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Influence of Demographic Factors on Attitude to Genetic Counselling Among Breast Cancer Patients in Lagos, Nigeria

Bolatito Funmilayo Ayeni[1,2], Adebayo Olayiwola Adejumo[2], Dare Azeez Fagbenro[3]

[1]Elizabeth House Acute Mental health hospital, Leicester, United Kingdom
[2]Department of Psychology, University of Ibadan, Nigeria.
[3]Department of Psychology, University of Ilorin, Ilorin, Nigeria

Corresponding author:

Dare A. Fagbenro
*Third Author
Fagbenro.da@unilorin.edu.ng

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Abstract

Background: Many factors have been investigated on attitude to genetic counselling among cancer patients but the role demographic factors can play on attitude to genetic counselling is still scarce in the extant literature. **Objective:** The study examined the influence of demographic factors (marital status and educational qualification) on attitude toward genetic counselling among breast cancer patients in Lagos, Nigeria. **Method:** The study adopted an ex post facto cross-sectional study design to purposively selected 187 respondents (mean age = 49.9years, σ = 14.04) who responded to a completed measures of socio demographic factors and attitude toward genetic counselling scale. **Results:** The results revealed that there was statistically significant main influence of marital status on attitude toward genetic counselling ($F_{4,182} = 3.32$, $p<.05$), with widowed patients having favourable attitude toward genetic counselling. There was also no statistically significant influence of educational qualification on attitude toward genetic counselling ($F_{4,182} = 1.96$, $p>.05$). **Conclusion:** The study concluded that marital status specifically divorced cancer patients have favourable attitude toward genetic counselling.

Keywords: Attitude toward genetic counselling; marital status, educational qualification; cancer patients

Abstrak

Latar Belakang: Banyak faktor telah diteliti mengenai sikap terhadap konseling genetik di kalangan pasien kanker, tetapi peran faktor demografis dalam sikap terhadap konseling genetik masih jarang dibahas dalam literatur yang ada. **Tujuan:** Studi ini meneliti pengaruh faktor demografis (status perkawinan, dan kualifikasi pendidikan) terhadap sikap terhadap konseling genetik di kalangan pasien kanker payudara di Lagos, Nigeria. **Metode:** Studi ini menggunakan desain studi potong lintang ex post facto untuk secara sengaja memilih 187 responden (usia rata-rata = 49,9 tahun, σ = 14,04) yang menjawab kuesioner lengkap mengenai faktor sosiodemografis dan skala sikap terhadap konseling genetik. **Hasil:** Hasil penelitian juga mengungkapkan adanya pengaruh utama yang signifikan secara statistik dari status pernikahan terhadap sikap terhadap konseling genetik ($F4,182 = 3,32$, $p < 0,05$), di mana pasien yang berstatus janda/duda memiliki sikap yang positif terhadap konseling genetik. Selain itu, tidak ditemukan pengaruh yang signifikan secara statistik dari jenjang pendidikan terhadap sikap terhadap konseling genetik. **Kesimpulan:** Studi ini menyimpulkan bahwa status pernikahan—khususnya pada pasien kanker yang telah bercerai—berkaitan dengan sikap positif terhadap konseling genetik.

Kata kunci: Sikap terhadap konseling genetik; jenis kelamin; status perkawinan; kualifikasi pendidikan; pasien kanker

Introduction

Globally, breast cancer remains a public health problem that is commonly diagnosed mainly among the female population (Cuthrell et al., 2023; Arnold et al., 2022; Huang et al., 2021). Approximately, 2.3 million breast cancer cases and 665,000 deaths have been reported in the world (Reddy et al., 2024) with more incidence in developing countries (Ramathebane et al., 2021). In Africa, specifically Lesotho, breast cancer incidence is around 9.6% of all cancers diagnosed in 2020 causing so many deaths of women (Global cancer observatory 2021). In sub-saharan region specifically Nigeria, cancer causes more than 70,000 deaths per year (Ogunniyi et al., 2025) making it the second leading cause of women death in the world (Siegel et al., 2023), and the deadliest cancer type in Nigeria (Ngene et al., 2018; Ogunniyi et al., 2025). The psychological impact of this disease among sufferers include depression, anxiety, post traumatic stress, suicide ideation and attempts (Myint et al., 2025).

