Application of Family Participatory Nursing Care in an Elderly Patient with Urethral Malformation and Indwelling Catheter: A Case Report

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Abstract

Objective: To investigate the efficacy of a family participatory nursing model in preventing complications among elderly home-based patients with indwelling urinary catheters. Methods: By developing nursing objectives, plans, and implementation protocols, providing systematic training and guidance to caregivers, and conducting effectiveness evaluations and compliance surveys, the application effects of family participatory nursing in patients with urethral malformation and indwelling catheters were assessed, and nursing experiences were summarized. Results: The patient was an elderly home-based individual who, due to prostate hyperplasia and congenital moderate urethral malformation, had an indwelling catheter for over one year, during which no complications such as infection, hematuria, catheter blockage, or dislodgement occurred. Conclusion: The family participatory nursing model can effectively prevent and reduce complications in elderly home-based patients with long-term indwelling catheters, thereby improving patient quality of life and family well-being while positively contributing to enhanced nursing quality.

Full Text

Application of Family Participatory Nursing in an Elderly Patient with Urethral Malformation Undergoing Indwelling Catheterization

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Abstract

Objective: To explore the effectiveness of a family participatory nursing model in preventing complications among elderly patients with indwelling catheters at home.

Methods: Through establishing nursing objectives, care plans, and implementation protocols, combined with systematic training and guidance for caregivers, we evaluated the application effects of family participatory nursing in a patient with urethral malformation undergoing indwelling catheterization. The approach included structured training for caregivers and subsequent evaluation of outcomes and compliance.

Results: The patient was an elderly homebound individual who required indwelling catheterization for over one year due to benign prostatic hyperplasia and congenital moderate urethral malformation. During this period, no complications such as infection, hematuria, catheter blockage, or dislodgement occurred.

Conclusion: The family participatory nursing model can effectively prevent and reduce complications in elderly homebound patients with long-term indwelling catheters. This approach not only improves patients' quality of life and family well-being but also positively contributes to enhancing overall nursing quality.

Keywords: Family participatory care; Indwelling catheter; Elderly homebound patients; Moderate urethral malformation

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Introduction

The family participatory nursing model, a modern care approach centered on the family, promotes mutual communication among patients, families, and healthcare professionals [1]. Derived from family-centered care, this model emphasizes integrating willing family members into the nursing team through education and basic skills training, enabling them to better care for patients in hospitals, homes, or community settings [2]. Its core principle involves transforming family members from passive supporters into active participants in disease knowledge training and health education. Nurses not only provide health education about the disease but also train family members in basic nursing procedures and techniques, enabling them to participate in the entire process of daily care implementation. In recent years, this model has been widely applied in the care of premature infants and stroke patients, yielding significant results [3-4]. With the development of healthcare services and increasing strain on medical resources such as hospital beds, more patients are receiving rehabilitation at home, extending the family participatory nursing model into various nursing domains.

Indwelling catheters are widely used clinically for patients with urinary difficulties, surgical anesthesia, urine drainage, and urinary incontinence. As a common invasive procedure, indwelling catheterization carries risks of urinary tract infection, with infection rates rising in recent years [5]. As China's population ages, elderly individuals constitute the majority of patients discharged with indwelling catheters for home care. These patients and their caregivers often lack self-care knowledge and skills, frequently experiencing complications such as urinary tract infection, catheter blockage, bleeding, urinary leakage, and urethral injury. Survey results indicate that the current state of family catheter care for homebound patients in China is concerning, with catheter-associated infection rates reaching 40-50% in this population. When healthcare professionals inquire about home catheter care during complication-related visits, they find that patients and family members have incomplete knowledge of relevant information [6]. Therefore, this article focuses on sharing experiences regarding the application effects of the family participatory nursing model in preventing complications among elderly patients with indwelling catheters at home.

