

Original Article

Factors Related to Medication Adherence in Patients with Benign Prostatic Hyperplasia

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ABSTRACT

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Objectives: This study is a descriptive survey research aimed at identifying the factors associated with medication adherence in patients with benign prostatic hyperplasia. **Methods:** Data were collected from October to December 2023, including 120 men diagnosed with BPH at the urology department of a general hospital located in U city, Gyeonggi-do. **Results:** The findings indicated that higher medication adherence was associated with older age and a greater number of comorbid chronic diseases. Furthermore, higher levels of family support and medication self-efficacy were found to significantly correlate with better medication adherence. **Conclusions:** Based on these results, nursing interventions should be developed to enhance factors associated with medication adherence. Additionally, it is necessary to develop various family counseling programs to strengthen family support and implement comprehensive health promotion programs.

Keywords: Benign prostatic hyperplasia, Family support, Medication adherence, Self-efficacy for medication use

1. Introduction

Benign Prostatic Hyperplasia (BPH) is a urological condition caused by the abnormal proliferation of the prostate gland, which can obstruct urine flow [1]. In South Korea, it is one of the most common diseases among men. Due to increasing social interest and the emphasis on health management, the number of patients visiting hospitals is steadily rising [2]. Medication is the primary treatment, and individuals experiencing related symptoms, such as voiding dysfunction, are encouraged to seek medical care rather than ignore the condition [3].

To ensure the effectiveness of the treatment, patients must maintain consistent medication intake without arbitrary discontinuation [4]. However, most men tend to view BPH as a natural consequence of aging rather than a life-threatening illness [5], leading them to accept it as

a normal part of daily life [6]. Such perceptions diminish therapeutic urgency, thereby increasing the risk of intentional non-adherence compared to other chronic diseases. Thus, identifying specific psychosocial determinants is essential to improve adherence in BPH patients.

Medication adherence is a critical concept that has been emphasized in the management of chronic diseases [7]. A chronic disease refers to a condition where symptoms persist for more than three months, requiring continuous treatment and nursing care [8]. According to Statistics Korea, the prevalence of BPH among men from 2017 to 2020 was the fourth highest among chronic diseases, following hypertension, diabetes, and hyperlipidemia, peaking at 20.8% in 2017 [9].

Since chronic diseases are difficult to cure completely, consistent medication management is essential [6]. self-efficacy for medication use—the confidence in one's ability

to take medicine correctly [10]—positively influences the management of complex activities and problem-solving skills. Thus, it plays a vital role for chronic patients who must adhere to specific dosages, schedules, and precautions [11]. On an individual level, low adherence leads to negative health outcomes and disease aggravation, while on a national level, it increases overall medical expenses [12].

Previous studies on patients with BPH include Moon's (2009) research on the impact of age, education, and lifestyle on health-related quality of life [13], and Kim's (2016) study identifying that smaller prostate size and fewer symptoms correlate with higher quality of life [14]. Most existing literature has focused on discomfort and quality of life due to lower urinary tract symptoms, while research identifying the specific factors associated with medication adherence remains scarce.

2. Methods

2.1. Study Design and Participants

This study is a descriptive survey study aimed at identifying the factors associated with medication adherence in patients with BPH. Data were collected at a general hospital in U city, Gyeonggi-do, after receiving approval from the Institutional Review Board (IRB No: UC23QASI0121). Between October and December 2023, the researcher selected participants in the outpatient waiting area who met the inclusion criteria: men diagnosed with BPH who had been on medication for at least three months and were capable of communication. Individuals with a history of urological surgery, cancer diagnosis, or those undergoing chemotherapy or radiation were excluded.

2.2. Measurements

2.2.1. Medication adherence

Measured using the ARMS-K, a Korean version translated by Han (2016) [15]. It consists of 12 items, including 8 items on the intent to adhere (frequency of missing doses) and 4 items on the Refill adherence (planning before medication runs out). Items are rated on a 4-point Likert scale. After reverse-coding negative items, higher total scores (range: 12-48) indicate higher medication adherence.

