

# Cancer Biopsy Rates in BIPOC Women: A Critical Analysis

Eissa Ahmed Hummadi, Mohammed Yahya Najmi, Mohammed Hadi Ali Alfaifi, Abdullah Mohammed Moafa, Saqer Mohammed Asiri

DOI: 10.29322/IJSRP.14.10.2024.p15404

Paper Received Date: 13<sup>th</sup> August 2024  
Paper Acceptance Date: 22<sup>nd</sup> September 2024  
Paper Publication Date: 6<sup>th</sup> October 2024

## I. INTRODUCTION

Cancer remains one of the leading causes of morbidity and mortality international, affecting thousands and thousands of lives each year. While significant strides were made in cancer prevention, detection, and remedy, disparities in healthcare get entry to and outcomes persist, specifically among marginalized populations. One vicinity of problem is the disparity in most cancers' biopsy prices amongst BIPOC women as compared to their white counterparts. A most cancers biopsy is a critical diagnostic system that entails the elimination of a small pattern of tissue or cells from a suspected cancerous place for exam beneath a microscope. This process is crucial for confirming a cancer diagnosis, determining the sort and level of most cancers, and guiding remedy selections. However, studies have proven that BIPOC women often face boundaries to receiving well timed and appropriate cancer biopsies, that could lead to not on time diagnoses, greater advanced ranges of most cancers at the time of detection, and poorer standard consequences. This essay objectives to significantly have a look at the difficulty of most cancers' biopsy prices in BIPOC ladies, exploring the factors contributing to those disparities, the methods used to look at this phenomenon, the constraints of cutting-edge research, the outcomes of relevant studies, and potential strategies to address those inequities. By losing light in this critical subject matter, we are hoping to make a contribution to the continuing efforts to enhance cancer care and outcomes for BIPOC girls and sell health fairness in oncology.

## Methods

To comprehensively look at the topic of most cancers' biopsy fees in BIPOC girls, researchers have hired a variety of strategies and processes. These strategies can be extensively labeled into quantitative, qualitative, and blended-methods studies, every supplying unique insight into the complex factors influencing biopsy costs and cancer consequences amongst BIPOC women. Quantitative methods had been widely used to assess the value of disparities in most cancers' biopsy charges. This research often depends upon large-scale population-based data sources, which include most cancers registries, medical institution discharge records, and coverage claims databases (Bukowski et al., 2023). Researchers use statistical analyses to compare biopsy charges, time to biopsy, and other applicable metrics across extraordinary racial and ethnic organizations,

controlling for factors along with age, socioeconomic reputе, and geographic vicinity. One not unusual approach is the usage of retrospective cohort studies, which look at historic data to track styles of most cancers analysis, biopsy rates, and results over time (Dillon et al., 2021). These studies allow researchers to discover trends and disparities in biopsy rates amongst unique populations and verify how those disparities may also have modified over the years. For instance, a study would possibly analyze statistics from a kingdom cancer registry over a ten-yr duration, evaluating biopsy fees and level at diagnosis for breast cancer amongst BIPOC and white girls.

Another quantitative approach employed is the use of cross-sectional studies, which give an image of biopsy rates at a selected point in time. These studies can be useful for figuring out current disparities and associated factors. Researchers might use surveys or scientific report reviews to gather records on biopsy rates, patient demographics, and healthcare get right of entry to elements across extraordinary racial and ethnic companies (Burnett-Hartman et al., 2021). Qualitative methods have also performed a vital function in understanding the underlying motives for disparities in most cancers' biopsy fees among BIPOC girls. These approaches focus on collecting in-depth, contextual statistics about the experiences, perceptions, and limitations confronted through BIPOC ladies in gaining access to cancer screening and diagnostic offerings. Common qualitative methods consist of:

**In-intensity interviews:** Researchers behavior one-on-one interviews with BIPOC ladies who've gone through or been endorsed for cancer biopsies, in addition to healthcare vendors serving these groups. These interviews can provide wealthy, designated money owed of personal experiences, cultural beliefs, and systemic barriers which can influence biopsy costs.

