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Original Article

Standardized post-catheter nursing intervention reduces incidence of catheter complications in the disabled elderly and improves their quality of life

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Abstract: Objective: The aim of this study was to determine the effect of standardized post-catheter nursing intervention on awareness rate of clinical knowledge and behavior, treatment compliance, and incidence of catheter complications in the disabled elderly. Methods: A total of 84 elderly patients with indwelling catheters treated in our hospital from September 2019 to March 2020 were retrospectively analyzed. Based on different nursing methods, 39 cases treated by routine nursing intervention were included in the control group (CG), and 45 cases receiving standardized post catheter nursing intervention were assigned to the experimental group (EG). The two groups were compared in terms of the following items: awareness rate of knowledge and behavior, treatment compliance, incidence of catheter complications before and after nursing, hospitalization time, nursing satisfaction and quality of life (QOL). Results: The EG exhibited significantly shorter hospitalization time and lower incidence of catheter complications than CG. The awareness rate of knowledge and behavior, treatment compliance and nursing satisfaction were significantly higher in the EG than in the CG. Furthermore, the QOL scores were not significantly different between CG and EG before nursing intervention, but were significantly higher in the EG than the CG after nursing intervention. Conclusions: Standardized post-catheter nursing intervention for the disabled elderly can better enhance the awareness rate of knowledge and behavior, improve treatment compliance and QOL of patients, and reduce the incidence of catheter complications.

Keywords: Disabled elderly, standardized post-catheter nursing intervention, treatment compliance, catheter complications

Introduction

The disabled elderly refers to the elderly who can't take care of themselves in daily life and need others to look after them to survive [1]. With the advent of an aging society in China, as well as the acceleration of population aging and "empty nest" phenomenon, the number of disabled elderly keeps increasing [2]. The elderly are at increased risk of diseases as a result of reduced physical functioning, and they need longer times for recovery [3]. Moreover, they will experience other adverse symptoms while suffering from a disease. All these complicate treatment and prolong the rehabilitation cycle. Therefore, how to ameliorate and protect the life of the elderly in their old age and improve their quality of life (QOL) is a pressing matter [4, 5].

A catheter, which involves various clinical disciplines and various parts of the human body, is one of the essential tools for the diagnosis and treatment of diseases for the disabled elderly in clinic. In particular, for patients with acute and critical illness after surgery, a variety of tubes, such as drainage tube, gastric tube and urinary catheter, will be indwelling in the body cavity. Such catheters can promote the rehabilitation of the disabled elderly albeit, while also bring certain hidden dangers in clinical nursing work [6-8]. With the development of surgery and catheter technology, catheter nursing and related safety issues such as unplanned extubation, pipe blockage, inadequate drainage, infection, and various complications are also very prominent [9]. Nurses are the direct implementers of catheter nursing, the quality of which is closely related to the patient's dis-

ease outcome, prognosis, and even life [10]. Therefore, it is the focus of clinical nursing to produce catheter nursing of high quality with effective intervention measures to ensure the safety of patients with catheterization. Standardized nursing is a standardized, systematic, planned and targeted nursing intervention model for patients under the guidance of the concept of comprehensive nursing, which is the embodiment of high-quality nursing [11]. However so far, the standardized nursing model has not been implemented in the pipeline nursing of the disabled elderly.

This study, by comparing the nursing effects of two nursing models on catheter care, analyzed the application effect of standardized post catheter nursing intervention for the disabled elderly, specifically as follows.

Data and methods

General information

This study retrospectively analyzed 84 elderly patients with indwelling urethral catheters hospitalized in the First People's Hospital of Lianyungang from September 2019 to March 2020. Among them, 45 patients receiving standardized post catheter nursing were included in the experimental group (EG), and the other 39 patients receiving routine nursing were included in the control group (CG). The Medical Ethics Committee of the Second Medical Center, PLA General Hospital approved the study protocol, and all the enrolled patients voluntarily signed an informed consent form for participation. Inclusion criteria: Patients aged 60-85 years old; Patients with one or more indwelling tubes such as gastric tube, urinary tube and artificial airway; Patients with clear consciousness. Exclusion criteria: Patients with communication disorders; Patients with incomplete clinical data; Patients with severe organ dysfunction; Patients with indwelling time <1 month. All patients in this study were informed and signed an informed consent. This study was approved by the Medical Ethics Committee of our hospital (Ethical Approval Number: LL024(2)05).

