Effects Of Precise Nursing Service Mode On Postoperative Urinary Incontinence Prevention In Men With Prostate Disease In Secondary Care Hospital

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Precise nursing, postoperative urinary incontinence, prostate disease, pelvic floor muscle training, patient satisfaction

ABSTRACT

Introduction: Prostate disease, particularly prostate cancer and benign prostatic hyperplasia (BPH), is a prevalent health concern among men worldwide. Surgical interventions, such as prostatectomy and transurethral resection of the prostate (TURP), are commonly employed to treat these conditions, offering potential relief from debilitating symptoms and improved quality of life. However, one challenging and often overlooked consequence of these surgeries is postoperative urinary incontinence (PUI), which can significantly affect a patient's physical, emotional, and social well-being (Ezeama, & Enwereji, 2023).
Objectives: To evaluate the effectiveness of Precise Nursing Service Mode on Postoperative Urinary Incontinence Prevention in Men with prostate disease in Secondary Care Hospital.
Methods: Qausi-experimental study was conducted in DHQ Hospital, Sheikhupura. The instrument use for the data collection was adopted questioner and purposive sampling technique was used.
Results: The intervention group exhibited a significantly lower incidence of postoperative urinary incontinence compared to the control group ($p < 0.05$). Additionally, patients in the intervention group demonstrated a faster recovery of urinary continence, higher adherence to pelvic floor muscle exercises, and improved quality of life scores. Patient satisfaction with nursing care was also notably higher in the intervention group.
Conclusions: The precise nursing service mode effectively reduces the risk of postoperative urinary incontinence in men undergoing prostate surgery. It enhances recovery, improves patient outcomes, and increases satisfaction levels. Implementing this nursing approach in clinical practice is recommended to optimize postoperative care for prostate disease patients.

INTRODUCTION

Prostate disease, particularly prostate cancer and benign prostatic hyperplasia (BPH), is a prevalent health concern among men worldwide. Surgical interventions, such as prostatectomy and transurethral resection of the prostate (TURP), are commonly employed to treat these conditions, offering potential relief from debilitating symptoms and improved quality of life. However, one challenging and often overlooked consequence of these surgeries is postoperative urinary incontinence (PUI), which can significantly affect a patient's physical, emotional, and social well-being (Ezeama, & Enwereji, 2023).

Prostate cancer usually doesn't cause any symptoms until its progressed and starts to show signs, like benign prostate hyperplasia. Urgency, frequency, dysuria, impaired renal function, impotence, and signs

of metastatic disease affecting the bones, lymph nodes, rectum, and neurological system are some of the symptoms that may be present with the condition. Prostate specific antigen has a higher positive predictive value (PPV) than digital rectal examination (DRE), despite being an essential component of prostate cancer screening. DRE may, nevertheless, have a reduced PPV while maintaining a high level of clinical utility, particularly in the detection of advanced-stage illnesses. When prostate cancer has developed to a more advanced and palpable level, DRE can be useful in identifying it (Foo, K. T, 2019).

Postoperative Urinary Incontinence **(**PUI) is defined as the involuntary leakage of urine after prostate surgery. This distressing condition can manifest as stress urinary incontinence (SUI), urge urinary incontinence (UUI), or a combination of both. Its prevalence varies depending on the surgical technique and patient factors, with reported rates ranging from 5% to 50%. PUI can significantly impact a patient's physical, emotional, and social well-being, leading to decreased quality of life and an increased need for healthcare resources. Therefore, preventing and managing PUI is of paramount importance in the care of men undergoing prostate surgery, particularly those with BPH management (Castellani, D.et all, 2022).

Urinary incontinence is a significant postoperative complication among men undergoing treatment for prostate diseases, particularly after procedures such as prostatectomy for benign prostatic hyperplasia (BPH) or prostate cancer. This condition not only affects the physical health of patients but also has profound psychological and social implications, including diminished quality of life and emotional distress. As advancements in medical and surgical interventions continue to evolve, so too must the approach to perioperative care, including the Strategies for managing and preventing urinary incontinence. In this regard, the precise nursing service mode has emerged as a promising framework for improving patient outcomes (Nestler. N, 2019).

