

Prevalence And Determinants of Benign Prostatic Hyperplasia Among Males Attending Primary Health Care Clinics At KFMMC, Dhahran, Eastern Region, KSA

*Yasser A. Yasein¹, Sultan Al Shammari², Turki Al Mutairi²

⁽¹⁾ Assistant Professor of Public Health and Community Medicine Department, Faculty of Medicine, Al-Azhar University, Egypt. Consultant of Preventive medicine, KFMMC, KSA

⁽²⁾ Family Medicine resident, KFMMC, KSA

Corresponding Author: *Yasser A. Yasein

Abstract

Background: The benign prostatic hyperplasia is of significant importance to public health, affecting tens of millions of older men globally.

Objectives: To determine the prevalence, investigate risk factors, and to clarify the complications associated with benign prostatic hyperplasia.

Methods: A cross sectional hospital based survey, was conducted among attendees of primary health care clinics in the King Fahd Military Medical Complex, Dhahran (KFMMC), Eastern Region, Kingdom of Saudi Arabia (KSA). The study included 300 patients, with a mean age of 49.18 ± 11.40 years and range (31-82 years).

Results: the prevalence of benign prostatic hyperplasia 42.0%. The prevalence was significantly higher among age groups 60 years or more (64.3%), and black men (52.9%). The benign prostatic hyperplasia was less reported among men who have practice sex twice a week or more (39.6%). Sleep disorders (OR=2.66; 95%CI;1.13–6.24), smoking (OR=3.04; 95%CI;1.87–4.97), positive family history of benign prostatic hyperplasia (OR=3.53; 95%CI;1.74–7.15), obesity (OR=2.18; 95%CI;1.36–3.48), diabetes (OR=5.41; 95%CI;3.26–8.95), hypertension (OR=2.24; 95%CI;1.38–3.63), cardiac diseases (OR=2.36; 95%CI;1.23–4.51), dyslipidemia (OR=1.92; 95%CI; 1.20–3.08), were factors which were significantly associated with presence of benign prostatic hyperplasia. On the other hand, practice of physical activity (OR=0.40; 95%CI;0.24–0.66), vegetables intake (OR=0.54; 95%CI;0.33–0.88), and fruits intake (OR=0.49; 95%CI;0.30–0.79), were factors which were significantly decrease the risk of benign prostatic hyperplasia.

Conclusion: The benign prostatic hyperplasia is a high prevalent disease among men. Factors that potentially increase the risk of benign prostatic hyperplasia were; age, positive family history, black skin, smoking, obesity, diabetes mellitus, cardiac diseases, hypertension, and dyslipidemia. Factors that potentially decrease the risk of benign prostatic hyperplasia were; more frequent practice of sex, practice of physical activity, and increased vegetables and fruits intake.

Keywords: Benign prostatic hyperplasia, prevalence, risk factors, primary health care clinic, KFMMC, KSA

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I. Introduction

Benign prostatic hyperplasia is a histological diagnosis associated with unregulated proliferation of connective tissue, smooth muscle and glandular epithelium within the prostatic transition zone⁽¹⁾. A glandular element composed of secretory ducts and acini; and a stromal element composed primarily of collagen and smooth muscle. In BPH, cellular proliferation leads to increased prostate volume and increased stromal smooth muscle tone. McNeal describes two phases of BPH progression. The first phase consists of an increase in BPH nodules in the periurethral zone and the second a significant increase in size of glandular nodules⁽²⁾. Benign prostatic hyperplasia is the most common prostate problem for men older than age 50. In 2010, as many as 14 million men in the United States had lower urinary tract symptoms suggestive of benign prostatic hyperplasia. Benign prostatic hyperplasia is a condition in men in which the prostate gland is enlarged and not cancerous. Benign prostatic hyperplasia is also called benign prostatic hypertrophy or benign prostatic obstruction^(3,4). The prevalence of histologically diagnosed prostatic hyperplasia increases from 8% in men aged 31-40 years, to 40-50% in men aged 51 to 60, to over 80% in men older than age 80⁽⁵⁾

