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Racial Differences in Incidence of Anxiety and Depression Among Mastectomy and Breast Reconstruction Patients Using the All of Us Database

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Abstract: Background: Breast reconstruction after mastectomy may improve psychological sequelae for patients. The objective of this study is to characterize differences in depression and anxiety rates for mastectomy and breast reconstruction (BR) patients by race. Methods: The All of Us database was utilized for patients who underwent mastectomy and BR post-mastectomy. Anxiety and depression rates and self-identified race were extracted from DatasetV7. Results: Of mastectomy patients, 2398 were White and 472 were Black. Black patients had the greatest difference in depression rates between mastectomy (44.5%) and BR patients (28.8%) (OR = 0.46, 95% CI 0.26–0.82). White patients had lower depression rates (40.4%) for mastectomy than Black patients. Asian patients had the lowest rates of depression for mastectomy (OR = 0.43, 95% CI 0.22–0.84) and for mastectomy and BR (OR = 0.35). Black patients had a decrease in anxiety rates from mastectomy (49.4%) to BR (40.9%) (OR = 0.67). Conclusions: Anxiety and depression varied significantly by race for mastectomy and BR patients. Black mastectomy patients had the highest rates of depression and anxiety, which decreased after receiving BR. Lower rates of anxiety and depression were found amongst Asian mastectomy patients. These data highlight the need to identify and treat races vulnerable to depression and anxiety before and after mastectomy/BR.

Keywords: race/ethnicity; anxiety; depression; mastectomy; breast reconstruction

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1. Introduction

Breast cancer affects millions of women globally and poses multifaceted challenges that extend beyond its physical manifestations. Surgical interventions, such as mastectomy and breast reconstruction, play a pivotal role in the comprehensive management of breast cancer, aiming to address both the pathological and psychological aspects of the disease. Mastectomy involves the complete removal of the breast tissue, while breast reconstruction offers a sophisticated technique to restore breast form and function following mastectomy.

Within the broader population, disparities have been observed in the prevalence and manifestation of anxiety and depression across diverse groups. Racial and ethnic factors, in particular, have emerged as critical determinants of how patients experience and cope with these psychological challenges. Prior work has demonstrated that the lifetime prevalence of generalized anxiety disorder is lower in Black patients than White patients, but that Black patients are less likely to receive treatment [1–3]. Studies have found significant racial differences in the prevalence of depression as well, with higher rates in Black and Hispanic patients compared to White patients [4].

Anxiety and depression are prevalent psychological sequelae among breast cancer patients, significantly influencing overall quality of life [5]. The diagnosis of breast cancer, coupled with the profound physiological and emotional changes that accompany it,

can engender a heightened vulnerability to these mental health conditions. The literature underscores the intricate interplay between various treatment interventions and their psychosocial ramifications. For example, women who underwent breast conservation or reconstruction with adjuvant chemotherapy were found to have more sexual dysfunction, poorer body image, and more psychological distress than if they received adjuvant radiation therapy [6]. Additionally, prior comparisons have shown improved cosmetic results and overall patient satisfaction following wide local excision in comparison to complete mastectomy [7,8]. Furthermore, previous research has demonstrated significantly higher scores in the satisfaction with breasts and satisfaction with outcome domains of the BREAST-Q survey in nipple-sparing mastectomy patients compared to non-nipple-sparing mastectomy patients [9]. These findings bring to light the importance of further exploring the incidence of clinically diagnosed anxiety and depression within the context of mastectomy and breast reconstruction.

Numerous studies investigate the impact mastectomy and breast reconstruction can have on a patient's anxiety and depression levels. Some studies report patients who received mastectomy alone had more depressive symptoms and lower anxiety levels than patients with mastectomy and reconstruction, breast conserving surgery or delayed breast reconstruction [10,11]. A previous review reported that mastectomy with breast reconstruction had positive effects in 69.2% of articles, while 23.1% had no clear differences in effect from mastectomy with breast reconstruction or mastectomy alone. The same study also found no statistically significant difference between depression and anxiety rates in patients receiving immediate breast reconstruction (IBR) versus delayed breast reconstruction (DBR), as both groups had lower anxiety and depression scores [12]. Other studies reported that anxiety scores decreased significantly for both patients who received IBR vs. DBR, however depression scores decreased over time in patients receiving DBR while there was no change in depression score for patients who received IBR [11,13]. While this is a widely investigated topic in the literature, larger prospective multi-center studies must be conducted to comprehensively understand the impact mastectomy with or without breast reconstruction can have on anxiety and depression.

Understanding the nuances of racial differences in the context of anxiety and depression is vital for promoting equitable healthcare outcomes and tailoring interventions that adequately address the unique needs of all patients. There is a paucity of rates of depression and anxiety in racially diverse women who undergo mastectomy or breast reconstruction in the literature. The objective of this study is to address this knowledge gap by investigating racial differences in the incidence of clinically diagnosed anxiety and depression among patients undergoing mastectomy and breast reconstruction, on a temporal basis. Thus, this study aims to explore the interplay of surgical interventions, race, and psychological well-being in order to foster a more holistic approach to patient care and support.

