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Health Iniquity, Unhealthy Behavior, and Coverage of Mammography in Brazil

Iniquidade em saúde, comportamentos não saudáveis e cobertura de mamografia no Brasil

Iniquidad de salud, comportamiento no saludable y cobertura de mamografía en Brasil

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ABSTRACT

Objective: To investigate the prevalence of mammography screening and the association among socio-demographic, behavior factors and non-adherence to mammography screening among women between 50 and 69 years old, using data from Vigitel 2016. **Method:** Cross-sectional, population-based study with data from Vigitel including 12,740 women in the 50-69 age group. The variables were analyzed using logistic regression. **Results:** Among the women studied, 21.8% had not had a mammography in the past 2 years. The characteristics associated with non-adherence to the test were having less than 12 years of education (p<0.001), having no partner (p=0.001), being underweight (p=0.002), having a negative self-perceived health status (p<0.001) and having at least one negative health behavior (p<0.001). **Conclusion:** There is a subgroup of women with markers of social vulnerability, which reflect the inequality in mammography screening.

Descriptors: Mammography; Health Status Disparities; Health Services Coverage; Health Services Accessibility; Mass Screening.

RESUMO

Objetivo: Investigar a prevalência da cobertura de mamografia e a relação entre fatores sociodemográficos e comportamentais associados à não realização de mamografia em mulheres de 50 a 69 anos de idade, usando dados do Vigitel 2016. **Método:** Estudo transversal, de base populacional, que utilizou dados do Vigitel e incluiu 12.740 mulheres na faixa etária de 50 a 69 anos. As variáveis foram analisadas por meio da regressão logística. **Resultados:** Entre as mulheres estudadas, 21,8% não haviam realizado a mamografia nos últimos 2 anos. As características associadas à não realização do exame foram mulheres com menos de 12 anos de estudo (p<0,001), que declararam não ter companheiro (p=0,001), com baixo peso (p=0,002), autoavaliação da sua saúde como negativa (p<0,001) e com pelo menos um comportamento negativo em saúde (p<0,001). **Conclusão:** Observa-se um subgrupo de mulheres com marcadores de maior vulnerabilidade, os quais refletem as iniquidades na cobertura da mamografia.

Descritores: Mamografia; Iniquidade em Saúde; Cobertura de Serviços de Saúde; Acesso aos Serviços de Saúde; Programas de Rastreamento.

RESUMEN

Objetivo: Investigar la prevalencia de la cobertura de mamografías y su relación entre los factores sociodemográficos y comportamentales asociados a la no realización de mamografías en mujeres de 50 a 69 años de edad, según datos del Vigitel 2016. **Método:** Se trata de un estudio transversal, de base poblacional, realizado con los datos del Vigitel que incluye 12.740 mujeres entre 50 y 69 años. Las variables se analizaron con regresión logística. **Resultados:** Entre las mujeres estudiadas, el 21,8% no se había hecho una mamografía en los últimos 2 años. La no realización del examen estaba relacionada con determinadas características: menos de 12 años de estudio (p<0,001), no tener pareja (p=0,001), bajo peso (p=0,002), autoevaluación de su salud como negativa (p<0,001) y por lo menos un comportamiento de salud negativo (p<0,001). **Conclusión:** Se observa un subgrupo de mujeres con marcadores de vulnerabilidad más elevados, lo que refleja las desigualdades en la cobertura de las mamografías.

Descriptores: Mamografía; Iniquidad en la Salud; Cobertura de los Servicios Sanitarios; Acceso a los Servicios Sanitarios; Programas de Rastreo.

INTRODUCTION

Breast cancer is the most common cancer in women worldwide. Mammography screening aims at early detection and reduction of mortality rates[1-3]. The highest incidence rates are in developed countries; however, the mortality rate is higher in developing countries, which can be attributed to late diagnosis [3-4] and lack of timely access to treatment[4].

