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Multiple myeloma and prostate cancer incidence, risk factors and survival rate: A review approach

Abiodun Quadri [1, *], Racheal Kikachukwu Ogan [1], Oyekemi Oyetoro [2], Omotolani Jimoh [2] and Paul Owhenagbo Alemoh [3]

[1] *Department of Information Science, University of Arkansas at Little Rock, AR, USA.*
[2] *Department of Biology, University of Arkansas at Little Rock, AR, USA.*
[3] *Department of Bioinformatics, University of Arkansas at Little Rock, AR, USA.*

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Abstract

Cancer has continued to be a major source of concern globally with increasing evidence of morbidity and mortality necessitating the need to understand the survival rate is becoming more and more important. Prostate Cancer (PC) and Multiple Myeloma (MM) are two different cancers posing serious threat to older adults. Multiple myeloma and prostate cancer have different origin, pathologies, symptoms and survival rates. Multiple myeloma is a hematological cancer that primarily affects the elderly, while prostate cancer primarily affects men in their later years. Prostate cancer starts in the prostate gland's epithelial cells, whereas multiple myeloma is a hematological cancer of plasma cells. However, multiple myeloma and prostate cancer share a few risk factors in common. The symptoms, diagnosis, survival rates, and therapeutic strategies for these diseases vary. The cancer risk factors include an individual's age, family history, lifestyle, diet, ethnicity, socioeconomic status, and medical conditions like diabetes and cardiovascular disease. Age, ethnicity, exposure to radiation, occupational exposure, lifestyle variables, diet, and history of infectious diseases are all risk factors for multiple myeloma and Prostate cancer. However, prostate cancer symptoms vary according to the disease's stage. At an advanced stage, some of the symptoms include bone pain, exhaustion, erectile dysfunction, pelvic discomfort, difficulty urinating, and weight loss. On the other hand, symptoms of multiple myeloma include fatigue, nausea, osteolytic lesions, and bone pain. Laboratory testing, imaging, screening at-risk individuals, and other digital evaluation methods are used to diagnose both illnesses. Thanks to developments in early diagnosis, treatment, and managed care, survival rates for both diseases have increased in recent decades.

Keywords: Multiple Myeloma; Prostate; Cancer; Survival Rate

1. Introduction

The need to understand cancer survival outcomes is receiving a lot of attention because cancer has continued to be a critical source of illness and death worldwide. Generally speaking, cancer occurs when a normal cell develops abnormalities and begins to grow out of control without the signals or "brakes" that normally limit cell growth. Prostate cancer (PC) and multiple myeloma (MM) are two different cancers that generally strike older adults. Prostate cancer starts in the prostate gland's epithelial cells, whereas multiple myeloma is a hematological cancer of plasma cells. In 2008, there were 913,000 new cases of prostate cancer (PC), making it one of the top five most common cancers worldwide (Ferlay *et al.,* 2010). In 2020, the number of new cases of PC increased to 1,414,259 men diagnoses with PC and 375,304 deaths from PC; in 2020, there were 414,259 new cases registered worldwide (Ferlay, 2020; Lawanson et al., 2025d). Although there are few risk factors in common between the two diseases, they differ significantly in origin, pathology, biology, prognosis, and survival outcomes (Bray *et al.,* 2018).

* Corresponding author: Abiodun Quadri

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The prostate gland's main job is to help in ejaculation during sexual activity and store a portion of seminal fluid. During ejaculation, the prostate's smooth muscles aid in the expulsion of semen. Sperm motility and viability are facilitated by the prostate's slightly alkaline fluid, which accounts up 25% of seminal fluid. Because the vaginal system is acidic, the semen's alkalinity balances the environment and keeps the sperm alive. Prostate cancer is reported to be much more prevalent in nations with a larger percentage of the population that is elderly (Ferlay *et al.,* 2010).

About 15% of all hematological malignancies reported in the Western world each year are multiple myeloma, a malignant plasma cell condition with the second-highest incidence among hematological malignancies (Alexander *et al.,* 2012). Anemia, bone fractures, renal failure, and immunological suppression are among the consequences that result from this disruption of normal hematopoiesis. According to the International Myeloma Working Group (IMWG), (2020), MM is the 18th deadliest cancer worldwide, accounting for 1.2% of all cancer deaths. 13% of all hematologic malignancies and 1% of all cancers are multiple myeloma (MM) (Howlade *et al.,* 2009). Every year, about 86,000 new cases of MM are reported worldwide (Becker, 2011). As an incurable hematological malignancy, multiple myeloma (MM) makes for roughly 17% of hematological malignancies and 1–2% of all cancers (International Myeloma Working Group: IMWG, 2020).

