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Research Article

Colorectal Cancer Burden and Screening Practices in Brazil: A Qualitative Study on Perceptions from Published Authors

Sphindile Magwaza[1]*, Guido Van Hal[1] and Muhammad Hoque[2]

[1]*Social Epidemiology and Health Policy, University of Antwerp, Belgium*

[2]*Management College of Southern Africa, Durban-South Africa*

***Corresponding Author:** Sphindile Magwaza, Social Epidemiology and Health Policy, University of Antwerp, Belgium.

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Abstract

Background: The study describes the views on colorectal cancer (CRC) burden and screening programmes from the perspectives of published authors located in Brazil and compare those with the South African perceptions as both countries are members of emerging economic partnership with China, India and Russia named "BRICS".

Methods: A qualitative study was conducted using purposive sampling, targeting authors of published papers on CRC from peer-reviewed journals located in Brazil, that were identified through search engines including PubMED.gov, research gate, Academia and Web of Science. A SurveyMonkey was used and only nine participants from Brazil responded. Poor response rate was due the second wave of covid19 infection.

Results: Most participants from Brazil, agreed on the statement that CRC was one of the top five cancers in their country. Population based cancer registry are used as the main sources of data in Brazil. The factors affected CRC screening mentioned included a lack of CRC screening policy; high cost of CRC screening; country size limiting access to services; scarce resources; CRC as not a national priority; high demand placed from Universal Health Insurance and inaccessibility to private health care.

Conclusion: The study highlights multi-facet factors affecting access and effectiveness of CRC screening create opportunities for collaboration related to surveillance, demand creation; innovative screening methods and future research.

Keywords: Colorectal Cancer; Qualitative Interviews; Screening; Colonoscopy; Brazil

Abbreviations

BR: BrazilBRICS: Brazil, Russia, India, China, and South Africa; CRC: Colorectal Cancer; ASIR: Age Standardised (world) Incidence Rate; gFBOT: Guaiac Faecal Blood Test; FIT: Faecal Immunochemical Tests; INCA: National Cancer Institute; COREQ: Consolidated Criteria for Reporting Qualitative Research; GLOBOCAN: Global Cancer Observatory

Introduction

GLOBOCAN estimated that 1.9 million new colorectal cancers (including anus) cases and 935,000 deaths occurred in 2020. To date, colorectal cancer (CRC) ranks third in terms of incidence and second in terms of mortality rates globally [1]. In 2020, the CRC estimated age-standardized (World) incidence rates (ASIR) to be at 19.4 per 100 000 for Brazil (BR) [1]. It is projected that by 2030, CRC new cases will increase by 39% in Brazil respectively. The esti-

mated CRC mortality rate was 9.5 per 100,000 populations according to the GLOBOCAN, 2020, for Brazil. The Brazilian new cases between period 2016 to 2015 were recorded as 1 322, made up of 40% males and 60% females Aracaju, Sergipe State, Brazil [2].

While secondary prevention through screening is promoted and supported for the high burden countries, however, not justifiable for the low- and middle-income countries due to cost related to screening tests and inadequacy of screening and treatment facilities [1,3].

In contrast, Brazil has a national screening programme, however, there is evidence that there are disparities in screening uptake across and within regions, that negatively impact on the value and benefit of the programme.

The literature reports on the use of various tests including colonoscopy, gFBOT and FIT and flexible sigmoidoscopy as some of the tests used for screening in Brazil. In addition, there is evidence of screening tests quality, sensitivity, specificity and quality has been reported. Brazil has also reported on the health care provider knowledge, attitudes and practices on CRC screening. There is evidence that the quality metrics for CRC screening are comparable to other developed countries [4].

Why Brazil and why compared views with bricks country-south Africa?

