

Research Progress on Nursing Care of Patients with Nasobiliary Drainage

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Abstract

Endoscopic nasobiliary drainage, as an external bile drainage method, can promote patient recovery, but also bring discomfort to patients. This article reviews the problems existing in patients with nasobiliary drainage, the main forms and effects of nursing, analyzes the limitations of existing research, and proposes suggestions and inspirations for nursing patients with nasobiliary drainage based on actual situations, in order to provide new perspectives and clinical basis for developing scientific and reasonable nursing plans in the future.

Keywords

Nasobiliary Duct, Nursing Care, Symptoms, Comfort, Review

1. Introduction

Endoscopic nasobiliary drainage (ENBD) is currently one of the preferred methods for noninvasive biliary drainage. This technique can provide an objective basis for evaluating the drainage effect by observing the drainage volume and its characteristics of bile. In addition, ENBD can also be used to flush drainage tubes and biliary tracts in patients with viscous drainage fluid, effectively reducing the probability of drainage tube blockage or poor drainage and improving the reliability and safety of drainage [1]. Although ENBD has its advantages, it is an invasive procedure, and the nasobiliary duct travels a long distance in the body, and the friction of the nasobiliary duct irritates the throat, which can easily lead to nausea, vomiting, sore throat, and throat discomfort, of which the incidence of sore throat is about 40% [2]. In addition to the above symptoms, patients with indwelling naso-

biliary ducts may also experience abnormal drainage conditions, such as nasobiliary obstruction and nasobiliary duct detachment, which will increase their distress, affect the treatment effect, and increase the patient's financial burden if the catheter is reinserted [3] [4]. Therefore, effective nasobiliary drainage care is an urgent need for the majority of patients. At present, scholars at home and abroad have actively carried out research on the nursing of patients with indwelling nasobiliary ducts to ensure effective drainage and improve the comfort of patients, and have also achieved certain results. This article reviews the research progress of nursing patients with indwelling nasobiliary duct at home and abroad, in order to provide guidance for clinicians to scientifically care patients with indwelling nasobiliary duct in the future.

2. Overview of ENBD

ENBD is an endoscopic biliary drainage method developed from endoscopic retrograde cholangio pancreatography (ERCP), in which the operator inserts the polyethylene nasal bile duct along the guidewire into the appropriate position of the bile duct by duodenoscopy under X-ray surveillance, and then withdraws the guidewire and exits the duodenoscope. The nasobiliary duct is then subjected to an oral-to-nasal conversion procedure to lead it out of one side of the nasal cavity and secure it [5]. As a means of external biliary drainage, ENBD not only has the effect of treating biliary and pancreatic system diseases, but also prevents infection after ERCP. A number of studies at home and abroad have shown that effective nursing of patients with indwelling nasobiliary ducts can reduce negative emotions and reduce negative emotions such as anxiety and depression [6]. At the same time, it is beneficial to promote postoperative recovery and reduce the occurrence of complications [7]. At present, the research focus on the nursing of patients with indwelling nasobiliary ducts focuses on the improvement of the pipeline (nasobiliary duct oral-nasal conversion, the development of new nasobiliary drainage tubes) [8] [9] and the nursing care of drainage tubes (nasobiliary fixation, drainage fluid observation) [10], and has been shown to improve the drainage effect of patients, alleviate the discomfort caused by drainage, and improve the quality of nursing services.

3. Patients with Nasobiliary Drainage Have Problems

Although the nasobiliary duct is helpful for postoperative recovery, a variety of problems can occur during catheterization [11]: 1) Drainage tube problems: Some patients will also have abnormal drainage during indwelling nasobiliary ducts, such as nasobiliary prolapse, displacement, blockage, and even pipeline breakage, which not only fails to achieve the expected drainage effect, but also may lead to retrograde flow of drainage fluid into the biliary system, increasing the risk of complications and adversely affecting the recovery process of the disease [12]. 2) Physical discomfort: For patients with abnormal drainage, the postoperative fasting time is often extended, and the long-term fasting state will not only cause the patient to have

