Perceptions About Genetic Counseling and Testing for Hereditary Breast and Ovary Cancer in the Population of Goiás

https://doi.org/10.32635/2176-9745.RBC.2026v72n2.5439EN

Percepções sobre o Aconselhamento Genético e Testagem para Câncer de Mama e Ovário Hereditário na População de Goiás

Percepciones sobre el Asesoramiento Genético y las Pruebas para el Cáncer de Mama y de Ovario Hereditario en la Población de Goiás

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ABSTRACT

Introduction: Genetic counseling for hereditary breast cancer represents an essential preventive strategy, especially in populations with facilitated access to testing, as provided by current legislation in Goiás, Brazil. However, sociocultural and informational barriers may still limit adherence. **Objective:** To understand the perception of the population of Goiás regarding genetic testing and counseling for hereditary breast and/or ovarian cancer. **Method:** This was an observational, cross-sectional, exploratory, and mixed-methods study with a convenience sample of 239 adult residents of Goiás. Data was collected through an electronic questionnaire disseminated via social media and messaging applications. Sociodemographic variables and 11 statements addressing benefits, practical aspects, and barriers to genetic counseling were evaluated using a Likert scale. **Results:** Most participants were female (80.8%), aged 18-50 years (84.1%), and had more than 12 years of schooling (82%). Overall perception of genetic counseling was positive, with high agreement regarding its perceived benefits. Participants with a personal history of cancer showed lower agreement with advantages and greater perception of family impact. Sex differences were observed in cultural barriers: men demonstrated lower predisposition to testing and greater influence of religious and fatalistic beliefs. Family history was associated with lower resistance to testing. **Conclusion:** The population of Goiás demonstrated broad acceptance of genetic counseling. Previous experiences with the disease influence perceptions of benefits and barriers. Educational and personalized strategies should consider these nuances to enhance adherence.

Key words: Breast Neoplasms; Genetic Counseling/statistics & numerical data; Women's Health.

RESUMO

Introdução: O aconselhamento genético para câncer de mama hereditário representa uma estratégia preventiva essencial, especialmente em populações com acesso facilitado à testagem, como prevê a legislação vigente em Goiás. No entanto, barreiras socioculturais e de acesso à informação ainda podem limitar a adesão. **Objetivo:** Analisar a percepção da população goiana sobre a testagem e o aconselhamento genético para câncer de mama e/ou ovário. **Método:** Estudo observacional, transversal, exploratório e quanti-qualitativo, com amostra obtida por conveniência, composta por 239 indivíduos adultos residentes em Goiás. A coleta de dados foi realizada por meio de questionário eletrônico divulgado em redes sociais e aplicativo de mensagens. Foram avaliadas variáveis sociodemográficas e 11 afirmativas sobre benefícios, aspectos práticos e barreiras ao aconselhamento genético, em escala de Likert. **Resultados:** A maioria dos participantes era do sexo feminino (80,8%), com idade entre 18 e 50 anos (84,1%) e escolaridade superior a 12 anos (82%). A percepção geral sobre o aconselhamento genético foi positiva, com alta concordância para os benefícios relatados. Participantes com histórico pessoal de câncer apresentaram menor concordância com as vantagens e maior percepção de impacto familiar. Diferenças entre os sexos foram observadas nas barreiras culturais; homens demonstraram menor predisposição à testagem e maior influência de crenças religiosas e fatalistas. O histórico familiar mostrou associação com menor resistência à testagem. **Conclusão:** A população goiana demonstrou ampla aceitação do aconselhamento genético. Experiências prévias com a doença influenciaram a percepção sobre benefícios e barreiras. Estratégias educativas e personalizadas devem considerar essas nuances para ampliar a adesão.

Palavras-chave: Neoplasias da Mama; Aconselhamento Genético/estatística & dados numéricos; Saúde da Mulher.