Screening mammography is recommended every two years from 50 to 69 years old, for early detection and reduction of mortality[5]. This recommendation is for the population at risk[2], as too many mammographies out of the age range may have a negative cost-benefit related to overdiagnosis, overtreatment, excessive exposure to radiation and death from radiation-induced cancer[2-5].

According to data from Vigitel, the mammography screening rate in Brazil in 2012 was 77.4%, exceeding by seven percentage points the goal proposed by the Ministry of Health for 2022[6]. However, results from the 2013 National Health Survey show variations according to region (North – 38.7%; and Southeast – 67.9%), level of education, and paying a private healthcare plan versus public healthcare - SUS (79.5% and 51.0%, respectively)[7]. These differences between the surveys can be attributed to methodological designs.

Studies show social inequalities in access to breast cancer screening[8-14]. Black and brown (*pardo)* women [8], with a low level of education[8,10-11,13], who were single or living without a partner [8,10,15,16], who smoked[8] and did not have health insurance[12-14] had mammographies less often. Additionally, studies with small samples[8,12] have shown that unhealthy behaviors, such as insufficient physical activity level and low intake of fruits and vegetables, may be associated with non-adherence to mammography screening.

Non-adherence to mammography screening is a serious health risk, as early detection increases the likelihood of finding a tumor at an early stage, which improves the chance of success in the treatment of this disease[17]. Thus, studies of negative health behaviors may point to an accumulated risk of breast cancer, as these behaviors are risk factors for this type of cancer and may be associated with non-adherence to mammography screening.

OBJECTIVE

To investigate mammography screening and the association among socio-demographic, behavior factors and non-adherence to mammography screening among women between 50 and 69 years old, using data from Vigitel 2016.

METHOD

Ethical aspects

Vigitel was approved by the National Commission for Ethics in Research with Human Beings (Conep no. 355.590/2013)[18] and verbal consent was obtained during telephone contact with participants[19].

Design, setting and period

This is a cross-sectional population-based study with data from Vigitel 2016. Vigitel is performed through telephone interviews with adults, aged 18 years and over in the capital cities of the 26 states and the Federal District in Brazil[19].

Population, sample; inclusion and exclusion criteria

Samples of 2,000 interviews in each capital are required. Sampling is carried out in two stages, based on a draw of 5,000 telephone lines in each city. For this, a systematic and stratified draw was carried out, using postal codes (CEP) according to the registration of lines in telephone companies. Subsequently, these residential lines are divided into replicas of 200 telephone lines[19].

After the identification of the eligible lines, one line was drawn and then one of the adults in the household was drawn, which corresponds to the second stage[19]. A trained team was responsible for applying a questionnaire through computer-guided telephone interviews. In 2016, of the 77,671 eligible lines, 53,210 completed the interviews[19].

Out of the 53,210 people interviewed in 2016, 32,952 were women. Of these, 12,740 were in the target age group for breast cancer screening (50 to 69 years old), according to national recommendations[5]. For the multivariate model, women with incomplete data in any of the variables of interest were excluded, and 12,483 women remained (Figure 1).

