

**REVIEW****Level of Awareness and Knowledge of Breast Cancer in Nigeria. A Systematic Review.****Agodirin S Olayide<sup>1\*</sup>, Akande J Halimat<sup>2</sup>, Olatoke A Samuel<sup>1</sup> Rahman A Ganiyu<sup>1</sup>, Oguntola A Soliu<sup>3</sup>****OPEN ACCESS**

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**ABSTRACT**

**BACKGROUND:** *Despite reports of improved awareness of breast cancer entity and seemingly upbeat levels of other awareness subthemes in Nigeria, patients continue to present late when treatment is least rewarding. This paradoxical trend of both rising awareness and late presentation coupled with reports suggesting other competing drivers of late presentation question the “theory of poor awareness” as the foremost driver of late presentations. By aggregating available data, we aimed to assess what still constitutes poor breast cancer awareness in Nigeria in order to suggest how to allocate resources to reverse the paradox*

**METHOD:** *Studies conducted on Nigerian populace from 2000 to date were reviewed systematically. Search was made in PROSPERO, PubMed/MEDLINE, AJOL, Cochrane library, GOOGLE, ResearchGate and ACADEMIA. Primary outcome was level of awareness about breast cancer entity.*

**RESULT:** *Fifty-one eligible (48 descriptive surveys, 3 interventional ones) studies were reviewed. They included 19,598 respondents (98.5% females; 43% rural dwellers). 17,086(87.2%) were laypersons in various walks of life; 2,512(12.8%) were healthcare professionals. There were high levels of awareness of breast cancer entity, BSE, knowledge of fatality and benefit of early detection (weighted percentages 80.6%, 60.1%, 73.2% and 73.9% respectively). Weighted percentages of knowledge of symptoms/signs was 45.1%. Weighted percentages of sense of susceptibility and performance of BSE were low-26.8% and 22.9% respectively. Generally, rate of performance of screening did not vary with changes in the level of awareness/knowledge of concepts.*

**CONCLUSION:** *In general, low awareness of breast cancer may not be the direct and foremost driver of persistent late presentation in Nigeria.*

**KEYWORDS:** *Breast cancer, awareness, knowledge, Systematic review, Nigeria*

## INTRODUCTION

The great improvements in outcome of breast cancer (BC) management in High Income Centers (HIC) is credited largely to early diagnosis which accompany widespread awareness and uptake of screening. The improvement in survival experienced in such centers is transforming BC to just another chronic illness with focus of management now shifting towards coping with long term survival. In contrast, BC remains a catastrophic illness in Low and Middle Income Centers (LMIC); the top 10 highest mortality rates from breast cancer are recorded in LMIC and Nigeria is third on the list (1).

In Nigeria, the failure being experienced in BC control is not from inactivity. Awareness is expected to vary inversely with the duo of late presentation and poor outcome hence enormous resources is expended on awareness boosting programs (2-6) as the bedrock of the fight against BC. Yet the high rate of late of presentations persists (7,8).

Despite increasing reports of growing awareness of BC as an entity (5,7,8) and equivocal but seemingly upbeat levels of other awareness subthemes (3,9-12), tertiary centers in Nigeria continue to receive patients at late stages when treatment is least rewarding (13). A recent report from Northern Nigeria reported 99% late presentation (14). This paradoxical trend of both growing awareness and persisting late presentation coupled with reports suggesting other competing drivers of late presentation question the “theory of poor awareness” as the foremost driver of the persistent late presentations.

Therefore, the aim of this review was to assess the level of awareness of BC and what still constitutes poor awareness of BC among Nigerian populace by aggregating available data on breast cancer awareness or knowledge. Unveiling the true role of awareness and defining the relationship between the levels of its subthemes will guide allocation of resources, design of specific campaign slogans and development of guidelines for breast-cancer-risk groups and health-care workers interactions.

