Case Report

Roy's Adaptation Model-Based Nursing Approach for Patients with Vesicocutaneous Fistula – A Case Report

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ABSTRACT

A vesicocutaneous fistula, connecting the bladder to the skin surface, causes continuous urine leakage and leads to significant physical, psychological, and social impacts. The Roy Adaptation Model (RAM) is an appropriate nursing model that can be implemented for every patient in any clinical setting. RAM-guided nursing practice provides a systematic framework for delivering purposeful nursing care. The paper aims to describe a clinical case of a patient diagnosed with a vesicocutaneous fistula, using RAM to guide the nursing process. RAM-based assessment, nursing diagnosis, intervention and evaluation provided the foundation for the development of suitable and personalized nursing care for 58-year-old male patient with a vesicocutaneous fistula. The focus of nursing care for a patient with vesicocutaneous fistula based on RAM included maintaining fluid and electrolyte balance, improving nutritional status, protecting the skin around the fistula, controlling infection, providing health education and psychological support. RAM-guided nursing practice for a patient with vesicocutaneous fistula aided nurses in identifying nursing problems and the causes. But challenges in analyzing stimuli can lead to inaccurate diagnoses, overlapping interventions, and suboptimal outcomes.

KEYWORDS: Roy's adaptation model, nursing process, vesicocutaneous fistula, case report.

INTRODUCTION

A fistula involves an abnormal channel between two organs lined with epithelium[1]. Fistulas found in the abdomen are classified based on their location, discharge volume, and cause[2,3]. A vesicocutaneous fistula is an abnormal channel that forms between the bladder and the skin surface, causing continuous urine leakage[1,4,5].

The development of vesicocutaneous fistulas involves risk factors including malignancy, trauma (iatrogenic), radiation, inflammatory conditions, chemotherapy, and radiotherapy. Patients with advanced pelvic malignancies have a higher likelihood of developing urinary tract fistulas[6]. Based on previous studies, vesicocutaneous fistulas can occur in conditions such as bladder cancer, cervical cancer, prostate cancer, or other pelvic tissue cancers[6,7].

Vesicocutaneous fistulas can be treated conservatively or surgically, depending on the patient's comorbidities and clinical presentation[6]. Fistulas originating from partially dehiscence anastomosis can usually be closed with conservative management. Fistulas that cannot be closed are most likely caused by malignancy at the origin of the fistula. Lack of improvement with urinary diversion, the presence of malignancy, infection, and chronic drainage indicate the need for surgical intervention[7]. Managing urinary tract fistulas can be challenging, especially in patients with cancer, who often have very poor performance status. Complications are more likely in this group because the native tissue has been altered by radiation, inflammation, chemotherapy, and/or previous surgery[8,9].

Chronic urine leakage from a fistula can be a source of social embarrassment and an obstacle to proper hygiene. Complications, including pain and skin damage, can severely limit activities[10]. Vesicocutaneous fistula is a complex condition with physical, psychological, and social impacts that are challenging to manage.

The metaparadigm concept of Roy's Adaptation Model (RAM) is people, environment, health, and nursing[12,13]. This theory explains stimuli, which are factors that influence a person in any way. Three stimuli related to adaptation are focal, contextual, and residual. Behavior in physiological mode is a manifestation of the physiological activities of the human body, consisting of nine basic physiological requirements[12,13]. The self-concept mode relates to a person's feelings and beliefs regarding body sensations, image, personality, and moral-ethical-spiritual aspects. Role function involves a person's position in the family, community, or organization. Interdependence relates to a person's relationships and interactions with others[11].

The RAM is a nursing theory-based model which is considered appropriate to be implemented on every patient in clinical setting[12]. This study center on nurses' roles, clinical practices based on the RAM, and analysis of the RAM-guided nursing care for a particular case of the man with vesicocutaneous fistula. The patient is expected to adapt to the changes due to the symptoms of the vesicocutaneous

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fistula. Concrete adaptation includes engaging in multidisciplinary management to address disturbances such as physical wounds, reduced appetite, and discomfort, as well as adjusting psychosocially to cope with emotional challenges.