The cancer results in damage, including renal impairment, hypercalcemia, lytic bone lesions, and anemia, which are hallmark of multiple myeloma (MM), a clonal plasma cell neoplasm with significant morbidity and mortality. As improved treatments have been developed, myeloma has evolved from an incurable condition to one that can be treated with primarily outpatient therapy but is still incurable. The last ten years have seen significant advancements in myeloma treatment. In the 1980s and 1990s, autologous stem cell transplantation (ASCT) was developed, marking the first significant advancement (Kazandjian and Landgren, 2016). Myeloma is distinct from other cancers because it can be diagnosed with basic diagnostic tests that should be available in low- and middle-income countries (LMICs), such as a basic metabolic panel, serum calcium, serum and urine protein electrophoresis, skeletal survey, and complete blood cell count with differential (Fleming *et al.,* 2017; Tan *et al.,* 2013). The cancer mostly impacting men and people of African American heritage (Siegel *et al.,* 2022). According to Siegel *et al.* (2013), 10% of all hematological malignancies are multiple myeloma (MM), an incurable progressive neoplasm.

2. Methods

The majority of the articles in this review of the literature are indexed in the Google Scholar electronic database. The two main medical disorders in the review are prostate cancer and multiple myeloma. The review utilized "prostate cancer" and "multiple myeloma" as well as important key words (highlighted in italics) as the primary criteria utilized in the search: ("*Prostate cancer incidence*" OR "*Prostate cancer survival rates*" OR "*Cancer treatment*" OR "*Prostate cancer management*" OR "*Multiple Myeloma incidence*" OR "*Multiple Myeloma survival rate*" OR "*Multiple myeloma treatment*" OR "*Multiple Myeloma management*" OR "*Risk factors for Prostate cancer*" OR "*Multiple Myeloma risk factors*" OR "*determinants*") among others. The researcher also examined the reference list of the selected literature for other relevant studies. The scope of the paper is America; however, references made to other countries outside America were also utilized for the purpose of drawing contrast and supporting robust discussion. Articles published between 1990-2024 were used.

Because only English-language publications were used, the searches were limited in terms of language. This is because the researchers is fluent in English; the study included scientific articles and write-ups published in the language to facilitate the search for additional publications on the topic. However, there were no restrictions on dates. The papers were transferred to the researcher's desktop in a folder created specifically for the exercise after the database was consulted in December 2024. The researcher started the cleaning process right away, which included eliminating duplicates and deleting articles that did not contain the information required for the study. The majority of the items that were removed were either duplicates, unreliable sources, or lacked important information. The research included papers that contained crucial information on fundamental terms or concepts found in the research title in their analysis. Works or publications that provide specific drugs or medications and surgeries were purposefully left out of the study as much as possible.

After reading the titles of the papers that were downloaded from the database, the researcher eliminated those that were deemed to be unrelated to prostate and multiple myeloma cancer incidence, risk factors, survival rates, therapy, and management strategies. The researcher after reading the abstracts, removed articles that didn't fit the requirements for inclusion. Articles whose abstracts and titles were unclear about whether they should be included or excluded were saved until the following stage, where they could be read in their entirety. The full-length articles that satisfied the requirements were chosen. After removing duplicate articles, the study had 138 articles to work with. Of these, 27 were removed after reading the abstracts and 38 were excluded after reading the titles because they did not fit the

requirements for inclusion. After reviewing these articles', a total of 73 articles were chosen for this review (see Figure 1). To conduct this study, the chosen articles were carefully read, assessed, and synthesized. An overview of the selection process is shown in Figure 1.

