

## Prostate Cancer Management in the UK and Other European Countries: A Systematic Review

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### Authors' contributions

*This work was carried out in collaboration between all authors. Author GBI designed the study, wrote protocol, and wrote the first draft of the manuscript. Author ONT managed the literature searches and analysis of the literatures. Author MID appraised and critically revised the manuscript. All Authors read and approved the final manuscript.*

### Article Information

DOI: 10.9734/JCTI/2016/22461

#### Editor(s):

(1) William CS Cho, Queen Elizabeth Hospital, Hong Kong.

#### Reviewers:

(1) Onur Erol, Antalya Training and Research Hospital, Antalya, Turkey.

(2) Sandra Aparecida Marinho, State University of Paraíba, Brazil.

(3) Vincenzo Ravo, National Cancer Institute Fondazione Pascale Napoli, Italy.

Complete Peer review History: <http://sciencedomain.org/review-history/12480>

**Systematic Review Article**

**Received 2<sup>nd</sup> October 2015**  
**Accepted 12<sup>th</sup> November 2015**  
**Published 27<sup>th</sup> November 2015**

### ABSTRACT

Prostate cancer is a growing health problem among men with new cases being diagnosed each day. At the point of diagnosis symptoms might not be obvious but with the progression of the disease it becomes clear. The diagnosis of prostate cancer put men through a lot of psychological trauma. Several studies have shown that there no consensus on the best approach to the treatment and management of prostate cancer. The aim of this study is to elicit the effectiveness of the available treatment options for prostate cancer. A computer based literature search was conducted through Science Direct, CINAHL, Medline, Cochrane library, Embase, Psyc article, Google Scholar and library services of University of Sunderland. Out of the 1350 studies that emerged from the search, a total of 10 research studies which met the inclusion criteria were

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selected and analyzed systematically. The result of this review highlighted several treatment options such as radical prostatectomy, radiotherapy, hormonal therapy, the use of chemotherapy and watchful waiting. The following available treatment options have their various side effects. Radical approach was found to be the most commonly used form of treatment. However, it does not form a gold standard with side effects such as bowel problem, urinary and sexual dysfunction. Considering the implications of the available treatment options, healthcare professionals have a responsibility in making sure that the patient and their family is aware of these side effects to enable them make informed choice. It is recommended that after the diagnosis of prostate cancer, patients should be actively monitored until there is progression before a radical approach will be adopted and this is only necessary for men with life expectancy of more than ten years.

*Keywords: Prostate cancer; diagnosis; treatment options; UK; European countries.*

## 1. INTRODUCTION

Prostate cancer is a growing public health problem. It is the most common cancer among men with its implications on socioeconomic life of individuals and society at large [1]. It has assumed the highest incidence among other cancers which occurs in men [2]. Prostate Cancer UK [3] estimated that over 40,000 diagnosis of prostate cancer are made in the UK every year and 250,000 men are currently living with prostate cancer. There is a progression in incidence as men gets older with an average age of 68 [4]. Its development might be quite slow, so may not have an immediate effect on men's health. Only rare cases have been recorded with men less than 50 years while the rest about (75%) occur among those aged 65 and above [5, 6]. Cancer Research UK [7] found the incidence of prostate cancer among 55-59 years to be 155 per 100,000, those 65-69 years, 510 per 100,000 and 75-79 years group, 751 per 100,000 and this shows a geometrical progression as men get older. The increase in longevity as a result of improved medical services has left us with increase in aging population and consequently will produce a rise in the incidence of prostate cancer [8].

Evidence showed that prostate cancer occurs most in the western world and least in Asian [9]. Turner and Drudge-Coates [10] emphasized that the causes of prostate cancer is yet to be fully understood. However, it is clear that testosterone (male hormone) has a role to play in its development. Reid and Hamdy [11] noted that this is because prostate cancer has not been recorded among men who have been castrated before puberty. Family history could also be a risk factor [6]. Men with family history of prostate cancer have a higher risk of developing the problem. An understanding of the risk factors will be very critical in developing a timely intervention

with the aim of preventing or managing cases of prostate cancer. Studies have indicated that the risk of developing prostate cancer is more among black men followed by the Caucasians [12]. Afro-Caribbean men living in the western world show higher incidence rate when compared to those of them living in Africa. It could be that black men show Prostate Specific Antigen (PSA) earlier and show disease symptom later but this evidence is ambiguous [6]. Other evidence suggests that prostate cancer growth may be more rapid in black men or that the cancer changes aggressively in black men earlier [13]. This low rate reported maybe due to poor record keeping or documentation of incidence and access to healthcare system [6,14]. This variation could be explained by the fact that most men in Africa might not live up to the age at which prostate cancer is prevalent as a result of other ailments [6]. The assumptions behind these findings are quite unclear but it is clear that diet, genetic and biological difference between ethnic groups have an association to the cause. Heidenreich et al. [12] identified sexual behavior, alcohol consumption, diet high in fat and occupational exposure as key cause but emphasized that prostate cancer is under investigated. Being overweight could also be implicated as one of the risk factor for prostate cancer [15].

### 1.1 Justification of the Study

Several studies exist on prostate cancer which has recorded treatment and management approaches with several arguments on what works and what does not [16-19]. The focus of this research is to critically evaluate the available evidence with the aim of suggesting best practice to the management of prostate cancer. I believe that with a clear understanding of the best practice on prostate cancer management, healthcare practitioners will be able to provide a

service that is comprehensive and above all helpful.

## 1.2 Aim

The aim of the research is to conduct a systematic review, evaluating the effectiveness of the available management strategies of prostate cancer.