CASE REPORT

Data collection and patient care occurred at a hospital in Indonesia for two weeks between 09 - 21 April 2025. Verbal informed consent for publication was obtained and identity details were omitted to ensure confidentiality. Nursing care is provided using RAM when patients are in the inpatient ward. The model guides nursing care through a five systematic process, including: 1) assessment of behavior and stimuli, 2) diagnosis, 3) goal setting, 4) planning, 5) intervention and evaluation[12,13]. The nursing process covered the assessment in preoperative stage to evaluation of postoperative stages.

A male patient, 58 years old, was admitted to the hospital with a vesicocutaneous fistula. The patient was diagnosed with rectal adenocarcinoma nine months before and underwent abdominoperineal resection with end colostomy. A week before being admitted to the hospital, pus was discharged from the lower abdomen, where the patient had undergone surgery. The patient visited a health service and received wound care. For a week, the patient experienced urine-like fluid leakage from the lower abdomen where he had previously undergone surgery. Other complaints included pain in the anal region, decreased appetite, and coughing. The patient's medical history included bladder exploration surgery, vesicolithotomy, and insertion of a right DJ stent, as well as reimplantation of the right ureter due to right hydroureter and vesicolithiasis.

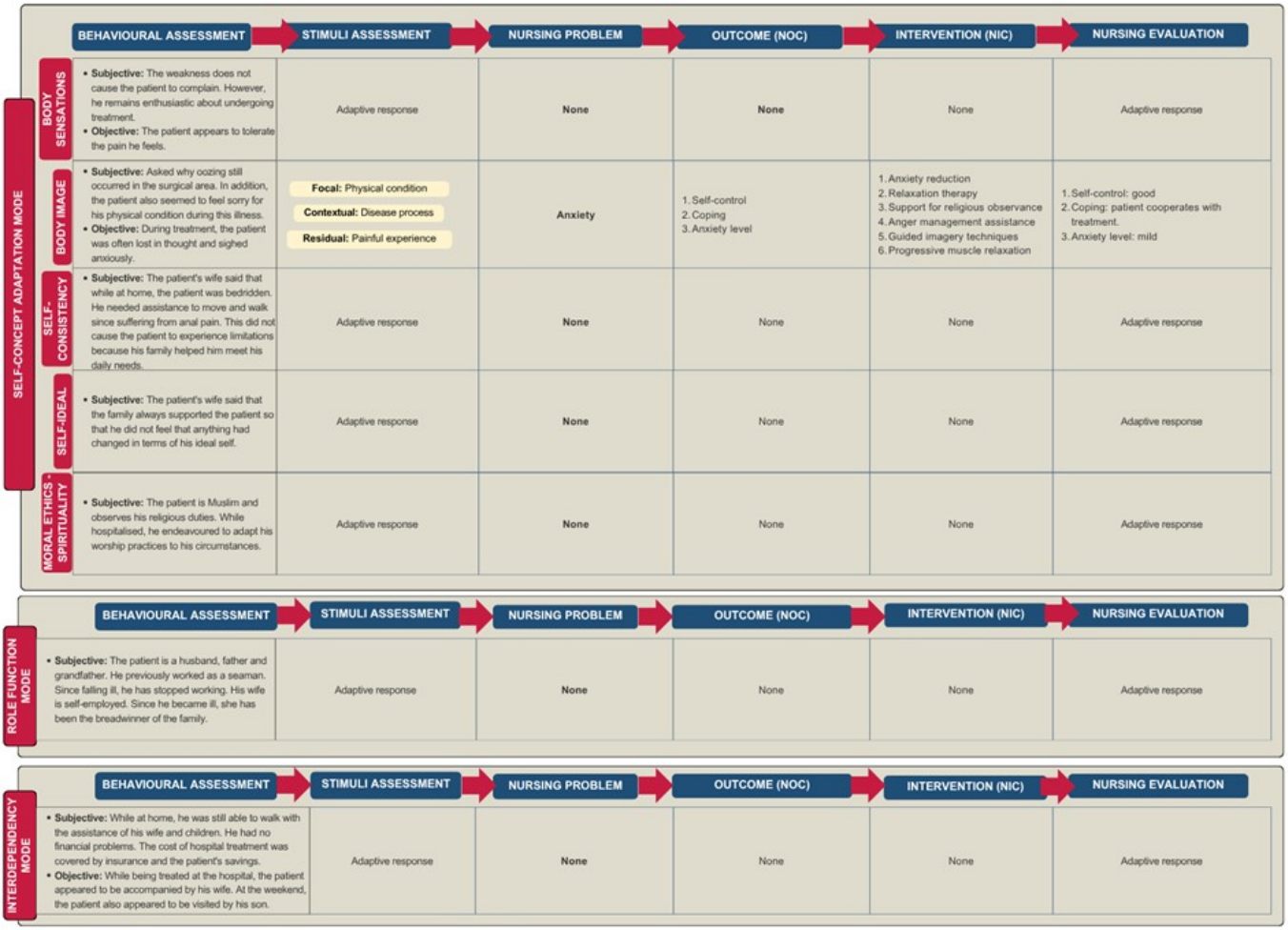
During the assessment, the patient had a stoma bag attached to an open hole in the pubic symphysis that discharged clear yellow urine-like fluid. The patient appeared weak. Patient reported spontaneous urination 5 times a day, clear, yellow urine, no blood, no pain during urination, and no lower back pain. Defecation and flatus were through a colostomy. Stoma assessment revealed an oval-shaped end colostomy in the lower left hemiabdomen with a stoma bag attached; a pink stoma, 4 cm in diameter, with a smooth, moist surface; 100 ml of brownish, fibrous stool; no bleeding; and the bag in good condition, well attached. Nodules were found in the external anal region at the 3 o'clock position, approximately 1 cm, oval in shape, firm in consistency, tender to touch, and without spontaneous bleeding. Urinalysis test result: albumin positive 2, pH 7.5, blood positive 3, leukocytes positive 2, erythrocytes 358.7 /uL, bacteria 79958.5 /uL, and leukocytes: 912.5 /uL.