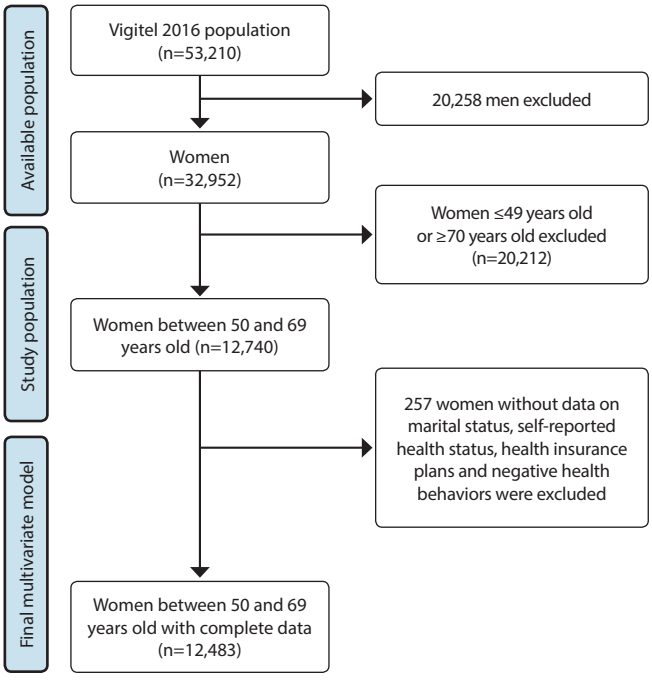

Figure 1– Flowchart of the population studied

Study protocol

The main outcome was not having a mammography in the past two years. The following questions were used: "Have you ever had a mammography/x-ray of the breasts?" and "How long has it been since you had a mammography?". Women who had never had the test done and those who had not had it in the past two years were classified as "non-adherence to mammography screening".

Socio-demographic variables were skin color/race (white, brown and black, yellow and indigenous), age group in years (50 to 59, 60 to 69), level of education in years (12 or more, 9 to 11, 0 to 8) and marital status (with and without a partner). The behavior and health variables were: diabetes, high blood pressure, body mass index - BMI (normal weight, underweight, overweight, obesity), physical activity during leisure time, recommended intake of fruits and vegetables, smoking, alcohol intake, self-reported health status (positive, negative), having a health insurance and negative health behaviors (none to four). The last variable was based on having negative health behaviors: not engaging in physical activity during leisure time, not consuming the recommended amount of fruits and vegetables, being a smoker/ex-smoker, consuming alcohol.

BMI was classified according to the World Health Organization (WHO) definition: normal weight ≥ 18.5 and < 25; underweight < 18.5; overweight ≥ 25 and < 30, obesity ≥ 30 kg/m^2 [20].

Engagement in physical activity during leisure time was defined by 150 minutes of light or moderate physical activity per week or at least 75 minutes of vigorous physical activity per week [19]. The recommended intake of fruits and vegetables was determined according to Vigitel: five or more daily portions of fruits and vegetables, at least five days a week[19]. Self-reported health status was positive if the woman assessed her health as very good or good, and negative when it was assessed as regular, bad or very bad[19].

Analysis of results and statistics

Data analysis included estimates of mammography screening, prevalence of non-adherence to mammography screening and standard error (±SE). Unadjusted and adjusted analyzes of potential socio-demographic, behavior and health variables associated with non-adherence to mammography screening in the past two years were conducted using logistic regression. The Odds Ratio (OR) and its respective 95% confidence intervals (95% CI) were estimated using the Stata statistical package, version 14.0, Survey module.

RESULTS

The mammography screening rate in the past two years among women in the target age group for this test (50 to 69 years old) was 78.2%. The prevalence of non-adherence to mammography screening was 21.8%, varying according to socio-demographic factors, behaviors, and health variables. This prevalence was higher in some groups, such as women who had a low level of education (28.8%), did not have a partner (26.3%), did not have health insurance (30.8%), had three (25.4%) and four (35.6%) unhealthy behaviors, were underweight (42.6%) or smokers (33.8%), among others (Tables 1 and 2).

Regarding the characteristics of women, most self-identified as white, were between 50 and 59 years old, had between 0 and 8 years of education, lived with their partners and were from the Southeast region. In the unadjusted analysis, women who self-identified as non-white had a lower level of education (0 to 8 and 9 to 11 years of education) and lived without a partner were more likely not to adhere to mammography screening, as were those who lived in the Northeast and Center-West regions (Table 1).

