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Review Article

Cancer Risk Assessment Tools in Primary Care Settings: An Integrative Review

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Abstract: Background: There are currently numerous risk instruments available to aid in predicting the present or future chance of getting a cancer diagnosis. It aids in determining a person's likelihood of developing certain cancers by looking at various risk factors, including environmental, behavioral, and genetic. **Aim:** To analyze the effectiveness of cancer risk assessment techniques utilized in primary care settings. **Methods**: An integrative review of literature **Results**: Five (5) studies were met the criteria based on the inclusion and exclusion criteria. These tools demonstrated effectiveness in improving patient outcomes and serving as useful therapeutic tools in the primary care setting. **Conclusion:** Advantages that may aid clinicians in the primary care setting in validating the diagnosis and assisting patients in determining the early signs and symptoms in the diagnosis of cancer. The role of assessment tools can enhance the reliability and caliber of clinical judgment, which can enhance patient outcomes. **Implications**: The role of healthcare professionals, such as oncologists, nurses, and the healthcare team, on cancer risk assessment in the primary care setting across the lifespan is crucial to ensure a care plan tailored to each patient's needs.

Keywords: Cancer, Oncology, Risk Assessment Tools, Primary Care Settings

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1. Introduction

Many cancer patients may not exhibit symptoms that allow for quick diagnosis. A large portion of this can be attributable to diagnostic delays, which can be caused by patients who present to doctors with symptoms later or by patients who present with delays. To help clinicians with cancer research, techniques for assessing cancer risk have been developed. When patients seek primary care due to symptoms, these evaluation procedures help identify cancer risk.

Currently, many risk instruments are available to forecast one's present or future risk of developing cancer. Many of the risk models for symptomatic individuals have been validated in separate populations. Some of the QCancer risk models are included, as well as the colorectal cancer RAT and other well-known models like the Selvachandran model for colorectal cancer [1]. The "YourDiseaseRisk" tool, which forecasts risks for patients 40 years of age and older, has been available in the United States of America (USA) since 2000 and has been developed in the United Kingdom (UK) to predict 11 malignancies, including cancers of the lungs, prostate, breast, bladder, colon, skin, stomach, pancreas, uterus, and ovaries [2]. Some tumor types (multiple myeloma, lung, stomach cancer, pancreatic) are more difficult to diagnose than others in primary care and can significantly make patients more likely to pay multiple visits to their providers before a referral compared with breast or endometrial cancer patients [3]. On the positive side, a systematic approach to risk assessment will allow the primary care clinician to identify female

patients at high risk for Breast cancer and provide an opportunity for shared decision-making regarding enhanced screening, referrals to a specialty clinic, genetic counseling, and risk-reduction strategies. With knowledge and understanding of personal risks, patients may have a higher perceived benefit to intervention and are more likely to use risk-reducing treatment [4].

Several diagnostic tools can estimate the likelihood that a patient has cancer based on their symptoms, blood test results, and other data. The instruments aid primary care physicians in determining who needs additional testing for potential cancer, including malignancies of the digestive, urinary, and reproductive systems as well as blood cancers. Studies have been assessed and done on how these tools were created, how effective and accurate they are, and their effects on patients. However, it was discovered that while many instruments have been created, there is little proof that it can increase life span or quality [5, 6]

The efficacy of using QCancer, a cancer risk assessment tool (RAT), concluded that obstacles included the need for more consultation time, unneeded worry and anxiety brought on by cancer investigations, a lack of training for practitioners regarding its use, an excessive number of referrals and demands placed on services, practitioner skepticism regarding the utility and efficacy of the tool, and the requirement to establish the tool's efficacy before implementing it in clinical practice. Perceptions to the tool would improve in facilitating the process of diagnosis and treatment, decision-making, assisting in identifying and modifying health risk behaviors, and customized care [7].

