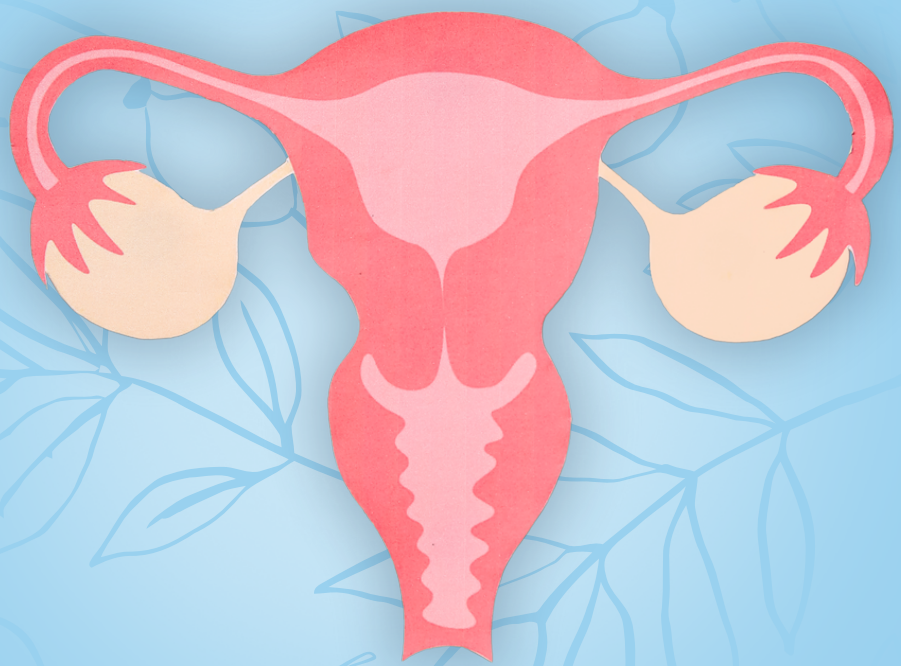
GLOBAL RESEARCHER CLUB

CERVICAL CANCER

Awareness, Prevention & Support



By the Global Researcher Club

About the Global Researcher Club

Global Researcher Club® is an international voluntary & non-profit scientific research community for researchers worldwide.
GRC® was established in August 2022 in Alexandria, Egypt, by Dr. Ramy Ghazy and Dr. Assem Gebreal. The club's origins can be traced back to September 2020, when it started as an informal group for scientists and students. Over time, the group grew in membership and scope, leading to the establishment of GRC® as a global research community.

The Global Researcher Club's vision is to establish a worldwide research community that has a constructive effect on the world by promoting research and youth to address pressing health challenges and enhance the health and well-being of people everywhere. The organization is dedicated to creating a world where research is accessible to everyone and researchers are empowered to positively impact society.
We are committed to fostering excellence, integrity, and social responsibility in research, transcending geographical, disciplinary, and cultural boundaries, and becoming a leading voice and catalyst for change in the global research landscape. We strive to promote diversity, equity, and inclusion.