## 1.3 Review Question

Are the current practices for the managements of prostate cancer effective in improving the quality of life for men living with cancer of the prostate?

## 1.4 Objectives

- To identify Randomized Control Trials (RCTs), case trials and primary research on the recent management of Prostate Cancer.
- To assess the quality of these studies and analyze them.
- To present a concise report on the literature search and make some recommendations for future purposes.

## 2. LITERATURE REVIEW

The prostate gland is found around the neck of the urethra and bladder and has a shape of a walnut in size [10]. It is partially glandular and muscular having a duct which opens into the urethra. It is made up of three zones; the central, peripheral and transitional. Cancer of the glandular epithelium (adenocarcinomas) often occurs at the peripheral zone of the prostate gland [7,20]. The function of prostate gland is primarily the secretion of alkaline fluid which is a component of the ejaculate with its core function in enhancing the motility and nourishment of the sperm cells [10].

There are several types of prostate cancer but the most common is the acinar adenocarcinomas [7]. About 90% of all diagnosis is the acinar adenocarcinomas [21]. Others include ductal adenocarcinoma, transitional cell cancer, squamous cell cancer, carcinoid, small cell cancer, sarcomas and sarcomatoid cancers. Little is known about these types of prostate cancer because they are rarely diagnosed [22]. Most of this cancer grow quite slowly and are less likely to spread thereby causing less death incidence but one particular type which grow

more aggressively in both young and old men known as tiger tumour, if not detected early could lead to death [10].

The presence of prostate cancer can stay undetected for a long time because of its long period of development and this poses a challenge to the effective management of cases [20]. Loveday and Linsley [23] suggested that screening and monitoring of prostate cancer is very critical. It requires a systematic collection and analysis of data to ascertain the risk on men's health. This could offer a clue on how prostate cancer could be effectively prevented or manage.

For many years prostate cancer screening has been an issue of debate. Prostate cancer is usually diagnosed through physical examination, Prostate Specific Antigen test, and biopsy test or by the presence of symptoms [24]. Schröder et al. [25] noted that the use of Prostate Specific Antigen (PSA) test was able to ameliorate the morality by 20% based on the randomized control trial carried out among Europeans [10].

However there was over diagnosis of associated risk. Some of the problems associated with these diagnoses are the issue of consistency with many men receiving false negative and positive results [10]. Based on these findings it appear that there is no consensus that national screening programme adopting PSA test will achieve a generally acceptable balance between the benefit and harm caused by over diagnosis, false positive and negative results [26]. Burford et al [8] indicated that the harm associated with over diagnosis far outweighs the benefit so the need for accurate diagnosis.

According to Walczak and Carducci [27] prostate cancer development is complex and it involves both environmental and genetic factors. Jani [2] established that if prostate cancer is detected at very early stage it will give room for appropriate referrals from the healthcare professionals to available community resources with the aim of improving the experiences and health outcome of the individual.

NICE [28] stated that treatment option for prostate cancer should be decided based on the stage of the disease and patients preference. It is crucial that men are enlightened on the implications of treatment options which could alter their sexual experiences, ejaculation, sexual function fertility, urinary function and

appearance. When men are diagnosed with prostate cancer, usually the typical treatment for localized cancer is radiotherapy or surgery to remove it [29]. Notwithstanding, the benefit of radical treatment could be outweighed among men with several other illnesses and reduced life expectancy because of its side effect and impact on their wellbeing [12].

A multifaceted approach is recommended when caring for men in this condition and a high quality, effective and compassionate care underpinned by good evidence is required to serve as a guide to healthcare professionals. After the diagnosis of a prostate cancer, treatment option to be selected is very crucial because it has the capacity to significantly impact on the individual's physical and psychological wellbeing and even his family. This impact on health vary from men to men, it could be physically, socially and emotionally. The need for arriving at a consensus on effective treatment options, interventions and modalities for management of prostate cancer cannot be underestimated and this should be based on proven evidences [30].

## 2.1 Radical Prostatectomy

The best approach to the management of prostate cancer in men has remained controversial [17]. Majority of death which occurs among men with prostate cancer are usually of different causes apart from for prostate cancer itself. Findings from a list of post-mortem procedures conducted in men who died with prostate cancer diagnosis showed that most of the prostate cancer did not actually develop to clinical disease and that these men died of a different cause [16,31]. The severity of prostate cancer could range from non-fatal, asymptomatic, slow growing tumour which might not call for concern to an aggressive tumour (metastatic stage) which shows all the symptoms [30]. The important issue to deal with here is whether the use of radical prostatectomy for men at early stage of localized prostate cancer produces better outcome than a conservative approach. Though there has being a rise in the use of radical treatment for the management of prostate cancer but a comparative evidence on its effectiveness and cost efficiency is lacking [30].

All available treatment of prostate cancer has its associated risks involved [6]. Though radical treatment is intended to provide cure, they could

have very deleterious impact on the health and wellbeing of the patients [30]. Example of such impacts include: pain, hospitalization, sexual dysfunction, incontinence and sometimes death. The wound discomfort which results from the surgical procedure can easily be managed using painkillers but the urine incontinence takes a little while before it is corrected [32].

Crawford [33] noted that because of the slow growing nature of prostate cancer, patients might suffer all the risk associated with radical treatment without the possibility of getting any benefit. Donovan et al. [30] noted that the risk of progression is imminent with conservative treatment but that majority of the cases might not be deadly. Their suggestion was that more attention should be paid to early detection of prostate cancer cases through effective screening of the Prostate Surface Antigen (PSA). But at point of detection of prostate cancer the choice of treatment always becomes an issue to deal with [7].