2.2.2. Self-efficacy for medication use

Measured using the SEAMS developed by Risser et al.

(2007) [16] and translated by Kim and Kim (2018) [17]. This 13-item tool assesses confidence in medication adherence during various situations, such as traveling, doctor changes, or experiencing side effects. Rated on a 3-point scale, higher total scores (range: 13-39) indicate higher self-efficacy for medication use.

2.2.3. Family support

Measured using the tool developed by Kang (1985) [18]. It consists of 11 items assessing the perceived degree of love, trust, and care from family members. Although this tool was developed some time ago, it was selected because it effectively reflects the cultural context of Korean family dynamics and has been consistently validated for its reliability and validity in numerous domestic nursing studies. It uses a 5-point Likert scale, with higher total scores (range: 11-55) indicating stronger family support.

2.3. Statistical analysis

Data were analyzed using SPSS 26.0. Descriptive statistics (frequency, percentage, mean, and standard deviation) were calculated. Differences were analyzed using t-tests and ANOVA with the Scheffé test for post-hoc analysis. Relationships between variables were examined using Pearson's correlation coefficients and multiple linear regression analysis.

3. Results

3.1. General characteristics of participants

The general characteristics of the participants are presented in Table 1.

Regarding age, 50.8% (n=61) were aged 60-69, followed by 20.0% (n=24) aged 50-59, 16.7% (n=20) aged 70 or older, and 12.5% (n=15) aged 49 or younger. In terms of marital status, 76.7% (n=92) were married, 7.5% (n=9) were unmarried, and 15.8% (n=19) were in other categories. For living arrangements, 65.0% (n=78) lived as a couple only, 21.7% (n=26) lived with two or more generations, 9.2% (n=11) lived alone, and 4.2% (n=5) were in other arrangements. Regarding economic status, 69.2% (n=83) reported "Middle", 27.5% (n=33) "Low", and 3.3% (n=4) "High". The number of comorbid chronic diseases was 0 for 45.0% (n=54), 1 for 31.7% (n=38), 2 for 16.7% (n=20), and 3 or more for 6.7% (n=8). The most common chronic diseases (multiple responses) were hypertension (42.3%), diabetes (29.8%), and hyperlipidemia (23.1%). The average

daily sitting time was 4.9 hours, with 85% (n=102) sitting for less than 8 hours per day.

Table 1. General characteristics of Participants (N=120)

Variables		n(%)	M ± SD
Age (years)	≤ 49	15(12.5)	60.8±9.62
	50-59	24(20.0)	
	60-69	61(50.8)	
	≥ 70	20(16.7)	
Marital Status	Unmarried	9(7.5)	
	Married	92(76.7)	
	OTHER	19(15.8)	
Living Arrangement	Alone	11(9.2)	
	Couple only	78(65.0)	
	Two or more generations	26(21.7)	
	Other	5(4.2)	
Economic Status	High	4(3.3)	
	Middle	83(69.2)	
	Low	33(27.5)	
Smoking Status	No	63(52.5)	
	Former smoker	34(28.3)	
	Current smoker	23(19.2)	
Alcohol Consumption	No	73(60.8)	
	Yes	47(39.2)	
Caffeine Intake	No	54(45.0)	
	Yes	66(55.0)	
Exercise	No	57(47.5)	
	Yes	63(52.5)	
Chronic Disease Count(count)	0	54(45.0)	0.9±.98
	1	38(31.7)	
	2	20(16.7)	
	≥ 3	8(6.7)	
† Chronic Disease	Hypertension	44(42.3)	
	Diabetes mellitus	31(29.8)	
	Dyslipidemia	24(23.1)	
	Other	5(4.8)	
Sleep Duration (hours/day)	<6 hours	25(20.8)	6.7±1.54
	≥ 6 hours	95(79.2)	
Sitting Time (hours/day)	<8 hours	102(85.0)	4.9±2.72
	≥ 8 hours	18(15.0)	

† Multiple responses included.