2. Materials and Methods

2.1. Data Source

The All of Us database was queried for patients with mastectomy and breast reconstruction (BR) post mastectomy. Patients classified as having mastectomy in the All of Us database included procedures of partial mastectomy, bilateral mastectomy, and mastectomy (simple, complete). Patients classified as having breast reconstruction included procedures labeled bilateral reconstruction of breasts, mammoplasty, reconstruction of breast with flap, and breast reconstruction (immediate or delayed with tissue expander). Dataset v7 was utilized to extract race, anxiety disorder, depressive disorder, time period of diagnosis, and type of surgery for each group. Asian, Black, and White patients were included. Those who indicated multiple races were excluded. The two groups included those with mastectomy and BR, versus those with only mastectomy.

2.2. Data Analysis

Data analysis was performed by calculating incidence within one year of mastectomy or BR, prevalence of anxiety or depression, odds ratios, and confidence intervals [14]. Patient data cannot be reported or extracted for groups with a count of 20 or less to protect the privacy of participants, in accordance with the All of Us guidelines. Thus, the reporting of counts is limited in this study. Python was used to conduct the data analysis, which involved calculating incidence rates within one year of mastectomy or BR, prevalence of anxiety or depression, odds ratios, and confidence intervals. This allowed the researchers to compare rates between the mastectomy only and mastectomy + BR groups, as well as across racial groups. Standard chi-squared tests were used to compare the incidence and prevalence of anxiety and depression between different groups (e.g., mastectomy vs. mastectomy + BR, different racial groups). These tests were performed without additional stratification or adjustment for covariates, as the goal was to assess the overall association between the variables. Furthermore, the study had a limited sample size, which reduced the statistical power of some analyses and constrained the researchers' ability to further analyze rates of anxiety and depression amongst various specific breast reconstruction procedure types.

3. Results

In total, 2398 mastectomy patients were White and 472 were Black. Asian patients were also included. 51% of patients were older than 65 yo, 40% between 45 to 64 yo, and 10% 18 to 44 yo. Patients >65 yo had significantly less incidence of anxiety and depression (33%) than patients ages 18–44 (43%) and 45–64 (43%) ($p = 0.012$ and $p < 0.001$, respectively). However, controlling for age had no significant effect on distribution of anxiety and depression by race. Chi-squared tests were used to compare the incidence of anxiety and depression between different racial and surgical groups.

3.1. Procedure Type

Of the mastectomy patients, 63% had partial mastectomies, including lumpectomy, tylectomy, quadrantectomy, or segmentectomy, 34% had simple complete mastectomy, and 3% had bilateral mastectomy. Mastectomy was done either preventatively in high-risk patients or therapeutically for cancer removal. Breast reconstruction was done either with immediate or delayed tissue expansion (90%) or with an autologous flap (10%). A transverse rectus abdominis muscle flap was performed 67% of the time, deep inferior epigastric perforator flap 17% of the time, and latissimus dorsi flap 14% of the time.

Incidence of depression within 1 year of surgery was similar for all mastectomy procedures: 25% for partial mastectomy, 26% for simple mastectomy, and 26% for bilateral mastectomy (Table 1). Incidence of anxiety within 1 year of surgery were 28% for partial mastectomy, 34% for simple mastectomy, and 26% for bilateral mastectomy. There was a significant difference in incidence of anxiety between partial and simple mastectomy patients ($p = 0.008$) and thus sub-analyses were conducted for each procedure. Controlling for procedure type had no statistically significant impact on the anxiety incidence distribution by race.

Table 1. Incidence of Anxiety and Depression by Mastectomy Procedure Type.

Procedure Type	Incidence of Depression (%)	Incidence of Anxiety (%)
Partial Mastectomy	25	28
Simple Complete Mastectomy	26	34
Bilateral Mastectomy	26	26

3.2. Depression

427 of BR patients were White. Depression incidence was determined by diagnosis of depressive disorders including major depressive disorder, recurrent depression, dysthymia, and bipolar affective disorder within 1 year of surgery. The overall incidence of depression within one year of a breast cancer procedure in our study was 24.9%. The incidence of depression diagnosed within a year of mastectomy was highest for Black patients at 28.2%, 24.7% for White patients, and lowest at 12.5% for Asian patients (Figure 1, Table 2). However, the incidence of depression within a year after breast reconstruction was lower at 21.2% for Black patients with breast reconstruction (OR = 0.69, not significant), higher at 25.8% for White patients, and lower at 5.9% for Asian patients (Figure 2).

