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PREVALENCE OF RISK FACTORS OF DIFFERENT TYPES OF BREAST LUMPS AMONG WOMEN IN KSA: A CROSS-SECTIONAL STUDY

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ABSTRACT

Objective: This research aims to determine the Prevalence of Risk Factors for Different Types of Breast Lumps among Women in KSA.

Methods: This study will utilize a cross-sectional design to examine the prevalence of risk factors associated with different types of breast lumps among women in Saudi Arabia. The cross-sectional design is appropriate for capturing a snapshot of the population at a single point in time, allowing for the analysis of the relationships between various risk factors and the occurrence of breast lumps.

Results: The study included 350 participants. The most frequent body mass index value BMI among study participants was 30-34.9 kg/m^2 (n=128, 36.6%), followed by 35 kg/m^2 and more (n=105, 30%), then 25-29.9 (n=57, 16.3%), 18.5-24.9kg/m^2 (n=45, 12.9%) and 18.5 kg/m^2 or less (n=15, 4.3%). The most frequent age among study participants was 40 years and more (n= 119, 34%) followed by 36-40 year (n= 94, 26.9%), then 31-35 year (n=57, 16.3%), 25-30 years (42, 12%) and less than 25 years (n=38, 10.9%). The most frequent marital status among study participants was married (n= 195, 55.7%) followed by single (n= 87, 24.9%), then divorce (n=68,

19.4%). Monthly income among study participants with most of them had good (n= 196, 56%) followed by weak (n= 83, 23.7%) and the least monthly income is high (n= 71, 20.3%). Figure 4 shows the distribution of monthly income status among study participants. Nationality among study participants with most of them was Saudi (n= 303, 56%) and non-Saudi (n= 47, 13.4%) and the least monthly income is high (n= 71, 20.3%). Participants were asked Age at menarche (years). There most frequent answer 12-13 years (n= 158, 45.1%), followed by 7-11 years (n=29, 36.9%), then 14 years and more (n=47, 13.4%) and unknown (n= 16, 4.6%).

Conclusion: The study revealed that the most common risk factors associated with breast lumps among women in Saudi Arabia included obesity, with the highest BMI range being 30-34.9 kg/m². The most prevalent age group was 40 years and older. Married women formed the majority of participants, with a high level of awareness regarding the importance of early detection and the influence of obesity and physical inactivity on breast cancer risk. The study recommends continued awareness campaigns on risk factors and the importance of early screening.

INTRODUCTION

Worldwide, breast cancer (BC) accounts for more cancer cases than any other kind of cancer, and it is the second most prevalent cancer killer of women. It is projected to account for 30% of female malignancies, with 276,480 new cases and over 42,000 deaths by 2020 [1]. Worldwide 684, 996 people have died as a result of BC [2]. As the most frequent cancer worldwide, BC is also rather common in Saudi Arabia [3]. Among all cancers diagnosed in Saudi Arabia, 19.8% were BC cases, according to epidemiological research [4]. Sex, age, estrogen exposure over an extended period of time, genetic predisposition, and family history are among the many variables that might raise the likelihood of developing BC [5]. Preventable risk factors, including obesity, lack of physical exercise, and alcohol use, account for about 30% of BC cases [6]. Recognizing BC at an early stage is crucial as it increases the likelihood of remission [6].

When it comes to early detection in women at average risk, mammography is still the way to go. The effectiveness of therapy is enhanced when tumors and lesions are diagnosed at an early stage when they are smaller, have fewer lymph node metastases, and have less histologic grade advancement [7]. Histologic examinations using established pathological criteria are the mainstay of BC diagnosis. Physical examination, tumor pathology, and disease extent assessment make up the clinical evaluation of a BC patient at first presentation. The stages, grades, and molecular subtypes of BC are the primary determinants of the therapeutic strategy. By identifying these factors, a more effective, individualized, and risk-free treatment may be provided. Both preoperative (neoadjuvant) and postoperative (adjuvant) radiation and systemic treatment are alternatives for patients with non-metastatic breast cancer who want to undergo breast-conserving surgery. The objective in the case of metastatic BC, which is currently incurable, is to halt the spread of the tumor. Regardless of the subtype or stage of cancer, the 5-year relative non-metastatic survival rate is 90.3%, which is very promising. Metastatic breast cancer has a poor 5-year relative cancer-specific survival rate of 29% overall and 12% in metastatic triple-negative breast cancer (TNBC) [8]. This is true irrespective of subtype.

