Epidemiological Study of Prostate Cancer and Its Associated Risk Factors

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Abstract
This effort was under taken during the tenure of a postgraduate study by Firew Admasu at Jimma University, Jimma Referral Hospital on the case of prostate cancer while discussing with medical doctors about symptom stages, risk factors, diagnosis, complications and its treatments during visiting a surgery patient and organizing while giving the course of human anatomy and physiology at Dilla University.

Background: *Based on human anatomy and physiology, prostate is a small gland, found only in men, located between penis and bladder, surrounds the urethra and used to produce a thick white fluid that creates semen when mixed with sperm produced by testicles and prostate cancer occurs if abnormal cells develop in the prostate gland to multiply in an uncontrolled mode. Prostate cancer is the most common cancer in men, develops slowly, there may no signs and symptoms appear until prostate become large enough to affect urinary tube and it is a common condition worldwide that have varying incidence and mortality, and it is the third most common cancer in men of developed countries.*

Objectives: *The main objective is to assess epidemiology of prostate cancer and its associated risk, specifically, to identify the major factors that increased chance of developing prostate cancer, to point out the main later stages symptoms, complications, prevention or reduce the risk, detection and diagnosis of prostate cancer.*

Methods: *The assessment of the epidemiological investigations of surveillance and descriptive studies on the distribution and determination of the characteristics of prostate cancer includes major factors, symptoms, complications, preventions, detection and diagnosis methods.*

Results: *The major factors strongly associated to increased chance of developing prostate cancer includes increasing age, positive family history (genetics), nutrition (obesity) and lifestyle. The later stages symptoms and complications include sudden need to urinate but difficulty with discomfort to urinate, bloody urine or semen, and dysfunction of erectile muscle. The risk of prostate cancer can be prevented or reduced by feeding a healthy diet, nutrition, doing physical exercise, and keeping our weight a healthy and it can be detected and diagnosed by a blood test and/or physical examination test and biopsy. In addition, different types of treatment choices at the early-stage of prostate cancer are advisable such as active surveillance, surgery, and radiation therapy are the standard therapy and difficulty to control urine may be happen after surgery due to splitting of sphincter muscle and erectile dysfunction. Therefore, this study and intervention efforts in the region should be focused on understanding its prevention methods, later stages symptoms, differences in treatment, stage at diagnosis, and early detection by socioeconomic status.*

Keywords: Epidemiological Study, Prostate Cancer, Prostate Gland, Risk Factors

Introduction
The world experts of prostate cancer (2018) reviewed information indicates that prostate cancer is the most common cancer in men, usually develops slowly, there may no signs for many years, no symptoms appear until the prostate is large enough to affect urinary tube. According to Ravi J Kumar, et al., (2005), prostate cancer is a common condition worldwide and different geographical regions have varying incidence and mortality, the sixth most common cancer, and the third most common cancer in men of developed countries [1]. The chances of developing prostate cancer is increased by African-American ethnicity, increasing age, positive family history, and other factors such as diet. There is no single test for prostate cancer and all tests used to help diagnose the condition have benefits and risks. However, National Cancer Institute (2011) explained different types of the most commonly used treatment choices for men at the early-stage of prostate cancer such as active surveillance, surgery, and radiation therapy are the standard therapy with their benefits and risks. In addition, those experts of prostate cancer also reported (2018) the information about the treatment options including blood

test, called a prostate-specific antigen (PSA) test, measures the level of PSA and may help detect early prostate cancer.