RESUMEN

Introducción: El asesoramiento genético para el cáncer de mama hereditario representa una estrategia preventiva esencial, especialmente en poblaciones con acceso facilitado a las pruebas genéticas, como establece la legislación vigente en Goiás, Brasil. No obstante, las barreras socioculturales y el acceso limitado a la información pueden restringir la adhesión. **Objetivo:** Analizar la percepción de la población de Goiás sobre las pruebas y el asesoramiento genético para el cáncer de mama y/o de ovario. **Método:** Estudio observacional, transversal, exploratorio y cuanti-cualitativo, realizado con una muestra obtenida por conveniencia de 239 adultos residentes en el estado de Goiás. Los datos se recolectaron mediante un cuestionario electrónico difundido en redes sociales y aplicaciones de mensajería. Se evaluaron variables sociodemográficas y 11 afirmaciones sobre beneficios, aspectos prácticos y barreras al asesoramiento genético, mediante una escala de Likert. **Resultados:** La mayoría de los participantes fue mujeres (80,8%), entre 18 y 50 años (84,1%) y con más de 12 años de educación (82%). La percepción general fue positiva, con alta concordancia respecto a los beneficios informados. Participantes con antecedentes personales de cáncer mostraron menor concordancia con las ventajas y mayor percepción del impacto familiar. Se observaron diferencias entre sexos en las barreras culturales: los hombres demostraron menor predisposición a realizarse pruebas y mayor influencia de creencias religiosas y fatalistas. **Conclusión:** La población de Goiás mostró amplia aceptación del asesoramiento genético. Las experiencias previas con la enfermedad influyeron en la percepción de beneficios y barreras, lo que exige estrategias educativas y personalizadas para ampliar la adhesión.

Palabras clave: Neoplasias de la Mama; Asesoramiento Genético/estadística & datos numéricos; Salud de la Mujer.

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INTRODUCTION

Breast cancer is an important global health challenge, being the second most common and the fifth leading cause of death from neoplasms, with 2.3 million new cases and 666 thousand deaths in 2022. Worldwide, the age-adjusted rate is 46.8 per 100 thousand women, while in Brazil it is 63.1 per 100 thousand. Nationally, it is the most prevalent cancer in women and the main cause of death from cancer in this group[1].

Ovarian cancer incidence ranks 18th worldwide and 14th in mortality. In Brazil, it has an incidence of 5.1 cases per 100 thousand women and corresponds to the seventh cause of death from female cancer[1]. In the State of Goiás, breast cancer leads the incidence in women, with 2,150 estimated cases for 2026 and a crude rate of 56.55 per 100 thousand women, while ovarian cancer presents 210 estimated cases and a crude rate of 5.48 per 100 thousand women[2].

Although developed countries present a higher incidence of breast and ovarian cancers, an expressive increase of these neoplasms has been observed in low and medium-income countries in South America, Africa, and Asia[1], due to hormonal, nutritional, reproductive factors, and socioeconomic status[3]. In those Regions, mortality rates remain high[1], reflecting limited screening, late diagnosis, and precarious access to healthcare. At the same time, high-income countries have been able to reduce them through better screening, diagnosis, and treatment strategies[4].

Between 5% and 10% of breast cancer cases originate from hereditary factors, especially germinative mutations in the *BRCA1* and *BRCA2* genes, which work as tumoral suppressors[3,5]. These mutations are associated with more aggressive tumors, worse clinical outcomes, and a higher risk for other cancers, such as breast, ovary, prostate, and pancreas, in addition to influencing customized therapeutic strategies[5].

Early identification of individuals at risk of mutations in the *BRCA1/2* genes is key to controlling hereditary breast cancer, but it faces significant barriers, mainly in low and medium income countries[6]. This is due to multiple factors, including communication failures, limited access to specialized professionals, and health professionals finding it hard to consistently identify high-risk individuals, resulting in under-referral[7]. Moreover, in low-income countries, underfunded and underarticulated public systems restrict access to tests, mainly due to financial obstacles[4]. Add that to patients' confusion regarding different testing modalities and ignorance of the importance of genetic counseling, impairing decision-making[4,7].

Genetic testing, indicated considering patients' personal and family history of cancer, early age at diagnosis, and tumoral characteristics, enables early screening, intensified monitoring strategies, chemical prevention, and risk-reducing surgeries[4,7,8]. Moreover, *BRCA1/2* mutations function as biomarkers for targeted therapies, influencing the choice of platinum-based Poly (ADP-ribose) polymerase (PARP) inhibitor chemotherapy, in addition to subsidizing family planning through genetic counseling[4,8].

In the State of Goiás, Law N. 20,707, of January 14, 2020[9], ensures women with a family and/or personal history of breast or ovarian cancer are tested, free of charge, to detect mutations in the *BRCA1* and *BRCA2* genes. By law, the Executive Power, in partnership with the National Health System (SUS), ensures women with a personal history of breast cancer and/or primary ovarian cancer diagnosed before age 40 or triple-negative diagnosed before age 50, as well as those with a family history of these neoplasms diagnosed before 50 years-old on the same side of the family up to the third degree, can be tested, as long as requested by a geneticist, mastologist, or oncologist doctor. This public policy constitutes a step forward in fighting breast and ovarian cancer, promoting a preventive and customized approach to women with elevated genetic risk.