The cause of benign prostatic hyperplasia is not well understood; however, it occurs mainly in older men. Men with the following factors are more likely to develop benign prostatic hyperplasia: age 40 years and older; family history of benign prostatic hyperplasia; medical conditions such as obesity, heart and circulatory

disease, and type 2 diabetes; lack of physical exercise; and erectile dysfunction⁽⁵⁾. Common symptoms of benign prostatic hyperplasia include; urinary frequency (urination eight or more times a day), urinary urgency (the inability to delay urination), trouble starting a urine stream, a weak or an interrupted urine stream, dribbling at the end of urination, nocturia (frequent urination during periods of sleep), urinary retention, urinary incontinence (the accidental loss of urine), pain after ejaculation or during urination and urine that has an unusual color or smell^(6,7). Urinary retention (inability to void) is a serious complication of severe benign prostatic hyperplasia that requires immediate medical attention. Urinary retention can be a sign of obstruction in the bladder. Bladder obstruction can cause kidney damage, bladder stones, urinary tract infections, blood in the urine, and incontinence as urine dribbles out in small amounts⁽⁸⁾.

Mosli et al. stated that, "the exact prevalence rate of benign prostatic hyperplasia in Saudi Arabia, as based upon properly conducted epidemiological studies, is still unknown. However, accurate numbers for the benign prostatic hyperplasia prevalence rate can only be reached by a properly conducted epidemiological study⁽⁹⁾. The current study was conducted to estimate; the prevalence of benign prostatic hyperplasia, to investigate risk factors, and to clarify the complications associated with benign prostatic hyperplasia.

Rational

So far, there have been few studies on the epidemiology of benign prostatic hypertrophy in Saudi Arabia, but none in Eastern Region. Therefore the present study was conducted to estimate the prevalence, investigate the risk factors and to determine the complications associated with benign prostatic hypertrophy among males attending primary health care clinics in King Fahd Medical Military Complex, Dhahran, Eastern Region, KSA

II . Subjects & Methods

Study design: A cross sectional hospital based survey, was conducted among attendees of primary health care clinics.

Study setting: The current study was conducted in the King Fahd Military Medical Complex, Dhahran (KFMMC), Eastern Region, Kingdom of Saudi Arabia (KSA). King Fahd Military Medical Complex was chosen for the study for the following reasons: ease of obtaining approval from the relevant authorities and ease of data collection. King Fahd Military Medical Complex included (9) primary health care clinics, all of these clinics were included in the study.

Inclusion criteria:

- All male patients
- Aged 30 years or more
- Saudi patients
- Attending primary health care clinics

Study sample:

All male patients attending the primary health care clinics for any purpose during the period of data collection (June and July 2016), and met the inclusion criteria were requested to be included in the study, and only 300 patients were accepted. Before data collection, oral consent from every participant was obtained with nearly 70% response rate.

Data collection technique: The questionnaire used in the study was prepared by researcher himself, according to American Urological Association and International Prostate Symptom Score (IPSS). the questionnaire was revised and approved by 2 urological consultant from KFMMC. The questionnaire included some questions on demographic and risk factors associated with benign prostatic hyperplasia.

Ethical considerations: Field survey was conducted after obtaining approval from local health authorities (King Fahd Military Medical Complex Research Ethical Committee and Family Medicine Board committee in the Eastern region).

Pilot study: The questionnaire was tested on 20 patients as a pilot study in order to evaluate the internal consistency and to determine the time needed to fill the questionnaire. The pilot study was conducted through one week on May 2016

Quality of data: Privacy and confidentiality were ensured during data collection process.

Data collection & field work:

The data were collected through an interview questionnaire by the researcher from all participants over a period of two month (June and July 2016). The field work took 3 days/ week with an average number of 10-15 patients interviewed per day, and the time needed to complete the questionnaire was 9-11 minutes. The International

Prostate Symptom Score (IPSS) was assessed and used to diagnose the clinical symptoms of benign prostatic hyperplasia. All patients were submitted to the following:

1. Weight and height measurement, in order to calculate body mass index.
2. Blood pressure measurement
3. Fasting, post 2 hours blood sugar and Lipid profile

Data analysis: Data was entered, organized, tabulated and analyzed using the standard computer program SPSS version 21. Data of this study were of both quantitative and qualitative types. Quantitative data were expressed as Mean±SD, while Qualitative data were expressed as frequency and percent. Chi Square (χ^2) was used to assess the relationship between two qualitative variables, with the significant level set at 0.05. Crude odds ratio (OR) and their 95% confidence intervals (CI) were calculated to test the significant of associated risk factors.