obvious discomfort due to hunger, but also may cause dry symptoms in the nasal cavity, oral cavity, and throat, resulting in increased friction between the nasobiliary duct wall and the oral and nasal mucosa, aggravating the stimulation of local tissues, and inducing or aggravating the patient's nausea, vomiting, choking and other uncomfortable reactions [13]. 3) Nutritional disorders: The nasobiliary ducts of such patients will be left in place for a longer time, and long-term drainage may lead to bile loss, causing water and electrolyte imbalances and malnutrition [14]. 4) Psychological effects: Patients with abnormal drainage have more obvious symptoms, such as pharyngeal itching and foreign body sensation, and are more likely to have anxiety and anxiety, which eventually leads to the occurrence of unplanned extubation [3]. In summary, patients will have various symptoms and complications during indwelling nasobiliary ducts, and clinicians should pay attention to the comprehensive care of patients, do a good job in health education of patients, and avoid the occurrence of risk events.

4. Main Forms of Care

4.1. Predictive Care

Predictive care, also known as proactive care, refers to the use of nursing procedures by nurses to predict and evaluate potential problems that may occur in patients based on professional knowledge and clinical experience, so as to pre-identify possible nursing risks and make predictive judgments about patients' conditions [15]. On this basis, nurses will develop corresponding prevention and control measures according to the specific risk factors of the patient to ensure the safety and health of the patient. This model of care emphasizes nurses' foresight and initiative in patient risk, which helps to improve the quality of care and patient satisfaction [16]. Studies have shown that predictive nursing intervention throughout the perioperative period can timely inform the changes in patients' physical signs through the monitoring of psychological and physiological indicators, and deal with abnormal conditions in time to avoid adverse consequences [17]. A randomised controlled trial showed that anticipatory care measures for patients with nasobiliary placement and oral gentamicin 30 minutes prior to ERCP treatment were effective in reducing the positive rate of postoperative bile cultures [18]. This highlights the potential of predictive care to mitigate complications through targeted interventions, particularly when implemented early in the care process. Some studies have pointed out that through the predictive analysis of possible complications (such as acute pancreatitis, acute cholangitis, bleeding, pain, etc.) after surgery or treatment, and the implementation of targeted nursing measures, the occurrence of complications can be effectively reduced, the cost of hospitalisation of patients can be reduced, the length of hospitalisation can be shortened, and the satisfaction of patients with nursing services can be improved [19]. He *et al.* carried out predictive health education and psychological intervention for patients, and found that it can significantly improve patients' knowledge and understanding of disease and surgical treatment, help patients establish a positive attitude,

and better cooperate with the treatment work [20]. This approach helps patients adopt a positive attitude and better cooperate with treatment protocols, potentially reducing anxiety and improving adherence to medical advice.

Despite its benefits, the effectiveness of predictive care depends on several critical factors. First, this model requires nurses to possess a strong foundation of disease-specific knowledge, extensive clinical experience, and systematic clinical thinking. Without these competencies, the accuracy of risk prediction and the appropriateness of interventions may be compromised. Second, the generalizability of predictive care programs is limited by contextual factors such as healthcare settings, resource availability, and patient demographics. For example, in resource-limited environments, the implementation of predictive care may face challenges due to insufficient staffing or inadequate access to diagnostic tools. The mechanisms underlying the success of predictive care can be attributed to its emphasis on early identification and proactive management of risks. By addressing potential issues before they escalate, predictive care reduces the likelihood of adverse events and enhances overall patient outcomes. However, the success of this model also hinges on interdisciplinary collaboration, as nurses often need to work closely with physicians, pharmacists, and other healthcare professionals to ensure comprehensive risk management.

In conclusion, while predictive care offers significant advantages in improving patient safety and satisfaction, its implementation requires careful consideration of the factors influencing its success. Future research should focus on identifying strategies to enhance the training and preparedness of nurses, as well as exploring ways to adapt predictive care models to diverse healthcare settings. Additionally, more rigorous evaluations are needed to assess the long-term impact of predictive care on patient outcomes and healthcare costs.