In this context, understanding the specific barriers and perceptions of the Goiás population is essential to adapting effective strategies and integrating them into healthcare, especially considering the State legislation that enables free access to the test. Thus, the objective of this study is to understand the perception of the population of Goiás regarding genetic testing and counseling for hereditary breast and/or ovarian cancer.

METHOD

Descriptive, quantitative, exploratory, cross-sectional, observational population-based study. Due to its exploratory nature, the sample was non-probabilistic, obtained by convenience, and formed through voluntary adherence of participants invited to participate in the research. The sample included people aged 18 or older, residing in Goiás, with or without breast cancer, with or without a family history of the illness, provided they understood and agreed to participate in the study. The sample did not include those who did not meet the aforementioned criteria, or who delivered incomplete questionnaires, or who provided identifiable data.

The general population was approached through an invitation link containing the Free and Informed Consent Form and the questionnaire, advertised mainly in the project's Instagram page (@projetoBRCA). The invitation was also sent by email and messaging app (WhatsApp) to people close to the researchers. The team acknowledged the bias inherent to this advertising strategy, which will be further addressed in the results' discussion as a methodological limitation to this study. The participants were encouraged to share the invitation with their connections to broaden the study's reach.

The standardized questionnaire specific to the studied population was elaborated based on a literature review on the theme. It is a self-applicable instrument, to be answered in its entirety by the participants, composed of multiple-choice questions, which address sex, age, schooling, income, and city of residence, in addition to personal and/or family history of breast and ovarian cancer. In case there was a positive personal history, the type of tumor was inquired. Furthermore, there were 11 statements related to genetic counseling for breast and/or ovarian cancer. These statements addressed positive, informational, practical, and oppositional aspects, evaluated on a 5-point Likert[10] scale, ranging from "completely agree" to "completely disagree". At the end of the questionnaire, the participants received, through informative leaflets, guidance on genetic mapping in breast cancer management — focus of the study and the most discussed theme due to Law N. 20,707, which stimulated the research — and ovarian cancer management, mentioned due to its genetic association with *BRCA1* and *BRCA2* gene mutations.

The collected data was organized in Microsoft Excel® spreadsheets and analyzed with the SPSS[11]® software (version 31.0.0.0). The categorical variables were described in absolute and relative frequencies, and the answers to the Likert-scale statements were grouped according to thematic dimensions. The analysis was conducted using descriptive statistics and a chi-square test[12] ($p<0.05$). The results were presented in tables and a descriptive graph.

The present study followed the guidelines of Resolution N. 466/2012[13] of the National Health Council on studies with human beings and was approved by the Research Ethics Committee of the *Universidade Evangélica de Goiás* under report number 7.413.928 (CAAE (submission to ethical review): 84082424.9.0000.5076).

RESULTS

A total of 239 people residing in the State of Goiás participated in the study. Table 1 shows that most participants were female, in the 18-50 years age group. Regarding monthly family income, most respondents reported earning more than one minimum wage. Self-declared skin color was mainly white and brown, with a lower proportion of black people. Regarding marital status, most claimed to have no partner. Considering the skin color variable, there was a statistically significant association with sex (p=0.01), indicating a possible difference in self-declared answers, considering the methodology of the questionnaire, between men and women. The other variables did not present a significant statistical value.

The data analysis demonstrated, consistently, a positive perception of genetic counseling for breast and/or ovarian cancer in all the studied subgroups, and this result was demonstrated in Figure 1, as well as Tables 2, 3, and 4. The questions addressed in the questionnaire were divided into 3 sections: Benefits perceived from genetic counseling; Informational, Practical, and Family Impact Aspects; and Barriers and Oppositions to Genetic Counseling. All the statements are described in the captions for Figure 1.

SECTION – BENEFITS PERCEIVED FROM GENETIC COUNSELING

1. "Genetic counseling would help me better understand the cancer risks and/or initiate discussions on the topic with other members of my family."
2. "I believe that there are important benefits in having genetic counseling to decide if I should or not do genetic testing for breast or ovarian cancer."
3. "Genetic counseling relieves my fear and concerns of developing breast or ovarian cancer."
4. "Genetic counseling helps me make important life decisions, from undergoing preventive surgery to other decisions, like having kids."

SECTION – INFORMATIONAL, PRACTICAL, AND FAMILY IMPACT ASPECTS

1. "I need more information on what genetic counseling offers, mainly about benefits for breast and/or ovarian cancer, and who to speak with to schedule an appointment."
2. "I would like to receive genetic counseling, but I worry about the costs."
3. "Genetic counseling would make me worry about the risk of breast and/or ovarian cancer in other members of my family."

SECTION – BARRIERS AND OPPOSITIONS TO GENETIC COUNSELING

1. "Receiving genetic counseling is not a priority for me, it would take too much of my time, or I am too busy dealing with other subjects."

