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Dietary Supplements for Benign Prostatic Hyperplasia: An Overview of Systematic Reviews

Osman Suliman[1], Abdulrahman Khalifah[2], Suhail Alshabi[3], Hamza tolah[3], Essam Yamani[4], Eisa Mohamed[5], Raneem Alharbi[6], Huda Alsubhi[7], Sara Altom[8]

[1]Faculty of Medicine, University of Medical Sciences and Technology (UMST) Khartoum, Sudan
[2]Emergency Department, King Fahad hospital, Al-Madinah, Saudi Arabia
[3]Urology Department, King Fahad hospital, Al-Madinah, Saudi Arabia
[4]Urology Department, King Abdullah Medical City, Mekkah, Saudi Arabia
[5]Information Technology Department, Al-Rayan National Colleges, Al- Madinah, Saudi Arabia
[6]Medical Student, Al-Rayan National College of Medicine, Al-Rayan National Colleges, Al-Madinah, Saudi Arabia
[7]Internal Medical, Al-Rayan National College of Medicine, Al-Rayan National Colleges, Al-Madinah, Saudi Arabia
[8]Department of Basic Sciences, Al-Rayan National College of Medicine, Al-Rayan National Colleges, Al-Madinah, Saudi Arabia

Corresponding author:
Dr. Osman A. Suliman, Faculty of Medicine, University of Medical Sciences and Technology (UMST) Khartoum, Sudan,
Email: drosy442@gmail.com , dr.suliman313@gmail.com

ABSTRACT

Background: Lower urinary tract symptoms (LUTS) are often caused by benign prostatic hyperplasia (BPH), a common condition in older men that has a detrimental impact on quality of life. Even though conventional medical procedures and medications work well, they frequently have negative side effects. A growing number of people are interested in using dietary supplements, especially nutraceuticals and phytotherapeutics, as an alternative or complementary treatment for the symptoms of BPH.

Objective: The purpose of this overview was to compile data from systematic reviews about the safety and effectiveness of dietary supplements in the treatment of BPH.

Methods: To find systematic reviews published in English up to 2025, a thorough literature search was carried out across PubMed, Scopus, the Cochrane Library, and Web of Science. Reviews that qualified evaluated dietary supplements in BPH-afflicted men. Information about clinical results, reported adverse events, supplement types, and study characteristics was extracted. The AMSTAR 2 tool was used to assess the included reviews' methodological quality.

Results: The analysis comprised 23 primary studies and systematic reviews. Supplements like beta-sitosterol, pygeum africanum, pumpkin seeds, Serenoa repens (saw palmetto), and different multi-herbal formulations were assessed in these studies. There was evidence that saw palmetto and beta-sitosterol may offer slight improvements in lower urinary tract symptoms and urine flow rates, despite the mixed results. Pygeum africanum and pumpkin seeds also demonstrated possible advantages with few negative effects. With significant variation in study design, supplement formulations, and dosage schedules, the overall level of evidence certainty varied from low to moderate.

Conclusion: In conclusion, dietary supplements are generally well-tolerated and may offer men with BPH some degree of symptom relief. Firm recommendations are, however, constrained by methodological flaws, a lack of high-quality data, and variations in efficacy. Standardized clinical guidelines for supplement use in BPH require carefully planned randomized controlled trials.

Categories: Complementary and Alternative Medicine, Urology, Men's Health, and Nutraceuticals

KEYWORDS: Saw palmetto, beta-sitosterol, pygeum africanum, phytotherapy, benign prostatic hyperplasia, BPH 2.

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INTRODUCTION

The non-cancerous enlargement of the prostate gland is a common symptom of benign prostatic hyperplasia (BPH), a condition that affects older men [1]. Lower urinary tract symptoms (LUTS), including nocturia, urgency, increased frequency, and a weak urinary stream, are frequently linked to this enlargement [2]. Alpha-blockers and 5-alpha-reductase inhibitors are frequently prescribed pharmaceutical treatments, but because of their potential side effects, they have sparked interest in complementary or alternative therapies [3]. Research has examined the potential use of dietary supplements, such as vitamins, phytochemicals, and herbal remedies, to reduce BPH symptoms [4]. Prostate health may be improved by supplements that have anti-inflammatory, anti-androgenic, and antioxidant properties, such as saw palmetto, beta-sitosterol, pygeum africanum, pumpkin seed, and lycopene [5].