4.2. Personalised Care

Individualised care is a nursing model developed on the basis of holistic care, and its core concept is to always put the patient at the centre of the care service, provide personalised care measures for the patient's disease, physical condition, and psychological characteristics, and meet the patient's physical and psychological needs as much as possible [21]. This approach recognises that patients with indwelling nasobiliary ducts may exhibit varying symptoms during catheterisation due to individual differences in health conditions, which can significantly impact their overall experience. Patients with indwelling nasobiliary ducts may have different symptoms during catheterisation due to individual differences in individual conditions, which may affect the patient's catheterisation experience. Studies have confirmed that combining the concept of "individualisation" with traditional care and implementing targeted personalised nursing interventions can effectively alleviate patients' negative emotions, improve their satisfaction, and effectively reduce the occurrence of complications [22]. The personalised care model is patient-centred, focuses on individual differences, and achieves precise care through spe-

cific measures [23]. For example, by customising care plans based on each patient's unique physiological and psychological profiles, nurses can address not only the medical aspects but also the emotional and psychological needs of patients, thereby enhancing their overall well-being.

However, several factors influence the effectiveness and feasibility of implementing such a model. Firstly, personalised care requires nurses to have an in-depth understanding of the patient's comprehensive health status, including their medical history, current condition, and personal preferences. This necessitates substantial time and effort from the nurse, which can be challenging given the busy schedules and shift work typical in clinical settings. The limited availability of resources, such as time and energy, especially for night-shift nurses, poses a significant barrier to the consistent application of personalised care strategies. Secondly, the success of personalised care hinges on effective communication and collaboration among healthcare professionals. Nurses must work closely with other members of the healthcare team, including physicians, pharmacists, and social workers, to ensure that all aspects of the patient's care are addressed comprehensively. This interdisciplinary approach enhances the accuracy and appropriateness of care decisions, leading to better patient outcomes. In conclusion, while the personalised care model offers numerous benefits, such as improved patient satisfaction and reduced complication rates, its implementation faces practical challenges. Future research should focus on developing strategies to streamline the process of gathering and analysing patient information, as well as exploring ways to enhance interdisciplinary collaboration and support for nurses working under demanding conditions. Additionally, more rigorous evaluations are needed to assess the long-term impact of personalised care on patient outcomes and cost-effectiveness.

4.3. Comfort Care

Comfort care is a nursing model that has attracted much attention in recent years, and its core is to create a comfortable environment and provide intimate services to enable patients to achieve the best physical and mental state, effectively reduce patients' discomfort and emotional stress, so that they can better cooperate with treatment, reduce complications, and promote early recovery [24]. Studies have pointed out that the implementation of comfortable care for patients with nasobiliary drainage, including preoperative psychological counselling, optimisation of the ward environment, reduction of operational discomfort during surgery, and psychological support during the recovery period, can effectively alleviate patients' anxiety and improve comfort and nursing satisfaction [25] [26]. For instance, Chen *et al.* used oral and nasal care interventions, including irrigation, brushing, and nasal oxygen nebulisation, which successfully alleviated nasal discomfort and oropharyngeal dryness during catheterisation [27]. Similarly, Lin *et al.* implemented intraoperative comfort care using a modified rhinobiliary duct oral-nasal conversion method [28]. Their findings revealed a low incidence of adverse reactions, shorter oral-nasal transition times, and improved overall patient comfort during

nasobiliary drainage.

However, despite these advancements, most studies on comfort care for patients with nasobiliary drainage primarily focus on improving comfort through tube care and environmental enhancements, while paying insufficient attention to the management of patients' symptoms. This limitation suggests that current interventions may not address the root causes of patient discomfort, such as physiological distress or psychological factors. For example, while optimising the ward environment can provide temporary relief, it does not fundamentally resolve issues like persistent pain, anxiety, or nausea, which are critical contributors to patient discomfort. The mechanisms underlying the success of comfort care include its emphasis on holistic patient well-being, addressing both physical and psychological needs. However, the effectiveness of this model is influenced by several factors. First, the implementation of comfort care requires nurses to possess strong clinical skills and a deep understanding of patient-specific needs. Without adequate training and resources, nurses may struggle to deliver comprehensive care. Second, the feasibility of comfort care interventions depends on the availability of supportive infrastructure, such as advanced equipment and multidisciplinary collaboration. Finally, the sustainability of comfort care outcomes relies on continuous monitoring and adjustment of care plans to ensure they remain aligned with patients' evolving needs.