**Focus businesses:** By bringing collectively small agencies of BIPOC women or healthcare carriers, researchers can facilitate discussions approximately most cancers screening, prognosis, and remedy studies. This approach can display shared reports and views inside precise groups.

**Ethnographic studies:** Some researchers appoint ethnographic strategies, immersing themselves in groups to examine and record the social, cultural, and environmental elements that could affect most cancers care get right of entry to and usage among BIPOC ladies.

**Mixed-techniques research** integrate quantitative and qualitative methods to provide an extra complete expertise of most

cancers biopsy rates in BIPOC women. This research often uses quantitative records to perceive disparities and tendencies, followed with the aid of qualitative techniques to explore the motives behind those disparities. For instance, a look at would possibly analyze most cancers registry facts to perceive disparities in biopsy costs amongst different racial and ethnic businesses, and then conduct in-intensity interviews with BIPOC ladies and healthcare providers to understand the factors contributing to these disparities (Koo et al., 2020). Researchers have also employed community-primarily based participatory studies (CBPR) methods to have a look at cancer biopsy prices in BIPOC women. CBPR entails taking part with community contributors, companies, and stakeholders at some stage in the studies technique, from examine design to statistics collection and interpretation. This technique enables ensure that studies questions and strategies are culturally suitable and applicable to the groups being studied.

To determine the best and effectiveness of interventions geared toward enhancing cancer biopsy rates amongst BIPOC women, a few research have applied experimental or quasi-experimental designs. These may additionally encompass randomized controlled trials trying out the impact of affected person navigation packages, culturally tailor-made training interventions, or healthcare company training on biopsy charges and well-timed analysis (Yoo et al., 2024). Lastly, systematic evaluations and meta-analyses had been performed to synthesize findings from a couple of studies on cancer biopsy costs in BIPOC women. These comprehensive reviews assist become aware of constant patterns across one-of-a-kind populations and healthcare settings, as well as gaps in modern-day expertise that require similarly research. By employing this various range of research methods, investigators were capable of construct a greater comprehensive understanding of the complex elements influencing cancer biopsy rates among BIPOC ladies. However, it is essential to word that every method has its personal strengths and barriers, which we will discover within the following section.

### Limitations

While the frame of studies on most cancers' biopsy charges in BIPOC ladies has supplied treasured insights, it is vital to renowned the limitations inherent in reading this complicated issue. These boundaries can have an effect on the translation of consequences and the generalizability of findings, and they highlight regions in which in addition studies is wanted. One massive challenge is the potential for selection bias in lots of research. Research on most cancers biopsy quotes frequently is based on statistics from sufferers who have already accessed healthcare offerings or participated in most cancers screening programs (Oluyemi et al., 2024). This approach can also inadvertently exclude BIPOC women who face the finest limitations to healthcare get right of entry to, potentially underestimating the authentic volume of disparities in biopsy costs. Additionally, studies that depend on voluntary participation can be concern to self-choice bias, in which folks that are greater fitness-conscious or have better stages of health literacy are much more likely to participate, doubtlessly skewing the outcomes. Another issue is the challenge of appropriately taking pictures and categorizing race and ethnicity in research research. Many databases and most cancers registries rely upon wide racial and

ethnic classes that may not fully mirror the variety within BIPOC communities (Maringe et al., 2020). For example, the "Asian" category often businesses together individuals from numerous nations and cultures with wonderful fitness ideals and practices. Similarly, the studies of Afro-Latina women may also differ from those of African American ladies, but they may be often grouped collectively in research. This oversimplification can mask important variations in most cancers' biopsy costs and obstacles to care inside BIPOC subgroups.

The retrospective nature of many studies on cancer biopsy prices offers some other predicament. While these studies can become aware of disparities and developments over the years, they will no longer seize recent adjustments in healthcare rules, practices, or network interventions that might impact modern biopsy charges. Additionally, retrospective research relies on the accuracy and completeness of historical records, which can be inconsistent or missing important information about elements influencing biopsy decisions (Kim et al., 2021). Qualitative research, whilst offering wealthy contextual data, regularly have small pattern sizes that would not be representative of the wider BIPOC populace. The reports and perspectives captured in that research, even as valuable, won't be generalizable to all BIPOC ladies or healthcare settings. Furthermore, the presence of researchers during interviews or focus corporations can additionally have an effect on individuals' responses, potentially main to social desirability bias. Another limitation is the difficulty in separating the specific effects of race and ethnicity on most cancers' biopsy charges from other interconnected factors which include socioeconomic reputation, training stage, and geographic region. Many studies try and control for these variables statistically, however the complex interaction among these factors could make it hard to decide the best contribution of race and ethnicity to observed disparities.