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1. Clinical Data

1.1 Patient Information The patient was an 85-year-old male who presented to our outpatient department one year ago with congenital moderate urethral malformation and urinary difficulty due to benign prostatic hyperplasia. The patient was alert and articulate with limited mobility in both lower extremities and moderate limitations in self-care abilities. He presented with hypospadias, posterior penile type, with the urethral meatus located at the posterior one-third of the penile shaft. He returned to our hospital for catheter replacement due to the presence of white flocculent material in the catheter for three days, accompanied by lower abdominal discomfort, urinary frequency, urgency, and dysuria, without fever. His caregiver accompanied him for the visit. The patient had a five-year history of benign prostatic hyperplasia and was taking finasteride 5mg orally once daily and tamsulosin hydrochloride sustained-release capsules 0.2mg orally once nightly. He denied other medical history and drug or food allergies.

Physical examination: Temperature 36.2°C, pulse 88 beats/min, respiration 20 breaths/min, blood pressure 140/70 mmHg. Following medical orders, an indwelling catheter was placed with monthly routine replacement and 500ml bladder irrigation with sodium chloride injection. Both the patient and family provided informed consent. During the home care period, nurses instructed the caregiver to provide basic nursing care, maintain personal hygiene, practice handwashing to avoid cross-infection, ensure catheter patency, and prevent kinking or compression. The caregiver was trained to establish daily drinking habits with fluid intake exceeding 2000mL per day, change urine bags weekly, and perform perineal scrubbing twice daily with iodophor. They were instructed to observe for urethral meatus redness, swelling, or discharge; monitor catheter

patency; check for dislodgement or urinary leakage; and observe urine color and characteristics. Weekly telephone follow-ups were conducted to monitor the situation and provide timely interventions. The result was that no complications such as infection, hematuria, catheter blockage, or dislodgement occurred during the one-year indwelling catheterization period.

1.2 Caregiver Information The caregiver was the patient's domestic helper, a 55-year-old female with junior high school education who had been working in this profession.

1.3 Catheterization Details On January 24, 2022, the patient's externally brought catheter was removed at our hospital. A small amount of white flocculent material was observed at the catheter tip, causing blockage. The patient and family were informed about indwelling catheter-related procedures and precautions. After obtaining patient consent, the family signed the informed consent form for indwelling catheterization. Catheterization was performed through the urethral meatus at the posterior one-third of the penile shaft, using a Shida three-lumen 18# silicone catheter inserted to a depth of 16cm. The procedure was successful, draining light yellow urine with a small amount of white flocculent material, followed by 500ml bladder irrigation with sodium chloride injection. The patient and family were instructed to return to our hospital monthly for catheter replacement and bladder irrigation. During home care, they were to change urine bags weekly and perform perineal scrubbing twice daily.

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2. Nursing Plan

2.1 Nursing Objectives The nursing objectives were: no redness, swelling, or discharge at the urethral meatus; maintenance of catheter patency without dislodgement, urinary leakage, hematuria, or urinary tract infection; caregivers achieving proficiency in home care knowledge and actively cooperating with nurses to complete family care according to standards; and patient and family satisfaction reaching over 95%.

2.2 Implementation Plans and Protocols

2.2.1 Daily Care Plan and Implementation The daily care protocol included: (1) Guiding patients to increase fluid intake to over 2000mL daily; (2) Maintaining clean and comfortable clothing and bedding, paying attention to personal hygiene, using showers or warm water sponge baths, drying the body with a clean towel, changing underwear frequently, and keeping the external genitalia clean.

