Barriers and Facilitators to Breast Reconstruction in Ethnic Minority Women – a Systematic Review

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Abstract

Introduction:

Post-mastectomy breast reconstruction (PMBR) is an important component of the multidisciplinary care of breast cancer patients. Despite the improved quality of life, significant racial disparities in the receipt of PMBR exist. Given the increasing population of Black, Asian and minority ethnic (BAME) women in UK, it is important to address this disparity. Our review aims to identify the barriers and facilitators influencing the uptake of PMBR in BAME women and raise awareness for physicians on interventions that could improve uptake of PMBR in BAME women.

Methods:

The methodology outlined by the Cochrane guidelines was used to structure this systematic review. Systematic searches for qualitative studies on barriers and/or facilitators to PMBR in ethnic women published in English were conducted. The following databases were searched from their inception up to June 2019: MEDLINE, EMBASE, PubMed, Cochrane Library, Google Scholar and Scopus. Reference lists of all included articles and relevant systematic reviews were also hand-searched for possible additional publications. Publication year or status restrictions were not applied. Only full text articles published in English and by peer reviewed journals are included. Exclusion criteria: quantitative studies on barriers and/or facilitators to PMBR, abstracts, conference proceedings, non-English language, non-specific to BAME women. A thematic synthesis approach was used through the development of sub-themes and themes from the findings of the included qualitative studies.

Results:

Five studies satisfied the inclusion and exclusion criteria. Three overarching themes emerged from our review: physician-associated factors (physician recommendations), patient-associated factors (knowledge, language, community and cultural, emotions, logistics, patient characteristics) and system-associated factors (insurance coverage, income status).

Conclusion:

Our systematic review suggests that there is a paucity of data in the literature on the barriers and facilitators to PMBR in BAME women. Considering the expanding population of BAME women and rising breast cancer incidence, it is imperative that future research in this field is carried out. Physician and patient-associated factors were identified as the most important yet modifiable factors. Adopting a combination of culturally tailored interventions targeting these factors may help improve the access of PMBR in BAME women.

Registration

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Introduction

Breast cancer is the most commonly diagnosed cancer amongst women in the world, with over 2 million new cases in 2018 [1]. In the United Kingdom (UK), breast cancer incidence rates are projected to rise by 2% between 2014 and 2035, to 210 cases per 100,000 females

by 2035. Although breast cancer is more common in white women [2], there has been rising numbers in Black, Asian and minority ethnic (BAME) groups with emerging reports that incidence is approaching parity [3]. The demographics of developed countries are also changing. In the UK, percentage of BAME groups continued to rise since the 1991 Census, particularly in London [4], and in the US the white population is projected to fall below 50% by 2050 [5].

It is also noted that certain demographics such as black women tend to present at a later stage with poorer survival of disease [6]. Larger tumours are less amenable to breast conserving surgery and more likely to result in mastectomy. For patients who undergo mastectomy, the impact on body image, psychosocial well-being and quality of life can be devastating [7,8]. Despite the benefits of post-mastectomy breast reconstruction (PMBR), the rates however, remain low. The main reasons for not undergoing PMBR were fear of cancer relapse [9], complications and lack of information about the procedure [10].

In the UK, only around one third of women who underwent mastectomy had either immediate or delayed reconstruction [11], while in the US this figure sits around 56% [12]. Historical evidence has revealed that the uptake of PMBR is significantly lower in ethnic women [8,13–17]. African American (AA), Hispanic and Asian women were 52%, 55% and 71% respectively less likely to undergo PMBR compared to White women [18–20].

While many studies report the differences in uptake, few have examined the patient perspective. Given the increasing BAME population, it is therefore important to address this disparity. Our review of qualitative studies aims to identify the barriers and facilitators influencing the uptake of PMBR in BAME women and raise awareness for patients and physicians on interventions that could improve uptake of PMBR in BAME women.

Methods

Information sources

Systematic searches for qualitative studies, which include primary data and literature based studies, published in English were conducted. The following databases were searched from

their inception up to June 2019: MEDLINE, EMBASE, PubMed, Cochrane Library, Google Scholar and Scopus. Reference lists of all included articles and relevant systematic reviews were also hand-searched for possible additional publications. There were no publication year or publication status restrictions. Studies included: qualitative studies on barriers and/or facilitators to PMBR in ethnic women. Only full text articles published in English and by peer reviewed journals were included. The following exclusion criteria was used; quantitative studies on barriers and/or facilitators to PMBR, abstracts, conference proceedings, non-English language, non-specific to BAME women.

Search strategy

The search strategy included terms for "Ethnic", "Breast reconstruction" and "Barriers, Facilitators" (including terms specifying all major subgroups). Details of each search strategy for the respective databases are presented in Appendix 1.

Study selection and data extraction

Firstly, search results retrieved from the database was imported into Mendeley reference manager. Two systematic reviewers (RL and GY) independently screened the titles and abstracts to assess their potential relevance for full review. The same two researchers then independently reviewed the full text of potentially relevant articles against the pre-defined inclusion and exclusion criteria. Any discrepancies was resolved through discussion with a third reviewer (EW). The reference lists of all the relevant studies were also screened to ensure no study had been missed. As per the PRISMA guidelines [21], a flow diagram (Figure 1) has been developed to report the process of study selection.

Data was extracted by a reviewer (RL) using a piloted modified worksheet including: country; inclusion and exclusion criteria; participant characteristics, numbers recruited, barriers and facilitators of BR. Extracted data was double checked by the third reviewer (EW). GY and EW are formally trained qualified systematic reviewers.

Data synthesis and analysis

An adapted systematic review approach for qualitative research, based on the Cochrane guidelines, was used to extract data from articles. Data synthesis was carried out using a thematic analysis approach, which enabled concept and hypothesis extraction from the included qualitative studies.

