



Modification in the Oncology Field during COVID-19 Pandemic

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Authors' contributions

This work was carried out in collaboration between both authors. Author FT managed the literature searches, synthesized the results, and wrote many sections of the manuscript. Author ABS designed the study, wrote the protocol, participated in literature searches, and wrote many sections of the manuscript. Both authors read and approved the final manuscript.

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ABSTRACT

Background: COVID-19 outbreak impacted all healthcare specializations including the oncology field.

Objective: To discuss in detail the varied effects of COVID-19 on the oncology field.

Methods: For this narrative review, the researchers relied only on accredited and peer-reviewed resources. As such, the references of this paper were mostly taken from Google Scholar and online repositories, such as PubMed, which hosts the National Center for Biotechnology Information (NCBI), Science Direct, JSTOR, and The Lancet.

Results: COVID-19 and the necessity of physical distancing have significantly changed the practice in the oncology field. The use of telehealth is widely adopted, physicians are recommended to consider other forms of treatment, and decisions on immediate cancer treatment depend on the level of risk of progression with cancer care delay. Cancer treatment delay is

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causing the highest mortality rate for patients who are suffering from cancer of the bladder, lungs, ovary, stomach, and esophagus. COVID-19 has shifted the focus of healthcare professionals away from other life-threatening diseases, like cancer. In the United Kingdom, it has been projected that there is at least a 20% increase in the expected cancer-related mortality rate. This is due to abrupt changes in diagnosing and treating cancer patients, physical distancing protocols, economic downfall, as well as the public's behavior in opting for medical assistance.

Conclusion: With the spread of COVID-19, the situation has become more difficult for cancer patients. The mortality rate for cancer patients has worsened during COVID-19. Health professionals working in the oncology field are also devastated by COVID-19.

Keywords: Coronavirus; COVID; SARS; physical distancing; oncology; cancer; pandemic.

1. INTRODUCTION

Coronavirus disease of 2019 (COVID-19) is a new strand of coronavirus that broke out in Wuhan, China around December 2019 [1]. On January 30, 2020, after the World Health Organization (WHO) confirmed that there are huge number of cases around the world, COVID-19 was declared as a public health emergency of international concern [2]. There is vaccine for this virus. In addition, the world can lessen the number of infected people is by implementing strict measures that could hopefully lessen the spread while pharmaceutical companies are trying to develop more vaccines for COVID-19.

One ongoing policy that is strictly observed by most nations is physical distancing. In addition, COVID-19 kept the majority of the world in lockdown. While physical distancing as well as lockdown are designed for public protection, this policy has serious consequences. From a medical perspective, physical distancing has been deterring advancements in cancer treatment and research [3]. This is because most hospitals have been dedicated to treating patients with COVID-19. While at high risk of acquiring the virus, cancer patients need to constantly interact with medical practitioners for health sustenance [4]. However, not being in lockdown and going out has become problematic as people with cancer are immunocompromised. Therefore, there is huge impact of COVID-19 on cancer patients. Cancer support programs are not abundant to begin with, but with the existence of the pandemic, what was then scarce became scarcer. This paper discusses in detail the varied effects of COVID-19 on the oncology field. Specifically, this paper illustrates how the pandemic affects cancer field.

2. MATERIAL AND METHODS

A narrative review of the effects of the COVID-19 outbreak to the oncology field and its

stakeholders was used as the methodology for this paper. A narrative review is defined as a synthesis of a certain topic or branch of knowledge wherein the researcher seeks to establish theoretical frameworks and draw conclusions [5]. It helps identify trends, which in turn serve as a basis for explaining information gaps in the status quo. For this narrative review, the researchers relied only on accredited and peer-reviewed resources. As such, the references of this paper were mostly taken from Google Scholar and online repositories, such as PubMed, which hosts the National Center for Biotechnology Information (NCBI), Science Direct, JSTOR, and The Lancet. The researchers highlighted certain sets of keywords for this paper. The keywords used to search for articles include the following: *Coronavirus, COVID-19, SARS Cov-2, physical distancing, oncology, cancer patients, and disadvantages of physical distancing*. Using suitable and targeted keywords prominently will make the article easier to track as well as attract readers [6].