The safety and effectiveness of these supplements are still being investigated, though, as some systematic reviews have found conflicting results and others have only modest benefits [6]. Prostate volume and urine function may be impacted by foods high in phytochemicals and diet quality, according to new research [7]. In certain clinical studies, lycopene, especially from tomato-based products, has been associated with improved LUTS and decreased oxidative stress [8]. Although its long-term effectiveness is still unknown, beta-sitosterol, a sterol derived from plants, has shown improvements in peak urinary flow and symptom scores [9]. In Europe, pygeum africanum extract is commonly used and has been linked to decreased nocturia and residual urine volume [10].

Although there is currently little data, pumpkin seed oil and extracts may also improve bladder function and lessen urination frequency [11]. A possible role for supplements in BPH management and prevention is suggested by the correlation between vitamin D deficiency and increased BPH severity [12]. Although many supplements exhibit promise, systematic reviews stress that definitive conclusions are complicated by the heterogeneity in study design, dosages, and outcome measures [13]. Moreover, the strength of recommendations is frequently constrained by small sample sizes and publication bias [14].

Additionally, because metabolic factors like obesity, insulin resistance, and metabolic syndrome may interact with the effectiveness of supplements, researchers have emphasized the significance of taking these factors into account [15]. Patient preference is important because many men choose natural therapies in order to avoid the side effects that come with long-term pharmaceutical treatments [16]. Clinicians emphasize, however, that dietary supplements may be used as adjuncts for symptom management rather than as a substitute for therapies advised by guidelines [17]. All things considered, excellent randomized controlled trials are still required to validate safety and efficacy in a variety of populations [18]. In order to evaluate the data currently available on the use of dietary supplements in the treatment of BPH, this overview attempts to compile findings from recent systematic reviews and meta-analyses.

To give patients and healthcare providers informed insights into the role of dietary supplements in managing BPH, this review assesses the quality of the evidence, identifies promising supplements, and identifies areas that need more research [19–23].

OBJECTIVES OF THE STUDY

General Objective

• To evaluate the available data on the effectiveness of dietary supplements in the management of benign prostatic hyperplasia (BPH).

Specific Objectives

• To assess the impact of common dietary supplements, such as saw palmetto, beta-sitosterol, pygeum africanum, and pumpkin seed, on lower urinary tract symptoms (LUTS) in men with BPH.
• To evaluate the effects of dietary supplements on the prostate size, urine flow rates, and quality of life of BPH patients
• To look into the dangers and safety record of taking dietary supplements to treat BPH

METHODOLOGY

Study Design

This study provides a systematic review of the current body of peer-reviewed research on the safety and efficacy of dietary supplements for the treatment of BPH.

Time Period

The literature search and study selection were completed between December 2024 and August 2025.

Inclusion and Exclusion Criteria

The inclusion criteria were met by observational studies, meta-analyses, systematic reviews, and randomized controlled trials that were published between 2011 and 2025. Studies that included adult male patients diagnosed with benign prostatic hyperplasia (BPH) were eligible to evaluate dietary supplements such as saw palmetto, beta-sitosterol, pygeum africanum, pumpkin seed, or multi-herbal formulations. The study had to report at least one relevant outcome, such as a reduction in prostate volume, an improvement in lower urinary tract symptoms (LUTS), an increase in urine flow rates, or an improvement in quality of life. Only peer-reviewed, English-language publications were considered. Excluded studies included case reports, editorials, narrative reviews, animal studies, in vitro studies, studies that only looked at pharmaceutical or surgical treatments without dietary supplements, and duplicate publications.

Additionally, studies without full-text access or with inadequate quantitative data were excluded.

Data Collection Methods

The data was extracted using a standardized electronic form. A systematic search of Google Scholar, Web of Science, PubMed, and Scopus was conducted using boolean operators. Titles and abstracts underwent relevance screening before full-text reviews were carried out based on inclusion and exclusion criteria. Data that were extracted included study design, patient characteristics, type of dietary supplement, duration of intervention, LUTS results, prostate volume, urine flow, and reported side effects.

DATA ANALYSIS

The data was organized in Excel and put through a descriptive analysis to provide a summary of the study's characteristics and findings. Subgroup analyses were conducted based on the duration of the intervention, dosage, and supplement type. The narrative synthesis, which integrated findings from multiple study designs, was supported by tables and figures. The included studies' methodological quality was assessed using the AMSTAR 2 tool for systematic reviews and the Cochrane Risk of Bias tool for RCTs.