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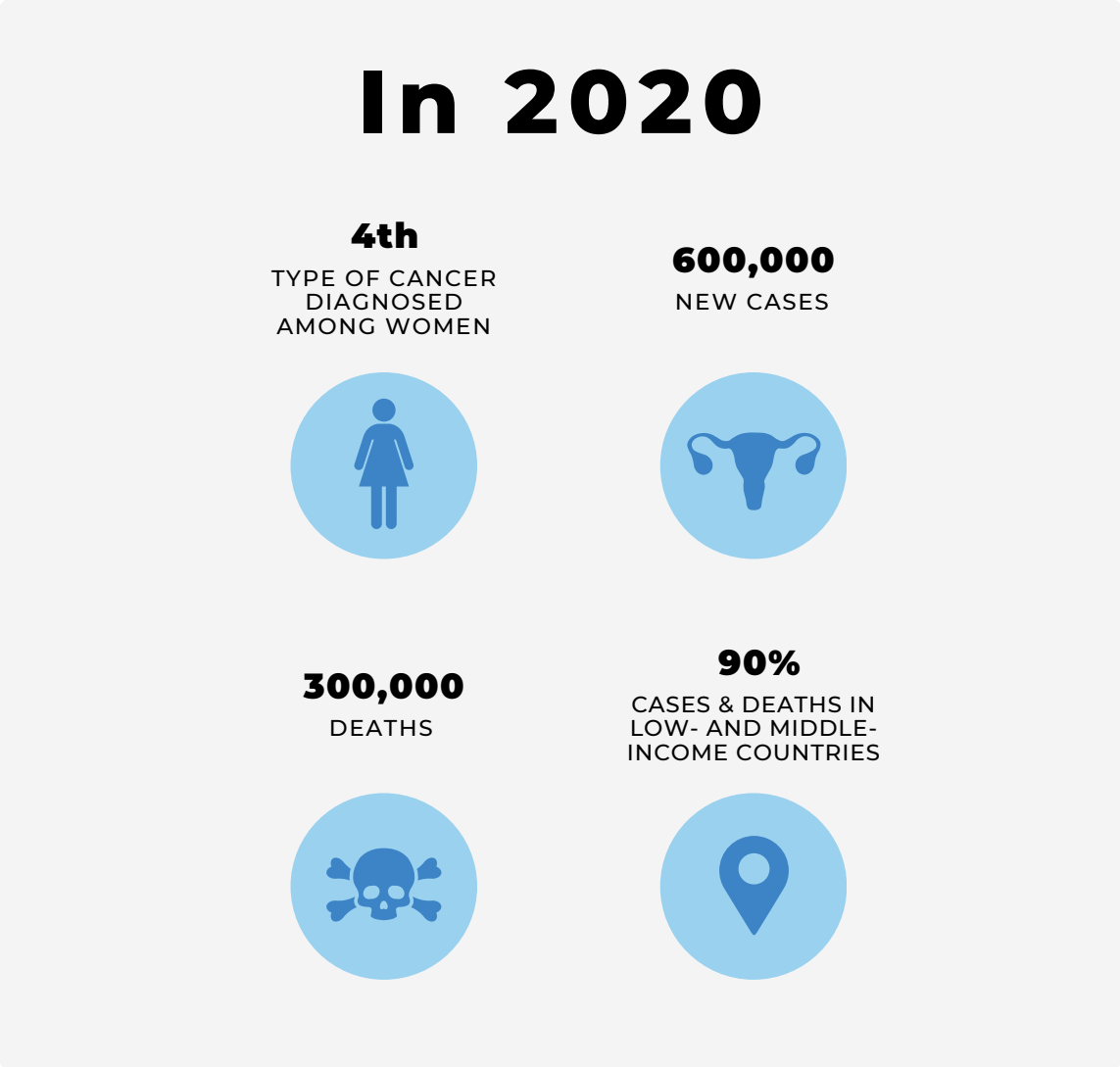
1. Cervical Cancer Awareness

1.1 Prevalence and incidence of Cervical cancer

Cervical cancer is a critical global health challenge. In 2020, cervical cancer ranked as the fourth type of cancer that was diagnosed among women this year with 600,000 new cases. Furthermore, Cervical cancer led to the death of over 300,000 in the same year (1). Of them, 90% of cases and deaths occurred in low- and middle-income countries (LMICs) (2). Globally, Southeast Asia, Central America, and sub-Saharan Africa (SSA) have the highest numbers of diagnosed cases and death rates of cervical cancer. (3).



Globally, South-East Asia, Central America, and sub-Saharan Africa (SSA) have the highest numbers of diagnosed cases and death rates of cervical cancer. (3). The main reasons for these huge differences in the regional burden of cervical cancer go back to differences in the health disparities and availability and coverage of screening programs, vaccination, and health care. HPV infection is the predominant cause of cervical cancer, responsible for more than 95% of cases globally, with types 16 and 18 contributing to 70% of cases (2, 4).