It is generally acceptable that those who have less than 10years life expectancy, poor general health, overweight or with breathing problems or cardiovascular illness might be better off considering other approaches [12,34]. There is no clear evidence on treatment approach for younger men [10]. Evidence has shown that the surgical removal of the prostate gland could enhance the survival rate in men with localized cancer when compared with radiation [32]. Wilt et al. [16] noted in their study that radical surgical removal of the prostate did not reduce the rate of mortality in men when compared with watchful waiting.

Though radical prostatectomy might be very effective, the present medical conditions of the patient must be considered. Those who have less than 10 years life expectancy, poor general health, overweight or with breathing problems or cardiovascular illness might be better off considering other approaches [12,34]. Droz et al. [4] emphasized that the health and wellbeing of the man diagnosed with prostate cancer is very crucial to the decision of treatment option. A more conservative approach is the best practice [12]. Han et al. [35] noted that radical prostatectomy is the preferred treatment for greater population of men. Droz et al. [4] emphasized that the choice of treatment has to depend on the oncological benefits, minimal risk of complications and high probability that a good functional result will be obtained especially with

incontinence and erectile function. Several approaches to prostatectomy exist and they include the robotic, retro pubic, perineal and laparoscopic [18].

## 2.2 Hormonal Approach

The prostate gland is a hormone responsive organ [36]. Therefore, interventions which either reduce testosterone or block the actions of the hormone can delay the need for treatment. Hormonal therapy tends to reduce the androgen levels specifically the testosterone, this invariable delivers a short term control for prostate cancer [37]. Hormonal therapy functions with the goal of preventing the testosterone from reaching the cancer thereby making it to shrink. The use of ADT appears very effective in that it helps to reduce intraprostatic Dihydrotestosterone by 80% which invariably results in the reduction in the androgen receptor stimulation and increased apoptosis in prostate cancer [20,38].

According to the Messing et al. [39], an immediate hormonal therapy appears very effective for men with metastatic prostate cancer treatment when compared to delayed approach. Even though orchiectomy appears as a gold standard for the treatment of prostate cancer in advanced stage, men will prefer to be treated with chemotherapy rather than orchiectomy because of its irreversibility [40]. The risk associated with delayed hormonal therapy for men are very enormous [6]. Research advocates that hormonal approach be introduced at the early stage before there is manifestation of symptoms suggestive of symptomatic progression. Bolla et al. [41] revealed that in men advanced localized prostate cancer, luteinizing hormone-releasing hormone (LHRH)-agonist therapy ordinarily began with therapy and continued for three years proved very effective in the improving the rate of survival when compared with delaying hormone therapy until the progressive stage of the disease. These findings gave ground to the use of hormonal therapy; it is now an acceptable practice to continue hormonal treatment for about three years after the treatment of prostate cancer with radiotherapy [42]. According to Payne and Mason [43] androgen deprivation therapy has played a critical role in the earlier stages of prostate cancer in two major ways; both as a single therapy and a combination therapy with radical radiotherapy and radical prostatectomy.

Bilateral orchiectomy work in such a way that it reduces testosterone levels which results in improvement of pain and other symptoms. Alva and Hussain [37] recommended bilateral orchiectomy as a standard approach for achieving gonadal testosterone deprivation. Kirby and Patel [20] noted that orchiectomy is very effective in reducing prostate surface antigen levels and ameliorate the bone pain to about 75% in men. The major impact associated with orchiectomy is the psychological trauma linked to loss of reproductive prowess and this disadvantage may far outweigh its benefits which could lead to many men and their partners deciding for the analogue intervention like the reversible non-surgical LHRH [6]. In those men whose cancer has spread to the bone this option might be the best approach because they might be experiencing bone pain. Kirby and Patel [20] referred to it as tumour flare and it could affect 8-32% of men and this could be averted by administering anti androgen few weeks prior to the LHRH analogues treatment commencement. When this type of complication results it is referred as Hormone refractory or androgen independent disease. A different form of ADT should be applied with the view of improving survival rate or chemotherapy if the cancer is not responding to treatment. Amid of these side effects, some men prefer an intermittent approach to treatment. This means stopping the hormonal therapy when the prostate specific antigen level has dropped significantly and starting the treatment when it begins to rise again. This is intended to give them some period free of side effects which improve their quality of life consequently.

## 2.3 Chemotherapy

The use chemotherapy in the treatment of prostate cancer is achieved by combination of drugs [2]. It is more of a palliative approach aimed at destroying the cancerous cell or inhibiting their growth. Hormone-refractory disease is one the most critical problem that results in men with prostate cancer and whenever it occurs, the attention of the palliative care specialist and oncologist is required. NICE [44] recommended that chemotherapeutic drugs like docetaxel should be used within the licensed indication for men with hormone-refractory prostate cancer only when they have more than 60% Karnofsky performance-status. Karnofsky performance is a scale used to classify the level of functional impairment in a patient. Heidenreich et al. [12] noted that the actual time for the

initiation of treatment has remained controversial. Originally, cytotoxic treatment is always reserved for the last stage but recently it's been advocated that docetaxel should be administered before oestrogens [10]. This appears to have a greater positive improvement in health status and the use of aggressive treatment with oestrogen diethylstilbestrol only comes to play once there is a progression in the disease after cytotoxic treatment [45].

