

Challenges and Issues in the Treatment of Reproductive Cancer in India: A Behavioural Science Perspective

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ABSTRACT

There has been a transition of diseases among the Indian masses seen over the last two decades. Of late, noncommunicable diseases and diseases due to environmental factors have increased manifold. Among them, cancer is a concern with every passing day across regions of India. Among them, reproductive cancers are conditions that occur in the reproductive organs contributing to the increased burden of diseases. These are cancers in the breast, cervix, uterus, vulva, endometrium and ovaries, which affect across demographics and geographies of India. Reproductive cancers can also be found in men, like prostate cancer, testicular cancer, and penile cancer. Reproductive cancers have a significant impact on the lives of men and women worldwide. Given the seriousness of the problem, this review discusses the various determinants of reproductive cancer care in India. Further, this review examines the access to cancer care among Indian men and women. The paper gathered existing evidence through a literature search about facts, figures, and narratives of reproductive cancer in India. According to the basic objective, a literature review was done to assess various factors affecting reproductive cancer in the Indian population. The issues of reproductive cancer were assessed at different levels like socio-cultural, concerns of cancer and access to cancer care. The search sites like PubMed, Scopus, Web of Science, and Journal Storage (JSTOR) were used to unravel the issues of reproductive cancer among men and women. The article brings out many concerns about the control of reproductive cancer in India. In India, the screening, diagnosis, and modern cancer care procedures are insufficient, especially reproductive cancer care. There is also a lack of access to reproductive cancer care in most parts of the country, especially in the rural areas. The infrastructure, workforce, and supply chain of medications for cancer care are very worrisome, which needs to be augmented for primary cancer care. Overall, the public health system has to be augmented by considering the systems thinking approach by including all the stakeholders. The complex issues need simplified solutions. Hence, there is a need for training and capacity building to enhance reproductive cancer care among individuals, families, and communities at large.

Keywords: Cervix, Carcinoma, Chemotherapy, Diagnosis, Prognosis

INTRODUCTION

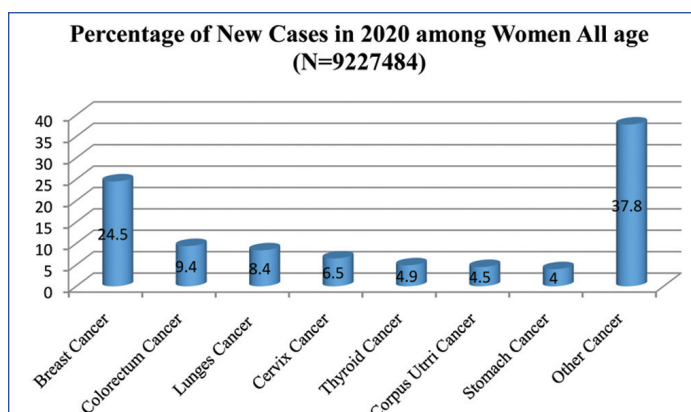
The cancer situation in the world has been worsening with a high rate of incidence and prevalence. There is a marked increase in reproductive cancers among women in the world. The number of reproductive organ related cancer is very high among women which is shown in [Table/Fig-1] [1]. The situation of male cancer is also increasing, though little slower than female. Overall in the world there is high rise of cancer cases across countries. The causative factors for cancer may vary but the global burden of diseases due to cancer is increasing to a great extent.

The transition of diseases having public health concerns in India has altered over time. Of late, the incidences of noncommunicable

diseases and diseases due to environmental factors have increased manifold [2,3]. Among them, cancer poses a severe danger across the states in India. The emergence of various cancers among men and women is visibly marked [4]. According to reports, the incidence and prevalence of female reproductive cancer across states of India increased in large numbers [2]. Also, India lacks an adequate number of healthcare facilities, cancer specialists, screening of cancer networks and rehabilitative care centres [2]. The exponential growth of cancer among women is a severe concern in urban and rural areas due to minimal awareness, diagnosis and treatment facilities [5]. The situation of male reproductive cancer is also alarmingly increasing. The treatment of reproductive cancer faces a double burden of the high cost of treatment and gendered accesses in Indian society.