Table 1. Sociodemographic profile of the researched population in Goiás

Variables	Total (n=239)		Female (n=193)		Male (n=46)		*p*
	n	%	n	%	n	%	
Age group							
18-50 years-old	201	84.1	162	83.9	39	84.8	0.88
>50 years	38	15.9	31	16.1	07	15.2	
Education							
≤12 years	43	18	34	17.6	09	19.6	0.75
>12 years	196	82	159	82.4	37	80.4	
Skin color							
White	146	61.1	121	62.7	25	54.3	0.01*
Brown	79	33.1	65	33.7	14	30.4	
Black	14	5.9	07	3.6	07	15.2	
Indigenous	0	-	0	-	0	-	
Marital status							
Has a partner	82	34.3	67	34.7	15	32.6	0.78
Does not have a partner	157	65.7	126	65.3	31	67.4	
Monthly family income							
≤1 minimum wage**	15	6.3	11	5.7	04	8.7	0.47
>1 minimum wage	224	93.7	182	94.3	42	91.3	
Family history of cancer							
Yes	185	77.4	154	79.8	31	67.4	0.07
No	54	22.6	39	20.2	15	32.6	
Personal history of cancer							
Yes	13	5.4	11	5.7	2	4.3	0.71
No	226	94.6	182	94.3	44	95.7	

Captions: *$p < 0.05$ as per the chi-square test (Pearson's χ^2); **Refers to the 2024 value (R$ 1,412.00).

2. "Genetic counseling would not help me deal with my fears and uncertainties, nor would it provide me with the means to prevent breast and/or ovarian cancer."
3. "Undergoing genetic counseling is not in line with my religious or spiritual beliefs."
4. "I believe that if I were diagnosed with breast and/or ovarian cancer, I would die, or it is my fate, so genetic counseling has no purpose and cannot help me."

On the first four statements – which addressed the advantages of counseling, like better understanding of the risks, support in the decision about testing, alleviating fears, and helping make life decisions – there was a lower total agreement among participants with a personal history of cancer (PH), while the differences by family history (FH) were not significant. In none of those four statements there was relevant variation between the female (♀) and male (♂) sex.

In the section referring to informational, practical, and family impact aspects, there was a heightened need for more information (93.8% of agreement), interest in the service in face of concerns with cost, and the perception that counseling would make them think of the risk to their families. However, no statistically significant differences were observed between the female (♀) and male (♂) sex.

Regarding barriers and oppositions, most participants disagreed with the four statements: lack of priority/time (67.2% disagreement), denial of the usefulness of counseling in dealing with fears (79.3% disagreement), conflict with religious beliefs (86.2% disagreement), and fatalism (88.8% disagreement). Unlike in the previous sections, there was a significant difference between the sexes.

Despite the heightened acceptance of genetic counseling, participants with a personal history of cancer presented significantly lower complete agreement rates in the four assessed benefits and higher agreement in the perception of family impact. Family history of cancer,