Various communities' levels of BC awareness have been evaluated in several epidemiological investigations. Several Western and Asian nations have a low degree of knowledge, according to most prior research [9–11]. Women with lesser levels of education are more likely to have this lack of knowledge for BC [12]. Another factor that contributes to the lack of knowledge is the restricted availability of health education programs, which disproportionately affect women in

rural, remote, and underserved areas [13]. Local studies have also shown that persons with a bachelor's degree or above have more knowledge about BC than those with a high school diploma, an intermediate diploma, or no education at all [14–15]. This holds true even when looking at a sample size of 500 Saudi women. While a number of studies have looked at women's knowledge of BC in various parts of Saudi Arabia, none have taken a nationwide look.

METHODS

Study design

This study will utilize a cross-sectional design to examine the prevalence of risk factors associated with different types of breast lumps among women in Saudi Arabia. The cross-sectional design is appropriate for capturing a snapshot of the population at a single time, allowing for the analysis of the relationships between various risk factors and breast lumps.

Study approach

The study will be conducted in various healthcare facilities across Saudi Arabia, including public hospitals, private clinics, and specialized breast health centers. This broad range of settings will ensure the inclusion of a diverse population of women from different regions and socio-economic backgrounds within the Kingdom.

Study population

The study population will consist of women aged 18 years and older who present with breast lumps or who are undergoing routine breast examinations in Saudi Arabia. Women with a previous history of breast cancer or those who have undergone breast surgery will be excluded from the study to focus on the identification of risk factors in the general population.

Study sample

A stratified random sampling method will ensure representation across different age groups, geographical locations, and healthcare settings. The sample size will be calculated based on the prevalence of breast lumps and expected effect sizes, with adjustments for anticipated response rates. Stratification will ensure that subgroups, such as women of different age ranges and those from urban and rural areas, are adequately represented.

Study tool

The questionnaire was adopted for data collection for the current study and was also categorized as a study tool.

Data collection

Data will be collected through structured interviews and medical record reviews. Participants will be interviewed using a standardized questionnaire designed to capture information on demographic characteristics, lifestyle factors, reproductive history, and family history of breast cancer. Medical records will be reviewed to confirm the type of breast lump and any relevant clinical findings.

Data analysis

Descriptive statistics will summarize the sample's demographic characteristics and the prevalence of different breast lumps. Inferential statistics, including chi-square tests and logistic regression, will be conducted to identify associations between risk factors and the presence of breast lumps. Multivariate analysis will control for potential confounding variables and identify independent predictors of breast lump types.

Ethical considerations

The study will follow the participating institutions' Institutional Review Board (IRB) ethical guidelines. Informed consent will be obtained from all participants before their inclusion in the

study, ensuring they are fully aware of the study's purpose, procedures, and their right to withdraw at any time. The confidentiality and anonymity of participants will be strictly maintained, with data being securely stored and only accessible to the research team. Ethical approval will be sought from relevant authorities before the commencement of the study.