After cardiac diseases, cancer has emerged as an important cause of morbidity and mortality in India [6]. The continuing global demographic and epidemiologic transitions signals an ever increasing cancer burden over the following decades, particularly in Low and Middle Income Countries (LMICs), with over 20 million new cases of cancer expected annually as early as 2025 [7]. According to The National Centre for Disease Informatics and Research (Indian Council of Medical Research), 1.45 million cancer cases were estimated to be diagnosed in 2016. This burden is likely to become double in the next 20 years. India's cancer incidence is estimated at 1.15 million new patients in 2018 and is predicted to almost double due to a single factor like demographic changes by 2040 [8].

There is a clear sign at the global level for the increase in cancer cases with a projection to cross two million by 2030, where a



[Table/Fig-1]: Estimation of the percentage of new cases in 2020 among women of all age in the world.

Sources: Sung H et al., (2020) [1]

developing country like India has the lion's share [9]. According to data of 2018, the situation of cancer in India is 13.2% of the entire Asian continent, which is relatively high compared to India's population and absolute numbers [4]. In India, the share of oral, breast, and cervical carcinoma is 33% among all forms of cancer. Across the Asian region, India contributes second highest in breast cancer (17.8%) and cervical cancer (30.7%), which is a concern for the health of the entire population [4]. Among the noncommunicable diseases, cancer contributes to a sizable number of deaths with multiple challenges across India [10]. The seriousness of cancer as a disease, particularly reproductive cancer, is clearly visible from the above information.

Reproductive cancers are disorders that occur in the reproductive organs. These are cancers in the breast, cervix, uterus, vulva, endometrium and ovaries. Reproductive cancers can also be found in the prostate, testicles and penis among the male population with relatively more minor incidence than their female counterparts. Reproductive cancers have a significant impact on the lives of men and women worldwide [11]. The Globocan statistics confirm that millions of new reproductive cancer cases occur in India; among them, gynaecological cancers like ovarian cancer and uterine cancer predominate. National Cancer Registry reports that 6.2% of all cancers are ovarian cancer [12]. While among men, the top five cancers are lung, head, and neck region (mouth, tongue and larynx), prostate and oesophagus, among women-breast, cervix, ovary, oral cavity, and uterine cancer are most common [13]. Cervical and ovarian cancers are the two leading cancer sites among women in India. Based on 13 Population Based Cancer Registries (PBCR) in India, cervical and ovarian cancer are the second and the fourth most common cancer in India. The corpus uteri cancer among women and prostate cancer in men has indicated an emerging trend [5]. According to data, the top five cancers among the Indian population, irrespective of gender, contribute to 47.2% of all cancers. The top five cancers among men and women, which can be prevented, screened and detected early for treatment are given in [Table/Fig-2] [14].

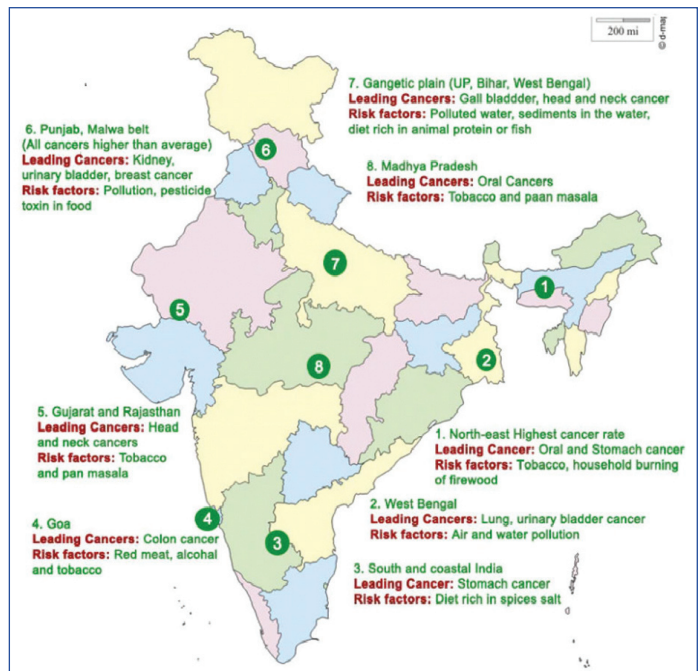
No.	Men	Women
1	Lip, oral cavity	Breast
2	Lung	Lip, oral
3	Stomach	Cervix
4	Colorectal	Lung
5	Oesophagus	Gastric