2.2.2 Caregiver Professional Training Plan and Implementation The training program involved: (1) One-on-one professional training by responsible

nurses covering patient daily living guidance, indwelling catheter maintenance and precautions, and observation and management of complications; (2) Instruction on proper disinfection techniques, specifically perineal cleaning and disinfection twice daily; (3) Education on maintaining catheter patency by preventing kinking, compression, or pulling, properly securing the catheter during ambulation, and positioning the urine collection bag below the pubic symphysis to facilitate drainage; (4) Guidance on wearing side-opening pants when going out to prevent urinary reflux and infection, properly securing the collection bag to avoid dragging on the floor, maintaining cleanliness, and timely replacement. During bag changes, operators must pay attention to hand hygiene, master handwashing timing, reinforce handwashing steps, and strictly follow the seven-step handwashing technique to avoid cross-infection; (5) Nurses providing correct guidance and explanations of precautions using simple, understandable language, recording procedures, drawing flowcharts, and having caregivers repeat the steps to reinforce details, ensuring safe and correct care of the indwelling catheter and reducing infection risk.

2.2.3 Hospital Nursing Plan and Implementation The hospital nursing protocol included: (1) Establishing registration forms to accurately record specific dates for monthly catheter replacement and weekly urine bag changes; (2) Conducting telephone follow-up within one week after each monthly catheter replacement to assess whether fluid intake goals were met, whether twice-daily perineal care was performed, and to observe for redness, swelling, or discharge at the urethral meatus, catheter patency, dislodgement, urinary leakage, and urine color and characteristics. Weekly telephone follow-ups were performed to monitor the situation and address problems promptly.

2.2.4 Additional Caregiver Training and Guidance Additional training focused on: (1) Education on indwelling catheter knowledge, specifically explaining the patient's special urethral malformation structure and precautions for protecting the catheter tip to avoid improper manipulation; (2) Lifestyle guidance including maintaining clean clothing and bedding, personal hygiene, showering or sponge bathing, drying with clean towels, changing underwear frequently, and practicing hand hygiene during bag changes following the seven-step technique; (3) Proper disinfection techniques: Due to the urethral malformation with the meatus located at the posterior one-third of the penile shaft, iodophor was used for cleaning and disinfection after thoroughly removing debris. The procedure involved first washing the meatus with warm water, then using sterile cotton swabs with iodophor for cleaning and disinfection, and allowing natural drying [7]; (4) Catheter maintenance: Instructions on maintaining patency, preventing kinking, compression, and pulling; preventing blockage; properly securing the catheter during ambulation; positioning the collection bag below pubic symphysis and never above bladder level to prevent dislodgement and urinary reflux [8]; wearing side-opening pants when going out to prevent reflux; properly securing the bag; and maintaining cleanliness with timely replacement; (5) Fluid

intake goals: Establishing daily drinking habits with over 2000mL intake to achieve effective urinary tract flushing [8] and prevent urine concentration and sediment formation that could block the catheter.

2.3 Evaluation Indicators and Outcome Assessment Evaluation focused on: absence of redness, swelling, or discharge at the urethral meatus; catheter patency without dislodgement, leakage, hematuria, or urinary tract infection; caregivers' mastery of home care knowledge, catheter maintenance, and complication observation and management; and satisfaction levels of patients and families.

2.3.1 Caregiver Compliance Survey Telephone follow-up within one week after monthly catheter replacement assessed: achievement of fluid intake goals, performance of twice-daily perineal care, and observation for redness, swelling, or discharge at the urethral meatus.

2.3.2 Catheter Monitoring Monitoring parameters included: catheter patency, absence of dislodgement, leakage, hematuria, or urinary tract infection, and observation of urine color, volume, and characteristics.

2.3.3 Satisfaction Survey Weekly telephone follow-ups monitored the situation and enabled prompt problem resolution. A questionnaire survey completed by family members or caregivers assessed three aspects: knowledge of indwelling catheter care and precautions, daily maintenance and observation practices, and satisfaction with nursing guidance. This approach effectively improved family participatory nursing quality and data objectivity, enhanced family well-being, strengthened trust between patients, caregivers, and nursing staff, and further improved nurses' professional competence, communication skills, coordination abilities, and technical skills, thereby enhancing the overall quality of the nursing team.