2.1. The flow chart for the quantitative search and screening is shown below:

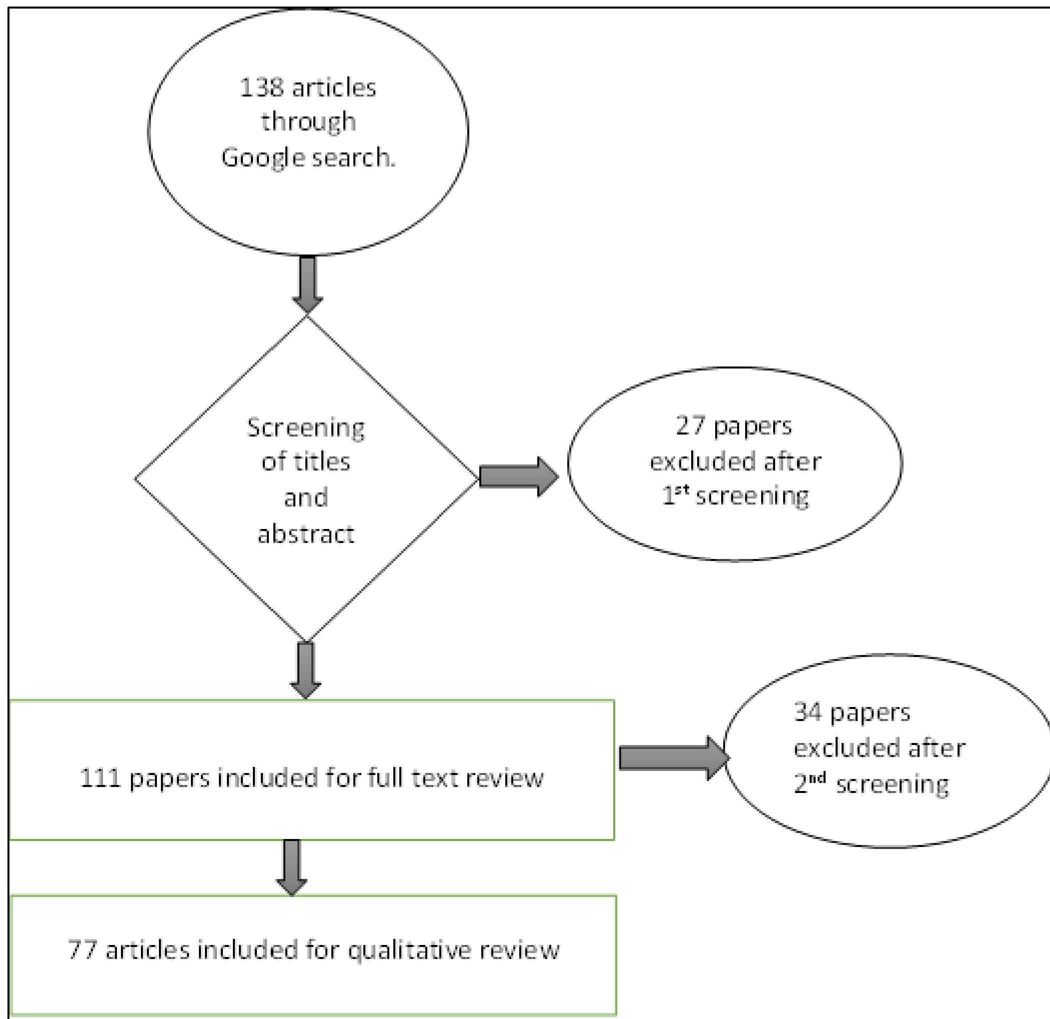

Figure 1 Flow diagram of the process of selection of articles in the different phases of the systematic review

3. Risk factors for Prostate cancer and Multiple Myeloma

3.1. Risk Factors for Prostate Cancer

Prostate cancer is one of the most prevalent malignancies in men, particularly in the US. According to Siegel *et al.* (2024), prostate cancer is the second most common cause of cancer-related fatalities, with an estimated 299,010 men receiving a new diagnosis and 35,250 men passing away from the condition. As a result, the illness is an important public health concern. Since the three main risk factors for prostate cancer are age, ethnicity, and family history cannot be changed, major prevention strategies has always been difficult. Age has a significant impact on the incidence of prostate cancer; few men are diagnosed with the disease before the age of 50, and around half of all men are diagnosed after the age of 70 (National Board of Health and Welfare in Sweden. Cancer Statistics, 2022). According to Jemal *et al.* (2010), prostate cancer is currently the most frequent cancer in older men; in the US, men over 65 accounted for 64% of new prostate cancer cases, while men over 75 accounted for 23% (Heinzer and Steuber, 2009). As people age, their risk of developing prostate cancer rises dramatically, especially beyond the age of fifty.

Genetic, environmental, and lifestyle variables are among the numerous factors that influence the development of prostate cancer. Men are two to three times more likely to develop prostate cancer if a first-degree relative, such as a

father or brother, has been diagnosed with the disease. It is therefore well recognized that family history increases the risk of PC. PC falls into one of three categories: genetic, familial, or sporadic (Bratt, 2002). A person's relative risk is doubled and their absolute risk is 15% if either their father or brother had PC. The relative risk triples and the absolute risk rises to 20% if either the father or a sibling had the illness prior to the age of 60. If both a brother and a father have PC, the absolute risk is 30% and the relative risk increases fourfold (Bratt, 2002). It is now well recognized that family history increases the risk of PC. PC falls into one of three categories: genetic, familial, or sporadic (Bratt, 2002).