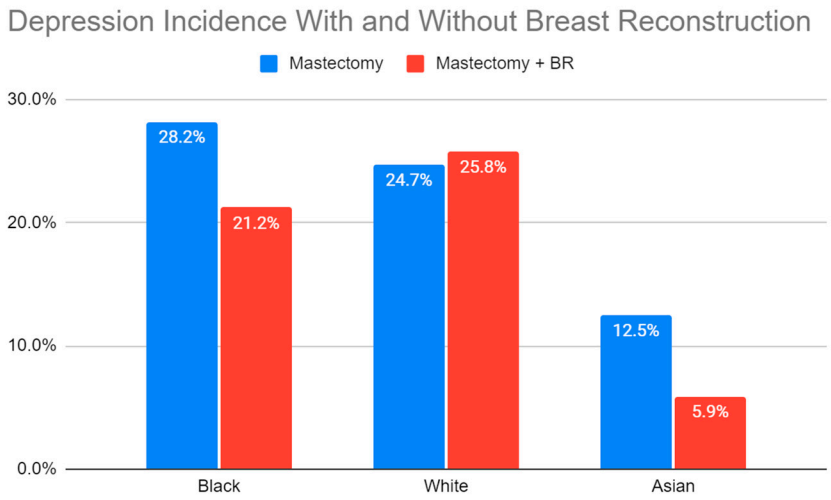

Figure 1. Incidence of depression in patients with and without BR.

Table 2. Incidence and Prevalence of Depression by Race.

Patient Group	Incidence of Depression (%)	Prevalence of Depression (%)
Mastectomy Only		
Black	28.2	44.5
White	24.7	40.4
Asian	12.5	21.9
Breast Reconstruction		
Black	21.2	28.8
White	25.8	39.3
Asian	5.9	17.7

Prevalence data gives us information on baseline levels of depression in our population that may have been diagnosed at any point in their lives. The overall prevalence of depression among our patient population was 40.1%, with significant variations observed across racial groups (Table 2). Black patients exhibited the greatest difference in depression prevalence between mastectomy (44.5%) and breast reconstruction (BR) patients (28.8%) (OR = 0.50, 95% CI 0.29–0.89, significant). White patients had a lower depression prevalence than Black patients at 40.4% for mastectomy, remaining consistent at 39.3% for BR patients (OR = 0.95, not significant). Asian patients showed the lowest depression prevalence: 21.9% for mastectomy (OR = 0.43, 95% CI 0.22–0.84, significant) and 17.7% for mastectomy with BR (OR = 0.35, not significant).

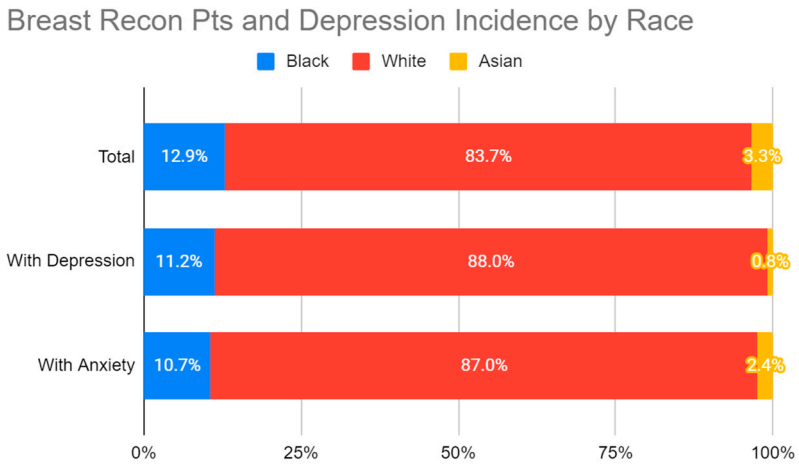

Figure 2. Incidence of depression for BR patients by race.

3.3. Anxiety

Anxiety was determined by a diagnosed anxiety disorder, including generalized anxiety disorder, chronic anxiety, anxiety about health, and panic. The incidence of anxiety within a year of mastectomy was highest for Black patients at 31.1%, 29.6% for White patients and lowest at 25.0% for Asian patients (Figure 3, Table 3). There were no significant differences between Black and White patients. Further sub-analysis by mastectomy type (simple vs. partial) did not reveal any differences either. However, the incidence of anxiety within a year after breast reconstruction was lower at 27.3% for Black patients (OR = 0.55, not significant), higher at 34.4% for White patients, and lower at 23.5% for Asian patients (Figure 3).