III . Results

The current study included 300 patients, with a mean age of 49.18 ± 11.40 years and range (31-82 years). The number of patients with benign prostatic hyperplasia by using International Prostate Symptoms Score (IPSS) was 126 with a proportion of (42.0%), **fig. 1**

According to International Prostate Symptoms Score. The findings showed that, patients with mild benign prostatic hyperplasia symptoms were (24.0%), compared to (14.3%) and (3.7%) for moderate and severe symptoms respectively, **fig. 2**

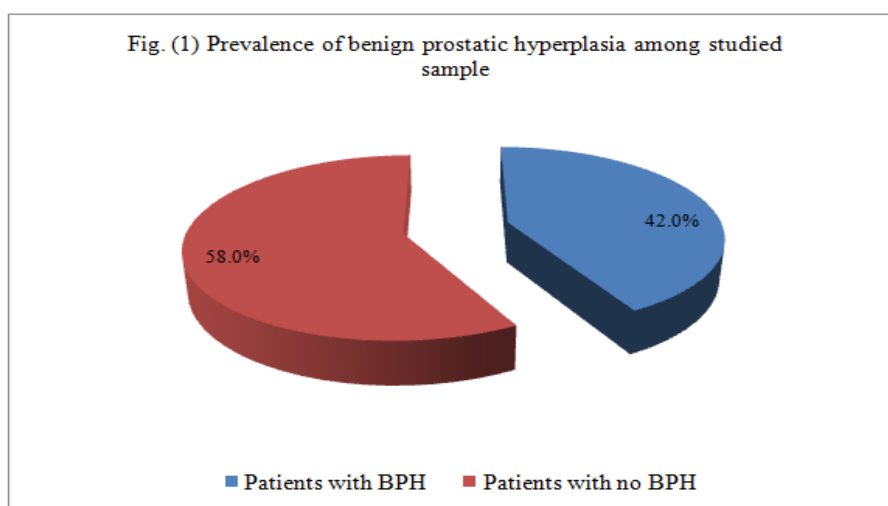
The prevalence of benign prostatic hyperplasia was significantly higher among age groups 60 years or more (64.3%). There were statistically significant differences ($\chi^2_3 = 25.8, P < 0.05$), **table 1**

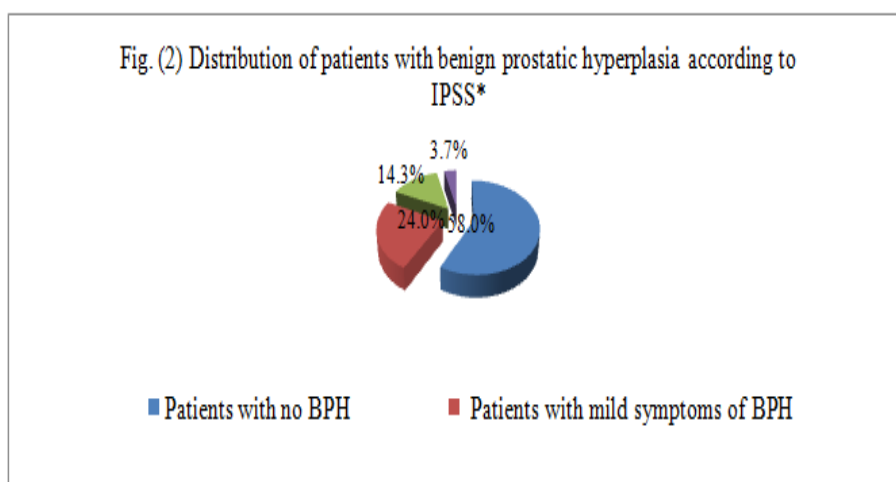
The results revealed that, there were no statistically significant differences regarding educational and occupational level ($P > 0.05$), **table 2**

There was a significant association between skin color and presence of benign prostatic hyperplasia ($\chi^2_1 = 5.82, P < 0.05$), the prevalence of benign prostatic hyperplasia was significantly higher among black men (52.9%), than in white (37.7%). The finding revealed that, there were no statistically significant differences between marital status, number of wives and presence of benign prostatic hyperplasia ($P > 0.05$). The prevalence of benign prostatic hyperplasia was less reported among men who have practice sex twice a week or more (39.6%), compared to (52.4%) among those who practice once a week. There were statistically significant differences ($\chi^2_2 = 9.02, P < 0.05$), **table 3**