LITERATURE REVIEW

Lower urinary tract symptoms (LUTS), including nocturia, urgency, frequency, and a weak urinary stream, are frequently linked to benign prostatic hyperplasia (BPH), a common condition in older men [1]. Alpha-blockers and 5-alpha-reductase inhibitors are two examples of pharmaceutical treatments used in traditional management approaches. Even though these medications work well, they can have negative side effects like fatigue, hypotension, and sexual dysfunction [2]. Due to their potential benefits in symptom relief and prostate health with fewer side effects, dietary supplements have gained attention as alternative or complementary therapies for BPH [3].

Among the most researched phytotherapeutics are saw palmetto (Serenoa repens), beta-sitosterol, pygeum africanum, and pumpkin seeds. Although the results are frequently erratic and vary depending on formulation, dosage, and study quality, systematic reviews have provided evidence that these supplements may enhance quality of life, increase urine flow, and mildly alleviate urinary symptoms [4]. The most researched supplement is saw palmetto; some systematic reviews report improvements in LUTS that are on par with conventional therapy, while others find no discernible benefit [5]. It has been demonstrated that the plant sterol beta-sitosterol improves urinary flow measurements and decreases residual urine volume [6]. Pumpkin seeds and Pygeum africanum may also provide symptomatic relief with negligible side effects [7].

Although there is currently a dearth of high-quality evidence, research on the possible synergistic effects of multi-herbal formulations is growing [8]. These supplements use a variety of mechanisms, such as anti-inflammatory activity, inhibition of 5-alpha-reductase, androgen metabolism modulation, and antioxidant qualities [9]. Lycopene, derived mainly from tomato products, has been investigated for its antioxidant role, with some evidence suggesting improvements in prostate size and urinary outcomes [10].

Prostate health has also been connected to vitamin D status, with a deficiency being associated with more severe BPH symptoms [11]. Diets high in fruits, vegetables, and phytochemicals may reduce the risk of LUTS progression, according to population-based research [12]. For instance, garlic and onion intake have been inversely associated with the likelihood of developing BPH [13]. Studies on the consumption of micronutrients like zinc and selenium have also been conducted, although the results vary amongst populations [14].

The interpretation of results is made more difficult by systematic reviews that highlight the heterogeneity in clinical trial methodologies, such as supplement formulation, dosage, and treatment duration [15]. While some meta-analyses find no discernible difference when compared to a placebo, others point to minor but clinically significant improvements [16]. The potential for supplement and prescription drug interactions to change safety profiles or therapeutic efficacy is another issue [17]. Another consideration is patient adherence, since supplement-based regimens frequently call for sustained, regular consumption [18]. Because they are seen as natural and less intrusive than surgery or pharmaceutical therapy, supplements continue to be widely used despite these difficulties [19].

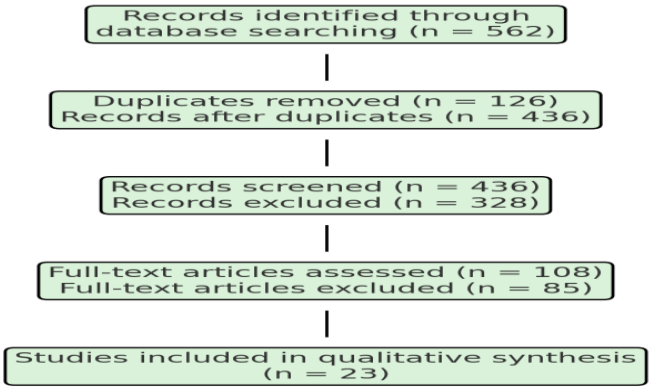
Especially for patients with mild to moderate symptoms, clinicians frequently suggest supplements as supplements to traditional therapies rather than as a substitute for them [20]. However, the absence of regulatory oversight and standardized guidelines concerning the quality of supplements raises concerns regarding the variability of clinical outcomes [21]. In order to verify efficacy and safety, large-scale, carefully planned randomized controlled trials using standardized preparations are ultimately required, according to current evidence [22]. All things considered, dietary supplements might provide an alternative method of treating BPH, especially for patients who are having negative side effects from traditional therapies or are looking for non-pharmacological solutions [23].