One way that have been identify to change the narration of breast cancer and its complications is attitude toward genetic counselling. Attitude to genetic counselling in this study refers to set of beliefs, emotions, and behaviours toward genetic screening and counselling. Attitudes are enduring, and they can be negative or positive. For instance, individuals with a favourable attitude toward genetic counselling will be more likely to seek and engage in genetic counselling, while people with a negative attitude toward genetic counselling may exhibit poor adherence and worsened health outcomes or increase the spread of such illness. Breast cancer genetic screening been associated to 33% reduction in breast cancer-related mortality through enabling early-stage tumors, which is linked to a favourable prognosis (Bhatia et al., 2020) for many patients.

Studies have also consistently shown a positive attitude in genetic testing for breast cancer and other hereditary diseases in developed countries (Botoseneanu et al. 2011; Ngene et al., 2018), while in developing countries there is low level of genetic counselling uptake/utilisation (Nja et al., 2022), despite higher disease burdens in the region (Martei et al., 2022). It is worrisome that despite several awareness and sensitization campaigns on the need for regular genetic counselling as a preventive measure for breast cancer; many women still have unfavourable attitude toward genetic counselling. Therefore, some personal factors that is relatively neglected in the extant literature need to be taken into consideration to understand these variations. Understanding these personal factors such as marital status and educational qualification can contribute to the design of appropriate interventions that can strengthen patient's toward having favourable attitude toward genetic counselling in a populated African country like Nigeria.

The theoretical frameworks of the Health Belief Model (Rosenstock et al., 1974) and the Theory of Planned Behaviour (Ajzen, 1980) also help expatiate the understanding of cancer patients' attitudes toward genetic counselling. The Health Belief Model (HBM) assert that health behaviour like breast cancer counselling, are influenced by the value of actions to mitigate them (Rosenstock et al., 1974). Therefore, cancer patients who perceive self as high risk and understand the threat of breast cancer are more likely to engage in genetic counselling. On the other hand, Theory of Planned Behaviour (Ajzen, 1980) emphasis that the intention to engage in a health behaviour such as genetic counselling is determined by subjective norms, perceived behavioural control, and attitudes. Thus, patients who perceive genetic counselling as beneficial and supported by family and friends are more likely to have a positive attitude, while patients who believe it may lead to increased anxiety may have a negative attitude.

Past empirical studies (Adejumo & Olaoye, 2018; Wuraola et al., 2025; Ayeni et al., 2026) have explored knowledge level, SMS-based psycho-education, cultural and psychological factors on attitude toward genetic counselling. Never the less personal attributes relating to attitude toward genetic counselling among cancer patients in Nigeria is scarce in given less research attention. Based on the theoretical frameworks of health belief model and theory of planned behaviour, we hope to fill this research gap by exploring the influence of demographic factors (marital status and educational qualification) on attitude toward genetic counselling. The outcome is expected to provide well informed tailoured personal attributes interventions aimed to improve genetic counselling among cancer patients in Africa and specifically Nigeria.

Literature Review

Marital status and attitude toward genetic counselling

Marital status refers to patient marital status in terms of being, single, married, divorced or separated. Study on marital status on attitude toward genetic counselling is scarce, Olubiyi et al. (2013) found that single respondents had a high level of knowledge about sickle cell disease and good attitude towards genetic counselling before marriage. Ghanim et al. (2025) in their study found that married individuals were more likely to engage in genetic services, largely because of concerns about childbearing and routine health decisions. Khalil et al. (2026) found that married individuals were more likely to engage in genetic services,

largely because of concerns about childbearing and routine health decisions. Bener et al. (2019) found that attitudes toward genetic counselling are strongly shaped by marriage-related decisions, cultural expectations, and partner selection, indicating that individuals approaching marriage are more motivated to accept counselling services. Muhammed and Ojo (2026) found that 69% of respondents had negative attitudes toward premarital genetic counselling, reflecting limited engagement among largely single populations. It therefore can be deduced that married individuals tend to have more positive attitudes toward genetic counselling, while single individuals often show lower acceptance