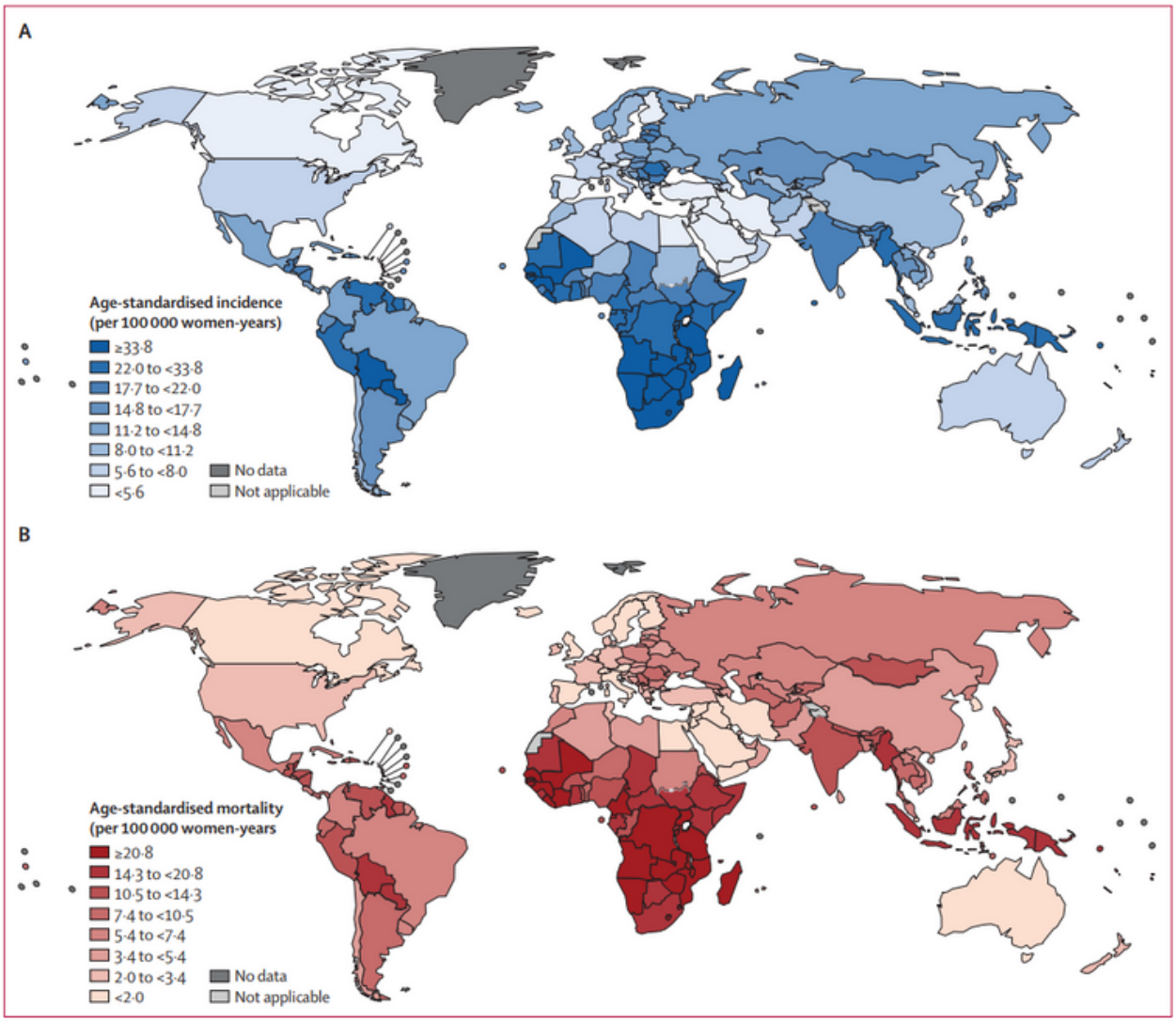


Figure 1: Age-standardised incidence (A) and mortality rates (B) of cervical cancer by country in 2020 (3)

1.2 Leading Cause

Cervical cancer can occur in any females of the reproductive age group, and the risk factors vary (5). Almost 90%, of cervical cancer is caused by long-lasting infection with the Human papillomavirus (HPV) (5,7). A number of risk factors are linked to exposure to HPV also (8).

1.2.1 Human papillomavirus (HPV)

1.2.1.1 What is HPV?

HPV is primarily responsible for the pre-cancerous and the cancerous cervix (8). It is considered to be a sexually transmitted disease that is mostly acquired by skin-to-skin contact in the genital area during intercourse, as well as by hand-to-genital contact and vaginal, anal, or oral sex (9).