Table 1 – Prevalence and unadjusted Odds Ratio of non-adherence to mammography screening among Brazilian women between 50 and 69 years old, according to socio-demographic characteristics, Brazil, 2016

Socio-demographic characteristics	n*	%† (±SE‡)	Non-adherence to mammography screening	
			%† (95% CI§)	OR‖ (95% CI§)
Skin color/race	11.520			
White	5.936	52.3 (1.0)	19.5 (17.18-22.08)	Ref.
Brown and black	5.240	44.3 (1.0)	22.9 (20.28-25.76)	1.22 (0.98-1.52)
Yellow and indigenous	344	3.4 (0.4)	25.8 (16.82-37.53)	1.43 (0.81-2.53)
Age group (years)	12.740			
50 to 59	6.359	62.1 (0.9)	22.0 (19.73-24.51)	1.00 (0.85-1.24)
60 to 69	6.381	37.9 (0.9)	21.5 (19.38-23.71)	Ref.
Level of education (years)	12.740			
12 or more	4.280	19.6 (0.6)	9.5 (7.85-11.37)	Ref.
9 to 11	4.249	28.6 (0.8)	17.6 (15.44-19.95)	2.04 (1.57-2.64)
0 to 8	4.211	51.8 (0.9)	28.8 (26.04-31.76)	3.87 (3.02-4.96)
Marital status	12.573			
With a partner	6.427	58.0 (0.9)	18.7 (16.49-21.13)	Ref.
Without a partner	6.146	42.0 (0.9)	26.3 (23.85-28.93)	1.55 (1.26-1.89)
Region	12.740			
South	1.607	9.1 (0.3)	18.8 (16.17-21.74)	Ref.
Center-West	1.996	10.4 (0.4)	20.8 (16.97-25.29)	1.13 (0.83-1.55)
Southeast	2.038	49.1 (0.9)	22.2 (19.22-25.48)	1.23 (0.95-1.59)
North	2.721	7.8 (0.2)	22.5 (19.77-25.50)	1.25 (0.98-1.60)
Northeast	4.378	23.7 (0.6)	22.4 (20.48-24.44)	1.24 (1.00-1.54)

*Note: * sample size, † population estimate, ‡ standard error, § 95% confidence interval, ‖ Odds Ratio.*

Table 2 – Prevalence and unadjusted Odds Ratio of non-adherence to mammography screening according to behavior and health variables, Brazil, 2016

Behavior and health variables	n*	%† (±SE‡)	Non-adherence to mammography screening	
			%† (95% CI§)	OR§ (95% CI‖)
Diabetes	12.740			
No	10.573	82.4 (0.7)	20.9 (19.12-22.79)	Ref.
Yes	2.167	17.6 (0.7)	26.1 (21.99-30.68)	1.33 (1.03-1.71)
Hipertension	12.740			
No	6.675	51.5 (0.9)	19.7 (17.58-22.07)	Ref.
Yes	6.065	48.5 (0.9)	24.0 (21.58-26.68)	1.28 (1.05-1.57)
Nutritional status	12.740			
Adequate weight	4.844	37.6 (0.9)	21.4 (18.66-24.43)	Ref.
Underweight	249	2.00 (0.2)	42.6 (29.56-56.68)	2.72 (1.50-4.92)
Overweight	4.805	36.1 (0.9)	19.1 (16.76-21.60)	0.86 (0.68-1.09)
Obesity	2.842	24.3 (0.8)	24.8 (21.3-28.76)	1.21 (0.93-1.57)
Physical activity during leisure time**	12.740			
Active	4.134	26.1 (0.8)	11.3 (9.32-13.7)	Ref.
Inactive	8.606	73.9 (0.8)	25.5 (23.44-27.7)	2.68 (2.09-3.42)
Recommended intake of fruits and vegetables††	12.740			
Yes	4.486	33.3 (0.9)	15.1 (12.69-18.03)	Ref.
No	8.254	66.7 (0.9)	25.1 (23.04-27.35)	1.87 (1.48-2.37)
Smoking	12.740			
No	7.799	58.3 (1.0)	19.3 (17.45-21.39)	Ref.
Ex-smoker	3.832	29.8 (0.9)	21.9 (18.88-25.25)	1.16 (0.93-1.46)
Yes	1.109	11.8 (0.7)	33.8 (27.72-40.44)	2.12 (1.55-2.90)
Alcohol intake	12.739			
No	9.553	75.4 (0.8)	22.5 (20.65-24.56)	Ref.
Yes	3.186	24.6 (0.8)	19.5 (16.35-23.20)	0.83 (0.65-1.06)
Self-perceived health status	12.688			
Positive (very good, good)	7.605	59.8 (0.5)	16.9 (15.09-18.98)	Ref.
Negative (regular, poor, very poor)	5.083	40.2 (0.5)	28.2 (25.38-31.22)	1.92 (1.57-2.35)