The findings revealed that, sleep disorders (OR=2.66; 95%CI;1.13–6.24), smoking (OR=3.04; 95%CI;1.87–4.97), positive family history of benign prostatic hyperplasia (OR=3.53; 95%CI;1.74–7.15), obesity (OR=2.18; 95%CI;1.36–3.48), diabetes mellitus (OR=5.41; 95%CI;3.26–8.95), hypertension (OR=2.24; 95%CI;1.38–3.63), cardiac diseases (OR=2.36; 95%CI;1.23–4.51), and dyslipidemia (OR=1.92; 95%CI;1.20–3.08), were factors which were significantly associated with presence of benign prostatic hyperplasia. On the other hand, practice of physical activity (OR=0.40; 95%CI;0.24–0.66), vegetables intake (OR=0.54; 95%CI;0.33 – 0.88), and fruits intake (OR=0.49; 95%CI;0.30–0.79), were factors which were significantly decrease the risk of benign prostatic hyperplasia, **table 4**

The most common complications associated with benign prostatic hyperplasia were; inability to empty bladder (62.7%), Urgency (23.8%), urinary tract infections (20.6%), daytime frequency (15.9), hematuria (15.1%), and small weak urine stream (13.5%), **table 5**





*Mild BPH symptoms = score 1-7, Moderate BPH symptoms = score 8-19, Severe BPH symptoms = score 20-35

Table (1) Distribution of studied sample according to age

Variable	Studied sample (n. = 300)					Total	χ^2	P value	df
	Patients with BPH (n. = 126)		Patients with no BPH (n. = 174)						
	No.	%	No.	%					
Age	30-39 year	12	18.8	52	81.3	64	25.8*	< 0.05	3
	40-49 year	47	42.7	63	57.3	110			
	50-59 year	31	44.3	39	55.7	70			
	≥ 60 year	36	64.3	20	35.7	56			

* Statistically significant difference

Table (2) Distribution of studied sample according to educational and occupational level

Variable	Studied sample (n. = 300)					Total	χ^2	P value	df
	Patients with BPH (n. = 126)		Patients with no BPH (n. = 174)						
	No.	%	No.	%					
Education	Illiterate	10	43.5	13	56.5	23	4.6	> 0.05	5
	Read & write	13	54.2	11	45.8	24			
	Primary level	11	47.8	12	52.2	23			
	Intermediate level	29	48.3	31	51.7	60			
	Secondary level	48	36.4	84	63.6	132			
	Higher level	15	39.5	23	60.5	38			
Occupation	Employee	62	37.3	104	62.7	166	5.25	> 0.05	2
	Non-employee	15	38.5	24	61.5	39			
	Retired	49	51.6	46	48.4	95			

Table (3) Distribution of studied sample according to skin color, marital status, number of wives and sexual activity

Variable	Studied sample (n. = 300)					Total	χ^2	P value	df
	Patients with BPH (n. = 126)		Patients with no BPH (n. = 174)						
	No.	%	No.	%					
Skin color	White	81	37.7	134	62.3	215	5.82*	< 0.05	1

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	Black	45	52.9	40	47.1	85			
Marital status	Single	6	35.3	11	64.7	17	1.065	> 0.05	2
	Married	113	41.9	157	58.1	270			
	Widow	7	53.8	6	46.2	13			
Number of wives	One wife	91	44.8	112	55.2	203	2.2	> 0.05	2
	≥ two wives	20	37.7	33	62.3	53			
	Not applicable	15	34.1	29	65.9	44			
Sexual activity	One time/week	54	52.4	49	47.6	103	9.02*	< 0.05	2
	Two times or more/week	57	39.6	87	60.4	114			
	Not applicable	15	28.3	38	71.7	53			

* Statistically significant difference

Table (4) Distribution of studied sample according to risk factors associated with benign prostatic hyperplasia

