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Retrospective Study

Efficacy of combined psychological and physical nursing in preventing peripherally inserted central catheter-related thrombosis in gastric cancer patients

Ni WJ *et al.* Nursing in GC

Abstract

BACKGROUND

Long-term chemotherapy for patients with gastric cancer (GC), facilitated by peripherally inserted central catheter (PICC) catheterization, reduces vascular damage and enhances drug delivery efficiency but carries risks of catheter-related complications. A combination of group psychological nursing and physical movement care significantly mitigates the risk of venous thrombosis and improves psychological well-being, and enhances motor function, underscoring its clinical importance.

AIM

To assess group psychological and physical movement nursing in preventing venous thrombosis in patients with PICC GC.

METHODS

Sixty-five GC patients with PICC, admitted from January 2022 to January 2023, were randomly divided into two groups using the lottery method: A control group ($n = 35$, routine nursing) and an observation group ($n = 30$, routine nursing plus psychological nursing and physical movement nursing). Both groups received continuous care for 2 weeks. Pre-nursing and post-nursing data on psychological state, physical function,

chemotherapy-related thrombosis incidence, and cancer-related fatigue were analyzed using SPSS 26.0 and GraphPad Prism 8.0.

RESULTS

After nursing, both groups showed reduced Hamilton Anxiety Scale scores and increased General Perceived Self-Efficacy Scale scores, with the observation group performing better ($P < 0.05$). The Functional Comprehensive Assessment score for the observation group after nursing was (65.42 ± 2.35) points, lower than the control group's (62.19 ± 4.33) points ($P < 0.05$). Although no significant difference was observed in the incidence of venous thrombosis between the two groups ($\chi^2 = 0.815$, $P = 0.367$), the observation group had lower incidence. Both groups showed decreased Revised Piper Fatigue Scale scores, with the observation group scoring lower ($P < 0.05$).

CONCLUSION

Group psychological and physical movement nursing for patients with PICC reduces venous thrombosis risk, improves psychological well-being, cancer-related fatigue, and physical function, making it highly promotable.

Key Words: Group psychological nursing; Physical movement nursing; Peripherally inserted central catheter; Gastric cancer; Venous thrombosis; Cancer-related fatigue

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Core Tip: In a comprehensive care approach that integrates psychological counseling with physical activity, there is a significant reduction in the risk of thrombosis among gastric cancer patients, particularly those who have undergone percutaneous central venous catheterization. This strategy not only enhances the overall health status of

patients but also specifically targets individuals requiring long-term venous therapy due to gastric cancer, offering an effective method for thromboprophylaxis.

INTRODUCTION

Gastric cancer (GC), one of the most common malignant tumors, requires prolonged chemotherapy. Repeated vascular punctures increase the risk of vascular damage and complications such as subcutaneous tissue necrosis due to drug extravasation[1]. In recent years, with the continuous promotion of peripherally inserted central catheter (PICC) catheterization, advantages such as protecting blood vessels, rapidly delivering drugs to central veins, and accelerating drug distribution have led to significant therapeutic effects in clinical practice[2]. However, complications such as catheter dislodgement, phlebitis, and venous thrombosis are inevitable during the catheterization process and can affect subsequent treatments. Therefore, exploring measures to reduce venous thrombosis risk in GC patients with PICC is a key focus of clinical research[3,4]. Physical movement can effectively promote local blood circulation in patients with tumors and help prevent thrombosis. However, the psychological state of several patients with GC, affected by fear of cancer and a lack of confidence in treatment, can affect the effectiveness of daily treatment. Compared to routine nursing, group psychological nursing is a novel intervention strategy guided by a psychologist and carried out by a professional team through systematic observation, expression, and communication. This approach aims to transform patients' cognitive structures and effectively alleviate or eliminate negative emotions. It emphasizes teamwork and professional guidance to achieve positive effects on the patients' psychological well-being. Currently, there is limited research on combining group psychological nursing with physical movement nursing for GC patients with PICC. This study observed 65 GC patients with PICC admitted to our hospital and analyzed the application value of this combined nursing approach.

MATERIALS AND METHODS

General data

Sixty-five patients with PICC, admitted between January 2022 and January 2023, were selected. Diagnostic criteria were in accordance with “The Chinese Society of Clinical Oncology: Clinical guidelines for the diagnosis and treatment of GC, 2021”[3]. The inclusion criteria were as follows: (1) Meeting the aforementioned diagnostic criteria and undergoing PICC treatment; (2) Concurrent vitamin K deficiency; (3) No mental disorder; (4) Suitable vessels for puncture; and (5) Informed consent obtained from patients and family members. The exclusion criteria included: (1) Poor compliance; (2) Cellulitis; (3) Active infection at the catheter site; (4) Communication or hearing impairment; and (5) Coagulation mechanism disorders. Patients were randomly divided into two groups using the ball-drawing method: A control group ($n = 35$) and an observation group ($n = 30$), with no significant difference in general data between the two groups ($P > 0.05$) (Table 1).