RESULT AND DISCUSSION

The implications of Roy's adaptation model in nursing care for patients with vesicocutaneous fistula are presented in the following table:

Table I: Implication of Roy's Adaptation Model in Clinical Nursing Care

	BEHAVIOUR ASSESSMENT	STIMULI ASSESSMENT	NURSING PROBLEM	OUTCOME (NOC)	INTERVENTION (NIC)	NURSING EVALUATION
PHYSIOLOGICAL ADAPTATION MODE – OXYGENATION	• **Subjective:** Cough with sticky, phlegmy sputum. History of active smoking. • **Objective:** Respiratory rate 19 breaths/minute, SpO2 97% in room air.	**Focal:** Hypersecretion of the airways **Contextual:** Bacterial inflammatory process **Residual:** Smoking history	**Ineffectiveness of airway clearance**	1. Airway patency 2. Respiratory rate 3. Oxygen saturation 4. Breath sounds 5. Amount and color of sputum	1. Effective Coughing Exercises 2. Breathing Management 3. Respiratory Monitoring 4. Positioning 5. Positioning Education	1. Airway: Clear, no aspiration, no cyanosis 2. Respiratory rate: 20 bpm 3. SpO2: 95% on room air 4. Breath sounds: Vesicular 5. Additional breathing sounds: None 6. Sputum: Minimal, cloudy and thick
NUTRITION	• **Subjective:** Decreased appetite. Weight loss. • **Objective:** Weight 45 kg, height 170 cm, Body Mass Index 15.6 (underweight), waist 80 cm, upper arm 21 cm. Serum albumin 2.63 g/dL, total protein 5.7 g/dL.	**Focal:** Decreased food intake **Contextual:** Hypermetabolism **Residual:** Anorexia	**Nutritional imbalance: less than the body's requirements**	1. Nutritional status 2. Blood albumin 3. Total protein 4. Haemoglobin 5. Haematocrit	1. Nutrition management 2. Parenteral nutrition management 3. Nutrition monitoring 4. Diet education	1. Nutritional status: malnutrition 2. Blood albumin: 2.49 g/dL 3. Total protein: - g/dL 4. Hemoglobin: 10.8 g/dL 5. Hematocrit: 33.1%
ELIMINATION	• **Subjective:** Oozing from a hole in lower abdomen, a scar from a previous operation. • **Objective:** A fistula in the centre of abdomen covered by a stoma bag. Production of fluid resembling urine.	**Focal:** Bladder fistula **Contextual:** Urinary tract infection **Residual:** Malignancy	**Persistent urinary incontinence**	1. Kidney function (Ur/Cr/eGFR) 2. Urine output 3. Diuresis 4. Balance	1. Urinary catheterisation 2. Urinary incontinence care 3. Urinary catheter care 4. Perineal care 5. Support for self-care with urination	1. Kidney function (Ur/Cr/eGFR: 58.5/ 2.27/ 30.87) 2. Urine output: 500 ml slightly cloudy yellow
ACTIVITIES & REST	• **Subjective:** Mobilisation and movement in bed with assistance. Unable to sit due to pain in the anal area. • **Objective:** Barthel Index: 10 (moderate dependence).	**Focal:** Chronic pain in the anal region **Contextual:** - **Residual:** Lack of knowledge about mobility strategies	**Mobility barriers in bed**	1. Mobility: (Independent/Assistive devices/Assistance from others) 2. Functional level 3. Muscle strength 4. Willingness to move 5. Initiation of positioning	1. Ambulatory Support 2. Mobilisation Support 3. Self-Care Support 4. Bed Rest Care 5. Ankle Pump Exercise Therapy	1. Mobility: Assistance from others 2. Functional Level: 2 3. Muscle strength: Upper 5555|5555. Lower 5555|5555. 4. Willingness to move: Yes 5. Positioning initiation: Minimal 6. Barthel Index: 6 (severe dependence)