To be continued

Table 2 (concluded)

Behavior and health variables	n*	%† (±SE‡)	Non-adherence to mammography screening %† (95% CI§)	OR§ (95% CI‖)
Health insurance	12.689			
Yes	7.353	57.7 (0.5)	11.2 (9.60-12.97)	Ref.
No	5.336	42.3 (0.5)	30.8 (28.11-33.51)	3.53 (2.85-4.36)
Unhealthy behaviors	12.739			
None	907	5.5 (0.4)	5.5 (3.71-7.92)	Ref.
One	3.047	21.7 (0.8)	16.1 (13.14-19.57)	3.33 (2.08-5.30)
Two	5.157	39.8 (0.9)	22.5 (20.04-25.12)	5.03 (3.28-7.71)
Three	2.888	26.3 (0.9)	25.4 (21.90-29.33)	5.92 (3.78-9.25)
Four	740	6.7 (0.5)	35.6 (27.95-44.08)	9.59 (5.61-16.40)

*Note: *sample size, †population estimate, ‡ standard error, § Odds Ratio, ‖ 95% confidence interval, ¶ body mass index, ** "150 minutes of light or moderate physical activity per week or at least 75 minutes of vigorous physical activity per week"[19], †† "five or more times a day, five or more days a week"[19].*

As for behavior and health variables, most women were not diagnosed with diabetes and hypertension, also had an adequate weight, were inactive, did not consume the recommended amount of fruits and vegetables, did not smoke, did not consume alcohol, had a positive self-perception of health, had health insurance and had at least one negative health behavior (Table 2). In the unadjusted analysis, women who had diabetes and hypertension, were underweight, were inactive, did not consume the recommended amount of fruits and vegetables, were smokers, had a negative self-perception of health, did not have health insurance and had one or more negative health behavior were more likely to not adhere to mammography screening (Table 2).

The adjusted model showed that women who had a lower level of educationes did not have a partner, were underweight, had a negative self-perception of health and had one or more negative health behaviors were more likely to not adhere to mammography screening (Table 3).

Table 3 – Adjusted Odds Ratio (OR) and 95% CI of non-adherence to mammography screening according to socio-demographic, behavior, and health variables, Brazil, 2016

Socio-demographic, behavior, and health variables	Adjusted OR* (95% CI†)	*p*
Level of education (years)		
12 or more	Ref.	
9 to 11	1.88 (1.43-2.47)	**<0.001**
0 to 8	3.24 (2.48-4.22)	**<0.001**
Marital status		
With partner	Ref.	
Without partner	1.43 (1.16-1.76)	0.001
Nutritional status		
Adequate weight	Ref.	
Underweight	2.38 (1.36-4.15)	0.002
Overweight	0.79 (0.62-1.01)	0.070
Obesity	1.04 (0.79-1.37)	0.769
Self-perceived health status		
Positive (very good, good)	Ref.	
Negative (regular, poor, very poor)	1.51 (1.22-1.87)	**<0.001**
Unhealthy behaviors		
None	Ref.	
One	2.79 (1.69-4.60)	**<0.001**
Two	3.86 (2.43-6.14)	**<0.001**
Three	4.29 (2.65-6.94)	**<0.001**
Four	7.55 (4.25-13.39)	**<0.001**

*Note: * Odds Ratio, † 95% confidence interval.*

The variable health insurance was not included in the final adjusted model, as it was correlated with level of education (correlation=0.3382). It should be noted that level of education and negative health behaviors showed a dose-response relationship (p<0.001 for both associations).

