Scientific Research Publishing

Influence of Socioeconomic Profile on Uptake of Immunohistochemistry Services among Women with Breast Cancer Attending Tertiary Health Facilities

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Abstract

Background: Breast cancer is the leading cause of death from cancer in women worldwide. It can be stratified by histological and immunopathological analysis as well as by molecular subtypes. Socioeconomic and cultural-mediated factors contribute to breast cancer heterogeneity and overall survivability. **Objective:** The aim of this study was to determine the influence of socioeconomic profile on the uptake of immunohistochemistry (IHC) services among women with breast cancer attending tertiary health facilities in Imo State. **Methodology:** This descriptive cross-sectional study was carried out among women with breast cancer in Imo State. The instrument for data collection used was a structured questionnaire constructed in line with the objectives of the study. A total of 121 respondents were selected randomly from a target study population of 891 using a systematic sampling technique. The software Statistical Package for Social Sciences (SPSS) version 21 was used for data analysis. **Results:** The mean age of the 121 respondents in this study was 45.2 ± 0.7 years. Age and education levels of the respondents were found to significantly influence the utilization of IHC services ($P < 0.0001$). In terms of age, the level of uptake of IHC services was found higher among younger women (75%) compared to the elderly. In relation to the level of education, uptake was found higher among participants with tertiary education (69.5%) compared to primary and secondary educational levels respectively. **Conclusion:** In our study, the consumption of IHC services was influenced significantly by

the respondents' age and level of education. Consequently, public health awareness programmes centred on the importance of IHC services in the management of breast cancer should be encouraged, so as to reach the less educationally endowed and older women in order to save more lives.

Keywords

Breast Cancer, Uptake, Immunohistochemistry, Socioeconomics Profile, Age, Education

1. Introduction

Among women worldwide, breast cancer is the most frequently diagnosed cancer and the leading cause of cancer-associated deaths accounting for almost one-quarter of incidents of cancer cases and 15% of cancer deaths [1]. According to the World Health Organization's (WHO) 2020 annual breast cancer report, an estimated 2.26 million new case was diagnosed worldwide in 2020 [2]. Although breast cancer incidence is said to be lower in Sub-Saharan African countries than in developed countries, African women are more likely than women in the developed world to be diagnosed at later stages of the disease and thus are more likely to die from it [3]. This is due to the lack of awareness by women, accessibility to screening methods and availability of African-based research findings that would influence decision-making at the governmental level [3] [4]. Some investigators have reported rising incidence in Nigeria [5]. In Imo State, breast cancer has been reported to be the most common cancer among women [6].

Globally, over the last few decades, there have been excellent advances in breast cancer management leading to earlier detection of disease and development of more effective treatments resulting in significant declines in breast cancer mortality rate, and improved outcomes among women living with the disease, especially in developed countries [7]. One of these advances in breast cancer management is the use of targeted hormone therapy that is necessitated by immunohistochemistry molecular subtyping of breast cancer. It has been estimated to be responsible for 35% - 72% of the reduction in mortality [8]. However, the mainstay of breast cancer management and treatment approach is surgery when the tumor is localized, followed by chemotherapy (when indicated), radiotherapy and targeted hormonal therapy (when hormone receptors status is known) [9]. However, of these four approaches, the use of hormonal therapy stands out because of its increased survival advantage.

Breast cancer subtypes can be identified and classified using immunohistochemistry. According to Shaath *et al.* (2021), breast cancer subtypes are commonly grouped into four categories based on the immunohistochemical expression of hormone receptors: estrogen receptor positive (ER+), progesterone receptor positive (PR+), human epidermal growth factor receptor positive (HER2+), and triple-negative (TNBC), which is characterized by the lack of expression of

any of the above receptors [10]. Molecular subtypes influence the choice of therapy, determine the progression of the disease and predict the treatment response and long-term survival [11].

Significant breast cancer-related morbidity and mortality in Nigeria may not be unconnected to a number of variables, such as the influence of some factors on the use of immunohistochemistry diagnostic services, and other management variables. Therefore, we investigated the influence of the socioeconomic profile of women on breast cancer immunohistochemistry diagnostic services uptake among women in Imo State tertiary hospitals.

2. Material and Methods

A descriptive study design was adopted to determine the influence of socioeconomic profile on the uptake of immunohistochemistry services among women with breast cancer attending tertiary health facilities in Imo State, with the view of understanding their influence on uptake decisions. The study was carried out at the two tertiary hospitals in the Imo State, Nigeria which are Federal Medical Centre Owerri (FMCO) and Imo State University Teaching Hospital, Orlu (IMSUTH). Imo State is one of the 36 States in Nigeria.

The selection of participants for the study was based on the systematic sampling techniques, as it is not easy to reach out to all participants, and work with them at the same time, within the research period. This entails selection of members at regular sample intervals in accordance with Gravetten and Forzano (2012) [12]. The consenting participants who signed the consent form were given a structured questionnaire aligned with the objectives of our study with the aid of qualified research assistants, in order to collect data.