In conclusion, while comfort care offers significant benefits in improving patient comfort and satisfaction, its application faces notable challenges. Future research should prioritise the development of more targeted symptom management strategies that address the root causes of discomfort. Additionally, efforts should focus on evaluating the long-term impact of comfort care interventions on patient outcomes and exploring ways to integrate these strategies into routine clinical practice.

4.4. Nasobiliary Nursing

4.4.1. Nasobiliary Duct Fixation

The study by Cen *et al.* [29] showed that the use of modified disposable masks to secure the nasobiliary drainage tube has a significant effect, which can effectively reduce the adverse reactions on the patient's skin and has a high safety profile. At the same time, it significantly improves patient comfort and enhances patients' tolerance to nasobiliary drainage tubes, which helps to improve the treatment experience and compliance of patients. Zeng *et al.* [30] effectively reduced the incidence of accidental detubation of the nasobiliary duct after ERCP by employing a new method of transparent dressing fixation. This not only improves the stability of drainage tube fixation but also enhances patient comfort, improves aesthetics, and reduces the discomfort and psychological burden associated with traditional fixation methods.

4.4.2. Improvement of Nasobiliary Ducts

In a retrospective study of patients with indwelling nasobiliary ducts, Sun *et al.* [31] introduced the nasobiliary cutting technique to trim the exposed part of the nasobiliary duct to 70 cm. The results showed that the application of this technique

could help reduce the risk of unplanned extubation, and at the same time, promote the standardisation of nasobiliary observation and recording. In addition, the incidence of complications such as postoperative cholangitis and pancreatitis did not increase significantly due to nasobiliary cutting. Mori *et al.* [32] designed and invented a new type of drainage device that can be converted internally and externally in order to alleviate the discomfort experienced by patients during nasobiliary drainage, and carried out clinical experiments, and the results showed that the device could significantly improve the patient's catheter placement experience and enhance the patient's comfort. In a randomised controlled trial conducted by Tsu-boi *et al.* [33], the researchers compared the clinical effects of two types of drains with diameters of 4-Fr and 6-Fr and found that the use of drains with diameters of 4-Fr significantly reduced patient discomfort.

Overall, modified nasobiliary fixation methods and improved nasobiliary devices can lead to a better treatment experience for patients, reduce discomfort and pain, reduce the risk of complications, and improve treatment outcomes and quality of life.

5. Effect of Patient Care for Nasobiliary Drainage

At present, scholars at home and abroad have used a variety of nursing intervention forms to intervene in patients with nasobiliary drainage, and have achieved certain results. Most of the studies were randomised controlled trials or quasi-experimental studies, and it was pointed out that scientific intervention programmes can ensure the effectiveness of patient drainage. Various forms of nursing intervention programmes can reduce the occurrence of various complications and improve the emotional state of patients to a certain extent. For example, through foresight care, personalised care, and comfort care, the occurrence of risk events can be reduced, the negative emotions of patients can be alleviated, and the comfort of patients can be increased. By improving the drainage device, the drainage effect can be improved and the patient's discomfort can be reduced. In addition, through the nursing management level, the use of PDCA cycle [6] and root cause analysis [34] to strengthen the risk management of patients can reduce the unplanned extubation of nasobiliary ducts and enhance the safety of medical treatment and nursing.

6. Limitations

6.1. Lack of Standardised Care Programmes

Although nursing staff have developed a preliminary care plan for patients with nasobiliary drainage, there is a lack of scientific and systematic nursing standards. There may be differences in the measures and methods taken by different hospitals, different departments, and even different nursing staff in the nursing process, which can lead to inconsistent nursing outcomes. At present, nasobiliary care measures mostly rely on clinical experience, and there is no standardised operation process based on evidence-based medicine. In the future, relevant clinical re-

search and nursing practices should be strengthened, scientific, standardised and operable nursing plans should be established, and verified in multiple centres and regions to ensure their wide applicability.

6.2. Patient's Experience of Catheterisation Is Not Considered

The existing nursing studies mostly focus on the improvement of patients' physiological indicators, ignoring patients' subjective feelings. Although nasobiliary drainage is a common postoperative treatment in clinical practice, due to its deep placement site and the hard material of most nasobiliary ducts, patients have obvious foreign body sensation and nasopharyngeal discomfort, which affects the patient's daily activities and recovery process, and even psychological problems such as anxiety and depression. In the future, attention should be paid to the patient's catheterisation experience, and the patient's catheterisation comfort should be improved through effective symptom management measures. At the same time, the design of nasobiliary ducts should be optimised in the future, and soft and tolerant materials should be selected to reduce the discomfort of patients.