RESULTS

The study included 350 participants. The most frequent body mass index value BMI among study participants was 30-34.9 kg/m^2 (n=128, 36.6%), followed by 35 kg/m^2 and more (n=105, 30%), then 25-29.9 (n=57, 16.3%), 18.5-24.9kg/m^2 (n=45, 12.9%) and 18.5 kg/m^2 or less (n=15, 4.3%) Figure 1 shows the distribution of BMI among study participants. The most frequent age among study participants was 40 years and more (n= 119, 34%) followed by 36-40 year (n= 94, 26.9%), then 31-35 year (n=57, 16.3%), 25-30 years (42, 12%) and less than 25 years (n=38, 10.9%). Figure 2 shows the age distribution among study participants. The most frequent marital status among study participants was married (n= 195, 55.7%) followed by single (n= 87, 24.9%), then divorce (n=68, 19.4%). Figure 3 shows the distribution of marital status among study participants.

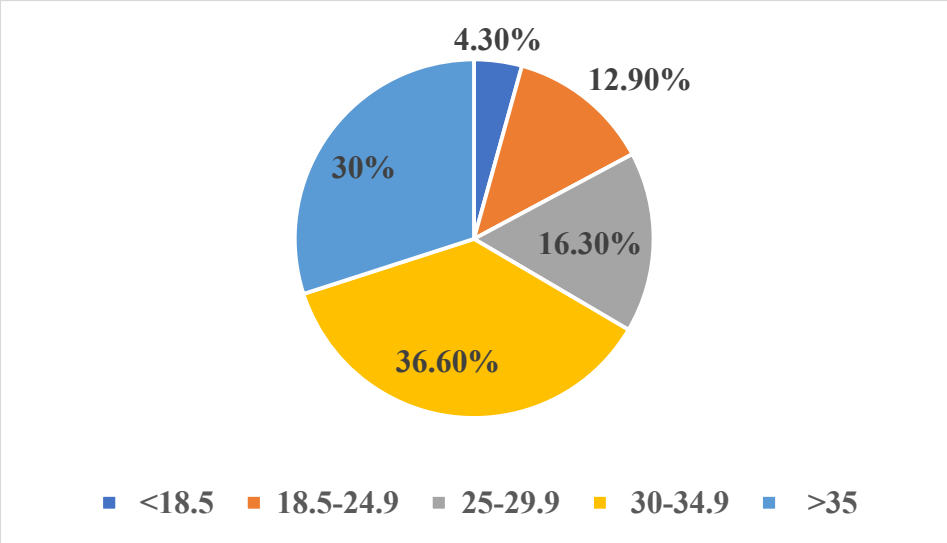

Figure 1: BMI distribution among study participants

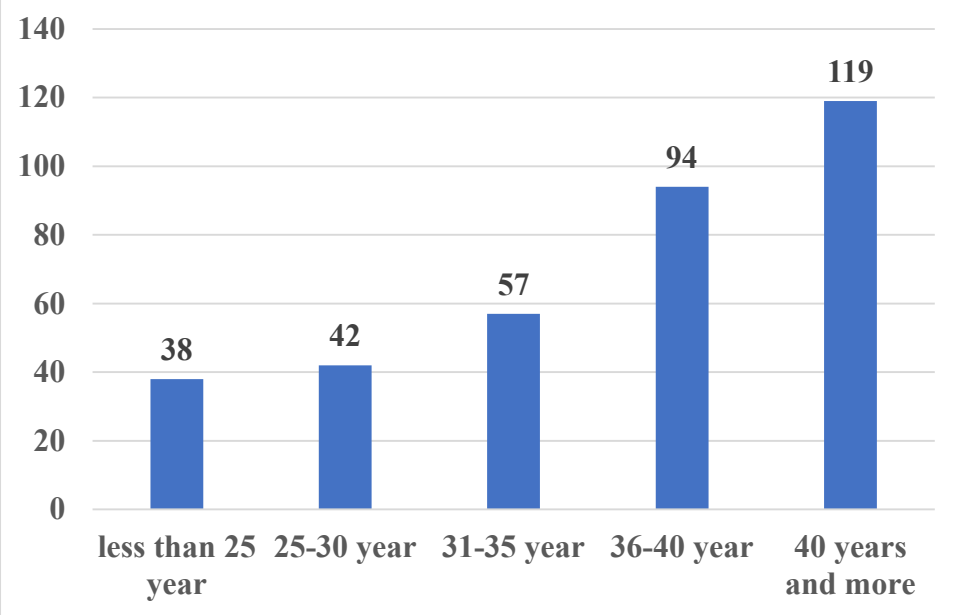

Figure 2: Age distribution among study participants

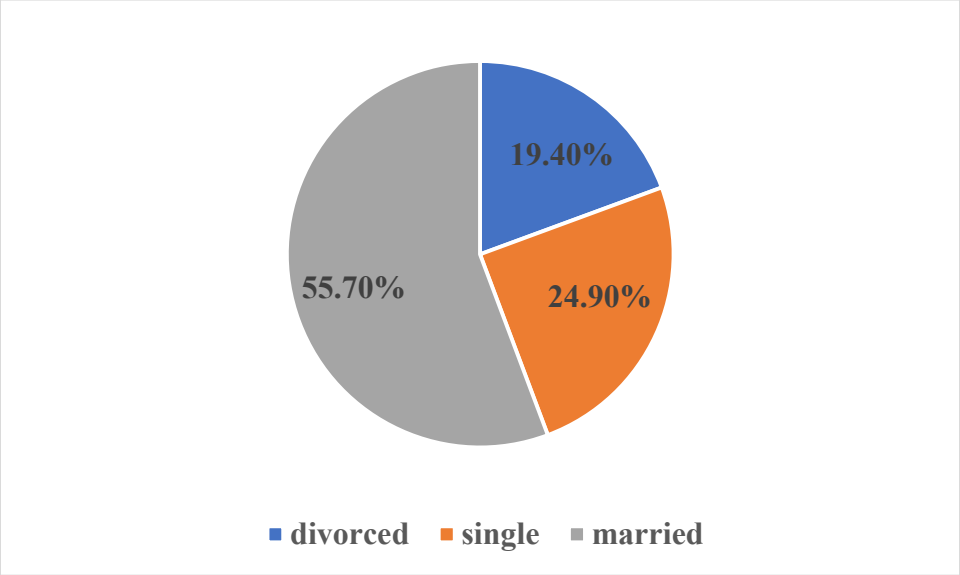

Figure 3: Marital status distribution among study participants

Monthly income among study participants with most of them had good (n= 196, 56%) followed by weak (n= 83, 23.7%) and the least monthly income is high (n= 71, 20.3%). Figure 4 shows the distribution of monthly income status among study participants.