3. RESULTS

Cancer refers to the uncontrollable growth of abnormal cells that can start almost anywhere in the body [7]. Cancer is considered as a major public health concern due to its prevalence. To be exact, more than 28 million worldwide live with a cancer diagnosis [8]. This rate is most likely to increase in the next decades. By 2025, about twenty million new cancer cases are expected to be diagnosed every year [9]. Close monitoring and regular treatment are necessary to treat cancer or to stop its progress [10]. Unfortunately, COVID-19 has made it difficult for cancer patients to access timely healthcare services. In response, the oncology field has introduced many shifts and changes in their practices due to COVID-19 pandemic.

3.1 Changes and Shifts

COVID-19 and the necessity of physical distancing have significantly changed the practice in the oncology field. Three notable changes are observed. First, the use of telehealth is widely adopted. Since the COVID-19 outbreak, in-person visits have been highly discouraged. Instead, routine visits are rescheduled or conducted remotely [11]. As such, patients and physicians are forced to communicate through phone calls, video applications, and/or patient portals [3]. Meetings among the cancer multidisciplinary team are also conducted virtually [11]. These types of consultations ensure that oncology patients and their caregivers are not exposed to the virus.

Second, physicians are recommended to consider other forms of treatment. For instance, intravenous treatments are replaced with subcutaneous or oral routes. It may also be considered by health institutions to set up a different facility for the treatment of patients with cancer so that they are not exposed to the hospital setting where COVID-19 is a constant threat. Last but not the least, decisions on immediate cancer treatment depend on the level of risk of progression with cancer care delay [12]. To illustrate, radiation treatment is prioritized for patients with rapidly proliferating tumors [11]. However, oncologists should balance the risks and benefits of immediate cancer treatment for patients over the age of 70 years old [12].

3.1.1 Prioritization and Recommendations during COVID-19 Pandemic

Various cancer organizations (e.g., American Society of Clinical Oncology [ASCO], European Society of Gynecological Oncology [ESGO], and European Society of Surgical Oncology [ESSO]) provided guidelines for prioritization and recommendations for providing care throughout the pandemic. These guidelines are primarily driven by the goal of creating a secure environment for healthcare professionals and patients [13]. The cancer organizations recommended the prioritization of treating patients with therapeutic or medicinal goal, including caring for cancer patients who require symptomatic palliation. Priorities must be given to patient care to counteract the threat of COVID-19 infections, as well as the preexisting cancer status, whether it is benign or malignant [14].

Treatment has to be individualized, and, if likely or necessary, plans must be streamlined to

lessen the frequency of mandatory face-to-face clinical consultations or visits. For those undergoing radiotherapy, shortened fractionation regimens must be taken into consideration to cut down the time needed to administer radiotherapy and possible risk of or exposure to the virus [15]. For types of cancers whose medications or treatments could be postponed or deferred with neo-adjuvant systemic treatment, the benefits and costs of suspending radiotherapy and surgery must be deliberated [13].

3.1.2 Cancer research and cancer drug discovery during COVID-19

Empirical studies show that the COVID-19 pandemic has affected almost all facets of cancer research and treatment. It obstructed the continuation of cancer research and the provision of cancer care and created new threats or hazards for cancer patients. The pandemic has a severe and troublesome impact on the continuity of clinical research in oncology with both direct and indirect outcomes [16]. Temporarily, physical, financial, and human capital for research have been reallocated to accommodate the wave of COVID-19 patients at numerous hospitals and academic facilities, and scheduled clinical trials have been postponed [16].

Clinical cancer trials, wherein prospective new drugs are observed and examined in patients, have been disrupted as well due to the pandemic. Several cancer facilities suspended admission or registration on clinical trials completely throughout the pandemic's peak [17]. In the long term, these postponements in the recruitment for clinical research due to the pandemic will adversely impact the scheduled drug development activities, with unfavorable financial repercussions and possible interruptions in providing the most effective drugs/treatments to cancer patients [18].

To prevent the spread of COVID-19, research facilities were advised to slow down on their operations. As a result, most of these facilities were unable to produce their regular output of research publications (Table 1). While research facilities have resorted to remote communication to proceed with their operations, problems like lack of research materials and the inability to conduct clinical trial experiments persist [19].