Methods

Patients in the CG were given routine nursing care, while those in the EG were intervened by standardized post catheter nursing. The main contents are as follows: (1) Before catheterization, nurses explained the matters needing attention to patients and gave them detailed and comprehensive health knowledge education. In addition, nurses strengthened their communication with patients in order to improve the actual effect of health knowledge education; (2) Nurses were trained in professional nursing skills to strengthen their sense of responsibility. Besides, they were required to be patient and meticulous to provide care for patients, and to take the initiative and seriously explain the knowledge related to catheter nursing for patients, especially some matters needing attention, and adverse reactions; (3) Nurses introduced the points for attention of catheter nursing to the patient's family members, and explained the operation steps of indwelling catheter, so as to improve the participation rate and cooperation rate of the family. Nurses communicated with the patient's family members to obtain their support and understanding, so as to facilitate patient recovery; (4) Nurses were urged to pay sufficient attention to patients, to ensure effective shift handover, and to strengthen the night patrol, so as to prevent high-risk situations due to unplanned extubation; (5) The awareness and attention of nurses in the EG on unplanned extubation were enhanced to ensure the high quality of nursing and avoid the occurrence of adverse events due to negligence; (6) The nursing staff provided patients with tailored psychological counseling based on the specific condition of patients, applied their professional knowledge to dispel patients' inner doubts, and actively assisted in solving the unhealthful psychology of patients, so as to help patients to establish a good state of mind to actively face the disease; (7) During indwelling of the catheter in the ureter, nurses regularly tested the indexes such as urine sugar, blood pressure and blood sugar of patients, and guided the self-monitoring of patients to improve their awareness of self-monitoring. In addition, targeted diet plans and rehabilitation training programs were developed to reduce the risk of complications; (8) Nurses assisted patients to fix the urinary catheter properly to ensure that the catheter was always lower than the level of the bladder to avoid reflux. In addition, the status of the catheter was checked regularly to avoid problems such as catheter removal and bending. Also, patients were assisted to regularly dump urine from their urine storage bags to prevent reflux and reduce the risk of infection.

Table 1. General data of patients in the two groups

Factor	Experimental group (n=45)	Control group (n=39)	t/n^2	P
Gender			0.306	0.580
Male	31 (68.89)	27 (69.23)		
Female	14 (31.11)	12 (30.77)		
Age	63.45±7.54	62.54±6.94	0.572	0.569
BMI	25.26±2.30	24.42±2.36	1.649	0.103
Degree of disability			1.424	0.491
Mild disability	16 (35.56)	12 (30.77)		
Moderate disability	24 (53.33)	19 (48.72)		
Severe disability	5 (11.11)	8 (20.51)		
Pipe type			1.747	0.626
Gastric tube	9 (20)	6 (15.38)		
Urinary catheter	19 (42.22)	22 (56.41)		
Artificial airway	10 (22.22)	7 (17.95)		
Multiple pipes	7 (15.56)	4 (10.26)		

Outcome measures

The effect indexes of the two groups after intervention were observed.

Primary outcome measures: Incidence of catheter complications such as infection, blockage, and displacement and detachment were observed in both groups. The SF-36 health survey scale was applied to evaluate the QOL of patients, including mental health, social functioning, and bodily pain, with a total score of 100 points in each item. The higher the score, the better the QOL [12]. The disease awareness was compared between the EG and CG. A questionnaire, which included the disease knowledge awareness rate, treatment situation and prognosis, was sent to patients by the responsible nurse to evaluate their awareness rate. The anxiety and depression emotions of the two groups were assessed using the Self-rating Anxiety Scale (SAS) and self-rating Depression Scale (SDS) [13]. Both the SAS and SDS included 20 items with 4 grades, and the questions were based on anxiety and depression of patients in the past 7 days. The patient's anxiety and depression scores were obtained by multiplying the total score of 20 items by 1.25, with higher scores indicating greater anxiety and depression.