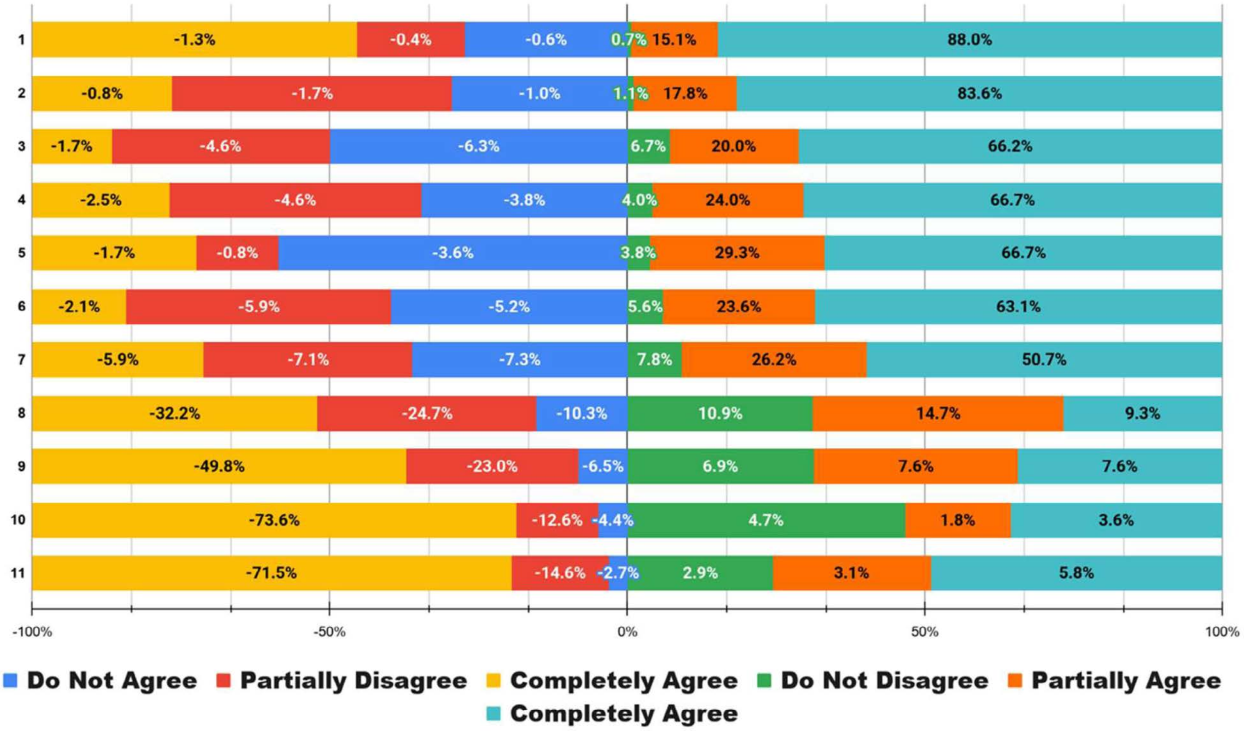

Figure 1. Distribution of the perspective of the surveyed population in Goiás regarding genetic mapping for breast and ovarian cancer
Caption: Y axis = statements.

Table 2. Association between a family history (FH) of cancer and the answers to the breast and ovarian cancer genetic counseling statements in the Goiás surveyed population

Statements	Completely agree n (%)		Partially agree n (%)		Neither agree nor disagree n (%)		Partially disagree n (%)		Completely disagree n (%)		p
	FH +	FH -	FH +	FH -	FH +	FH -	FH +	FH -	FH +	FH -	
1	155 (83.8)	43 (79.6)	26 (14.1)	08 (14.8)	03 (1.6)	00 (0.0)	00 (0.0)	01 (1.9)	01 (0.5)	02 (3.7)	0.102
2	148 (80)	40 (74.1)	29 (15.7)	11 (20.4)	04 (2.2)	01 (1.9)	03 (1.6)	01 (1.9)	01 (0.5)	01 (1.9)	0.804
3	119 (64.3)	30 (55.6)	31 (16.8)	14 (25.9)	23 (12.4)	07 (13)	09 (4.9)	02 (3.7)	03 (1.6)	01 (1.9)	0.640
4	117 (63.2)	33 (61.1)	42 (22.7)	12 (22.2)	14 (7.6)	04 (7.4)	09 (4.9)	02 (3.7)	03 (1.6)	03 (5.6)	0.603
5	116 (62.7)	34 (63)	53 (28.6)	13 (24.1)	13 (07)	04 (7.4)	01 (0.5)	01 (1.9)	02 (1.1)	02 (3.7)	0.574
6	112 (60.5)	30 (55.6)	39 (21.1)	14 (25.9)	22 (11.9)	03 (5.6)	10 (5.4)	04 (7.4)	02 (1.1)	03 (5.6)	0.164
7	94 (50.8)	20 (37)	40 (21.6)	19 (35.2)	28 (15.1)	07 (13)	14 (7.6)	03 (5.6)	09 (4.9)	05 (9.3)	0.163
8	14 (7.6)	07 (13)	26 (14.1)	07 (13)	30 (16.2)	19 (35.2)	52 (28.1)	07 (13)	63 (34.1)	14 (25.9)	0.009*
9	09 (4.9)	08 (14.8)	11 (5.9%)	06 (11.1)	25 (3.5)	06 (11.1)	44 (23.8)	11 (20.4)	96 (51.9)	23 (42.6)	0.075
10	05 (2.7)	03 (5.6)	01 (0.5)	03 (5.6)	18 (9.7)	03 (5.6)	20 (10.8)	10 (18.5)	141 (76.2)	35 (64.8)	0.028*
11	07 (3.8)	06 (11.1)	06 (3.2)	01 (1.9)	12 (6.5)	01 (1.9)	25 (13.5)	10 (18.5)	135 (73)	36 (66.7)	0.136

Captions: FH +: Positive family history of cancer; FH-: Negative family history of cancer; *$p<0.05$ as per the chi-square test (Pearson's χ^2).