Variable		Studied sample (n. = 300)				Total	OR	95% CI
		Patients with BPH (n. = 126)		Patients with no BPH (n. = 174)				
		No.	%	No.	%			
Sleep disorders	Yes	16	64.0	9	36.0	25	2.66*	(1.13 – 6.24)
	No	110	40.0	165	60.0	275		
Smoking	Yes	64	59.3	44	40.7	108	3.04*	(1.87 – 4.97)
	No	62	32.3	130	67.7	192		
Family history	Positive	28	68.3	13	31.7	41	3.53*	(1.74 – 7.15)
	Negative	98	37.8	161	62.2	259		
Alcohol intake	Yes	10	40.0	15	60.0	25	0.913	(0.39 – 2.10)
	No	116	42.2	159	57.8	275		
Obesity	Yes	75	51.7	70	48.3	145	2.18*	1.36 – 3.48)
	No	51	32.9	104	67.1	155		
Diabetes Mellitus	Yes	92	61.3	58	38.7	150	5.41*	(3.26 – 8.95)
	No	34	22.7	116	77.3	150		
Hypertension	Yes	59	54.6	49	45.4	108	2.24*	(1.38 – 3.63)
	No	67	34.9	125	65.1	192		
Cardiac diseases	Yes	27	60.0	18	40.0	45	2.36*	(1.23 – 4.51)
	No	99	38.8	156	61.2	255		
Dyslipidemia	Yes	61	51.7	57	48.3	118	1.92*	(1.20 – 3.08)
	No	65	35.7	117	64.3	182		
Renal disease	Yes	11	34.4	21	65.6	32	0.69	(0.32 – 1.50)
	No	115	42.9	153	57.1	268		
Chest disease	Yes	13	32.5	27	67.5	40	0.62	(0.30 – 1.26)
	No	113	43.5	147	56.5	260		
Practice of Physical activity	Yes	31	28.4	78	71.6	109	0.40**	(0.24 – 0.66)
	No	95	49.7	96	50.3	191		
Vegetables intake	Yes	70	36.6	121	63.4	191	0.54**	(0.33 – 0.88)
	No	56	51.4	53	48.6	109		
Fruits intake	Yes	66	35.5	120	64.5	186	0.49**	(0.30 – 0.79)
	No	60	52.6	54	47.4	114		

*Significantly associated risk factor

** Significantly decrease the risk of benign prostatic hyperplasia.

Table (5) displays the most common complications associated with benign prostatic hyperplasia

Complications	Frequency		
	No	%	
Benign prostatic hyperplasia (n. = 126)	Inability to empty bladder	79	62.7
	Urgency	30	23.8
	Urinary tract infections	26	20.6
	Day time frequency	20	15.9
	Hematuria	19	15.1
	Small weak urine stream	17	13.5

IV . Discussion

The benign prostatic hyperplasia is of significant importance to public health, affecting tens of millions of older men globally⁽¹⁰⁾.

The occurrence rates of benign prostatic hyperplasia reported in epidemiological studies were considerably different among different countries⁽¹¹⁾. In the current study, the overall prevalence of benign prostatic hyperplasia using IPSS questionnaire was (42.0%). The similar finding is found in the study conducted by Rao *et al.* who found that, the prevalence was (40.0%)⁽¹²⁾. The current figure is lower than that reported in south-west Nigeria (88.0%)⁽¹³⁾, Ethiopia (84.4%)⁽¹⁴⁾, Japan (56.0%)⁽¹⁶⁾, and higher than that reported in other countries as in Netherland (10.3%)⁽¹⁶⁾, France (14.0%)⁽¹⁶⁾, Denmark (17%)⁽¹⁶⁾, Scotland (18.0%)⁽¹⁶⁾, Ghana (19.9%)⁽¹⁷⁾, Iran (23.8%)⁽¹⁸⁾, Sweden (24.0%)⁽¹⁶⁾, and USA (38.0%)⁽¹⁶⁾. One explanation for the large variation in the reported prevalence is the lack of consensus on the definition and diagnostic criteria of clinical BPH in different investigations. Additionally, sample age, race, socio-economic status and sampling methods have a profound influence on the prevalence of benign prostatic hyperplasia.

Multiple observational studies from Europe, the US and Asia have demonstrated older age to be a risk factor for benign prostatic hyperplasia onset^(4, 10, 19, 20). In the present study the results showed that, the prevalence of benign prostatic hyperplasia rises markedly with age and commonly reported among men aged 60 years or older, in agreement with other studies^(20, 21, 22). Chute *et al.* stated that "increasing age and male hormones play an important role in glandular hyperplasia and continuous enlargement of the prostate"⁽²³⁾. Benign prostatic hyperplasia is inexorable with aging, the rate of growth is variable from individual to individual. Data from the Krimpen and Baltimore Longitudinal Study of Aging (BLSA) cohorts suggesting a prostate growth rate of 2.0% to 2.5% per year in older men^(24, 25).