Secondary outcome measures: Treatment compliance and hospitalization time of patients in both groups were recorded, and the treatment compliance was evaluated with the self-made compliance scale of our hospital. Patients' satisfaction with nursing care was assessed by a questionnaire survey. On a 100-point scale, the higher the score was, the higher the patient's nursing satisfaction was. The validity of the questionnaire conformed to the test standard, with more than 80 indicating markedly satisfied, 60-80 who were basically satisfied, and less than 60 showing they were dissatisfied. Satisfaction = number of (markedly satisfied + basically satisfied) cases/total number of cases ×100%.

Statistical processing

SPSS 22.0 software was used for statistical analysis of the data. The measured data were described in the form of "Mean ± SD", and compared by the t test. The counted data were recorded as percentage (%), and analyzed by the x^2 test. A *P*-value <0.05 was considered significant.

Results

Patient general data

There were 31 males and 14 females in the EG, with an average age of (63.45±7.54) and a body mass index (BMI) of (25.26±2.30) kg/m^2. Mild disability was found in 16 cases (35.56%), moderate disability in 24 cases (53.33%) and severe disability in 5 cases (11.11%). In the CG, there were 27 males and 12 females with an average age of (62.54±6.94) years old and a BMI of (24.42±2.36) kg/m^2. Among them, 12 cases (30.77%) had mild disability, 19 cases (48.72%) had moderate disability and 8 cases (20.51%) had severe disability. Other general data such as gender, age and BMI differed insignificantly between the EG and CG (P>0.05) (**Table 1**).

Comparison of hospitalization time

The hospitalization time in the EG was statistically shorter than that in the CG (P<0.05). See **Figure 1**.

Comparison of incidence of catheter complications

In the EG, the incidence rates of catheter-related infection and catheter displacement and

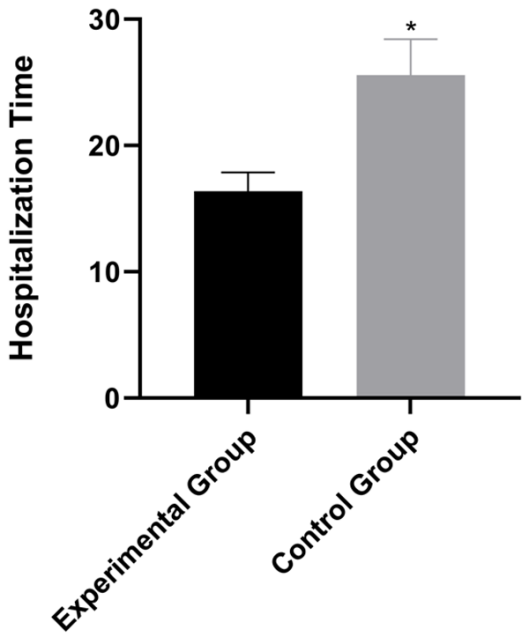

Figure 1. Comparison of hospitalization time between the two groups. Note: *P<0.05 *vs.* the experimental group.

detachment were 6.67% (3/45) and 4.44% (2/45) respectively, with a total incidence of catheter complications of 11.11 (5/45). In the CG, the incidence rates of catheter-related infection, catheter blockage, as well as catheter displacement and detachment were 23.08 (9/39), 7.69% (3/39), and 20.51% (8/39), respectively. Therefore, the incidence of catheter complications in the EG was significantly lower than that in the CG (P<0.05). See **Table 2**.