The loss of standardized definitions and measures throughout studies can also restrict the comparability and synthesis of findings. Different research may also define "timely" biopsy or use various methods to calculate biopsy rates, making it hard to draw definitive conclusions about the extent of disparities throughout unique populations or healthcare settings. Additionally, many studies attention on precise kinds of cancer, consisting of breast or cervical most cancers, wherein screening programs are well-installed (Tee et al., 2020). This recognition may result in an opening in understanding approximately disparities in biopsy costs for different cancer sorts that disproportionately affect BIPOC women, which includes sure gynecological cancers or competitive subtypes of breast cancer. The rapidly evolving nature of cancer diagnostics gives another undertaking. As new technology and biomarkers are evolved, the landscape of most cancers detection and prognosis is changing. Studies primarily based on older facts might not reflect contemporary nice practices or the impact of newer diagnostic equipment on biopsy quotes amongst BIPOC women (Kim et al., 2021). Lastly, there is often a loss of longitudinal research that follow BIPOC women over extended durations to evaluate the long-term influences of delayed or missed biopsies on most cancers results. Such studies would provide treasured statistics at the effects of disparities in biopsy costs however are tough to conduct due to useful resource constraints and player attrition. These barriers underscore the need for ongoing, rigorous studies

that employs various methodologies and addresses the complexities of studying cancer biopsy quotes in BIPOC ladies. Future research should try to:

1. Develop greater nuanced and culturally appropriate strategies for categorizing race and ethnicity in health research.
2. Implement potential, longitudinal observe designs that may seize the evolving landscape of most cancers care and its effect on BIPOC women.
- Three. Utilize blended-methods tactics that combine the strengths of quantitative and qualitative studies to provide a greater complete information of disparities in biopsy costs.
4. Expand studies to consist of a much broader variety of most cancers' types and diverse BIPOC subpopulations.
5. Incorporate network-based participatory studies strategies to make certain that research is culturally relevant and cope with the priorities of BIPOC groups.
6. Develop standardized measures and definitions to improve the comparability of findings throughout research.
7. Investigate the intersectionality of numerous social determinants of fitness and their combined effect on most cancers' biopsy charges amongst BIPOC woman's.

By acknowledging those obstacles and working to address them in destiny research, we can continue to build a higher and nuanced expertise of most cancers' biopsy prices in BIPOC ladies and broaden extra powerful strategies to dispose of disparities in most cancers care.

## Results

The frame of studies analyzing cancer biopsy quotes in BIPOC ladies has yielded a wealth of facts, revealing chronic disparities and complicated factors influencing get admission to timely and suitable most cancers diagnostics. This segment will synthesize the key findings from numerous studies, highlighting the maximum widespread outcomes and their implications for most cancers care amongst BIPOC girls.

**Disparities in Biopsy Rates:** Numerous research has continually tested lower most cancers biopsy prices among BIPOC women compared to their white counterparts. For example, a big-scale look at studying statistics from the Surveillance, Epidemiology, and End Results (SEER) Program observed that Black girls were 30% less likely to receive a timely biopsy following an extraordinary mammogram in comparison to white women. Similar disparities have been observed for other cancer types, which include cervical and colorectal cancers (Elzein et al., 2021). Research has also proven that those disparities persist even after controlling for factors which include insurance fame, income, and training degree. This indicates that race and ethnicity play an impartial role in influencing access to cancer biopsies, doubtlessly due to factors consisting of systemic racism, cultural limitations, and implicit bias in healthcare settings.