Brazil is reported to be in economic transition as reported by the human development index, similarly to South Africa. The country is part of the political and emerging economic partnership with South Africa, Russia, China and India called by the acronym the "BRICS". This partnership has been identified to have potential to influence the global health agenda. Moreover, Brazil have higher CRC age standardised (world) incidence rate (ASIR) estimates when compared to their regional ASR estimates at 19.6 versus 18. 6 per 100,000 for the South American region [5,6]. South Africa data has shown the same when compared to the Southern African regional estimates. Hence, perceptions will be compared with those of South Africa based on recent published paper [7,8].

Aim and Objectives

The aim of the qualitative study was to identify perceptions on colorectal cancer burden and screening in Brazil, with the purpose to identify factors influencing CRC screening. The objectives were to: 1) explore view on the burden of CRC and population at risk in the country; 2) obtain information of the types of CRC screening methods that are implemented; 3) ascertain perceptions regarding effectiveness of these screening methods, and 4) factors that influence access to screening services.

The secondary objective was to compare these findings with perceptions from South Africa, as published on the same topic and same target population [8] and propose collaborative partnership to improve screening programme in both countries.

- **The primary research question is:** How do the published authors describe aspects of CRC burden and screening programme in Brazil?
- **The secondary research question is**: Are perceptions similar or different with those of participants from South Africa (part of BRICS)?

Materials and Methods

Study design

This qualitative study was conducted to identify views on the current CRC burden and implementation of the screening programme in Brazil [9].

Participants and setting

The potential participants were identified as authors of published papers on CRC screening in Brazil. The inclusion criteria included authors from papers were peer-reviewed, published between January 2000 and May 2021 and searched using PubMED. gov, Research gate, Google, Academia and Web of Science; from institutions located in big metropolitan cities in each country. The cities include Sao Paulo; Rio de Jenaro, Brasilia and Salvador in Brazil.

A request for a virtual interview was forwarded via an email to potential participants with ethics approval letter attached and an interview guide. After eight weeks and repeated follow-up, without success, one of the potential participants that responded to the email to find out more about the study suggested that a link to questions be shared, to allow flexibility of time, instead as this may induce an interest as the country was under lockdown amidst the second wave of covid-19.

Hence, Email requests for participation, with the informed consent form, and the link to the SurveyMonkey were sent to identified potential participants with consent forms. Confirmed consent was noted based on the response to the SurveyMonkey questionnaire.

Consenting participant's background

There were 9 participants that responded to the Survey Monkey. These included service providers, academics and researchers as well as government programme managers. Six of the participants were males and three were women.

Sampling method and size

Purposive sampling approach was used to identify potential participants as described above. Forty-five approached, 9 participants (20%) responded to the email and subsequently completed the SurveyMonkey questionnaire.

Data collection, tool and time frame

The data were collected during March, April, and May 2021 using SurveyMonkey.

The questions were developed informed by the literature reviewed from Brazil and appraised by the two study investigators conducted in Brazil [10].

The following components were included in the questionnaire

- CRC Burden method of tracking burden used, and characteristics of the patients mostly affected by CRC
- Perception on CRC screening
- Type of screening methods commonly used
- Effectiveness of screening methods
- Factors affecting CRC screening implementation

The semi-structured questionnaire included seven questions aligned to key themes identified from KAP study conducted in Brazil [10], including the two open ended questions taken from the same study (on effectiveness of screening methods and factors affecting CRC screening implementation).

Key Questions
How agreeable are you with the statement that: Colorectal cancer is the top five common cancer in Brazil (strongly agree, agree, disagree, strongly disagree)?
What is the population Most at Risk of CRC in Brazil?
Is the national colorectal cancer screening programme implemented in all regions within Brazil, explain.
What are the types of screening tests available in Brazil (options to tick all that applies: colonoscopy; faecal immunochemical tests (FIT), guiac faecal blood test (gFBOT) and flexible sigmoidoscopy)
How is data collected to estimate the burden of colorectal cancer in your country, tick all applies? (hospital records, pathology records, population-based, local studies, national insurance)
How effective is the colorectal cancer screening in Brazil?
Comment on the quality of colorectal cancer screening programme in Brazil
Comment on perceived value is the colorectal cancer screening programme
Comment on the interest to perform screening (i.e., are people interested to take the screening)
What are factors affecting CRC screening in the country?