Comparison of treatment compliance

After intervention, the treatment compliance (prescribed medication, healthy diet and timely reexamination) of patients in the EG was significantly higher than that in the CG (P<0.05). See **Table 3**.

Comparison of nursing satisfaction

Comparing the nursing satisfaction of the two groups, it was found that the nursing satisfaction in the EG was significantly higher than that in the CG (P<0.05). See **Table 4**.

Comparison of QOL scores

The QOL scores identified no evident difference between CG and EG before nursing intervention (P>0.05); after nursing, the QOL scores were significantly higher in the EG than in the CG (P<0.05). See **Table 5**.

Comparison of awareness of disease knowledge

The comparison exhibited that the awareness of disease knowledge was significantly better in the EG than in the CG (P<0.05). See **Table 6**.

Comparison of SAS and SDS scores before and after intervention

There was no significant difference in SAS and SDS scores between the two groups before intervention (P>0.05). However, both the SAS and SDS scores were statistically lower in the EG than in the CG after intervention (P<0.05). See **Figure 2**.

Discussion

Disability is a symptom of impaired physical function caused by psychological disorders, chronic diseases and/or physical injuries in the elderly, that can significantly affect their daily activities [14, 15]. Catheter nursing is one of the focuses of clinical nursing work for the disabled elderly, especially for critically ill patients, whose life is maintained by tracheal intubation, arteriovenous catheterization, and thoracic duct. Improper operation will bring great pain to patients, delay the treatment, and even endanger their lives in severe cases [16-19]. Therefore, strengthening the standardization of catheter nursing, enhancing the knowledge related to clinical catheter nursing and consolidating the nursing knowledge are of paramount importance for the thorough improvement of catheter nursing quality [20].

Based on a clinical objective basis, standardized post catheter nursing integrates the values and desires of patients with the skills of nursing staff. According to the actual clinical situation, nursing theory and practice are combined to reduce the subjective decision-making and blindness in nursing care, so that the clinical nursing work can be based on evidence, thus improving its quality. In this experiment, the CG was intervened in by a conventional nursing mode while the EG was intervened in by standardized post-catheter nursing care. The results showed that hospitalization expenses

Table 2. Comparison of incidence of catheter complications between the two groups

Classification	Infection	Blockage	Displacement and detachment	Total incidence
Experimental group (n=45)	3 (6.67)	0 (0)	2 (4.44)	5 (11.11)
Control group (n=39)	9 (23.08)	3 (7.69)	8 (20.51)	20 (51.28)
χ^2 value				16.13
P value				<0.01

Table 3. Comparison of treatment compliance between the two groups

Categories	Prescribed medication	Healthy diet	Timely reexamination
Experimental group (n=45)	42 (93.33)	39 (86.67)	38 (84.44)
Control group (n=39)	20 (51.28)	24 (61.54)	23 (58.97)
χ^2 value	4.372	7.036	6.816
P value	<0.01	0.008	0.009

Table 4. Comparison of nursing satisfaction between the two groups

Classification	Very satisfied	Satisfied	Dissatisfied	Overall satisfaction
Experimental group (n=45)	28	12	5	40
Control group (n=39)	16	14	9	30
X^2 value				4.926
P value				0.027