Educational qualification and attitude toward genetic counselling

Educational qualification refers to the highest level of formal education an individual has completed. Direct study on educational qualification on attitude toward genetic counselling especially in Nigeria is limited but available in another context. Al-Enezi et al. (2017) found that educational qualification predict knowledge about hereditary disease. Alotaibi et al. (2022) found that level of education was significantly associated with knowledge of genetics, which in turn strongly predicted attitudes toward genetic testing and counselling. Ghanim et al. (2025) found that Individuals with higher educational backgrounds were more aware of the benefits, risks, and applications of genetic counselling, leading to more favourable perceptions and willingness to utilize these services. Al shawish and Yaseen (2018) in their cross-sectional study in Palestine found that there is a significant positive relationship between parents' educational level and their knowledge regards genetic disorder which in turn predicted more positive attitudes toward genetic counselling and testing. Čargonja et al. (2021) found among medical students that education in medical genetics significantly improved attitudes toward genetic testing and counselling. This means that higher educational exposure leads to increased competence and positive attitudes. Likhanov et al. (2023) found that there was weak correlation between educational level and willingness to undergo genetic testing. Studies such as Henneman et al. (2006) and Sanderson et al. (2004) found that less education did not lead participants to engage in genetic testing for heart disease. Studies such as (Morren et al., 2007; Calsbeek et al., 2007) found that young adults with higher educational levels have higher level of genetic knowledge.

Hypotheses

Based on the aforementioned empirical review and theoretical standpoint, the stated hypotheses guided the present study:

1. There will be significant influence of marital status on attitude toward genetic counselling
2. There will be significant influence of educational qualification on attitude toward genetic counselling.

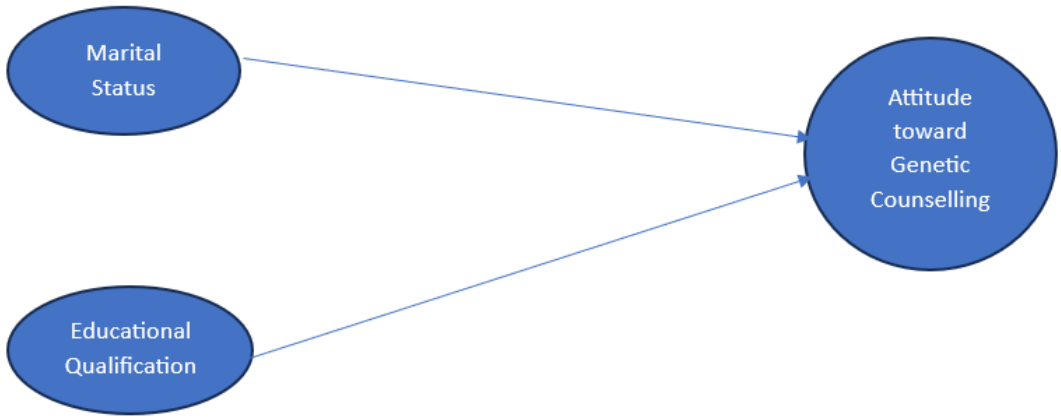


Figure 1. Hypothesised Model of the study

Method

study adopted the ex post facto cross-sectional study design. This is because data was collected using a questionnaire at a point in time from participants who were breast cancer patients. The criterion variable is attitude toward genetic counselling while the independent variables are demographic factors (marital status and educational qualification). The design is popular, cost effective and simple to recruit population like breast cancer patients.

Sample or Population

The participants of the study consist of one hundred and eighty-seven (187) selected from participants receiving treatment for breast cancer at the Lagos University Teaching Hospital (LUTH). Table 1 shows the socio-demographic features of the study sample. The inclusion criteria are that participants must be diagnosed and managed for breast cancer by the Lagos State University Teaching Hospital; must be able to communicate and write in the English language, and must be willing to give written consent prior to participation in the study. Participants with other types of cancer, as well as low levels of education below secondary school, were excluded from the study.

The sample size was determined using the Yamane's (1967) statistical formula $N/(1+Ne^2)$. The population of cancer patients in the hospital as at December 2020 was two hundred and fifty-eight (258), with a 0.05 margin of error (e^2). Hence the sample size came out to be 157 but for better robustness, the sample was increase to two hundred (200). Participants of the study were selected based on the inclusion/exclusion criteria while selected respondents completed questionnaires that starts from November 2021 to April 2022.