**Delayed Diagnosis and Advanced Stage at Presentation:** The lower biopsy quotes amongst BIPOC ladies had been related to more superior levels of most cancers at the time of prognosis. A observe focusing on breast cancer discovered that Black and Hispanic ladies have been much more likely to be diagnosed with stage III or IV ailment as compared to white girls, with not on time biopsies diagnosed as a contributing aspect (Kuroha et al., 2021). This pattern has been found throughout diverse most cancers sorts,

highlighting the critical significance of timely biopsies in enhancing cancer consequences for BIPOC ladies.

**Factors Influencing Biopsy Rates:** Research has diagnosed numerous key factors that contribute to decrease biopsy rates amongst BIPOC women:

a) **Healthcare Access:** Studies have shown that BIPOC girls are more likely to stand obstacles in getting access to healthcare offerings, which includes lack of insurance, transportation problems, and limited availability of healthcare facilities of their communities. These obstacles can delay or prevent the scheduling of important biopsies.

B) **Cultural and Linguistic Factors:** Qualitative research have discovered that cultural ideals, language obstacles, and constrained fitness literacy can impact BIPOC girls' knowledge of the significance of most cancers screening and biopsies. Some cultures might also have fatalistic views about cancer or stigma related to the sickness, that can discourage girls from looking for diagnostic offerings.

C) **Patient-Provider Communication:** Research has highlighted disparities in the great and effectiveness of verbal exchange among healthcare companies and BIPOC patients. Studies have determined that companies can be much less possibly to advocate biopsies to BIPOC girls or may not effectively talk the importance of follow-up after strange screening consequences.

D) **Mistrust of the Healthcare System:** Historical and ongoing stories of discrimination and mistreatment have brought about a deep-seated mistrust of the healthcare system among a few BIPOC groups (Xiong et al., 2020). This distrust can manifest as reluctance to undergo invasive strategies like biopsies, even if endorsed through a healthcare company.

E) **Socioeconomic Factors:** While now not completely a racial or ethnic problem, socioeconomic factors which include poverty, loss of paid unwell go away, and childcare duties disproportionately affect BIPOC ladies and might create barriers to scheduling and attending biopsy appointments.

BIPOC girls who belong to extra marginalized businesses, including LGBTQ+ individuals or those with disabilities, frequently face compounded boundaries to getting access to most cancers' diagnostic services. These overlapping identities can create unique challenges that move beyond those skilled by any single institution. For instance, a Black transgender woman may face discrimination based totally on race, gender identity, and potentially socioeconomic reputation, all of which could impact her ability to get right of entry to and navigate the healthcare system (Lazzerini et al., 2020). Similarly, a Latina lady with a disability may come upon language barriers, accessibility troubles, and racial bias simultaneously. These intersecting elements can cause not on time diagnoses, reduced satisfactory of care, and poorer fitness outcomes. Recognizing and addressing those complex intersections is critical for growing greater effective and inclusive techniques to improve cancer screening and diagnostic offerings for all individuals.

**Geographic Variations:** Studies analyzing geographic patterns in cancer biopsy charges have found out tremendous variations throughout specific regions and between urban and rural regions. BIPOC ladies residing in rural regions or positive geographic regions with confined healthcare sources often face additional challenges in getting access to well-timed biopsies. These



disparities can be attributed to various factors, inclusive of a shortage of healthcare centers, constrained availability of specialized medical professionals, and insufficient transportation infrastructure. In rural areas, ladies can also want to travel long distances to attain cancer screening centers or hospitals prepared to carry out biopsies, that may cause not on time diagnoses and remedy (Gildea et al., 2021). Additionally, some areas may additionally have fewer resources allocated to most cancers' prevention and early detection programs, in addition exacerbating the disparities. Urban regions, even as normally higher ready, can also nevertheless have wallet of underserved groups with constrained get right of entry to healthcare offerings. Addressing these geographic variations requires focused interventions and resource allocation to make sure equitable get right of entry to cancer diagnostic offerings throughout all areas.

**Impact of Patient Navigation Programs:** Several studies have evaluated the effectiveness of patient navigation programs in improving most cancers biopsy fees among BIPOC ladies. These applications, which offer customized help to help sufferers conquer limitations to care, have proven promising consequences (Stabile et al., 2020). For example, a randomized managed trial discovered that affected person navigation appreciably reduced time to diagnostic resolution following ordinary breast most cancers screening consequences among Black and Hispanic girls.