Table 3. Association between a personal history (PH) of cancer and the answers to the breast and ovarian cancer genetic counseling statements in the Goiás surveyed population

Statements	Completely agree n (%)		Partially agree n (%)		Neither agree nor disagree n (%)		Partially disagree n (%)		Completely disagree n (%)		*p*
	PH +	PH -	PH +	PH -	PH +	PH -	PH +	PH -	PH +	PH -	
1	08 (61.5)	190 (84.1)	03 (23.1)	31 (13.7)	01 (7.7)	02 (0.9)	00 (0.0)	01 (0.4)	01 (7.7)	02 (0.9)	0.031*
2	06 (46.2)	182 (80.5)	04 (30.8)	36 (15.9)	01 (7.7)	04 (1.8)	01 (7.7)	03 (1.3)	01 (7.7)	01 (0.4)	0.003*
3	06 (46.2)	143 (63.3)	00 (0.0)	45 (19.9)	03 (23.1)	27 (11.9)	02 (15.4)	09 (04)	02 (15.4)	02 (0.9)	<0.001*
4	06 (46.2)	144 (63.7)	02 (15.4)	52 (23)	01 (7.7)	17 (7.5)	02 (15.4)	09 (04)	02 (15.4)	04 (1.8)	0.009*
5	10 (76.9)	140 (61.9)	02 (15.4)	64 (28.3)	01 (7.7)	16 (7.1)	00 (0.0)	02 (0.9)	00 (0.0)	04 (1.8)	0.820
6	08 (61.5)	134 (59.3)	02 (15.4)	51 (22.6)	00 (0.0)	25 (11.1)	02 (15.4)	12 (5.3)	01 (7.7)	04 (1.8)	0.205
7	06 (46.2)	108 (47.8)	00 (0.0)	59 (26.1)	02 (15.4)	33 (14.6)	03 (23.1)	14 (6.2)	02 (15.4)	12 (5.3)	0.033*
8	01 (7.7)	20 (8.8)	04 (30.8)	29 (12.8)	00 (0.0)	49 (21.7)	01 (7.7)	58 (25.7)	07 (53.8)	70 (31)	0.054
9	03 (23.1)	14 (6.2)	03 (23.1)	14 (6.2)	00 (0.0)	31 (13.7)	02 (15.4)	53 (23.5)	05 (38.5)	114 (50.4)	0.015*
10	01 (7.7)	07 (3.1)	00 (0.0)	04 (1.8)	01 (7.7)	20 (8.8)	01 (7.7)	29 (12.8)	10 (76.9)	166 (73.5)	0.861
11	02 (15.4)	11 (4.9)	01 (7.7)	06 (2.7)	02 (15.4)	11 (4.9)	00 (0.0)	35 (15.5)	08 (61.5)	163 (72.1)	0.082

Captions: PH +: Positive personal history of cancer; PH-: Negative personal history of cancer; *$p<0.05$ as per the chi-square test (Pearson's χ^2).

on the other hand, had an association with only certain barriers. Differences between men and women were observed exclusively in the barriers section.

DISCUSSION

This study sought to understand the perspective of the Goiás population on genetic testing and counseling, as well as the perceived benefits and barriers, considering sociodemographic aspects and perceptions on the patients' therapeutic strategies process. However, it must be noted that the findings predominantly reflect the perceptions of the sample's major group, composed mainly of women (80.8%), young adults (84.1% in the 18–50 years age group), with high schooling (82% with >12 years of study), and a high proportion of spouse-less participants (65.7%), with an income greater than one minimum wage (93.3%).

The distribution of mostly self-declared white (61.1%) and brown (33.1%) individuals, although suggesting some sample biases or cultural nuances that deserve further investigation, also reinforces something already discussed in the literature, associated with experiences of institutional racism and structural barriers[14,15]. This racial composition of the sample also helps contextualize the absence of indigenous participants, which reinforces the persistent invisibility of these groups in health studies and SUS services — a reality marked by territorial, cultural, and institutional barriers that compromise access to and continuity of care[16,17].

Regarding the perception of genetic counseling, the high percentages of complete agreement on the perceived benefits (63.6%-83.6%) point towards a consistent acceptance of this service, aligned with international evidence that highlights the usefulness of counseling in the promotion of genetic health literacy[18,19]. However, the lower rate of complete agreement with items related to family impact (statement 7: 47.6%) and the increase of partial agreement answers suggests uncertainties about the emotional consequences for families, which has already been described as a subjective barrier to genetic planning in other populations[7].