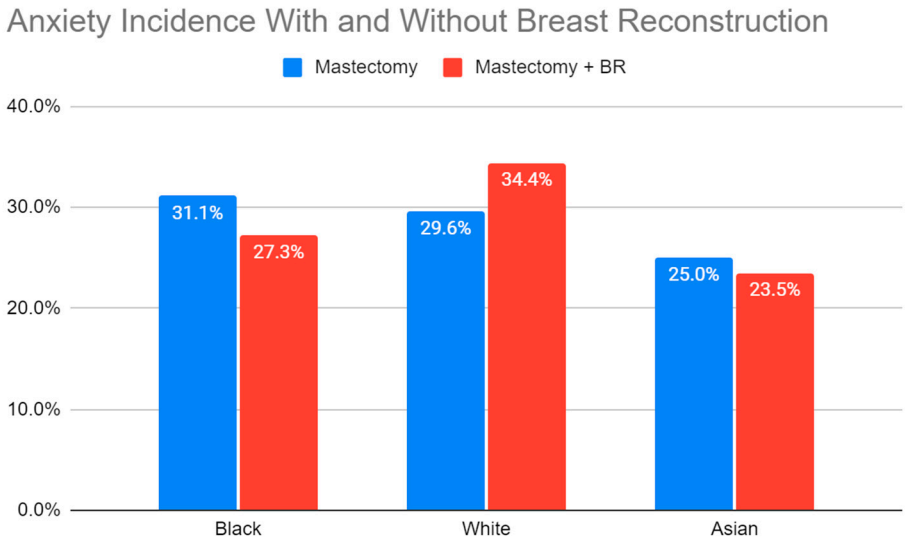

Figure 3. Incidence of anxiety in patients with and without BR.

Regarding prevalence of anxiety, which indicates a diagnosis of anxiety at any time, only Black patients had a lower anxiety prevalence for BR patients (40.9%) compared to mastectomy (49.4%) (OR = 0.67, not significant) (Table 3). White patients had a higher anxiety prevalence for BR (51.0%) (OR = 1.08, not significant). Asian patients had the lowest prevalence of anxiety for mastectomy patients at 34.4% but also had a higher prevalence for BR patients (41.2%) (OR = 1.26, not significant).

Table 3. Incidence and prevalence of anxiety by race.

Patient Group	Incidence of Anxiety (%)	Prevalence of Anxiety (%)
Mastectomy Only		
Black	31.1	49.4
White	29.6	49.1
Asian	25.0	34.4
Breast Reconstruction		
Black	27.3	40.9
White	34.4	51.0
Asian	23.5	41.2

4. Discussion

This study sought to investigate the knowledge gap regarding racial differences in the incidence of clinically diagnosed anxiety and depression among patients undergoing mastectomy and breast reconstruction. This has not been previously investigated. Utilizing the All of Us database, the interplay between surgical interventions, race, and psychological well-being was investigated. The All of Us database is a program established by the National Institutes of Health that stores data from more than one million participants in the United States with the hopes of encapsulating various races, ethnicities, age groups, regions of the country, gender identities, sexual orientations, socioeconomic statuses, education levels, disabilities, and health statuses in the dataset [15]. The representation of White and Black patients in our study closely mirrors the make-up of the US population, with 75% of the population being White and 14% Black [16]. Our findings provide valuable insights into the relationships between these factors and offer a foundation for informed patient care strategies.

4.1. Depression

Depression has a well-documented correlation with cancer diagnoses, including breast cancer, across the world [17–20].There are several factors influencing global prevalence rates, including geographic location and national development status. Our study found an overall prevalence of 40.5% among breast cancer mastectomy patients and incidence within one year of a breast cancer procedure of 24.9%, which suggests that breast cancer procedures may influence the development of depression. A previous review found a 24.6% prevalence of depression amongst breast cancer patients in the Americas [17]. Thus, our results suggest that the addition of a surgical procedure may increase a patient's risk of having depression. Although not significant, we found that incidence rates of depression within one year of surgery were lower overall for patients with breast reconstruction compared to mastectomy alone. While there are not widely reported incidence rates specifically for depression in patients who undergo a breast reconstruction procedure, a study by Kim et al. [21], found that there was a higher incidence of depression up to 3 years after receiving mastectomy, with middle aged and older adults ($\geq$40 years) having higher incidence of depression up to 2 years after mastectomy when compared to a non-breast cancer cohort. Other studies report that younger patients (18–47 years old) who receive mastectomy alone have the highest rates of depressive symptoms when compared to those who underwent mastectomy with reconstruction. A previous meta-analysis on depression after mastectomy found a 1.36 times higher risk of depression within one year after mastectomy compared to mastectomy and reconstruction [22]. However, another review found that 7.7% of the articles within the literature review demonstrated higher depressive symptoms and negative moods in patients who received mastectomy with breast reconstruction versus mastectomy alone worldwide [12]. Studies have yet to investigate how mastectomy type (simple versus partial) may impact depression and anxiety rates.

Studies also report that depression rates may fluctuate depending on the type of breast reconstruction a patient receives. One review paper found 71.4% of studies found no statistically significant difference between depression rates in patients receiving IBR versus DBR while 28.5% of studies found decreased depression rates and prevalence in patients who underwent IBR versus DBR [12]. Our results, in combination with previous research, may suggest that the type of reconstruction and age can impact rates of depression and anxiety after mastectomy, suggesting the need for larger prospective multi-center studies in the future, to provide a comprehensive understanding of anxiety and depression in this patient population. Our study demonstrated significantly lower rates of anxiety and depression amongst mastectomy patients 65 and older compared to <65 yo. Our results are in alignment with studies in the literature reporting greater anxiety and depression rates amongst young adults compared to older adults [23]. However, our analyses demonstrated no influence of age on racial disparities in anxiety and depression rates.