As information of different researchers indicates that death rates due to prostate cancer diminished in the 1990s due to a decrease in advanced cases with distant metastasis. About 9.7% of cancers in men are due to prostate cancer; in developed parts of the world it increases to 15.3% and in the developing world it only accounts for 4.3% [2]. In the US, the most commonly diagnosed cancer in men is prostate cancer and it is the second most common cause of death after lung cancer. The American Cancer Society (2004) estimates that by the end of 2004 about 230,110 new cases of prostate cancer will be diagnosed in the United State [3]. One in six men will be diagnosed with prostate cancer, and one in 32 will die of prostate cancer. It is estimated that 29,900 men in the United State will die secondary to prostate cancer in 2004. Incidence of prostate cancer is highest in the US, Canada, and Scandinivia, and lowest in China and Asian countries [4]. This variation could be due to different genetic predisposition, differences in diet, variation in quality of healthcare, and deficiencies in cancer registration; or due to multiple factors as mentioned above. Prostate cancer is a disease related to older age, as it is very infrequent below the age of 40 but very common above 65. It is estimated that by 2030, with an increase in the proportion of people over 65 to from 12.4% to 19.6%, the number of prostate cancer cases will quadruple [5].

According to GLOBOCAN (2012), an estimated 1.1 million new cases and 307,000 death were reported in 2012. Prostate cancer is the most common malignancy among males worldwide, and the second leading cause of cancer death among men in United State. WHO (2019), Epidemiology is the study of the distribution and determination of health related states including diseases, and the application of this study to control diseases and other health problems. There are various methods used to carry out epidemiological investigations such as surveillance and descriptive studies can be used to study distribution; and analytical studies used to study determinants. Prostate cancer is now recognized as one of the most important medical problems facing the males. In Europe, prostate cancer is the most common solid neoplasm, with an incidence rate of 214 cases per 1000 men, outnumbering lung and colorectal cancer [6]. Moreover, prostate cancer is currently the second most common cause of cancer death in men [7]. In addition, since 1985, there has been a slight increase in most countries in the number of deaths from prostate cancer, even in countries or regions where prostate cancer is not common [4]. Prostate cancer affects elderly men more often than young men and it is therefore a bigger health concern in developed countries with their greater proportion of elderly men. Thus, about 15% of male cancers are prostate cancer in developed countries compared to 4% of male cancers in developing countries and so that it is significance mentioning that there are large regional differences in incidence rates of prostate cancer [2]. Example, in Sweden, where there is a long life expectancy and mortality from smoking-related diseases is relatively modest, prostate cancer is the most common malignancy in males, accounting for 37% of all new cases of cancer in 2004 [8].

In general, anatomically, it is clear that only men have a small size prostate gland that situated below the bladder surrounds the urethra and prostate cancer occurs when abnormal cells develop in the prostate to multiply in an uncontrolled way. There may no symptom in the early stages however, later stages symptoms of prostate cancer includes sudden need to urinate but difficulty with discomfort to urinate, bloody urine or semen, lower back and upper hips pain, and dysfunction of erectile muscle, etc and if any of this symptom experience is better to discuss with doctor. The major factors that are most strongly linked to an increased chance of developing prostate cancer that mainly observed includes age, family history, race, genetics, diet, obesity and lifestyle. Complications of prostate cancer include cancer that spreads, incontinence, erectile dysfunction. There are various methods used to prevent or reduce the risk of prostate cancer by feeding a healthy diet, nutrition, doing physical exercise, and keeping a healthy weight. Prostate cancer can be detected and diagnosed by a blood test and/or physical examination using prostate specific antigen (PSA) test, digital rectal examination (DRE) and biopsy to check the health of the prostate. Therefore, this study and intervention efforts in the region should be focused on understanding the major factors that increase the chance of developing prostate cancer, the later stages symptoms and complications, the risk prevented or reducing methods and also detection and diagnoses methods of prostate cancer and early detection by socioeconomic status.