Permission and clearance to carry out this study were obtained from the Ethical Review Committees of Federal University Teaching Hospital, Owerri and Imo State University Teaching Hospital, Orlu respectively. The Statistical analysis in this study was performed, using the Statistical Package for Social Sciences (SPSS) version 21.0, and descriptive and inferential data statistics were deployed. Statistical significance was at 0.05.

3. Results

3.1. Sociodemographic Profile

A study of 121 respondents with age range 24 - 78 and mean of 45.2 years. Table 1 shows that the sociodemographic profile in our study shows that more proportion of the respondents were between 40 - 49 years of age with a total number of 49 (40.5%), followed by the 30 - 39 years old and the 50 - 59 with total numbers 28 (23.1%) and 24 (19.8%) respectively. The less than 20 years old were the least of all the age groups having 0 (0%) followed by 20 - 29 years old having 10 (8.3%) members each. All the women had formal education with majority (82: 67.8%) having studied up to tertiary education level, 36 (29.8%) have secondary education level and 3 (2.5%) have primary education level of education. The

Table 1. Distribution of respondents by sociodemograpic profile (n = 121).

Sociodemographic profile	Frequency	Percent (%)
Age (in years)		
Less than 20	0	0
20 - 29	10	8.3
30 - 39	28	23.1
40 - 49	49	40.5
50 - 59	24	19.8
60 - 69	10	8.3
Total	121	100.0
Education		
Primary	3	2.5
Secondary	36	29.8
Tertiary	82	67.8
Total	121	100.0
Marital status		
Single	16	13.2
Married	92	76.0
Divorced	3	2.5
Separated	10	8.3
Total	121	100.0
Occupation		
Unemployed/applicant	16	13.2
Public servant	57	47.1
Business/trading	43	35.5
Farming	4	3.3
Others	1	0.8
Monthly income in naira (₦)		
Less than 30,000	34	28.1
30,000 - 49,000	20	16.5
50,000 - 69,000	25	20.7
70,000 - 89,000	12	9.9
90,000 - 109,000	22	18.2
110,000 and above	8	6.6
Religious denomination		
Catholic	73	60.3

Continued

Protestant	21	17.4
Pentecostal	24	19.8
Faith tabernacle	3	2.5
Other religion (Islam, African Trad, religion, etc.)	0	0.0
When was the diagnosis of breast cancer made		
Less than 6 months	16	13.2
6 - 11 months	25	20.7
12 - 17 months	47	38.8
18 - 23 months	5	4.1
24 months and above	24	19.8
Not sure	4	3.3

group was dominated by married women (92: 76%), while 16 of them (13.2%) were single women, and the rest were either divorced (2.5%) or separated (8.3%).

Reasonable number of the subjects was either public servant (47.1%) or was engaged in business or trading activities (35.5%). Also, 13.2% were unemployed or job seekers.

In terms of monthly income 34 (28.1%) earn below the national minimum wage of ₦30,000 per month, 25 (20.7%) earn between ₦50 - 69, while only 8 (6.6%) earn at least ₦110,000. The respondents were all Christians, dominated by Catholic denomination (60.3%), while 17.4% and 19.8% were respectively of Protestants (Anglican, Methodist, etc.) and Pentecostal.

A total of 47 (38.8%) have been diagnosed of breast cancer for 12 - 17 months, and 25 (20.7%), were within 6 - 11 months. Those that were diagnosed of the disease within less than 6 months were 13.2%, while 19.8% were diagnosed within 24 months and beyond.

3.2. Socioeconomic Profile and Uptake of IHC Services

The relationship between the socioeconomic profile of the respondents and the uptake of IHC services was shown in Table 2. The table revealed predominant uptake among the younger women compared to the elderly. The uptake for patients below 30 years was 100%, followed by the patients 30 - 39 75%. Uptake within 40 - 49 was 51.%, 54.2% for 50 - 59, and 60 - 69, 50%.There is statistically significant association between age and uptake ($P = 0.019$, $\chi^2 = 11.747$). In relation to the level of education, IHC services uptake was found higher among tertiary education participants (69.5%) compared to those that were with secondary education level (41.7%). All the respondents had at least primary education level with only 2 at the primary level. Statistical significant between education level and the uptake is recorded in this study ($P = 0.017$, $\chi^2 = 8.094$).

Table 2. Socioeconomic profile of respondents and the uptake of immunohistochemistry.