Risk assessment tools are the initial step in assisting with cancer diagnosis and therapy. Given that most evaluation tools are beneficial during clinic visits for medical care, the researchers emphasized using RAT in the primary care setting. Different risk assessment techniques are being developed and encouraged in the primary sector to address the issue of cancer's frequently delayed identification. This study's key objective was to analyze the practical usability and efficacy of several cancer risk assessment techniques with a focus on primary care settings.

2. Materials and Methods

2.1. Design

This paper is an integrative review of related literature. The integrative literature review is a unique type of research that develops various knowledge about a subject by synthesizing, analyzing, and reviewing representative literature on a subject in a way that creates new perspectives and frameworks on the subject. It aligns the integrative literature review's methods with its purpose, which provides unity and coherence to the review [8]. In accordance with the integrative review process, the researchers identified research questions and the findings were summarized by the purpose of the study. With the guidance of Whittemore and Knafl (2005) methodology [9], the researchers made use of the following steps identification of research interest, review, and synthesis of data, interpretation of the collated data, and application of the result in the clinical setting.

2.2. Search Strategy

The integrative search strategy of this study utilized different electronic resources such as Science Direct, Google Scholar, Pubmed, CINAHL, Wiley, and Scopus. With the use of Boolean operators (AND, OR, and NOT), the keywords used are Cancer (Neoplasm), Risk Assessment Tools, and Primary Care Settings. The PRISMA search flow diagram was adopted as shown on Figure 1.

The inclusion criteria in the selection of articles are published from 2015 to 2022, peer-reviewed journals in the English language or with translation into English and centered on risk assessment tools in primary care settings. The exclusion criteria are those not

centered on risk assessment tools and primary care. Table 1 further depicts the eligibility criteria of Inclusion and Exclusion criteria.

In the initial search, 152 abstracts were identified and further reviewed. Based on the inclusion criteria, 20 abstracts were reviewed and chosen, of which 10 full-text articles were further examined. After considering the criteria, only five (5) articles were included that met all the necessary requirements.