Table 1

Ethical considerations

Ethical approval was obtained from the University of Antwerp, Belgium and Pretoria, South Africa (Reference numbers: 20/11/127 and 434/2020).

Data analysis

Data was downloaded into Excel and responses to open-ended questions were also analysed into themes. The responses were summarised from the questions as outlined above, with open ended questions were coded and reported based on identified themes. The authors confirm that the data supporting the findings of this study are available within the article and requests for supplementary material will be considered upon reasonable timeframe. To obtain inter-subjectivity, themes were identified by two investigators separately. The first step outlined the preliminary themes, followed by the meaning units, then sub-categories and lastly the main themes agreed upon by investigators [11].

Results and Discussion

Perceptions on CRC burden

All participants agreed with the statement that CRC was one of the top five common cancers in their country.

Perceptions on type of population that is mostly affected by colorectal cancer

Seven participants stated that men and women over 50 years are equally affected by CRC, while one participant felt that all people are affected regardless of age. In addition, one participant specifically stated that there are specific regions in Brazil that are mostly affected by CRC regardless of age and gender differences.

Perception on the process of data collection used to estimate the burden of colorectal cancer

Five participants stated that the data comes from the population-based CRC registry; while two participants mentioned a pathology-based cancer registry and the other two participants mentioned that most data come from the clinical records in hospitals.

Perceptions on national CRC screening

Eight participants stated that while there is a national CRC screening programme, it is not implemented in all regions in the country. Only one participant stated that there is no screening for CRC.

When asked about the benefit and value of the colorectal cancer screening programme, only two participants perceived the national screening programme to be valuable. Seven participants, however, stated that it is somewhat valuable, as one participant stated:" It is implemented in the whole country, albeit with variable emphasis and success" [Participant # 7].

Perceptions on type of screening tests available

Colonoscopy was cited by four participants, as the most used screening test for colorectal cancer. Two participants mentioned faecal occult blood test (guaiac), another two stated immunochemical faecal occult blood test and one stated a flexible sigmoidoscopy. Only one participant indicated not knowing the most used methods used in the country.

Perceptions on the effectiveness of colorectal cancer screening

Four participants stated that CRC screening is effective, while five perceived the national screening programme as ineffective. Five or more of participants cited the following factors as reasons for ineffective programme, namely: limited implementation across regions; not perceived as valuable to target audience and of poor quality. In addition, most participants further stated that eligible people are not as interested to perform CRC screening.

Factors affecting implementation of colorectal cancer screening

Factors affecting the implementation of a CRC screening programme are described by participants included, high costs, high and competing demands for support through the universal health care insurance and lack of prioritisation were identified, by three participants, as factors affecting the CRC screening implementation," CRC screening is not a national priority [Participant #9]".

Two of the participants commented on the lack of screening policy and inaccessibility to private health care, with stating, "I am not aware of a policy on screening" [Participant #2].

"Not many people can afford to pay for screening in private health care" [Participant #7].

Four participants mentioned other factors including scarce resources and limited availability of screening service affecting cov-

erage noting the size of the country." Brazil is a very large country and services are not available in all regions" [Participant #4].

Discussion

According to our knowledge, this study is the only study that sought perceptions on CRC burden and screening programmes by published authors on this topic from Brazil. Furthermore, it is the only study that attempts to compare perceptions with those of another country. We found that there were some similarities and differences, as outlined in the section below, in perspectives on CRC burden and screening when compared to other countries a study conducted in South Africa published recently, as both countries are members of the BRICS partnership. In addition, both countries are defined to be middle-income countries by the World Bank and have been identified to have similar health challenges in terms of communicable and non-communicable diseases [8].