Cultural and religious barriers were widely rejected (≥72% of total disagreement in statements 10 and

Table 4. Association between answers to genetic counseling statements and sex of the Goiás surveyed population

Statements	**Completely agree** **n (%)**		**Partially agree** **n (%)**		**Neither agree nor disagree** **n (%)**		**Partially disagree** n (%)		**Completely disagree** n (%)		***p***
	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	
1	160 (82.9)	38 (82.6)	27 (14)	07 (15.2)	03 (1.6)	00 (0.0)	01 (0.5)	00 (0.0)	02 (01)	01 (2.2)	0.848
2	154 (79.8)	34 (73.9)	31 (16.1)	09 (19.6)	04 (2.1)	01 (2.2)	03 (1.6)	01 (2.2)	01 (0.5)	01 (2.2)	0.784
3	125 (64.8)	24 (52.2)	35 (18.1)	10 (21.7)	22 (11.4)	08 (17.4)	09 (4.7)	02 (4.3)	02 (01)	02 (4.3)	0.319
4	125 (64.8)	25 (54.3)	44 (22.8)	10 (21.7)	11 (5.7)	07 (15.2)	09 (4.7)	02 (4.3)	04 (2.1)	02 (4.3)	0.207
5	125 (64.8)	25 (54.3)	50 (25.9)	16 (34.8)	15 (7.8)	02 (4.3)	01 (0.5)	01 (2.2)	02 (01)	02 (4.3)	0.202
6	117 (60.6)	25 (54.3)	41 (21.2)	12 (26.1)	21 (10.9)	04 (8.7)	11 (5.7)	03 (6.5)	03 (1.6)	02 (4.3)	0.692
7	91 (47.2)	23 (50)	47 (24.4)	12 (26.1)	30 (15.5)	05 (10.9)	13 (6.7)	04 (8.7)	12 (6.2)	02 (4.3)	0.897
8	12 (6.2)	09 (19.6)	23 (11.9)	10 (21.7)	36 (18.7)	13 (28.3)	51 (26.4)	08 (17.4)	71 (36.8)	06 (13)	<0.001*
9	10 (5.2)	07 (15.2)	11 (5.7)	06 (13)	23 (11.9)	08 (17.4)	43 (22.3)	12 (26.1)	106 (54.9)	13 (28.3)	0.006*
10	04 (2.1)	04 (8.7)	00 (0.0)	04 (8.7)	16 (8.3)	05 (10.9)	25 (13)	05 (10.9)	148 (76.7)	28 (60.9)	<0.001*
11	06 (3.1)	07 (15.2)	03 (1.6)	04 (8.7)	07 (3.6)	06 (13)	29 (15)	06 (13)	148 (76.7)	23 (50)	<0.001*

Captions: ♀ female, ♂ male; **p*<0.05 as per the chi-square test (Pearson's χ^2).

11), indicating that fatalistic or religious beliefs do not constitute central obstacles to this population sample, which has also been observed in similar studies[20]. This result contrasts with opposition reports influenced by spiritual beliefs in less educated communities[21], possibly explained by the high education and previous access to the genetic information of the participants in this research. On the other hand, practical and financial doubts (statement 6) maintained moderate levels of partial agreement, showing that, despite a general acknowledgment of the benefits, concerns about costs and logistics remain tangible barriers, which has also been acknowledged by the literature[7].

The results of the statistical association reinforce important nuances: the personal history of cancer was correlated to lower complete agreement rates in the perceived advantages and greater sensitivity to family impact, suggesting that direct experience of the illness modulates both expectations and fears regarding genetic counseling. This relationship contrasts with the literature findings in which oncological patients develop a greater responsibility for their health[22]; however, it aligns with the finding that recently diagnosed cancer patients usually experience greater mental suffering, which negatively affects their self-care abilities[23].

In fact, the emotional impact of cancer frequently involves anxiety, depression, and persistent pain, conditions that reduce motivation to seek information and adherence to genetic counseling[24]. Moreover, psychosocial barriers described in recent reviews suggest that fear of genetic stigma, emotional overload concerning risks to the family, and limited perception of the immediate benefit are determining factors in the refusal to get counseling[25,26]. These elements help explain the lower agreement rate among individuals with a personal history of the illness, who might perceive counseling not as an empowering tool, but as a reinforcement of the vulnerability and uncertainty associated with cancer. Such findings reinforce the need for integrated strategies that articulate emotional support and genetic education, favoring informed participation and reconstruction of a sense of control among survivors and oncological patients.

On the other hand, family history presented an association only with certain barriers (statements 8 and 10), which might indicate that bonds of affection and memories of family cases especially influence the cost-benefit perception and conflict with personal beliefs, facilitating the process towards a favorable decision to undergo preventive exams. We highlight that, although a family history of cancer usually increases motivation for preventive actions, the type of personal experience — that is, if the individual experienced cancer directly, followed the illness of a close relative, or just had indirect contact with cases in their community — distinctly shapes risk perceptions and self-care strategies[27].