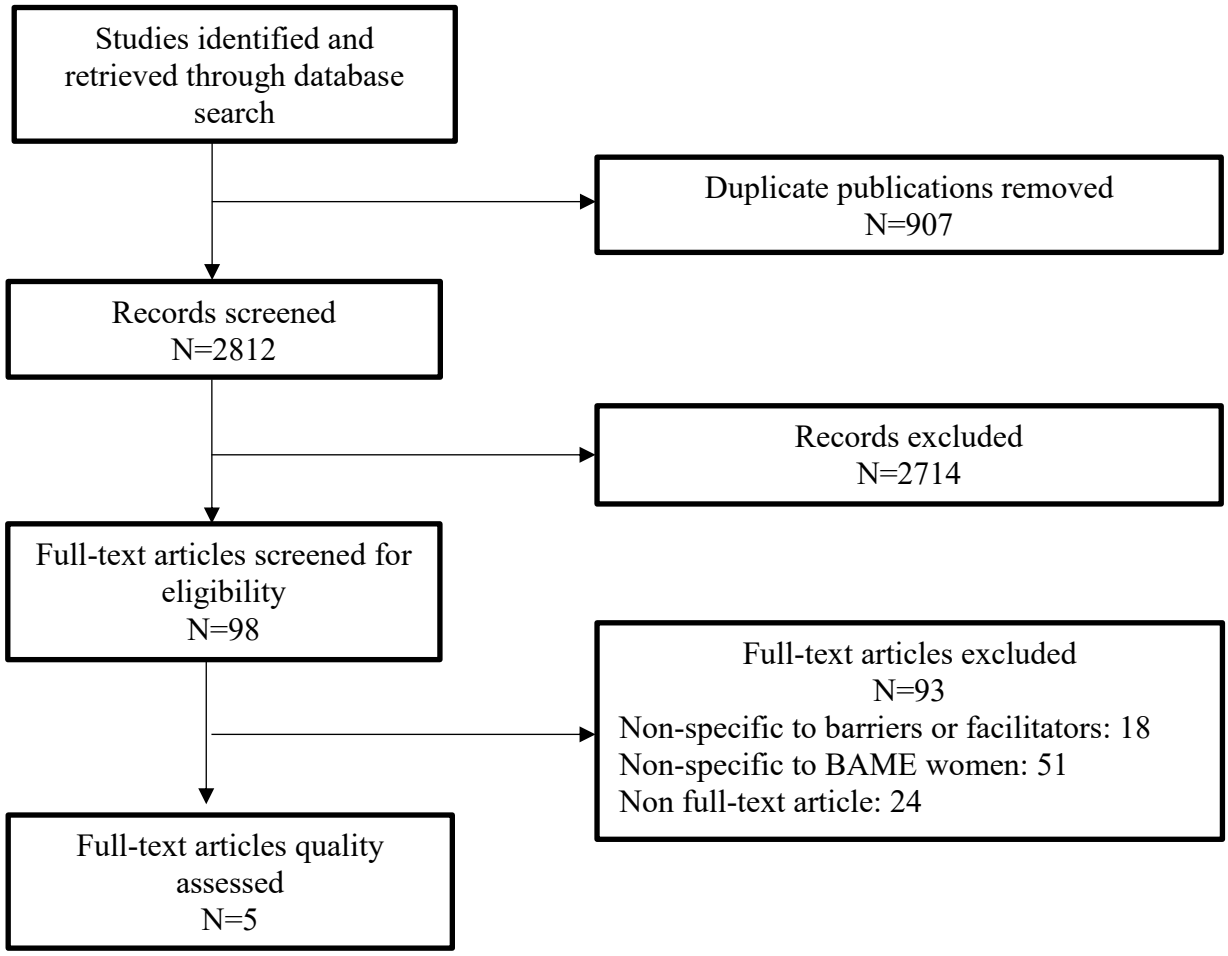
The extracted results were input into data extraction forms allowing the identification and summarisation of emerging sub themes and themes, which detailed the main barriers and facilitators of the included studies. The overarching themes were finalised through discussion to avoid any discrepancies.

Quality of synthesis assessment

Currently, there is no universal consensus on criteria to assess the methodological quality of qualitative studies. This review combined both the Critical Appraisal Skills Programme (CASP) quality assessment tool for qualitative and quantitative studies to develop a framework appropriate to the included studies [22]. The final studies were critically appraised using the adapted CASP checklist involving 8 questions, which were scored as either yes, can't tell or no correlating to a score of 2, 1 and 0 respectively. The papers were ranked according to their numerical score and grouped into very good (17-18), good (15-16), OK (13-14), and weak (≥12) as detailed in Appendix 1. Two independent reviewers (RL and GY) judged and categorised the studies and any discrepancies regarding the quality of the studies were resolved through discussions with a third reviewer (EW).

Results

Figure 1: Study Selection Process



In total, 3719 articles were identified. After removal of duplicates, 2812 results were left. After title and abstract screening, 98 papers were deemed potentially eligible and undergone full text screening. After review, 93 were excluded for reasons indicated in the PRISMA flow chart as seen in Figure 1. Five studies published between 2013-2018 were included in this review and their characteristics are summarised in Table 1. Four of the included studies were conducted in the United States (US), with the exception of a study conducted in Malaysia. There were no UK based papers.