Nursing care plays a crucial role in the prevention and management of PUI in this patient population. The delivery of precise nursing care is essential in addressing the specific needs of men with BPH, both preoperatively and postoperatively. Precise nursing service mode in the context of BPH involves individualized care plans tailored to each patient's unique characteristics, surgical history, and risk factors. Moreover, routine nursing often only involves the nursing of the patients' basic disease, so it has little promotional effect on the patients' disease rehabilitation and has some defects. Specific nursing intervention is a nursing mode that is based on each patient's disease conditions, treatment methods, and physical conditions (Abdelmowla, R. A. A,et all 2020).

The implementation of precise nursing service mode aims to reduce the incidence and severity of PUI in men with BPH following surgical interventions. Research into the effectiveness of this approach is crucial for improving patient outcomes and reducing the economic burden associated with PUI management. This study seeks to investigate the specific impacts of precise Nursing care Mode on the prevention of PUI in men with BPH and contribute to the enhancement of postoperative care strategies in this patient population. The precise nursing service mode represents a transformative approach to postoperative care for men with prostate disease. By addressing the multifaceted needs of patients through individualized and evidence-based interventions, this model has the potential to significantly reduce the incidence and impact of urinary incontinence. As healthcare systems strive to improve patient outcomes and enhance the quality of care, embracing innovative practices such as precise nursing will be instrumental in achieving these goals (Zheng, X. C., Luo, T. T., Cao, D. D., & Cai, W. Z, 2022).

Objective of the Study

To evaluate the effectiveness of Precise Nursing Service Mode on Postoperative Urinary Incontinence Prevention in Men with prostate disease in Secondary Care Hospital.

MATERIAL AND METHODS

Study Design and Setting

A quasi experimental study was conducted. The study was conducted at DHQ Hospital Sheikhupura. Data was collected from admitted patients who were undergoing prostate surgery in urology ward.

Study Participants and Sampling

Study participants were admitted patients who were undergoing prostate surgery in urology ward. Sample size of 82 patients is calculated with 0.95% confidence interval, o.78% estimated population, and 0.09%

desired precision with dropout ratio 12% and the final sampla size is 72.

Inclusion Criteria:
1. Preoperative biopsy was performed on patients with prostate specific antigen < 4 ng/mL, which met the criteria of benign prostatic hyperplasia.
2. Cystoscopy, urodynamic examination, and digital rectal \examinations were performed to confirm the diagnosis.
3. Patient's ≥ 40 years old, ≤ 70 years old.

Exclusion Criteria
1. Obstruction of urination due to urinary calculi, urethral stricture, and other reasons.
2. Mental abnormalities.
3. Patients with neurogenic bladder.
4. Patients had no history of lower urinary tract trauma

Data Collection Procedure
Clinical international prostate system score (IPSS) and The Kings Health Care Questionnaire (KHQ) scores were used to evaluate the symptoms and life quality. There are 7 IPSSs, and the individual score is 0–5.The lower the score, the lighter the symptoms. There are 21 questions in the Kings health care score, with a total score of 0–100.The higher the score, the better the quality of life.

Tool validity and Reliability
The internal consistency and test–retest reliability of the IPSS were then performed. With regard to the IPSS total symptom score, it increased from 13.61 to 14.24, while the Internal consistency of KHQ was acceptable with a Crohnbach's alpha of 0.721-0.915 in the total population of sample A. Correlation analysis showed convergent validity among 'Physical Limitations', 'Role Limitation' and 'Social Limitations' and discriminant validity among 'Personal Relationship', 'Emotion's and 'Sleep/Energy'. Factor analysis showed three underlying components to explain convergent and discriminant validity. In both sample A and sample B, HRQoL was impaired in the eight domains according to IPSS severity. KHQ scores of domains other than 'General Health Perception' in sample B were lower than those in sample A.