Socioeconomic profile	Uptake: yes		Uptake: no		Total	χ^2	P
	Freq.	%	Freq.	%			
Age							
Less than 30	10	100.0	0	0.0	10		
30 - 39	21	75.0	7	25.0	28		
40 - 49	25	51.0	24	49.0	49		
50 - 59	13	54.2	11	45.8	24		
60 - 69	5	50.0	5	50.0	10		
Total	74	61.2	47	38.8	121	11.747	0.019*
Education							
Primary	2	66.7	1	33.3	3		
Secondary	15	41.7	21	58.3	36		
Tertiary	57	69.5	25	30.5	82		
Total	74	61.2	47	38.8	121	8.094[L]	0.017*
Marital status							
Single	11	68.8	5	31.3	16		
Married	54	58.7	38	41.3	92		
Divorced/separated	9	69.2	4	30.8	13		
Total	74	61.2	74	61.2	47	0.980	0.613
Occupation							
Unemployed/applicant	12	75.0	4	25.0	16		
Public servant	31	54.4	26	45.6	57		
Business/trading	29	67.4	14	32.6	43		
Farming	2	50.0	2	50.0	4		
Others	0	0.0	1	100.0	1		
Total	74	61.2	47	38.8	121	4.890	0.299
Monthly income in naira (₦)							
Less than 30,000	21	61.8	13	38.2	34		
30,000 - 49,000	13	65.0	7	35.0	20		
50,000 - 69,000	15	60.0	10	40.0	25		
70,000 - 89,000	4	33.3	8	66.7	12		
90,000 - 109,000	14	63.6	8	36.4	22		
110,000 and above	7	87.5	1	12.5	8		
Total	74	61.2	47	38.8	121	6.448	0.265
Religious denomination							
Catholic	42	57.5	31	42.5	73		

Continued

Protestant	16	76.2	5	23.8	21		
Pentecostal	14	58.3	10	41.7	24		
Faith tabernacle	2	66.7	1	33.3	3		
Others	0	0.0	0.0	0.0	0		
Total	74	61.2	47	38.8%	121	2.520	0.472
Duration: since diagnosed of breast cancer							
Less than 6 months	12	75.0	4	25.0	16		
6 - 11 months	14	56.0	11	44.0	25		
12 - 17 months	24	51.1	23	48.9	47		
18 - 23 months	4	80.0	1	20.0	5		
24 months and above	16	66.7	8	33.3	24		
Not sure	4	100	0	0.0	4		
Total	74	61.2	47	38.8	121	8.683[L]	0.122

L: likelihood ratio; χ^2 = Chi-square, P = probability value; *: significance at 5%.

Single ladies in our investigation had uptake of 11 (68.8%), 54 (58.7%) for married and 9 (69%). There is no statistical significant association between marital status and the uptake ($P > 0.05$). Similarly, no evidence of association was obtained in associating IHC services uptake with different occupations among the studied group ($P > 5\%$), yet uptake was found to be higher among the unemployed (75%) and those engaged in business or trading (67.4%) compared to the public servants. No particular pattern could be depicted on the correlation between monthly income IHC services uptake. The uptake was highest (87.5%) among the women earning at least ₦110,000 per month, followed by the women whose monthly income were between ₦30,000 - 49,000 at 65% and the ₦90,000 - 109,000 at 63.6%. However, at 5% level, significant association could not be established between uptake and income earned per month in the index study ($P > 0.05$).

Religious affiliation and duration since breast cancer diagnosed were not found to be significant associating factors of IHC services uptake in this study. All the participants were of Christian religion hence within different denominations in Christianity, uptake was similar among the Catholics (57.5%) and the Pentecostals (58.3%), but was found higher among the Protestants (76.2%).

4. Discussion

The participants in this study have a mean age of 45.2 and an age range of 24 - 78 years. This is consistent with a previous study Kafor *et al.* (2023), in which they profiled incidence of common breast cancer markers [13]. The mean age of the respondents is up to a decade younger than that of Caucasians and is comparable to Blacks in the western world [14] [15]. Most of the patients at the pres-

entation were premenopausal and youthful. This study is comparable to ones from other African institutions where the average age is 48 years [16] [17].

More respondents had tertiary level of education 82 (67.8%), followed by secondary education 36 (29.8%) and then primary education 3 (2.55%). It is expected that the level of knowledge should reflect the level of knowledge and hence perception which influences decisions.

Socioeconomic Profile and Uptake of IHC

Our study's results revealed that younger women were more likely to use immunohistochemistry services. First of all, this group of women had the highest incidence of breast cancer, which inevitably put them in the lead. They are also more likely to have anxiety about the risk of developing the disease and dying, which makes them more aware of the need to take action to avoid problems.

From our analysis, education was a key predictor of immunohistochemistry service uptake. Education means being endowed with knowledge that primarily influences decisions, and this cannot be overemphasized when it comes to use of beneficial health care [16]. Educated women among the respondents have the highest consumption of IHC services. Women with better education would be aware of the value of immunohistochemistry services and be more likely to use them.

5. Conclusions and Recommendations

This study affirms the predominance of breast cancer among youthful and premenopausal women, and this might be the reason for the higher uptake of IHC services from this category of respondents. The highest level of education attained by our respondents in this study was tertiary education, still dominated by the same youthful and premenopausal groups, making education a good predictor of IHC service uptake. Cues for action, particularly from health, as well as knowing knowledge of any victim of breast cancer, and knowing someone who has utilized IHC services, contributed to the uptake in this study. The perception of breast 3 Allred cancer/its treatment, despite the high degree of positivity, does not count as a predictor of IHC service utilization.

We hereby recommend that the health workers should be encouraged further in their role of giving all information that will motivate cancer patients to complete all necessary protocols for a full treatment of breast cancer patients. The government and all enlightened individuals should be involved in an awareness campaign on the needs of IHC service uptake.

Acknowledgements

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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