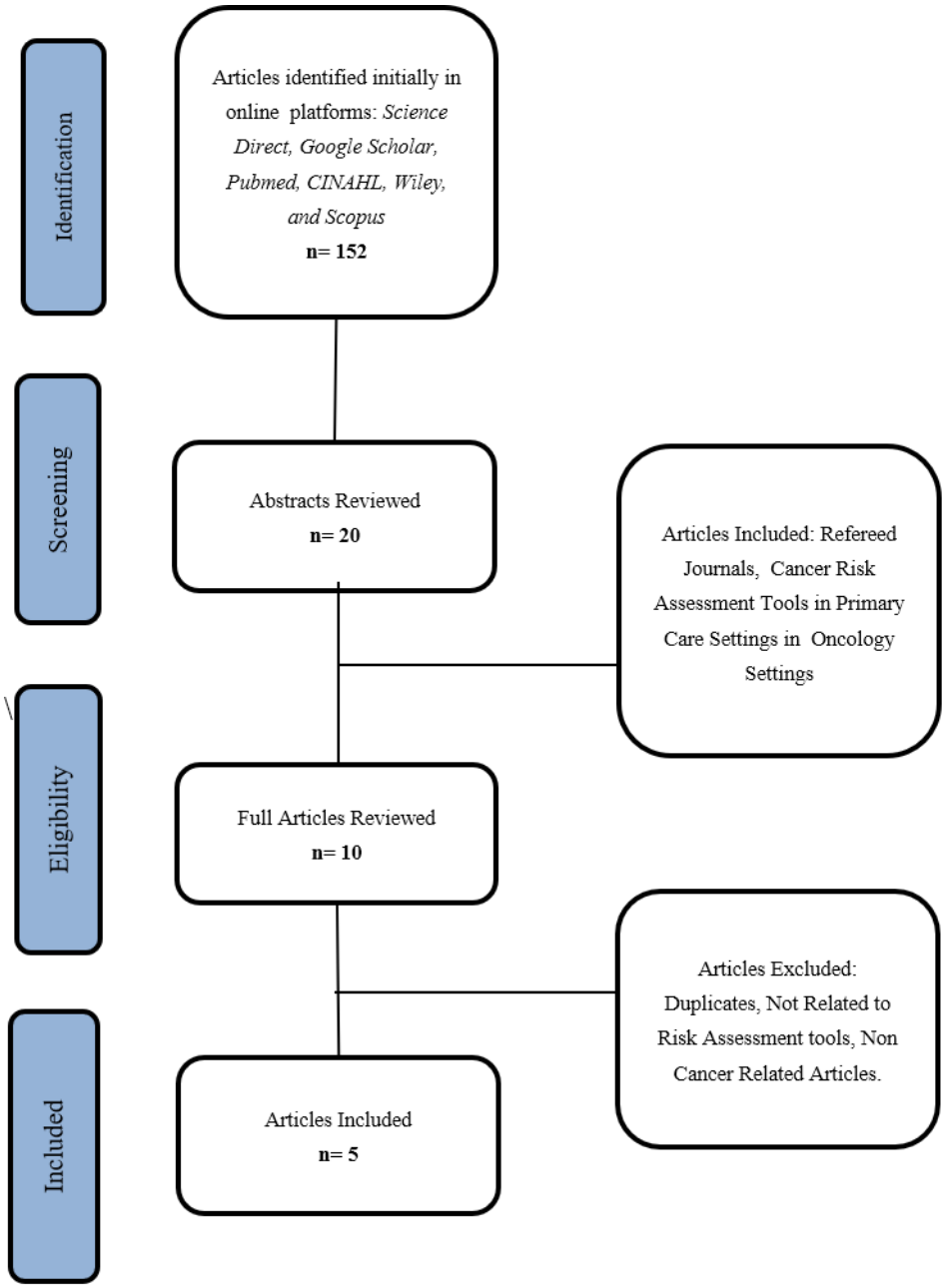

Figure 1. PRISMA Flow Diagram on on the Effectiveness of Cancer Risk Assessment Tools in Primary Care Settings

Table 1. Eligibility of the Inclusion and Exclusion Criteria

Criteria	Inclusion	Exclusion
Publication types	Peer reviewed articles Clinical trials Randomized-controlled trials Quasi-experimental Cohort studies Qualitative Descriptive studies	Systematic reviews Literature reviews Integrative reviews Other types of review Case studies Case reports Books Ongoing studies Editorials Studies without results
Language	English Any language with translation into English	Other languages
Population (P)	Primary Care Settings	Other settings
Interventions (I)	Risk Assessment Tools in Cancer Care	N/A
Comparison (C)	N/A	N/A
Outcomes (O)	Effectiveness	N/A
Time (T)	2015 - 2022	Studies older than before 2015

2.3. Data Synthesis and Evaluation

An evaluation matrix was extracted using Sparbel & Anderson (2000) guide [10] throughout the data collection procedure from the included publications with the following information: authors, country, publication year, design, sampling, settings, study findings, and degree of evidence were all provided. Data from primary sources were classified, sorted, and summarized into a cohesive and integrated conclusion throughout the data analysis process. For the data analysis procedure, the articles were coded, categorized, and rated using the matrix. Each publication was manually, independently examined and reviewed by all of the researchers while considering its goal, approach, and conclusions. Agreement for the selection of articles was made through consensus.

To critically appraise the selected studies, the Critical Appraisal Programme (CASP) Checklist (2018) was used [11] because it is a commonly utilized tool for health-related evidence synthesis, considering its three main sections: validity of the results, the significance of findings, and helpfulness of the findings in practice [12]. In addition, the Hierarchy of Evidence for Intervention and Melnyk & Fineout-Overholt's Treatment Questions (2022) was also used to classify the level of evidence (LOE) to answer clinical questions and critically appraise each study based on its validity and usefulness in practice can guide the practice and improve outcomes [13].