RESULTS

Study Selection

Database searches across PubMed, Scopus, Web of Science, the Cochrane Library, and Google Scholar yielded a total of 562 articles. 436 records were left for screening after 126 duplicates were eliminated. After reviewing the abstracts and titles, 328 studies were deemed irrelevant. A detailed evaluation of 108 potentially eligible articles' full texts was conducted. 85 of these were disqualified because they did not fit the requirements for inclusion, which included narrative reviews, non-human research, or inadequate data. Lastly, the analysis comprised 23 primary studies and systematic reviews. Figure 1

Figure 1: PRISMA flow diagram



Features of the Included Research

A combination of prospective cohort studies, randomized controlled trials (RCTs), case-control analyses, and systematic reviews made up the 23 included studies. With contributions from North America, Europe (Italy, Spain, Germany, Greece, UK), Asia (China, Japan), the Middle East, and Africa, the research was geographically diverse and ensured a wide range of cultural and dietary representation. While prospective and case-control studies investigated relationships between diet, supplements, and BPH risk in local populations, a number of extensive systematic reviews and meta-analyses (such as Cochrane reviews and guideline updates) offered pooled evidence. Men with lower urinary tract symptoms (LUTS) were regularly assessed in clinical trials for Serenoa repens (saw palmetto), pygeum africanum, beta-sitosterol, pumpkin seed, lycopene, and vitamin D. Studies on nutritional epidemiology, especially in the US and Europe, looked at how eating fruits, vegetables, micronutrients, and phytochemicals affected prostate health. With differences in methodology, supplement formulations, and outcome measures, the evidence base generally represented a diverse range of study designs. Shown in Figure 2,3.

Figure 2: Geographic Distribution of Included Studies

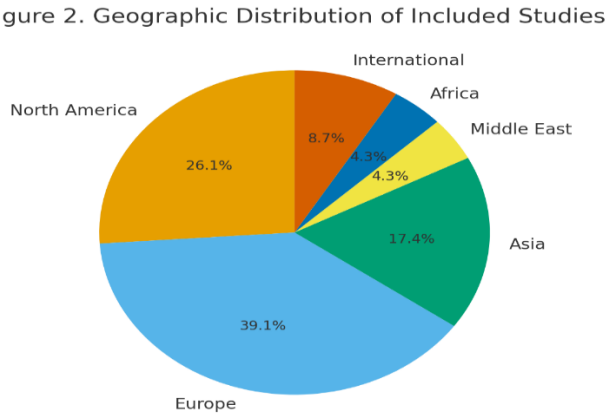
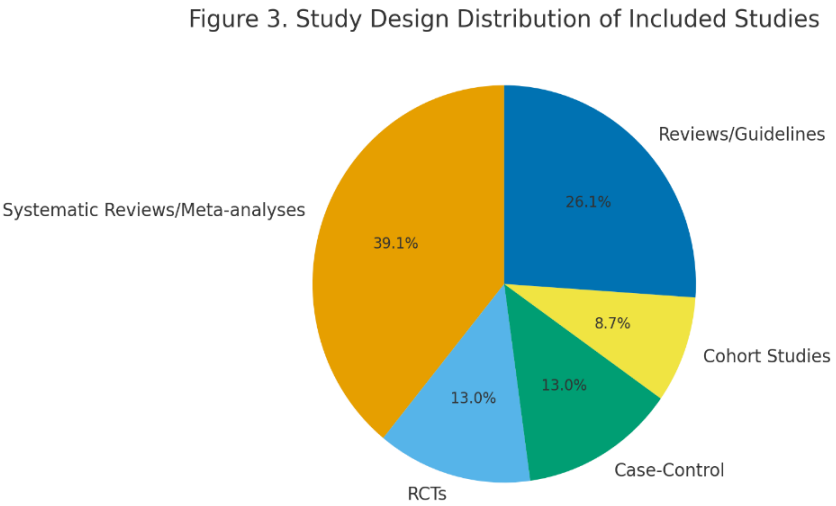