3.2. Levels of medication adherence, self-efficacy for medication use, and family support

The mean scores and normality distribution of the variables are shown in Table 2.

The mean score for medication adherence was 43.9±4.14 (out of 48). Self-efficacy for medication use was 32.4±7.68 (out of 39), and Family support was 19.8±7.95 (out of 55). Normality was assessed using skewness and kurtosis; all variables met the criteria (skewness < |3|, kurtosis < |10|), confirming a normal distribution [19].

Table 2. Levels of measured variables (N=120)

Variables	M ± SD	Min-Max	Skewness	Kurtosis
Medication adherence	43.9±4.14	12-48	-1.99	5.21
Self-efficacy for medication use	32.4±7.68	13-39	-1.01	0.00
Family support	19.8±7.95	11-47	1.17	1.64

3.3. Differences in measured variables by general characteristics

Differences in the study variables by general characteristics are presented in Table 3. Medication adherence was significantly higher as age increased ($F = 3.662$, $p = .015$) and as the number of comorbid chronic diseases increased ($F = 4.762$, $p = .003$). Post-hoc analysis for age revealed that the "70 or older" group had higher adherence than the "49 or younger" group. Regarding the number of chronic diseases, the "3 or more" group showed the highest adherence compared to the "0" group.

Self-efficacy for medication use was significantly higher as economic status increased ($F = 7.419$, $p = .001$). Post-hoc analysis showed that the "High" income group had significantly higher self-efficacy than the "Middle" or "Low" groups.

Family support was significantly higher among those living as a couple only ($F = 8.132$, $p < .001$), those with higher economic status ($F = 5.900$, $p = .004$), and those with longer daily sitting times ($t = 2.619$, $p = .010$). Post-hoc analysis for living arrangements showed that participants living with family had higher support, with the "Couple only" group reporting the highest levels compared to the "Two or more generations" group. For economic status, the "High" group showed higher support than the "Middle" or "Low" groups. Participants in the "8 hours or more" sitting time group reported higher family support.

3.4. Correlations among medication adherence, self-efficacy for medication use, and family support

The correlations between the variables are presented in Table 4. Medication adherence showed a statistically significant positive (+) correlation with self-efficacy for medication use ($r = 0.295$, $p < .001$) and Family support ($r = 0.245$, $p < .001$). Its sub-domains, "Intent to adhere" ($r = 0.758$, $p < .001$) and "Refill adherence" ($r = 0.635$, $p < .001$), also showed significant positive correlations. Furthermore, a significant positive (+) correlation was found between self-efficacy for medication use and Family support ($r = 0.377$, $p < .001$). Specifically, "Intent to adhere" correlated

Table 3. Differences in medication adherence, self-efficacy for medication use, and family support by general characteristics (N=120)