Epidemiology of prostate Cancer
Prostate cancer is the most common tumor among males worldwide, and the second leading cause of cancer death among men in United State and it is the most common cancer in elderly males (> 70 years of age) in Europe. It is a major health concern, especially in developed countries with their greater proportion of elderly men in the general population. The incidence is highest in Northern and Western Europe (> 200 per 100,000), while rates in Eastern and Southern Europe have showed a continuous increase [9]. There is still a survival difference between men diagnosed in Eastern Europe and those in the rest of Europe [10]. Overall, during the last decade, the 5-year relative survival percentages for prostate cancer steadily increased from 73.4% in 1999-2001 to 83.4% in 2005-2007 [10]. With the expected increase in the life expectancy of men and in the incidence of prostate cancer, the disease's economic burden in Europe is also expected to increase substantially. It is estimated that the total economic costs of prostate cancer in Europe exceed €8.43 billion with a high proportion of the costs of prostate cancer care occurring in the first year after diagnosis [11]. In European countries with available data (UK, Germany, France, Italy, Spain, the Netherlands), this amounted to €106.7-179.0 million for all prostate cancer patients diagnosed in 2006.

The frequency of incident and autopsy detected cancers is roughly the same in different parts of the world. This finding is in sharp contrast to the incidence of clinical prostate cancer, which differs widely between different geographical areas, being high in the USA and northern Europe and low in South-East Asia. However, if Japanese men move from Japan to Hawaii, their risk of prostate cancer increases. If they move to California their risk increases even more, approaching that of American men [12]. Factors such as the foods consumed, the pattern of sexual behavior, alcohol consumption, exposure to ultraviolet radiation, chronic inflammation and occupational exposure have being aetiologically important [13,14]. Prostate cancer may be an ideal candidate for exogenous preventive measures, such as dietary and pharmacological prevention, are due to specific features of high prevalence, long latency, endocrine dependency, availability of serum markers (PSA) and the histological precursor lesion prostatic intraepithelial neoplasia [13].

Based on experts of prostate cancer (2018) information indicates that the causes of prostate cancer are largely unknown. However, certain things can increase your risk of developing the condition. The chances of developing prostate cancer increase as you get older and in most cases develop in men aged 50 or older. For reasons not yet understood, prostate cancer is more common in men of African-Caribbean or African descent, and less common in Asian men. Recent research suggests that men whose father or brother were affected by prostate cancer are at slightly increased risk themselves and obesity increases the risk of prostate cancer. Therefore, the major factors that increase the chance of prostate cancer including anatomy of prostate gland; the main symptoms and complications; the risk reduced or prevention methods; detection, diagnoses and treatment methods of prostate cancer are explained briefly as follows.

The major factors that increase the chance of prostate cancer
There are a number of factors that increase the chance of prostate cancer, the major factors that are most strongly linked to an increased chance of developing prostate cancer that mainly observed includes age, family history, race, genetics, diet, obesity and lifestyle. The anatomy of prostate gland and the main factors of the prostate cancer are explained as follows.