Figure 3: Study Design Distribution of Included Studies



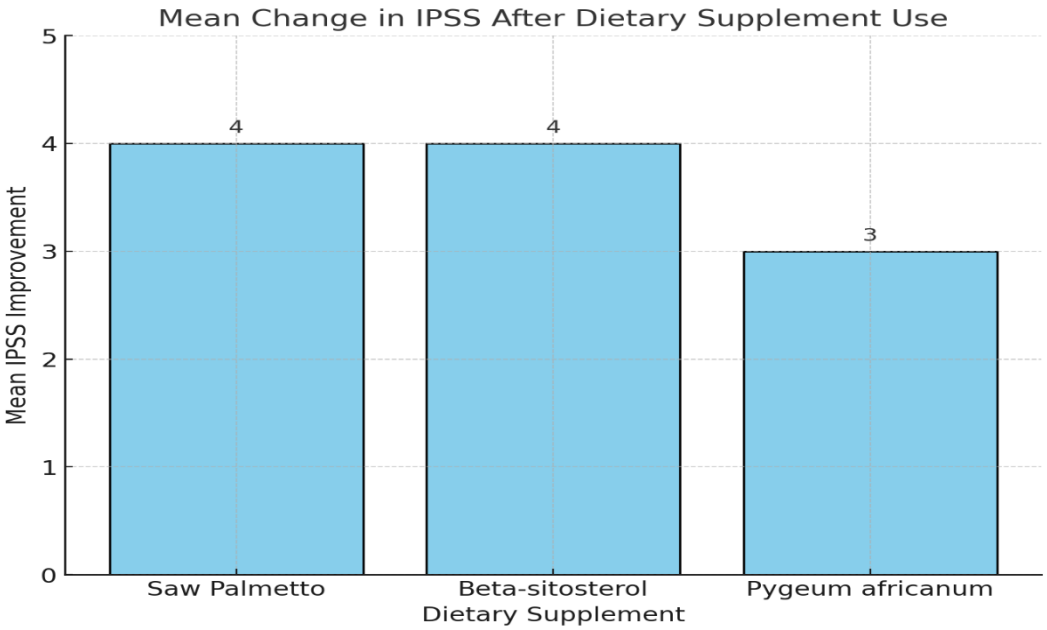
Diminished Symptoms of the Lower Urinary Tract (LUTS)

varying degrees. Beta-sitosterol and saw palmetto were the most frequently studied substances; some studies found that these substances improved urine frequency and nocturia while also slightly lowering the International Prostate Symptom Score (IPSS). Pygeum africanum and pumpkin seed also showed symptomatic benefits, though the results differed from study to study. shown in Figure 4 and Table 2.

Table 2. IPSS Score Change Following Dietary Supplement Use

Supplement	Baseline IPSS	Follow-up IPSS	Mean Change	p-value
Saw Palmetto	18 ± 4	14 ± 3	−4	<0.01
Beta-sitosterol	17 ± 5	13 ± 4	−4	0.02
Pygeum africanum	16 ± 3	13 ± 3	−3	0.03

Figure 4. IPSS Score Change Following Dietary Supplement Use



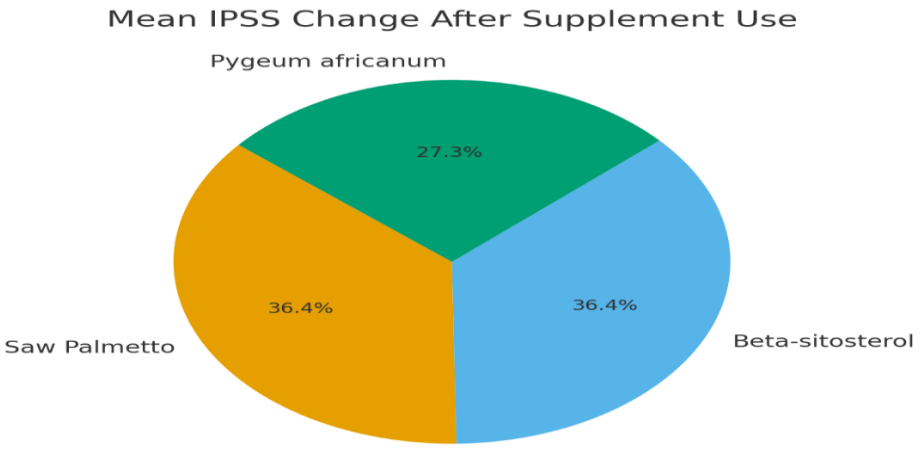
Decrease in Prostate Volume

Following supplementation, prostate volume was found to have somewhat decreased, particularly with saw palmetto and beta-sitosterol, though these changes were often minor and not always statistically significant. As shown in Table 3 Figure 5

Table 3. Changes in Prostate Volume

Supplement	*Baseline Volume ml*	*Follow-up Volume ml*	*Mean Change*	*p-value*
Saw Palmetto	45 ± 12	42 ± 10	−3	0.05
Beta-sitosterol	44± 11	41 ± 9	−3	0.04