Sartor [46] noted that the use of docetaxel has shown to have the capacity to improve the survival and quality of life of men with prostate cancer. NICE [47] explained that the use of bisphosphonates does not have any positive effect on the complications associated with the metastasis in hormone refractory prostate cancer. Bone metastasis interrupts the metabolism in the bone and could lead to huge morbidity, including pathological fracture, spinal cord compression and bone pain [48]. This results in deterioration of the quality of life of the patient. The use of bisphosphate in men with hormonal refractory prostate cancer is intended to serve as a pain reliever when other treatments have failed and for palliative care. Moreover NICE [28] noted that it should be administered based on tolerance and convenience. Meanwhile this exposes the patients to the risk of osteoporosis, so they are given bisphosphonate therapy annually [49]. Bisphosphonate has its contraindications, it could hinder the renal function and can cause osteonecrosis of the jaw, hence the need for effective monitoring of patients case and need to obtain informed consent before such treatment [50].

## 2.4 Radiotherapy

The use of radiotherapy assumes a significant role in the management of localized advanced prostate cancer [18]. It is intended to destroy or delay the growth of the cancerous cell in men with prostate cancer. The typical treatment requires a daily visit of about 8 weeks but it is not with its own complications like gastrointestinal or urinary problems linked with the extreme toxicity of the radiation and tiredness or fatigue [1]. There could also be some erectile dysfunction and secondary malignancy induced by the use of radiation [51]. The indications for the use of radiotherapy could include neuropathic bone pain, uncomplicated bone pain, spinal cord compression and pathological fracture [52].

Turner and Drudge-Coates [10] was of the opinion that radiotherapy is more suitable for

men with localized and locally advanced prostate cancer. Another study by Heidenreich et al. [12] suggests that a combination approach is very effective, that is the administration of androgen deprivation therapy about two months before the commencement of radiotherapy and continued until regimen is completed. Among men with high risk of radiotherapy is often continued [35]. Turner and Drudge-Coates [10] explained that in men with hormone-refractory prostate cancer, radiotherapy has revealed to have extensive relief for bone metastases. Radiotherapy appears more of a palliative care approach [18].

Another essential way of delivering radiotherapy is by the use of external beam radiotherapy (EBRT) [53]. The high energy photon is the most commonly used while the protons or neutrons are the less commonly used. They have theoretical benefit in terms of the radiobiological and dosimetrical point of view in the management of prostate cancer [18]. Kirby and Patel [20] argued that the use of external beam radiotherapy as having up to 80% rapid improvement in pain among men. The treatment could be administered over 6-7 weeks. According to Jani et al. [53] the theoretical advantage has not translate to better outcome and this may be due to the inability to measure or calibrate the actual doses of the particle beam. Radiotherapy has its own side effects, so the choice of treatment option should consider the health and wellbeing of the patient and such tailor it to suit their immediate needs. Radiotherapy must be considered in terms of its advantages in the treatment of prostate cancer. In particular the risk involved in its administration like erectile dysfunction urinary symptoms and rectal symptoms must be weighed against its benefits and other available treatment options.

## 2.5 Brachytherapy

Brachytherapy is basically the delivery of radioactive sources directly to the prostate and it could be performed either using a low dose rate source, or high dose rate sources [54]. It is usually offered to men with a reduced risk of prostate cancer if there are no signs and symptoms of lower urinary tract problem. Brachytherapy has some established advantages for the early stage of the disease based on the fact that the dose distribution is conformal to the prostate [2]. This means that the doses delivered will have lower toxicity on the rectal and sexual organ. This therapy involves direct implantation of the radionuclide in the tumour. It appears effective but lacks availability

of evidence on the long term of free biochemical occurrence. Radiation can be used as a single therapy or in combination with high dose external beam radiation for localized prostate cancer. Acute urinary symptoms persist in about 20% of men after brachytherapy [10]. Other complications like prostatitis and erectile dysfunction could continue for long time [12].

## **2.6 Cryotherapy**

The use of cryotherapy approach was intended to reduce the growth of the cancerous cells by freezing [3]. There has been scanty evidence on the long term benefit of the use of cryotherapy for the treatment of localized prostate cancer and the 5 years free biochemical occurrence status appear very substandard to other approaches [12]. NICE [55] emphasized that cryotherapy should not be used for patients with localized prostate cancer. This is because long term effectiveness evidence is not available though it shows good control of the cancerous cell in short term [56].

## **2.7 Watchful Waiting**

The stage of prostate cancer disease is crucial in deciding the effective treatment approach [57]. Watchful waiting is an example of management option for prostate cancer. This entails not offering treatment after diagnosis of prostate cancer until the patient starts to manifest the signs and symptoms of the localized or metastatic stage of the disease. During watchful waiting, the patients are monitored usually by examination and checking the prostate specific antigen (PSA) level at intervals and based on the outcomes further decisions concerning the appropriate interventions are made depending on the patients' medical conditions and the rate at which the disease is progressing. Majority of the prostate cancer diagnosis are found among men who are over 70 years and they may probably have less than 10 years of life expectancy. Evidence has shown that the rate of prostate cancer progression is usually between 10 and 20% progression within the first 10 years of the disease diagnosis [58]. Watchful waiting is built on the premise that patients might have or develop several other medical conditions which may result in their death instead of the prostate cancer itself as such helping avert the morbidity which is associated with the proper treatment of prostate cancer. Moreover, evidence exists to support the idea that there was no reduction in the mortality associated with the radical

prostatectomy when compared to conservative patient treatment [59].

Few evidences showed that conservative management may not be acceptable to some patients and not as harmless as it is has been once viewed [59,60]. For an effective decision to be made on the choice of treatment it is very important to understand the stage of the prostate cancer and base all the treatments on these facts. Differentiation of prostate cancer based on grade appears to be critical in choosing treatment option. The idea behind conservative treatment is not yet well defined. Dall'Era et al [58] were of the opinion that watchful waiting should be reserved for older men with prostate cancer.