Anatomy of human prostate gland and prostate cancer
It is obvious that only men have a prostate and it is a small gland that sits below the bladder near the rectum. It surrounds the urethra, the passage in the penis through which urine and semen pass as indicated in figure 1. The prostate gland is part of the male reproductive system. It produces most of the fluid that makes up semen that enriches sperm. The prostate needs the male hormone testosterone to grow and develop. The prostate is often described as being the size of a walnut and it is normal for it to grow as men age. Sometimes this can cause problems, such as difficulty urinating. These problems are common in older men and not always symptoms or signs of cancer (WPC, 2014). It's not clear what causes prostate cancer but mutations in the abnormal cells' DNA cause the cells to grow and divide more rapidly than normal cells do and the abnormal cells continue living, when other cells would die and finally the accumulating abnormal cells form a tumor that can grow to invade nearby tissue. Some abnormal cells can also break off and metastasize (spread) to other parts of the body. Prostate cancer occurs when abnormal cells develop in the prostate. These abnormal cells can continue to multiply in an uncontrolled way and sometimes spread outside the prostate into nearby or distant parts of the body. Prostate cancer is generally a slow growing disease and the majority of men with low rating prostate cancer live for many years without symptoms and without it spreading and becoming life threatening. However, high-grade disease spreads quickly and can be lethal. Therefore, appropriate management is key to reduce prostate cancer [15].
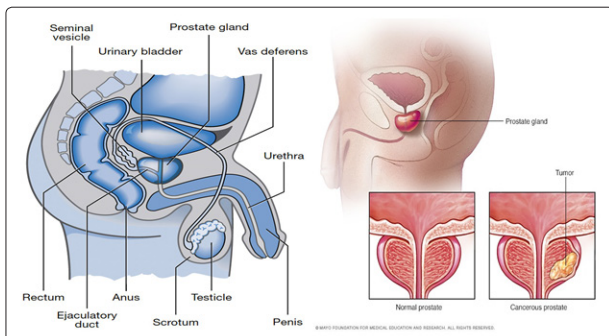
The main risk factors of prostate cancer
Factors that are most strongly linked to an increased chance of developing prostate cancer includes age, family history/genetics, race, diets/obesity, life style, etc. According to experts of prostate cancer (2018), age is one of the main risk factor to increase the chance of developing prostate cancer. Prostate cancer is an age-dependent disease, which means the chance of developing it increases with age. The risk of getting prostate cancer by the age of 75 is 1 in 7 men. By the age of 85, this increases to 1 in 5. Your risk of prostate cancer increases as you age. Other than skin cancer, prostate cancer is the most common cancer in American men. The American Cancer Society's estimates for prostate cancer in the United States for 2019 are about 174,650 new cases of prostate cancer, about 31,620 deaths from prostate cancer. The risk of prostate cancer is about 1 man in 9 will be diagnosed with prostate cancer during his lifetime. Prostate cancer develops mainly in older men and in African-American men. About 6 cases in 10 are diagnosed in men aged 65 or older, and it is rare before age 40. The average age at the time of diagnosis is about 66. Deaths from prostate cancer data indicates that prostate cancer is the second leading cause of cancer death in American men, behind lung cancer. About 1 man in 41 will die of prostate cancer. Prostate cancer can be a serious disease, but most men diagnosed with prostate. In fact, more than 2.9 million men in the United States who have been diagnosed with prostate cancer at some point are still alive today [16].

Based on the family history, if you have a first-degree male relative with prostate cancer, you have a higher chance of developing it than men with no such history. The risk increases again if more than one male relative has prostate cancer. Risks are also higher for men whose male relatives were diagnosed when young. Race information indicates that even if reasons not yet determined, black men carry a greater risk of prostate cancer than do men of other races. In black men, prostate cancer is also more likely to be aggressive or advanced. According to genetics, genes are found in every cell of the body. They control the way the cells in the body grow and behave. Every person has a set of many thousands of genes inherited from both parents. Changes to genes can increase the risk of prostate cancer being passed from parent to child. Although prostate cancer can't be inherited, a man can inherit genes that can increase the risk. There is some evidence of diet to suggest that eating a lot of processed meat or food that is high in fat can increase the risk of developing prostate cancer. Obesity is the other factor that increase the chance of developing cancer, and obese men diagnosed with prostate cancer may be more likely to have advanced disease that's more difficult to treat. There is evidence to show that environment and lifestyle can affect the risk of developing prostate cancer. Basically, there are three well-established risk factors that determine the risk of developing for prostate cancer such as increasing age; ethnic origin; and heredity. If one first-line relative has prostate cancer, the risk is at least doubled. If two or more first-line relatives are affected, the risk increases by 5-11 fold [17,18]. A small subpopulation of men with prostate cancer about 9% have true hereditary prostate cancer which is defined as three or more affected relatives, or at least two relatives who have developed early-onset disease before age of 55 and patients with hereditary prostate cancer usually have an onset six to seven years earlier than spontaneous cases, but do not differ in other ways [17].