Since autopsy records show that around half of all men have microscopically detectable prostate cancer at age 80 or beyond, differences in diagnostic activity and population age composition account for a major portion of the incidence discrepancies between nations (Bell *et al.,* 2015). There are racial disparities in PC incidence. Caucasians are shown to be at a higher risk than Asians, while Black men are 1.5–2 times more likely than White men to have PC (Brawley et al., 2007; Krieger et al., 1999). The question of whether the genetic predisposition of some races to develop PC or the differential distribution of other factors, such as socioeconomic status, dietary and lifestyle choices, and access to health care services, are the causes of these disparities in PC incidence has been brought up by these differences. The question that these disparities in PC incidence among different races raise is whether these differences are due to a genetic predisposition of some races to develop the disease or to a differential distribution of other factors, such as socioeconomic status, dietary and lifestyle choices, and access to health care services.

Increased risk has been associated with diets heavy in red meat and saturated fats and low in fruits and vegetables. Although the exact relationship between obesity and prostate cancer is unknown, obesity is linked to more aggressive and higher-grade prostate cancers. According to Nunzio and Lombardo (2024), there is currently no single dietary or lifestyle guideline that can lower the risk of prostate cancer. Coffee and tea are two of the most widely consumed liquids in the world, and their potential to influence PC development has been studied. Although epidemiological research is conflicting, there are no established guidelines for the use of these beverages, despite the fact that they are one of the few potentially modifiable risk factors for PC (Shafique, 2012). Green tea or purified extracts have been shown to have a chemopreventive effect on PC carcinogenesis, however, epidemiological studies on the relationship between green tea consumption and carcinogenesis have also produced conflicting findings (Henning *et al.,* 2011; McKey and Blumberg, 2002). There is ongoing discussion on whether socioeconomic level and health care access disparities or a genetic predisposition to prostate cancer in particular ethnic groups are responsible for these outcomes (Mucci *et al.,* 2016). For instance, the incidence of various malignancies, including PC, has been linked to socioeconomic situations. It is believed that the socioeconomic disparities in cancer development are linked to numerous other factors (Shafique, 2012). In the context of socioeconomic conditions, the ability to obtain health care services and the caliber of testing services accessible to various socioeconomic groups are considered a crucial factor (Shafique, 2012).

One risk factor for the development of prostate cancer has been found to be hormones. Higher amounts of androgens, or male sex hormones, for instance, may encourage the formation of prostate cancer. Risk may be increased by conditions that affect testosterone metabolism. Although there is ample scientific evidence that hormones, especially androgens, are important in the development of PC, the majority of epidemiological information regarding the relationship between hormone dose and cancer risk has not been conclusive (Hsing, 2001). Consequently, a little increase in risk may result from exposure to substances such industrial pollutants and pesticides. According to Gillessen and Powles (2020), cancer patients are more likely to become unwell or die from coronavirus disease (COVID-19). Other variables, such as male gender and pre-existing comorbidities like diabetes or cardiovascular disease, have also been linked to infection severity and death (Caffo *et al.,* 2021). Patients with prostate cancer who are elderly and have comorbidities are particularly vulnerable to acquiring more severe illness and following a COVID-19 infection. Additionally, it is well recognized that extended use of androgen-deprivation therapy (ADT), the cornerstone of treatment for advanced prostate cancer (APC), is linked to weight gain, diabetes, and cardiovascular disease (Nguyen *et al.,* 2015).

3.2. Risk Factors for Multiple Myeloma

Multiple myeloma is a plasma cell cancer with a unique set of risk factors. Like prostate cancer, the risk increases with age, with most cases being diagnosed in people over 65. Generally speaking, myeloma affects older adults (the average age upon diagnosis is 69). Multiple myeloma primarily affects the elderly, with a sharp increase in incidence as people age (Kyle *et al.,* 2014; Turesson *et al.,* 2010; Lawanson et al., 2025a). This is due to the disease's average age of onset, which is between 70 and 75 years old. The prevalence of multiple myeloma is higher in men than in women. According to Blimark *et al.* (2015), men are approximately 1.5 times more likely than women to have multiple myeloma. African Americans are twice as likely as Caucasians to develop multiple myeloma, while Asians are the least likely of any racial group to do so. Family history is important; those who have a close relative with multiple myeloma or similar plasma

cell disorders (such as Monoclonal Gammopathy of Undetermined significance, or MGUS) are more likely to develop the disease themselves.

Studies of atomic bomb survivors provide compelling evidence that radiation exposure is linked to myeloma; those who entered Hiroshima city within three days of the explosion had a nearly 60% higher risk of dying from myeloma than those who were not exposed (Shimizu *et al.,* 1990).