[Table/Fig-2]: Top five cancers among men and women. Source: India against cancer. Cancer Statistics of India, (2021) [14]

The major type of cancers across the states of India varies. The data shows there is an increasing trend across the states of India. The concerns of cancer among Indian states have been shown in the map presented in [Table/Fig-3] [15]. The leading causes and risk factors are also outlines by the data of cancer India and India today analysis. Given the seriousness of this review discusses various determinants of reproductive cancer care in India. Further, the review examines the access to cancer care among Indian men and women.

LITERATURE SURVEY

The review follows a thorough literature search to gather facts, figures and narratives of reproductive cancer in India. A literature review was done following the basic objective of the impact of reproductive cancer among the Indian population. The issues of reproductive cancer were assessed on the basis of the impact of cancer on India at different levels like socio-cultural, psychological, concerns of cancer, and access to cancer care. The search sites like PubMed, Scopus, Web of Science, and JSTOR were used to unravel the issues of reproductive cancer among men and women.



[Table/Fig-3]: Concerns of cancer among Indian states. Source: Adapted from Cancer India and India Today statistics (2018) (Map is not according to scale, only representative in nature) [15]

The search strategy used keywords like reproductive cancer in India, breast cancer, cervical cancer, penile cancer, prostate cancer, cancer care policies, chemotherapy, access to cancer care and out of pocket expenditure. Some of them were searched in a combined manner, which ensured the relationship between different variables to know the association of those factors. Further, the process of manual searching was employed to find out authentic sources of cancer literature in India. A majority of the articles were taken from the year 2010 onwards. However, few older papers were integrated into the augmentation process due to their theoretical contribution. The paper is arranged according to multiple thematic areas to explain the issues and challenges of reproductive cancer. The existing reproductive cancer care models have been discussed to understand the relation of care and cure of cancer in India. Evidence from international literature has also been put forth to understand cancer care at different geographical locations. The themes are discussed in the article with relevant evidence to strengthen the arguments. The article purposefully highlights the themes like the concern of reproductive cancer, awareness among the population about reproductive cancer, inefficient detection mechanism of reproductive cancer, the impact of the screening program in reduction of cancer, treatment for reproductive cancer and challenges thereof, lack of diagnosis of cancer in India, psychological effects of cancer, social support for cancer care, public health intervention for reduction of cancer cases, access to cancer medicines, and social care of reproductive cancer.

CONCERN OF REPRODUCTIVE CANCER

The concern of reproductive cancer among males and females has been rising in the cancer literature and reported by various surveys, cancer registries and scientific studies. According to a population-based registry survey in five cities of India, the concerns of reproductive cancer are highlighted. It is found that one quarter of females and one-tenth of males are being affected by reproductive cancers among the total cancer cases in those five cities of India [16]. The top three cancer categories that happen among females are cervical cancer (55.5%), ovarian cancer (26.1%), and corpus uteri (12.4%). Whereas, among males the top culprits of cancer are prostate carcinoma (77.6%), penile cancer (11.6%) and cancer of testicles (10.5%) [16]. Other forms of reproductive cancer are also increasing at an alarming speed. Reproductive cancer has a far wider effect on the socio-economic milieu of India.

Pieces of evidence emerge that diagnosis of reproductive cancer was made at pretty advanced conditions, which leads to a dangerously high mortality rate, especially in the case of breast cancer. For this, factors like abysmal awareness levels, clumsy referral system for diagnosis and minimal access to functional and incomplete line of treatment play a major role [17-24]. All these factors need much effort to correct over a short period. Many factors are out of the ambit of medical care for cancer patients. There are many stakeholders to provide care to the patients. In addition to strengthening the cancer care, there is a need for a systems approach in reducing the caseload of cancer in the long run [2].