In the present study, the prevalence of benign prostatic hyperplasia was more common in the black men than in the white. The similar finding is supported by^(26, 27, 28). This can be explained by the fact that, the blacks had greater total and transitional zone prostate volume, besides the benign prostatic tissue of black men appears to contribute more prostate-specific antigen(PSA) to the circulating blood than does the benign prostatic tissue of white men^(4, 29). In the current study the findings revealed that, men who reported sexual activity at least twice a week or more were less likely to have benign prostatic hyperplasia symptoms, in agreement with other studies^(30, 31). In contrast with Jacobsen *et al.* who found that, no relationship between the frequency of ejaculation and benign prostatic hyperplasia⁽³²⁾. Experts suggest that in addition to clearing toxins through ejaculation, sex may reduce the development of tiny crystals that are associated with prostate problems.

Sleep apnea is a common sleep disorder characterized by multiple cessations of breath during sleep, which cause intermittent hypoxia. Intermittent hypoxia is a trigger for systemic inflammation, which might promote development of benign prostatic hyperplasia^(33,34,35). Similar results have been found in the current study, in agreement with others^(35,36,37).

The smoking was associated with an increased risk of benign prostatic hyperplasia⁽³⁸⁾. Two studies suggested that men who currently smoked ≥ 1.5 packs/day or ≥ 1 pack/day had a higher risk of symptomatic BPH compared with nonsmokers^(39,40). Cigarette smoking affects plasma steroid hormone levels, including higher testosterone concentration, and nicotine has been shown to lead to di-hydro-testosterone accumulation in the prostate of the dog^(41,42,43). An elevation in prostate androgens, particularly the more potent di-hydro-testosterone, would be compatible with an elevated risk of benign prostatic hyperplasia, most likely manifested as prostatic enlargement, among smokers compared with nonsmokers. To the contrary, Mittler *et al.* showed that dogs that chronically inhaled cigarette smoke had lower testosterone concentrations and smaller prostates⁽⁴⁴⁾. Similarly, some studies reported lower prostate volume among smokers^(39, 45), while others found no correlation between prostate size and current smoking or smoking history⁽⁴⁶⁾. An alternative explanation for the positive relation between currently smoking ≥ 35 cigarettes/day and risk of BPH is that nicotine increases sympathetic nervous system activity and, thus, may affect prostate tone, or other cigarette smoke constituents may irritate the bladder⁽⁴⁷⁾.

Genetic factors play a role in the development of benign prostatic hyperplasia⁽¹¹⁾. A family history of benign prostatic hyperplasia appears to increase a man's chance of developing the condition⁽⁴⁸⁾. Watson and Kim, stated that "benign prostatic hyperplasia runs in families. You're more likely to have prostate issues if your father or brother had them"⁽⁴⁹⁾. Similar results have been found in the current study, in agreement with Sanda *et al.*⁽⁵⁰⁾.

In the current study the findings showed that, the obesity markedly increase the risk of benign prostatic hyperplasia, in agreement with others^(51,52,53,54,55). Other studies have observed that obesity increases the risks of benign prostatic hyperplasia surgery and initiation of medical therapy^(56, 57, 58). According to Parsons *et al.* each 1 kg/m² increase in BMI corresponded to a 0.41 cc increase in prostate volume. In addition, obese (BMI ≥ 35 kg/m²) participants had a 3.5-fold increased risk of prostate enlargement compared to non obese (BMI <25 kg/m²) participants⁽⁵⁹⁾. Obesity is part of a larger group of symptoms called metabolic syndrome, which is also linked to prostate growth⁽⁶⁰⁾.

Disruptions in glucose homeostasis at multiple different levels from alterations in serum insulin growth factor (IGF) concentrations to diagnosis of clinical diabetes are associated with higher likelihoods of benign prostatic hyperplasia and benign prostatic enlargement. Higher serum concentrations of serum insulin growth factor-1 (IGF-1) and insulin-like growth factor binding protein 3 have been associated with increased risk of clinical benign prostatic hyperplasia and benign prostatic hyperplasia surgery⁽⁶¹⁾. The findings of the present study showed that there was a positive association between diabetes and presence of benign prostatic hyperplasia, in agreement with others^(51,61,62,63). In people with type 2 diabetes, the body doesn't respond as well to insulin. That causes a spike in blood sugar levels. When the pancreas pumps out more insulin to bring down blood sugar, that excess insulin stimulates the liver to produce more of a substance called insulin-like growth factor (IGF). IGF is believed to trigger prostate growth⁽⁴⁹⁾.