These experiences range from more concrete and emotional (like the diagnosis itself) to generalized or symbolic (like the memory of a relative who had cancer), which influences the way each person interprets messages on genetic counseling. Whereas practical experiences, in which the individual actively participates in the care of families or friends, usually strengthen the sense of responsibility and surveillance, favoring early detection attitudes and adherence to preventive practices[27].

Finally, no consistent sex differences were observed in most assessed categories, except for men, who demonstrated less willingness to genetic testing — justifying it mainly due to low prioritization of the theme, reduced perception of its usefulness, religious barriers, and a fatalist perspective on testing. Qualitative studies suggest that men in families with a genetic risk face obstacles: ignorance of their own risk, difficulties communicating with family, less direct referral by healthcare professionals, and concerns about the psychological and logistical implications of the test[28,29]. Another specific study on men with prostate cancer found that many valued genetic counseling, but underestimated the risks the results could bring to female relatives, and tend to seek information only in specific moments of the illness journey[30].

These findings suggest that communication strategies and genetic counseling provision should go beyond gender differentiation: they require customized interventions that consider life narratives, illness experience, the cultural context, and the care network of each individual. Thus, counseling models that integrate psychosocial — such as building meaning, coping with fears, family dynamics — and economic components — accessibility and logistics — to purely genetic aspects could increase adherence and effectiveness in male populations at risk[7,18,19].

The main limitation of this study is the non-probabilistic convenience sampling, conducted mainly via social networks and personal connections, which introduces a selection bias by favoring the participation of individuals with higher education and socioeconomic backgrounds. In the Brazilian context, evidence from the Information and Communication Technology (ICT) Homes survey indicate that the main inequalities in the use and engagement in digital platforms are found in individuals who have studied up to high school, while people who studied further than high school (≥12 years of study) present high and relatively similar use rates, especially when associated with higher incomes[31]. This structural inequality also helps us understand the results observed in the present study.

The racial profile of the sample demonstrates an over-representation of white individuals, who correspond to 61.1% of participants, a proportion superior to that observed in the population of the State of Goiás (36.2%). In contrast, groups that compose the majority or an expressive portion of the Goiás population — like brown (54.18%), black (9.2%), and indigenous (0.28%) people — are underrepresented in the sample. It must be further underscored that the study had no indigenous participant[32]. This racial composition of the sample must be interpreted considering the methodological design and the self-selection bias, and not as a direct reflection of differences in access or use of digital technologies according to skin color[31]. Moreover, this distribution may reflect historical and institutional inequalities in access to healthcare services, genetic information, and participation in scientific studies, a phenomenon described in the literature and previously discussed[14-17].

Consequently, the findings must not be extrapolated to the totality of the Goiás population. They are predominantly restricted to the perceptions of a privileged socioeconomic and educational portion of society. This characteristic imposes caution in the interpretation of agreement with genetic counseling and assessment of the relevance of cultural and practical barriers in vulnerable contexts. To advance on the theme, further studies are needed that employ stratified, robust samples and methodologies dedicated to elucidating the underlying motivations and barriers faced by historically marginalized groups, ensuring greater external validity and practical applicability of the results.

CONCLUSION

This study showed a favorable perception of genetic counseling for breast and/or ovarian cancer in a mostly female, young sample of educated people from Goiás, with high adherence to benefits and rejection of the main cultural and religious barriers. The analyses indicated that a personal history of cancer has more influence on the rate of agreement on the benefits and family impact, while a family history modulates some opposition to the service. The lack of significant differences between men and women in most statements reinforces the universality of acceptance, despite variations in specific barriers.

These findings reinforce the importance of strategies that integrate technical aspects and individual experiences, including financial concerns, to optimize adherence to the service. We recommend that further multicentric qualitative studies be conducted to deepen understanding of the psychosocial factors and guide actions directed at less represented groups.

CONTRIBUTIONS

Amanda Vitória de Oliveira Lima and Jalsi Tacon Arruda have substantially contributed to the study design, acquisition, analysis and interpretation of the data, wording, and critical review. Isadora Alves Gamboa, João Victor Martins Bordigoni, Pedro Henrique Paulino Pereira de Souza, and Ysabelle de Oliveira Saraiva have substantially contributed to the study design, acquisition, analysis and interpretation of the data, and critical review. All the authors approved the final version for publication.

DECLARATION OF CONFLICT OF INTERESTS

There is no conflict of interest to declare.

DATA AVAILABILITY STATEMENT

All the contents associated with the article are included in the manuscript.

FUNDING SOURCES

None.

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Recebido em 25/8/2025
Aprovado em 2/2/2026

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