



# The Association Between Quality of Life and the Level of Vitamin D in Benign Prostate Hyperplasia

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## SUMMARY

**Introduction:** Epidemiological studies have suggested an association between vitamin D deficiency and benign prostatic hyperplasia (BPH). The prevalence of vitamin D deficiency in the male population with urological symptoms suggests a relationship between BPH and vitamin D.

**Methods:** This paper will present information from relevant professional/scientific sources regarding the correlation of vitamin D levels with symptom intensity and quality of life of patients with BPH, as well as patient education and health care.

**Topic:** The incidence of BPH is increasing with age to such an extent that it is unusual to find a histologically normal prostate in a man over 70 years of age, thus raising a question whether it should be considered an abnormality at all. From the beginning, the disease was classified as „the agony of the aged man” because benign gland enlargement carries a significant risk of morbidity due to urinary flow obstruction. Due to the long course of benign prostate hyperplasia, which significantly affects the quality of life and quality of sleep, the mental pressure in patients increases, resulting from both physical and mental pain. Therefore, the priority is to focus on medical measures which would improve the quality of life of elderly patients with BPH.

**Conclusion:** After reviewing the literature, we came to the conclusion that the level of vitamin D is responsible for the quality of life of patients with benign prostatic hyperplasia. Health care integration emphasizes the integration of existing resources within the overall health policy planning, and professionally trained medical staff provides medical treatment, rehabilitation, home care, psychological counseling and hospital care for elderly patients with chronic diseases and semi-disabled, disabled and oncological patients.

**Keywords:** Benign Prostatic Hyperplasia, Quality of Life, Vitamin D

## INTRODUCTION

Benign prostatic hyperplasia (BPH) is actually only a histological diagnosis without apparent clinical significance, it only becomes a clinical entity when it is associated with disturbing lower urinary tract symptoms (LUTS), significant prostate enlargement and/or bladder outlet obstruction. Of all men older than 40 years,

about 50% will develop histological hyperplasia in an age-dependent manner, of these 30% to 50% will have disturbing lower urinary tract symptoms LUTS, which can also be caused by some other conditions, some will develop a significant enlargement of the prostate, some will develop bladder outlet obstruction which

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can also be a consequence of another cause [1]. Symptoms of the lower urinary tract can be mild, moderate and severe, which can significantly worsen the quality of life (QoL) in patients with BPH [2]. LUTS includes voiding symptoms (hesitation, intermittent, slow stream, interruption or splashing, straining, terminal dribbling) and storage symptoms (nocturia, urgency, increased frequency, urinary incontinence). These symptoms can interfere with daily activities and have a significant negative impact on the quality of life of patients and their partners [3]. The International Prostate Symptom Score (IPSS) is a validated questionnaire for the assessment of LUTS consisting of eight questions, seven of which are related to urinary symptoms (including slow urinary stream, double stream or splashing of urinary stream, intermittent urinary stream, hesitancy, straining to void and terminal dribbling) or bladder storage symptoms (including increased frequency, urgency and incontinence), and the last question is related to quality of life [4]. The study by Dabanović V and colleagues estimates that the average annual consumption of drugs in Montenegro, among the patients with benign prostatic hyperplasia, was 266.63 EUR, with moderate symptoms of BPH 343.26 EUR, i.e. BPH symptoms - 413.51 EUR, patients with AUR - 493.93 EUR and after TURP - 1,013.16 EUR. The projection of the total one-year consumption of medicines in Montenegro would amount to 2,338,008.66 EUR, which would amount to 1.43% of the total funds allocated for the country healthcare system [5]. LUTS associated with BPH is sometimes very severe and undertreated. LUTS / BPH have a major impact on men, their families, health services and society. Men with LUTS secondary to BPH should not simply accept their symptoms as part of aging, but should be encouraged to consult with their doctors if they experience bothersome symptoms [6].

## METHODOLOGY

This paper will present information from relevant professional/scientific sources regarding the correlation of vitamin D levels with symptom intensity and quality of life of patients with BPH, as well as patient education and health care.