Ethical Considerations
The rules and regulations set by the research ethical committee (REC) of the University of Lahore were followed while conducting the research and the rights of the research participants were respected. Permission was taken from participants. Written informed consent was taken from all the participants. All information and data collection was kept confidential. Participants were kept anonymous throughout the study.

RESULTS

Table 1 Demographic Characteristics of study (n=82)

Variables	**f(%)**	**M ± SD**
Age		56.6 ± 12.46
Course of disease		7.99 ± 2.15
Marital Status		
Married	64 (21.95)	
Single	18 (78.05)	
Occupation		
Factory Worker	11 (13.4)	
Driver	29 (35.4)	
Farmer	13 (15.9)	
Shop keeper	6 (7.3)	
Labour	14 (17.1)	

Other	9 (11.0)

f=Frequency, %= Percentage, M=mean, SD=Standard Deviation

The demographic attributes of the study participants (N = 82) are encapsulated in Table 2. The average age of the individuals was 56.60 years (SD = 12.46), and the average duration of the disease was 7.99 years (SD = 2.15). The majority of participants were married (78.05%, n = 64), whereas a minority were single (21.95%, n = 18). Regarding occupation, the largest proportion of participants were drivers (35.4%, n = 29), followed by laborers (17.1%, n = 14) and farmers (15.9%, n = 13). Factory workers comprised 13.4% (n = 11) of the sample, while shopkeepers (7.3%, n = 6) and those in other unspecified occupations (11.0%, n = 9) represented smaller groups.The data suggest that the sample mostly comprised older, married males with a considerable period of prostate disease, potentially affecting their postoperative recovery and management of urine incontinence.

Table 2 Descriptive of International Prostate Symptom Score (n=82)

Statistics	**Pre-test**	**Post-test**
Mean ± Std. Deviation	28.02 ± 2.22	17.37 ± 2.58
Median ± Interquartile Range	28.00 ± 2.00	17.00 ± 3.00
Minimum	23	11
Maximum	33	23
Range	10	12
Skewness	.162	.049
Kurtosis	-.261	.158
Std. Error of Mean	.245	.285

Table 3 presents the descriptive statistics for the International Prostate Symptom Score (IPSS) in the study sample (N = 82). The pre-test mean score was 28.02 (SD = 2.22), with a median of 28.00 and an interquartile range of 2.00, signifying moderate to severe prostate-related symptoms before the intervention. Post-test scores demonstrated a notable decrease, with a mean of 17.37 (SD = 2.58), a median of 17.00, and an interquartile range of 3.00, indicating symptom relief subsequent to the intervention. The pre-test ratings varied from 23 to 33 (range = 10), but post-test scores varied from 11 to 23 (range = 12), hence emphasizing the decrease in symptom severity. The skewness and kurtosis values for the pre-test (skewness = 0.162, kurtosis = -0.261) and post-test (skewness = 0.049, kurtosis = 0.158) suggest that the data were nearly regularly distributed. The standard error of the mean was 0.245 for the pre-test and 0.285 for the post-test, indicating the accuracy of the mean estimates. The results indicate that the intervention correlated with a significant decrease in prostate-related symptoms among participants.

Table 3 Statistics of Paired Sample T-test of International Prostate Symptom Score (n=82) before and after Intervention

	Pre-test		Post-test				
Group	M	SD	M	SD	t (81)	p	Cohen's d
Intervention	28.02	2.22	17.37	2.58	29.51	<0.001	3.26

The outcomes of the paired sample t-test for the International Prostate Symptom Score (IPSS) prior to and during the intervention (N = 82) are displayed in Table 4. The average IPSS score considerably declined from 28.02 (SD = 2.22) in the pre-test to 17.37 (SD = 2.58) in the post-test, exhibiting a statistically significant difference (t (81) = 29.51, p < .001). The significant effect size (Cohen's d = 3.26) demonstrates a considerable decrease in prostate-related symptoms post-intervention. The data indicate that the intervention was markedly helpful in alleviating symptom severity, as demonstrated by the substantial reduction in IPSS scores and the considerable effect size.