were less and the incidence of complications was evidently lower in the EG than in the CG. This indicates that the standardized post catheter nursing is more effective, solves problems in a targeted way, and reduces the complications of patients. In addition, it was found that the treatment compliance and nursing satisfaction in the EG were higher than those in the CG, suggesting that standardized post-catheter nursing can improve patients' treatment compliance, enhance the nurse-patient relationship, and bolster nursing service quality. We also formulated targeted diet programs and rehabilitation training programs according to the physical condition and disease recovery of the disabled elderly, so as to improve their nutritional status and QOL. Furthermore, the QOL scores and disease knowledge awareness were compared. We identified no significant difference in the QOL scores between the two groups before nursing, but higher QOL scores in the EG after nursing, indicating that the implementation of standardized post-catheter nursing intervention improves the QOL of the disabled elderly. Scullion et al. believed that the establishment of a disability social model will help nursing work to fulfill its obligations more seriously and eliminate discrimination [21]. With the same idea, we strengthened the training of nurses in catheter-related knowledge to improve their mastery of catheter nursing knowledge. Catheter fixation standard was standardized and implemented in clinical practice. All catheters were fixed according to requirements, and the quality standard of catheter nursing was used for quality control. We also supervised and inspected the implementation of catheter nursing norms of clinical nurses, provided timely feedback on existing problems, and standardized the behavior of nursing staff. At the same time, the nursing staff listened patiently to the disabled elderly, gave them personalized psychological counseling, and encouraged them to face their diseases and life actively, to improve their compliance of catheter nursing. Therefore, such a nursing model has a significant role in promoting the rehabilitation of patients.

Due to the lack of awareness of disease and treatment, coupled with the insertion of foreign bodies, patients are prone to psychological problems and adverse emotions such as anxiety and depression during treatment [22]. Hence, it is vital to communicate with patients and their families in the course of treatment, so as to eliminate their doubts and enhance their confidence in treatment [23]. In our research, the SAS and SDS scores decreased in both groups after nursing, with lower scores in the EG. Moreover, the awareness of disease knowledge in the EG was far more superior to that in the CG. Findings demonstrate that after nursing intervention, the patient's disease awareness is improved, the adverse mood is chan-

Table 5. Comparison of QOL scores between the two groups

Classification	Mental health	Social Functioning	Activity of daily living	Bodily pain
Experimental group (n=45)	90.57±15.89	92.35±20.18	93.79±18.74	93.3±19.60
Control group (n=39)	74.26±17.43	73.29±16.21	76.43±17.51	73.19±14.57
t value	4.485	4.723	4.365	5.268
P value	<0.01	<0.01	<0.01	<0.01

Table 6. Comparison of awareness of disease knowledge between the two groups

Classification	Disease awareness	Disease treatment	Prognosis
Experimental group (n=45)	40 (88.89)	37 (82.22)	34 (75.56)
Control group (n=39)	5 (12.82)	24 (61.54)	21 (53.85)
χ^2 value	5.002	4.495	4.356
P value	0.025	0.034	0.037

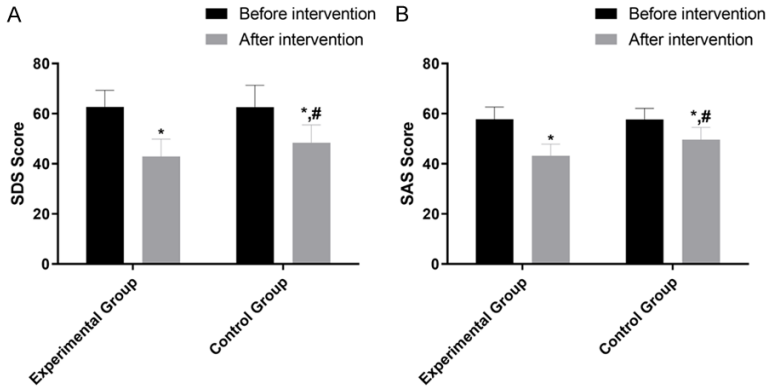

Figure 2. Comparison of SDS and SAS scores between the two groups before and after intervention. A. Comparison of SDS scores between the two groups before and after intervention. B. Comparison of SAS scores between the two groups before and after intervention. Note: *P<0.05 *vs.* before treatment; #P<0.05 *vs*. the experimental group after treatment.