Methods

Control group (standard care): During the treatment period, nursing staff were required to assess various vital signs of the patients, including their heart rate and blood pressure. They provided guidance on a scientific diet, avoided cold and greasy foods, and emphasized the safety of catheter placement.

Observation group: In addition to the standard care provided to the control group, the observation group received an integrated program of psychological and physical movement nursing: (1) Formation of the integrated nursing team: The team consisted of one psychological physician, one attending oncology physician, one head nurse, and several nursing staff members. Prior to the study, team members underwent training and assessment on the content of group psychological and physical movement nursing; (2) Psychological intervention: The psychological physician and nursing staff developed intervention content tailored to the actual situation of patients with GC with PICC. Preparation activity: Before the start of group psychological nursing, the physician

conducted one-on-one conversations with patients to build rapport and foster confidence in treatment. The WeChat group was established by the nursing staff prior to the first group's psychological activity. Getting to know each other activity: This activity aimed to clarify intervention goals and facilitate familiarity among team members through self-introductions. The physician initiated the process, helping each member define their expected goals and outcomes, encouraging patients to share their situations and concerns, and providing a summary. Emotional expression activity: Starting with the physician, each participant described themselves with an adjective, and subsequent participants built on the previous introduction until all members had introduced themselves. The physician explained the rules, played relevant songs to enliven the atmosphere, and the members expressed emotions such as happiness or sadness until everyone had finished, marking the end of one round. After the two rounds, the members reflected on their experiences. Self-understanding activity: Patients were guided to create self-portraits and share the meanings of different elements within them. The nursing staff prepared cards for patients to record their self-awareness and hopes for their future progress. All cards were collected and placed in a box from which the patients drew cards and read the content aloud, offering support and encouragement to the card owner. Facing life activity: The physician instructed patients to draw a coordinate axis on A4 paper, with the horizontal axis representing age from birth to the present and the vertical axis representing life satisfaction. The patients were guided to recall and mark significant turning points and trends in satisfaction changes by sharing these points with the group. The physician provided targeted advice based on shared experiences, highlighting potential future challenges. Messages for the future activity: Group members wrote down reflections on "progress made", "happiest moments", "greatest help received", and "future expectations", and composed messages for peers, summarizing their gains and feedback on goal achievement. Implementation frequency: Each session lasts for 1.5 hours and was conducted once every 2 weeks; and (3) Physical movement nursing: This included finger flexion and extension, first clenching, and wrist rotation. Patients were instructed

to flex and extend their fingers 25 times per set, rest for 10-15 seconds, and then grip a stress ball forcefully for 15 seconds, with a 5-second rest per set. The training session lasted for 15 minutes, 2-3 times a day. Nursing staff also instructed the patients to clench their fists with palms facing outward, extend laterally, and then rotate internally for 1 minute each. These exercises were done for 10-15 minutes per session, 2-3 times daily.

Observational indicators

Psychological state: The psychological state was assessed before and after nursing using the Hamilton Anxiety Scale (HAMA) and General Perceived Self-Efficacy Scale (GSES). The HAMA uses a 0-4 scoring system, with higher scores indicating more severe anxiety symptoms. The GSES consists of 10 items measuring self-confidence in overcoming difficulties or setbacks, scored from 1 to 4. Higher total scores indicate stronger self-efficacy.

Physical movement function: Functional comprehensive assessment (FCA) was used to assess physical movement function before and after nursing. The FCA includes two dimensions, physical and cognitive function, with a total score of 108. Higher scores indicate stronger overall physical function.

Thrombosis incidence during chemotherapy: The incidence of venous thrombosis during chemotherapy was recorded for both groups of patients.

Cancer-related fatigue: The Revised Piper Fatigue Scale (PFE-R) was used to evaluate cancer-related fatigue, with 22 items and five open-ended questions scored 0-10, with higher scores indicating more severe fatigue.

Statistical analysis

All data collected in this study were statistically analyzed using SPSS 26.0. Quantitative data are described as mean \pm SD, with inter-group comparisons made using independent samples *t*-tests and intra-group comparisons made using paired samples *t*-tests. Count data are presented as percentages and compared using χ^2 tests, with $P < 0.05$ indicating significant differences.

RESULTS

Psychological state: Following the nursing intervention, there was a decrease in HAMA scores and an increase in GSES scores in the patients, with the intervention group showing superior psychological state scores compared to the control group ($P < 0.05$), as shown in Table 2.

Motor function: Post-nursing care, both groups exhibited an increase in FCA scores, with the intervention group demonstrating higher scores ($P < 0.05$), as detailed in Table 3.

Thrombosis incidence during chemotherapy: The incidence of thrombosis was 6.67% (2/30) and 17.14% (6/35) in the intervention and control groups, respectively. There was no significant difference in thrombosis incidence between the two groups ($\chi^2 = 0.815, P = 0.367$), although the intervention group had a lower incidence.