The significantly higher proportion of depression in the Black group compared to White and Asian groups underscores the importance of considering racial factors in the psychological well-being of breast cancer patients. This finding aligns with prior research indicating higher rates of depression in Black patients. The analysis also revealed that the Black group experienced higher anxiety prevalence in the "Mastectomy Only" category compared to "Mastectomy + BR" (Figure 3), suggesting that breast reconstruction may have a positive impact on reducing anxiety levels in this population. This observation is consistent with previous studies reporting improved psychological outcomes following breast reconstruction. Conversely, the Asian group exhibited the lowest anxiety prevalence ratios in both treatment types, highlighting potential cultural or societal factors that may influence their psychological response to breast cancer treatment.

Interestingly, we found significant racial differences in the prevalence of depression among our patient population. There was a significantly lower prevalence of depression among Black patients who underwent reconstruction compared to mastectomy alone. This demonstrates there may be an underlying racial component that may affect postoperative depression prevalence for patients who undergo reconstructive surgery after mastectomy. Previous studies have shown that racial identity and gender play a significant role in body image among Black patients, which could help explain the differences we see in our study population [24,25]. Further studies are needed to investigate the interplay of race, gender, and reconstructive surgery after mastectomy. Our results did not reveal significant differences in depression rates, but greater anxiety rates within 1 year of simple mastectomy as compared to partial. It may be that psychological sequelae vary between partial removal of breast tissue as compared to full removal, as well as the pathology that necessitates partial versus full removal. Further studies should investigate such differences in order to inform additional medical evaluation for depression or anxiety. It is also important to screen for patients who already have anxiety or depression, as these comorbid conditions may have an impact on psychological recovery post-mastectomy or breast reconstruction. Our study was not able to determine exact periods of anxiety or depression, however there is a need to further explore.

Asian patients were found to have the lowest prevalence of depression in both the mastectomy and breast reconstruction groups. However, a recent review discussing depression and anxiety among Asian American breast cancer survivors highlighted the lack of Asian-American representation in literature and the difficulty these patients often face when seeking social support to process cancer-related stressors [26]. It is important not to view the lower reported prevalence of depression as an indication that this patient population does not require psychological support through their diagnosis.

There were no significant racial differences in depression incidence within one year of mastectomy. These results suggest that reconstructive surgery and race may have a correlation with depression rates, but not a causative effect.

4.2. Anxiety

Anxiety is another common psychological reaction to the diagnosis of breast cancer and its subsequent treatment procedures [27–29]. Our study demonstrates notable trends in anxiety incidence across racial groups. Black patients consistently displayed higher anxiety rates than White and Asian patients both after mastectomy and breast reconstruction. This observation aligns with prior research indicating that Black patients often experience greater psychological distress in various medical contexts [30–34]. Interestingly, the incidence of anxiety decreased for Black patients following breast reconstruction, suggesting that the reconstructive procedure may offer a source of psychological relief for this subgroup. However, it is important to note that this decrease did not reach statistical significance, warranting further investigation. Conversely, White patients exhibited a slight increase in anxiety incidence after breast reconstruction, albeit not statistically significant, indicating that the reconstructive process might introduce additional stressors for this group. Other work has found that higher quality patient–provider communication reduced incidence of anxiety in Black breast cancer survivors [35]. Further work is warranted to comprehend the factors contributing to racial differences in anxiety incidence and strategies to mitigate them.

Prior research has found that a number of other factors influence anxiety in cancer patients, including age, treatment type, number of treatments undergone, and living situation [36–38]. While our study does not look into specific breast reconstruction types, some studies demonstrate variable differences in anxiety rates when looking at types of breast reconstruction. Studies demonstrate decreased anxiety rates and prevalence in patients who underwent IBR versus DBR, while other studies demonstrate no statistically significant difference in anxiety rates between IBR and DBR. Another study reported that patients who undergo breast-conserving surgery or delayed breast reconstruction have higher anxiety levels versus patients who undergo mastectomy alone [11]. There is a need for further work to investigate the inconsistencies in the literature in regard to which procedures yield higher anxiety and depression rates, and what contributes to these higher rates in certain breast reconstruction types.