Uncertainty surrounds the impact of occupational exposures on multiple myeloma risk. According to Riedel *et al.* (1991), the majority of occupational connections with multiple myeloma have been in farming. Monoclonal plasma cell proliferation, or MGUS, occurs before almost all cases of multiple myeloma. Higher risk has been linked to exposure to pollutants including benzene and pesticides, as well as ionizing radiation (Lawanson et al., 2025c). Multiple myeloma is known to be associated with obesity, which may be caused by alterations in immunological responses and chronic inflammation

Finally, both prostate cancer and multiple myeloma are prevalent in older individual, but, while prostate is only among older males, multiple myeloma is common among older individuals, diagnosed beyond 65 years. Asians are less likely to get prostate cancer than African Americans. In a similar vein, Asians have the lowest rate of multiple myeloma and African Americans the highest. An important factor in prostate cancer is family history. Multiple myeloma is preceded by MGUS and family history. Obesity and a high-fat diet are associated with a higher risk of prostate cancer. In contrast, obesity and persistent inflammation are important factors for multiple myeloma. Environmental elements that have been linked to an increased risk of prostate cancer include pollutants, industrial chemicals, and pesticides. Occupational exposures, benzene, and radiation are more strongly associated with multiple myeloma. Significant prostate cancer is caused by hormones like androgens and pathways linked to testosterone. Multiple myeloma has MGUS as a known precursor, whereas there is no known precursor disorders linked to the development of prostate cancer. African Americans are more susceptible to both multiple myeloma and prostate cancer, which share risk factors include racial predispositions and advanced age. While environmental exposures and antecedent conditions (MGUS) have a substantial impact on multiple myeloma, prostate cancer is more strongly linked to hormonal and nutritional variables.

4. Symptoms and Diagnosis of Prostate cancer and Multiple myeloma

Despite being different cancer, types, multiple myeloma and prostate cancer share similar diagnostic and treatment difficulties. In the male reproductive system, prostate cancer develops from the prostate gland, whereas multiple myeloma is defined by the malignant growth of bone marrow plasma cells. Both disorders have a major negative influence on patients' quality of life, making early identification and efficient treatment plans essential.

4.1. Symptoms and Diagnosis of Prostate Cancer

Around 10% of all male cancer-related deaths in Europe are still caused by prostate cancer, which remains a significant cause of death (European Cancer Information System (ECIS, 2022). The majority of men who pass away from prostate cancer have several bone metastases prior to their passing, which results in severe discomfort and morbidity (Gandaglia *et al.,* 2014). The stage of prostate cancer affects the symptoms. For instance, the localized Stage, which is frequently asymptomatic, is discovered by chance during routine digital rectal examinations (DREs) or prostate-specific antigen (PSA) testing. Hematuria, pelvic pain, erectile dysfunction, and trouble urinating are some of the symptoms of the locally advanced stage. Fatigue, inadvertent weight loss, and bone pain, particularly in the hips, ribs, and spine, are signs of the metastatic stage.

PC investigations may be initiated by clinical symptoms or by screening at-risk individuals with serum Prostate Specific Antigen (PSA) tests and/or clinical examinations. But only by histologically examining prostatic tissue taken by biopsy can a conclusive diagnosis be achieved (Shafique, 2012). Progressive PCs may exhibit certain lower urinary tract symptoms, such as frequent urination, nocturia (increased frequency of urination at night), haematuria (blood in urine), or dysuria (pain during urination), however early PCs are unlikely to exhibit any symptoms (Frankel *et al.,* 2003). Over time, the clinical presentation pattern of PC has undergone significant change. Today, the majority of PC cases are asymptomatic, and signs and symptoms associated with malignancy are less frequent at the time of diagnosis. Because PSA and prostatic biopsies are increasingly being used to diagnose early-stage disease and, in the majority of cases, small tumors in asymptomatic individuals, the clinical presentation of PC has changed dramatically since the 1990s (Frankel et al., 2003). Diagnostic methods combine clinical, biochemical, and imaging techniques:

Digital Rectal Examination (DRE): identifies nodules, asymmetry, or induration of the prostate; Imaging: Transrectal ultrasound (TRUS), magnetic resonance imaging (MRI), and bone scans for metastasis evaluation;

- Biopsy: Core needle biopsy under ultrasound guidance is still the gold standard; and
- PSA: Elevated levels may indicate cancer but can also occur in benign conditions.

4.2. Symptoms and Diagnosis of Multiple Myeloma

One of the signs of multiple myeloma is hypercalcemia, which can cause nausea, constipation, and disorientation. Renal impairment may be brought on by hypercalcemia or light chain nephropathy. A patient with MM may also have anemia symptoms, such as fatigue and pallor, which could be brought on by bone marrow infiltration. Osteolytic lesions, pathological fractures, and bone pain are among the bone lesions that MM patient's experience.