## TOPIC

### Benign prostatic hyperplasia

The presence of BPH in older men is strongly associated with the development of lower urinary tract symptoms [7], the prevalence and incidence rates of BPH/LUTS increase with age and vary with symptom severity [8]. The incidence of BPH is increasing with age to such extent that it is unusual to find a histologically normal prostate in a man over 70 years of age, thus rising a question whether it should be considered an abnormality at all. From the beginning, the disease was classified as „the agony of the aged man” because benign gland enlargement carries a significant risk of morbidity due to urinary flow obstruction. The incidence of BPH at the age of 70 years is about 40-50% in men in the Western world, as estimated by gross enlargement of the gland. For most men, an enlarged prostate causes minor problems with urination. It has been reported that the incidence of BPH is the highest in black men and the lowest in yellow men, also environmental factors and dietary habits affect the risk of developing BPH [9]. In the United Kingdom, France, the Netherlands, Spain, the USA, Germany and Italy, the prevalence of benign prostatic hyperplasia increased in men aged 50-59 from 22% to 45% in men aged 70-80. In a study conducted in Croatia, 78.4% of patients with BPH were older than 60 years, while the average age of the patients was 67 years [10]. Genetics, diet and lifestyle also play an important role. Recent reports indicate a strong association of clinical BPH with metabolic syndrome and erectile dysfunction, as well as a possible role of inflammation as a cause of BPH [11]. The presence of comorbidities, especially diabetes, coronary artery disease, and cerebrovascular insult, has a negative association with LUTS [5]. Lifestyle changes, including exercise and diet, are important strategies in controlling this common disease [11].

In the last decade, epidemiological models of BPH have evolved significantly. Although age and genetics play an important role in the etiology of BPH, recent data have revealed new, modifiable risk factors that present opportunities for treatment and prevention of BPH. These risk factors appear to potentially influence the natural course of BPH during different stages of clinical pro-

gression. Some risk factors associated with BPH and LUTS are modifiable (sex steroid hormones, metabolic syndrome, obesity, diabetes, physical activity, diet and inflammation) while other non-modifiable risk factors are age, race and genetics [12]. In the histopathological sense, BPH is characterized by an increased number of epithelial and stromal cells in the periurethral region of the prostate, so the term hyperplasia is correctly used, in contrast to the previously used term hypertrophy. The exact molecular etiology of this process is not known. It is hypothesized that the reason for the increase in the number of these cells may be due to epithelial and stromal proliferation or impaired programmed cell death, which leads to cell accumulation. The role of other indicators such as androgens, estrogens, stroma-epithelium interaction, growth factors and neurotransmitters is considered [5]. Prostate enlargement in old age can remain without symptoms for a long time, and every man who has an enlarged prostate does not have to suffer from these disorders. In some patients, it takes only a few years from the first symptoms to the stadium with complications, in others it takes a decade, and in some even some kind of regression occurs, a reduction of complaints, easier urination after disturbances that lasted for several years [13]. As the prostate enlarges, it can put pressure on the urethra, which leads to progressive obstruction of the bladder outlet, resulting in a spectrum of manifestations of mild symptoms of the lower urinary tract up to complete retention of urine [14]. BHP goes through several stadiums in its development:

- Stadium I – minor complaints present and the patient can still completely empty his bladder (no residual urine), [13].
- Stage II – symptoms in the second stage are intensified and the patient suffers more. He urinates harder and harder, he strains very hard every time he urinates, urination is more frequent and at night the patient gets up several times, 2 to 3 times and sometimes more often. At the end of urination, he feels that the bladder has not been emptied because the bladder cannot eliminate urine effectively, the residual urine amounts to over 100 ml. Subjective and objective signs are more pronounced, especially obstructive symptoms, [13].
- Stage III – further progression of the disease, very severe complaints, residual urine exceeds 500 ml and even more than one liter [13].