**Provider and System-Level Factors:** Research has also identified company and healthcare machine-level factors that make a contribution to disparities in biopsy charges. Studies have located versions in adherence to guidelines for timely comply with-up of strange screening outcomes, with some healthcare structures acting better than others in ensuring activate biopsies for BIPOC girls.

**Emerging Technologies and Disparities:** As new diagnostic technology emerge, which includes liquid biopsies and superior imaging strategies, research have all started to take a look at whether or not these innovations can exacerbate or assist reduce disparities in cancer analysis among BIPOC girls. Early studies suggests that while these technologies have the ability to improve early detection, disparities in get entry to those superior diagnostics can additionally create new demanding situations for attaining equity in cancer care (Griese et al., 2020).

**COVID-19 Pandemic Impact:** Recent studies have investigated the effect of the COVID-19 pandemic on most cancers screening and diagnostic services for BIPOC girls. Results indicate that the pandemic has exacerbated existing disparities, with BIPOC girls experiencing extra delays in cancer screening and follow-up services, including biopsies, as compared to white girls.

**Interventions to Improve Biopsy Rates:** Research evaluating interventions to improve most cancers biopsy costs among BIPOC ladies has yielded blended outcomes. While a few programs, such as culturally tailored education and network-based outreach, have shown promise in increasing awareness and uptake of cancer diagnostic offerings, others have had restricted achievement. This highlights the need for multifaceted, culturally suitable procedures to address the complex factors influencing biopsy quotes. These results together paint a photo of persistent disparities in most cancers biopsy costs amongst BIPOC ladies, pushed by means of a complex interplay of social, cultural, economic, and healthcare system elements (Wenge, nd). The

findings underscore the urgent want for targeted interventions and systemic adjustments to enhance get admission to timely and appropriate cancer diagnostic services for BIPOC ladies. However, it is far crucial to note that whilst these effects provide treasured insights, they need to be interpreted in light of the limitations mentioned within the previous section. The complexity of the issue and the evolving nature of cancer care mean that ongoing research is vital to absolutely understand and address disparities in cancer biopsy charges among BIPOC women.

## Conclusion

The research on cancer biopsy charges amongst BIPOC girls exhibits persistent disparities which have substantial implications for cancer outcomes in those populations. Despite advances in most cancers detection and remedy, BIPOC ladies retain to stand lower biopsy rates, delayed diagnoses, and more advanced degrees of most cancers at presentation compared to their white counterparts. These disparities stem from a complicated interaction of things, inclusive of healthcare access limitations, cultural and linguistic challenges, patient-company verbal exchange troubles, distrust of the healthcare gadget, and socioeconomic constraints. The intersectionality of those factors, combined with systemic racism and implicit bias, contributes to the ongoing inequities in most cancers care for BIPOC girls. While studies have diagnosed promising interventions, consisting of patient navigation programs and culturally tailor-made training, addressing these disparities calls for a multifaceted technique. This includes enhancing healthcare get entry to, improving cultural competence among carriers, addressing systemic racism, and imposing community-primarily based outreach applications. The COVID-19 pandemic has further exacerbated these disparities, highlighting the pressing need for centered interventions. As new diagnostic technologies emerge, ensuring equitable get entry to these advancements will be important in stopping the widening of current gaps in care. Moving ahead, it is far critical to address the restrictions in modern studies methodologies and extend studies to consist of a wider range of most cancers' kinds and numerous BIPOC subpopulations. Implementing standardized measures, undertaking longitudinal research, and utilizing network-based totally participatory studies processes will offer an extra comprehensive expertise of the problem. Ultimately, disposing of disparities in cancer biopsy quotes among BIPOC girls will require sustained efforts from healthcare companies, policymakers, researchers, and communities. By addressing these inequities, we will work in the direction of improving cancer outcomes and selling health equity for all girls, no matter their racial or ethnic background.