DISCUSSION

The mammography screening rate in this study was 78.2% in the past two years, which is higher than the recommended goal[6]. There were significant differences between the groups studied. Rates were proportionally lower in the most socially vulnerable groups. In the present study, the women who had a low level of education, lived without a partner, were underweight and had a negative self-perception of health were more likely to not adhere to mammography screening. Similar results were found in relation to the cervical cancer prevention test[21].

As it is a socioeconomic factor[8,11], the low level of education could explain why women in these conditions have less access to information related to the mammography and do not understand its importance, which decreases the chance of getting the exam[8,14,22].

The association between civil status and breast cancer screening is controversial in the literature. Studies in more developed countries such as Australia demonstrated that the partner can encourage women to get tested and that their contribution can be related to social support and its vital role as incentive for women to seek health care[15]. In contrast, a study showed that in more conservative countries, such as Mexico, married women may not get tested due to the male chauvinism of their partner (related to the exposure of the woman's body)[23]. Despite of the association between civil status and higher adherence to mammography screening, the authors point out that asking about civil status does not necessarily reveal if the person lives with or without a partner, making it difficult to infer how the partner influences women' screening habits[10,16].

In this study, women who self-perceived their health as regular, poor or very poor were more likely to not adhere to mammography screening. A negative self-perceived health status is related to negative health behaviors such as smoking, alcoholism and physical inactivity[24]. Thus, it can be inferred that, in addition to these behaviors, this population seeks health promotion and disease prevention services less often, and do not adhere to screening guidelines.

Unhealthy behaviors, such as insufficient physical activity, intake of alcohol and tobacco and unhealthy diets are considered risk factors for breast cancer[5]. In this study, these factors were associated with a lower chance of getting a mammography, which makes them a double risk, as they are factors associated with breast cancer and with failure to make an early diagnosis[17]. The use of an unhealthy behavior score in this study allowed this assessment. It should also be noted that some studies show that women do not get a mammography because they do not consider themselves at risk for breast cancer, as they do not feel pain or do not feel any changes[23], or because they do not have a family history[25]. This behavior demonstrates lack of knowledge about the disease and its risk factors and perhaps a deficiency of the health care service in relation to health education for disease prevention and health promotion. Our findings related to level of education may reinforce this.

It is observed that the achievement of the quantitative goals of mammography screening does not have the expected impact on the reduction of breast cancer incidence and mortality rates in the country[5]. Prevention actions complemented by timely access to treatment and priority screening for groups less likely to perform the test and groups at high risk of the disease can help reduce mortality from breast cancer through early detection[8].

Therefore, our findings indicate that, despite the increase in mammography screening rates in the country and the compliance with the national goal, disparities still exist, revealing inequalities in screening. The exam was less frequent in groups with socio-demographic and behavior differences, with emphasis on women who had a low level education, were underweight and had negative health behaviors, which are also risk factors for the occurrence of breast cancer. Thus, it is demonstrated that inequalities are barriers to examination. This evidence is useful and should be considered when defining the allocation of resources to improve the screening of the disease in the country.

Limitations of the study

The limitations of the present study must be explained. Cross-sectional studies only indicate associative relationships between exposure and outcome variables. However, it is plausible that women with low socioeconomic levels and unhealthy behaviors adhere to public mass screening in a smaller proportion. Memory bias may also be present in the characterization of the period in which the exam was performed, which results in difficulty estimating its direction and magnitude.

Contributions to Nursing

Nurses have a fundamental role in primary health care, where screening strategies occur in our country, and thus can contribute to the improvement of the disparities found. Prioritizing the most vulnerable women, who do not perform the exam or who do it less often, could be the first step towards building a more strategic and less opportunistic screening. In addition, it would allow affordable and qualified care for this group of women.

CONCLUSION

The prevalence of mammography in the prior two years among women who were in the target age group for this exam (50 to 69 years old) was 78.2%. The prevalence of non-adherence (21.8%) varied according to socio-demographic factors, behaviors and health characteristics, and was higher among women with characteristics that may indicate social and behavior inequities, such as a having a low level of education, being underweight, having a negative self-perceived health, having a high score of unhealthy behaviors and having no partner.