A number of studies have been suggested that a genetic role in prostate cancer on case control, cohort studies, twin studies, and

family-based studies. An analysis of different case control and cohort studies places an odds risk ratio of 2:5 for familial prostate cancer, and the risk is higher if a brother has prostate cancer compared with the father [19]. Identification of a heritable genetic basis is done by several methods, one of which is a family-based segregation analysis studies point to an autosomal dominant gene, which is rare with a frequency of 0.003 to 0.006 and a high penetrance of 88% to 97% [20]. Twin studies are better placed than family-based segregation studies in identifying genetic bases of disease registries from Scandinavian countries have shown a concordance rate of 21.1% for monozygotic twins compared with 6.4% for dizygotic twins [21]. A definition of hereditary prostate cancer includes cases occurring in the family at less than 55 years old, a case occurring in three successive generations on paternal or maternal side, and three cases occurring in a nuclear family [22]. Linkage studies from the US and Sweden have pointed to a hereditary prostate cancer gene (HPC) 1 on the long arm of chromosome one [23]. In these families, prostate cancer occurred in up to five relatives and occurred in at least two generations, and cases occurred at a lower age range than usual [24]. Later, multiple families with prostate cancer were analyzed and genetic linkage to HPC 1 was found in only 6% of families [25].

Epidemiological evidence on a growing body suggests a positive link between obesity and the incidence of mortality from prostate cancer, particularly in aggressive cases [26-28]. Obesity may promote the development and progression of prostate cancer by several mechanisms, including increased levels of insulin-like growth factor 1, sex hormones, and adipokines [26]. Obesity is also associated with inflammation that maybe involved in the development of prostate cancer [27]. The worldwide variation in the incidence of prostate cancer coincides with variations in dietary patterns [29]. Some ecological studies have correlated a diet typical of industrialized countries with a high use of saturated fats, fatty meats, and dairy products are with prostate cancer [30]. In industrialized countries, the incidence of prostate cancer is the highest in the world and the diet is high in animal fat (30-40% calories from fat), whereas, in Asian countries, the incidence of prostate cancer is low and the diet is rich in soya proteins and low in animal fats [29].

The main symptoms and complications of prostate cancer
The result of different researchers such as Ray and David, (2014) and American Cancer Society, (2019) indicates that there may no symptom in the early stages however, later stages symptoms of prostate cancer includes sudden need to urinate but difficulty with discomfort to urinate, bloody urine or semen, lower back and upper hips pain, and dysfunction of erectile muscle, etc and complications of prostate cancer include cancer that spreads, incontinence, erectile dysfunction. The main symptoms and complications of prostate cancer are explained as follows.

The main symptoms of prostate cancer
There are a number of early and later stages symptoms of prostate cancer. In the early stages, there may be no symptoms but, in the later developed stages, some symptoms of prostate cancer might includes feeling the frequent need to urinate, finding it difficult to urinate (for example, trouble starting to urinate when there is feeling or poor urine flow) especially at night, discomfort when urinating, finding blood in urine or semen, pain in the lower back, upper thighs or hips, and getting erectile dysfunction. These symptoms may not mean you have prostate cancer, but if you experience any of them, but better to see by doctor because of most of these problems are

more likely to be caused by something other than prostate cancer, example, trouble urinating is much more often caused by benign prostatic hyperplasia (BPH), a non-cancerous growth of the prostate [15,16].

Complications of prostate cancer
The main complications and treatments of prostate cancer are metastasizes, incontinence and erectile dysfunction. According to American Cancer Society, (2019), and complications of prostate cancer including spreading of nearby organs, cause urinary incontinence and erectile dysfunction [15,16]. Spreading of cancer also called metastasizes is prostate cancer can spread to nearby organs, such as your bladder, or travel through your bloodstream or lymphatic system to your bones or other organs. Prostate cancer that spreads to the bones can cause pain and broken bones. Once prostate cancer has spread to other areas of the body, it may still respond to treatment and may be controlled, but it's unlikely to be cured. Both prostate cancer and its treatment can cause urinary incontinence. Treatment for incontinence depends on the type you have, how severe it is and the likelihood it will improve over time. Treatment options may include medications, catheters and surgery. Erectile dysfunction can result from prostate cancer or its treatment, including surgery, radiation or hormone treatments. Medications, vacuum devices that assist in achieving erection and surgery are available to treat erectile dysfunction.