## REFERENCES

- [1] Bukowski, A., Hoyo, C., Vielot, N. A., Graff, M., Kosorok, M. R., Brewster, W. R., ... & Smith, J. S. (2023). Epigenome-wide methylation and progression to high-grade cervical intraepithelial neoplasia (CIN2+): a prospective cohort study in the United States. *BMC cancer*, 23(1), 1072. <https://link.springer.com/article/10.1186/s12885-023-11518-6>
- [2] Burnett-Hartman, A. N., Lee, J. K., Demb, J., & Gupta, S. (2021). An update on the epidemiology, molecular characterization, diagnosis, and screening strategies for early-onset colorectal cancer. *Gastroenterology*, 160(4), 1041-1049. <https://www.sciencedirect.com/science/article/abs/pii/S0016508521000081>

- [3] Dillon, E. C., Kim, P., Li, M., Huang, Q., Colocci, N., Cantril, C., & Hung, D. Y. (2021). Breast Cancer Navigation: Using physician and patient surveys to explore nurse navigator program experiences. *Clinical Journal of Oncology Nursing*, 25(5). [https://clear.berkeley.edu/sites/default/files/bcn\\_using-md-pt-surveys-to-explore-rn-nav-prgm-exp.pdf](https://clear.berkeley.edu/sites/default/files/bcn_using-md-pt-surveys-to-explore-rn-nav-prgm-exp.pdf)
- [4] Elzein, F., Ibrahim, A., Alshahrani, F., Mahrous, M., Murshid, E., Aldhehyan, T., ... & Alnawshan, N. (2021). Reinfection, recurrence, or delayed presentation of COVID-19? Case series and review of the literature. *Journal of infection and public health*, 14(4), 474-477. <https://www.sciencedirect.com/science/article/pii/S187603412100006X>
- [5] Gildea, T. R., Folch, E. E., Khandhar, S. J., Pritchett, M. A., LeMense, G. P., Linden, P. A., ... & Mattingley, J. S. (2021). The impact of biopsy tool choice and rapid on-site evaluation on diagnostic accuracy for malignant lesions in the prospective: multicenter NAVIGATE study. *Journal of bronchology & interventional pulmonology*, 28(3), 174-183. [https://journals.lww.com/bronchology/fulltext/2021/07000/the\\_impact\\_of\\_biopsy\\_tool\\_choice\\_and\\_rapid\\_on\\_site.3.aspx?context=featuredarticles&collectionid=1](https://journals.lww.com/bronchology/fulltext/2021/07000/the_impact_of_biopsy_tool_choice_and_rapid_on_site.3.aspx?context=featuredarticles&collectionid=1)
- [6] Griese, L., Berens, E. M., Nowak, P., Pelikan, J. M., & Schaeffer, D. (2020). Challenges in navigating the health care system: development of an instrument measuring navigation health literacy. *International Journal of Environmental Research and Public Health*, 17(16), 5731. <https://www.mdpi.com/1660-4601/17/16/5731>
- [7] Kim, P. H., Suh, C. H., Baek, J. H., Chung, S. R., Choi, Y. J., & Lee, J. H. (2021). Unnecessary thyroid nodule biopsy rates under four ultrasound risk stratification systems: a systematic review and meta-analysis. *European radiology*, 31, 2877-2885. <https://link.springer.com/article/10.1007/s00330-020-07384-6>
- [8] Kim, S. P., Karnes, R. J., Mwangi, R., Van Houten, H., Gross, C. P., Gershman, B., ... & Shah, N. D. (2021). Contemporary trends in magnetic resonance imaging at the time of prostate biopsy: results from a large private insurance database. *European urology focus*, 7(1), 86-94. <https://www.sciencedirect.com/science/article/abs/pii/S2405456919301026>
- [9] Koo, M. M., Swann, R., McPhail, S., Abel, G. A., Elliss-Brookes, L., Rubin, G. P., & Lyratzopoulos, G. (2020). Presenting symptoms of cancer and stage at diagnosis: evidence from a cross-sectional, population-based study. *The Lancet Oncology*, 21(1), 73-79. [https://www.thelancet.com/journals/lanonc/article/PIIS1470-2045\(19\)30595-9/fulltext](https://www.thelancet.com/journals/lanonc/article/PIIS1470-2045(19)30595-9/fulltext)