The degree of oncogenicity of the HPV type is one factor that determines the risk of cancer progression. Because of changes in sexual behavior, the age group of 25 has the highest prevalence of HPV. Various research indicated that HPV-related cervical disease in women younger than 25 years is self-limiting. Also, low-grade infections will spontaneously resolve within two years. When there are other carcinogenic risk factors present, the lesion progresses to a high grade.

There are more than 130 types of known HPV, among them 20 types are cancer-related (10). Among them, types 16 and 18 are the common types to cause cancer and are identified in invasive cancer screening (10). Since types 6 and 11 typically result in anogenital warts, they are regarded as low risk. The activation of two viral oncoproteins, E6 and E7, which interfere with important tumor suppressor genes like p53, is the primary mechanism for carcinogenesis.

Equivalently, they modify the major cellular pathways that control apoptosis, immunological response, cell adhesion, genetic integrity, and cellular regulation through their interactions with cellular proteins and DNA methylation changes (11).

1.3 Risk Factors

Apart from HPV, other risk factors that contribute to the development of cervical cancer include:

Human immunodeficiency virus (HIV)

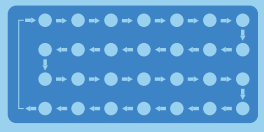
The risk of developing cervical cancer from high-risk HPV is higher in HIV patients (8,10,12).

Reproductive factors and sexual behavior

Multiple sex partners, early age at first sexual intercourse, multi-parity (5,6,8,10).

Oral contraceptive pills

It is the known independent risk factor for cervical cancer. Increased duration of using OCP of at least 5 years, the risk of developing cervical cancer is doubled (13).



Age and Early Childbirth

Women in the reproductive age group, mostly under the age of 45 & Early childbirth (under 17 years old) .

Smoking & Passive Smoking

Components in tobacco may damage the cervical cells and make it prone to cancer cell growth.

Immunocompromised

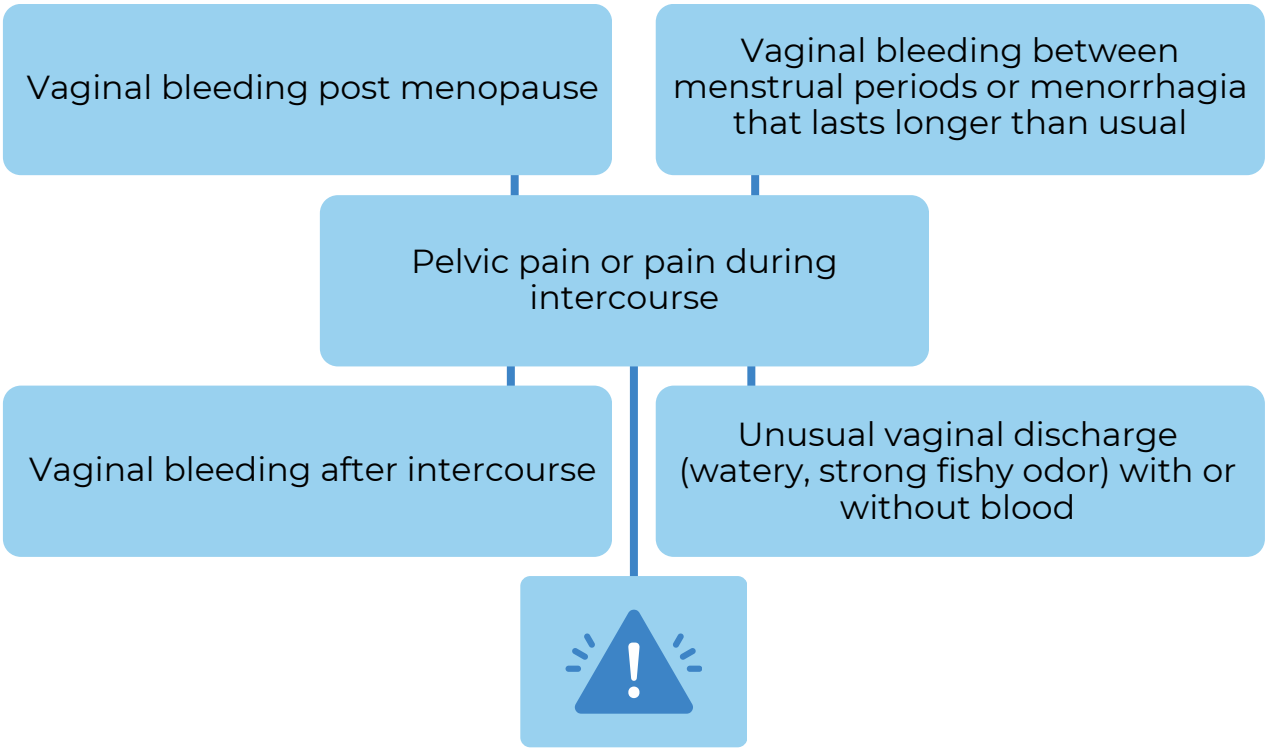
immunocompromised People, or with weakened immune systems are more likely to develop cancer, where the body's ability to fight the HPV infection (8,10,14).