Therefore, the presence of social and behavioral inequities potentially determines disparities in mammography screening rate in Brazil. This result points out possibilities to identify groups that are more distant from the recommended screening goals.

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REFERENCES

1. Martei YM, Pace LE, Brock JE, Shulman LN. Breast cancer in low- and middle-income countries: why we need pathology capability to solve this challenge. Clin Lab Med. 2018;38(1):161-73. doi: 10.1016/j.cll.2017.10.013
2. Ministério da Saúde (BR), Instituto Nacional de Câncer José Alencar Gomes da Silva. Diretrizes para a detecção precoce do câncer de mama no Brasil. Rio de Janeiro: INCA, 2015.
3. Ghoncheh M, Pournamdar Z, Salehiniya H. Incidence and Mortality and Epidemiology of Breast Cancer in the World. Asian Pac J Cancer Prev [Internet] 2016 [cited 2019 Oct 17];17(S3):43-6. Available from: http://journal.waocp.org/?sid=Entrez:PubMed&id=pmid:27165206&key=2016.17.S3.43
4. Dianatinasab M, Fararouei M, Mohammadianpanah M, Zare-Bandamiri M. Impact of social and clinical factors on diagnostic delay of breast cancer. Medicine (Baltimore) [Internet] 2016 [cited 2018 Sep 22];95(38):1-6. Available from: https://journals.lww.com/md-journal/Fulltext/2016/09200/Impact_of_social_and_clinical_factors_on.8.aspx
5. Migowski A, Azevedo Silva G, Dias MBK, Diz MDPE, Sant'Ana DR, Nadanovsky P. Guidelines for early detection of breast câncer in Brazil. II – New national recommendations, main evidence, and controversies. Cad Saúde Pública [Internet] 2018 [cited 2018 Oct 15];34(6):1-16. Available from: http://www.scielo.br/pdf/csp/v34n6/1678-4464-csp-34-06-e00074817.pdf
6. Bernal RTI, Malta DC, Iser BPM, Monteiro RA. Método de projeção de indicadores das metas do Plano de Ações Estratégicas para o Enfrentamento das Doenças Crônicas não Transmissíveis no Brasil segundo capitais dos estados e Distrito Federal. Epidemiol. Serv. Saude. 2016;25(3):455-66. doi: 10.5123/s1679-49742016000300002
7. Azevedo e Silva G, Souza-Júnior PRB, Damacena GN, Szwarcwald CL. Early detection of breast cancer in Brazil: data from the National Health Survey, 2013. Rev Saude Publica. 2017;51(supl.1). doi: 10.1590/s1518-8787.2017051000191
8. Buranello MC, Meirelles MCCC, Walsh IAP, Pereira GA, Castro SS. Prática de exames de rastreio para câncer de mama e fatores associados – Inquérito de Saúde da Mulher em Uberaba MG, Brasil, 2014. Ciên Saúde Coletiva [Internet] 2018 [cited 2019 Feb 04];23(8):2661-70. Available from: http://www.scielo.br/pdf/csc/v23n8/1413-8123-csc-23-08-2661.pdf
9. Gathirua-Mwangi W, Cohee A, Tarver WL, Marley A, Biederman E, Stump T, et al. Factors associated with adherence to mammography screening among insured women differ by income levels. Womens Health Issues. 2018;28(5):462-9. doi: 10.1016/j.whi.2018.06.001

10. Chkotua S, Peleteiro B. Mammography Use in Portugal: National Health Survey 2014. Prev Chronic Dis. 2017;14(170054). doi: 10.5888/pcd14.170054

11. Chongthawonsatid S. Inequity of healthcare utilization on mammography examination and Pap smear screening in Thailand: Analysis of a population-based household survey. PLoS ONE [Internet] 2017 [cited 2018 out 15];12 (3). Available from: https://www.researchgate.net/publication/314648885