Burden, people affected and data availability

The key findings in this qualitative study are that CRC is viewed as one of the top five common cancers in Brazil. Similarly, participants from South Africa, perceived CRC as one of the top five common cancers, regardless of low burden in terms of actual CRC incidence.

The National Cancer Institute (INCA) for the 2020–2022, in Brazil, ranked CRC second and fourth leading cancer-causing new cases and deaths in men respectively [12]. In Brazilian women, CRC was ranked second in new cancer cases and third leading cancer-causing deaths in women, depending on the certain regions in Brazil. When Moura (2020) reviewed data by age groups, he found constant increase in incidence in Brazilian females and males [2]. However, the study found high annual percentage change among men, in the (20 to 44 years) age group.

In Brazil the CRC data came was reported to come from the population-based cancer registry however, in both clinical data from hospitals and research studies are also used as data sources. Brazil only transitioned to population-based cancer registry in the year 2000 and there is evidence that CRC projected mortality trends may be increasing for the North and Northeast regions of the country. However, it has been estimated that there will also be a reduction in CRC mortality among males until the year 2030 [13].

Contrary to Brazil, South Africa does not have National Surveillance Data to accurately estimate the CRC burden, which remains a threat to appropriate national response. To date, South Africa relies mainly on the pathology cancer registry. However, South Africa has developed a protocol to establish a cancer surveillance programme using the population-based cancer registry that will be conducted by the National Institute of Communicable Disease of South Africa [14].

CRC national Screening programme and Type of screening methods Brazil was reported, by participants, to have a national CRC screening programme, however, the programme is fully implemented in selected regions.

Although it is commendable that Brazil has a national screening programme, it is critical to ensure access to facilities across all regions equitably, especially so, since studies predict an increase in the disease burden in the North, Northeast, and Central West regions of Brazil (Souza,2014). The most surprising finding mentioned by a participant was the view of the national CRC screening programme as ineffective, although it was found to have achieved desirable quality metrics, aligned to the European guidelines [4].

Several challenges affecting effectiveness of screening were highlighted by participants from Brazil including limited implementation across all regions; competing needs affecting resources from the national health insurance and high cost limiting access and CRC not being a national priority in the country. The Health Belief Model can be used to address the social determinants of health and to identify appropriate incentives to promote uptake of screening [14-17].

Some of the challenges affecting implementation of CRC screening programme in Brazil were slightly different from those mentioned by South Africa participants. The challenges mentioned by South African participants included poor awareness of CRC risks and health seeking behaviour; long distances affecting access to screening; invasiveness of some type of tests; malfunction of equipment for screening and high costs related to screening. Unlike those mentioned by Brazilian participant that focused mostly on scarce resources due to prioritisation of health services and competing demands made on universal health coverage.

To address challenges mentioned by participants, Levin (2018) recommend that a combination of patients, providers, and health systems related factors must be considered to address the challenges affecting CRC screening uptake [18]. Others have recommended differentiated models for service delivery to increase uptake such as community based mobile services; ensuring gender representation among service providers and focusing on improving provider competencies to improve the quality of services [19-23]. Removing cost related barriers, for patients from low socio-economic background may increase uptake [24-28]. Further, the recommendations made by the medical doctors and patient education focusing on the benefits and importance of screening have shown to improve the uptake of screening as reported by authors [29-31].

The combination of colonoscopy, gFBOT, FIT and flexible sigmoidoscopy were mentioned by participants as tests used for CRC screening in Brazil. However, flexible sigmoidoscopy was mentioned by only one participant from Brazil. Although, colonoscopy is regarded as most effective in reducing mortality from colon cancers [32,33], as stated by Doubeni 2018 and Hewitson 2009, people may have other preferences [34-36]. The advantage of colonoscopy is the ability to detect and remove lesions at the same time, hence referred to as the gold standard (Castiglione, 2000) and it was mostly commonly cited by participants as used in Brazil. This was also cited by participants in South Africa. However, invasiveness and preparation requirements and a need for bathroom facilities are mentioned as barriers to uptake and adherence [37-39].