PROTECTION	• **Subjective:** Fluid discharge from the lower mid-abdomen. • **Objective:** There is a fistula in the middle of the abdomen covered by a stoma bag. Clear yellow fluid resembling urine is produced.	**Focal:** Inflammatory process **Contextual:** Changes in nutritional status **Residual:** History of surgery and radiation	**Damage to skin/tissue integrity**	1. Mucous membranes and skin 2. Wound healing 3. Purulent drainage 4. Erythema 5. Fever	1. Skin integrity care 2. Wound care 3. Topical medication administration 4. Incision site care 5. Nail care	1. Mucous membranes and skin: moist 2. Wound healing: Not yet 3. Purulent drainage: Yes 4. Erythema: Yes 5. Fever: None
	• **Subjective:** The lower middle abdomen was previously discharging pus. • **Objective:** Hb/Ht/Leu/Tc/Et: 10.5/33.9/9.4/491/3.99 • Absolute lymphocyte count: 443 /uL	**Fokal:** DJ stent neglected **Contextual:** Inadequacy of the body's defences **Residual:** Increased exposure to microorganisms	**Risk of infection**	1. Immune status (absolute leukocyte/ lymphocyte count, CRP, lactic acid) 2. Body temperature	1. Prevention of shock 2. Monitoring of vital signs 3. Infection control	1. White blood cells: 10.2 thousand/uL 2. Body temperature: 37.1 °C 3. qSOFA score: 0 (low risk)
SENSATION	• **Subjective:** Provocation (P): pain worsens when pressed. Quality (Q): burning. Region (R): anal area. Severity (S): NRS scale 3/10. Timing (T): constant pain. • **Objective:** Nodules around external anus at the 3 o'clock position, approximately 1 cm, oval, firm, no spontaneous bleeding. Patient grimaces when changing position.	**Focal:** Rectal tumour mass **Contextual:** - **Residual:** Painful experience	**Chronic pain**	1. Pain control 2. Severity of effects on daily functioning 3. Severity of cognitive and emotional responses	1. Pain management 2. Comfort care 3. Relaxation therapy 4. Pain monitoring 5. Disease process education	1. Pain control: Yes 2. Severity of effects on daily functioning: Yes (Physical mobility) 3. Severity of cognitive and emotional responses: Yes (Emotional)
FLUIDS & ELECTROLYTES	• **Subjective:** Drinks water during illness. Before illness, enjoyed drinking coffee. • **Objective:** Fluid balance: +650 ml/24 hours. Diuresis: 0.46 cc/kgBW/hour. Ur/Cr/eGFR: 68.1/2.78/24.16. Na/K/Cl: 139/3.3/108.	**Focal:** Fluid regulation disorder **Contextual:** Hypoalbuminemia **Residual:** Decreased kidney function	**Risk of fluid and electrolyte imbalance**	1. Skin turgor 2. Fluid intake 3. Fluid output 4. Balance 5. Edema 6. Laboratory of electrolyte	1. Fluid management 2. Fluid monitoring 3. Intravenous insertion 4. Hypo-volaemia management 5. Electrolyte monitoring 6. Electrolyte management	1. Skin turgor: decreased 2. Diuresis: 0.46 cc/kgBW/hour 3. Input: 2000 ml 4. Output: 950 ml 5. Fluid balance: +1050 ml/24 hours 6. Edema: None 7. Blood test results: Na/K/Cl: 138/4.0/109