3.2 Patient Care

Many patients with cancer and oncologists find the use of telehealth satisfactory. However,

entrenched culture and financial constraints have been identified as barriers to effective remote care [11]. On the other hand, some patients express concerns regarding the care they receive due to COVID-19 situation. A survey conducted by the American Cancer Society reveals that nearly a quarter of the 1,219 respondents (who are diagnosed with cancer) have trouble receiving the care they need [20]. Because of this difficulty, delay became inevitable.

Table 1. Number of Publications on Oncology and COVID-19 Per Week*

Date	Number of Publications
Feb 10 – Feb 16	3
Feb 17 – Feb 23	3
Feb 24 – Mar 1	10
Mar 2 – Mar 8	8
Mar 9 – Mar 15	1
Mar 16 – Mar 22	10
Mar 23 – Mar 29	26
Mar 29 – Apr 4	1

*Information derived from Moujaess et al (2020) [19].

3.2.1 Cancer treatment interruption or delay

The delay in treatments affects each cancer patient differently. But as the treatment delay becomes longer, the more intensive the possible impact will be. Certain types of cancer, such as those involving solid tumors, lung or blood malignancies that are already in an advanced stage, have a greater susceptibility to serious complications or death from Covid-19 [21]. Myeloma, lymphoma, leukemia, and other blood cancers undermine immunity, diminishing the natural defenses of patients and further exposing them to fatal infections. Lung cancer patients are also significantly at-risk due to impaired lung health. Furthermore, certain treatments, like surgery and chemotherapy, also undermine immunity [22]. Studies show that cancer patients who already received complete or thorough treatment had greater vulnerability to severe complications of Covid-19 [23]. Fig. 1 and Fig. 2 show that treatment delay is causing the highest mortality rate for patients who are suffering from cancer of the bladder, lungs, ovary, stomach, and esophagus [24].

3.3 Patient Severity

COVID-19 has shifted the focus of healthcare professionals away from other life-threatening diseases, like cancer [25]. This is understandable

because the new virus is fatal when it infects vulnerable populations. The death toll in many countries, including the United States, is high. Aside from that, even medical practitioners are not exempted from the infection and some have already succumbed. To conserve resources and to protect cancer patients against exposure to the virus, access to in-person appointments, imaging, surgery, and other services have been limited. Particularly, those who need urgent cancer care are prioritized. According to Grady (2020), this change in oncology practice contradicts the goals of cancer treatment, which is early diagnosis and early treatment to prevent cancer from progressing [26].

In the United Kingdom, it has been projected that there is at least a 20% increase in the expected cancer-related mortality rate due to abrupt changes in diagnosing and treating cancer patients, physical distancing protocols, economic downfall, as well as the public's behavior in opting for medical assistance (Fig. 3) [27]. While numbers may differ, a similar trend is expected across many countries.

3.4 Clinical Perspective

Interruptions in the delivery of cancer services have been quite severe for patients due to their high vulnerability to Covid-19 and high rates of mortality either because of radiotherapy, chemotherapy, and other anti-cancer treatments or immunosuppression brought about by the illness itself [28]. As a result, postponement or decrease of face-to-face patient interactions with healthcare professionals, suspension of cancer surgeries, and chemotherapy delays have been executed in numerous oncology facilities. Cancer patients are highly at-risk of contracting Covid-19 in its severe form due to an impaired immune system and comorbidities [28]. Blood cancer patients could be at a greater risk of death and serious infection from Covid-19 compared to patients with tumors due to the fact that blood cancer patients have dwindling or deviant quantities of immune cells that generate antibodies against the virus [29]. Also, in cancer patients, the major risk factors for Covid-19 could comprise immunosuppressive treatments (e.g. stem cell or bone marrow transplantation), undergoing general radiation therapy or cytotoxic chemotherapy, kind of cancer (e.g. thoracic or hematological disorders, like myeloma, lymphoma, chronic leukemia), advanced age, and advancing and active cancer status [30].