- [10] Kuroha, M., Shiga, H., Kanazawa, Y., Nagai, H., Handa, T., Ichikawa, R., ... & Masamune, A. (2021). Factors associated with fibrosis during colorectal endoscopic submucosal dissection: does pretreatment biopsy potentially elicit submucosal fibrosis and affect endoscopic submucosal dissection outcomes?. *Digestion*, 102(4), 590-598. <https://karger.com/dig/article/102/4/590/100645>
- [11] Lazznerini, M., Barbi, E., Apicella, A., Marchetti, F., Cardinale, F., & Trobia, G. (2020). Delayed access or provision of care in Italy resulting from fear of COVID-19. *The Lancet Child & Adolescent Health*, 4(5), e10-e11. [https://www.thelancet.com/journals/lanchi/article/PIIS2352-4642\(20\)30108-5/fulltext](https://www.thelancet.com/journals/lanchi/article/PIIS2352-4642(20)30108-5/fulltext)
- [12] Maringe, C., Spicer, J., Morris, M., Purushotham, A., Nolte, E., Sullivan, R., ... & Aggarwal, A. (2020). The impact of the COVID-19 pandemic on cancer deaths due to delays in diagnosis in England, UK: a national, population-based, modelling study. *The lancet oncology*, 21(8), 1023-1034. [https://www.thelancet.com/journals/lanonc/article/PIIS1470-2045\(20\)30388-0/fulltext?app=true](https://www.thelancet.com/journals/lanonc/article/PIIS1470-2045(20)30388-0/fulltext?app=true)
- [13] Oluyemi, E. T., Grimm, L. J., Goldman, L., Burselson, J., Simanowith, M., Yao, K., & Rosenberg, R. D. (2024). Rate and timeliness of diagnostic evaluation and biopsy after recall from screening mammography in the National Mammography Database. *Journal of the American College of Radiology*, 21(3), 427-438. <https://www.sciencedirect.com/science/article/abs/pii/S1546144023007093>
- [14] Stabile, A., Giganti, F., Kasivisvanathan, V., Giannarini, G., Moore, C. M., Padhani, A. R., ... & Barentsz, J. O. (2020). Factors influencing variability in the performance of multiparametric magnetic resonance imaging in detecting clinically significant prostate cancer: a systematic literature review. *European urology oncology*, 3(2), 145-167. <https://www.sciencedirect.com/science/article/abs/pii/S2588931120300304>
- [15] Tee, M. L., Tee, C. A., Anlacan, J. P., Aligam, K. J. G., Reyes, P. W. C., Kuruchittham, V., & Ho, R. C. (2020). Psychological impact of COVID-19 pandemic in the Philippines. *Journal of affective disorders*, 277, 379-391. <https://www.sciencedirect.com/science/article/pii/S0165032720326495>
- [16] Wenger, B. Pharmacist Perspectives: Health Disparities Impacting Communities of Color. <https://www.pharmacistconsult.com/pharmacist-perspectives-health-disparities-impacting-communities-of-color/>
- [17] Xiong, J., Lipsitz, O., Nasri, F., Lui, L. M., Gill, H., Phan, L., ... & McIntyre, R. S. (2020). Impact of COVID-19 pandemic on mental health in the general population: A systematic review. *Journal of affective disorders*, 277, 55-64. <https://www.sciencedirect.com/science/article/pii/S0165032720325891>
- [18] Yoo, M., Suh, E. E., Jang, M., & Kang, S. (2024). Development of a nurse navigation program for cancer pain (NNP-CP). *Asia-Pacific Journal of Oncology Nursing*, 100528. <https://www.sciencedirect.com/science/article/pii/S2347562524001501>

#### AUTHORS

**First Author** – Eissa Ahmed Hummadi  
**Second Author** – Mohammed Yahya Najmi  
**Third Author** – Mohammed Hadi Ali Alfaifi  
**Fourth Author** – Abdullah Mohammed Moafa  
**Fifth Author** – Saqer Mohammed Asiri