The number of cancer cases is destined to increase due to upswing in ageing in most parts of the world, where the situation in India is very similar [25]. The projection of reproductive cancer among different ages, sex and social groups is complicated for India due to the unavailability of data and curated information from the hospitals. According to a study, the female reproductive cancer of breast, cervix and ovary is estimated to be around 34% of all cancer deaths by 2026 [26]. It has been further suggested that immediate intervention should drastically reduce the risk factors to minimise the damages due to reproductive cancer. The incidence of penile cancer is also increasing in India due to the factors affecting genitourinary cancer among the older male having an uncircumcised penis [27].

According to a study in Chennai, it is reported that cervical cancer among Muslim women is low in comparison to the Hindu and Christian communities [28]. The incidence of penile cancer is increasing along with age. Interestingly, there was no penile cancer reported among Muslim men [28]. However, the decades old study might have changed slightly due to various carcinogenic factors. The demography and socio-economic factors affecting cancer are also in a changing condition. Overall, religion, age and socio-economic conditions play an important role in India's current condition and projection of reproductive cancer [2].

Some diseases co-exist with reproductive cancers across India. A disease like Human Immunodeficiency Virus/Acquired immunodeficiency syndrome (HIV/AIDS) is associated with many forms of reproductive cancer. The HIV/AIDS is the condition that makes cancer disease severe. The existing treatment procedures do not act efficiently to cure cancer due to HIV/AIDS. A study in Pune, India, reported that besides many co-morbid cancers, reproductive cancers are found among HIV/AIDS patients, which is dangerous for the survival of the patients [29]. Co-morbid cancer patients are also liable to slow prognosis and low cure rates. The survival years also get affected evidently among the co-morbid patients. Even specialist treatments for co-morbid conditions are challenging to access due to the unavailability of many other specialties in the vicinity of the cancer care centres.

Awareness among the Population about Reproductive Cancer

A study confirm a serious lack of knowledge and attitude on the importance of early detection of cancer related to the reproductive system [30]. The same study also reported a prominent divide between rural and urban areas in Knowledge, Attitude, and Practice (KAP) related to cervical cancer [30]. In India, there is a dire shortage of screening facilities and Human Papillomavirus (HPV) vaccination, which accentuates the situation worse. Even among educated men, cancer prevention and screening practice are low. The taboo around topics like sex and sexuality is the root cause for many women's issues. Male involvement in reproductive health issues has been poor in India and women often depend on husbands and other family members to make decisions in sexual and reproductive health matters [31]. Thus, the cultural and family related factors also interact with the decision process of cancer care. The Indian cultural value system often acts as an impediment in diagnosing and treating cancer among women. The

gendered practices and patriarchy play a negative role in women's healthcare, especially reproductive health and cancer care.

Cancer care is shrouded with many myths and misconceptions in India regarding reproductive healthcare. Authors reported many myths, from genetic makeups to practicing the supernatural things found in villages [32]. The taboos are challenging to remove from the system. Without the community's deep involvement in reproductive cancer care, it is nearly impossible to control cancer in a hostile atmosphere. Every member of the community and family has to be alert against the myths of reproductive cancer. Further, the myths and misconceptions have to be removed with functional awareness system and scientific facts by the public health professionals in the society.

There is a need to understand the knowledge attitude and practices regarding reproductive system cancer among Indian men and women and to develop psychoeducational interventions based on the KAP assessment [2]. It is essential for understanding the healthcare access for patients (men and women) with reproductive system cancer concerning 5 A's (affordability, availability, accessibility, accommodation and acceptability). Besides modern cancer care methods, there is a need for awareness to tackle cancer at the early stages in Indian societies.

Inefficient Detection Mechanism of Reproductive Cancer

All the reproductive cancers have tendency for late detection and diagnosis among the Indian people [33]. Almost 75-80% of patients have advanced disease (Stage 3-4) at the time of diagnosis [34]. Studies report that massive deaths have occurred on account of cervical cancer in India during the last few decades due to a lack of awareness and effective treatment [34,35]. A study in Goa (India) shows that a minuscule of women (3.5%) had good awareness about cancer and how to handle it appropriately. At the same time, only 14.1% of women identify the symptoms of ovarian cancer and related risk factors, which is very low compared to global awareness of cancer [36].