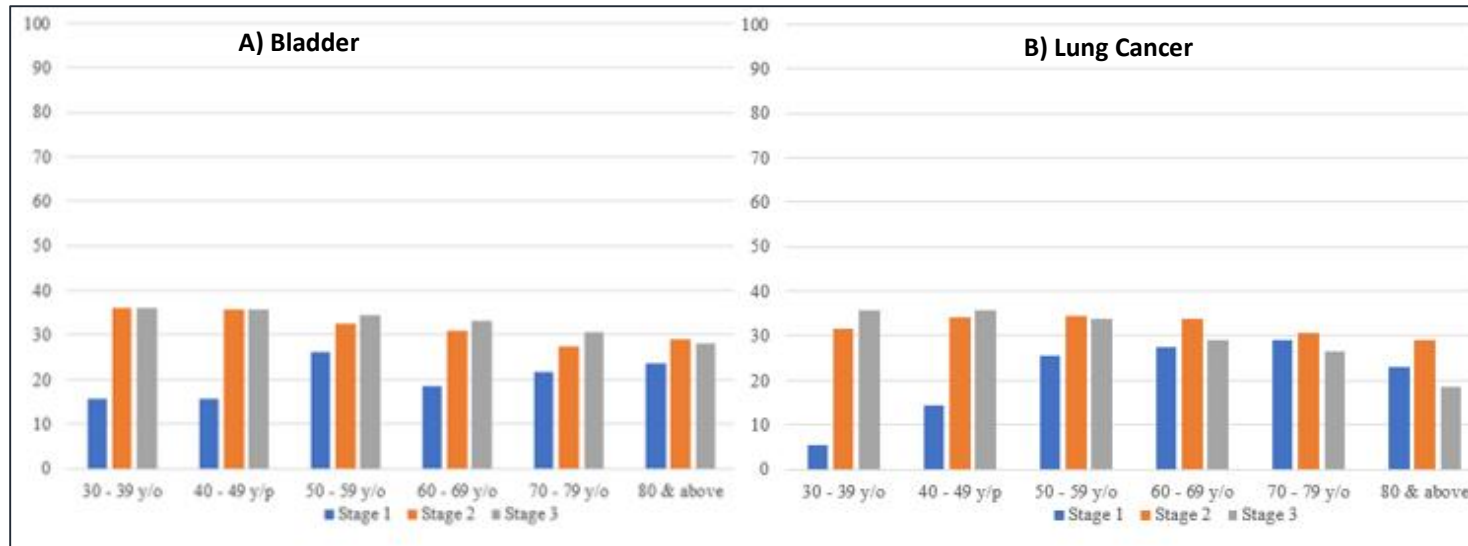


Fig. 1. Increase in Mortality Rate Due to Delayed Surgeries in Bladder Cancer Patients and Lung Cancer Patients

