SciencePG
Science Publishing Group

Research Article

Impact of an Orthopedic Nurse Specialist-Led Therapeutic Communication Model on Medication Adherence in Patients with Fragility Fractures: Emphasizing the Role of Nurse-Led Interventions

Yanfei Li[1], [†] (iD)**, Wenyan Chen[1], [†]** (iD)**, Yinxia Hong[1]** (iD)**, Jie Hong[2], [*]** (iD)**, Huixuan Chen[3], [*]** (iD)

[1]Department of Spinal and Trauma, The First Affiliated Hospital of Jinan University, Guangzhou, China

[2]Center for Orthopedics and Sports Medicine, The First Affiliated Hospital of Jinan University, Guangzhou, China

[3]Department of Neurosurgery, The First Affiliated Hospital of Jinan University, Guangzhou, China

Abstract

Objective To explore the effect of a specialized nurse-led therapeutic communication model on medication adherence of patients with fragility fractures after discharge from the hospital. *Methods:* In this study, 114 fragility fracture patients admitted to the orthopedic ward of a tertiary hospital in Guangdong Province from December 2022 to July 2023 were selected as the study subjects. The control group received routine inpatient health education. For the intervention group, specialized nurses implemented a structured therapeutic communication model during hospitalization. This included: 1. Establishing trust with patients through relational communication. 2. Conducting a comprehensive health assessment using evaluative communication. 3. Providing personalized health education based on the assessment results (therapeutic communication). 4. Feeding back the assessment results to physicians to assist in formulating personalized treatment plans. Additionally, specialized nurses conducted telephone follow-ups at 1 and 3 months post-discharge. Each follow-up involved: Re-establishing trust with patients (relational communication), assessing bone health maintenance and medication adherence (evaluative communication). Providing tailored health guidance to address identified issues (therapeutic communication). *Results:* The intervention group, which received the specialized nurse-led therapeutic communication model, showed significantly greater improvement in medication adherence at 1 and 3 months post-discharge compared to the control group. Medication adherence improved progressively over time in the intervention group. *Conclusion:* The specialized nurse-led therapeutic communication model significantly enhances medication adherence in fragility fracture patients post-discharge, outperforming traditional health education and communication approaches.

Keywords

Therapeutic Communication, Fragility Fracture, Compliance

[*]Corresponding author: hongjie_17@163.com (Jie Hong), jnuchenhuixuan@126.com (Huixuan Chen)

[†]Yanfei Li and WenYan Chen are co-first authors.

1. Introduction

Therapeutic communication (TC) is a patient-centered, two-way communication between medical staff and patients and their families in treatment and care; the two parties in the communication are based on relational communication to establish a trusting therapeutic relationship with each other, and evaluative communication as the core to assess and monitor the patient's physiological, psychological, social and environmental adaptation problems, as well as attitudinal (including beliefs and emotions), cognitive and behavioral problems in the diagnosis and care of the corresponding diseases. With assessment communication as the core, we apply professional and professionally related knowledge to assess and monitor patients' physical, psychological, social and environmental adaptation problems, as well as attitudinal (including beliefs and emotions, etc.), cognitive and behavioral problems in the diagnosis, treatment and care of the corresponding diseases, to explore the causes of the problems and to seek the resources needed to solve the problems; with therapeutic communication as the essence, we screen a series of disease problems according to the priorities and the patient's needs and demands and solve the problems by using the available resources; the ultimate goal is to help the patients to seek self-help and/or help from others. The ultimate goal is to help patients seek self-help and/or other help, establish a good social support system, cope with the disease positively, alleviate pain, and restore health [1].

The effectiveness of therapeutic communication in practice is affected by a variety of factors, and the effectiveness of therapeutic communication may vary greatly among healthcare professionals with different academic backgrounds, professional experiences, and years of experience, even when they are dealing with patients suffering from the same type of disease, at the same stage and in the same environment [2, 3]. Orthopaedic specialist nurses have a complete knowledge base, clinical risk anticipation skills and teamwork skills [4]. They have extensive clinical nursing practice skills to achieve efficient outcomes in the practice of clinical nursing.

Good communication can improve patients' medication adherence [5]. High quality discharge communication should include complete and timely information about primary diagnosis, diagnostic test results, treatment or hospital course, discharge medications, pending studies, patient and family counseling, and followup plans [6]. Orthopedic specialist nurses, with their advanced skills and knowledge, are uniquely equipped to leverage TC for better patient outcomes. Recent literature supports the integration of TC into orthopedic nursing practices, particularly in the management of fragility fractures and osteoporosis, to address the existing "management gap" and improve long-term patient health.