4.3. Limitations

Several limitations must be acknowledged. First, the study's retrospective nature may have introduced biases and confounding factors that were not controlled for. Other factors may have contributed to the diagnosis of anxiety or depression within a year of surgery rather than the breast cancer and surgery itself. Additionally, the reliance on diagnostic codes for anxiety and depression might not capture the full spectrum of psychological experiences that patients undergo. We also do not have the exact date of depression and anxiety diagnosis. Furthermore, the codes utilized for mastectomy and BR were non-homogenous. However, analyses by mastectomy procedure type revealed no impact on results. Our sample size was also limited by adding in many variables to analyze at once such as mastectomy type, breast reconstruction procedure, race, anxiety, and depression. This resulted in numbers <20 for some racial groups, which are not reported in numerical value, but rather percentage. This way, analyses could still be done. Small sample sizes also reduced the power of our statistical analyses, limiting our ability to further analyze rates of anxiety and depression amongst various breast reconstruction procedure types. The study's focus on clinically diagnosed cases may overlook subthreshold psychological symptoms that could influence patient well-being. In addition, we are unable to determine the duration and periods of depressive episodes for patients, only whether they were diagnosed with depression within a year of surgery. Lastly, the dataset's use of self-reported race might not fully capture the complexity of patients' racial identities.

4.4. Future Implications

This study contributes to the growing body of literature exploring racial disparities in the psychological sequelae of breast cancer treatment. The observed differences in anxiety

and depression incidence emphasize the need for specifically tailored interventions that address the unique needs of patients from diverse racial backgrounds. Future research could delve deeper into the sociocultural, socioeconomic, and psychosocial factors that contribute to these disparities. Longitudinal studies tracking patients' psychological trajectories over an extended period could provide insights into the long-term effects of surgical interventions on mental health outcomes. Moreover, qualitative research methodologies could help to shed light on patients' lived experiences. Incorporating patient-reported outcomes and subjective well-being measures could also provide a more comprehensive understanding of the impact of surgical choices on mental health.

5. Conclusions

Anxiety and depression varied significantly by race for mastectomy and BR patients. Black mastectomy patients had the highest rates of depression and anxiety, which decreased after receiving BR. Lower rates of anxiety and depression were found amongst Asian mastectomy patients. These data highlight the need to identify and treat races vulnerable to depression and anxiety before and after mastectomy/BR. These data demonstrate the need for holistic patient care strategies that consider psychological well-being alongside physical outcomes, while also paving the way for further research to deepen our understanding of these complex dynamics. Such insights are pivotal for fostering equitable and patient-centered health care that addresses the needs of all breast cancer patients.

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Conflicts of Interest: Jason Ko is a consultant for Checkpoint Surgical, Inc., Integra Lifesciences, Inc., and Neuraptive Therapeutics, Inc. Robert Galiano is a consultant, receives research support, and/or serves on the Board of Directors from the following companies: Solventum, MTF, Smith and Nephew, Altrazeal, Piomic, MedRegen. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript; or in the decision to publish the results. No other disclosures by any of the authors.

References

1. Breslau, J.; Aguilar-Gaxiola, S.; Kendler, K.S.; Su, M.; Williams, D.; Kessler, R.C. Specifying race-ethnic differences in risk for psychiatric disorder in a USA national sample. *Psychol. Med.* **2006**, *36*, 57–68. [CrossRef] [PubMed] [PubMed Central]
2. Grant, B.F.; Hasin, D.S.; Stinson, F.S.; Dawson, D.A.; June Ruan, W.; Goldstein, R.B.; Smith, S.M.; Saha, T.D.; Huang, B. Prevalence, correlates, co-morbidity, and comparative disability of DSM-IV generalized anxiety disorder in the USA: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Psychol. Med.* **2005**, *35*, 1747–1759. [CrossRef] [PubMed]
3. Young, A.S.; Klap, R.; Sherbourne, C.D.; Wells, K.B. The quality of care for depressive and anxiety disorders in the United States. *Arch. Gen. Psychiatry* **2001**, *58*, 55–61. [CrossRef] [PubMed]