Table 1 Compliance Survey Urethral meatus redness and swelling Urethral meatus discharge

Table 2 Catheter Monitoring Urine color and characteristics: clear light dark yellow, clear light yellow (repeated)

Table 3 Satisfaction Survey Indwelling catheter knowledge and precautions Daily maintenance and observation Satisfaction with nursing guidance

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4. Discussion

4.1 Current Status of Indwelling Catheters Long-term indwelling catheterization refers to catheterization exceeding 28 days, typically used for patients unable to effectively and safely empty their bladder or those with

urinary incontinence and mobility limitations. Approximately 90,000 patients in the UK have long-term indwelling catheters [9]. A foreign study showed that 3.8% of individuals over 65 in nursing homes have long-term indwelling catheters [10]. Given China's large population base, the number of patients with long-term indwelling catheters may be even greater.

Reports indicate that approximately 70% of urinary tract infections are directly related to indwelling catheters [11]. The "very elderly" refers to individuals over 80 years old, representing the most distinctive segment of the aging population and one of society's most concerning groups [12]. As China's population ages, elderly individuals constitute the majority of homebound patients with indwelling catheters. Due to degenerating tissue and organ function and weakened immunity, elderly patients with indwelling catheters are highly susceptible to urinary tract infections [13]. The current state of family catheter care for homebound patients in China is concerning, with catheter-associated infection rates reaching 40-50%, closely related to improper family care by primary caregivers [14]. Patients and families often fail to master indwelling catheter knowledge, leading to improper home care and high rates of catheter-related complications, consistent with relevant research findings [15-17]. Urinary tract infections and catheter-related complications not only increase patient suffering but also elevate the risk of other complications in elderly patients, significantly impacting prognosis and severely reducing quality of life. Therefore, effectively preventing and controlling catheter-associated urinary tract infections (CAUTI) and catheter-related complications in elderly homebound patients is an urgent issue for healthcare professionals.

4.2 Current Status of Family Participatory Nursing Model The family participatory nursing model is an approach where family members, after professional learning and guidance, can provide non-medical nursing care [18]. This model emphasizes family members' learning capacity for nursing knowledge. Through professional training and guidance from responsible nurses, family members can master relevant nursing knowledge early to care for patients. When family caregivers' skills meet requirements through assessment, they can provide more scientific and effective care, benefiting homebound patients [19].

With rapid advancements in modern medical technology, the collaborative care model involving family members was introduced from abroad, encouraging families to participate in basic nursing work and become primary caregivers. Research indicates that traditional disease-centered nursing has transformed into a people-centered philosophy, with the bio-psycho-social nursing model now widely applied. As the fundamental unit of society, the family plays a crucial supportive role in elderly patient populations.

This case study explored the effectiveness of implementing a family participatory nursing model to prevent complications in elderly homebound patients with indwelling catheters. Results demonstrated that through establishing nursing objectives, care plans, and implementation protocols, combined with systematic

caregiver training and guidance, followed by outcome evaluation and compliance assessment, the family participatory nursing model proved effective in patients with urethral malformation. The intervention enhanced caregivers' theoretical knowledge, technical skills, and execution capabilities, resulting in no complications such as urinary tract infection, hematuria, catheter blockage, dislodgement, or urinary leakage for over one year in this elderly homebound patient with urethral malformation. Patient and caregiver satisfaction with nursing guidance was reported as very high. These results indicate that implementing a family participatory nursing model for elderly homebound patients with long-term indwelling catheters can effectively prevent complications, improve quality of life, reduce complication rates, and enhance overall satisfaction, yielding significant social benefits.

In summary, implementing family participatory guidance for patients with indwelling catheters is an effective nursing model that reduces urinary tract infection rates and related complications. This approach positively impacts reducing healthcare facility utilization pressure, lowering medical costs, improving patient quality of life, enhancing family well-being, and increasing patient satisfaction. With its growing application, this model conserves medical resources, improves patients' quality of life, facilitates nurse-patient communication, and demonstrates good health, economic, and social benefits worthy of clinical promotion. Further research is needed to explore whether the family participatory nursing model has similar positive effects for other types of external medical devices.

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