



Who should be screened for colorectal cancer and how can it be prevented more effectively?

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Abstract

In this editorial, we comment on the article published by Agatsuma *et al* in a recent issue of the *World J Gastroenterol* (2024; 30: 1368-1376). We firmly concur with Agatsuma *et al* regarding the vital significance of colorectal cancer (CRC) screening as a public health strategy to diminish disease burden. Individuals exposed to risk factors for CRC, those with comorbid conditions, and those with limited health literacy should undergo screening. However, we believe that more regular screenings should be accompanied by a greater focus on primary prevention (PP) of CRC. CRC remains a significant global health challenge, and its incidence is strongly linked to age, lifestyle, and socioeconomic factors. It is particularly noteworthy that the majority of CRC patients are diagnosed outside of established screening pathways and frequently at an advanced stage of the disease, and the majority of patients possess inadequate or even nonexistent knowledge regarding CRC, which significantly impacts the prognosis and imposes a substantial economic burden. This study revealed that CRC identified during hospital visits for comorbid conditions was typically diagnosed at an earlier stage than detected *via* symptomatic pathways. Remarkably, early incidental detection of CRC aligns closely with the timing of discovery through routine cancer screenings. This suggests that by adopting more inclusive screening protocols that combine opportunistic testing with traditional screening methods, health care systems can create a more comprehensive safety net for individuals at risk of CRC. However, before maximizing the health benefits of screening programs, it is essential to make additional efforts prior to screening, such as raising awareness *via* public education, risk assessment, and personalized recommendations, enhancing the knowledge and skills of health care professionals, optimizing the accessibility and convenience of screening processes,

ensuring the quality and safety of screening services, strengthening follow-up and support systems, and providing policy support and financial investment. The establishment of a comprehensive screening system often requires substantial investment in human, material, and financial resources, which can be challenging to achieve in regions with limited health care resources. Strengthening PP strategies can reduce the disease burden by targeting the cause, representing a more cost-effective and impactful approach. Establishing a comprehensive cancer PP service platform that integrates authoritative public education on malignant tumor PP, individualized malignant tumor risk assessment, and self-health management assistance accessible to the entire population will significantly enhance the overall effectiveness of CRC PP strategies.

Key Words: Colorectal cancer; Primary prevention; Screening program; Disease burden; Health literacy; Economic benefits

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Core Tip: Most colorectal cancer (CRC) patients are identified outside standard screening protocols, and CRC is frequently diagnosed at an advanced stage through clinical methods. The effectiveness of screening initiatives is limited by factors such as recognizing the importance of screening, screening methodologies and their frequency, economic development, and the scope of coverage. Thus, the implementation of primary prevention strategies, which include enhancing awareness of CRC and controlling exposure to its risk factors, is the most effective approach for the prevention of CRC.

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INTRODUCTION

Colorectal cancer (CRC) is a major gastrointestinal malignancy with a high incidence rate and is strongly associated with socioeconomic development[1-3]. Globally, the incidence of CRC increases with age, and projections indicate that the occurrence of early-onset CRC will more than double by 2030[4,5]. This trend may be linked to Western lifestyles, antibiotic usage, and environmental factors[4,5]. There were an estimated 1.9 million new cases of CRC and 904000 deaths globally in 2022, accounting for approximately 10% of cancer cases and deaths[6]. Given the dual challenges posed by an aging population and an increase in younger patients, CRC is expected to impose a significant disease burden globally. One study revealed that primary and secondary prevention played a 35% and 53% role in reducing CRC mortality, respectively[7]. Effective management of CRC cannot rely solely on tertiary prevention (treatment); instead, primary and secondary prevention strategies have emerged as the most cost-effective, long-term approaches for mitigating the impact of this disease[8].

Primary prevention (PP) of cancer can be achieved through lifestyle changes, control of exposure to environmental risk factors, and vaccination[9]. Effective PP not only reduces the incidence of cancer but also alleviates the burden on health care systems and enhances the population's health. Approximately 30% to 40% of malignant tumors in Western countries can be attributed to known modifiable risk factors[10]. The etiology of CRC remains elusive, yet extensive studies have pinpointed both risk and protective elements linked to this disease[11-14]. Factors such as familial predisposition to CRC, chronic inflammatory bowel conditions, consumption of red and processed meats, diabetes, obesity, tobacco use, and excessive alcohol intake have been associated with an elevated risk of developing CRC. Conversely, the regular use of aspirin and a diet rich in dietary fiber, whole grains, and dairy products, along with maintaining an active lifestyle, has been shown to mitigate this risk. Therefore, implementing PP strategies targeting known risk factors can significantly reduce the incidence of CRC at the population level. Additionally, understanding the public's awareness of cancer and its risk factors is fundamental to designing effective cancer prevention and education strategies.