12. Lopes TCR, Gravena AAF, Agnolo CMD, Rocha-Brischiliari SC, Demitto MO, Carvalho MDB, et al. Prevalência e fatores associados à realização de mamografia e exame citopatológico. Rev Bras Promoç Saúde. 2015;28(3):402-10. doi: 10.5020/18061230.2015.p402

13. Mukem S, Meng Q, Sriplung H, Tangcharoensathienet V. Low coverage and disparities of breast and cervical cancer screening in Thai women: analysis of National Representative Household Surveys. Asian Pac J Cancer Prev. 2015;16(18):8541-51. doi: 10.7314/APJCP.2015.16.18.8541

14. Barbosa YC, Oliveira AGC, Rabelo PPC, Silva FS, Santos AM. Fatores associados à não realização de mamografia: Pesquisa Nacional de Saúde, 2013. Rev Bras Epidemiol. 2019;22:E190069. doi: 10.1590/1980-549720190069

15. Lam M, Kwok C, Lee M. Prevalence and sociodemographic correlates of routine breast cancer screening practices among migrant-Australian women. Aust NZ J Public Health. 2018;42(1):98-103. doi: 10.1111/1753-6405.12752

16. Al-Wassia RK, Farsi NJ, Merdad LA, Hagi SK. Patterns, knowledge, and barriers of mammography use among women in Saudi Arabia. Saudi Med J [Internet] 2017 [cited 2019 May 03];38(9):913-21. Available from: https://smj.org.sa/index.php/smj/article/view/smj.2017.9.20842/10487

17. Ministério da Saúde (BR), Câncer de mama. [Internet] 2018 [cited 2018 Sep 25]. Available from: www.saude.mg.gov.br/saudedamulher.

18. Ministério da Saúde (BR), Secretaria de Vigilância em Saúde. Vigitel Brasil 2013: vigilância de fatores de risco e proteção para doenças crônicas por inquérito telefônico. Brasília: MS; 2014.

19. Ministério da Saúde (BR), Secretaria de Vigilância em Saúde. Vigitel Brasil 2016: vigilância de fatores de risco e proteção para doenças crônicas por inquérito telefônico. Brasília: MS; 2017.

20. Ministério da Saúde (BR), Índice de Massa Corpórea[Internet]. 2018 [cited 2018 Sep 22]. Available from: http://portalms.saude.gov.br/component/content/article/804-imc/40509-imc-em-adultos

21. Tiensoli SDT, Felisbino-Mendes MS, Velasquez-Melendez G. Avaliação da não realização do exame Papanicolaou por meio do Sistema de Vigilância por inquérito telefônico. Rev Esc Enferm USP. 2018;52: 1-7. doi: 10.1590/s1980-220x2017029503390.

22. Gonçalves CV, Camargo VP, Cagol JM, Miranda B, Mendoza-Sassi RA. O conhecimento de mulheres sobre os métodos para prevenção secundária do câncer de mama. Ciên Saúde Coletiva [Internet] 2017 [cited 2019 May 03];22(12):4073-81. Available from: http://www.scielo.br/pdf/csc/v22n12/1413-8123-csc-22-12-4073.pdf

23. Tejeda S, Thompson B, Coronado GD, Martin DP. Barriers and facilitators related to mammography use among lower educated Mexican women in the USA. Soc Sci Med. 2009;68(5):832-9. doi: 10.1016/j.socscimed.2008.12.023

24. Pavão ALB, Werneck GL, Campos MR. Autoavaliação do estado de saúde e a associação com fatores sociodemográficos, hábitos de vida e morbidade na população: um inquérito nacional. Cad Saúde Pública. 2013;29(4):723-34. doi: 10.1590/S0102-311X2013000400010

25. Schneider IJC, Corseuil MW, Boing AF, d'Orsi E. Knowledge about mammography and associated factors: population surveys with female adults and elderly. Rev Bras Epidemiol. 2013;16(4):930-42. doi: 10.1590/S1415-790X2013000400013