3. Results

Table 2 shows the five articles that were included based on the inclusion and exclusion criteria. All related literature were published between 2015 and 2022, with major output in the UK (n=2), USA (n=1), and Australia (n=2), which was conducted in primary care settings. Studies in a single descriptive or qualitative research (n=4), and a cohort

study (n=1). The overall sample size of all the examined publications is 133 participants, and a population-based cohort study with 2646 patients. The respondents included were clinicians, administrators, patients with cancer, and families who had cancer. The methods and tools used vary in each study which included questionnaires, interviews, and Electronic Health Records (EHR) databases.

Table 2. Selected Articles and Characteristics

Primary Author (year) Country	Design	Service Area Offered/Data Range Collection	Sample and Setting	Method/ Instrument Used	Level of Evidence (LOE)
Milton et al. (2022) Australia	Qualitative study	Victoria, Australia between September 2018 to September 2019	13 practice nurses in a General Practice clinic	Interview (via phone, zoom, and one on one).	LOE VI
Akanuwe et al. (2020) United Kingdom	Qualitative study	Primary care setting in Linconshire 2016	36 participants consisting of 17 practitioners and 19 clients	focus groups and semi-structured individual interviews, Risk Analysis Framework	LOE VI
Walker et al. (2017) Australia	Qualitative study using Action design using Exploratory study	Victorian Primary Care Practice-Based Research Network (VicReN). date not specified	14 GPs (general practitioners), 9 PNs (practice nurses), and 6 PMs (practice managers)	Interview using the Normalization Process Theory (NPT)	LOE VI
Seesaghur et al. (2021) United Kingdom	Population-based cohort study	UK Clinical Practice Research Datalink between January 1, 2006, and December 31, 2016	2646 NDMM eligible patients, under 18 years old, newly diagnosed with multiple myeloma (NDMM), registered in a primary care practice for less than two years and no history of solid tumors	Clinical Practice Research Datalink (CPRD) GOLD data- base, and Aetion Evidence Platform.	LOE IV
Yadav et al (2019) United States of America	Qualitative Study	William Beaumont Hospital's Primary care clinic between April and November 2016	43 fresh graduates from medical schools in the US and Canada who are currently in their first year of the residency program.	Questionnaires, EHR (electronic health record) review, pre and post education program of BCRAT	LOE VI

As indicated in Table 3, each study employed different types of Cancer Risk Assessment Tools that met the requirement to assess their effectiveness in patient outcomes and clinical utility on their visit to the Primary Care Setting.

Table 3. Tools for Cancer Risk Assessment and Its Effectiveness

Study	Tool	Effectiveness
Milton et al. (2022) Australia	Colorectal Cancer Risk Prediction tool (CRISP)	This tool identified both unsuccessful and successful implementation of adaptive methodology and highlighted the significance of co-design output to use in other settings and with other risk instruments.
Akanuwe et al. (2020) United Kingdom	QCancer tool	This tool improved patient education strategies that incorporate openness when discussing risks, patient participation in the process, and adequate consultation time within the context of a professional approach.
Walker et al. (2017) Australia	Colorectal Cancer Risk Prediction tool (CRISP)	Clinicians were competent in hypothetical consultations, accustomed to using risk assessment tools while making therapeutic decisions, and have the capacity to use this tool effectively.
Seesaghur et al. (2021) United Kingdom	CRAB criteria (hyperCalcaemia, Renal impairment, Anemia, Bone lesions)	Early identification of myeloma's clinical characteristics and effective use of investigations in primary care may expedite the diagnosis of multiple myeloma (MM).
Yadav et al. (2019) United States of America	NCI Breast Cancer Risk Assessment Tool (BCRAT)	Clearly proved that the education program improved residents' awareness and application of the tool.

4. Discussion

The aim of this study is to analyze the practical usability and efficacy of several cancer risk assessment techniques with a focus on primary care settings.