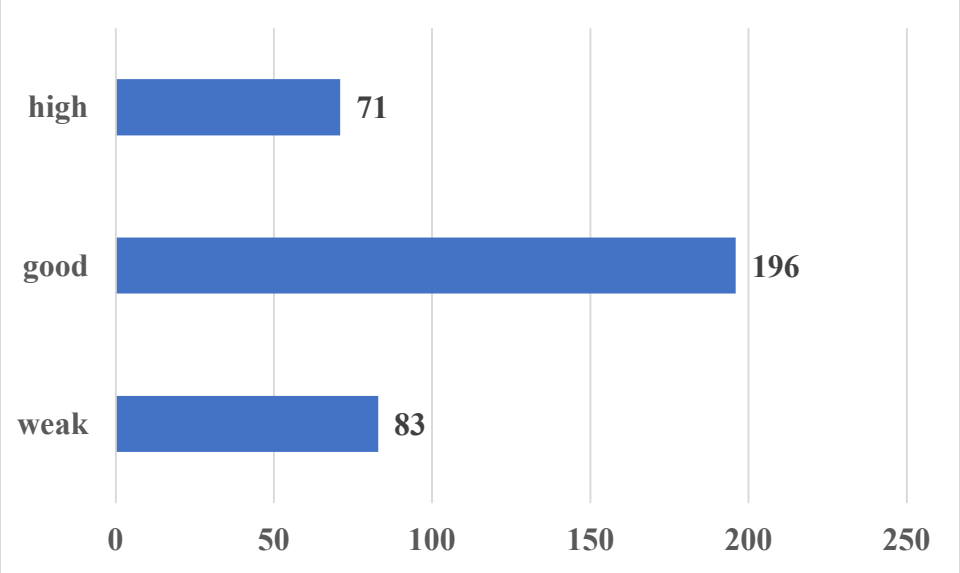

Figure 4: Monthly income distribution among study participants

Nationality among study participants with most of them was Saudi (n= 303, 56%) and non-Saudi (n= 47, 13.4%) and the least monthly income is high (n= 71, 20.3%). Figure 5 shows the distribution of nationality among study participants.

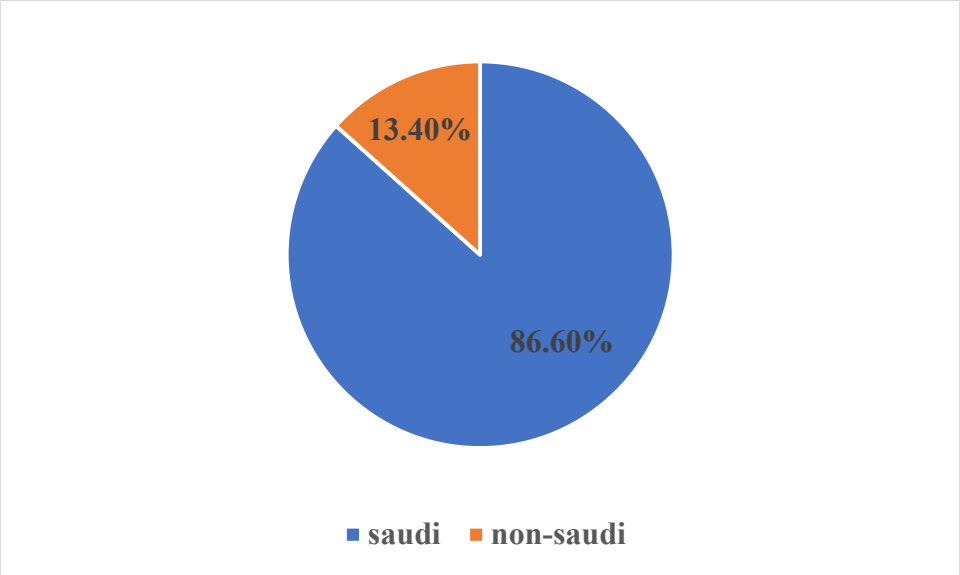

Figure 4: Nationality income distribution among study participants

Participants were asked Age at menarche (years). There most frequent answer 12-13 years (n= 158, 45.1%), followed by 7-11 years (n=29, 36.9%), then 14 years and more (n=47, 13.4%) and unknown (n= 16, 4.6%).

Participants were asked about knowledge. Their responses and results are presented in Table 1.

Item	Yes	No	Don't Know
Do you think that being older can increase the chance of developing breast cancer?	235 (67.1%)	67 (19.1%)	48 (13.7%)
Do you think that not breastfeeding can increase the chance of developing breast cancer?	295 (84.3%)	36 (10.3%)	19 (5.4%)
Do you think that having a close relative with breast cancer can increase the chance of developing breast cancer?	316 (90.3%)	22 (12%)	12 (3.4%)
Do you think that long-term hormone contraceptive use can increase the chance of developing breast cancer?	322 (92%)	20 (5.7%)	8 (2.3%)
Do you think that early detection is important to surviving breast cancer?	328 (93.7%)	14 (4%)	8 (2.3%)
Do you think that obesity and lack of exercise are considered a risk for breast cancer?	325 (92.9%)	13 (3.7%)	12 (3.4%)
Do you think that it is possible to treat breast cancer?	313 (89.4%)	15 (4.3%)	22 (6.3%)

Participants were asked about What do you think is the suitable age for starting mammography. The most frequent was above 50 (n= 144, 41.1%) followed by above 40 (n= 133, 38%) then don't know (n=32, 9.10%) and above 30 (n=25, 7.1%), above 20 (n=16, 4.6%).