## METHODS

**Search strategy and data sources:** The search was conducted in three steps: the preliminary scoping and registration search, the detailed electronic search and the hand-search/snowballing. Preliminary scoping search and registration[registration no: 42016039869] in PROSPERO, an international register of prospective systematic reviews held by the University of York’s center for Reviews and Dissemination, confirmed that no similar systematic review was on-going or had been conducted recently. A preliminary scoping search in PubMed/MEDLINE identified search terms in preparation for detailed electronic search. The elected search terms were combined with Boolean operators for detailed electronic search in PubMed/MEDLINE(NCBI), EBSCOhost, Cochrane library, as “(breast cancer AND Nigeria) AND (awareness OR attitude OR perception OR knowledge OR practice OR screening OR behavior OR self-breast examination)” and in African Journals Online(AJOL) advanced search box as “breast AND awareness OR attitude OR perception OR knowledge OR practice OR screening OR behavior OR self-breast examination”. Based on the eligibility criteria, initial screening of article titles and abstracts identified from the detailed electronic search was conducted. Further search in PubMed Central, google, google scholar, ACADEMIA and ResearchGate was conducted by hand-searching plus snowballing on references of the articles that fit the eligibility criteria. Attempt was made to contact corresponding authors of articles not freely available in full. The search process opened on the 23<sup>rd</sup> of May 2016 and concluded on the 9<sup>th</sup> of July 2016.

**Quality assessment and data extraction:** Quality assessment preceded data extraction. Both processes employed specially designed forms. The data extraction form collected information about level of awareness of BC as an entity, awareness and performance of screening, knowledge of symptoms and risk factors of BC, awareness of severity of BC and awareness of benefit of screening and early detection. The detailed electronic search, quality assessment and data

extraction were conducted independently by two separate reviewers (ASO and AHJ) after initial training pilot sessions. The results obtained by the independent reviewers were harmonized. A third reviewer, OSA, was the tie-breaker. The quality assessment form was adapted from the STROBE statement checklist for observational studies (15) to suit the review requirements. Reviewers were not blinded to authors of the articles.

**Analysis:** Extracted data were imputed into SPSS v16 and R version 3.2.2 statistical package. Weighted percentages of the level of various concepts were calculated. Results were presented in descriptive statistics using SPSS v16 and R statistical software. The report was presented according to the PRISMA recommendations (16).

## RESULTS

The detailed online electronic search using the elected keywords/MeSH terms yielded a total initial hit of 413 articles of which 18 were duplicates. Sixty-two articles were eligible after the initial title and abstract review and snowballing/hand-searching. Among the 62, forty-nine were available in full on-line; one of the 49 article was stored and reviewed as two independent articles with two separate groups of respondents (17) because of its method and reporting pattern. Correspondence with two responsive authors yielded three articles but only two were eligible for inclusion after review of the full articles, making a total of 52 full articles. Five authors did not respond, and five could not be reached (Figure 2.). One of the 52 full article was excluded after full article review because it was difficult to aggregate and extract data for this review (9) (Figure 1).

The 51 eligible surveys (48 descriptive, 3 interventional) (see references in quality assessment table) included 19,598 respondents (98.5% females, 43% rural dwellers). Thirty-seven studies involved 17,086(87.2%) respondents from various walks of life (Table 1), while 14

studies involved 2,512(12.8%) respondents who were healthcare professionals including nursing students and medical students. Respondents recorded as students represented secondary school students, tertiary institution undergraduates and postgraduates excluding nursing students and medical students. Respondents recorded as teachers were secondary school teachers. Respondents recorded as health workers were mixed populations of doctors, nurses and other health professionals (pharmacists, radiographers, laboratory technicians, community health extension workers, environmental health assistants). Those recorded as laypersons included traders, farmers, secondary school students, artisans, non-health professionals, civil servants and unemployed persons. Outpatients attendees included persons attending surgery outpatient clinics, general practice outpatient clinics, immunization clinics and antenatal clinics. Respondents recorded as rural dwellers had similar composition as laypersons, but most were traders, farmers and artisans.

The minimum number of subjects in any one study was 18 conducted among medical students, and the maximum was 2048 conducted among rural dwellers. Only two of the surveys included males; one included both sexes, 99 of whom were males (18) and the other was conducted solely in 217 married men (66). Overall, the youngest respondent was 12 years old while the oldest was 86 years old. Twenty-five surveys (45.7% of respondents) were 12-50 years, 19 studies (26.8% of respondents) were 12-70 years and 7 surveys (25.7% of respondents) were 12-86 years. Eighteen of the studies were conducted in rural settings, 26 in urban settings and 7 in semi-urban settings. Regarding distribution among the three major tribal units in Nigeria, 27 of the studies were conducted among the Yorubas-mainly Southern states, 15 among Igbos-mainly Eastern states and 9 among the Hausas-mainly Northern states.