To determine the efficacy of cancer risk assessment methods in primary care settings, five (5) studies were selected for this integrative review. In this investigation, various tools were used. The CRISP aims to promote a suitable screening for Colorectal Cancer. This tool may be implemented into clinical practice by utilizing evidence-based techniques such as continuous training, designating a practice champion, and integrating it into current management systems. Regular involvement with clinical staff and interactive modifications also helped apply strategies and accommodate changes in general practice [14, 15] CRAB used clinical features as an assessment tool for Multiple Myeloma. This tool identified the frequency and timing of particular clinical symptoms in the primary care setting before a Multiple Myeloma diagnosis [16]. The goal was to utilize Qcancer RAT to comprehend the attitudes of clients and primary care physicians on sharing information about cancer risk with patients [7]. It emphasized on the importance of personalizing information to suit the educational level, cultural background, and general level of understanding of individual patients. An educational program improved PCPs' (Primary Care Physicians) understanding of and use of BCRAT while they were internal medicine residents [17].

A nurse consultation would be a better setting for using the CRISP tool. Clinicians could employ this instrument well in hypothetical consultations while making treatment decisions [14]. In relation, it is beneficial to train the personnel on how to utilize CRISP

[15] to help how individualized colorectal cancer risk assessments and screening may assist. CRISP placed a strong emphasis on having conversations with patients about their overall health because smoking, eating well, and exercising are all risk factors for colorectal cancer and a variety of other health problems. Further, This tool demonstrated the importance of the co-design output for application in other settings and with different risk instruments. Another, a CRAB criteria increased awareness of Multiple Myeloma (MM) clinical features, such as how the disease initially manifests as bone pain, which may lead to earlier identification and testing for MM in primary care, speeding up disease diagnosis and prompt treatment [16].

Participants believed that RAT can improve the problem-solving process and medical decisions in patient outcomes, particularly with patients whose cancer symptoms were vague, helping to speed up the diagnosis, evaluation, and treatment of cancer. This tool enhanced patient education techniques that encourage open discussion of risks and patient participation. However, it requires a lot more time for consultations [7]. Over two-thirds of the medical residents were unaware of BCRAT before the start of the program. Their study serves as a reminder to other training programs to emphasize using BCRAT when addressing early detection and breast cancer prevention. Furthermore, if the first live birth and menarche date—two crucial BCRAT components—were included in the HER, residents might find it quicker to identify those at a higher risk [17]. Despite large decreases and subsequent recoveries in colorectal, prostate, and breast cancer monthly screening rates, there will still be an estimated 9.4 million screening deficit attributed to the COVID-19 pandemic for the US population in 2020. By socioeconomic status index and geographic region, screening decreases varied, and telehealth use was linked to more excellent screening rates, and telehealth use was linked to greater screening rates. To bridge the significant cancer screening gap brought during the COVID-19 pandemic, public health initiatives are required, including the expanded use of non-invasive screening methods [18].

In summary, the study's tools demonstrate potential for improving patient outcomes and serving as useful therapeutic tools in the primary care setting. This made it easier for the doctors to understand how screening and individualized risk assessments can be helpful on the first visit to the primary settings. Additionally, these tools assisted the patients in understanding their risk factors, symptoms, and the required patient education to avoid delays in diagnosis.

4.1. Implications

The nature of cancer control is evolving, with a growing focus on early diagnosis, patient experience, and prevention, throughout the treatment, driven by public and political demand. As a result of rising healthcare needs, efforts to control healthcare costs, and patient preferences for care near home, governments and health payers around the world are increasingly promoting primary care as the preferred venue for most healthcare [19]. Therefore, it is essential to think about how this growing primary care role can benefit cancer control, which has traditionally been dominated by highly technological interventions focused on treatment and in which primary care has generally been seen as having a minimal impact.