DISCUSSION

Women of childbearing age are at increased risk for developing breast lumps or tumors. More than a quarter of women will experience breast cancer at some point in their lives, and most of those instances will first manifest as a new lump at a routine care appointment. Physiological adenosis and aggressive cancer are two of the many possible origins of breast tumors. The vast majority of breast masses occur in adult females, although they may also develop in males and children. A well-considered index of suspicion is necessary for the prompt detection and treatment of male breast cancer, which is a well-documented disease [16–17].

With an incidence of over 12%, breast cancer is by far the most frequent cancer among women globally. Having said that, most bumps in the breast are harmless. In every instance, a methodical and comprehensive strategy is necessary. The technique should typically adhere to the three-pronged evaluation process that includes a clinical examination, imaging with radiology, and analysis by pathologists. The article explains this method and uses examples of common breast diseases [18–19] to illustrate its use.

Etiology

Anatomy

A modified sweat gland, the mammary gland (also known as the breast) contains adipose, fibrous, and glandular tissue. In the subareolar area, under the nipple, lactiferous ducts converge to drain 15–20 lobes of each breast. Foamy stroma and fibrous stroma hold the lobes in place. Axillary lymph nodes, in conjunction with subscapular, internal mammary, and pectoral nodes, are the main conduits for lymphatic drainage [20]. Panorama of the Breast from the Side View. Both sexes have breast tissue, although puberty brings to a greater development of it in reproductive-age females. After menopause, the glandular tissue in the breasts atrophy's from decreased estrogen levels in the blood and is mostly replaced by adipose tissue, causing the breast tissues to involute. Alterations to hormone levels have an effect on breast tissues and the majority of breast diseases [20].

CONCLUSION

The study revealed that the most common risk factors associated with breast lumps among women in Saudi Arabia included obesity, with the highest BMI range being 30-34.9 kg/m². The most prevalent age group was 40 years and older. Married women formed the majority of participants, with a high level of awareness regarding the importance of early detection and the influence of obesity and physical inactivity on breast cancer risk. The study recommends continued awareness campaigns on risk factors and the importance of early screening.

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ANNEX 1: DATA COLLECTION TOOL

Age (years)						
Educational Level	Illiterate		School		University	
Marital Status	Single		Married	Divorced		Widow
Husband education	Illiterate		School	University		Unmarried
Monthly income	Weak		Good		High	
Nationality	Saudi	Non-Saudi	**Smoking status**		Yes	No
Weight (Kg)			**Height (meter)**			

Item	**Categories**
Age at menarche (years)	Unknown
	7-11
	12-13
	≥ 14
Age at first live birth (years)	No children
	≤ 20
	20-24

	≥ 30
Number of first-degree relatives with breast cancer?	Unknown
	Zero relatives
	One relative
	More than one
Did you do a breast biopsy?	Yes
	No
	Do not know

Item	**Yes**	**No**	**Don't Know**
Do you think that being older can increase the chance of developing breast cancer?			
Do you think that not breastfeeding can increase the chance of developing breast cancer?			
Do you think that having a close relative with breast cancer can increase the chance of developing breast cancer?			
Do you think that long-term hormone contraceptive use can increase the chance of developing breast cancer?			
Do you think that early detection is important to surviving breast cancer?			
Do you think that obesity and lack of exercise are considered a risk for breast cancer?			
Do you think that it is possible to treat breast cancer?			

What do you think is the suitable age for starting mammography?				
Above 20	Above 30	Above 40	Above 50	Don't know

Item	**Yes**	**No**	**Don't know**
Do you believe that all breast lumps require surgical removal?			
Is it true that breast-conserving surgery (lumpectomy) can be an alternative to a mastectomy in some cases?			
Can surgical removal of a breast lump prevent the spread of breast cancer?			
Is surgery the only treatment option for malignant breast lumps?			
Do you think that early detection of a breast lump improves the success rate of surgical management?			