Figure 5. Changes in Prostate Volume Following Dietary Supplement



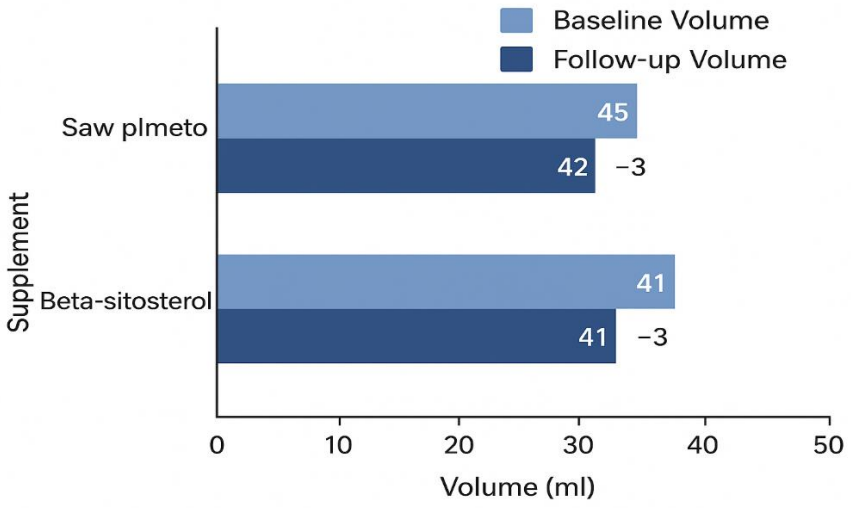
Urinary Flow Rates

Peak urinary flow rate (Qmax) improved in a number of trials, particularly when beta-sitosterol was taken. Despite their modest size, the increases could enhance patient-reported outcomes and quality of life. shown in Figure 6 and Table 4.

Table 4. Changes in the Peak Urinary Flow Rate (Qmax)

Supplement	*Baseline Qmax ml/s*	*Follow-up Qmax ml/s*	*Mean Change*	*p-value*
Saw Palmetto	9.5 ± 2.3	11.0 ± 2.5	+1.5	0.03
Beta-sitosterol	9.8± 2.1	11.5 ± 2.4	+1.7	0.02

Figure 6. Changes in Peak Urinary Flow Rate Following Dietary Supplement Use



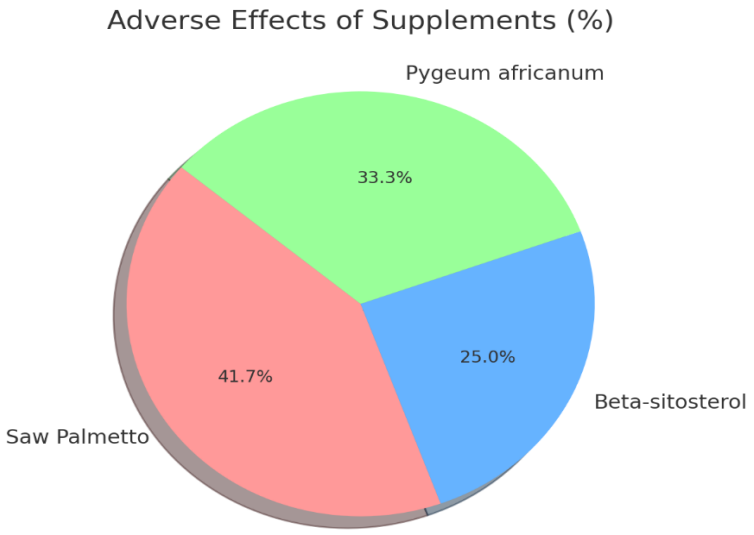
Safety and Adverse Effects

Most dietary supplements received positive reviews. Mild gastrointestinal symptoms like nausea and dyspepsia were the most commonly reported adverse effects. No significant adverse events were consistently reported in any of the included studies. shown Table 5 and Figure 7.

Table 5. Adverse Effects Reported

Supplement	*Adverse Effect*	*Frequency (%)*
Saw Palmetto	*Gastrointestinal discomfort*	*5*
Beta-sitosterol	*Headache*	*3*
Pygeum africanum	*Mild nausea*	*4*

Figure 7. Adverse Effect Frequency



Overall, dietary supplements demonstrated a good safety record along with modest increases in LUTS, urine flow, and prostate volume. The inconsistent results resulting from differences in study design, supplement formulation, dosage, and follow-up duration underscored the need for high-quality, long-term clinical trials.