neled, and the symptoms of anxiety and depression are effectively alleviated, confirming that standardized post-catheter nursing intervention is more effective in alleviating patients' mood than conventional nursing intervention. Under this nursing model, the elderly have a better awareness about their disease and significantly alleviated adverse emotions such as anxiety and depression; as such, their enthusiasm for treatment is mobilized, and their consciousness is raised accordingly, which ultimately improves their treatment compliance. The study reported by Ling et al. showed that whole-course high-quality nursing could alleviate bad mood, reduce adverse reactions, and improve QOL and nursing satisfaction of patients with liver cancer during radiotherapy [24]. This study also found that standardized post-catheter nursing is beneficial to the rehabilitation of patients. In addition, in a study reported by Yu et al. [25], it was found that pipeline care ameliorated the QOL and bad mood of gastrointestinal patients. Through pipeline care, we also improve the QOL and bad mood of disabled elderly. Thus, we have strong evidence that shows that standardized post-catheter care can better alleviate patients' anxiety and depression and improve their QOL.

However, there are still some limitations in this research. First, the effect of standardized post-catheter nursing on the long-term self-care ability of the disabled elderly was not observed. Second, the effect of such a nursing model in other clinical diseases remains to be explored. These deficiencies will be addressed in future research.

To sum up, standardized post catheter nursing intervention for the disabled elderly can better enhance the awareness rate of knowledge and behavior, improve the treatment compliance and QOL, and reduce the incidence of catheter complications.

Disclosure of conflict of interest

None.

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References

[1] Memetov SS and Sharkunov NP. Some aspects of rehabilitation of disabled persons of the elderly and senior age at the present stage. Adv Gerontol 2019; 32: 211-214.

[2] Liu X, Lu B and Feng Z. Intergenerational transfers and informal care for disabled elderly persons in China: evidence from CHARLS. Health Soc Care Community 2017; 25: 1364-1374.

[3] McGrath R, Erlandson KM, Vincent BM, Hackney KJ, Herrmann SD and Clark BC. Decreased handgrip strength is associated with impairments in each autonomous living task for aging adults in the United States. J Frailty Aging 2019; 8: 141-145.

[4] Volkova OA, Koneva TN, Kopytov AA and Artemova YS. The social interactions as a factor of activity of the elderly and the disabled in receiving dental services. Probl Sotsialnoi Gig Zdravookhranenniiai Istor Med 2019; 27: 404-407.

[5] Younesi S, Parsian H, Hosseini SR, Noreddini H, Mosapour A, Bijani A and Halalkhor S. Dyshomeostasis of serum oxidant/antioxidant status and copper, zinc, and selenium levels in elderly physically disabled persons: an AHAP-based study. Biol Trace Elem Res 2015; 166: 136-141.

[6] Hagemans JAW, Voogt ELK, Rothbarth J, Nieuwenhuijzen GAP, Kirkels WJ, Boormans JL, Koldewijn EL, Richardson R, Verhoef C, Rutten HJT and Burger JWA. Outcomes of urinary diversion after surgery for locally advanced or locally recurrent rectal cancer with complete cystectomy; ileal and colon conduit. Eur J Surg Oncol 2020; 46: 1160-1166.

[7] Kanno T, Inoue T, Kawakita M, Ito K, Okumura K, Yamada H, Kubota M, Fujii M, Shimizu Y, Yatsuda J, Kobori G, Moroi S, Shichiri Y, Akao T, Sawada A, Saito R, Kobayashi T and Ogawa O. Perioperative and oncological outcomes of laparoscopic radical cystectomy with intracorporeal versus extracorporeal ileal conduit: a matched-pair comparison in a multicenter cohort in Japan. Int J Urol 2020; 27: 559-565.

[8] Wouters Y, Vissers RK, Groenewoud H, Kievit W and Wanten GJA. Repair of damaged central venous catheters is safe and doubles catheter survival: a home parenteral nutrition patient cohort study. Clin Nutr 2019; 38: 1692-1699.

[9] Chalouhi N, Tjoumakaris SI, Gonzalez LF, Hasan D, Pema PJ, Gould G, Rosenwasser RH and Jabbour PM. Spontaneous delayed migration/shortening of the pipeline embolization device: report of 5 cases. AJNR Am J Neuroradiol 2013; 34: 2326-2330.