Even among educated men, cancer prevention and screening practices are low. A study on educated Indian adults in the United States shows that men reported low clinical testicular examination, foecal occult blood test, and prostate specific antigen screening [37]. The taboo around topics like sex and sexuality is the root cause for many issues of people, especially women. During the literature search process, it was observed that many studies were done on cervical cancer about KAP. However, few studies were found for other reproductive system cancer such as ovarian, uterus, prostate, and testicular [11]. Overall, the inefficient system for the detection of cancer is one of the causes of the advancement of cancer among the Indian population, where other public health measures are also found to be in an abysmal state.

Impact of the Screening Program in Reduction of Cancer

India has reported that due to lack of trained human resources, especially healthcare workers, the screening was not done correctly [2]. This is further accentuated by concerns like uneven distribution of healthcare workers, lack of point of care and functional awareness creating networks. However, evidence from randomised trials confirms that in the Indian situation, the low-cost innovative procedures like visual inspection with acetic acid application help in the diagnosis of cervical cancer. The same study also found that self breast examination followed with inspection by trained healthcare workers help in the diagnosis of reproductive cancers [38-40]. The screening programs help understand the problem of reproductive health cancer and intervention thereof. Overall, evidence in India confirms that the incidence of cancer can be brought down substantially with the intervention by screening programs [41]. The screening programs in India have to be upgraded with modern techniques to reach more people. Unlike many developed countries, India can not

afford costly procedures and diagnostic methods. Hence, innovative models can help in ameliorating such problems.

Lack of Diagnosis of Cancer in India

Early detection of cancer in India is abysmal due to various loopholes in the public health system. This is evident because more than 75% of the cases are diagnosed in advanced carcinoma stages, especially at stage three or four [5,39]. Further, metastasis and local advancement occurred in high numbers for breast cancer (57.0%) and cervical cancer (60.0%). Other forms of reproductive cancers are also highly spreading in India. The spreading of cancer is alarming among the Indian population compared to many developed countries having their advanced cancer surveillance system. The reporting of reproductive cancer is further delayed due to stigma factors in the community. Overall, evidence confirms that in LMIC like India, the determinants like poor awareness of carcinoma, late diagnosis, and inequitable access to care hamper carcinoma treatment [42]. According to an indicator of 5 year relative survival rate, India fares low in breast and cervical cancer patients, which is a significant cause of concern for treating cancer in India [43,44]. This outcome measure is a dire situation in India, which necessitates the immediate improvement of reproductive cancer treatment. Further, evidence galore about the stark division of cancer care in rural and urban pockets, which is ever increasing [6]. The urban areas have relatively advanced technology and necessary resources for the intervention of cancer care in comparison to the rural hinterland.

A systematic review of reproductive cancer, primarily breast carcinoma, shows a severe lack of cancer awareness among the Indian population irrespective of the socio-economic conditions of the women [45]. This requires effective cancer awareness programs for the nationwide dissemination of relevant information to seek care by involving a range of stakeholders. The stakeholders can be decided according to the community's need for cancer care. Further, the matter gets complicated when Indian women are diagnosed at the latter stage with no time to receive cancer treatment. The disproportionate rise in cancer cases coupled with high mortality is due to a low level of awareness [13,18]. The average age of cancer diagnosis among Indian women is 10 years more than their western counterparts, which is a challenge for the concerted effort to control cancer in India [46]. Pieces of evidence confirm that in a cohort study the factors like increasing age, increased number of pregnancies, and absence of formal education increase the risk of cervical cancer, particularly in rural areas [47].

TREATMENT OF REPRODUCTIVE CANCER AND CHALLENGES THEREOF

According to the evidence generated for decades, many procedures have been adopted to treat cancer in India. Modern methods like personalised care, gene therapy, genomics and experimental trial medicines are rarely used in India. Evidence found that combined therapy like radiotherapy and chemotherapy is widely used in the treatment of cervical (48.3%) and vaginal (43.9%) cancer [16]. Whereas shreds of evidence confirm that surgery followed by chemotherapy (54.9%) is used for ovarian carcinoma. Further surgical intervention and radiotherapy are used to treat corpus uteri (39.8%) [16]. All these essential procedures and treatment lines are hardly accessible to the Indian masses for various reasons.