APPENDIX 2: Participants responses to scale items

BMI level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<18.5	15	4.3	4.3	4.3
	18.5-24.9	45	12.9	12.9	17.1
	25-29.9	57	16.3	16.3	33.4
	30-34.9	128	36.6	36.6	70.0
	>35	105	30.0	30.0	100.0
	Total	350	100.0	100.0	

age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	less than 25 year	38	10.9	10.9	10.9
	25-30 year	42	12.0	12.0	22.9
	31-35 year	57	16.3	16.3	39.1
	36-40 year	94	26.9	26.9	66.0
	40 years and more	119	34.0	34.0	100.0
	Total	350	100.0	100.0	

Educational level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Illiterate	50	14.3	14.3	14.3
	School	84	24.0	24.0	38.3
	University	216	61.7	61.7	100.0
	Total	350	100.0	100.0	

Marital status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	single	68	19.4	19.4	19.4
	married	87	24.9	24.9	44.3
	divorced	195	55.7	55.7	100.0
	Total	350	100.0	100.0	

Husband educational

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Illiterate	55	15.7	15.7	15.7
	school	77	22.0	22.0	37.7
	univsersity	137	39.1	39.1	76.9
	unmarried	81	23.1	23.1	100.0
	Total	350	100.0	100.0	

Monthly income

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	weak	83	23.7	23.7	23.7
	good	196	56.0	56.0	79.7
	high	71	20.3	20.3	100.0
	Total	350	100.0	100.0	

natinality

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	saudi	303	86.6	86.6	86.6
	non-saudi	47	13.4	13.4	100.0
	Total	350	100.0	100.0	

moking

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	137	39.1	39.1	39.1
	no	213	60.9	60.9	100.0
	Total	350	100.0	100.0	

A1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	unknown	16	4.6	4.6	4.6
	7-11	129	36.9	36.9	41.4
	12-13	158	45.1	45.1	86.6
	14 and more	47	13.4	13.4	100.0
	Total	350	100.0	100.0	

A2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no children	62	17.7	17.7	17.7
	20 and less	40	11.4	11.4	29.1
	20-40	158	45.1	45.1	74.3
	30 and more	90	25.7	25.7	100.0
	Total	350	100.0	100.0	

A3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	unknown	28	8.0	8.0	8.0
	zero relative	44	12.6	12.6	20.6
	one relative	114	32.6	32.6	53.1
	more than one	164	46.9	46.9	100.0
	Total	350	100.0	100.0	

A4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	116	33.1	33.1	33.1
	no	234	66.9	66.9	100.0
	Total	350	100.0	100.0	

Suitable age for starting mammography

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Above 20	16	4.6	4.6	4.6
	Above 30	25	7.1	7.1	11.7
	Above 40	133	38.0	38.0	49.7
	Above 50	144	41.1	41.1	90.9
	Don't know	32	9.1	9.1	100.0
	Total	350	100.0	100.0	

Item	**Yes**	**No**	**Don't Know**
Do you think that being older can increase the chance of developing breast cancer?	235 (67.1%)	67 (19.1%)	48 (13.7%)
Do you think that not breastfeeding can increase the chance of developing breast cancer?	295 (84.3%)	36 (10.3%)	19 (5.4%)
Do you think that having a close relative with breast cancer can increase the chance of developing breast cancer?	316 (90.3%)	22 (12%)	12 (3.4%)

Do you think that long-term hormone contraceptive use can increase the chance of developing breast cancer?	322 (92%)	20 (5.7%)	8 (2.3%)
Do you think that early detection is important to surviving breast cancer?	328 (93.7%)	14 (4%)	8 (2.3%)
Do you think that obesity and lack of exercise are considered a risk for breast cancer?	325 (92.9%)	13 (3.7%)	12 (3.4%)
Do you think that it is possible to treat breast cancer?	313 (89.4%)	15 (4.3%)	22 (6.3%)