Other Causes & Risk Factors

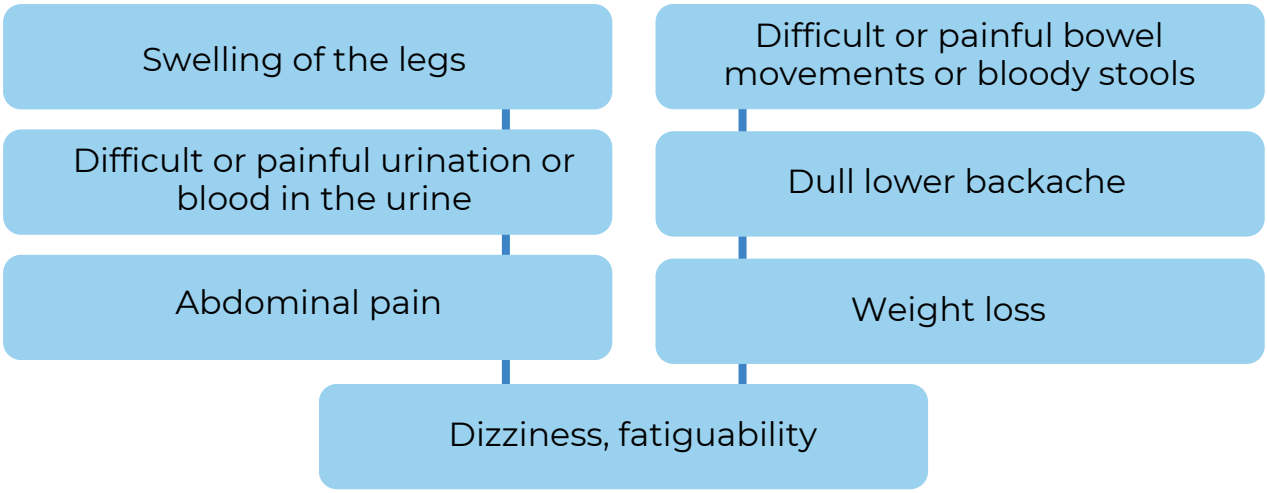
Family history of cervical cancer, Any other terminal cancer or cervical abnormality (cervical erosion, and pelvic inflammatory disease) , obesity, co-infection with herpes simplex virus infection and other genital infections, dietary habits (diet low in fruits and vegetables), improper genital hygiene, lack of regular cervical screening tests, and low socioeconomic level(10).

1.4 Warning signs and symptoms of cervical cancer

Among the symptoms, five warning signs includes:



Other symptoms of advanced cancer include:



1.5 Prevention of cervical cancer

Is it possible to prevent Cervical Cancer?

Preventing cervical cancer is a feasible goal that can be achieved by implementing appropriate measures. Early detection and screening, coupled with proper treatment, can significantly decrease the incidence of this disease. Vaccination against HPV, routine screening for cervical cancer, and prompt follow-up treatment are crucial strategies to prevent cervical cancer in the majority of instances (15). In 2018, the global effort to eliminate cervical cancer was launched by the World Health Organization, calling on all involved parties to work together towards this common goal. Subsequently, in August 2020, the World Health Assembly endorsed a Global Strategy to eradicate cervical cancer (16).