The risk prevented or reduced methods of prostate cancer
There is no evidence that the following protective factors can stop prostate cancer from developing, but they can improve your overall health and possibly reduce the risk of prostate cancer. According to Ray and David, (2014), the risk of prostate cancer can be reduce using the following methods, such as choosing a healthy diet full of fruits and vegetables, healthy foods over supplements, physical exercise, maintain a healthy weight and also talking to doctor about increased risk of prostate cancer. In broad sense, avoid high-fat foods and instead focus on choosing a variety of fruits, vegetables and whole grains. Fruits and vegetables contain many vitamins and nutrients that can contribute to maintain healthy body. Whether you can prevent prostate cancer through diet has yet to be conclusively proved, but eating a healthy diet with a variety of fruits and vegetables can improve your overall health and eating meals that are nutritious and what is good for the heart is good for the prostate. There is some evidence to show that physical activity and regular exercise can be protective factors for cancer by doing exercise at least 30 minutes per day. Physical exercise improves overall health, helps to maintain body weight and improves mood and some evidence indicates that men who don't exercise have higher PSA levels, while men who exercise may have a lower risk of prostate cancer. Men with a high risk of prostate cancer may consider medications or other treatments to reduce their risk and also some studies suggest that taking 5-alpha reductase inhibitors, including finasteride (Propecia, Proscar) and dutasteride (Avodart), may reduce the overall risk of developing prostate cancer. These drugs are used to control prostate gland enlargement and hair loss in men. However, some evidence indicates that men taking these medications may have an increased risk of getting a more serious form of prostate cancer (high-grade prostate cancer [15].

Detection, diagnoses and treatment methods of prostate cancer
Based on experts of prostate cancer (2018) information, there is no single test for prostate cancer, so that all the tests used to help

diagnose the condition have benefits and risks that the prostate cancer patient discuss with doctor. However, the most commonly used tests for prostate cancer are blood tests, digital rectal examination (DRE), an MRI scan and a biopsy. In addition, those experts of prostate cancer also reported (2018) the information about the treatment options including blood test, called a prostate-specific antigen (PSA) test, measures the level of PSA and may help detect early prostate cancer, surgically removing the prostate, radiotherapy either on its own or alongside hormone therapy, Some cases are only diagnosed at a later stage, when the cancer has spread. If the cancer spreads to other parts of the body and can't be cured, then treatment is focused on prolonging life and relieving symptoms.

Detection methods of prostate cancer

According to experts of prostate cancer (2018), a doctor will usually do a blood test and/or physical examination to check the health of the prostate. Blood test of prostate specific antigen (PSA) test result shows whether there is an increase in this specific protein and depending on the result, you might need further investigation by a specialist. However, a high PSA test result does not necessarily mean cancer. Because, prostate diseases other than cancer can also cause a higher than normal PSA level. Digital Rectal Examination (DRE) is a detection method of prostate cancer, because of where the prostate is located, the doctor inserts a gloved, lubricated finger into the rectum to check the size of the prostate and assess if there are any abnormalities. A normal DRE result does not rule out prostate cancer [31,32].

Anatomically, most prostate cancers are located in the marginal zone of the prostate gland and may be detected by digital rectal examination (DRE) when the volume is greater or equal to 0.2 mL. Abnormal DRE is associated with an increased risk of higher score and is an indication for biopsy [33,34]. The measurement of Prostate-specific antigen (PSA) level revolutionized the diagnosis of prostate cancer and it is a kallikrein-like serine protease produced almost exclusively by the epithelial cells of the prostate, and it is organ specific but not cancer-specific. Thus, serum levels may be elevated in the presence of benign prostatic hypertrophy (BPH), prostatitis and other non-malignant conditions. The level of PSA as an independent variable is a better predictor of cancer than suspicious findings on DRE or TRUS [35].