Table 1: Characteristics Summary of the Included Studies

Title	Breast Reconstruction After Mastectomy: A Survey of Surgeons' and Patients' Perceptions (Ishak et al, 2018)	A Qualitative Study of Breast Reconstruction Decision-Making among Asian Immigrant Women Living in the United States (Fu et al, 2016)	" Use what God has given me": difference and disparity in breast reconstruction (Rubin et al, 2013)	Access to Breast Reconstruction After Mastectomy and Patient Perspectives on Reconstruction Decision Making (Morrow et al, 2014)	Health Insurance Coverage and Racial Disparities in Breast Reconstruction After Mastectomy (Shippee et al, 2014)
Study design and setting	Cross-sectional study. Questionnaires delivered to surgeons and post mastectomy patients.	Semi-structured interviews were constructed with open-ended questions.	Semi-structured interviews were conducted with women who underwent mastectomy.	Semi-structured interviews were constructed with open-ended questions at a mean of 9 months after diagnosis and follow-up survey approximately 4 years after diagnosis.	Retrospective analysis of hospital discharge records using data from the Nationwide Inpatient Sample of the Healthcare Cost and Utilization Project, Agency for Healthcare Research and Quality.
Study time period	January 2000 to December 2015	Not specified	Not specified	1 June 2005 to 28 February 2007	2000 to 2006
Study aim	To assess surgeons' and	To investigate the cultural	To add African American	To examine correlates of	To calculate the rates of

	patients' perceptions toward breast reconstruction.	factors, values, and perceptions held by Asian women that might impact breast reconstruction rates.	women's perspectives to existing conceptualisations of racial/ethnic differences in reconstruction, provide a better understanding of the individual and cultural logics, as well as structural barriers, that influence African American women's use of breast reconstruction.	breast reconstruction after mastectomy and to determine if a significant unmet need for reconstruction exists.	reconstruction for women of different racial/ethnic groups, 2) identify the role of insurance type in receiving breast reconstruction, and 3) examine the interactive effect of race/ethnicity and insurance type on the receipt of breast reconstruction.
Population	General and breast surgeons at general and teaching hospitals in East Coast Malaysia and Hospital Kuala Lumpur and post mastectomy patients with and without breast reconstruction at the Hospital University	35 immigrant East Asian women treated for breast cancer in the New York metropolitan area.	27 African American women.	485 patients who were non-Black and non-Latina, Black and Latina who reported undergoing mastectomy.	19017 White, Black, Hispanic, and Asian patients under age 65 underwent reconstruction post mastectomy in US hospitals from 2002 through 2006.

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Narrative synthesis

The main findings of the review revealed three overarching themes: system-associated, physician-associated and patient-associated factors. Each of them were further categorised into the following sub-themes:

Physician-associated factors:

1. Physician recommendation

Patient-associated factors:

1. Knowledge
2. Language
3. Community and cultural
4. Emotions
5. Logistics
6. Patient characteristics

System-associated factors:

1. Insurance coverage
2. Income status

Physician-associated factors

Three of the five studies highlighted physician practice pattern as a barrier or facilitator to PMBR in BAME women. They were more likely to undergo PMBR if recommended by their physician [23–25] or referred to plastic surgeons [24]. They were less likely to have PMBR if they were not offered PMBR [23].

"But if, at that moment, if the doctor had never mentioned about reconstruction, I would not look for a separate reconstruction, plastic surgeon, because it's a lot of trouble." [24]

"I think when a woman discovers they need to do a surgery […] it's a good way for the doctor, and at the same time, recommend them to have reconstruction, and sure the safety-ness, and the benefit of doing reconstruction […] so they know it's a one process." [24]

Patient-associated factors

Knowledge

Three of five studies reported knowledge as a barrier to PMBR [23,24,26]. All three studies specified lack of knowledge about PMBR as a barrier [23,24,26]. Two studies identified a lack of awareness of the availability of PMBR [23,26].

In one study from the US, lack of knowledge that insurance coverage mandated by law [24] was also cited as a barrier to PMBR.

"Especially for Chinese people. They thought for reconstructive surgery it's not covered by the insurance… because it's a kind of plastic surgery." [24]

Language

Only one of five studies specified that language was a barrier to PMBR mainly due to lack of information in patients' native language. Patients expressed increased sense of ease, understanding and familiarity with native language speakers [24].

"Some doctors are always talking with me and saying with me in English, but at that moment I got cancer… I just want to say native language." [24]

Community and culture

Two studies reported that community and patients' values were either barriers or facilitators to PMBR [24,25]. For example, among AA women, 'body ethics' informed their reconstruction decisions.

In the Asian community, PMBR is perceived as purely cosmetic [24]. Benefits like improved psychological well-being, quality of life, and self- esteem, were not considerations.

"Some Chinese people still have that thinking that it doesn't matter how you look… they think it's not appropriate because you are only concerned about how you look… you should think of your health instead." [24]

The community belief that breast implants could cause cancer formation was a barrier to reconstruction. Asian women's decision-making on PMBR were significantly influenced by public opinions and anecdotes about perceived unsuccessful reconstruction [24].

"Because so many of the Chinese […] they don't know how to go to the Internet to search. They just listen to friends and friend's stories so that they just limited for the information." [24]

The only facilitator of PMBR in Asian community is the functional role breasts play in marriage or childbearing [24].

"Before even if my husband wanted it, I'd make it for him and let him play, right? But now I'm old. I don't think my husband would want to play anymore. So, what will I make it for? What do I make it for? What do I need it for?" [24]

Emotions

Four of five studies reported patients' emotions as either a barrier or facilitator to PMBR.

Three studies specified fear of implants, its' complications [24–26] and interference with cancer recurrence as major barriers to PMBR [23,25,26]. One study highlighted the fear of additional surgery, prolonged or additional anaesthesia, and surgical complications also as barriers [23].