The progression from precursor lesions, such as adenomatous polyps or sessile serrated lesions, to CRC typically spans 5 to 10 years for most sporadic cases[14,15]. This gradual development offers a crucial opportunity for early detection and clinical intervention. Screening for CRC serves as an effective public health measure to avoid getting CRC by identifying and excising precancerous polyps before they progress into cancer. Individuals diagnosed with CRC through screening often present with earlier stages of the disease, benefit from less costly early treatment, and have a more favorable prognosis[16]. The strategy of screening for cancer and removing precancerous lesions has been shown to be effective in lowering the overall incidence and mortality rates associated with CRC[17-19]. Although screening is generally considered secondary prevention, regular screening for high-risk populations can also be regarded as a preventive measure because it helps identify and modify risk behaviors while increasing individuals' awareness of health risks.

CHALLENGES AND RECOMMENDATIONS IN PRIMARY AND SECONDARY PREVENTION OF CRC

The Organization for Economic Cooperation and Development has found that, on average, 54% of the adult population are overweight or obese, with 18% classified as obese. Furthermore, a mere 15% of adults consume the recommended five or more servings of fruits and vegetables daily, and only 40% meet the guideline of 150 min of moderate to vigorous physical activity per week. Despite ongoing health campaigns, 16% of individuals aged 15 and above continue to smoke daily, while the prevalence of e-cigarette use (vaping) is on the rise[20]. Young Jordanian university students had good knowledge and awareness of CRC and its risk factors, but these levels were not reflected in their dietary behaviors and food choices for CRC prevention[21]. However, Saudi medical students had a limited understanding of the risk factors for CRC, and their attitudes toward CRC screening were shown to be poor[22]. Another study revealed that individuals under 50 years of age lacked knowledge about CRC, with only 36% correctly identifying the recommended age at which to start CRC screening and few (8%) correctly identifying all CRC screening modalities[23]. Globally, the understanding of risk factors associated with malignant tumors is generally limited[9,24-28]. These challenges indicate the need for multi-country approaches to promote and enhance the translation of knowledge and awareness about CRC and its risk factors into meaningful, healthy dietary and lifestyle behaviors, especially among young populations.

Current CRC screening methods include both invasive and noninvasive. Noninvasive stool examinations, including fecal occult blood tests (Guaiac-based Fecal Occult Blood Test and Fecal Immunochemical Assay), are preferred in certain areas for their affordability and simplicity of administration. Fecal immunochemical assays, in particular, are the most commonly used detection methods and have higher detection rates owing to their enhanced sensitivity. Conversely, invasive procedures such as colonoscopies, though considered the gold standard, necessitate substantial screening resources. Some programs reserve colonoscopies exclusively for diagnostic confirmation following positive preliminary screenings. Moreover, innovative approaches such as multitarget fecal DNA testing present additional avenues for CRC screening. This noninvasive method aims to streamline the selection of individuals for colonoscopy, thereby alleviating the overall burden and risk associated with colonoscopy for those at low risk of developing CRC[29,30].

CRC screening participation rates have been on the rise globally, with the average rate hovering at approximately 54%, albeit with significant disparities across different nations[31,32]. Notably, Slovenia and the Basque Country in Spain reported high detection rates through screening (40%-60%), in stark contrast to most other countries and regions where detection rates fall below 30%[33]. In a study where participants among the general population in Jeddah, Saudi Arabia were interviewed, only one-third of the respondents knew of any tests or examinations used to detect CRC[34]. Another study revealed no significant differences in knowledge, understanding of disease severity, or awareness of screening benefits between individuals who participated and those who did not participate in CRC screening in Malta. However, the main reason for not participating in screening was a higher perception of barriers, such as fear of discovering something wrong[35]. A comprehensive survey of advanced-stage CRC patients in China regarding the diagnostic and treatment status of their condition revealed that 65.1% of patients were completely unaware of the risk factors for CRC, 84.9% lacked knowledge of the importance of early screening, and a staggering 97.3% had never undergone colonoscopy screening[36]. Understanding and addressing factors influencing patient adherence to CRC screening, including nonmodifiable factors (such as demographic characteristics, educational level, health insurance, or income) and modifiable factors (such as knowledge of CRC and available screening, attitudes of patients and providers, or structural barriers to screening) are crucial for increasing screening participation rates[37].