Data Measurement

Data in this study was collected from Faculty of the Social Sciences and Humanities Research Ethics Committee (SSHREC) with assigned number (UI/SSHREC/2018/0036) and Health Research Ethics Committee LUTH with the assigned number (ADM/DCST/HREC/APP/4172). Before the data collection, the researcher sought informed consent via written from the participants of the study. Also, the researcher explained the rationale of the study and also assured participants of their confidentiality. They were also assured voluntary withdrawn at anytime they so wish to. No incentive was attached to the study rather the participants were thanked at the end of the exercise. In all, the study was done in accordance with Declaration of Helsinki on ethical standards and guidelines for research involving human participants. The study used a validated questionnaire that consist of two sections. The first section consists of the demographic profile of the respondents which consist of age, gender, ethnicity, educational qualification and marital status. The second section is the attitude toward genetic counselling developed by Adejumo and Olaoye (2018). The section measures the kind of attitude individuals have toward genetic counselling. The scale was scored on a 4-point Likert scale (1 = strongly agree, 4 = strongly disagree). A sample of the scale reads, "No matter the obstacles, I support genetic counselling" and "I place high priority on genetic counselling." A score above the mean of 18.74 and SD= 3.76 indicates a positive attitude towards genetic counselling, and a score below the mean of 18.74 and SD= 3.76 indicates a negative attitude towards genetic counselling. A Cronbach's alpha of 0.68 was obtained by the authors. The present study also reported a Cronbach's α (0.82). Bartlett's test of sphericity was statistically significant ($p < .001$), and the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy was 0.79, implying data independence.

Data Analysis

Data in the study was entered and analysed using the Social Sciences Statistical Package (IBM-SPSS) version 27. Descriptive statistics such as means, frequencies and percentages were used to report the sample personal characteristics. The inferential statistics such as One way ANOVA was used to test hypothesis 1 and 2. Prior to main analysis, a preliminary analysis was done to check missing values, normality, homoscedasticity, and linearity. All these assumptions were met accordingly to Hair et al. (2010)

Result

Table 1: Socio-demographic distribution of respondents

Demographic variables	**n**	**%**
Gender		
Female	184	98.4

Male	3	1.31
Marital Status		
Married	135	75.2
Single	25	10.2
Separated	14	7.5
Divorced	9	4.8
Widowed	4	2.1
Religion		
Christianity	143	76.5
Islam	44	23.5
Ethnic Group		
Yoruba	109	58.3
Non-Yoruba	78	41.7
Educational qualification		
Secondary school cert.	53	28.3
National Diploma	47	23.1
Higher ND	17	9.1
University degree	58	31.1
Postgraduate	12	6.4

Note. *N=187(100%).* The mean age was 49.9, the minimum age was 23, and the maximum was 86 (SD=14.04).

The demographic characteristics revealed that 3(1.6%) were males while majority 184(98.4%) were females. Their marital status shows that 135(75.2%) are married, 25(10.2%) are single, 14(7.5%) were separate, 9(4.8%) were divorced while 4(2.1%) were widowed. In terms of religion affiliation, 143(76.5%) were practicing Christianity while 44(23.5%) practiced Islam. Their ethnic group shows that 109(58.3%) were Yoruba while 78(41.7%) were non-Yoruba. In terms of educational qualification 53(28.3%) had secondary school certificate, 47(23.1%) had national diploma, 17(9.1%) had higher ND, 58(31.1%) had university degree while 12(6.4%) had postgraduate. Finally, the mean age is 49.9years and SD of 14.04 and participants ranges from 23 to 86years.

Hypothesis Testing

H1: There will be significant influence of marital status on attitude toward genetic counselling. The hypothesis was tested using one-way ANOVA and the analysis presented in Table 2a, b and c.

Table 2a. Summary of one-way ANOVA showing the influence of marital status on attitude toward genetic counselling

		Sum of Squares	df	Mean Square	F	p
Attitude toward genetic counselling	Between Groups	199.74	4	49.94	3.32	<.05
	Within Groups	2739.35	182	15.05		
	Total	2939.09	186			

The result above revealed that there was statistically significant main influence of marital status on attitude toward genetic counselling ($F_{4,182}$ = 3.32, p<.05). A Kruskal–Wallis test was further conducted to determine whether the outcome differs significantly across the five marital-status groups.

Table 2b. Summary of Kruskal–Wallis test of the marital status groups

Rank	Marital status	N	Mean Rank	Kruskal-Wallis H	df	Asymp. Sig.
				15.13	4	.004
Attitude Genetic Counselling	Married	135	99.16			
	Single	25	87.22			
	Separated	14	60.43			
	Divorced	9	61.50			
	Widowed	4	153.00			

The Table 2b shows that widowed group (153.00) has the highest mean rank, followed by married (99.16), single (87.22), divorced (61.50) and separated (60.43). The test revealed that the outcome differs significantly across the five marital-status groups which makes the pairwise comparisons robust enough for the ANOVA result. Consequently, Tukey's-Kramer HSD (Honest Significant Difference) for unequal group post hoc test was conducted in order to know the marital status mean differences that influence attitude toward genetic counselling. The analysis is presented in Table 2c:

Table 2c. Tukey's-Kramer HSD for unequal Groups showing multiple comparison of marital status on relapse avoidance ability

SN	Marital status	1	2	3	4	5	Mean	SD
1	Married	-					18.66	3.89
2	Single	.90	-				17.76	3.79
3	Separated	2.52*	1.62	-			16.14	3.11
4	Divorced	2.99*	2.09	.48	-		15.67	5.55
5	Widowed	3.09	3.99	5.61*	6.08*	-	21.75	0.50

The results of the post hoc Tukey's-Kramer HSD test indicated that patients who are widowed (M= 21.75, S.D = 0.50) reported higher scores on attitude toward genetic counselling, compared to those who are married (M= 18.66, S.D = 3.89), single (M= 17.76, S.D = 3.79), separated (M= 16.14, S.D = 3.11) and divorced (M= 15.67, S.D = 5.55). Furthermore, the results revealed a significant difference in the attitude toward genetic counselling of patients who are married and separated (Tukey = 2.52; p<.05) and patients who are married and divorced (Tukey = 2.99; p<.05). Also, those who are separated and widowed (Tukey = 5.61; p<.05) and patients who are divorced and widowed (Tukey = 6.08; p<.05). Hypothesis 1 was accepted. This was also graphically presented in Figure 2.

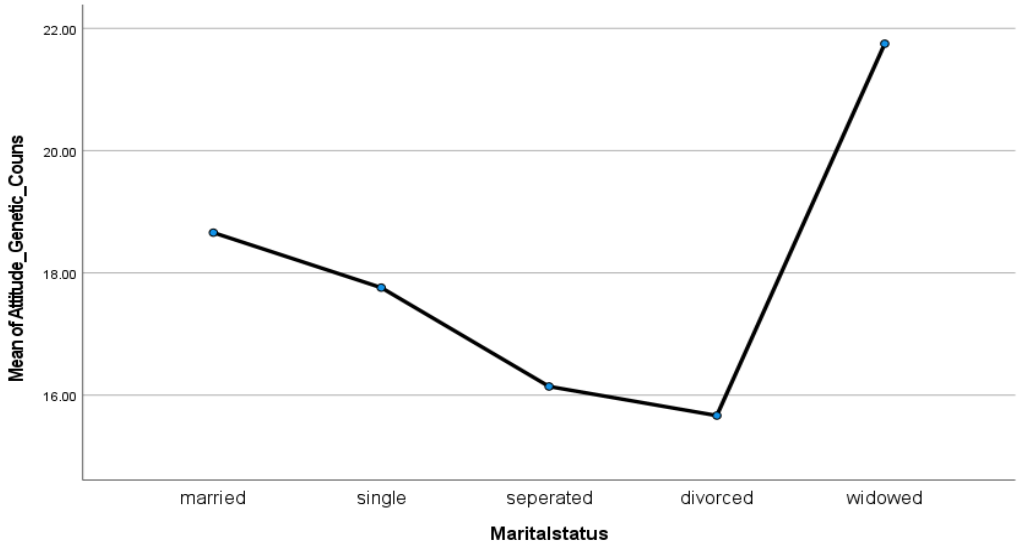


Figure 2. Graphical representation of breast cancer patients on their attitude toward genetic counselling based on marital status

H2: There will be significant influence of educational qualification on attitude toward genetic counselling. The hypothesis was tested using one-way ANOVA and the analysis presented in Table 3.

Table 3. Summary of one-way ANOVA showing the influence of educational qualification on attitude toward genetic counselling

		Sum of Squares	df	Mean Square	F	p
Attitude toward genetic counselling	Between Groups	122.43	4	30.60	1.96	.10
	Within Groups	2816.65	182	15.47		
	Total	2939.091	186			

The result above revealed that there was no statistically significant main influence of educational qualification on attitude toward genetic counselling ($F_{4,182} = 1.96$, $p>.05$). Therefore, H2 was rejected

Discussion

The present study examined the influence of demographic factors (marital status and educational qualification) on attitude toward genetic counselling. Two hypotheses were postulated to guide the study. The first hypothesis hypothesised that there will be significant influence of marital status on attitude toward genetic counselling. It was discovered that participants who are widowed tends to have favourable attitude toward genetic counselling than patients who are single, married, separated and divorced. The study finding was in line with Bener et al. (2019) who found that attitudes toward genetic counselling are strongly shaped by marriage-related decisions, cultural expectations, and partner selection, indicating that individuals approaching marriage are more motivated to accept counselling services.