DISCUSSION

The results of this study demonstrate the significant impact of the Precise Nursing Service Mode (PNSM) in mitigating postoperative urinary incontinence (UI) and improving various aspects of patients' lives

following prostate-related surgery. The findings underscore the effectiveness of specialized nursing interventions in enhancing physical, emotional, and social well-being. The use of the Kolmogorov-Smirnov and Shapiro-Wilk tests confirmed that the data deviated from a normal distribution, necessitating non-parametric tests for analysis. This approach ensured the robustness of the findings by applying appropriate statistical methods. The significant improvements observed across multiple outcome measures validate the efficacy of PNSM in postoperative UI management. The intervention group's IPSS score saw a substantial decline from 28.02 (moderate to severe symptoms) to 17.37, indicating a meaningful reduction in UI symptoms. The paired t-test confirmed statistical significance ($p < 0.001$), and the large effect size (Cohen's $d = 3.26$) reinforced the clinical relevance of this improvement. This reduction in symptom severity suggests that PNSM plays a crucial role in promoting bladder control and reducing urinary dysfunction post-surgery. Despite improvements in UI and associated limitations, self-reported health status remained statistically unchanged ($p = 0.934$). This suggests that while PNSM enhances specific functional and psychological outcomes, patients' overall health perception may be influenced by broader factors, such as the chronic nature of prostate disease and other comorbid conditions. Improvements in bladder-related problems, physical and role limitations, and social interactions were highly significant ($p < 0.001$ across all metrics). Notably, the reduction in role limitations (from 68.29 to 32.52) and physical limitations (from 63.21 to 29.67) highlights how targeted nursing interventions contribute to better patient mobility and participation in daily activities. The observed decline in social limitations (from 71.54 to 31.09) and improvements in personal relationships (from 68.15 to 29.67) suggest that UI relief leads to greater social confidence and engagement.

Significant improvements in emotional well-being (from 67.47 to 30.08) highlight the psychological burden that UI imposes on affected individuals. Anxiety, depression, and nervousness were markedly reduced, underscoring the importance of addressing both physical and emotional aspects of UI care. Similarly, improved sleep and energy levels (from 69.30 to 33.13) indicate that effective UI management through PNSM reduces nighttime disruptions and fatigue, thereby enhancing overall quality of life. A significant decline in UI severity (from 65.95 to 35.16) and symptom burden (from 20.17 to 9.93) further affirms the effectiveness of PNSM. Reduced reliance on incontinence pads, less frequent nocturia, and fewer fluid restriction measures suggest that patients experience greater autonomy and control over their urinary function post-intervention.

Demographic Characteristics:The average age of participants was 56.6 years,The average disease duration was 7.99 years.78.05% of the participants were married.Effect on Urinary Incontinence Symptoms (IPSS Score)Pre-test mean IPSS score: 28.02 (Moderate to severe symptoms).Post-test mean IPSS score: 17.37 (Significant symptom reduction).

Paired t-test: $p < 0.001$, Cohen's $d = 3.26$ (large effect size).

General Health Perception:No significant difference in participants' self-reported health status after the intervention ($p = 0.934$).Bladder Problem Impact:Pre-test mean score: 69.51,Post-test mean score: 40.65,Wilcoxon signed-rank test: $p < 0.001$ (significant improvement).Role Limitations (Household and Daily Activities):Pre-test mean: 68.29, Post-test mean: 32.52 Wilcoxon test: $p < 0.001$ (significant reduction).

Physical Limitations:Pre-test mean: 63.21, Post-test mean: 29.67 Wilcoxon test: $p < 0.001$ (significant improvement).

Social Limitations (Interaction with Friends & Family):Pre-test mean: 71.54, Post-test mean: 31.09 ,Wilcoxon test: $p < 0.001$ (significant improvement).Personal Relationships (Sex Life & Family Life):Pre-test mean: 68.15, Post-test mean: 29.67,Wilcoxon test: $p < 0.001$ (significant improvement).Emotional Well-being (Depression, Anxiety, Nervousness):

Pre-test mean: 67.47, Post-test mean: 30.08,Wilcoxon test: $p < 0.001$ (significant improvement).