**Information is derived from Sud et al. (2020) [24].*

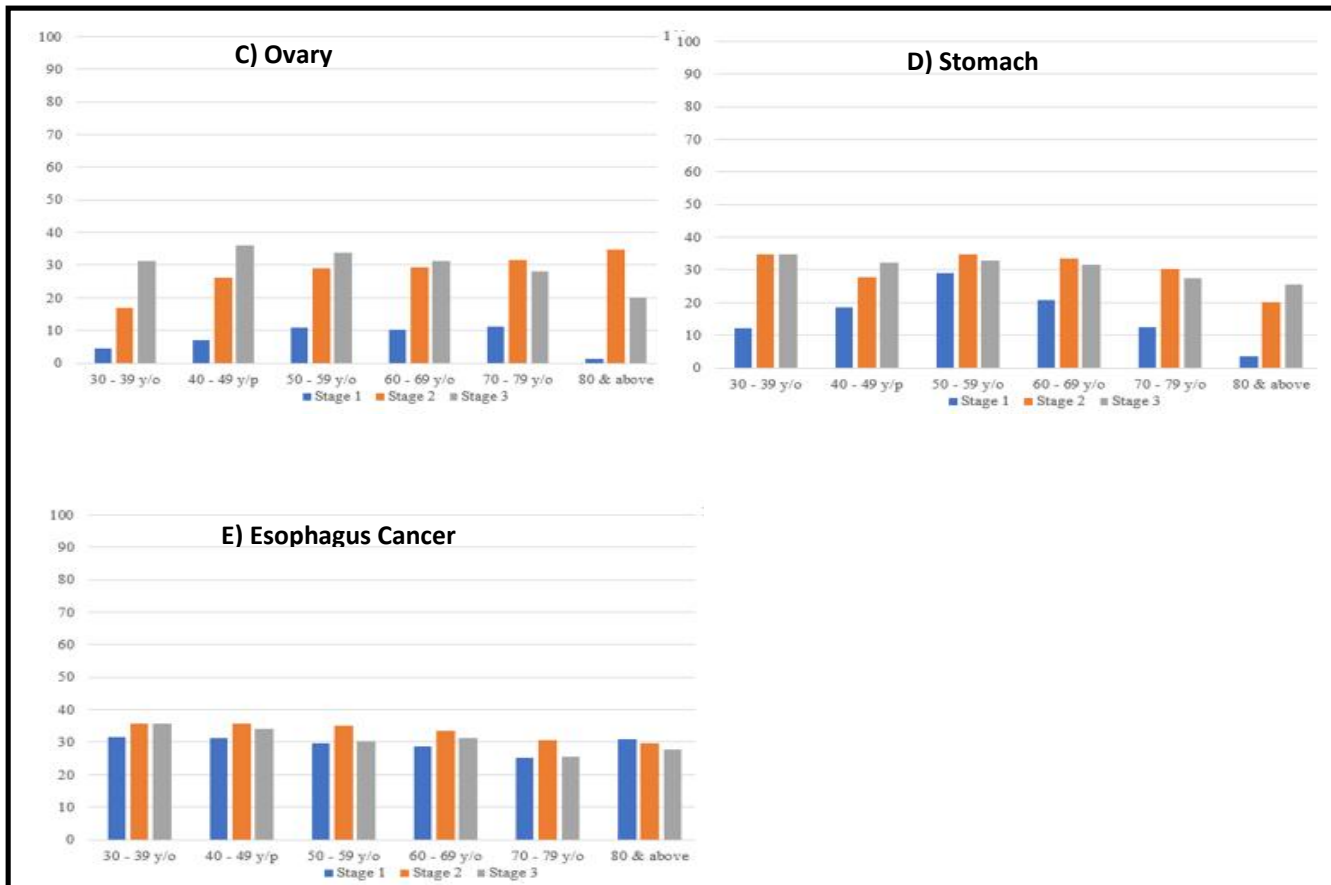


Fig. 2. Increase in Mortality Rate Due to Delayed Surgeries in Ovary Cancer Patients, Stomach Cancer Patients. and Esophagus Cancer Patients*

**Information is derived from Sud et al. (2020) [24].*

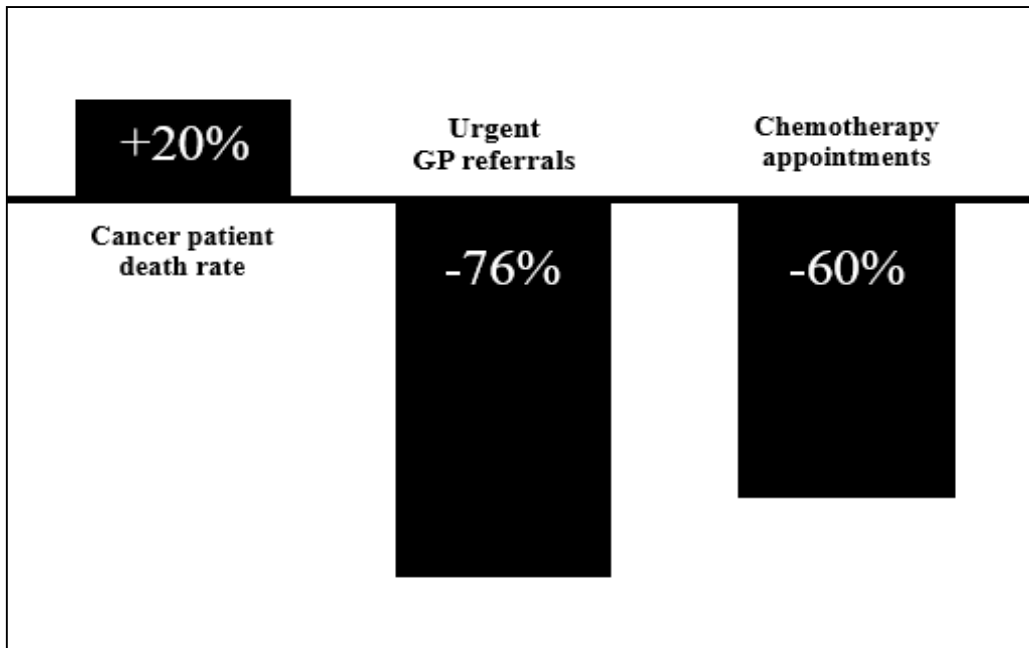


Fig. 3. Projected Increase in Cancer-Related Deaths in the Next 12 Months*

**Information is derived from Armstrong (2020) [27].*

GP: general practitioner.