SELF-CONCEPT ADAPTATION MODE

BEHAVIOURAL ASSESSMENT	STIMULI ASSESSMENT	NURSING PROBLEM	OUTCOME (NOC)	INTERVENTION (NIC)	NURSING EVALUATION
BODY SENSATIONS • **Subjective:** The weakness does not cause the patient to complain. However, he remains enthusiastic about undergoing treatment. • **Objective:** The patient appears to tolerate the pain he feels.	Adaptive response	**None**	**None**	None	Adaptive response
BODY IMAGE • **Subjective:** Asked why oozing still occurred in the surgical area. In addition, the patient also seemed to feel sorry for his physical condition during this illness. • **Objective:** During treatment, the patient was often lost in thought and sighed anxiously.	**Focal:** Physical condition **Contextual:** Disease process **Residual:** Painful experience	**Anxiety**	1. Self-control 2. Coping 3. Anxiety level	1. Anxiety reduction 2. Relaxation therapy 3. Support for religious observance 4. Anger management assistance 5. Guided imagery techniques 6. Progressive muscle relaxation	1. Self-control: good 2. Coping: patient cooperates with treatment. 3. Anxiety level: mild
SELF-CONSISTENCY • **Subjective:** The patient's wife said that while at home, the patient was bedridden. He needed assistance to move and walk since suffering from anal pain. This did not cause the patient to experience limitations because his family helped him meet his daily needs.	Adaptive response	**None**	None	None	Adaptive response
SELF-IDEAL • **Subjective:** The patient's wife said that the family always supported the patient so that he did not feel that anything had changed in terms of his ideal self.	Adaptive response	**None**	None	None	Adaptive response
MORAL ETHICS - SPIRITUALITY • **Subjective:** The patient is Muslim and observes his religious duties. While hospitalised, he endeavoured to adapt his worship practices to his circumstances.	Adaptive response	**None**	None	None	Adaptive response

ROLE FUNCTION MODE

BEHAVIOURAL ASSESSMENT	STIMULI ASSESSMENT	NURSING PROBLEM	OUTCOME (NOC)	INTERVENTION (NIC)	NURSING EVALUATION
• **Subjective:** The patient is a husband, father and grandfather. He previously worked as a seaman. Since falling ill, he has stopped working. His wife is self-employed. Since he became ill, she has been the breadwinner of the family.	Adaptive response	**None**	None	None	Adaptive response