## **3. METHODOLOGY**

### **3.1 Search Strategy**

A computer based literature was carried out via Science Direct, CINAHL, MEDLINE, Psyc ARTICLES, Google Scholar, Athens, Springer Link, Embase and Cochrane Library for relevant publications. The following key words were used for the search; "prostate cancer", "treatment", "management", "screening", "testing", "prevalence", "incidence" and "testing". The search was limited to studies published in English language from 2002 to 2014 and must be from the UK or European country. The references of the original articles were also screened for potentially relevant studies. The abstract for the selected studies were screened to identify potential article which met the inclusion criteria. For those articles full text versions were retrieved to determine whether they met the inclusion criteria. Articles included in this review were articles with focus on intervention towards prevention and treatment of prostate cancer, clinical outcomes, and healthcare professional's approach, self-management and the life experiences of men with prostate cancer. Clinical outcome measures for various treatment and management approaches were considered. Included here are randomized controlled trials and studies that looked at life experiences of men with prostate cancer.

Out of 1350 articles got from the initial search, 1233 were excluded due to lack of focus on the topic, 53 based on year of publication, 26 based on the location of the study, 15 based on the language of publication, 5 based on lack of

quality while 8 could not be retrieved (see Fig. 1). The remaining 10 studies were used for this systematic review.

### 3.2 Assessment of Methodological Quality

The assessment of the quality of the studies carried out to ascertain the methodological paucities using the research appraisal framework as described by [61]. This looked at the method, sampling approach, and analytical processes adopted in the research to find the rigor or bias. A total of 10 journals which met the criteria for this review were selected and critically appraised using the research framework, data were extracted from these ten journals and represented in a tabular form (see Appendix 1). Hulley et al. [62] explained that the methodological design for a research such as randomization and blinding of controlled trials influences the research strength. The influence on primary studies might not be clear when compared to a systematic review. The use of research appraisal framework helped the researcher to assess overall strength and weakness of the study based on the quality of the method.

## 4. RESULTS

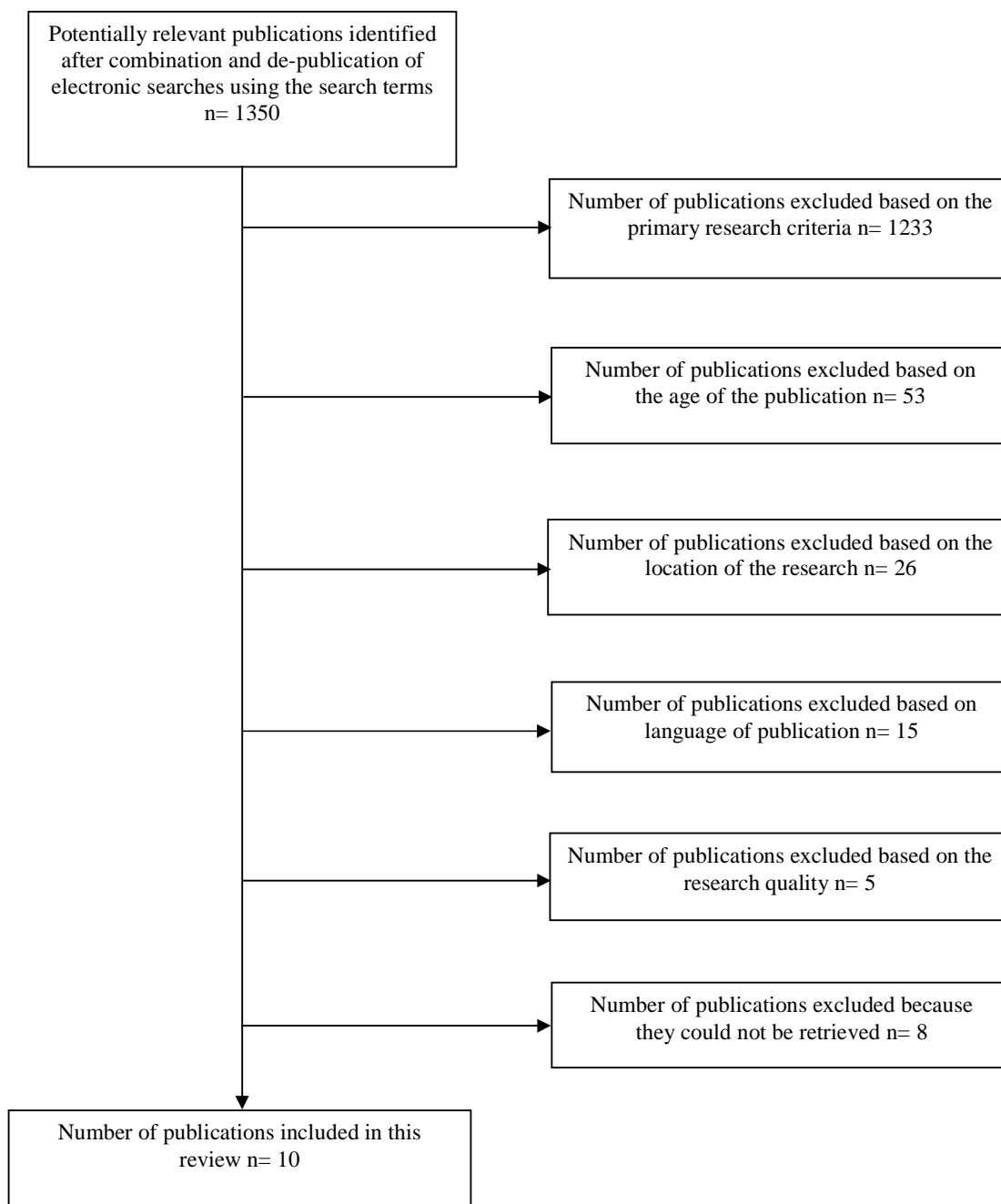
Some of the studies reviewed were randomized control trial [17,31,57,59,63,64] others used a mixture of qualitative and quantitative approach [17], while two of the studies were exploratory studies which aimed at understanding the patients satisfaction with choice of treatment [19,30]. MacDougall et al. [18] was a case trial as such the use of fewer sample. Non-randomized studies were included because only few RCTs highlighted the major treatment approaches. The view presented in these studies showed variance in the level of effectiveness. Three of these studies compared radical prostatectomy with watchful waiting while one with observation. One of the studies focused on radiotherapy and compared two different approaches, the rapid arch and cyber knife approach. The sample sizes selected for the RCTs were appropriate and thorough unlike the exploratory studies and case trial. However the intention of this review was not to produce generalizable findings but to explore the different factors which could impede the effective patient care delivery which is very vital in promoting health and wellbeing among this group and in informing future practice.