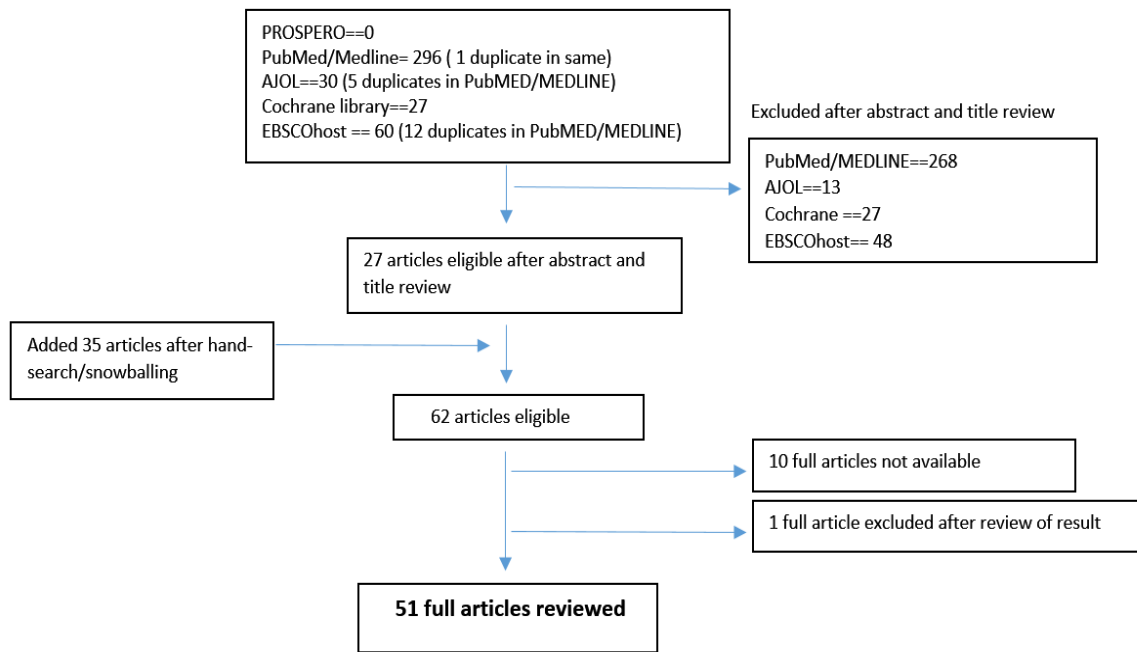


Figure 1: Flow chart of systematic search

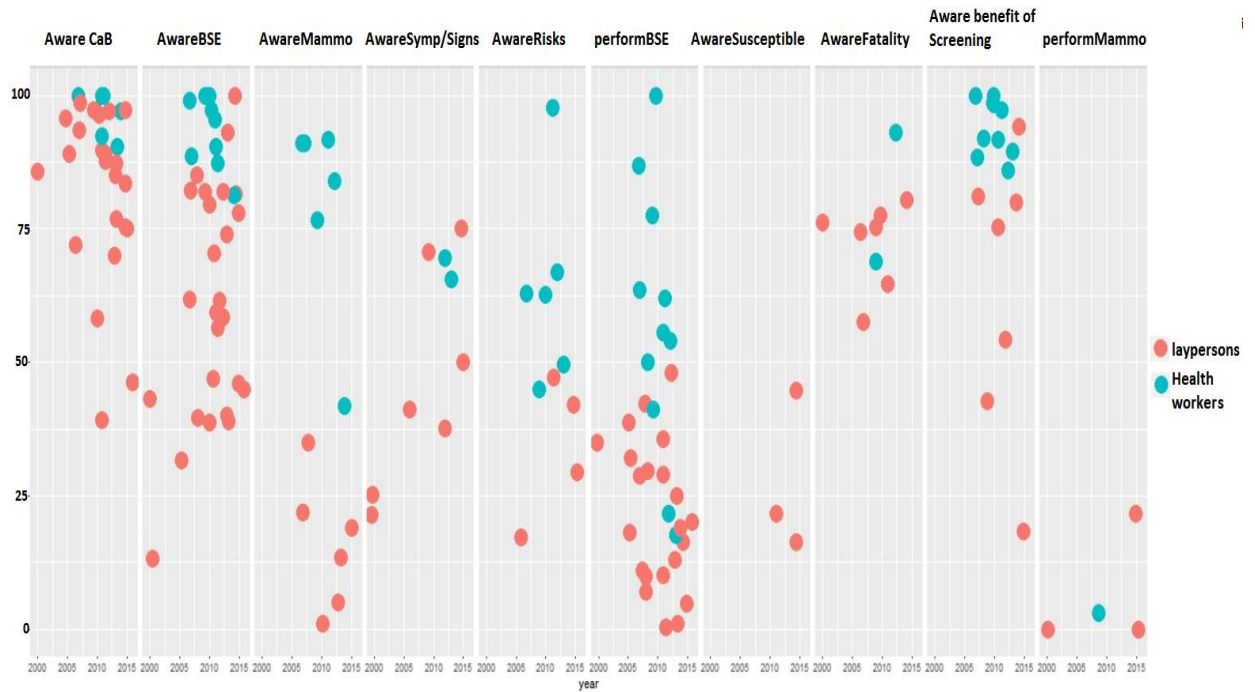


Figure 2: Relationship between subthemes of awareness of breast cancer

Table 1: Distribution of respondents

Respondents	No of studies	Minimum no of respondents per study	Maximum no of respondents per study	Total sum of respondents in review
Students	11	200	700	3125
School teachers	3	100	326	726
Healthcare workers (mixed population of nurses, doctors and other health professionals)	8	100	424	1868
Rural dwellers	8	100	2048	4465
Nurses	4	74	135	426
Lay women	6	203	1600	4711
Market women	4	238	1194	2316
Outpatient clinic attendees (both sexes)	5	140	818	1743
Medical students	1	18	18	18
Nursing students	1	200	200	200
<b>Grand total</b>				19,598

The quality assessment showed that the period of study was not stated in 52% of the studies. In 44%, there was no explicit question to establish the level of awareness of breast cancer as a disease entity before further questioning (Table 3). All the studies specified their aim but relevance of the study was not clear in some studies, and sample size justification was lacking in many of the studies (Table 2). Overall, one study was rated excellent quality (quality assessment of 100%), 22 studies were rated high quality (quality assessment score of more than 80-99%), 18 studies were rated moderately high quality (quality assessment score between 70% and 79%) and 8 were rated marginal quality (quality assessment score of between 60% and 69%) (Table 3). However, one of the studies was rated low quality (quality assessment score less than 60%).

The mean( $\pm$ SD) level of awareness of breast cancer as a disease entity was  $85.7\pm 16.3\%$ , the

mean level of awareness of breast self-examination and mammography as methods of screening for breast cancer were  $73.36.3 \pm 24.1\%$  and  $48\pm 20.1$  respectively. The knowledge of risk factors for breast cancer was higher than the knowledge of symptoms. The percentages of respondents who performed breast self-examination regularly as screening procedure were higher than those who performed mammography (Table 3) as recommended in practice for the appropriate age brackets.

The scatterplot (Figure 2) shows a high level of awareness of the entity, high level of knowledge of fatality, mid-range level of knowledge of clinical features and risk factors and low level of sense of susceptibility and performance of screening procedures. The levels of all subthemes of awareness were higher among the health care workers.