The evolution of BPH is a long-term

process, during which numerous complications can develop [5]. If left untreated, BPH has an advanced course [15]. In some patients with BPH, complications begin early, while in others they do not begin before the stage III [13]. Rapid control of distressing symptoms and improvement of quality of life are primary goals in the treatment of lower urinary tract symptoms suggestive of BPH [15]. Symptoms related to the prostate and lower urinary tract are common and can significantly impair the patient's quality of life. Different manifestations can occur in patients. Potential complications of untreated BPH include acute urinary retention [16]. Acute urinary retention (AUR) is among the most common complications [5]. Acute urinary retention can occur suddenly, in patients who empty their bladder relatively well, or gradually, with progressive deterioration of bladder emptying. Urinary retention is a phenomenon when the patient cannot urinate at all, empty the bladder/empty the bladder completely even though he empties it partially. Urine that remains in the bladder after urination is called residual or residual urine [13]. Benign prostatic hyperplasia is a major cause of lower urinary tract obstruction in male patients, and bladder outlet obstruction (BOO) secondary to BPH can lead to urinary tract infections (UTIs) in men. Complicated urinary tract infection is a symptomatic urinary infection accompanied by functional or structural abnormalities of the genitourinary tract. Screening for the presence of bacteriuria is recommended before any urinary tract manipulation procedure, and imaging of the upper urinary tract is recommended to identify underlying abnormalities [17]. A significant number of patients will also have other complications of BPH. These include hematuria, bladder stones, bladder wall damage, renal dysfunction, incontinence, and erectile dysfunction [18]. Renal failure resulting from long-term obstruction caused by the prostate is a serious complication. Prolonged subvesical obstruction may result in urine reflux, ureterohydronephrosis and compression atrophy of the parenchyma. Neglected patients sometimes come to the doctor because of oliguria and uremia, which are later determined to be the result of subvesical obstruction. Kidney function disorders are sometimes irreversible. Calculus of the bladder is most often caused by a combination of urinary retention in the bladder and urinary infection caused by urea-

splitting bacteria [5]. Early recognition of BPH complications allows for more effective management of these complications. This is especially important for more serious urinary infections, as well as chronic high-grade retention [18].

Establishing a precise diagnosis, or differential diagnosis, in order to discover the cause of LUTS is of key importance. When taking a history of the disease, it is preferable to apply "symptom scores using a questionnaire for assessing the severity of LUTS. [5]. The most commonly used questionnaire is the IPSS (English International Prostate Symptom Score), this questionnaire has become the international standard in the diagnosis of BPH. It originates from the American Association of Urologists, and was first described by Barry and colleagues in the early nineties (Barry MJ I et al., 1992). [15]. The IPSS questionnaire consists of seven questions related to storage symptoms and emptying symptoms, and the eighth question within the IPSS assesses the impact of urinary symptoms on quality of life. Also, this question primarily determines to what extent the patient is able to tolerate his symptoms [15]. This questionnaire can be used as a guide for treatment decisions, to monitor response to treatment, and also as a predictor of outcome [16]. According to the American Agency for Health Care Policy and Research Guidelines (AUA Practice Guidelines Committee, 2003), all patients can be classified into three groups depending on the value of the IPSS score, [15] i.e., using the IPSS, we can describe 3 categories of symptom severity: mild (0-7), moderate (8-19) and severe symptoms (20-35) [16]. A urinalysis should also be done for every patient with BPH. With this analysis, we get information about the presence of any urinary tract infection, proteinuria, hematuria and glycosuria. If the patient's history or clinical picture suggests the possibility of renal dysfunction, or if surgery has been considered, renal function should be assessed by determination of serum urea and creatinine concentrations and glomerular filtration rate [19]. A particularly important step is measuring the concentration of prostate-specific antigen (PSA) [19]. PSA is the recommended test in both European and American guidelines. Therefore, this analysis is mandatory in every patient with BPH, who complain of LUTS or both [16] and to exclude prostate cancer [15]. PSA level, unless influenced by other patholog-

ical processes, correlates with prostate volume and is a strong predictor of prostate growth. However, there is no known direct association between BPH and prostate cancer, and patients with BPH should be informed about the advantages and disadvantages of prostate cancer screening [19]. Wide use of ultrasound diagnostics in urology allows not only to check the morphology of the upper urinary tract (dilation of the pyelocaliceal system; thickening of the bladder wall), but also to estimate the volume of residual urine (physiological: <50 mL) [19].

### Vitamin D (calciferol)

According to the chemical structure, compounds from the vitamin D group belong to sterol group, characterized by an open ring B. The most important are vitamin D2 or ergocalciferol and vitamin D3 or cholecalciferol. Unlike cholecalciferol, ergocalciferol is characterized by the presence of a single methyl group and one more double bond [20]. Vitamin D has a strong effect on increasing the absorption of calcium from the intestinal tract, also has important effects on the deposition and resorption of bones. However, vitamin D itself is not the active substance that actually achieves these effects. Vitamin D must first, through successive reactions in the liver and kidneys, be converted into the final active product, also called 1,25 (OH)2D3 [21].