The leading cancer treatment for males is restricted to hormonotherapy for prostate cancer (39.6%). Penile cancer in males is treated by radical surgery (81.3%). In contrast, a combination of treatment through surgical intervention and chemotherapy is used for testicular carcinoma (57.6%), according to a survey based study in five Indian cities [16]. The modern methods with the latest evidence need to be integrated into cancer care for better prognosis and survival.

The treatment procedures for reproductive cancer are evolving with the investment of the government and private sector in India along

with the overall healthcare investment [48]. The reach of modern and effective treatment procedures remains a challenge in large part of India due to late diagnosis [2]. The survival rate of reproductive cancer is yet to be achieved shortly. India needs to augment the existing treatment procedures methods and adopt the new treatment lines coming out of gold standard trials.

Access to Cancer Medicines and Social Care of Reproductive Cancer

The access to cancer care in India is deficient due to significant problems like infrastructure, finance, workforce and the supply chain of cancer therapy medicines [49]. The social support system of cancer care is not functioning optimally in most parts of India [2]. The patient bed ratio in India is already very poor [3]. When cancer care comes into the picture, the situation becomes worse. The patent regime makes things more difficult for the Indians to access good quality cancer medicines. Most cancer molecules are very costly due to the monopoly of international pharmaceutical companies. The reproductive cancer drugs are also so costly due to the company's policy to recover the cost of research and development soon, along with the greed of generating high profitability. Even though cancer drugs are crucial for the survival of reproductive cancer patients, the prices are still very high. The government also cannot enforce low-cost medicines due to international obligations for protecting the interest of the global pharmaceutical giants. The social support system in the Non Governmental Organisation sector, civil society organisations, and community are in rudimentary state in India as far as reproductive cancer is concerned [2]. Patient's families face broader problems due to a lack of social support networks in the care and cure of reproductive cancer patients [11].

Psychological Perspectives to Cancer Care

Evidence from various researches proves that cancer patients undergo psychological distress throughout the continuum from detection to treatment to complete survivorship, it can be said, to the end of their life [50]. The patient's experience emotional distress, helplessness, anxiety, depression, hopelessness and uncertainty. Psychological distress needs to be understood and strategies to reduce it need to be implemented as it tends to reduce cancer patient's mental strength and positivity. This is important for any cancer patient to fight the disease and provide them the strength to bear the pain through the process. Psychological problems seen in women include depression, anger management, anxiety, frustration and despair, low self-esteem and problems in sex lives [50]. The study also reveals that psychological distress worsens as cancer progress [51]. Distress related to cancer is seen in the patients and in family members. Thus, patients and their family members need appropriate interventions to deal with such stress [52]. Thus, through literature, we understand that there is a need to understand the psychosocial issues patients and their caregivers face throughout the cancer process. Such information needs to be used to design and implement interventions for psychological support to patients and their caregivers.

Role of Individual, Family, Community, and Healthcare Team in Cancer Care

High quality cancer treatment requires a co-ordinated effort among the cancer care team members. The cancer care team includes oncologists and oncology nurses. It also includes primary care clinicians, family caregivers, and care workers. High quality cancer care depends on an adequate number of trained health care clinicians, their competency and co-ordination among the inter-professional healthcare team members. It is seen that the above issues need to be addressed as it is essential to deliver high quality cancer care, which is currently not up to the expected standard [53]. An essential requirement for quality cancer care is the co-ordination between primary care clinicians and the cancer care team. A study

by Institute of Medicine (IOM, USA) suggests that a cancer care plan serves as an essential tool in aiding this co-ordination [54,55]. A cancer care plan includes patient's needs, treatment related information, and follow-up care.