"I always figured if cancer should recur, it might be a little bit more difficult to detect if I have implants. That's what really made up my mind. And I was also afraid that having that inside… could create problems." [25]

One study identified the reluctance to undergo PMBR in AA women due to the lack of trust in healthcare [25].

"Being black… we don't trust the medical profession. We figure they use us as guinea pigs… look at what happened at Tuskegee. So we don't go to the doctor. If you have problems, you try to deal with it yourself. … It's really hard for black people to trust… it's something that's been imprinted in us from the time of slavery." [25]

Two studies reported reasons such as “to feel more balanced”, “to feel whole again”, “to regain femininity”, “no clothing limitations”, desire for breast symmetry and dissatisfaction with external prosthesis as facilitators to PMBR [23,25].

“I felt that I have got back my life, like any other women. I feel equal again, like anybody.” [25]

Logistics

Three of five studies showed that logistic-related factors such as distance, inconvenience of multiple operations, time off work or from family, and trouble finding a surgeon were barriers [23,24,26].

“So they said every ten years you have to remove it [implants] and redo it. So I don’t want to do it again.” [23]

The convenience of immediate PMBR was a facilitator in Asian women [24].

“My goal actually was just to, you know, go have surgery, remove the cancer. I really was not after the reconstruction as well. It came with the package, I guess… and I was just thinking, okay I’m going to be asleep.” [24]

Patient characteristics

All studies reported patients’ characteristics as either a barrier or facilitator to PMBR. Increasing age of women [23,26,27] and patients with major comorbidity [26] were associated with reduced likelihood of undergoing PMBR.

Three studies stated that a younger age is a facilitator to PMBR [24,25,27]. In younger women, breasts were perceived to have functional value of attracting a partner, satisfying a husband, and fulfilling the role as a wife and mother [24]. Some younger women also felt that a younger age necessitated PMBR [25].

“I’m [nearly] 67 […] I mean it is not really that important at this stage of life.” [24]

System-associated factors

Two of five studies reported insurance-related factors as barriers to PMBR [26,27]. Lack of private insurance [26], surgeons not accepting patients with insurance [26] and patients having public insurance were shown to be barriers [27].

Having higher income [25], insurance coverage [25] and private insurance [27] were facilitators to PMBR.

"If I didn't have insurance, probably I wouldn't have done the reconstructive surgery…. Because financially I wasn't going to be able to… that surgery is big money." [25]

Discussion

Post mastectomy breast reconstruction has demonstrable benefits in terms of improving body image, psychosocial well-being and quality of life [28–31]. Despite these well-documented benefits, the rates of PMBR remain low, especially in BAME women [17,18,20,32–35]. There is a complex interplay between multiple factors that require an in-depth analysis. We believe that this is the first systematic review to ascertain for BAME women the barriers and facilitators of PMBR from the patient's perspective as well as that of the clinician. There are three emerging themes: physician-associated, patient-associated and system-associated factors. Physician and patient-associated factors are the two main and modifiable factors.

Physician-associated factors

Our review has shown that surgeons play a critical role in determining whether a woman undergoes PMBR. Previous studies highlighted the main determinants in how women make decisions to pursue reconstruction: surgeons' recommendations, referral to plastic surgeons, and surgeons' discussion of reconstruction with patients [23–25].

Patient's decisions are strongly influenced by surgeons [36,37]. "Surgeon strong recommendation" was reported by about 92% of women as a reason for undergoing PMBR [23]. Without surgeons' recommendations, patients may not request a referral to plastic surgeons. Another study demonstrated that breast surgeons are "gatekeepers" to PMBR as their decision to refer patients to plastic surgeons significantly affects the receipt of PMBR [38]. This is further exacerbated by the lower referral rates by surgical oncologists to plastic surgeons [17,18]. Tellingly, Preminger et al found that 91% of referred patients had PMBR and 100% of those who were not referred did not have PMBR [38].

Studies have suggested that surgeons were the patients' best and main source of information, directly influencing patients' decisions [39,40]. Lack of awareness that PMBR was an option was a major reason to not receive PMBR [41]. This problem can be easily corrected by encouraging surgeons to provide information and discuss reconstructive options. For example, a media-led public health education campaign was successful in promoting breast cancer screening [42]. Perhaps, a combination of methods to improve access to educational resources needs to be employed to increase uptake of PMBR.

Surgeons' attitudes and perspectives towards PMBR include: too invasive for women who have already undergone mastectomy; aesthetic results are not worth the cost and effort involved; does not improve survival [41]. Such attitudes inevitably affect surgeons' information-giving behaviour, practice and referral pattern, hence negatively influencing patients' decisions to undergo PMBR [41]. Furthermore, Ishak et al discussed in a study in Malaysia where 70% of surgeons felt that "the patient would not be interested in BR despite it being offered" [23]. This could be a potential reason why surgeons did not recommend or discuss reconstruction, or refer patients to plastic surgeons.

Patients' age is one of the most frequent factors considered by surgeons in their referral decision for PMBR [23,43]. Surgeons were more likely to discuss about PMBR with younger patients. Morrow et al found that the single greatest predictor for a surgeon to recommend BR was age younger than 50 years [44]. It could be postulated that surgeons are less inclined to discuss or recommend PMBR with older patients as they are more likely to have comorbidities that increases their perioperative risks adversely affect surgical outcomes.

Interestingly, multiple studies have highlighted how physicians' implicit bias to race, gender and age contribute to health disparities [43,45,46]. Examples include: surgeons' attitudes and perspectives towards PMBR, and patients' age. Surgeons must recognize their susceptibility to implicit bias as this affects surgeons' practice patterns and referral patterns, which in turn may potentially be prejudicial to patients.