Among foods of animal origin, rich sources of vitamin D are fish oil, egg yolks, milk, butter, and liver. Vitamin D can be formed from provitamins under the influence of ultraviolet light. Ergocalciferol is produced from the plant sterol ergosterol found in yeast, mushrooms and plants (wheat, alfalfa, peas, spinach, cabbage). Cholecalciferol originates from the provitamin, 7-dehydrocholesterol, found in the skin where it is synthesized from cholesterol by oxidation and introduction of a double bond between C1 and C8 in the B ring. Under the influence of ultraviolet light, photolysis occurs, the splitting of ring B, between C 9 and C 10, and in this way the corresponding vitamins are formed from provitamins. [20]. The active form of vitamin D is 1 $\alpha$ ,25-dehydroxyvitamin D3 (1 $\alpha$ , 25(OH)2D3) [21], which is produced in the kidney by hydroxylation of its precursor, 25-hydroxyvitamin D3 (25(OH)D3), and plays a central role in calcium homeostasis and bone remodeling.

The biological effects of  $1\alpha, 25(\text{OH})_2\text{D}_3$  are mediated by its receptor, the vitamin D receptor (VDR), a member of the nuclear receptor (NRs) superfamily. The VDR gene is located on the human chromosome [22]. Vitamin D shows antitumor effects thanks to the role of a transcription factor that regulates cell growth, differentiation, apoptosis and other cellular mechanisms of cancer development [23].

Deficiency, and optimal values of vitamin D in the blood are defined by the recommendations of the central laboratory of the Clinical Center of Montenegro (KCCG). Thus, a deficiency is indicated by values of vitamin D  $< 30$  nmol/l, insufficient values range from 30 to 50 nmol/l and optimal values of vitamin D are  $> 50$  nmol/l. [24]. During the summer months, exposure to the sun leads to the deposition of vitamin D in adipose tissue and is an important source of vitamin D during the winter. It is considered that exposure to the sun for 5-30 minutes twice a week is enough to deposit a physiological amount of vitamin D in fat tissue. In 2002, Holick established that vitamin D deficiency increases the chance of developing osteoporosis. A higher incidence of cardiovascular disease with increasing latitude was also found, which was also linked to vitamin D [25]. Recommendations for vitamin D supplementation in adults aged up to 65 years are 800 to 2000 IU per day. Substitution is not mandatory for this group of patients if they are exposed to the sun for at least 15 minutes a day (hands and legs) in the period May - September. It is important to emphasize that this recommendation applies to people who do not use UV protection creams. For people 65 to 75 years old, that dose is also 800 to 2000 IU per day, regardless of whether they are exposed to the sun or not. Finally, for people over 75 years of age, the recommended dose is 2000 to 4000 IU per day, also regardless of sun exposure. Mandatory supplementation after the age of 65 is due to the reduced capacity of the skin to synthesize vitamin D in later life [26].

### Vitamin D and benign prostatic hyperplasia

Epidemiological studies have suggested a link between vitamin D deficiency and BPH [27]. The prevalence of vitamin D deficiency in the male population with urological symptoms indicates a link between BPH and vitamin D [28]. VDR is not only expressed in bone, intestine and kidney, but also in numerous ad-

ditional human tissues, including those originating from the urogenital sinus, e.g. prostate or bladder. It has pleiotropic effects that go beyond its traditional role in calcium homeostasis. The non-calcemic action of vitamin D affects the normal and pathological growth of cells in various organs, including the prostate [22]. Results from the Nationwide Health and Nutrition Examination Survey showed in multivariate analysis that vitamin D deficiency is associated with LUTS among US men. The intake of vitamin D supplements and vitamin D analogues has been shown to be associated with a reduction in the prevalence of BPH and a reduction in prostate size [29]. Over the past few decades, VDR gene variants have been widely investigated in several prostate diseases and appear to have an important relationship with disease risk. The activation of the VDR gene can affect the activation of the androgen receptor (AR) leading to the development of BPH and therefore variants of the VDR gene have been investigated in BPH for many decades. Habuchi et al. for the first time assessed the risk of BPH with VDR gene polymorphism and reported a significant association [30]. VDR genotypes are associated with the risk of prostate enlargement in BPH in Japanese men [31]. There was a positive correlation between VDR gene variants and prostate volume [32]. He was also the first to report that VDR genotypes, especially the Tak-I polymorphic variant, were significantly associated with improvement in BPH patients with standard drug therapy [33]. In contrast, others reported no association between VDR gene polymorphisms and BPH risk. Nevertheless, the modification of BPH susceptibility by certain VDR polymorphisms supports the idea that the VDR pathway, and thus vitamin D is likely to modify the risk of BPH [22]. The active hormonal form of vitamin D,  $1\alpha,25$ -dihydroxyvitamin D<sub>3</sub> (calcitriol), plays a key role in cell proliferation and differentiation of normal and malignant cells. VDRs are not only expressed in normal but also in hyperplastic and cancerous prostate [34], therefore calcitriol has potential for therapeutic treatment of BPH and prostate cancer. However, the therapeutic applicability of calcitriol is inadequate due to the additional effects of hypercalcemia and hyperphosphatemia. Therefore, analogues of calcitriol have been developed that retain antiproliferative properties but do not cause unwanted effects of hypercalcemia in vivo [35].