In a study carried out by Wilt et al. [59] 731 patients who were medically fit for radical prostatectomy and clinically confirmed localized tumour (Stage T1 – T2 NxMO) randomly assigned to treatment. 364 men were assigned for radical prostatectomy while 367 to observation. These patients also had the PSA less than 50 ng/ml (Mean 10.1), diagnosed within 12 months, aged 75 and below (mean 67 years) and at least 10 years life expectancy. 33% were black, 25% scored 7 and above on Gleason histological scale, 85% were self-caring and 66% had tumours. Radical prostatectomy was found to be linked with reduced death rate among men with PSA higher than 10nmg/ml and among those with higher risk of tumour. When tested for significance, radical prostatectomy did not show a significant reduction in the prostate cancer related death when compared with observation even after 12 years follow up. The difference recorded was less than 3%. Their findings were similar to that of Holmberg et al. [64].

Holmberg et al. [64] carried out their study with 695 men with stage T1, T1c or T2 cancer Gleason grade 4 and was randomly assigned to radical prostatectomy and watchful waiting. These group were followed up for a median of 6.2 years, 53 deaths was recorded for those assigned to radical prostatectomy while 62 for those assigned to watchful waiting ( $p = 0.31$ ). The result showed that there was no significant difference between those assigned to radical prostatectomy and watchful waiting in terms of overall survival but conversely radical prostatectomy brought about significant reduction in the disease related death.

The study by Steineck et al. [31] was carried out in Sweden with 376 men with localized prostate cancer randomly assigned to radical prostatectomy and watchful waiting. In converse from other studies, the outcome was measure based on the influence on wellbeing for such individuals. After 4 years of follow up, the result revealed that each of these interventions has their associated risks like erectile dysfunction, urinary leakage, urinary obstruction, bowel problem, prevalence of anxiety and depression, influence on wellbeing and quality of life. Both watchful waiting and radical prostatectomy has varying risk and the choice of which one to go for has little or no effect on the wellbeing and overall quality of life on the individual.





**Fig. 1. Summary of study screening processes**

Contrary to these findings, Bill-Axelsson [63] reported that radical prostatectomy was associated with reduction in the death rate unlike the watchful waiting. This study is an RCT carried out with 695 men; cancers stage T1b, T1 or T2, average PSA level of 13ng/ml and mean age 65 years. 347 were assigned to radical prostatectomy and 166 died while 348 were

assigned to watchful waiting and 201 died after an average of 12.8 years follow up. 15 men needed to be treated in order to avert one death and 7 for men below the age of 65. The use of biopsy as a mean of diagnosis impacted this study by lowering the sensitivity level for diagnosing high risk cancer the extensive protocol. This finding is in line with a recent study

by Bill-Axelson et al. [57]. The argument might be that the other studies which reported no significance were not powered enough to detect the difference [59,64].

In another study, Donovan et al [30] carried out a RCT on the treatment of prostate cancer using a sample size of 8505 men aged between 50-69 years in the UK, a total of 7383 were diagnosed using PSA test level and 3ng/ml was the cut off. The findings were not conclusive because their diagnosis was achieved using different parameter and the randomization was not total. This invariably will affect the overall outcome of the study and a longer follow up duration should be applied to enable it highlight the intricacies and presumed benefit.

Lane et al. [17], in their study evaluated prostate cancer treatment and screening using 550 men within the age of 50–69 years. This study also evaluated the psychological impact of prostate cancer screening revealed that 10% of the men experiences distress following prostate cancer biopsies, though a smaller proportion of them. This research was focused on white population and as such lack generalizability to black community in the UK.

Templeton and Coates [65] carried out a randomized trial to evaluate the impact of health education among men undergoing hormonal therapy. About 41.8% of these men aged 71-80 years, from social class II (non-manual), 69.1% are married. The analysis of the findings using independent t-test revealed no significant difference with age, marriage, or social class. The t-test on the knowledge of prostate cancer disease prior to the intervention after showed some significance and for treatment available for prostate cancer also showed significance. Though the sample size was small and only simple randomization was used the result showed that health education around prostate cancer for men with the disease is very crucial.

MacDougall et al. [18] in a comparative study carried between using two different approaches from radiotherapy (Rapidarc and Cyberknife) to assess effectiveness found that the mean planning and delivery time for Cyberknife was 39 minutes while Rapidarc was 3 minutes. Though the two approaches did not show significance in terms of the dosimetric advantage but Rapidarc showed possible benefit based on the planning and delivery time. The shortfall of these approaches is that they have negative effects on

the adjacent organs which pose a potential error. In addition, the sample size was very small and the intervention was not randomized. Therefore the findings could said to be inconclusive and as such not generalizable.