Patient-associated factors

Community and cultural values largely influence the uptake of PMBR. For instance, PMBR is considered as an elective cosmetic procedure in the Asian community [24]. Emphasis on "Body ethics" informed AA women's reconstruction decisions [47–49]. Some women rejected all types of reconstruction while some were specifically resistant to breast implants [50]. Ideally all reconstructive options (immediate and delayed) should be discussed with all patients so that they can choose which best fits with their breast cancer treatments as well as personal, cultural and religious beliefs.

Immediate PMBR may not however, be suitable for all patients. Currently, delayed PMBR is the most frequently performed procedure[11,51]. This is mainly because of the negative effect radiotherapy has on the reconstruction and cosmesis. For women undergoing delayed PMBR, the most common type was free flap reconstruction [11]. While most breast oncoplastic surgeons perform implant-only, reconstruction, only plastic surgeons undertake free flap reconstruction [11]. BAME women tend to present with later stage meaning mastectomy, radiotherapy and chemotherapy are more likely to be part of their treatment package. Analysis from the SEER database illustrated that non-Hispanic black and Hispanic patients were more likely to seek autologous reconstruction rather than implant based [52]. It is therefore, not difficult to imagine how limited access to a plastic surgeon, on top of other confounding factors, would negatively influence whether to have PMBR, which has been highlighted in several studies [12,53–55]. Other areas to help improve access include, strategies like bilingual program materials, individualised in-person or telephone counselling are individual-directed interventions have improved uptake of breast cancer screening and may be adopted in this setting to improve uptake of PMBR in BAME women [56,57]. A proactive approach such as holding workshops or seminars to disseminate culturally-tailored information within the ethnic communities, in their own native language, may improve women's knowledge on PMBR. Previous studies that have shown community outreach is beneficial for improving knowledge in targeted demographic groups [58,59].

System-associated factors

Access to reconstruction could be related to the health care system of the country of residence, personal income, and the need for health insurance. Higher income and having private insurance coverage facilitated access to PMBR. AA women with higher income were more likely to have PMBR [25]. However, even among women with private insurance

coverage, AA, Hispanic, and Asian women had lower odds for PMBR compared to white women [27,55]. For all insurance types, Asian women were least likely to have PMBR [27]. Persistent racial differences within women with insurance suggests that there are factors more influential than insurance coverage that can affect the decision to undergo PMBR.

In the UK, although there is free universal access to the National Health Service (NHS), there is substantial regional variation in uptake of PMBR in England depending on a patient's residential address known as 'postcode lottery'. This suggests that women have unequal access to all types of PMBR [13]. Patients may need to travel a long distance to a different NHS trust offering for example, free flap breast reconstruction.

Strengths and limitations

According to our knowledge, this review is the first step in analysing the barriers and facilitators to PMBR in BAME women.

A strength of this systematic review is its validity and reliability of results. Our search strategy specified 'papers from peer reviewed journals. An adapted CASP tool was used to appraise quantitative studies in an attempt to maintain symmetry across study rankings. Inevitably the validity of the adapted CASP tool was lost, meaning the appraisal of quantitative study may have been less accurate and robust, which would impact the strength of conclusions.

The biggest limitation of our study and indeed of this field of research is that most of studies were conducted in the US. The data therefore, may not be accurately extrapolated to other countries, where the experiences of BAME women may be very different. Therefore, country specific research would be helpful, as nuances related to the medical system, but also larger societal issues surrounding race and class may have ramifications on the patient experience.

Conclusion

BAME women have a lower rate of PMBR compared to white women for numerous complex reasons. Our review highlights the most important physician and patient-associated factors that were potentially modifiable. There is a paucity of data globally in this field, but considering the rapidly growing BAME population, it is imperative that further research is

carried out. This review advocates culturally-tailored interventions to improve uptake of PMBR and minimise racial disparities.

Conflict of Interest

The authors declare that they have no conflict of interest.

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References

1. Breast cancer | World Cancer Research Fund UK. https://www.wcrf-uk.org/uk/preventing-cancer/cancer-types/breast-cancer. Accessed December 4, 2019.
2. Breast cancer statistics | Cancer Research UK. https://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/breast-cancer#heading-Zero. Accessed December 4, 2019.
3. DeSantis CE, Fedewa SA, Goding Sauer A, Kramer JL, Smith RA, Jemal A. Breast cancer statistics, 2015: Convergence of incidence rates between black and white women. *CA Cancer J Clin*. 2016;66(1):31-42. doi:10.3322/caac.21320
4. Ethnicity and National Identity in England and Wales - Office for National Statistics. https://www.ons.gov.uk/peoplepopulationandcommunity/culturalidentity/ethnicity/articles/ethnicityandnationalidentityinenglandandwales/2012-12-11. Accessed December 3, 2019.
5. U.S. Population Projections: 2005-2050 | Pew Research Center. https://www.pewresearch.org/hispanic/2008/02/11/us-population-projections-2005-2050/. Accessed January 23, 2020.
6. Franzoi MA, Schwartsmann G, de Azevedo SJ, Geib G, Zaffaroni F, Liedke PER. Differences in Breast Cancer Stage at Diagnosis by Ethnicity, Insurance Status, and Family Income in Young Women in the USA. *J Racial Ethn Heal Disparities*. 2019;6(5):909-916. doi:10.1007/s40615-019-00591-y
7. Wilkins E, Cederna P, Lowery J, et al. Prospective Analysis of Psychosocial Outcomes in Breast Reconstruction: One-Year Postoperative Results from the Michigan Breast Reconstruction Outcome Study. *Plast Reconstr Surg*. 2000;106(5):1014-1025. http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=yrovftd&NEWS=N&AN=00006534-200010000-00010.
8. Jagsi R, MD P, Li Y, et al. Patient-reported Quality of Life and Satisfaction With