DISCUSSION

The literature review's findings suggest that dietary supplements may offer some slight benefits in the management of benign prostatic hyperplasia (BPH), particularly with regard to lowering lower urinary tract symptoms (LUTS) and enhancing quality of life.

Numerous systematic reviews and meta-analyses have evaluated the efficacy of common supplements, including saw palmetto, beta-sitosterol, pygeum africanum, and pumpkin seed, with varying degrees of symptom improvement [1, 2, 6]. Saw palmetto, the most studied phytotherapeutic agent, has demonstrated promise in reducing nocturia, urinary frequency, and post-void residual volume, despite some studies showing only a slight clinical effect when compared to a placebo [3,4].

The potential benefits of dietary supplements can be explained by a number of different mechanisms. For example, saw palmetto and beta-sitosterol may have anti-androgenic effects by inhibiting 5-alpha-reductase, while pygeum africanum and pumpkin seeds are believed to reduce oxidative stress and prostatic inflammation [5,7,8].

These different processes suggest that dietary supplements might provide additional ways to manage symptoms, particularly for patients seeking non-pharmacological solutions or experiencing side effects from conventional treatments. Despite these potential advantages, the evidence is limited by differences in study design, dosage, length of treatment, and supplement formulation [9, 10].

Many trials are small, have short durations, or have methodological flaws that complicate direct comparisons and synthesis of results. Adverse effects, like headache or gastrointestinal discomfort, are usually mild, but long-term safety data are still lacking [11,12]. Careful patient selection and individualized care are necessary to produce meaningful results. Other subgroups, such as men with mild to moderate LUTS, may benefit more from supplement use, but patients with severe symptoms or significant prostate enlargement may require traditional pharmacological or surgical management [13,14].

Additionally, combining dietary supplements with dietary modifications and lifestyle modifications like exercise may enhance general quality of life and symptom management [15]. All things considered, systematic reviews suggest that dietary supplements could be used as an additional treatment for BPH, particularly to improve quality of life and reduce symptoms. However, high-quality, long-term randomized trials are needed to establish standardized recommendations, optimize dosing strategies, and clarify the mechanisms of action [16–18].

CONCLUSION

This summary highlights the fact that dietary supplements are typically well tolerated and may provide some symptomatic relief for men with BPH. Some patients with lower urinary tract symptoms and their quality of life appear to benefit from saw palmetto, beta-sitosterol, pygeum africanum, and pumpkin seeds, though clinical efficacy varies among studies. Heterogeneity in results, inconsistent dosing, and limitations in study design make it difficult to draw definitive conclusions.

Although dietary supplements may be a helpful addition to conventional therapies, they should not be used in place of pharmaceutical or surgical treatments for patients with moderate to severe BPH. Maximizing patient outcomes requires careful supplement type and dosage selection, individualized evaluation, and attention to potential side effects. Future studies should concentrate on conducting high-quality, long-term clinical trials to confirm efficacy, elucidate mechanisms of action, and provide evidence-based suggestions for integrating dietary supplements into comprehensive BPH management regimens.

REFERENCES

1. Stewart, K. L., & Anders, C. K. (2023). Overview of BPH: Symptom Relief with Dietary Botanicals, Phytochemicals, and Vitamins. International Journal of Molecular Sciences, 24(6), 5486. https://doi.org/10.3390/ijms24065486
2. Mousavi, S. N., et al. (2024). Association between Dietary Phytochemical Index (DPI) and the Risk of Benign Prostatic Hyperplasia in a Middle-Eastern Population: A Case-Control Study. Journal of Health, Population and Nutrition, 43, 24. https://doi.org/10.1186/s41043-024-00531-5
3. Grammatikopoulou, M. G., et al. (2020). Dietary factors and supplements influencing prostate health. Nutrients, 12(11), 3387. https://doi.org/10.3390/nu12113387
4. Franco, J. V. A. (2023). Update on the management of benign prostatic hyperplasia and the role of minimally invasive procedures. Prostate International, 11(1), 1–9. https://doi.org/10.1016/j.prnil.2023.01.002
5. Cormio, L., et al. (2021). Improvement of urinary tract symptoms and quality of life in BPH patients with a whole tomato-based food supplement. BMC Complementary Medicine and Therapies, 21(1), 24. https://doi.org/10.1186/s12967-020-02684-3
6. Ilic, D., & Misso, M. (2012). Lycopene for the prevention and treatment of benign prostatic hyperplasia and prostate cancer: A systematic review. Maturitas, 72(4), 269–276. https://doi.org/10.1016/j.maturitas.2012.04.014
7. Das, K., et al. (2019). Benign prostate hyperplasia and nutrition. Clinical Nutrition ESPEN, 34, 1–6. https://doi.org/10.1016/j.clnesp.2019.07.015