Variables	Medication adherence					Self-efficacy for medication use				Family support					
	M	± SD	t or F	p	Scheffé	M	± SD	t or F	p	Scheffé	M	± SD	t or F	p	Scheffé
Age	≤49 ^a	40.9 ± 6.60	3.662	.015	d>a	29.8 ± 8.28	.764	.516			19.9 ± 9.99	1.428	.238		
	50-59 ^b	42.1 ± 4.34				32.5 ± 7.26					18.4 ± 5.34				
	60-69 ^c	43.9 ± 3.46				32.6 ± 7.73					19.3 ± 8.70				
	≥70 ^d	44.7 ± 2.56				32.4 ± 7.71					23.0 ± 5.83				
Marital status	Unmarried	40.9 ± 7.22	1.113	.202		32.9 ± 8.13	.914	.363			20.5 ± 8.48	1.250	.214		
	Married	44.5 ± 3.45				31.6 ± 6.95					18.7 ± 6.98				
	OTHER	42.8 ± 4.70				28.0 ± 10.07					26.9 ± 9.73				
Living arrangement	Alone ^a	44.4 ± 2.62	0.054	.948		27.6 ± 8.85	1.698	.171			20.2 ± 7.60	8.132	.000	b,c>a,d	
	Couple only ^b	44.0 ± 3.56				32.9 ± 7.18					29.4 ± 12.60				
	Two or more generations ^c	43.9 ± 5.71				33.2 ± 7.96					27.2 ± 10.36				
	Other ^d	43.2 ± 6.10				31.8 ± 9.93					18.0 ± 6.30				
Economic status	High ^a	45.1 ± 3.86	.722	.397		34.1 ± 6.28	7.419	.001	a>b,c		23.7 ± 10.68	5.900	.004	a>b,c	
	Middle ^b	44.1 ± 3.98				32.5 ± 7.51					18.3 ± 7.80				
	Low ^c	43.4 ± 4.58				28.3 ± 9.41					18.3 ± 6.04				
Chronic disease Count	0 ^a	42.7 ± 3.84	4.762	.003	d>a	32.5 ± 7.83	.229	.876			20.8 ± 8.02	0.516	.672		
	1 ^b	43.7 ± 3.53				31.7 ± 8.01					19.2 ± 8.11				
	2 ^c	43.9 ± 2.43				33.5 ± 6.93					19.1 ± 5.22				
	≥3 ^d	44.6 ± 8.07				32.5 ± 8.04					18.0 ± 12.25				
Sitting time	<8 hours ^a	42.7 ± 3.67	0.555	.646		32.8 ± 7.41	2.246	.027			19.0 ± 7.22	2.619	.010	a<b	
	≥8 hours ^b	44.6 ± 6.12				30.2 ± 9.01					24.2 ± 10.39				

Note. Smoking status, alcohol consumption, caffeine intake, exercise, and sleep duration were not significantly associated with medication adherence, self-efficacy, or family support

Table 4. Correlations among medication adherence, self-efficacy for medication use, and family support (N=120)

Variables	Medication adherence	Intent to adhere	Refill adherence	Self-efficacy for medication use	Family support
	r(p)				
Medication adherence	1				
Intent to adhere	0.758 (<.001)	1			
Refill adherence	0.635 (<.001)	0.798 (<.001)	1		
Self-efficacy for medication use	0.295 (<.001)	0.229 (0.013)	0.278 (<.001)	1	
Family support	0.245 (<.001)	0.338 (<.001)	0.135 (0.014)	0.377 (<.001)	1

positively with self-efficacy for medication use ($r = 0.229$, $p = 0.013$) and Family support ($r = 0.338$, $p < .001$). "Refill adherence" also showed significant positive correlations with self-efficacy for medication use ($r = 0.278$, $p < .001$) and Family support ($r = 0.135$, $p = 0.014$).

3.5. Factors associated with medication adherence

Multiple regression analysis was conducted to identify factors associated with medication adherence Table 5. The regression model was statistically significant

($F = 3.826$, $p < .001$) with an explanatory power of 19.5% (Adjusted $R^2 = .195$). Durbin-Watson was 2.196, confirming independence, and no multi-collinearity issues were found. Factors significantly associated with medication adherence in patients with Benign Prostatic Hyperplasia included age ($\beta = .33$, $p = .014$), Family support ($\beta = .33$, $p = .014$), number of chronic diseases ($\beta = .25$, $p = .004$), Self-efficacy for medication use ($\beta = .20$, $p = .038$), economic status ($\beta = .19$, $p = .040$), and sitting time ($\beta = .19$, $p = .032$). age and family support were the strongest predictors of adherence.

Table 5. Factors associated with medication adherence (N=120)

Variables	B	SE	β	t	p
Age	3.683	1.474	0.334	2.499	0.014
Living arrangement	1.975	1.359	0.179	1.454	0.149
Economic status	0.102	0.049	0.189	2.080	0.040
Sitting time	0.786	0.362	0.186	2.170	0.032
Chronic disease count	4.158	1.417	0.252	2.934	0.004
Self-efficacy for medication use	0.106	0.051	0.197	2.100	0.038
Family support	0.418	0.167	0.333	2.498	0.014

$F = 3.826, R = 0.441, Adjusted R^2 = 0.195$

4. Discussion

This study was conducted to identify the factors associated with medication adherence, focusing on general characteristics, self-efficacy for medication use, and family support among patients with BPH.