Chronic inflammation is now considered a determinant of BPH, promoting, along with hormonal conditions, prostate overgrowth and lower urinary tract symptoms. Calcitriol can also promote innate immunity and regulate adaptive immune responses, which is potentially useful in the treatment of inflammatory diseases as well as BPH [36].

### Quality of lives

Quality of Life (QoL) has become an important concept and goal of research and practice in the fields of health and medicine. Understanding the quality of life is important for improvement, symptom relief, care and rehabilitation of patients. Problems revealed by patients' self-reported changes in quality of life may lead to modifications and improvements in treatment and care, or may demonstrate that some therapies offer little benefit. QoL is also used to identify the range of problems that may affect patients. This type of information can be passed on to future patients to help them predict and understand the consequences of their disease and its treatment. In addition, cured patients and long-term survivors may have ongoing problems long after treatment ends. These late problems may be overlooked without assessing quality of life. Quality of life is also important for medical decision-making because quality of life is a predictor of treatment success and is therefore of prognostic significance. For example, quality of life has been shown to be a strong predictor of survival. This prognostic ability suggests that there is a need for routine assessment of quality of life in clinical trials [37]. The quality of life referred to as „comprehensive” or „global” is distinguished from the terminologically narrower quality of life related to health (health related quality of life-HRQoL) [5]. Health-related quality of life is a subjective sense of overall well-being and satisfaction with health and is determined by perceptions of physical and mental health (CDC 2000, Ferrans et al. 2005). HRQoL becomes an important fact to consider in the treatment of diseases [38]. Despite the importance of quality of life in healthcare and medicine, there is an ongoing conceptual and methodological debate about the meaning of quality of life and what should be measured [37]. Quality of life is becoming an important consideration in disease management. Previously, disease management focused mainly on physical param-

eters, which are now clearly insufficient to improve the patient's overall quality of life. Also, the impact caused by the disease and the effects of the treatment on the psychological and social aspects of the patient's health should be taken into account. This is particularly relevant for BPH, since one of the main indicators for treatment is the degree of interference of LUTS on the patient's quality of life [38]. As life expectancy has increased significantly, so has interest in health policies, the desire to live free of disease and disability, and efforts to improve health-related quality of life. With age, patients increasingly develop chronic diseases. Benign prostatic hyperplasia is a disease that occurs in men during the aging process. Worsening of lower urinary tract symptoms is known as a common symptom of senium disease in men. Specifically, BPH accounts for nearly 80% of diseases that cause lower urinary tract symptoms, and typically affects 25% of men worldwide. BPH, which usually occurs in men in their 40s and 50s, causes urinary symptoms such as straining, incomplete emptying of the bladder, pain during urination, etc., and acts as a factor in QoL degradation. In addition, if left untreated, it can cause cystitis and renal failure, therefore continuous care is necessary [39]. An individual's health condition can affect his daily life, which also affects his life satisfaction. As BPH progresses, it is often associated with worsening urinary symptoms and the development of long-term complications. With a chronic disease such as BPH, studies have shown that individuals experience emotional and social difficulties in functioning such as anxiety, depression, social isolation and pain, which additionally results in daytime fatigue, reduced vitality, insomnia and increased incidence of infection, all of which negatively impact patients' quality of life [40]. Over the past decade, both generic and disease-specific HRQoL tools have been used to measure HRQoL in men with BPH. Generic HRQoL tools tend to measure overall HRQoL, for example the 12-item Short Form Health Survey (SF-12) and the 36-item Short Form Health Survey (SF-36). It has been criticized that generic HRQoL instruments are not sensitive enough to detect significant changes in men with BPH. Therefore, disease-specific HRQoL instruments have been developed to be sensitive to the specific condition they measure, and the International Prostate Symptom Score (IPSS) is the commonly used tool for

BPH patients [38].