4. Lim, E.; Davis, J.; Chen, J.J. The Association of Race/Ethnicity, Dietary Intake, and Physical Activity with Depression. *J. Racial Ethn. Health Disparities* **2021**, *8*, 315–331. [CrossRef] [PubMed] [PubMed Central]
5. Tsaras, K.; Papathanasiou, I.V.; Mitsi, D.; Veneti, A.; Kelesi, M.; Zyga, S.; Fradelos, E.C. Assessment of Depression and Anxiety in Breast Cancer Patients: Prevalence and Associated Factors. *Asian Pac. J. Cancer Prev.* **2018**, *19*, 1661–1669. [CrossRef] [PubMed] [PubMed Central]
6. Schover, L.R.; Yetman, R.J.; Tuason, L.J.; Meisler, E.; Esselstyn, C.B.; Hermann, R.E.; Grundfest-Broniatowski, S.; Dowden, R.V. Partial mastectomy and breast reconstruction. A comparison of their effects on psychosocial adjustment, body image, and sexuality. *Cancer* **1995**, *75*, 54–64. [CrossRef] [PubMed]
7. Al-Ghazal, S.K.; Blamey, R.W.; Stewart, J.; Morgan, A.A. The cosmetic outcome in early breast cancer treated with breast conservation. *Eur. J. Surg. Oncol.* **1999**, *25*, 566–570. [CrossRef] [PubMed]
8. Al-Ghazal, S.K.; Fallowfield, L.; Blamey, R.W. Patient evaluation of cosmetic outcome after conserving surgery for treatment of primary breast cancer. *Eur. J. Surg. Oncol.* **1999**, *25*, 344–346. [CrossRef] [PubMed]
9. Bailey, C.R.; Ogbuagu, O.; Baltodano, P.A.; Simjee, U.F.; Manahan, M.A.; Cooney, D.S.; Jacobs, L.K.; Tsangaris, T.N.; Cooney, C.M.; Rosson, G.D. Quality-of-Life Outcomes Improve with Nipple-Sparing Mastectomy and Breast Reconstruction. *Plast. Reconstr. Surg.* **2017**, *140*, 219–226. [CrossRef] [PubMed]
10. Archangelo, S.C.V.; Sabino Neto, M.; Veiga, D.F.; Garcia, E.B.; Ferreira, L.M. Sexuality, depression and body image after breast reconstruction. *Clinics* **2019**, *74*, e883. [CrossRef]
11. Heimes, A.S.; Stewen, K.; Hasenburg, A. Psychosocial Aspects of Immediate versus Delayed Breast Reconstruction. *Breast Care* **2017**, *12*, 374–377. [CrossRef] [PubMed]
12. Roy, N.; Downes, M.H.; Ibelli, T.; Amakiri, U.O.; Li, T.; Tebha, S.S.; Balija, T.M.; Schnur, J.B.; Montgomery, G.H.; Hendersons, P.W. The psychological impacts of post-mastectomy breast reconstruction: A systematic review. *Ann. Breast Surg.* **2023**, *8*. Available online: https://abs.amegroups.org/article/view/8262 (accessed on 14 August 2024). [CrossRef] [PubMed]
13. Zhong, T.; Hu, J.; Bagher, S.; Vo, A.; O'Neill, A.C.; Butler, K.; Novak, C.B.; Hofer, S.O.P.; Metcalfe, K.A. A Comparison of Psychological Response, Body Image, Sexuality, and Quality of Life between Immediate and Delayed Autologous Tissue Breast Reconstruction: A Prospective Long-Term Outcome Study. *Plast. Reconstr. Surg.* **2016**, *138*, 772–780. [CrossRef] [PubMed]
14. Fanakidou, I.; Zyga, S.; Alikari, V.; Tsironi, M.; Stathoulis, J.; Theofilou, P. Mental health, loneliness, and illness perception outcomes in quality of life among young breast cancer patients after mastectomy: The role of breast reconstruction. *Qual. Life Res.* **2018**, *27*, 539–543. [CrossRef]
15. All of Us Research Program Overview. All of Us Research Program NIH. 18 October 2023. Available online: https://allofus.nih.gov/about/program-overview (accessed on 14 August 2024).
16. United States Census Bureau. U.S. Census Bureau Quickfacts: United States. 2022. Available online: https://www.census.gov/quickfacts/fact/table/US/PST045222 (accessed on 14 August 2024).
17. Pilevarzadeh, M.; Amirshahi, M.; Afsargharehbagh, R.; Rafiemanesh, H.; Hashemi, S.M.; Balouchi, A. Global prevalence of depression among breast cancer patients: A systematic review and meta-analysis. *Breast Cancer Res. Treat.* **2019**, *176*, 519–533. [CrossRef]
18. Jafari, A.; Goudarzian, A.H.; Nesami, M.B. Depression in Women with Breast Cancer: A Systematic Review of Cross-Sectional Studies in Iran. *Asian Pac. J. Cancer Prev.* **2018**, *19*, 1–7. [CrossRef]
19. Wondimagegnehu, A.; Abebe, W.; Abraha, A.; Teferra, S. Depression and social support among breast cancer patients in Addis Ababa, Ethiopia. *BMC Cancer* **2019**, *19*, 836. [CrossRef]
20. Wang, Y.H.; Li, J.Q.; Shi, J.F.; Que, J.-Y.; Liu, J.-J.; Lappin, J.M.; Leung, J.; Ravindran, A.V.; Chen, W.-Q.; Qiao, Y.-L.; et al. Depression and anxiety in relation to cancer incidence and mortality: A systematic review and meta-analysis of cohort studies. *Mol. Psychiatry* **2020**, *25*, 1487–1499. [CrossRef] [PubMed]
21. Kim, M.S.; Kim, S.Y.; Kim, J.H.; Park, B.; Choi, H.G. Depression in breast cancer patients who have undergone mastectomy: A national cohort study. *PLoS ONE* **2017**, *12*, e0175395. [CrossRef]
22. Padmalatha, S.; Tsai, Y.T.; Ku, H.C.; Wu, Y.-L.; Yu, T.; Fang, S.-Y.; Ko, N.-Y. Higher Risk of Depression After Total Mastectomy Versus Breast Reconstruction Among Adult Women With Breast Cancer: A Systematic Review and Metaregression. *Clin. Breast Cancer* **2021**, *21*, e526–e538. [CrossRef]
23. Goodwin, R.D.; Weinberger, A.H.; Kim, J.H.; Wu, M.; Galea, S. Trends in anxiety among adults in the United States, 2008–2018: Rapid increases among young adults. *J. Psychiatr. Res.* **2020**, *130*, 441–446. [CrossRef] [PubMed]
24. Watson, L.B.; Lewis, J.A.; Moody, A.T. A sociocultural examination of body image among Black women. *Body Image* **2019**, *31*, 280–287. [CrossRef] [PubMed]
25. Oney, C.N.; Cole, E.R.; Sellers, R.M. Racial Identity and Gender as Moderators of the Relationship Between Body Image and Self-esteem for African Americans. *Sex Roles* **2011**, *65*, 619–631. [CrossRef]
26. Tsai, W.; Nusrath, S.; Zhu, R. Systematic review of depressive, anxiety and post-traumatic stress symptoms among Asian American breast cancer survivors. *BMJ Open* **2020**, *10*, e037078. [CrossRef]
27. Ashbury, F.D.; Findlay, H.; Reynolds, B.; McKerracher, K. A Canadian survey of cancer patients' experiences: Are their needs being met? *J. Pain Symptom Manag.* **1998**, *16*, 298–306. [CrossRef] [PubMed]
28. Burgess, C.; Cornelius, V.; Love, S.; Graham, J.; Richards, M.; Ramirez, A. Depression and anxiety in women with early breast cancer: Five year observational cohort study. *BMJ* **2005**, *330*, 702. [CrossRef] [PubMed] [PubMed Central]