From advocating early detection and diagnosis to offering care during and after treatment for cancer and any concurrent disorders, primary care clinicians have essential roles to play across the cancer continuum. Evidence suggests that higher cancer screening participation rates are associated with improved primary care involvement [20,21] Thus, the role of healthcare professionals, such as oncologists, nurses, and the healthcare team, on cancer risk assessment in the primary care setting across the lifespan is crucial to ensure a care plan tailored to each patient's needs.

To conclude, the study's findings demonstrated that the use of risk assessment tools provides favorable outcomes and is beneficial in clinical settings based on information on

their efficacy. The results of this study have demonstrated advantages that may aid clinicians in primary care in validating the diagnosis and allowing patients to recognize the early symptoms and warning signs of cancer. Overall, these assessment methods can enhance the reliability and caliber of clinical judgment, enhancing patient outcomes, especially in primary care settings.

5. Patents

Author Contributions: CPV: Conceptualization, Methodology, Formal analysis, Investigation, Data curation, Writing – original draft, Project administration. **KIN**: Conceptualization, Methodology, Formal analysis, Investigation, Data curation, Writing – original draft, Project administration. **KC**: Conceptualization, Methodology, Formal analysis, Investigation, Data curation, Writing – original draft, Project administration. **RAN**: Formal analysis, Investigation, Supervision, Validation, Visualization, Writing – review & editing,

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References

[1] Usher-Smith J, Emery J, Hamilton W, Griffin SJ, Walter FM. Risk prediction tools for cancer in primary care. *British journal of cancer*. 2015 Dec;113(12):1645-50. https://doi.org/10.1038/bjc.2015.409

[2] Lophatananon, A., Usher-Smith, J., Campbell, J., Warcaba, J., Silarova, B., Waters, E. A., ... & Muir, K. R. (2017). Development of a Cancer Risk Prediction Tool for Use in the UK Primary Care and Community SettingsDevelopment of a Cancer Risk Prediction Tool. *Cancer Prevention Research*, 10(7), 421-430.. https://doi.org/10.1158/1940-6207.CAPR-16-0288

[3] Chiang PP, Glance D, Walker J, Walter FM, Emery JD. Implementing a QCancer risk tool into general practice consultations: an exploratory study using simulated consultations with Australian general practitioners. British journal of cancer. 2015 Mar;112(1):S77-83.. https://doi.org/10.1038/bjc.2015.46

[4] Klassen CL, Gilman E, Kaur A, Lester SP, Pruthi S. Breast cancer risk evaluation for the primary care physician. Cleveland Clinic journal of medicine. 2022 Mar 1;89(3):139-46.. https://doi.org/10.3949/ccjm.89a.21023

[5] Medina-Lara A, Grigore B, Lewis R, Peters J, Price S, Landa P, Robinson S, Neal R, Hamilton W, Spencer AE. Cancer diagnostic tools to aid decision-making in primary care: mixed-methods systematic reviews and cost-effectiveness analysis. Health Technology Assessment (Winchester, England). 2020 Nov;24(66):1. https://doi.org/10.3310/hta24660

[6] King, Sarah, Josephine Exley, Sarah Parks, Sarah Ball, Teresa Bienkowska-Gibbs, Calum MacLure, Emma Harte et al. "The use and impact of quality of life assessment tools in clinical care settings for cancer patients, with a particular emphasis on brain cancer: insights from a systematic review and stakeholder consultations." Quality of Life Research 25, no. 9 (2016): 2245-2256. https://doi.org/10.1007/s11136-016-1278-6

[7] Akanuwe JN, Black S, Owen S, Siriwardena AN. Communicating cancer risk in the primary care consultation when using a cancer risk assessment tool: qualitative study with service users and practitioners. Health Expectations. 2020 Apr;23(2):509-18. https://doi.org/10.1111/hex.13016

[8] Torraco RJ. Writing integrative literature reviews: Guidelines and examples. Human resource development review. 2005 Sep;4(3):356-67.. https://doi.org/ 10.4018/IJAVET.2016070106