The role of oncology professionals for quality treatment is tremendous, but there are shortages of trained professionals. They play a crucial role in administering care and developing a solid relationship with the patients, but it cannot be denied that they too undergo tremendous stress and burnout. Hence, recruitment and retention have been issues that need to be taken care of [56]. Another important member of the cancer care team is the caregivers, including family and direct caregivers. They play a prominent role in the at home care given to the patient and surveillance. Thus, the cancer care team must communicate effectively with the caregivers as they do with the patients. Thus, involving them in important decision making and facilitating them in terms of training and support to make them better equipped to take better care of the patients. Often, family caregivers provide nursing tasks for which they have no knowledge and training thus, making them feels unprepared [57].

Responsiveness Programmes as Interventions

The taboo around sex and sexuality is the root cause for the many issues people, especially women, face daily. A study showed a serious lack of knowledge and attitude towards the importance of early detection of cancer-related to the reproductive system, such as cervical [30]. This leads to delay in cancer diagnosis leading to high mortality. Numerous researches are highlighting the importance of interventions to promote cancer responsiveness. There are myths and misconceptions that come in the way, which also need to be addressed. Hence, the need for an education programme primarily related to reproductive cancer gains significance, especially in a country like India, where people are conservative to discuss issues related to sex because of the taboo associated with it. Interventions for increasing awareness, removing misconceptions, understanding the psychological needs of cancer patients and caregivers are the need of the hour. Research shows that low cancer awareness leads to late stage diagnosis. According to the same study, low cancer awareness includes knowledge about cancer symptoms, early screening and treatment, associated risk factors, and strategies for effective treatment [58]. Interventions for cancer awareness are needed both at the individual and community level.

Research suggests that individual level interventions lead to increased cancer awareness [58,59]. Interventions delivered to the community, results in increased awareness and early presentation. It has been observed further that Community-based cancer education requires intervention at many levels that address the fundamental concerns contributing issues to the myriad of health disparities [60]. Recent research reveals that cancer prevention and control interventions are cost-effective and need to be implemented in a planned process [61]. Interventions in the awareness programme are needed to inculcate safe practices [59]. What is also important is that the knowledge and experience gained through such programmes need to be shared with primary clinicians who are the first point of contact with any cancer patients. Awareness programme for healthcare providers is also an area of concern. Community level intervention based on KAP assessment is the need of the hour. Community interventions in the form of the awareness programme on cancer prevention, early screening, reducing risk factors, diagnosis and treatment, facilities for screening, health schemes, and policies need to be developed and implemented. India related data on the impact of such interventions would help develop better and holistic interventions and guide policy makers to develop holistic cancer prevention and treatment programmes.

Public Health Intervention for Reduction of Cancer Cases

Public health intervention is the key to controlling cancer among the masses rather than curative care. Assessment of root causes of

cancer and intervention thereof play a cardinal role. Well researched findings show that many factors like infections, alcoholism, specific dietary factors, physical composition, prolonged asbestos exposure, increased air pollution and several occupation related hazardous exposures are responsible for the development of cancer [62,63]. In addition, higher Body Mass Index (BMI), inadequate consumption of fruit and vegetables, less physical activity, and chewing of tobacco act as leading behavioural risks for one-third of deaths from carcinoma [64,65]. In this context, many cancerous conditions can be avoided up to 30-50% by avoiding eminent risk factors by adopting alternative healthy behaviours. The early detection and treatment of diseases can further help reduce cancer mortality and morbidity to a great extent, which ultimately ushers in a higher survival rate.

As per current evidence, 30-50% of cancers could be prevented by avoiding known risk factors and implementing existing evidence-based preventive strategies [65]. Public health measures like understanding the risk factors are also needed for reproductive cancer. Preventable cancer cases result from proactive measures by the government and civil society. This would save millions of lives and boost the economy in the long run. In addition, early detection and appropriate management would further reduce the cancer burden, associated morbidity, mortality and financial burden by improving the probability of cure when diagnosed early and treated adequately [64]. In a country like India, the burden of disease is unbearable, which otherwise suffers from many social and economic ills. The myths and misconceptions among cancer patients and healthcare workers are detrimental factors in applying public health measures for cancer care, which is evident from the lack of understanding about concepts like risk factors of carcinoma, signs, and symptoms of cancer, and ultimately diagnosis and treatment.