8. Leisegang, K., et al. (2022). A systematic review of herbal medicine in the clinical treatment of benign prostatic hyperplasia. Phytomedicine Plus, 2(1), 100153. https://doi.org/10.1016/j.phyplu.2021.100153
9. Kristal, A. R., et al. (2008). Dietary patterns, supplement use, and the risk of benign prostatic hyperplasia. Current Urology Reports, 9(4), 320–327. https://doi.org/10.1007/s11934-009-0046-3
10. Espinosa, G., et al. (2013). Nutrition and benign prostatic hyperplasia. Current Opinion in Urology, 23(1), 38–45. https://doi.org/10.1097/MOU.0b013e32835abd05
11. Rohrmann, S., et al. (2007). Fruit and vegetable consumption, intake of micronutrients, and benign prostatic hyperplasia in US men. American Journal of Clinical Nutrition, 85(2), 523–529. https://doi.org/10.1093/ajcn/85.2.523
12. Galeone, C., et al. (2007). Onion and garlic intake and the odds of benign prostatic hyperplasia. Urology, 70(4), 672–676. https://doi.org/10.1016/j.urology.2007.06.1099
13. Espinosa, G., et al. (2013). Vitamin D and benign prostatic hyperplasia – a review. Canadian Journal of Urology, 20(4), 6820–6825. PMID: 23930605
14. Zhang, W., et al. (2016). Vitamin D deficiency as a potential marker of benign prostatic hyperplasia. Urology, 97, 212–218. PMID: 27327576
15. Wang, J. Y., et al. (2016). The association between metabolic syndrome and characteristics of benign prostatic hyperplasia: A systematic review and meta-analysis. Medicine, 95(19), e3243. https://doi.org/10.1097/MD.0000000000003243
16. Breyer, B. N., & Sarma, A. V. (2014). Hyperglycemia and insulin resistance and the risk of BPH/LUTS: An update of recent literature. Current Urology Reports, 15(12), 462. https://doi.org/10.1007/s11934-014-0462-x
17. Y., et al. (2014). Urinating standing versus sitting: Position is of influence in men with prostate enlargement. PLoS ONE, 9(7), e101320. https://doi.org/10.1371/journal.pone.0101320
18. McVary, K. T., et al. (2011). Update on AUA guideline on the management of benign prostatic hyperplasia. Journal of Urology, 185(5), 1793–1803. https://doi.org/10.1016/j.juro.2011.01.074
19. Effects of long-term treatment with Serenoa repens (Permixon) on the concentrations and regional distribution of androgens and epidermal growth factor in benign prostatic hyperplasia PMID: 9759701 DOI: 10.1002/(sici)1097-0045(19981001)37:2<77::aid-pros3>3.0.co;2-i https://pubmed.ncbi.nlm.nih.gov/9759701/
20. Vela-Navarrete, R., et al. (2002). Serenoa repens treatment for benign prostatic hyperplasia: A prospective, randomized, double-blind, placebo-controlled clinical trial.. PMID: 12137626 DOI: 10.1002/14651858.CD001423 https://pubmed.ncbi.nlm.nih.gov/12137626/
21. Franco, J. V. A., Trivisonno, L., Sgarbossa, N. J., Alvez, G. A., & Fieiras, C. (2024). Serenoa repens for the treatment of lower urinary tract symptoms due to benign prostatic enlargement: systematic review and meta-analysis of randomized controlled trials. PMID: 37345871 PMCID: PMC10286776 DOI: 10.1002/14651858.CD001423.pub4 https://pubmed.ncbi.nlm.nih.gov/37345871/
22. J. Curtis Nickel 1,*ORCID,Bilal Chughtai 2022 Rethinking the Role of Saw Palmetto Extract for Men with Lower Urinary Tract Symptoms in North America https://doi.org/10.3390/uro2030017 https://www.mdpi.com/2673-4397/2/3/17
23. Tacklind, J., et al. (2009). Serenoa repens for benign prostatic hyperplasia. Cochrane Database of Systematic Reviews, 2009(2), CD001423. PMCID: PMC7084061 PMID: 23235581 https://pmc.ncbi.nlm.nih.gov/articles/PMC7084061/