	1		1		1		1	
Royal Medical Services	0.97	0.962	1.0	0.985	1.1	0.865	1.1	0.779
Private Sector	1.1	0.752	1.6	0.015*	1.2	0.357	1.5	0.042*

*Significant difference; P-value <0.05.

- SE, standard error.

- Breast screening practices were performed among women aged 35 years or older (n=1,157).

- Pap smear was performed among ever-married women only aged 35 years or older, women with previous history of having hysterectomy were excluded from the analysis of Pap smear (n=1,018).

the country. Unpublished data from the Ministry of Health shows that the percentage of received mammogram services was reported to be the lowest in the southern region. In four out of six mammogram units in this region, the number of received cases was zero mainly due to shortage of qualified trained staff. In Jordan, the majority of mammogram services

are provided by the private sector and are centralized in the capital city (Amman).

Although 44.8% of Jordanian women are aware of clinical breast examination [11], we observed that only 25.1% of women reported having ever had a CBE. In Jordan, CBE was integrated into primary health care services during

the last decade; becoming an important component of maternal and child health services that are provided free of charge regardless of one's health insurance. Nonetheless, women receiving care through the private sector reported the highest prevalence of CBE. The low prevalence of CBE among women in Jordan might signal the need for raising awareness among health care professionals about the importance of performing clinical breast examinations with special attention paid to those who work in the southern region. Health care professionals should be encouraged to focus on older women and women with no formal education.

Despite several controversial studies on the benefits of self-breast examination as a screening tool, women are still encouraged to use it [19]. While the benefits of SBE remain unclear, women who practice SBE are more likely to go to for screening mammogram [20]. Prior reports suggest that approximately 70% of Jordanian women know about SBE [11]. The low prevalence of performing SBE on monthly basis observed in our data was consistent with studies from Jordan and elsewhere [11, 20, 21]. Similar to other studies, education and age were important factors associated with performing SBE [20, 22, 23]. In 2008, the National Jordan Breast Cancer programme launched the National Breast Cancer Screening and Diagnosis Guideline [24]. According to the guideline instructions, women should perform self-breast examinations (SBE) starting in their adolescent years.

Little was known about utilization of Pap smear services in Jordan. In the present study, only 27.8% of married women reported having ever had a Papanicolaou test. Lack of awareness and understanding is perhaps one of the most important determinants of Pap smear screening. In fact, reports suggest that 67% to 75% of Jordanian women had never had heard of a Pap smear [25, 26]. Jordanian women who have had a Pap smear (most often on opportunistic basis [25]) have a clear preference for a female doctor or a female nurse [26]. The low uptake of Pap smear could be due to the low incidence of cervix cervical cancer in Jordan and the fact that this disease is primarily caused by HPV infection which is a sexually transmitted disease and believed to be uncommon in a conservative Muslim country. Nonetheless, special attention should be given to the low Pap smear screening prevalence among women in Jordan and the establishment of a comprehensive program for the early detection and prevention of cervical cancer may be warranted. Such a program could be integrated into the National Jordan Breast Cancer Program; established in 2006 for breast cancer screening and early detection.

Our results should be interpreted in light of the following limitations. These data are self-reported. Conceivably, some respondents may have misreported their cancer screening practices either out of embarrassment or to provide a socially desirable response. Women were not asked to answer more detailed questions about screening practices.

Many researchers investigated the knowledge and estimated the prevalence of breast and cervical cancer screening among different communities. The knowledge about the screening methods of breast cancer was estimated in southeast Iran for married women aged 15-60 years with a mean age of 28.8 years. The women had relatively sufficient knowledge about breast self-examination and mammogram corresponding to 55.7% and 72.7% respectively [27]. Other

researchers reported poor understanding and lack of awareness about risk factors and screening of breast cancer among samples of Asian women [20], and Pakistani women [21]. In Saudi Arabia, low knowledge of breast cancer risk factors among female secondary schools was demonstrated with 39.6% of female students stated ever hearing about breast self-examination [28].

With respect to performing the screening methods, generally, the use of the screening methods is low especially in low and middle income countries [29]. In southeast Iran only 4.1% had ever performed clinical breast examination, and 1.3% had ever had the mammogram. Furthermore, it was reported that 76.8% have never performed a breast self examination [26]. In a study from Pakistan, only 4.9% had performed a mammogram at some point in their life [20]. Studies from Qatar [30], and Kuwait [31] showed that 39.4%, 35.2%, and 14.3% respectively had ever performed a Pap smear.

Advanced age, lower education level, insufficient health insurance, and lower income are all factors that may contribute to the poorer knowledge and prevalence of performing breast cancer and cervical screening tests. This finding was in parallel to other researches on Jordanian women [11, 23], Iranian women [26], Asian women [20], Qatari women [30], and Kuwaiti women [31].

In summary, these are among the most up-to-date estimates of breast cancer and cervical cancer screening practices in Jordan. The low prevalence of reported cancer screening activities among women in Jordan should serve as a call for action to policy makers and health care professionals working in the country. Finally, our data provide a foundation for evidence and result-based breast cancer screening programmes in Jordan and are an essential element for raising public awareness, advocacy, and improving service delivery. Continued monitoring and evaluation of breast and cervical cancer screening practices are essential to developing future targeted and effective programmes and policies in Jordan.

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CONFLICT OF INTEREST

None of the authors have any conflicts of interest to report.

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