Laboratory testing, imaging, and bone marrow analysis are all part of the diagnosis:

- Blood tests: hypercalcemia, serum-free light chain ratio, and elevated monoclonal protein (M protein).
- Bence Jones proteins (free light chains) are used in urine tests.
- Clonal plasma cells ≥10% are confirmed by bone marrow biopsy.
- Imaging: PET/CT or whole-body low-dose CT to identify bone abnormalities.

5. Management and Treatments of Prostate cancer and Multiple Myeloma

Prostate cancer management has changed significantly over the past few decades due to better diagnostic and treatment options such as hormone therapy, radical prostatectomy, and prostate radiation. Significant developments in prostate cancer treatment and diagnosis methods in recent years have completely changed how the disease is managed in day-to-day practice. Intensity-modulated radiation therapy and robot-assisted radical prostatectomy are two new techniques that have gained widespread use globally. This section discusses the care and therapies for multiple myeloma and prostate cancer.

5.1. Management and Treatments of Prostate Cancer

Early cancer diagnosis frequently opens up more therapy options. While certain early malignancies may exhibit visible signs and symptoms, this is not always the case (American Cancer Society,2023). Although early identification and therapy of localized prostate cancer have improved recently, there is still debate about the disease's management. In the United States, 33,000 men lost their lives to prostate cancer in 2020, while about 192,000 men were diagnosed with the condition (Islami *et al.,* 2021). Localized illness incidence has decreased while regional and advanced case incidences have grown after the U.S. Preventive Services Task Force revised its recommendations in 2012 and 2018 (US Preventive Services Task Force, 2018) (Desai *et al.,* 2022).

For PC, there are numerous treatment methods available, some of which are better suited for specific patients. During active surveillance, PSA testing, digital rectal examination, and occasionally prostate biopsy are used to follow up with these individuals (Albertsen, 2010; Heidenreich *et al.,* 2011). When compared to other treatment regimens for localized PC, some evidence indicates that men on active surveillance have the highest quality of life (Albertsen, 2010; Hayes *et al.,* 2010). While active surveillance has become a viable treatment option, it is still challenging to anticipate the tumor growth of particular patients, which could undermine the likelihood of an eventual cure.

The three primary treatment options for early PC are active surveillance, radiation, and surgery. PSA monitoring (watchful waiting) or androgen ablation hormone therapy may be options for people with less favorable overall health status (Shafique, 2012). There are several advantages to surgery, and the goal of this treatment is typically to cure. The removal of the prostate gland, or radical prostatectomy, enables a thorough pathological evaluation of the tumor. Additionally, this approach can be used to evaluate the presence of surgical margins and expansion to neighboring structures (Heidenreich *et al.,* 2011). As a curative measure, radiotherapy is also utilized in conjunction with radical prostatectomy. According to Heidenreich *et al.* (2011), external beam therapy has the advantage of lowering the risks associated with surgical therapy, such as the possibility of anesthesia and the need for an inpatient hospital stay.

5.2. Management and Treatments of Multiple Myeloma

Multiple Myeloma (MM) is first and foremost regarded as an incurable illness. Both the clinical course of the disease and survival have improved in recent decades due to new therapeutic options (Palumbo *et al.,* 2011). Multiple myeloma (MM) patients now have a higher chance of survival thanks to new treatment choices that have been offered in recent decades (Kristinsson *et al.,* 2014; Kristinsson *et al.,* 2007). Multiple myeloma patients do not now have access to a proven curative treatment. But over the last ten to twenty years, the advent of contemporary treatments has led to

significant and long-lasting therapeutic responses in a significant number of patients, which has led to long-term illness control and the possibility of a future cure (Landgren and Iskander, 2017).

According to Palumbo and Anderson (2011), monoclonal plasma cells that express amonoclonal protein proliferate in multiple myeloma (MM). End-organ damage (hypercalcemia, renal impairment, anemia, bone lesions) and indicators of active disease (e.g., an involved: uninvolved serum-free light-chain ratio of 100%, bone marrow plasma cells of 60%, or.1 lesion found on magnetic resonance imaging) are the basis for treatment indications (Rajkumar *et al.,* 2014). As MM patients live longer, managing the disease's side effects, including infections, thrombosis, and neuropathy, has become increasingly crucial (Palumbo and Mina, 2013). One of the main causes of death and a major cause of illness for people with MM is infection (Kyle and Rajkumar, 2004; Nucci, 2009). In research including more than 3000 MM patients, Augustson and colleagues found that infections accounted for 45% of early deaths (within 6 months). T-cell, dendritic cell, and NK-cell abnormalities, as well as B-cell dysfunction, including hypogammaglobulinemia, are all part of MM-related immunodeficiency (Pratt, 2007). Numerous myeloma patients have also been demonstrated to exhibit a weak immune response to vaccinations and infections, which has been linked to an increased risk of infection (Karlsson *et al.,* 2011; Hargreaves *et al.,* 1995).