### **The role of the health care specialist in the education and implementation of health care in patients with benign prostatic hyperplasia**

Globally, nurses are the largest component of the health profession [39]. The World Health Organization constantly emphasizes the importance of the contribution of nurses to the health of the population, as the most numerous group of health workers [40]. Continuous improvement of the practice and quality of health care requires faster and greater progress, which must be achieved with rational and controlled costs, the introduction of a modern system for professional training and continuous education [40]. Due to the long course of benign prostate hyperplasia, which significantly affects the quality of life and quality of sleep of the patients, the mental pressure of the patients increases and causes their physical and mental pain. Therefore, the priority is to focus on medical measures which would improve the quality of life of elderly patients with BPH. The integration of medical care emphasizes the integration of existing resources within the overall planning of the government, and professionally trained medical staff provides medical treatment, rehabilitation, life care, psychological counseling and hospital care for elderly patients with chronic diseases and semi-disabled, disabled and oncological patients. The integrated service model is promoted and applied in the treatment of various chronic diseases. Continuum of care within the integrated medical care model can extend hospital care of patients to the community, family after discharge, so that hospital capacity can be better utilized [41]. To date, there are no guidelines for either preventive or curative treatment of benign prostatic hyperplasia. Dietary and nutritional factors may influence the etiology and symptoms of BPH through different mechanisms, but the literature on this topic is scarce. Early interventions with lifestyle changes, dietary modifications or the addition of dietary supplements can limit the progression of this condition, avoid or delay the need for drugs with significant side effects or surgery with associated morbidity [42]. Certainly, as an initial step, certain changes in behavior and dietary modifications are recommended. This includes educating patients about their

condition (emphasizing the frequency of BPH and that the cause of the disturbances is not only cancer), periodic check-ups (as a rule once a year) and lifestyle changes that include the following [43]:

- the patient is recommended a lifestyle and diet in accordance with healthy lifestyles, he should avoid everything that causes hyperemia of the prostate and pelvic organs and has an irritating effect on the urinary tract,
- the diet must be varied, rich in vitamins, moderately salty and spicy,
- avoiding prolonged sitting and lying down, strenuous walking and cycling,
- a patient with BPH must not take drugs that reduce the tone of the detrusor and affect the function of the bladder (anticholinergics, etc.), because otherwise retention may occur [13].
- reduction of fluid intake at a certain time with the aim of reducing the frequency of urination when it is not appropriate (before going to a public place or at night to reduce nocturia)
- avoiding or moderate consumption of drinks with caffeine or alcohol because they have a diuretic and/or irritating effect, and their consumption leads to an increase in the amount of urine excreted, frequency of urination, urgency and nocturia [43], including the use of relaxation techniques and double discharge techniques, using breathing exercises, perineal pressure and mental tricks to reduce the thought of the need to urinate, all with the aim of more effective control of urinary disturbances [13], „bladder training” to help patients retain urine despite urgency, and to increase bladder capacity and time between urinations, harmonizing medicines and optimizing the time of their taking or replacing them with other medicines that have a lesser effect on the urinary system (this applies especially to diuretics), ensuring the ability to assist when there is impairment, mobility, ensuring assistance to people with reduced mobility [43]. weight loss as well as improved diabetes control reduce the risk factor of worsening the patient’s general condition as well as the risk of the same in the future, reduce the risk of anesthesia and postoperative complications [13]. A healthy lifestyle and self-care not only prevent the worsening of BPH symptoms, but also slow the progression of the disease and improve quality of life [40]. Quality of life implies the right of all people to be satisfied with their lives and have a good quality of life. The very principle of improving the quality of life