Nicolas *et al.* revealed that, there is a statistically significant relationship between hypertension and benign prostatic hyperplasia⁽⁶⁴⁾. Other studies have shown that men with heart disease are at significantly increased risk of benign prostatic hyperplasia^(65,66,67,68,69,70). In the present study, the results are consistent with previous researches.

The results showed that, there was association between dyslipidemia and presence of benign prostatic hyperplasia, in agreement with study conducted by Ahmet *et al.*, who concluded that, the total cholesterol concentrations were significantly higher in benign prostatic hyperplasia case⁽⁷¹⁾. Also Nandeeshia *et al.* found that total cholesterol and LDL-cholesterol were significantly higher and HDL- cholesterol was significantly lower in BPH cases⁽⁷²⁾. Other studies have demonstrated that abnormal lipid profile can lead to prostatism and hypothesized that dyslipidemia is a risk factor in the development of benign prostatic hyperplasia^(40,73,74). According to study conducted by Parsons *et al.*, dyslipidemia perse is not sufficient enough to induce prostate enlargement, but the concomitant presence of other metabolic derangements, such as type 2 diabetes mellitus or those concurring with the metabolic syndrome construct, favors the process⁽⁷⁵⁾.

The findings of present study revealed that, the practice of physical activity and exercise was factor which was significantly decreasing the risk of benign prostatic hyperplasia. These results are similar to other studies^(51,76,77,65). Several mechanisms for this relationship have been proposed, including decreased sympathetic tone and reduced oxidative damage of the prostate⁽²²⁾.

Increased total energy intake, energy-adjusted total protein intake, red meat, fat, milk and dairy products, cereals, bread, poultry, and starch potentially increase the risks of symptomatic benign prostatic hyperplasia. In contrast vegetables (particularly carotenoids such as tomatoes and carrots), and fruits potentially decrease the risks of benign prostatic hyperplasia⁽⁷⁸⁾. In the present study, increased intake of vegetables and fruits were significantly decrease the risk of benign prostatic hyperplasia, in agreement with other studies^(78,79,80). One potential explanation is that vegetables and fruits contain high levels of antioxidants, polyphenols, vitamins, minerals, and fiber that may play an important roles in altering inflammatory pathways associated with the pathogenesis of benign prostatic hyperplasia⁽⁸⁰⁾.

In agreement with Mayo Clinic⁽²⁸⁾, the most common complications associated with benign prostatic hyperplasia were; inability to empty bladder, Urgency, frequent and burning of micturition, daytime frequency, hematuria, and small weak urine stream. Also US National Library of Medicine, reported that, urinary retention (inability to void) is a serious complication of severe benign prostatic hyperplasia that requires immediate medical attention. Urinary retention can be a sign of obstruction in the bladder. Bladder obstruction can cause kidney damage, bladder stones, urinary tract infections, blood in the urine, and incontinence as urine dribbles out in small amounts⁽⁸⁾. The results of the current study showed that, there was no association between occupation, education, marital status, number of wives and presence of benign prostatic hyperplasia

V . Conclusions

In conclusion; the findings of the current study revealed that: The benign prostatic hyperplasia is a high prevalent disease among men. Factors that potentially increase the risk of benign prostatic hyperplasia were; old age, positive family history, black skin, smoking, obesity, diabetes mellitus, cardiac diseases, hypertension, and dyslipidemia. Factors that potentially decrease the risk of benign prostatic hyperplasia were; more frequent practice of sex, practice of physical activity, and increased intake of vegetables and fruits. There was no association between occupation, education, marital status, number of wives, renal disease, chest disease, alcohol intake and presence of benign prostatic hyperplasia.

VI . Recommendation

According the results of the current study the following recommendations are suggested: Intensifying health education campaign to raise public awareness about, factors that potentially increase and decrease the risk of benign prostatic hyperplasia. Screening programs for all people at a higher risk are required to ensure early presentation of benign prostatic hyperplasia. More in depth studies researching all aspects of benign prostatic hyperplasia are needed to highlight the best prevention strategy and to improve patient care. Engorgement and

acceptance the concept of lifestyle alterations. Increase the amount of fresh fruit and vegetables in the daily foods. Increase the level of physical activity through 30 minutes moderate activity per day at least 5 times a week.

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