Myeloma diagnosis, therapy, and supportive care have advanced significantly during the past 18 years. The US Food and Drug Administration has approved 15 new medications for the treatment of myeloma over this time, and myeloma patient survival rates have tripled. The introduction of four novel myeloma medications in 2015 alone was a first for any disease.

Because multiple myeloma and prostate cancer are heterogeneous, tailored management approaches are required. Personalized therapy is now possible because to new biomarkers and therapeutic targets discovered by molecular biology advancements. Disparities in access to care, drug resistance, and treatment toxicity are obstacles, especially in areas with limited resources. Two major public health issues that still exist are multiple myeloma and prostate cancer. To increase survival and quality of life, early diagnosis and specialized treatment are essential. To fill current care gaps and create novel treatments, further research is necessary.

6. Survival rates and Determinants of Prostate cancer and Multiple Myeloma patients

When evaluating the effectiveness of therapeutic and diagnostic measures, cancer survival rates are essential metrics. Cancer survival is the length of time that the disease lasts after a diagnosis, concluding with death from cancer or another cause. The percentage of cancer survivors who are still alive five or ten years following their diagnosis is typically used to describe cancer survival. According to Shafique (2012), cancer survival is arguably the most commonly cited indicator of the impact of several factors, including timely diagnosis, treatment efficacy, socioeconomic status, and other aspects of health services.

6.1. Survival rate and Its Determinants among Prostate Cancer patients

Because of breakthroughs in early identification and treatment, prostate cancer, the second most frequent cancer in males worldwide, has seen impressive increases in survival. Particularly in wealthy nations, prostate cancer survival rates have significantly increased in recent decades.

- Localized and Regional Disease: According to the SEER (Surveillance, Epidemiology, and End Results) database, the 5-year survival rate is over 100%.
- Distant Metastatic Disease: About 31% of patients survive for five years.
- Long-Term Results: For localized disease, the 10-year survival rate is around 98%.
- Treatment-resistant patients and late-stage progression are reflected in the 15-year survival rates, which drop to 91%.

For males with local or regional prostate cancer, the 5-year relative survival rate is higher than 99% in the US. Stated differently, there is often little danger of the cancer spreading or of a man passing away from prostate cancer. Prostate cancer can take many different forms, though, and some of them can be aggressive even if they seem to be limited to the prostate (Prostate Cancer Foundation, 2021). Survival rates may help you better grasp the likelihood that your therapy will be successful, but they cannot predict how long you will survive. Evaluation of the burden of prostate cancer and the results of early detection and treatment require knowledge of death statistics (Orrason, 2022). The PSA-based testing, which resulted in an earlier detection and timely treatment of localized disease, is also responsible for the observed decrease in mortality rate (Hussain *et al.,* 2008). The treatment that the patient receives may possibly account

for some of the differences in survival between age groups, since patients over 75 are less likely to obtain a curative treatment (Bechis *et al.,* 2011).

It is crucial to keep in mind that while disease stage and grade are independent indicators of survival, they also progress with age (Merrill and Bird, 2002). Various factors explain the prognostic value of race, including differential aggressiveness and disease stage at presentation, socio-economic differences, and treatment disparities between different racial groups. In the United States, the survival of patients with PC has improved over time, but regional studies have also reported socio-economic inequalities in survival (Hussain *et al.,* 2008; Rowan *et al.,* 2008). However, the relationship between these factors is unclear and attributed to different factors. The influence of disease grade and stage was the primary cause of poorer survival among the youngest and oldest age group (Merrill and Bird, 2002). In the US, Black people are known to have a far higher risk of PC, more advanced and high-grade disease, and a worse prognosis than White people (Fowler, Jr. et al., 2000).