Table 2: Quality assessment

Author	Aim	Relevance	Subject Selection method well stated	Subjects well stated	Sample Size justified	Questionnaire type and administration method well stated	Period Of study stated	Awareness Of breast cancer entity noted	Results Ease of extraction	Ethical consideration	quality
Agboola et al (41)	1	1	0	0.5	0	1	1	1	1	1	75
Akhigbe et al (24)	1	1	1	0.5	0.5	0.5	1	0	1	1	75
Akpo et al(42)	1	1	1	1	0	1	1	0	1	1	80
Amoran et al (25)	0.5	0.5	1	1	1	1	1	0	1	1	80
Amosu et al(43)	1	1	0	1	0	1	0	0	0.5	1	55
Azubuikwe et al (44)	1	1	1	1	1	0.5	1	1	0.5	1	90
Azubuikwe et al(7)	1	1	0.5	1	0	0.5	0	0.5	1	1	65
Balogun et al(45)	1	1	1	1	0	1	0	0	1	1	70
Bassey et al (46)	1	1	1	0.5	0	1	1	1	1	1	85
Bello et al(17)	1	0.5	0.5	0.5	0	1	1	1	1	1	75
Egubbe et al (34)	1	1	1	1	0	1	1	1	0.5	1	85
Faronbi et al(47)	1	1	1	1	0	1	0	0	1	1	70
Gwarzo et al(48)	1	1	1	0.5	1	1	1	1	1	1	95
Ibrahim et al(49)	1	1	1	0.5	1	1	1	0	1	1	85
Irurhe et al(50)	1	0	1	1	1	0.5	1	1	1	0.5	80
Isara et al(28)	1	1	0.5	1	0	1	1	1	1	1	85
Kayode(51)	1	0.5	1	1	0	1	0	1	1	1	75
Makanjuola et al(52)	1	1	0	1	0	1	1	1	1	1	80
Obaji et al(53)	1	0	0.5	1	0	1	0	1	1	1	65
Obajimiet al(35)	1	1	1	1	1	0.5	0	0	1	1	75
Ocheet al(54)	1	1	1	1	1	1	0	1	1	0.5	85
Oguntola et al(18)	1	0.5	0	1	0	1	1	1	1	1	75
Okobiaet al(55)	1	0.5	1	1	1	0.5	1	0	1	1	80
Okolie(56)	1	1	0	1	0	1	1	1	1	1	80
Oladimeji et al (57)	1	0.5	1	0.5	1	1	1	0	0.5	1	75
Olugbenga et al(30)	1	1	1	0.5	1	1	0	1	1	1	85
Oluwatosin et al (8)	1	1	1	0.5	1	1	0	1	1	1	85
Oluwatosin et al (31)	1	1	1	1	0	1	1	0	1	1	80
Oluwole(58)	1	0.5	1	1	0	1	1	0	0.5	1	70
Omotara et al (59)	1	1	1	1	1	1	1	1	1	1	100
Salaudeen et al(60)	1	0	1	1	0	1	0	1	1	1	70

Table 2 continued...

Utoo et al(61)	1	1	1	0.5	0	1	0	0	1	1	65
Adegbenro et al (23)	1	0	1	1	1	1	1	1	1	0.5	85
Chioma et al(62)	1	1	1	1	0	1	0	1	1	0.5	75
Yakubu et al(10)	1	1	0	1	0	1	1	0	1	1	70
Ogunbode et al(36)	1	0.5	1	1	1	1	1	0	0.5	1	80
Aluko et al(63)	1	0	1	1	1	1	0	0	1	1	70
Abazie et al (29)	1	1	1	1	1	1	0	0	1	1	80
Asuquo et al (64)	1	1	1	1	1	1	0	1	0	1	80
Ezeonu et al(65)	1	1	1	1	1	1	0	1	1	1	90
Isichei et al(5)	0.5	0	1	1	0	1	0	1	1	0.5	60
Tobin et al(2)	1	0	1	1	1	1	0	0	1	1	70
Neji et al(4)	1	1	1	1	1	1	0	1	1	1	90
Iheanacho et al	1	1	1	0	1	1	0	0	0	1	60
Adeoti et al (66)	1	0.5	1	1	0	1	0	0	1	1	65
Osime et al (67)	1	1	0.5	1	0	1	0	0	0.5	1	60
Aderounmu et al (68)	1	1	1	0.5	0	1	0	1	1	1	75
Bellgam et al(69)	1	0.5	1	1	0	1	1	0	1	1	75
Sambo et al(32)	0.5	0	1	1	0	1	0	1	0.5	1	60
Ajayi et al(70)	1	0	1	1	0	1	0	1	1	1	70

Quality assessment legend: 100=> excellent, 80-99=> high, 70-79=>moderate high, 60-69=>marginal, <60 => low