6.3. Patients Lack Self-Care Ability

Due to the limited education level of patients, and the fact that they are often in a state of physical discomfort after surgery, coupled with the particularity of nasobiliary ducts, patients may have blind spots in the care of nasobiliary ducts. Therefore, many patients lack the awareness of self-care after surgery and rely on the care of nursing staff. Patient education is the key to improving self-care ability, and nursing staff should explain in detail to patients and their families the nursing methods of nasobiliary ducts, including how to correctly fix the drainage tube and drainage bag, how to observe the drainage fluid, how to reduce the occurrence of complications, etc., so as to gradually improve the patient's self-management ability. At the same time, it is necessary to pay attention to the supporting role of family members, and the participation of family members can effectively reduce the pressure of nursing and help the patient's recovery when the patient is weak.

7. Future Research Directions

7.1. Combine Modern Means to Improve the Effectiveness of Patient Care

Most of the existing studies have taken the form of offline intervention for patients with indwelling nasobiliary ducts, and there are few studies that have adopted the mixed intervention form of "online + offline". Offline intervention requires nurses to have direct contact with patients, which will take more time and energy, especially for patients who are discharged with tubes, and offline intervention will consume a lot of manpower and material costs, which is not conducive to the promotion and use of intervention programmes. The advantage of online intervention is that it can communicate with patients more conveniently, and can provide patients with diversified health services through WeChat groups, official accounts

and other forms. The nursing of patients with nasobiliary drainage should make full use of Internet technology and develop medical APP, and the follow-up research should adopt the form of “online + offline” to improve the flexibility and accessibility of intervention, enhance the patient’s independent learning ability, and at the same time help medical staff to obtain dynamic feedback from the intervention object in a timely manner and realise the effective interaction between doctors and patients. Due to the differences in patients’ education level and age, there may be differences in the needs of different individuals for intervention content, and future research can consider using text, pictures, voice, video and other means to improve the effectiveness and compliance of intervention.

7.2. Construct a Scientific Nursing Plan Based on Clinical Practice

Follow-up studies should combine nursing theories, learn from existing studies, learn from each other’s strengths, and consider the differences in patients’ conditions and symptoms, focus on the three aspects of “physiological-psychological-social”, take the patient’s catheterization experience as the starting point, and provide corresponding care according to the needs of patients, so as to further construct a more scientific and effective. A highly targeted care plan is essential for patients with indwelling nasobiliary ducts. At the same time, the patient’s age, underlying medical conditions, postoperative complications, etc. should be taken into account in the care plan to ensure that the care plan is more relevant to the patient’s needs.

7.3. Mobilise Patient Participation and Do a Good Job in Health Guidance

Engaging patients, especially pre- and post-operative health coaching, can help patients better understand their condition, care needs, and treatment process, leading to better outcomes. The knowledge of the rhinobiliary duct can be included in the content of the preoperative visit to strengthen the patient’s awareness of post-operative nasobiliary care. At the same time, patients are encouraged to monitor their health status after surgery, and report abnormal conditions to medical staff in a timely manner, such as drainage tube blockage, drainage volume changes, etc., to help patients grasp their own conditions and enhance their self-management ability. In addition, patients should be involved in the formulation of the nursing plan, and patients should be informed of timely feedback on the problems and doubts encountered in the treatment process after surgery. Patient feedback can help caregivers identify gaps in care procedures and improve follow-up care plans to improve the quality of care.

8. Conclusion

As the focus of intervention research on patients with nasobiliary drainage has gradually shifted from “ensuring effective drainage” to “patient comfort”, the intervention of such patients has received more and more attention from research-

ers and nursing managers in research and practice. At present, nursing interventions for patients with nasobiliary drainage are effective, but their content and form need further research and improvement, and there are not many high-quality studies on the care of patients with nasobiliary drainage. In the future, we can learn from the achievements and experience of other pipeline nursing, combined with the actual needs of such patients, and construct a scientific and high-quality intervention programme for patients with nasobiliary drainage.

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Conflicts of Interest

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