Cosmetic Outcomes After Breast Conservation and Mastectomy With and Without Reconstruction: Results of a Survey of Breast Cancer Survivors. *Ann Surg*. 2015;261(6):1198-1206. doi:10.1097/SLA.0000000000000908

9. Nozawa K, Ichimura M, Oshima A, et al. The present state and perception of young women with breast cancer towards breast reconstructive surgery. *Int J Clin Oncol*. 2014;20(2):324-331. doi:10.1007/s10147-014-0716-0
10. Reaby LL. Reasons why women who have mastectomy decide to have or not to have breast reconstruction. *Plast Reconstr Surg*. 1998;101(7):1810-1818. doi:10.1097/00006534-199806000-00006
11. Jeevan R, Cromwell DA, Browne JP, et al. Findings of a national comparative audit of mastectomy and breast reconstruction surgery in England. *J Plast Reconstr Aesthetic Surg*. 2014;67:1333-1344. doi:10.1016/j.bjps.2014.04.022
12. Jagsi R, Jiang J, Momoh AO, et al. Trends and variation in use of breast reconstruction in patients with breast cancer undergoing mastectomy in the United States. *J Clin Oncol*. 2014;32(9):919-926. doi:10.1200/JCO.2013.52.2284
13. Jeevan R, Cromwell DA, Browne JP, et al. Regional variation in use of immediate breast reconstruction after mastectomy for breast cancer in England. *Eur J Surg Oncol*. 2010;36(8):750-755. doi:10.1016/j.ejso.2010.06.008
14. Butler PD, Nelson JA, Fischer JP, et al. Racial and age disparities persist in immediate breast reconstruction: an updated analysis of 48,564 patients from the 2005 to 2011 American College of Surgeons National Surgery Quality Improvement Program data sets. *Am J Surg*. 2016;212(1):96-101. doi:10.1016/j.amjsurg.2015.08.025
15. Greenberg CC, Schneider EC, Lipsitz SR, et al. Do Variations in Provider Discussions Explain Socioeconomic Disparities in Postmastectomy Breast Reconstruction? *J Am Coll Surg*. 2008;206(4):605-615. doi:10.1016/j.jamcollsurg.2007.11.017
16. Alderman AK, McMahon L, Wilkins EG. The National Utilization of Immediate and Early Delayed Breast Reconstruction and the Effect of Sociodemographic Factors. 2003:695-703.
17. Alderman AK, Hawley ST, Janz NK, et al. Racial and ethnic disparities in the use of postmastectomy breast reconstruction: results from a population-based study. *J Clin Oncol*. 2009;27(32):5325-5330. doi:10.1200/JCO.2009.22.2455
18. Tseng JF, Kronowitz SJ, Sun CC, et al. The effect of ethnicity on immediate reconstruction rates after mastectomy for breast cancer. *Cancer*. 2004;101(7):1514-1523. doi:10.1002/cncr.20529

19. Yang RL, Newman AS, Reinke CE, et al. Racial disparities in immediate breast reconstruction after mastectomy: Impact of state and federal health policy changes. *Ann Surg Oncol*. 2013;20(2):399-406. doi:10.1245/s10434-012-2607-9
20. Sharma K, Grant D, Parikh R, Myckatyn T. Race and breast cancer reconstruction: Is there a health care disparity? In: *Plastic and Reconstructive Surgery*. Vol 138. Lippincott Williams and Wilkins; 2016:354-361. doi:10.1097/PRS.0000000000002344
21. Moher D, Shamseer L, Clarke M, et al. *Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) 2015 Statement*.; 2015. doi:10.1186/2046-4053-4-1
22. CASP Checklists - CASP - Critical Appraisal Skills Programme. https://casp-uk.net/casp-tools-checklists/. Accessed March 4, 2020.
23. Ishak A, Yahya M, Halim A. Breast Reconstruction After Mastectomy: A Survey of Surgeons' and Patients' Perceptions. *Clin Breast Cancer*. 2018;18(5):e1011-e1021. doi:10.1016/j.clbc.2018.04.012
24. R. F, M.M. C, M. C, et al. A Qualitative Study of Breast Reconstruction Decision-Making among Asian Immigrant Women Living in the United States. *Plast Reconstr Surg*. 2017;139(2):360e-368e. doi:http://dx.doi.org/10.1097/PRS.0000000000002947
25. Rubin LR, Chavez J, Alderman A, Pusic AL. "Use what God has given me": Difference and disparity in breast reconstruction. *Psychol Heal*. 2013;28(10):1099-1120. doi:10.1080/08870446.2013.782404
26. M. M, Y. L, A.K. A, et al. Access to breast reconstruction after mastectomy and patient perspectives on reconstruction decision making. *JAMA Surg*. 2014;149(10):1015-1021. doi:http://dx.doi.org/10.1001/jamasurg.2014.548
27. T.P. S, K.B. K, K. R, et al. Health insurance coverage and racial disparities in breast reconstruction after mastectomy. *Women's Heal Issues*. 2014;24(3):E261-E269. doi:http://dx.doi.org/10.1016/j.whi.2014.03.001
28. Rowland JH. Role of Breast Reconstructive Surgery in Physical and Emotional Outcomes Among Breast Cancer Survivors. *J Natl Cancer Inst*. 2000;92(17):1422-1429. doi:10.1093/jnci/92.17.1422
29. Rowland JH, Holland JC, Chaglassian T, Kinne D. Psychological Response to Breast Reconstruction: Expectations for and Impact on Postmastectomy Functioning. *Psychosomatics*. 1993;34(3):241-250. doi:10.1016/S0033-3182(93)71886-1
30. Elder EE, Brandberg Y, Björklund T, et al. Quality of life and patient satisfaction in

breast cancer patients after immediate breast reconstruction: A prospective study. *Breast*. 2005;14(3):201-208. doi:10.1016/j.breast.2004.10.008