Bourke et al. [19] study was a randomized trial using 12 men with prostate cancer (stage T3–T4) undergoing androgen suppression therapy. A lifestyle intervention was implemented for 12 weeks and data were collected using a qualitative focus group meeting. The findings showed that lifestyle intervention were very beneficial but not well appreciated. There was no information on their diagnosis, the preferences of participants were not considered because some has reduced functionality, selection was purposive and very small sample size was used and this affected the quality and generalizability though it provided insight which might need further exploration.

## 5. DISCUSSION

All choices of treatment for prostate cancer have side effects [57,59,63]. They include urinary obstruction, bowel problems, sexual dysfunction and this primarily occurs after treatment. The frequency of occurrence and duration for the correction of the side effects or its severity differs with treatment options and from one individual to another. In comparative studies between radical prostatectomy and watchful waiting, majority of the research findings supported the idea that it is more effective than watchful waiting [57,63,66]. This study was in contradiction of the findings of [31] who noted that there was no significant difference in the rate of survival. This group of patients was followed between 6 -12 years. One of the important issue which was noted was that the use of PSA testing and grading system for prostate cancer were not quite well developed at the time of the study [31].

Against this back drop, it has been suggested by several studies that though radical prostatectomy is usually the first option that comes to mind when thinking of treatment, there is need to weigh the impact of the option on the overall health and wellbeing of individuals before deciding on the option [2,67,68]. Holmberg et al [64] noted that management of prostate cancer appears a bit more controversial. Despite the implications of radical prostatectomy, it has been widely used but it does not make it a standard treatment approach for everyone. It is therefore very difficult to establish a comparative standard

for assessing effectiveness of treatment [6]. The fact that some of the patient might be at different stages of the disease and individual characteristics could affect the manifestation of signs and symptoms and also treatment outcome [32].

Steineck et al. [31] explained that men after being diagnosed with prostate cancer might go through psychologically problems due to the knowledge that they have the condition even without the manifestation of the symptoms. Treatment of early stage of prostate cancer after detection with PSA testing is usually controversial [10]. According to [7] there is high tendency of being diagnosed of prostate cancer but very little of the population (17%) actually dying from it. Majority of deaths which occur among people who has been diagnosed of prostate cancer are usually due to comorbidity [17]. Watchful waiting might be more beneficial to people who have lower life expectancy. During this period of watchful waiting an active monitoring and regular screening should be observed to monitor the rate of the disease progression. Steineck et al. [31] suggested that treatment should be deferred at the early stage of prostate cancer until the manifestation of symptoms. However radical prostatectomy could be applied as it progresses probably with Androgen suppression therapy [19] and radiotherapy [68].

Each of the treatment option has their side effects. The intention of radical treatment was to provide a potential cure for prostate cancer but they could have deleterious impact on the patient's health and wellbeing like pain, long term hospitalization, incontinence, impotence and probably death. Wilt et al [59] was of the opinion that if there is low risk of dying from prostate cancer, there is a clear indication that conservative management could be crucial for men as suggested by Thompson et al. [67]. The justification is that patients might possibly go through the pain involved in the treatment without any tangible benefit but with conservative approach this risk is reduced [30].

A clear approach suggested here is that men should ensure early or prompt diagnosis of prostate cancer cases and nurses should be integral part of this to help in talking them through the complex patient journey, the significant changes they will witness and the overall impact on their health and wellbeing. They should be informed of the available

services and links which could support them and their families through this process. Critically, patient should be made aware of the side effects of the available treatment options with the aim of empowering them to make appropriate decisions with a clear knowledge of the implications on their health, sexual and psychological wellbeing. After diagnosis a more conservative approach should be applied until proper manifestation of symptoms. For those with lower life expectancy the use of palliative approaches like cytotoxic drugs, hormonal therapy and radiotherapy should be applied.

### 5.1 Implication for Practice

Prostate cancer is a growing public health issue among men, with the increase in diagnosis rate [7]. This has been brought about by the increased level of awareness and acceptance of Prostate Specific Antigen (PSA) test for prostate cancer. The need for effective management has become very important [22]. Several approaches exist for the treatment of prostate cancer but based on research findings; prostatectomy, watchful waiting and radiotherapy is a generally acceptable approach to the treatment of prostate cancer in men. It is advisable that for men 75 years and above who have low level of PSA should be monitored and managed without any radical treatment [57,59]. It is believed that in men with less than 10 years life expectancy, the side effects associated with treatment options available do not worth taking the risk considering they might die of any other health problem apart from prostate cancer. Moreover, evidence has shown that with conservative management the disease progression can be termed within 10 - 25% in the next 10 Years [63,69].

Patients with longer life expectancy will be treated with the intention to cure. Relatively younger patients with a localized prostate cancer should be offered a radical prostatectomy while for older patient with some existing medical conditions or reduced quality of life radiotherapy could be a better option [1]. These available treatment options do have any unique advantage over the other. It is critical that the patient is aware of the implications of available treatment option and its impact on their quality of life before making their final decision.

For advance stage of prostate cancer, hormonal therapy should be more appropriate [70]. It could be offered with different modification or in combination with other therapy. It is important to

make it clear that hormonal therapy does not cure prostate cancer but provides palliation for advanced stage [29]. As the disease progresses hormonal refractory cancer develops and this deadly form of the disease remains resilient to management options available.