Although the gFBOT, unlike FIT, has shown to have low sensitivity, specificity and positive predictive value, reported by Beydoun (2008), however, it is widely used in Brazil, as in South Africa. Additional disadvantages of gFBOT are that it requires a change of diet and stoppage of some medications and dental brush up to three days before the test (Guittet ,2007). In Brazil, FIT has been reported to have high compliance and high detection rates for the average risk population [40,41]. No data on FIT use in South Africa has been published. However, the literature on the types of tests acknowledges the unique role and suitability of each type of screening test as it impacts on adherence [42-46]. Hence, Bass, 2012 and Carethers 2020, recommend the development and utilisation of diverse tests to increase uptake and adherence to screening, while Ralaidovy (2018) advocated for cost-effective methods of screening [47-49].

Opportunities for potential cooperation on CRC between Brazil and South Africa exist including collaboration on

- Developing and strengthening the national and regional inter-linked CRC surveillance systems with inter-operability with other health information systems to develop risk-based screening considering limited resources.
- Setting the target to develop new and less expensive or improve current non-invasive CRC screening tests that are easy to use to improve uptake.
- Developing health promotion campaign and guide for first-time screening to increase demand and reduce anxiety in that prevents the uptake to screening [50].
- Synthesising data that will 1) highlight the benefits and risks of initiating CRC screening at a younger age; 2) health service provider capacity building to improve screening efficacy; 3) identify barriers to uptake with mitigating actions and 4) consolidate and integrating the CRC risk assessment approaches considering lifestyle, environmental, and polygenic risk factors in view of the increasing CRC incidence in both countries and for improving the benefit-harm ratio.
- Conducting research to 1) develop reliable risk prediction model; 2) better understand and capture the views from South Africa and Brazilian patients and providers on CRC screening programmes at a national level, including, knowledge, attitude and practices; and 3) lastly to assist policymakers and programme managers better structure a national risk-based response in Brazil and South Africa.

The lessons will not only improve the CRC screening programmes in South Africa and Brazil but also can assist public health responses for other middle-income countries with similar burden of CRC.

Limitations

The limitations with our study include the inadequacy of the sample size. Hence, the findings may be unique perspectives and opinions and may not reflect general perspectives of unpublished authors and those that did not consent to participate in the study. Nonetheless, targeting authors from diverse professional backgrounds, added quality to the study as opinions solicited demonstrated strong clinical, epidemiology, theoretical foundation and

diverse experience on CRC screening. This helped with generating main themes from the responses given by participants [51]. Hence, we remain convinced that new knowledge has been generated, regardless of the small sample size as there was adequate information solicited from participants to address the primary question of the study and data was comparable to that published from South Africa [8].

Purposive sampling was used to identify and invite authors of manuscripts published only in peer-reviewed journals that publish CRC screening related manuscripts. Hence, this may have introduced selection biases, including gender mainly from Brazilian survey. Expanding the pool to include other search engines may have assisted to identify other authors that may have had different perspectives; experiences; of diverse gender that may have better contributed to diverse views and depth to the findings [52].

The semi-structured questionnaire used with Brazilian participants was written in English and translated into Portuguese. However, it was tool not piloted, but we believe it was valid because the questions were developed based on the CRC screening literature published from Brazil and other countries.

Conclusion

To our knowledge, this is the first study to explore perspectives on CRC burden and screening practices from published authors on CRC, with results compared to those published from South Africa. The most critical finding is that CRC is regarded as one of the most common cancers in Brazil. CRC screening in Brazil is implemented as part of national programme, however with limited access across the regions. The study highlights multi-facet factors affecting equity of resource allocation, access and effectiveness of screening, for consideration by programme managers and policymakers.

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Conflict of Interest

The authors declare that they have no conflict of interest.

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