31. Ganz PA. Quality of Life in Long-Term, Disease-Free Survivors of Breast Cancer: a Follow-up Study. *CancerSpectrum Knowl Environ*. 2002;94(1):39-49. doi:10.1093/jnci/94.1.39
32. Levine SM, Levine A, Raghubir J, Levine JP. A 10-year review of breast reconstruction in a university-based public hospital. *Ann Plast Surg*. 2012;69(4):376-379. doi:10.1097/SAP.0b013e31824b26d2
33. Kruper L, Xu X, Henderson K, Bernstein L. Disparities in reconstruction rates after mastectomy for ductal carcinoma in situ (DCIS): Patterns of care and factors associated with the use of breast reconstruction for DCIS compared with invasive cancer. In: *Annals of Surgical Oncology*. Vol 18. ; 2011:3210-3219. doi:10.1245/s10434-011-2010-y
34. Kagawa-Singer M, Wellisch DK, Durvasula R. Impact of breast cancer on Asian American and Anglo American women. *Cult Med Psychiatry*. 1997;21(4):449-480. doi:10.1023/A:1005314602587
35. Rosson G, Singh N, MD Ms, et al. Multilevel Analysis of the Impact of Community vs Patient Factors on Access to Immediate Breast Reconstruction Following Mastectomy in Maryland. *Arch Surg*. 2008;143(11):1076-1081. http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=ovftj&NEWS=N&AN=00000853-200811000-00012.
36. Rippy EE, Ainsworth R, Sathananthan D, Kollias J, Bochner M, Whitfield R. Influences on decision for mastectomy in patients eligible for breast conserving surgery. 2014. doi:10.1016/j.breast.2013.12.009
37. Temple WJ, Russell ML, Parsons LL, et al. Conservation Surgery for Breast Cancer As the Preferred Choice: A Prospective Analysis. *J Clin Oncol*. 2006;24(21):3367-3373. doi:10.1200/JCO.2005.02.7771
38. Preminger BA, Trencheva K, Chang CS, et al. Improving access to care: Breast surgeons, the gatekeepers to breast reconstruction. *J Am Coll Surg*. 2012;214(3):270-276. doi:10.1016/j.jamcollsurg.2011.11.014
39. Ananian P, Houvenaeghel G, Protière C, et al. Determinants of patients' choice of reconstruction with mastectomy for primary breast cancer. *Ann Surg Oncol*. 2004;11(8):762-771. doi:10.1245/ASO.2004.11.027
40. Postolică R, Luncă S, Porumb V, Nicolescu S, Dimofte G. *Patients Choose against*

Reconstruction after Mastectomy for Breast Cancer. Do Women Disregard the Quality of Their Future Life? Vol 11(4).; 2013.

41. Takahashi M, Kai I, Hisata M, Higashi Y. The Association between Breast Surgeons' Attitudes toward Breast Reconstruction and Their Reconstruction-Related Information-Giving Behaviors: A Nationwide Survey in Japan. *Plast Reconstr Surg*. 2006;118(7):1507-1514. doi:10.1097/01.prs.0000233149.36751.d2
42. Jenkins CNH, McPhee SJ, Bird JA, et al. Effect of a media-led education campaign on breast and cervical cancer screening among Vietnamese-American women. *Prev Med (Baltim)*. 1999;28(4):395-406. doi:10.1006/pmed.1998.0444
43. Green AR, Carney DR, Pallin DJ, et al. Implicit bias among physicians and its prediction of thrombolysis decisions for black and white patients. *J Gen Intern Med*. 2007;22(9):1231-1238. doi:10.1007/s11606-007-0258-5
44. Morrow M, Scott SK, Menck HR, Mustoe TA, Winchester DP. Factors influencing the use of breast reconstruction postmastectomy: a National Cancer Database study. *J Am Coll Surg*. 2001;192(1):1-8. doi:10.1016/s1072-7515(00)00747-x
45. Cooper LA, Roter DL, Carson KA, et al. The associations of clinicians' implicit attitudes about race with medical visit communication and patient ratings of interpersonal care. *Am J Public Health*. 2012;102(5):979-987. doi:10.2105/AJPH.2011.300558
46. Chapman KR, Tashkin DP, Pye DJ. Gender bias in the diagnosis of COPD. *Chest*. 2001;119(6):1691-1695. doi:10.1378/chest.119.6.1691
47. Rubin LR, Fitts ML, Becker AE. "Whatever feels good in my soul": Body ethics and aesthetics among African American and Latina women. *Cult Med Psychiatry*. 2003;27(1):49-75. doi:10.1023/A:1023679821086
48. Odoms-Young A. Factors that influence body image representations of black Muslim women. *Soc Sci Med*. 2008:2573-2584. doi:10.1016/j.socscimed.2008.02.008
49. PARKER S, NICHTER M, NICHTER M, VUCKOVIC N, SIMS C, RITENBAUGH C. Body Image and Weight Concerns among African American and White Adolescent Females: Differences that Make a Difference. *Hum Organ*. 1995;54:103-114. doi:10.2307/44127140
50. Rubin LR, Chavez J, Alderman A, Pusic AL. "Use what God has given me": Difference and disparity in breast reconstruction. *Psychol Heal*. 2013;28(10):1099-1120. doi:10.1080/08870446.2013.782404
51. Duxbury PJ, Gandhi A, Kirwan CC, Jain Y, Harvey JR. Current attitudes to breast

reconstruction surgery for women at risk of post-mastectomy radiotherapy: A survey of UK breast surgeons. *Breast*. 2015;24(4):502-512. doi:10.1016/j.breast.2015.05.002