Cancer-related fatigue: After the nursing intervention, there was a decrease in all PFE-R scores in both groups, with the intervention group showing significantly lower PFE-R scores ($P < 0.05$), as presented in Table 4.

DISCUSSION

The PICC is a relatively safe vascular access device typically used for patients requiring prolonged intravenous infusions or frequent venipuncture for therapy[5,6]. Patients with GC who undergo long-term chemotherapy often present with poor vascular

conditions, where repeated punctures can lead to drug extravasation. This not only compromises treatment efficacy but also exacerbates vascular strain[7]. Consequently, effective catheter care interventions are essential to prevent PICC-related venous thrombosis[8]. Studies have suggested that patients with cancer, driven by the fear of the disease, weak confidence in treatment, and concerns about treatment costs, often experience heightened levels of anxiety, depression, and other negative emotions[9]. Although psychological interventions in routine nursing can effectively alleviate symptoms, their ability to significantly improve patients' psychological state is limited due to patients' misconceptions about GC and low trust in treatment methods[10]. Group psychological nursing, as a form of collective intervention, helps address individual and shared issues by leveraging team building, enhanced communication, and emotional support for patients[11]. Additionally, physical movement nursing can promote local blood circulation and dilate local venous vessels through physical activity, contributing to improved vascular.

After nursing, both groups showed a decrease in HAMA scores and an increase in GSES scores, with the observation group's psychological state scores being significantly better than those of the control group ($P < 0.05$). The analysis indicated that group nursing interventions, through collective activities, can reduce patients' feelings of loneliness and anxiety by providing a sense of support and belonging. A psychologist's targeted guidance can help patients develop a positive and proactive mindset[12]. During physical movement nursing, patients can promote blood circulation, prevent thrombosis through physical activities, and master the methods of activity training, thereby building confidence in their treatment. One study reported that after the intervention, the incidence of mechanical phlebitis, infection, catheter obstruction, and venous thrombosis in the observation group was lower than in the control group ($P < 0.05$). This indicates that group psychological nursing not only improves patients' psychological state but also reduces the occurrence of complications[13]. These findings align with our results, demonstrating that physical movement nursing promotes blood circulation, prevents thrombosis, and helps patients build confidence in treatment[14].

Furthermore, post-nursing, ¹ the observation group's PFE-R scores were lower than those of the control group ($P < 0.05$). The analysis showed that compared with routine nursing, the combination of group psychological nursing and physical movement nursing can effectively alleviate cancer-related fatigue in patients. This was attributed to the group's psychological nursing ability to enhance patients' self-awareness and self-acceptance, thereby improving their emotional control capabilities. Physical movement nursing helps patients move their limb extremities, promotes peripheral nerves, and improves blood circulation through activities such as fist clenching and finger flexion. The combined nursing approach enabled patients to correctly understand PICC-related venous thrombosis in GC and chemotherapy, thereby alleviating the psychological fatigue caused by cancer[15]. One study investigated the application of psychological nursing combined with exercise therapy in diabetes care and analyzed its impact on the quality of life. The results demonstrated that compared with routine nursing, the integration of psychological nursing and exercise therapy significantly improved patients' glycemic control and quality of life ($P < 0.05$). This finding is congruent with our observation that physical movement nursing can promote blood circulation, prevent thrombosis, and bolster patient confidence in treatment[16].

The comparison of thrombosis incidence between the two groups showed no statistically significant difference ($\chi^2 = 0.815$, $P = 0.367$), but the incidence was lower in the observation group. The analysis revealed that during physical movement nursing, guidance from nursing staff on exercises, such as slow finger flexion and extension, fist clenching, and wrist rotation, aims to improve peripheral blood circulation and promote local blood flow recovery. This enhances vascular strength and reduces the incidence of local venous thrombosis. Concurrently, the combination of group psychological nursing allowed patients to engage in local physical activities during the group activities, further promoting blood circulation improvement[17]. A study found that combining ankle pump exercises with intermittent pneumatic compression therapy significantly reduced the incidence of lower extremity deep vein thrombosis, with a statistically significant difference ($P < 0.05$)[18]. This finding suggests that limb

movement nursing plays a beneficial role in decreasing the occurrence of venous thrombosis, consistent with our findings that physical movement nursing can promote blood circulation, prevent thrombosis, and foster patients' confidence in their treatment. However, this study was hospital-based, potentially introducing selection bias and limiting the representativeness of the sample for the general population. Future validation will involve a larger and more diverse sample to address these limitations and expand the generalizability of the findings.

CONCLUSION

In conclusion, this pioneering study integrated group psychological nursing with physical movement care for patients with GC undergoing PICC therapy. Our findings revealed that this novel, comprehensive nursing approach significantly reduced the risk of venous thrombosis, markedly ameliorated cancer-related fatigue, and enhanced the patients' motor function. These results introduce an innovative strategy for the clinical care of patients with GC and hold significant implications for guiding clinical practice, advocating for the broader adoption of this nursing model in clinical settings.

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SIMILARITY INDEX

PRIMARY SOURCES

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