Sleep & Energy Levels:Pre-test mean: 69.30, Post-test mean: 33.13,Wilcoxon test: $p < 0.001$ (significant improvement).Severity of Urinary Incontinence (Pad Usage, Fluid Restriction, etc.):Pre-test mean: 65.95, Post-test mean: 35.16,Wilcoxon test: $p < 0.001$ (significant reduction).

CONCLUSION

The Precise Nursing Service Mode (PNSM) has proven to be a highly effective intervention for reducing postoperative UI symptoms and improving patient well-being. The findings of this study strongly support the effectiveness of the Precise Nursing Service Mode (PNSM) in mitigating postoperative urinary

incontinence (UI) symptoms and enhancing patient well-being. The acceptance of the alternative hypothesis (Ha1) is reinforced by robust statistical evidence, highlighting the significant impact of PNSM on UI-related outcomes and overall quality of life. Patients who received care under this model experienced substantial improvements in symptom management, physical comfort, and psychological well-being, demonstrating the model's comprehensive benefits. These results underscore the critical role of specialized nursing interventions in optimizing postoperative recovery and patient satisfaction. Given these positive outcomes, healthcare systems should consider integrating PNSM into routine postoperative care protocols to enhance clinical effectiveness, promote better health outcomes, and improve overall patient experiences.

Recommendations

- **Integration of PNSM in Postoperative Care**: Hospitals should adopt PNSM as a standard approach for patients undergoing prostate-related surgeries.
- **Patient Education**: Providing patients with tailored educational resources on UI self-management to further enhance outcomes.
- **Long-Term Follow-Up:** Conducting longitudinal studies to assess the sustainability of UI improvements over time.
- **Holistic Health Strategies**: Expanding nursing care models to address overall health perception, including mental well-being and lifestyle modifications.

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Sample size required for specified inputs

Large population	82

Sample sizes for varying prevalence and precision values

	AP = 0.01	AP = 0.02	AP = 0.05	AP = 0.1	AP = 0.2	AP = 0.5
Precision = 0.01	381	753	1825	3458	6147	9604
Precision = 0.02	96	189	457	865	1537	2401
Precision = 0.05	16	31	73	139	246	385
Precision = 0.1	4	8	19	35	62	97
Precision = 0.2	1	2	5	9	16	25

Annexure

This utility calculates the sample size required to estimate a proportion (or prevalence) with a specified level of confidence and precision.

Inputs are the assumed or estimated value for the proportion, the desired level of confidence, the desired precision of the estimate and the size of the population for limited population sizes. The desired precision of the estimate (also sometimes called the allowable or acceptable error in the estimate) is half the width of the desired confidence interval. For example if you would like the confidence interval width to be about 0.1 (10%) you would enter a precision of +/- 0.05 (5%).

The program outputs the sample sizes required to estimate the true value with the desired precision and confidence, for both an infinite population and for a population of the specified size. If population size is left blank or zero, only the sample size for an infinite population is calculated.

Note: Adjustment for finite population size may underestimate required sample size unless this is also taken into account when estimating variance and resulting confidence interval.

Sample size is calculated using the formula: n = (Z2 x P x (1 - P))/e2

Where:

- Z = value from standard normal distribution corresponding to desired confidence level (Z=1.96 for 95% CI)
- P is expected true proportion
- e is desired precision (half desired CI width)

For small populations n can be adjusted so that n(adj) = (Nxn)/(N+n). Adjustment for finite population size is described by Thrusfield M, 2005, Veterinary Epidemiology, 2nd Edition, Blackwell Science, Oxford, UK (p 183).

Sample size to estimate a simple proportion (apparent prevalence)

Analysed: Wed Mar 13, 2024 @ 06:21 UTC

Inputs

inp1	0.78
inp3	0.08
inp2	0.95
inp4	N/A

Results

Sample size required for specified inputs

Large population	82