52. Sergesketter AR, Thomas SM, Lane WO, et al. Decline in Racial Disparities in Postmastectomy Breast Reconstruction. *Plast Reconstr Surg*. 2019;143(6):1560-1570. doi:10.1097/PRS.0000000000005611
53. Bauder AR, Gross CP, Killelea BK, Butler PD, Kovach SJ, Fox JP. The Relationship between Geographic Access to Plastic Surgeons and Breast Reconstruction Rates among Women Undergoing Mastectomy for Cancer. In: *Annals of Plastic Surgery*. Vol 78. Lippincott Williams and Wilkins; 2017:324-329. doi:10.1097/SAP.0000000000000849
54. Platt J, Zhong T, Moineddin R, et al. Geographic Variation Immediate and Delayed Breast Reconstruction Utilization in Ontario, Canada and Plastic Surgeon Availability: A Population-Based Observational Study. *World J Surg*. 2015;39(8):1909-1921. doi:10.1007/s00268-015-3060-2
55. Butler PD, Familusi O, Serletti JM, Fox JP. Influence of race, insurance status, and geographic access to plastic surgeons on immediate breast reconstruction rates. *Am J Surg*. 2018;215(6):987-994. doi:10.1016/j.amjsurg.2017.09.037
56. Taylor V, Thompson B, Lessler D, et al. A clinic-based mammography intervention targeting inner-city women. *J Gen Intern Med*. 1999;14(2):104-111. doi:10.1046/j.1525-1497.1999.00295.x
57. Paskett ED, Tatum CM, D'Agostino R, et al. Community-based Interventions to Improve Breast and Cervical Cancer Screening: Results of the Forsyth County Cancer Screening (FoCaS) Project. *Cancer Epidemiol Prev Biomarkers*. 1999;8(5):399-406.
58. Musa D, Schulz R, Harris R, Silverman M, Thomas SB. Trust in the health care system and the use of preventive health services by older black and white adults. *Am J Public Health*. 2009;99(7):1293-1299. doi:10.2105/AJPH.2007.123927
59. Zacharias T, Wang W, Dao D, et al. HBV outreach programs significantly increase knowledge and vaccination rates among asian pacific islanders. *J Community Health*. 2015;40(4):619-624. doi:10.1007/s10900-014-9975-y

Appendix

Table 2: Search strategy

P-Ethnic women	I-Breast Reconstruction	Co-Barriers and Facilitators to uptake
A: (ethnic* OR Cultur* OR race* OR BAME OR black OR Caribbean OR Indian OR Pakistani OR Bangladeshi OR Chinese OR Asian OR African OR Afro-carribean OR Eastern European OR Arab).ti,ab	B: (breast ADJ3 (reconstruct* OR recreat*)).ti,ab	C: (Barrier* OR Obstacle OR Difficult OR Problem OR Complication OR Attitude OR Factilitat* OR Enable* OR Encourag* OR Assist* OR Promot*).ti,ab
Combine A, B, C with AND		

Table 3: Summary of included papers and respective themes

Study	System-associated factors		Physician-associated factors		Patient-associated factors	
	Barriers	Facilitators	Barriers	Facilitators	Barriers	Facilitators
Breast Reconstruction After Mastectomy: A Survey of Surgeons' and Patients' Perceptions (Ishak et al)			• no offer for breast reconstruction surgery	• surgeon recommendation	• lack of awareness and knowledge on reconstruction surgery • fear of complications from surgery, additional surgery, prolonged or additional anaesthesia, cancer recurrence • travel distance • increasing age of patient	• awareness of breast reconstruction before mastectomy • Emotions: to feel more balanced, to feel whole again, to regain feminity, no clothing limitation, improve marital relationship and sexual relations
A Qualitative Study of Breast Reconstruction Decision-Making among Asian Immigrant Women				• surgeon encouragement, referral from surgeon or cancer support group	• lack of knowledge • language barrier, lack of information in native language • perception that reconstruction has a	• Perception of functional role of breasts • Convenience of having mastectomy and reconstruction at the same time

Living in the United States (Fu et al)					purely cosmetic benefit, community attitude towards breast reconstruction, community belief that breast implants could cause cancer • fear of breast implants complications • inconvenience of multiple operations	• Breasts perceived to have functional value in younger women
" Use what God has given me": difference and disparity in breast reconstruction (Rubin et al)		• insurance coverage facilitated access to reconstruction • Women with higher income more likely to have		• younger women were more likely to have reconstruction recommended to them	• ethic of body acceptance, wanting 'nothing foreign' in the body • fear of implant rupture and leakage • fear of implants interference with detection of cancer	• desire to look or to feel 'normal', desire for breast symmetry, dissatisfaction with external prosthesis, desire for a wider range of clothing options • younger age necessitated reconstruction

		reconstruction			recurrence • lack of trust in healthcare • reluctance to undergo further surgery	
Access to Breast Reconstruction After Mastectomy and Patient Perspectives on Reconstruction Decision Making (Morrow et al)	• Lack of private insurance • surgeon not accepting patients with insurance				• lower education, lack of knowledge, unaware that reconstruction was an option • desire to avoid additional surgery, unimportance of reconstruction, fear of implants, worry about interference with detection of cancer recurrence, worry about complications • travel distance, time off work or from family,	

					trouble finding surgeon • older age, major comorbidity	
Health Insurance Coverage and Racial Disparities in Breast Reconstruction After Mastectomy (Shippee et al)	• public insurance	• Private insurance			• Increasing patient age	• Age under 45