The study finding was not similar to Olubiyi et al. (2013) who found that single respondents had a high level of knowledge about sickle cell disease and good attitude towards genetic counselling before marriage. The finding was in support of Mochiki et al. (2022) who reported that divorced cancer patients might be more hesitant to seek genetic counselling due to concerns about societal perceptions or personal insecurities. The study was also not in accordance with Ghanim et al. (2025) who found that married individuals were more likely to engage in genetic services, largely because of concerns about childbearing and routine health decisions. The study does not align with Khalil et al. (2026) who found that married individuals were more likely to engage in genetic services, largely because of concerns about childbearing and routine health decisions. The justification for this surprising finding maybe that widowed individuals most time have heightened health awareness and healthcare utilization as a result of the loss of their spouse. Therefore, having experienced the loss of a partner (possibly from illness), widowed individuals may be more motivated to seek

preventive information, including genetic counselling, to avoid further health crises. Also, widowed individuals may have greater autonomy in health decision-making compared to other kind of individuals from other marital status, whose decisions are often influenced by external forces such as spouses, finance or family structures. This autonomy can facilitate a more positive and independent attitude toward genetic counselling.

The second hypothesis stated that there will be significant influence of educational qualification on attitude toward genetic counselling. The finding revealed that educational qualification did not influence attitude toward genetic counselling. The study finding was not in accordance with Likhanov et al. (2023) who found that there was weak correlation between educational level and willingness to undergo genetic testing. Also, studies such as Henneman et al. (2006) and Sanderson et al. (2004) found that less education did not lead participants to engage in genetic testing for heart disease. The study was not similar with Ghanim et al. (2025) who found that Individuals with higher educational backgrounds were more aware of the benefits, risks, and applications of genetic counselling, leading to more favourable perceptions and willingness to utilize these services. Also, the finding was not in line with Al shawish and Yaseen (2018) who found that there is a significant positive relationship between parents' educational level and their knowledge regards genetic disorder which in turn predicted more positive attitudes toward genetic counselling and testing. The rationale for this finding may be unconnected to the fact that health information especially on cancer may be largely regulated by health workers specifically doctors and clinicians rather than whether a patient is highly educated or less educated. Also, the severe sample size limitation of the group especially among widowed may have also change the direction of the result.

Despite the significant contributions this present study has contributed to the extant literature, it still has some limitations. First, the study makes use of one teaching hospital (Lagos State Teaching Hospital) in Nigeria which may limit the result generalisation to the entire breast cancer patients in Nigeria. Also, the sample size is also relatively small which may also limit it interpretation to broader contexts. Also, ex post facto cross-sectional study design of the study may limit causality among the study variables. Lastly, despite a significant influence of marital status specifically widowed having an influence on attitude toward genetic counselling, the findings need to be interpreted cautiously due to the unequal group comparisons.

Conclusion

The study was able to conclude that widowed cancer patients have better attitude toward genetic counselling than patients who are single, married, divorced and separated. The study also concluded that educational qualification did not play any role on attitude toward genetic counselling among cancer patients. Based on this conclusion, the study implies theoretically that the study contributed to extant literature on attitude toward genetic counselling by showing the important role of Health Belief Model (Rosenstock et al., 1974) and Theory of Planned Behaviour (Ajzen, 1980) in explaining the influence of demographic factors (marital status and educational qualification). Empirically, the present study has filled a gap in the body of knowledge by being the first study to have explored demographic factors of marital status and educational qualification on attitude toward genetic counselling. Thus, the study advocates a paradigm shift in the intervention that will not only inculcate psychological interventions but also demographic-inclined interventions. We therefore recommend that clinical psychologists in collaborations with genetic counsellors should design psycho-education intervention that is specifically tailoured toward cancer patients who are single, married, separated and divorced and are educated and uneducated individuals. This invariable will improve their level of awareness and in turns make them have a favourable attitude toward genetic counselling. Also, awareness genetic programmes should also be promoted among Nigerian population. This way will make Nigerians have positive attitude toward genetic counselling. It is vital to recognize that the aforementioned limitations can be addressed by future studies, for example future studies may increase the sample size of the study to enhance robustness and generalisation of the result findings. Also, longitudinal study may be carried out by future studies in a bid to have a deeper and better understanding of factors influencing attitude toward genetic counselling. Finally, more public hospitals can be utilised in order to have a more valid and meaningful findings.

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