INTERDEPENDENCY MODE

BEHAVIOURAL ASSESSMENT	STIMULI ASSESSMENT	NURSING PROBLEM	OUTCOME (NOC)	INTERVENTION (NIC)	NURSING EVALUATION
• **Subjective:** While at home, he was still able to walk with the assistance of his wife and children. He had no financial problems. The cost of hospital treatment was covered by insurance and the patient's savings. • **Objective:** While being treated at the hospital, the patient appeared to be accompanied by his wife. At the weekend, the patient also appeared to be visited by his son.	Adaptive response	**None**	None	None	Adaptive response

The first mode is physiological adaptation consisting of oxygenation, nutrition, elimination, protection, sensation, activity and rest, fluid and electrolytes, neurological and endocrine functions[13]. Overall, patients have not been able to adapt optimally in terms of physical mode. This is evidenced by the evaluation of patient behavioural output. Several stimuli that impede adaptation included malnutrition status, malignancy, and decreased immunity.

Adaptation in fluid and electrolyte mode can be difficult due to the large amount of fluid output from the fistula. In this case, patient experienced constant leakage through a complex external fistula and was unaware of his incontinence. Maintaining adapation in nutritional status and kidney function were other important focuses in caring patients with vesicocutaneous fistulas. Interventions focused on preserving kidney function through lab monitoring and education on self-care for urination. Total Parenteral Nutrition (TPN) improved nutritional status in conditions of decreased body fluids resulting from the large volume of fistula output. Skin integrity impairment involves damage to the epidermis or dermis and caused both physical and psychological discomfort for patient. His vesicocutaneous fistula was linked to factors such as urinary tract infection, malignancy, and prior surgery.

The self-concept mode focuses on the personal self-image and spiritual-social-moral impressions. The literature consistently shows that individuals with anal cancer and complications like vesicocutaneous fistula often experience significant psychological distress, including anxiety and sadness[14]. In the above case, the patient had a disturbed self-concept in terms of feelings regret about his current physical condition. During treatment, he frequently sighed, suggesting emotional distress and anxiety.

Psychological support address emotional distress and anxiety caused by fistula. Nursing interventions provided to reduce anxiety included aromatherapy, support for religious practices, anger management assistance, and progressive muscle relaxation therapy. Although the patient cooperates with treatment, sometimes he looks powerlessness of his condition. Patient and family involvement significantly supports adaptive response, especially for emotional encouragement and practical help.

The role functions mode: since the onset of illness, the patient has been unable to maintain employment, resulting in a reorganization of family roles, with his self-employed wife assuming the responsibilities of primary breadwinner. Despite these adjustments, the

patient exhibited an adaptive response to the stimuli received, reflecting effective coping within the family system.

Interdependence mode reflects meaningful relationships and support systems[12,15]. In this case, the patient currently unemployed, relies primarily on his wife and family for assistance. He can ambulate at home with their support and reports no financial difficulties, as hospital expenses are covered by insurance and personal savings.

CONCLUSION

The application of RAM in medical–surgical nursing care serves as a systematic approach that helps identify specific ineffective adaptation in each mode, allowing interventions to be tailored for patients with urinary system disorders. It also enables holistic and personalized care, which can influence the outcomes of vesicocutaneous fistula treatment. Applying RAM to patients with vesicocutaneous fistulas nursing care is also challenging. Although nurses understand the assessment and intervention framework, they often struggle with in-depth analysis of stimuli, which is essential for accurate nursing diagnoses and effective interventions. This study specifically focuses on maintaining fluid and electrolyte balance, improving nutritional status, protecting the skin around the fistula, controlling infections, and providing psychological support and health education for patients and their families.

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AUTHOR CONTRIBUTION

Aini Q: Concept, design, drafting, final approval, agreement to accountability.
Maria R: Concept, critical revision, final approval, agreement to accountability.
Sukmarini L: Concept, critical revision, final approval, agreement to accountability.

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