[10] Parker LA, Withers JH and Talaga E. Comparison of neonatal nursing practices for determining feeding tube insertion length and verifying gastric placement with current best evidence. Adv Neonatal Care 2018; 18: 307-317.

[11] Hooker L, Small R, Humphreys C, Hegarty K and Taft A. Applying normalization process theory to understand implementation of a family violence screening and care model in maternal and child health nursing practice: a mixed method process evaluation of a randomised controlled trial. Implement Sci 2015; 10: 39.

[12] Shayan NA, Arslan UE, Hooshmand AM, Arshad MZ and Ozcebe H. The short form health survey (SF-36): translation and validation study in Afghanistan. East Mediterr Health J 2020; 26: 899-908.

[13] Yue T, Li Q, Wang R, Liu Z, Guo M, Bai F, Zhang Z, Wang W, Cheng Y and Wang H. Comparison of hospital anxiety and depression scale (HADS) and Zung self-rating anxiety/depression scale (SAS/SDS) in evaluating anxiety and depression in patients with psoriatic arthritis. Dermatology 2020; 236: 170-178.

[14] Bashkireva AS, Shestakov VP, Svintsov AA, Cherniakina TS, Chernova GI and Bogdanov EA. An analysis of the state of social services for elderly citizens and disabled persons in Russian Federation. Adv Gerontol 2013; 26: 569-574.

[15] Hasan H and Aljunid SM. Job satisfaction among community-based rehabilitation (CBR) workers in caring for disabled persons in the east coast region of Peninsular Malaysia. BMC Public Health 2019; 19: 208.

[16] Poletti F, Coccino C, Monolo D, Crespi P, Cicciolì G, Cordio G, Seveso G and De Servi S. Efficacy and safety of peripherally inserted central venous catheters in acute cardiac care management. J Vasc Access 2018; 19: 455-460.

[17] Murayama R, Takahashi T, Tanabe H, Yabunaka K, Oe M, Komiyama C and Sanada H. Exploring the causes of peripheral intravenous catheter failure based on shape of catheters removed from various insertion sites. Drug Discov Ther 2018; 12: 170-177.

[18] Hon K, Bihari S, Holt A, Bersten A and Kulkarni H. Rate of catheter-related bloodstream infections between tunneled central venous catheters versus peripherally inserted central catheters in adult home parenteral nutrition: a meta-analysis. JPEN J Parenter Enteral Nutr 2019; 43: 41-53.

[19] Moy DM, Kim TE, Harrison TK, Leng JC, Carvalho B, Howard SK, Shum C, Kou A and Mariano ER; Anesthesiology-Directed Advanced Pro-

cedural Training (ADAPT) Research Group. Comparative echogenicity of an epidural catheter and 2 new catheters designed for ultrasound-guided continuous peripheral nerve blocks. J Ultrasound Med 2017; 36: 2571-2576.
[20] Wilde MH. Life with an indwelling urinary catheter: the dialectic of stigma and acceptance. Qual Health Res 2003; 13: 1189-1204.
[21] Scullion PA. Models of disability: their influence in nursing and potential role in challenging discrimination. J Adv Nurs 2010; 66: 697-707.
[22] Sareen J, Jacobi F, Cox BJ, Belik SL, Clara I and Stein MB. Disability and poor quality of life associated with comorbid anxiety disorders and physical conditions. Arch Intern Med 2006; 166: 2109-2116.
[23] Redfern RE, Micham J, Sievert D and Chen JT. Effects of thermomechanical stimulation during intravenous catheter insertion in adults: a prospective randomized study. J Infus Nurs 2018; 41: 294-300.
[24] Pang L, Wang Y, Xing Y and Zhao C. Application effects of whole course high-quality nursing on patients with liver cancer during radiotherapy. Iran J Public Health 2019; 48: 1777-1785.
[25] Yu L. Effect of evidence-based nursing on patients' psychological state and tracts in gastrointestinal surgical tract nursing. China Modern Doctor 2019; 29: 147-149.