2. Materials and Methods

2.1. Participants

Patients with fragility fractures admitted to the orthopedic ward of a tertiary hospital in Guangdong Province from December 2022 to July 2023 were selected for this study. Inclusion criteria: (1) patients diagnosed with osteoporosis according to the Chinese Guidelines for the Diagnosis and Treatment of Osteoporosis in the Elderly (2018); (2) patients with fragility fracture caused by low-energy trauma; (3) aged ≥50 years; (4) with certain cognitive and communication skills; and (5) voluntarily participating in this study and signing an informed consent form. Exclusion criteria: (1) patients with severe hepatic and renal dysfunction or severe gastrointestinal diseases; (2) people with severe cognitive impairment and illiterate patients; (3) blurred vision, deafness and other diseases affecting normal communication; (4) secondary fracture due to other diseases; and (5) patients admitted to the hospital for the first time for fragility fracture.

2.2. Procedure

2.2.1. Grouping Method

Grouping method Patients who met the enrollment criteria began to implement the therapeutic communication model to intervene in patients according to the admission time, 2023 April.

2.2.2. Intervention Methods

Control group

During hospitalization, nurses used traditional communication mode to implement routine health assessment, health education and doctors to implement diagnosis and treatment plan: (1) General nurses of orthopaedic ward assessed patients' current condition, underlying diseases, medication, daily life ability, diarrhea problems, psychological condition, bone density, bone metabolism markers and so on. (2) According to the assessment results, the orthopaedic ward nurses gave health education in the form of ipad or pamphlet, face-to-face verbal education, etc. The contents were as follows: (1) basic nursing care: including admission assessment and publicity, daily basic nursing care, perioperative routine nursing care, pain nursing care, psychological nursing care, medication nursing care, etc.; (2) knowledge of the disease: symptoms of osteoporosis, hazards, etc.; (3) daily health care guidance: the patients were instructed to take in calcium, moderate protein, low protein, and low calcium, low calcium, low protein and low calcium. Daily recommended intake of calcium is 1000～1200 mg (1000 mg/d for men aged 50～70 years; 1200 mg/d for women aged ≥51 years and men aged ≥71 years), and the recommended daily intake of vitamin D is 800～1000 IU (for adults aged 50 years and above at moderate risk of vitamin D deficiency). The recommended daily

intake of vitamin D is 800-1000 IU (for adults over 50 years of age at moderate risk of vitamin D deficiency). Sodium salt should not exceed 5 g, and protein intake should be 0.8-1.0 g/kg per day. (4) Fall prevention: assess the risk factors for fall, patients with Morse score of medium-high risk need to be accompanied by family members. Instruction on activities during bed rest and precautions for getting down to the ground. (5) Pre-discharge guidance: orthopedic ward nurses provide routine discharge guidance to patients with fragility fractures on the day or 1 day before the patient is discharged from the hospital.

Intervention group

During hospitalization, the orthopaedic specialist nurses use therapeutic communication to conduct a comprehensive assessment of the patients (evaluative communication) and personalized health education according to the results of the assessment (therapeutic communication) on the basis of the establishment of trust between the nurse and patient (relational communication).

Phase 1: relational communication. Orthopaedic nurses establish a harmonious and trusting nurse-patient relationship with patients in 1-2 days after admission to improve patients' cooperation and ensure that the follow-up communication is real and effective, and the relational communication is carried out throughout the whole communication process. Communication content: 1) initiative self-introduction, detailed introduction of the ward environment, help patients to solve urgent problems, enhance the degree of trust. 2) Use restrictive conversation to understand the patient's general information. For example: gender, age, education level, occupation, family financial situation, medical expenses, social support system and other aspects. 3) Assess the patient's psychological state; understand the patient's character traits and lay the foundation for the next assessment.

Phase 2: evaluative communication. Orthopaedic specialist nurses during hospitalization 1) assess the patient's current condition: symptoms and signs, underlying diseases, medication, X-rays, laboratory test indexes (bone metabolism markers, blood routine, biochemistry), bone mineral density, self-care ability in daily life, diarrhea problems and other issues. 2) Assessment of bone health maintenance: osteoporosis knowledge mastery, daily bone health care behaviors, medication adherence, etc.; 3) Assessment of patients' osteoporosis self-efficacy; through evaluative communication, we understood the patients' current condition, bone health maintenance, and osteoporosis self-efficacy. The researcher condensed the main problems of the patients and listed the outline of the therapeutic communication to prepare for the therapeutic communication.