2 Strategies for Eliminating Cervical Cancer:

Actions across the **three pillars of vaccination**, **screening**, and **treatment** should be implemented widely to achieve the global goal, and the intervention must be applied to all pillars, not just a single pillar (17).

2.1 Pillar-1: Vaccination

The use of the HPV vaccine is a reliable and proven method to prevent cervical cancer. The FDA-sanctioned Gardasil 9 vaccine is accessible to individuals aged 9 to 45, regardless of gender. This product was developed to hinder the development of precancers, and cancers associated with seven high-risk HPV strains: 16, 18, 31, 33, 45, 52, and 58. Additionally, it aids in preventing genital warts caused by HPV types 6 and 11. It is important to note that vaccines cannot cure existing HPV infections (15).

The administration of the HPV vaccine is before an individual becomes sexually active since Individuals who are already sexually active may experience reduced benefits from the vaccine (15).

The Centers for Disease Control and Prevention (CDC) suggests that HPV vaccination should be administered to boys and girls at 11 or 12. Children as young as nine are also eligible for the vaccine. If individuals miss the recommended age window, the CDC recommends HPV vaccination up to age 26. Those between 27 and 45 years old who haven't received the vaccine may still be eligible, depending on their vulnerability to new HPV infections, after consulting with their healthcare provider (15).
The regular procedure for giving the HPV vaccine comprises two or three doses, depending on the individual's age. If children commence the vaccine series before reaching 15 years of age, they need two doses. In comparison, individuals who get the initial dose at or after their 15th birthday, or those with certain immunocompromised conditions, necessitate three doses (15).

2.2 Pillar-2: Screening and Early Detection

It is claimed that if a woman is screened for cervical cancer once in her life after the age of 35 her risk of dying from this type of cancer drops by 70%, while it drops by more than 85% if she is screened every 5 years (20). Given its high incidence rate, cervical cancer screening should be encouraged and made available as a routine checkup in primary healthcare centers.

Cervical cancer caused by HPV infections accounts for more than 90%, thus HPV testing is necessary. Another essential test to detect abnormal cervical cells is the Papanicolaou (Pap) test (21).
It is recommended that women with a cervix, aged 21-29 years be tested with Pap smear alone every 3 years. For women with a cervix, aged 30-65 years, a Pap smear along with high-risk HPV testing every 5 years is preferred (20).
Screening can be done with cytology, HPV testing, and visual inspection (22).

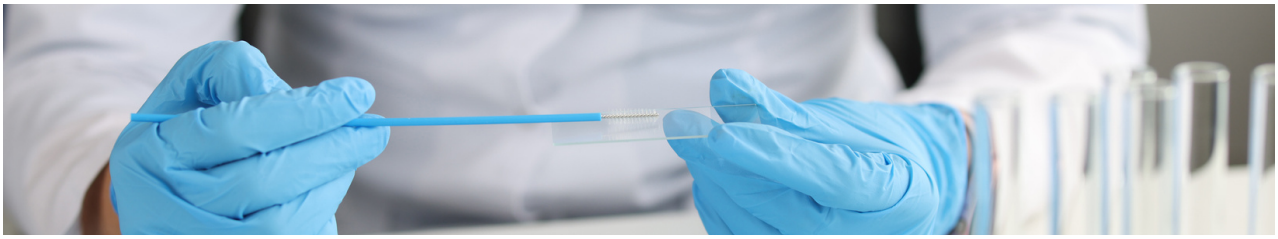
2.2.1 More Preventive tips:

- Eliminating the chances of cervical cancer and sexually transmitted infections is essential for practicing safe sex. **It is recommended that measures be taken, such as using a condom in sexual activity**. It is also helpful to decrease your risk by limiting the number of sexual partners you have(19).

- **Refrain from smoking,** If you are a smoker, have a conversation with a healthcare expert to explore strategies for quitting. (19)

2.3 Pillar-3: Treatment

The treatment landscape for cervical cancer has seen significant advancements in recent years. *More Details on page 15*



2.4 Eliminating cervical cancer contributes to achieving various Sustainable Development Goals (SDGs):

SDG 1

To eliminate poverty in all forms.