focuses on helping people enjoy their lives to the fullest extent possible. People who live in different cultures and belong to different generations have a different understanding of the quality of life and therefore a person should be viewed in a social context, emphasizing the importance of the psychosocial, i.e. the integrity and mutual dependence of the psychological and social aspects, with each of them continuously influencing the other [44]. The quality of health care shows how successfully nurses use their abilities, professional knowledge, skills and skillful communication during work. When performing any intervention, the nurse must not forget any of the three main aspects of human health - physical, psychological (especially emotional) and social. Regardless of which type of need is dominant, it is possible to satisfy others through it. When a nurse talks to a patient while providing physical care, if she is attentive and kind in contact, shows interest in his problem and the possibility of his participation, if she supports him in developing self-care skills and emphasizes the importance of that effort for his better functioning in the family and community, that time affects all aspects of human health [40]. Patient and family education is a process during which the nurse helps the patient and the family in an organized manner to better understand the changes caused by the disease and to successfully overcome the resulting difficulties, prevent possible complications, and by achieving the patient's independence, preserve a satisfactory quality of life. In order to improve communication with the patient and his family, it is necessary, among other things, to enable the availability of information at all times. Providing health care means ensuring the quality of fully accessible education about their health condition, necessary health behavior and potential treatment options. Patient education is an essential component of the nursing process of health care. Nurses have a responsibility towards patients not only in meeting their basic human needs, but also in education, which is not so simple considering that patients come from different ethnic and socioeconomic backgrounds and have different priorities in the health care process itself [45]. Regardless of what type of professional work nurses are engaged in, they must follow the development and achievement of health care as the broadest discipline of her profession, because it is the common basis of all professional activities in

the field of nursing [40].

## CONCLUSION

After reviewing the literature, we came to the conclusion that the level of vitamin D is responsible for the quality of life of patients with benign prostatic hyperplasia. The integration of health care emphasizes the integration of existing resources within the overall health policy planning, and professionally trained medical staff provides medical treatment, rehabilitation, life care, psychological counseling and hospital care for elderly patients with chronic diseases and semi-disabled, disabled and oncological patients. Predictions are that, given the trend of global population aging, an increasing proportion of the world's population will suffer from some of the symptoms of LUTS. LUTS affect numerous aspects of usual daily activities, and almost all domains of the quality of life (eng. health related quality of life), (HRQoL). These symptoms also affect increased health insurance costs, absenteeism and reduced work productivity, as well as sexual dysfunction, sleep disorders, anxiety and depression. All of the above speaks in favor of the fact that LUTS, primarily caused by benign prostate enlargement, are a major clinical and public health problem.

## CONFLICTS OF INTEREST

All authors declare no conflict of interest.

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# Povezanost kvaliteta života i nivoa vitamina D kod benigne hiperplazije prostate

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## KRATAK SADRŽAJ

**Uvod:** Epidemiološke studije su sugerisale na povezanost nedostatka vitamina D i Benigne hiperplazije prostate BPH. Prevalenca nedostatka vitamina D kod muške populacije sa urološkom simptomatologijom ukazuje na vezu između BPH i vitamina D.

**Metodologija:** U ovom radu biće predstavljene informacije iz relevantnih stručnih/naučnih izvora podataka o korelaciji nivoa vitamina D na intenzitet simptoma i kvalitet života pacijenata sa BPH, kao i na edukaciju bolesnika i zdravstvenu negu.

**Tema:** Sa starenjem, BPH kod muškarca je toliko česta pojava da se može postaviti pitanje da li je smatrati abnormalnošću, nego je neobično naći histološki normalnu prostatu kod muškarca preko 70 godina starosti. Bolest je od početka klasifikovana kao „muka ostarelog muškarca” jer benigno uvećanje žlezde nosi značajan rizik od morbiditeta zbog opstrukcije odliva mokraće. Usled dugog toka benigne hiperplazije prostate, koji značajno utiče na kvalitet života i kvalitet sna, povećava se mentalni pritisak pacijenata, izazivajući njihov fizički i mentalni bol. U tom smislu je prioritet kako i formulisati rad i napore medicinske sestre i zdravstvenog tima za poboljšanje kvaliteta života starijih pacijenata sa BPH.

**Zaključak:** Uvidom u literature došli smo do zaključka da je nivo vitamin D odgovoran za kvalitet života pacijenata sa benignom hiperplazijom prostate. Integracija zdravstvene nege stavlja akcenat na integraciju postojećih resursa u okviru ukupnog planiranja zdravstvene politike, a stručno osposobljeno medicinskog osoblja obezbeđuje medicinski tretman, rehabilitaciju, kućnu negu, psihološko savetovanje i hospitalnu negu za starije pacijente sa hroničnim bolestima i poluinvalidnih, invalidnih i onkoloških pacijenata.

**Ključne reči:** benigna hiperplazija prostate, kvalitet života, vitamin D

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