In a study by Agatsuma *et al*[38], it was found that CRC detected during incidental medical encounters due to comorbidities is often diagnosed at earlier stages than that detected through symptomatic pathways, and the equivalence in the detection stage between CRC identified through hospital visits and that identified through cancer screening programs suggests the potential for coordinated screening efforts across different health care settings. By adopting more inclusive screening protocols that combine opportunistic screenings with traditional screening methods, health care systems can create a more comprehensive safety net for individuals at risk of CRC. However, this indirect detection route may not benefit those who do not frequently visit hospitals for comorbidities, highlighting a gap in early CRC detection. Therefore, it is worth exploring the health literacy of the population.

In fact, while screening has a positive impact in reducing mortality rates associated with specific diseases, its diminished efficacy should not be solely attributed to the screening procedure itself. This phenomenon also encompasses heightened disease management and treatment strategy awareness, allowing more cases of CRC to be diagnosed early. Particularly in many low-income countries, the introduction of screenings for conditions such as CRC is not only financially burdensome but may also be challenging for patients to adhere to given the preexisting challenges of receiving adequate support from the current health care infrastructure. Therefore, advocating and implementing cost-effective and feasible PP measures can effectively reduce the financial burden of treating malignant tumors while promoting a more equitable and rational allocation of global medical resources.

A multifaceted approach encompassing enhanced public education and advocacy, community involvement, fortified communication between health care providers and patients, policy reinforcement, streamlined screening processes, and the application of technological innovations is imperative to increase public awareness regarding CRC prevention and boost screening participation. These strategies are aimed at enhancing the dissemination of CRC-related knowledge, minimizing obstacles to screening, and fostering the adoption of healthful practices, thus increasing screening participation, enhancing the efficacy of early intervention, and augmenting patient survival rates and quality of life. Addressing the distinct challenges present in economically disadvantaged and remote regions necessitates targeted interventions such as deploying mobile health services, training primary health care workers, advancing telehealth capabilities, reinforcing community engagement and educational efforts, securing policy and fiscal support, simplifying screening methodologies, and establishing robust tracking and feedback systems. These initiatives that are tailored to local circumstances aim to enhance the dissemination of knowledge on CRC prevention and treatment and boost

residents' willingness and ability to undergo screening, particularly in areas with constrained health care resources.

The overarching goal is for each country to establish an authoritative and comprehensive scientific education platform that encompasses primary cancer prevention, enabling the public to transition from the traditional notion of "cancer treatment" to embracing the new concept of "cancer prevention, early screening, early diagnosis, and early treatment". This will foster a global understanding of the importance and effectiveness of all stages in cancer prevention, screening, diagnosis, treatment, and rehabilitation[9].

VALUE OF PP

PP is a cost-effective approach that enhances public health and reduces health care system burdens. Promoting healthier lifestyles not only offers economic benefits but also decreases the incidence of chronic diseases such as cancer, cardiovascular diseases, and diabetes, thereby lessening the disease burden and associated mental and physical stress. Furthermore, it improves public health awareness and encourages the adoption of healthy behaviors through education, leading to a culture of health. Early intervention allows individuals to avoid disease risks early on, securing lifelong health benefits. This underscores the vital role of PP in long-term public health and wellness.

CONCLUSION

Undoubtedly, CRC screening significantly contributes to alleviating the burden of the disease. Screening offers individuals at high risk and CRC patients a chance to assess their health status and initiate timely interventions. However, this is not the most pivotal aspect. PP strategies, by fostering healthy lifestyle modifications and minimizing exposure to risk factors, solve the problem at its root. Compared to expensive screening processes and cancer treatments, PP puts less financial pressure on the public health infrastructure, making it as a more cost-efficient and sustainable method. The successful execution of primary cancer prevention hinges on a holistic strategy that merges public education, policy reforms aimed at fostering healthier environments, and the encouragement of healthier lifestyle choices among individuals. Leveraging the "knowledge-attitude-practice" model, public health endeavors can more efficaciously prompt individuals to participate in PP strategies. This, in turn, diminishes the overall prevalence of cancer and associated chronic conditions.

FOOTNOTES

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