Item	**Yes**	**No**	**Don't know**
Do you believe that all breast lumps require surgical removal?	319 (91%)	16 (4.6%)	15 (4.3%)
Is it true that breast-conserving surgery (lumpectomy) can be an alternative to a mastectomy in some cases?	299 (85.4%)	29 (8.3%)	22 (6.3%)
Can surgical removal of a breast lump prevent the spread of breast cancer?	295 (84.3%)	27 (7.7%)	28 (8%)
Is surgery the only treatment option for malignant breast lumps?	318 (90.9%)	20 (5.7%)	12 (3.4%)
Do you think that early detection of a breast lump improves the success rate of surgical management?	321 (91.7%)	17 (4.9%)	12 (3.4%)

natinality

	Observed N	Expected N	Residual
saudi	303	175.0	128.0
non-saudi	47	175.0	-128.0
Total	350		

moking

	Observed N	Expected N	Residual
yes	137	175.0	-38.0
no	213	175.0	38.0
Total	350		

A1

	Observed N	Expected N	Residual
unknown	16	87.5	-71.5
7-11	129	87.5	41.5
12-13	158	87.5	70.5
14 and more	47	87.5	-40.5
Total	350		

A2

	Observed N	Expected N	Residual
no children	62	87.5	-25.5
20 and less	40	87.5	-47.5
20-40	158	87.5	70.5
30 and more	90	87.5	2.5
Total	350		

A3

	Observed N	Expected N	Residual
unknown	28	87.5	-59.5
zero relative	44	87.5	-43.5
one relative	114	87.5	26.5
more than one	164	87.5	76.5
Total	350		

Chi-square

A4

	Observed N	Expected N	Residual
yes	116	175.0	-59.0
no	234	175.0	59.0
Total	350		

BMI.level

	Observed N	Expected N	Residual
1	15	70.0	-55.0
2	45	70.0	-25.0
3	57	70.0	-13.0
4	128	70.0	58.0
5	105	70.0	35.0
Total	350		

Test Statistics

	educational. level	marital.status	husband. educational	monthly. income	natinality	moking	A1	A2	A3	A4	BMI.level
Chi-Square	131.817[a]	80.440[a]	41.817[b]	81.537[a]	187.246[c]	16.503[c]	153.657[b]	90.091[b]	136.994[b]	39.783[c]	120.114[d]
df	2	2	3	2	1	1	3	3	3	1	4
Asymp. Sig.	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 116.7.

b. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 87.5.

c. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 175.0.

d. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 70.0.

Test Statistics

	educational. level	marital.status	husband. educational	monthly. income	natinality	moking	BMI.level	B1	B2	B3	B4	B5	B6	B7
Chi-Square	131.817[a]	80.440[a]	41.817[b]	81.537[a]	187.246[c]	16.503[c]	120.114[d]	181.583[a]	410.131[a]	511.291[a]	542.697[a]	574.377[a]	558.040[a]	495.811[a]
df	2	2	3	2	1	1	4	2	2	2	2	2	2	2
Asymp. Sig.	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 116.7.

b. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 87.5.

c. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 175.0.

d. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 70.0.

Test Statistics

	educational. level	marital.status	husband. educational	monthly. income	natinality	moking	BMI.level	C1	C2	C3	C4	C5
Chi-Square	131.817[a]	80.440[a]	41.817[b]	81.537[a]	187.246[c]	16.503[c]	120.114[d]	526.360[a]	427.651[a]	408.897[a]	521.440[a]	536.920[a]
df	2	2	3	2	1	1	4	2	2	2	2	2
Asymp. Sig.	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 116.7.

b. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 87.5.

c. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 175.0.

d. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 70.0.