Diagnosis methods of prostate cancer

Based on the result of detection, if your tests show you may be at risk of prostate cancer, the next step is a biopsy. A biopsy is the only way a firm diagnosis of prostate cancer can be made and a urologist removes small samples of tissue from your prostate, using very thin, hollow needles guided by an ultrasound. The prostate is either accessed through the rectum or the perineum, which is the area between the anus and the scrotum. A biopsy is usually done as an outpatient procedure and the doctor will likely advise a course of antibiotics afterwards to reduce the chance of infection. The tissue is sent to a pathologist to identify whether the cells are malignant or benign. Definitive diagnosis depends on histopathological verification of adenocarcinoma in prostate biopsy cores or specimens from trans rectal ultrasonography (TURP) or prostatectomy for benign prostatic enlargement (BPE). Prostate biopsy such as baseline biopsy, repeat biopsy after previously negative biopsy, saturation biopsy, sampling sites and number of cores, diagnostic transurethral resection of the prostate, seminal vesicle biopsy, transition zone biopsy, antibiotics prior to biopsy, local anesthesia prior to biopsy, fine-needle aspiration

biopsy and biopsy complications [31,32].

Treatments of prostate cancer

National Cancer Institute (2011) explained different types of treatment choices for men at the early-stage of prostate cancer such as active surveillance, surgery, and radiation therapy are the standard therapy with their benefits and risks.

Active Surveillance is closely watching for any sign that the cancer may be growing or changing with frequently visiting by doctor and tests, such as DRE, PSA tests, and biopsies before deciding on a treatment right away. If these tests show that prostate cancer is growing or changing in any way, the doctor will offer radiation therapy or surgery to treat the cancer. Active surveillance can be used for men with early-stage prostate cancer because the cancer often grows so slowly that it may not cause problems during a man's lifetime. For some men, active surveillance may be a way to avoid the side effects and costs of treatment without shortening their life [36].

Surgery is a treatment choice for men with early-stage prostate cancer who are in good health. There are different types of surgery for prostate cancer, including open prostatectomy, laparoscopic surgery and perineal prostatectomy [36].

- ➢ **Open prostatectomy surgery** also called retro pubic prostatectomy is the removal of the prostate through a single long cut made in the abdomen from a point below the navel to just above the pubic bone and any one might also check nearby lymph nodes for cancer and such kind of surgery can be used for nerve-sparing surgery. Nerve-sparing surgery lessens the chances that the nerves near the prostate will be harmed and so the function of nerves control erections and normal bladder is affected.
- ➢ **Laparoscopic surgery** is a type of surgery that the doctor uses a laparoscope to see and remove the prostate. A laparoscope is a long slender tube with a light and camera on the end and surgery is done through 4 to 6 small cuts in the navel and the abdomen, instead of a single long cut in the abdomen. The laparoscope is inserted through one of the cuts, and surgery tools are inserted through the others and this type of surgery can also be used for nerve sparing surgery [36].
- ➢ **Perineal prostatectomy** is another type of surgery that the doctor removes the prostate through an incision between the scrotum and anus. In this method, the surgeon is not able to check the lymph nodes for cancer and nerve-sparing surgery is more difficult to do and so, this type of surgery is not used very often [36].

Radiation Therapy is a type of treatment uses high doses of radiation energy to treat cancer. Radiation therapy is a good choice for many men with early-stage prostate cancer. It is also the best treatment for older men or those who have other health problems. There are external beam and internal types of radiation therapy. External beam radiation therapy is a machine aims radiation at cancer and moves around the body, sending radiation from many directions to the exact location of prostate used to treat prostate cancer and such treatment implement once a day, 5 days a week, for 6 to 9 weeks and each treatment session lasts about 15 minutes. Internal radiation therapy such as Brachytherapy places radioactive material inside the prostate and it is a choice for men with low-risk prostate cancer. There are two major types of brachytherapy used

for prostate cancer, low-dose rate (LDR) and high-dose rate (HDR). LDR brachytherapy by placing low-dose sources of radiation, or small seed implants, throughout the prostate and HDR brachytherapy by placing tiny catheters throughout the prostate in the hospital radiation clinic for the entire course of treatment [36].