29. Lim, C.C.; Devi, M.K.; Ang, E. Anxiety in women with breast cancer undergoing treatment: A systematic review. *Int. J. Evid. Based Healthc.* **2011**, *9*, 215–235. [CrossRef] [PubMed]
30. Weisenberg, M.; Kreindler, M.L.; Schachat, R.; Werboff, J. Pain: Anxiety and attitudes in Black, White and Puerto Rican patients. *Psychosom. Med.* **1975**, *37*, 123–135. [CrossRef] [PubMed]
31. Mossman, B.; Perry, L.M.; Walsh, L.E.; Gerhart, J.; Malhotra, S.; Horswell, R.; Chu, S.; Raines, A.M.; Lefante, J.; Blais, C.M.; et al. Anxiety, depression, and end-of-life care utilization in adults with metastatic cancer. *Psychooncology* **2021**, *30*, 1876–1883. [CrossRef] [PubMed]
32. Walker, F.B., IV; Novack, D.H.; Kaiser, D.L.; Knight, A.; Oblinger, P. Anxiety and depression among medical and surgical patients nearing hospital discharge. *J. Gen. Intern. Med.* **1987**, *2*, 99–101. [CrossRef] [PubMed]
33. Cukor, D.; Coplan, J.; Brown, C.; Friedman, S.; Cromwell-Smith, A.; Peterson, R.A.; Kimmel, P.L. Depression and anxiety in urban hemodialysis patients. *Clin. J. Am. Soc. Nephrol.* **2007**, *2*, 484–490. [CrossRef] [PubMed]
34. Barberio, B.; Zamani, M.; Black, C.J.; Savarino, E.V.; Ford, A.C. Prevalence of symptoms of anxiety and depression in patients with inflammatory bowel disease: A systematic review and meta-analysis. *Lancet Gastroenterol. Hepatol.* **2021**, *6*, 359–370. [CrossRef] [PubMed]
35. Lake, P.W.; Conley, C.C.; Pal, T.; Sutton, S.K.; Vadaparampil, S.T. Anxiety and depression among Black breast cancer survivors: Examining the role of patient-provider communication and cultural values. *Patient Educ. Couns.* **2022**, *105*, 2391–2396. [CrossRef] [PubMed]
36. Hjörleifsdóttir, E.; Rahm Hallberg, I.; Agren Bolmsjö, I.; Gunnarsdóttir, E.D. Icelandic cancer patients receiving chemotherapy or radiotherapy: Does distance from treatment center influence distress and coping? *Cancer Nurs.* **2007**, *30*, E1–E10. [CrossRef] [PubMed]
37. Browall, M.; Ahlberg, K.; Karlsson, P.; Danielson, E.; Persson, L.O.; Gaston-Johansson, F. Health-related quality of life during adjuvant treatment for breast cancer among postmenopausal women. *Eur. J. Oncol. Nurs.* **2008**, *12*, 180–189. [CrossRef] [PubMed]
38. Sheppard, V.B.; Harper, F.W.; Davis, K.; Hirpa, F.; Makambi, K. The importance of contextual factors and age in association with anxiety and depression in Black breast cancer patients. *Psychooncology* **2014**, *23*, 143–150. [CrossRef] [PubMed] [PubMed Central]