SDG 3

Promoting overall well-being and ensuring good health for individuals of all ages involves preventing and treating noncommunicable diseases to decrease premature mortality by one-third. This encompasses fostering mental well-being, sustaining wellness, and ensuring accessibility to reproductive and sexual healthcare services for all, including family planning, information, and education. National strategies and programs should incorporate reproductive health, guaranteeing universal health coverage. This involves offering financial risk protection, access to high-quality essential healthcare services, and ensuring the availability of vaccines and safe, sufficient, quality, and affordable essential medicines for everyone (16)

SDG 5

Ensuring gender parity and enabling the advancement of women and girls.

SDG 10

Working towards decreasing inequality within and between nations (16).

3 The Role of Support

Here are five support strategies for cervical cancer patients:

3.1 Gathering Information

Information on cervical cancer should be gathered to make informed decisions regarding treatment options. Prepare for your next healthcare appointment by creating a list of queries to ask your healthcare team. Organize your questions logically, keep sentences short, and use everyday language.

3.2 Seek Support

Engaging in conversations with friends or family members can provide solace, and joining a formal support group may be beneficial. There are also support groups that cater to the families of cancer survivors who may need it. These groups provided assistance and comfort to those affected by the disease.

3.3 Accept Assistance

Cancer treatment can be debilitating, and it is essential to allow loved ones to provide support in any way. Communicate your needs clearly to enable you to offer the most helpful assistance.

3.4 Set Attainable Goals

Having goals can instill a sense of control and purpose, but it is crucial to set realistic targets that can be accomplished.

3.5 Prioritizing Self-care

it is recommended to develop healthy habits, such as maintaining a well-balanced diet, practicing relaxation techniques, and ensuring sufficient sleep to reduce the stress caused by cancer. (18)

4 Treatment and Palliative Care of Cervical Cancer

The treatment landscape for cervical cancer has seen significant advancements in recent years, This section explores treatment modalities , symptom management, and post-treatment care.

4.1 Surgical Intervention

Surgery is a crucial intervention for managing the disease. There is a range of surgical procedures available, from less invasive approaches for early-stage cases to more extensive interventions for advanced stages (23,24).

4.2 Radiation Therapy

Current research emphasizes the effectiveness of combining external beam radiation with brachytherapy, showcasing improved outcomes in localized cervical cancer (25).

4.3 Chemotherapy

Chemotherapy is a crucial component of cervical cancer treatment, employed as adjuvant therapy post-surgery for high-risk cases and often integrated with radiotherapy, particularly in the context of locally advanced disease. The field of chemotherapy, especially targeted therapies, has demonstrated promising results in terms of response rates and reduced toxicity, contributing to more personalized treatment plans (26).

4.4 Immunotherapy

Ongoing studies in immunotherapy reveal its potential in leveraging the body's immune system to target cervical cancer cells, with clinical trials showing encouraging results (26).

4.5 Palliative Care

Palliative care has gained recognition as a crucial component of cervical cancer management. The undeniable importance of early integration of palliative care focuses on improving the quality of life for cervical cancer patients, irrespective of the stage of disease progression (27). Advanced pain management strategies, fatigue alleviation, and improved antiemetic medications contribute to more effective symptom management, ensuring a more comfortable treatment experience for patients (28)

4.6 Psychological Wellbeing

Emphasize the role of counseling, therapy, and support groups in addressing the emotional and psychological needs of cervical cancer patients, contributing to an overall improved well-being (29).

4.7 Post-Treatment Monitoring

Personalized follow-up plans, including regular screenings and advanced imaging techniques, are crucial for detecting cervical cancer recurrence at an early, treatable stage(30). Recent research sheds light on the long-term side effects of cervical cancer treatment, offering insights into strategies for managing these effects and enhancing the survivorship experience (31).

4.8 Lifestyle Considerations

Emerging studies also suggest the positive impact of adopting a healthy lifestyle post-treatment, encompassing nutritional considerations, regular exercise (32), and smoking cessation (33), on long-term outcomes.

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