Table 3: Summary statistics of level of subthemes of awareness

Concept in awareness	No of studies	Minimum percentage Possessing concept	Maximum percentage Possessing concept	Average percentage	Weighted percentage
Awareness of BC the breast as a disease entity	31	39.2	100	85.9±15.5	80.7
Awareness of BSE as a screening method	35	13.3	100	69.3±23.8	60.7
Awareness of mammography as a screening method	12	1	91.8	37.8±36.5	36.9
Knew symptoms and signs	9	21.4	75	50.6 ±20.4	45.1
Knew risk factors	10	17.4	97.6	52± 22.16	40
Knew BC is a fatal/severe disease	9	57.6	93	74.3±10.0	73.2
accepted susceptibility	3	16.3	44.8	27.6 ±15.1	26.8
Knew screening/early treatment is beneficial	17	18.3	100	81.7±22.8	74
Regularly performed BSE	33	0.5	100	33.5±24.8.0	22.9
Regularly Performed screening mammography	3	0	3.1	1.4±1.0	0.7

## DISCUSSION

The rate of late presentation of BC has remained persistently high in Nigeria despite growing awareness. The leading cause of the late presentation is becoming contentious; the reasons competing for dominance are lack of awareness, fear of treatment coupled with non-acceptance of treatment or preference for alternative therapy, poverty and ignorance. In a study by Khan et al (19) among Pakistani women, the highest ranking reason for late presentation was preference for alternative care, while in a study by Goncalves et al(20) among Brazilian women, the most frequent barriers responsible for delays in breast cancer care were hospital related.

The factors leading to delay in the management of breast cancer may ensue before diagnosis or after diagnosis. The factors leading to delay in either of these periods may be patient

related or system related (21,22). Some recognized subthemes of awareness contributing to delays before diagnosis are poor knowledge about the disease and its clinical features, poor sense of susceptibility, poor sense of fatality and poor knowledge of benefit of screening. After diagnosis, poor knowledge of benefit of screening, poor knowledge of fatality of the disease and mistrust of hospital are factors leading to delays in presentation. The finding in this review showed mostly high level of awareness of breast cancer as a disease entity, high level of perception of severity of the disease and high sense of benefit of screening. The knowledge of the clinical features and the risk factors for BC were mostly low and midrange (Figure 2). Commenting on the overall aggregate, these findings imply that the information necessary to arm the respondents against late presentation was not really hidden, but the expected behavioral change, i.e. performance



of screening, which is expected to promote early detection was low.

In the studies reviewed, many authors who reported high level of other subthemes but low levels of the knowledge of risk reported low level of performance of screening procedures. Likewise, many who reported high levels of awareness of the various subthemes including knowledge of clinical features and risks also reported low level of performance of screening procedures. Most who reported low level of knowledge of clinical features and risk factors blamed the same for low level of performance of screens (23-28), while most who reported higher levels of knowledge of clinical features and risk factors reasoned that knowledge was not translated to health seeking behavior (29-32). In a simple term, collectively, the rate of performance of screening appeared to be resistant to changes in the levels of awareness or knowledge. This makes us share the view that awareness does not translate into knowledge of risks and knowledge of risks will not automatically translate to positive health-seeking behavior (6,28,33). We also share the view that there are other conditions (third factor(s)) which would be satisfied before awareness and knowledge can positively influence the rate of performance of screening as suggested in the health belief model.

The health care workers among the respondents in the studies reviewed had relatively higher level of performance of breast self-examination. Others who had been previously recognized to have relatively higher rate of performance of screening were women who had family history of BC, women who had previous history of breast pathologies and women who had been exposed to clinical breast examination (34-36). In general, this review suggests a dissociation between awareness and performance of screening.

If the knowledge of clinical features and risk factors carry more weight than other subthemes such as awareness of the entity, awareness of breast self-examination, perception of benefit of screening and fatality of the disease, awareness may be regarded as a foremost factor still propelling late presentation of breast cancer in Nigeria. Nonetheless, more doubts are cast on the leading role of awareness when recent studies

suggest fear of mastectomy and other hospital related factors as frequent reasons for delays in management of breast cancer (20,22,37-40).

In conclusion, our study showed that awareness of BC as an entity and most of the other subthemes of awareness was not low among respondents in the studies reviewed. It also showed that the level of awareness subthemes did not always directly influence the performance of breast cancer screening procedure among the respondents. While awareness themes could still be strong factors, it is paramount at this time, to commit more resources to interventional researches which will bridge the gap between knowledge and positive breast health behaviors. As the knowledge of clinical features and risks were low, we suggest that awareness boosting programs focus more on communicating the clinical features and risk factors of breast cancer.

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