4. DISCUSSION

The shifts and changes adopted as a response to COVID-19 pandemic and the necessity for physical distancing have negatively affected the practice in the oncology field. Doctors in all types of specializations have been called to render service related to COVID-19, because there are millions of people who are infected while millions have already died. As a result, the healthcare system's professionals, including those who specialize in oncology, must make changes in their practice to ensure that they are able to help in the current pandemic while keeping themselves and their regular patients free from the disease.

Based on the results, the patients appear to be the most affected. Early diagnosis and early treatment are critical for patients with cancer. More specifically, it increases the chances of successful treatment. In turn, they have a greater likelihood of survival and spend lower costs of care [31, 32]. For these reasons, routine check-ups and immediate access to cancer care services are necessary. However, COVID-19 outbreak has made it difficult, if not impossible, for many patients with cancer to seek immediate treatment.

4.1 During COVID-19

As mentioned, cancer care during the COVID-19 crisis includes expanding telehealth for outpatient care [25]. Routine visits are made via video conference and/or phone calls. Moreover, patients with less serious conditions are forced to delay treatment [33], while those with serious conditions are recommended to maintain therapy or proceed with the necessary treatment or surgery [25]. These shifts and changes pose a threat to patient care. According Jones et al (2020), delays in healthcare system responses to people with suspected symptoms of cancer have become inevitable [34]. However, more alarming is when cancer patients have to visit hospitals for their treatments because the chances of acquiring the virus within the hospital setting increases.

While precautions have been made so that everyone who is in the hospital setting is protected, it is inevitable for some to be infected. The same could be true, particularly cancer patients who visit hospitals because of chemotherapy treatment. To note, there are hospitals with cancer wards and the people who are admitted there, some are children, are placed in a very precarious situation. They cannot leave because of treatment, which means that their

movement in the hospital is further restricted. If they were allowed to move around the hospitals in the past, they could not do now due to COVID-19.

4.2 Reasons for the Shifts and Changes

While clinic visits, infusion sessions, radiation therapy appointments, imaging studies, and hospital admissions are typically included in managing and treating cancer, these services have been limited since the outbreak of COVID-19 [35]. One main reason for the shifts and changes in the oncology practice is the necessity for physical distancing. COVID-19 is easily spread through direct contact with the person(s) infected with the virus [36]. People who are immunocompromised are at higher risk for COVID-19. These include people who are under any type of cancer treatment [37]. Apart from the higher risk of transmission, COVID-19 increases the risk of death and complications in patients with cancer. This is especially true for those with blood or lung malignancies or those with tumors that have already spread throughout the body [38]. To minimize and possibly prevent exposure to the virus, patients with cancer are encouraged to practice physical distancing. Unless necessary, they are advised to stay at their homes as much as possible. Another reason for the shifts and changes is to preserve the resources. Same with other healthcare professionals, oncologists and oncology nurses use personal protective equipment (PPE). However, COVID-19 pandemic has caused the supply of PPE to dwindle [39].

5. CONCLUSION

Cancer is difficult to handle and those who are ill need constant visits to their doctors or healthcare facilities. However, with the spread of COVID-19, the situation has become more difficult for cancer patients. Even with the presence of vaccines, this paper could be an insight for oncology services in the pandemic. One of the biggest struggles that cancer patients have to hurdle is physical distancing. While digital options for consultation and other support services are available, the patients still appear to be dissatisfied. If cancer patients cannot go to health facilities, they cannot undergo therapies and surgeries. Going to hospitals though is risky since most of these facilities are being used for treating patients with COVID-19. The mortality rate for cancer patients has worsened during COVID-19. Health professionals working in the oncology field are

also devastated by COVID-19. With tight regulations, they are not as free to conduct studies and experiments that entail the participation of many cancer patients.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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