Management of prostate cancer disease

According to Hayes, et al., (2013), many men with localized prostate cancer will not benefit from definitive treatment, and ~45% of men with PSA detected prostate cancer are candidates for deferred management [37,38]. In men with co morbidity and limited life expectancy, treatment of localized prostate cancer may be deferred to avoid loss of quality of life. There are two distinct strategies for conservative management that aim to reduce overtreatment: active surveillance and watchful waiting. Active surveillance also called 'active monitoring' is the new term for the conservative management of prostate cancer and the patient followed up under close surveillance and treated at pre-defined thresholds that categorize sequence which aims to accomplish exact timing for healing treatment [39]. Patients remain under close surveillance, and treatment is indicative of potentially life-threatening disease, while considering individual life expectancy. Watchful waiting also called deferred or symptom-guided treatment and refers to conservative management, until the development of local or systemic progression imminent disease-related complaints. Patients are then treated palliatively with TURP or other procedures for urinary tract obstruction, and hormonal therapy or radiotherapy for palliation of metastatic lesions without standardized follow-up.

Conclusion and future directions
Conclusion

In conclusion, prostate gland is found only in men have a small size gland that situated underneath the bladder which surrounds the urethra and prostate cancer occurs when abnormal cells develop in the prostate to multiply in an uncontrolled way. There may no symptom in the early stages however, later stages symptoms of prostate cancer includes sudden need to urinate but discomfort to urinate, bloody urine or semen, lower back and upper hips pain, and dysfunction of erectile muscle, etc. There are various complications of prostate cancer includes spreading of cancer, urinary incontinence and erectile dysfunction and also methods used to reduce the risk of prostate cancer including feeding a healthy diet, nutrition, doing physical exercise, and keeping a healthy weight and can be detected and diagnosed with blood test, prostate specific antigen (PSA) test, digital rectal examination (DRE) and biopsy. The major factors that strongly associated to increase the chance of developing prostate cancer includes age, family history, race, genetics, diet, obesity and lifestyle. In addition to age, family history/genetics, race, several factors have been studied on prostate cancer, therefore, a man who eat a lot of red meat or high-fat dairy products appear to have a slightly higher chance of getting prostate cancer, smoking have small increased the risk of dying by prostate cancer, chemicals increase the risk of prostate cancer, sexually transmitted infections and vasectomy also have a slightly increased the risk for prostate cancer.

Future Directions

Since prostate cancer is the most common worldwide cancer in men, which develops slowly, without signs and symptoms appear until prostate become large to affect urinary tube with varying incidence and mortality, the following future directions are important to reduce or prevent the main factors which increase the risk of prostate cancer.

Several factors have been studied on prostate cancer, therefore, hereditary factors are important in determining the risk of developing prostate cancer, while exogenous factors may have an important impact on the risk of progression but lack of insufficient evidence to recommend lifestyle changes to reduced intake of animal fat and an increased intake of fruit, cereals and vegetables in order to decrease the risk. Most studies have not found a link between smoking and getting prostate cancer but some research has linked smoking to a possible small increased the risk of dying from prostate cancer, but this finding needs to be confirmed by other studies. There is some evidence that firefighters can be exposed to chemicals that may increase their risk of prostate cancer and some studies have suggested that inflammation of the prostate gland may be linked to an increased risk of prostate cancer, but other studies have not found such a link. Researchers have looked to see if sexually transmitted infections might increase the risk of prostate cancer, because they can lead to inflammation of the prostate. Some studies have suggested that men who have had a vasectomy have a slightly increased risk for prostate cancer, but other studies have not found this.

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