6.2. Survival Rates and Its Determinants among Multiple Myeloma Patients

Even with comparable developments, the prognosis for multiple myeloma, a hematologic cancer marked by plasma cell growth, is more varied. As of right now, over 100,000 Americans suffer with multiple myeloma, and according to the American Cancer Society, 34,920 new cases of the disease will be discovered in 2021. It has been well documented that patients diagnosed in the early to mid-2000s had better survival rates from multiple myeloma (MM) than patients diagnosed in previous decades (Kristinsson, Anderson, and Landgren, 2014; Waxman, 2010; Ailawadhi *et al.,* 2012). Increased use of autologous hematopoietic cell transplantation (auto-HCT) and the introduction of new agents, particularly the first generation of immunomodulatory drugs (IMiDs) (Palumbo *et al.,* 2012; Dimopoulos *et al.,* 2007) and proteasome inhibitors (PIs) (Richardson *et al.,* 2005; San et al., 2008), were thought to be the causes of these improvements. Ailawadhi et al. (2012) and racial and ethnic minorities (Pulte *et al.,* 2014) did not show any significant gains in survival, while patients diagnosed at an older age of onset (Kristinsson, Anderson, and Landgren, 2014) did not see any changes in survival.

Prostate cancer and multiple myeloma survival rates are influenced by the biology of the disease, the availability of treatments, and access to healthcare. Effective screening and curative measures have led to higher survival rates for prostate cancer, particularly in early stages of the illness. On the other hand, multiple myeloma is still incurable despite significant advancements in treatment, and drug resistance and relapse limit survival. Survival results for both diseases are significantly influenced by factors including healthcare disparities and socioeconomic status, especially in environments with limited resources. Bridging the survival gap requires both fair access to healthcare and ongoing innovation in therapeutic approaches.

Although prostate cancer usually has a good prognosis, especially if caught early, multiple myeloma is more clinically challenging since it is more likely to return. Both malignancies are prime examples of how crucial early detection, tailored treatment, and continued research are to improving survival rates. Inequalities in access to treatment continue to be a major concern for international oncology. Research from the United States has demonstrated decreased early mortality in all age categories in recent years, as well as better long-term survival for patients who were diagnosed between the ages of 65 and 80 (Kristinsson *et al.,* 2014).

Despite improvements, multiple myeloma survival rates are still lower than those of prostate cancer:

- 5-year Survival Rate: SEER data indicates a 5-year survival rate of roughly 59%.
- After ten years, the survival rate falls to about 30%.
- Long-term Results
- Relapse rates are significant for multiple myeloma, necessitating a series of treatments.
- Survival Disparities: Poorer results are a result of limited access to innovative treatments in low-resource environments

7. Conclusion and Recommendations

This study reviewed pertinent literature on the symptoms, diagnosis, prognosis, and treatment of patients with multiple myeloma and prostate cancer. Two different cancers that usually affect older persons are multiple myeloma (MM) and prostate cancer (PC). The pathogenesis and etiology of multiple myeloma and prostate cancer are different. Multiple myeloma is a hematological malignancy that primarily affects the elderly, whereas prostate cancer primarily affects men in their later years. According to the review, prostate cancer is the second most frequent type of cancer and the fifth most common cause of cancer-related mortality for males globally. Accordingly, the second most common

hematological malignancy is multiple myeloma, a malignant plasma cell condition that accounts for 15% of all hematological malignancies reported each year in developed nations. Major risk factors for prostate cancer include race/ethnicity, lifestyle, age, ethnicity, and family history, which cannot be changed. Among other things, exposure to radiation from bomb blasts, age, gender, race/ethnicity, and occupational hazards are risk factors for multiple myeloma. Problems urinating, hematuria, pelvic pain, erectile dysfunction, bone pain (particularly in the spine, hips, and ribs), exhaustion, and inadvertent weight loss are some of the symptoms associated with prostate cancer. Hypercalcemia, nausea, constipation, and renal dysfunction, which can be caused by light chain nephropathy or hypercalcemia, are symptoms that are linked to multiple myeloma. A patient with MM may also have anemia symptoms, such as weariness and pallor, which could be brought on by bone marrow infiltration.

Cancer survival is arguably the most commonly used metric to assess the impact of many factors, such as timely diagnosis, treatment efficacy, socioeconomic status, and other factors. In recent decades, prostate cancer survival rates have significantly increased, particularly in wealthy nations. When compared to people diagnosed in previous decades, the survival rate for patients with multiple myeloma (MM) has improved over time. Initially, MM was a disease that could not be treated until the early to mid-2000s. The increasing prevalence of prostate cancer and multiple myeloma, especially in groups with established inequities, emphasizes the necessity of ongoing improvements in early detection, tailored treatments, and fair healthcare provision. It is still crucial to raise awareness and provide access to innovative treatments for multiple myeloma. Improving early detection of aggressive forms of prostate cancer while reducing overdiagnosis requires the improvement of screening techniques. Reducing racial and socioeconomic inequalities through community-based interventions and legislative reforms can greatly improve both malignancies' survival rates. According to the review's findings, both types of cancer are public health concerns that have serious effects on patients. Early diagnosis is advised in order to allow for appropriate treatment of the disease and increase patient survival rates.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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