There should be adequate infrastructure, workforce, and medical supplies to address cancer care [66,67]. Systematic approach is needed to achieve goals instead of a piecemeal approach for cancer control. In a diverse country like India, there is a need for many public health innovations in cancer care. Evidence from two states shows that the lack of essential factors like lack of human resources, trained staff, self-care and aggressive screening impedes cancer care [68,69]. Many of the gaps cannot be resolved overnight. They need time and investment in public health programs of cancer care. Overall, the infrastructure issues are hounding reproductive cancer in men and women.

Authors argue for effective cancer program management, implementation of preventive, promotive, and rehabilitative care [70]. Further, many health system issues must be addressed by early diagnosis, mass awareness, ease of access to care, proper clinical evaluation, sharp diagnosis, accurate staging of cancer, equitable cancer access and universal affordability [70]. A responsive system with adequate resource allocation from government, private and trust is immediately needed to bridge the public health infrastructure gap.

FUTURE APPROACH

The article brought out many concerns for controlling reproductive cancer in India. Pieces of evidence found that there is a lack of awareness about cancer in India, which pushes the nation to the brink of a cancer epidemic. Therefore, it is necessary to increase awareness among the masses, saving millions of lives from mortality and morbidity.

The screening and diagnosis of cancer care are insufficient in India for reproductive cancer care. As screening and early diagnosis have many positive externalities in people's lives in the control of cancer, it is necessary to be included in national programs and other public health programs.

There is also a lack of access to reproductive cancer care in most parts, mainly rural areas. The infrastructure, human resources, and medical supply chain of cancer care are worrisome and fragmented. Hence, there is a need to upgrade the infrastructure of the cancer

hospitals and cancer registries and improve the supply chain of cancer drugs to reduce the awful condition of the people.

Psychological perspectives to cancer care provide a holistic approach to solving reproductive cancer concerns in the Indian context. Many scientific studies identified that the psychological support network complements the treatment process and hasten the curing process. Therefore, it is essential to adopt psychological care by national cancer management programs through different cancer care centres.

The role of individual, family, community, and healthcare team in cancer care is the need of the hour to fight out life-threatening and debilitating cases of reproductive cancer. The social support networks have to be augmented even to address the issues of caregivers in the battle against reproductive cancer. Thus, both patients and caregivers need to be provided with medical and social support through various means.

Overall, the public health system has to be augmented, considering the systems thinking by including all the stakeholders. The complex issues need amicable solutions, so there is a need for training and capacity building of reproductive cancer care to address the issues immediately.

Besides curative care for immediate amelioration of the cancer situation among millions, there is a need for a public health approach to strengthening the entire value chain of reproductive cancer care in India. Further, evidence-based research output across communities about cancer has to be integrated into the cancer treatment process. The details of the integrative approach in reproductive cancer care in India are given in [Table/Fig-4].

S. No.	Factors of integrative reproductive cancer care
1.	Understanding concerns of reproductive cancer in India.
2.	Awareness among population about reproductive cancer.
3.	Efficient detection mechanism.
4.	Impactful screening programme at national level.
5.	Improved diagnosis.
6.	Improved treatment.
7.	Ease of access to cancer medicines.
8.	Social care with human touch.
9.	Effective psychological support.
10.	Integrate individual/family/community in the provision of cancer care.
11.	Systems thinking and public health approach in care.
12.	Removing sexual health-related taboos, myths, and misconception.
13.	Introducing reproductive cancer care in the educational curriculum.
14.	Removing rural-urban disparity in cancer care infrastructure.
15.	Capacity building.

[Table/Fig-4]: Integrative approach in reproductive cancer care in India.
(Source: Authors own compilation, 2021)

CONCLUSION(S)

Many scientists and social scientists in India acknowledge the concern of reproductive cancer care. The factors like early case detection, diagnosis, prognosis and treatment of reproductive cancer among the Indian population was found to be impacted due to uneven cancer care infrastructure, medical supply chain and general awareness among masses. Further, the psychosocial support system is not strengthened with due importance to the integrative care system of cancer treatment. Hence, it is inferred that the medical and psychosocial systems need to be augmented in record time to reduce reproductive cancer mortality and morbidity among the Indian population. The public health system must be integrated with systems thinking by analysing evidence-based medicine and policymaking.

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