[9] Whittemore R, Knafl K. The integrative review: updated methodology. Journal of advanced nursing. 2005 Dec;52(5):546-53. https://doi.org/10.1111/j.1365-2648.2005.03621.x

[10] Sparbel KJ, Anderson MA. Integrated literature review of continuity of care: Part 1, conceptual issues. Journal of nursing scholarship. 2000 Mar;32(1):17-24. https://doi.org/10.1111/j.1547-5069.2000.00017.x

[11] Critical Appraisal Skills Programme. CASP Checklist. 2018;13. https://casp-uk.net/how-to-use-checklist/

[12] Long HA, French DP, Brooks JM. Optimising the value of the critical appraisal skills programme (CASP) tool for quality appraisal in qualitative evidence synthesis. Research Methods in Medicine & Health Sciences. 2020 Sep;1(1):31-42. https://doi.org/10.1177/2632084320947559

[13] Melnyk BM, Fineout-Overholt E. *Evidence-based practice in nursing & healthcare: A guide to best practice*. Lippincott Williams & Wilkins; 2022 Aug 16.

[14] Walker JG, Bickerstaffe A, Hewabandu N, Maddumarachchi S, Dowty JG, Jenkins M, Pirotta M, Walter FM, Emery JD. The CRISP colorectal cancer risk prediction tool: an exploratory study using simulated consultations in Australian primary care. BMC medical informatics and decision making. 2017 Dec;17(1):1-1.https://doi.org/10.1186/s12911-017-0407-7

[15] Milton S, Emery JD, Rinaldi J, Kinder J, Bickerstaffe A, Saya S, Jenkins MA, McIntosh J. Exploring a novel method for optimising the implementation of a colorectal cancer risk prediction tool into primary care: a qualitative study. Implementation Science. 2022 Dec;17(1):1-4. https://doi.org/10.1186/s13012-022-01205-8

[16] Seesaghur A, Petruski-Ivleva N, Banks VL, Wang JR, Abbasi A, Neasham D, Ramasamy K. Clinical features and diagnosis of multiple myeloma: a population-based cohort study in primary care. BMJ open. 2021 Oct 1;11(10):e052759. https://doi.org/10.1136/bmjopen-2021-052759

[17] Yadav S, Hartkop S, Cardenas PY, Ladkany R, Halalau A, Shoichet S, Maddens M, Zakalik D. Utilization of a breast cancer risk assessment tool by internal medicine residents in a primary care clinic: impact of an educational program. BMC cancer. 2019 Dec;19(1):1-7. https://doi.org/10.1186/s12885-019-5418-6

[18] Chen RC, Haynes K, Du S, Barron J, Katz AJ. Association of cancer screening deficit in the United States with the COVID-19 pandemic. JAMA oncology. 2021 Jun 1;7(6):878-84.. https://doi.org/10.1001/jamaoncol.2021.0884

[19] Rubin, G., Berendsen, A., Crawford, S. M., Dommett, R., Earle, C., Emery, J., & Zimmermann, C. The expanding role of primary care in cancer control. The lancet oncology, 2015; 16(12), 1231-1272. https://doi.org/10.1016/S1470-2045(15)00205-3

[20] Emery, J., Shaw, K., Williams, B., Mazza, D., Fallon-Ferguson, J., Varlow, M., & Trevena, L (2014).. The role of primary care in early detection and follow-up of cancer. Nat Rev Clin Oncol 11, 38–48. https://doi.org/10.1038/nrclinonc.2013.212

[21] Verbunt, E., Boyd, L., Creagh, N., Milley, K., Emery, J., Nightingale, C., & Kelaher, M. (2022). Health care system factors influencing primary healthcare worker's engagement in national cancer screening programs: a qualitative study. Wiley online library. https://doi.org/10.1111/1753-6405.13272