## 6. CONCLUSION

Prostate cancer is a growing problem with increasing rate of diagnosis each year among aging population of men and its cause is hormonal related [69]. Its diagnosis does not entail the manifestation of signs and symptoms, that might take a long time for it to show and the rate of progression differs between individuals. Several treatment approaches exist for the management of prostate cancer. They include; radical prostatectomy, radiotherapy, chemotherapy, brachytherapy, hormonal therapy and watchful waiting. Radical prostatectomy is a very effective approach for especially men with longevity above 10 years and should be discouraged for men with co-morbidities which will reduce the chances of survival. The treatment of prostate cancer and metastatic disease is usually done using androgen ablation [18]. This is seen as a valuable way of treating the case, but it is just for a short period of time because the disease usually advances to a stage where androgen deprivation therapy could not control the cancer any more. It becomes very difficult to manage when it advances to become hormone refractory and at this point, management approach applied is usually for palliation by means of cytotoxic drugs or radiation. The use of chemotherapy has proven to be effective prolong life, reducing pain and improving the quality of life of men with hormone refractory condition with benefits in terms of palliation. For palliative care, docetaxel is the drug of choice and radiotherapy should also be continued. All the treatment options available for the management of prostate cancer have a significant side effect on the quality of life. So a good understanding of these by healthcare professionals especially nurses will help to enhance the patient's experiences of treatment and a management of the side effects. Every decision concerning treatment options should be patient centered, healthcare professional should tailor it to individual needs and nurses should provide opportunity for patients and their families to discuss the significant changes and the implications of treatment options available right from the point of diagnosis before final decision making.

## CONSENT

It is not applicable.

## ETHICAL APPROVAL

It is not applicable.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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## APPENDIX 1

## Summary of the studies characteristics

S/N	Authors	Location	Participants	Research methods	Intervention	Aim	Intention to treat	Follow up period	Outcome	Outcome measure	Limitation	Strength	Implication for practice
1	MacDougall et al. (2014)	UK	6	Case trial	Rapid Arch Vs cyberknife	Radiotherapy-Rapidarch vs cyberknife an evaluation	Yes	NR	There is no discernible benefit over each other. Rapidarch showed reduce exposure time which could also be seen as an advantage	Planning Target volume PTV	Longer treatment time resulted in dosimetric consequences	Small sample size affects the generalizability	Reduced exposure time could reduce the associated risk
2	Lane et al. (2010)	UK	550	RCT/clinical Trial	Treatment vs Screening	An evaluation of PSA screening vs treatment	Yes	6years	PSA - High acceptability and anxiety while treatment-less anxiety	Prostate lung, colorectal and ovarian screening method PLCO	lack of generalizability to non - white ethnic group because < 10% was represented/<50yrs was included	Cluster randomization enhanced geographical representation/ reduced contamination	Need for counselling for men with prostate cancer
3	Templeton and Coates (2004)	UK	55	RCT	Exp = 28, Control Group = 27	to evaluate education intervention for men undergoing hormonal therapy	NA	NR	Positive impact on knowledge, quality of life and satisfaction with care	Impact on quality of life and satisfaction	Small sample size	Internal validity is questionable due to lack of blinding	Education intervention should be provided to men with prostate cancer
4	Donovan et al. (2003)	UK	15,151	RCT/In-depth interview		An evaluation of PC treatment	Yes	6 years	PSA- high anxiety and low depression	Hospital anxiety and depression scale/ICS male (urinary symptom)	process of consenting appears coercive and unethical	Use of qualitative approach added some credibility to the findings	Need further studies to confirm effectiveness
5	Bourke et al. 2012	UK	12	Focus Group	NA	An evaluation of lifestyle intervention undergoing AST	NA	6 Months	Benefits of lifestyle intervention are not well appreciated	Benefits of lifestyle intervention are not well appreciated	Lack of randomization	It provided insight into patients feeling of the intervention	Strategies for the implementation of lifestyle changes need to be evaluated



S/N	Authors	Location	Participants	Research methods	Intervention	Aim	Intention to treat	Follow up period	Outcome	Outcome measure	Limitation	Strength	Implication for practice
6	wilt et al. 2012		731	RCT	RP =364, observation = 367	Effectiveness of RP vs observation	Yes	12 years	RP = no significant	mortality rate reduction	underrepresentation of categories	Randomised design an completeness of follow up	Treatment choice should consider lifespan
7	Bill-Axelson et al. 2011	Scandinavian	695	RCT	RP = 347 +ADT, WW= 348	Rapid Prostatectomy Vs Watchful Waiting	Yes	12.8 years	RP gave a reduced mortality and risk of metastases	Mortality rate	Interpretation was based on quantitative estimate	Randomised design, blindness & independent evaluation of the cause of death	Men with extra - capsular tumour may benefit from adjuvant local or systemic treatment
8	Steineck et al. 2002	Sweden	376	RCT	RP = 189, WW = 187	RP Vs Watchful waiting	Yes	8 years	No significant difference was observed	Quality of life	no blinding, unadjusted relative risk	Randomised design and completeness of follow up	Choice of treatment has its own risks so patient should be involved in it
9	Holmberg et al. 2002	Sweden, Finland & Iceland	698	RCT	RP = 347, WW= 348	RP vs Watchful waiting	Yes	6.2 years	Radical prostatectomy showed reduced mortality	Mortality rate	Trial was initiated before the era of PSA testing	Randomised design and completeness of follow up	there is need for information on alternative therapy
10	Bill-Axelson et al. 2005	Scandinavian	699	RCT	RP = 347, WW= 349	RP vs Watchful waiting	Yes	10 years	Radical prostatectomy reduced mortality and risk of metastases	Mortality rate	lack of generalizability to western population	Randomised design and completeness of follow up	there is need for information on alternative therapy

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