In this study, the level of medication adherence among patients with BPH was an average of 43.9 out of 48 points. This indicates a relatively high level of adherence compared to those in previous studies conducted on patients with other chronic diseases.

Among the general characteristics, age showed a statistically significant result in relation to medication adherence ($F = 3.662, p = .015$). Adherence was highest in those aged 70 and older, followed by the 60-69, 50-59, and under 49 groups. This suggests that medication adherence increases with age, likely because individuals aged 65 and older are more prone to health issues from chronic diseases, leading to a stronger correlation with adherence than in other age groups [20].

The number of comorbid chronic diseases also significantly influenced medication adherence ($F = 4.762, p = .003$). The "3 or more" group showed the highest level, followed by 2, 1, and 0. While this study confirmed that higher comorbidities are associated with higher adherence in this population, it has been noted that an increase in chronic diseases in the elderly can lead to non-adherence due to complex medication regimens and an increased number of pills [21].

Regarding self-efficacy for medication use, economic status showed a significant result ($F = 7.419, p = .001$). The "High" income group demonstrated the highest efficacy. While self-efficacy for medication use is a complex variable influenced by diverse factors, it is suggested that a higher monthly income reduces the financial burden of treatment

and maintains psychosocial well-being, which in turn enhances self-efficacy [22]. While this study identified key factors, applying theoretical frameworks like the Health Belief Model (HBM) in future studies could provide a more comprehensive understanding of the cognitive mechanisms underlying medication adherence in BPH patients.

In terms of Family support, living arrangements showed a significant result ($F = 8.132, p < .001$), with the "Couple only" group reporting the highest levels. This study emphasized the role of the family as a vital member of the care team. Families play a critical role as primary providers of active support, exerting a positive influence on the patient's health and well-being [23]. Therefore, further research focused on family-centered support is necessary.

The correlation analysis revealed that medication adherence has a significant positive (+) correlation with both self-efficacy for medication use ($r = 0.295, p < .001$) and Family support ($r = 0.245, p < .001$). High self-efficacy leads to better acceptance of medication, helping patients remember and follow their prescriptions accurately. Although medication adherence is influenced by complex factors, self-efficacy for medication use plays a vital role in explaining behavioral change and persistence [24].

In addition, age, economic status, sitting time, and the number of chronic diseases were identified as significant associated factors.

Comparing the standardized coefficients (β), age and family support emerged as the strongest predictors of medication adherence. Notably, the regression model confirmed that economic status significantly influenced medication adherence, indicating that patients with higher economic status are more likely to adhere to their medication regimens. Collectively, medication adherence levels were found to be significantly higher when age and economic status were higher, the number of chronic diseases was greater, sitting time was longer, and both self-efficacy for medication use and family support were high.

This study confirmed that family support is a crucial factor for medication adherence in patients with Benign Prostatic Hyperplasia.

5. Conclusion

In conclusion, medication adherence was influenced by factors such as age, economic status, sedentary time, and the number of comorbid chronic conditions; however, because these factors operate in complex ways, only a limited number showed statistically significant associations [24,25].

Higher levels of medication self-efficacy and family support were significantly associated with adherence, although

the instruments used in this study have been widely applied across research on various chronic diseases.

There is a lack of previous studies reporting these variables in patients with benign prostatic hyperplasia, which limits direct comparisons.

There is a need to develop assessment tools and appropriate nursing interventions tailored to improve medication adherence in patients with benign prostatic hyperplasia. This study is meaningful in that it identifies predictors of medication adherence in this population and provides a foundation for ongoing future research.

From a broader perspective, these findings highlight the importance of medication adherence in the management of chronic diseases and provide a basis for developing educational programs aimed at symptom relief and health promotion, taking into account levels of medication self-efficacy.

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Conflicts of Interest

The authors declare no conflict of interest.

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