Phase 3: therapeutic communication. Orthopaedic specialist nurses gave personalized health education according to the patients' own comprehensive assessment results. The content includes: 1) according to the patient's personal dietary habits, laboratory test indexes, bone density and other personalized dietary prescriptions for the patient, follow up on the patient's dietary knowledge and daily calcium intake, pay attention to the self-efficacy of calcium intake. 2) According to the patient's condition, the patient should formulate a time interval exercise program and follow up the self-efficacy of exercise. 3) Give targeted drug knowledge education, inform the precautions for drug use, and follow up the patients' adherence to medication. Fall prevention: Provide fall prevention measures for high-risk groups, including fall risk assessment and care, and home environment safety assessment. 4) Peer education: Orthopaedic specialist nurses introduce successful cases of bone health maintenance to patients to help them eliminate fear and establish positive treatment beliefs. Through therapeutic communication, patients understand the danger of osteoporosis and the preventable nature of the disease. Patients acquire knowledge of osteoporosis-related diseases and self-care methods and adhere to them. For the osteoporosis knowledge and bone health maintenance behaviors that patients have not mastered, they enter the cycle of repeated evaluative communication and therapeutic communication.

Orthopaedic nurses will feedback the comprehensive assessment results obtained in the communication to the bedside doctors and assist them in formulating personalized treatment plans.

Pharmacological treatment: the orthopedic nurse will communicate the assessment results to the team bedside doctors: the bedside doctors will carry out individualized anti-osteoporosis treatment according to the osteoporosis diagnosis and treatment guidelines. Surgical treatment plan: the managing doctor decides the treatment plan according to the type of disease. Orthopaedic nurses use therapeutic communication to intervene during the follow-up phase of the patient's discharge from the hospital.

Orthopedic nurses conduct follow-up visits 1 or 3 months after discharge, usually choosing 8:30-11:30 and 15:00-17:00 to communicate with patients by phone. Orthopaedic nurses use therapeutic communication to conduct telephone follow-up, and each telephone follow-up firstly establishes a good relationship of trust with the discharged patients (relational communication), understands their home bone health maintenance, medication adherence, etc. (evaluative communication), and gives personalized health guidance to the existing problems.

2.3. Measuring Tool

Morisky Medication Adherence Scale (MMAS-8) is used to investigate the patients' medication adherence, the higher the score, the better the adherence, Morisky et al. compiled the scale in 1986, and Morisky et al. added entries based on the original scale's four entries to form a new scale with eight entries in 2008. In 2008, Morisky et al. added entries to the four items of the original scale to form a new scale with eight items, and its Cornbach's alpha coefficient was 0.83, with good reliability. The Cornbach's alpha coefficient of the

questionnaire is 0.64, which still has good reliability. The scale consisted of 8 items, with 0 points for "yes" and 1 point for "no" for items 1-7, of which question 5 was reverse scored, and question 8 was scored as 1, 0.75, 0.5, 0.25, and 0 points in a hierarchical scale. The patients were scored by the "Morisky Medication Adherence Scale" in the first and third months after discharge from the hospital.

2.4. Quality Control

In the course of the study, problems were found and communicated with doctors in a timely manner to ensure that the intervention was carried out smoothly. The person in charge of the project group supervised the progress and quality control of the project throughout the whole process. Orthopaedic surgeons were responsible for formulating and adjusting the treatment plan; orthopaedic specialist nurses contacted the patients or family members of the intervention group by telephone at regular intervals to follow up on their medication and rehabilitation exercises and to assess the effect of the intervention.

=During the data collection process, patients were allowed to fill in the questionnaires by themselves as much as possible, while those who were unable to fill in the questionnaires were explained by the researchers to complete them one by one. The quality of the questionnaires was verified and collected after completion. For patients who did not have regular follow-up, the researchers contacted the patients by phone to assist in completing the questionnaire.

Two-person data entry was used and checked and reviewed to reduce errors and information bias generated during data entry.

2.5. Statistical Analysis

Data were analyzed using SPSS 25.0 statistical software, and P < 0.05 was taken as statistically significant difference. Count data were statistically described using frequency, and count data were statistically analyzed using X^2. Measurement data conforming to normal distribution were statistically described by mean ± standard deviation, and two independent samples were statistically analyzed by t-test; medication adherence statistics were analyzed by repeated-measures analysis of variance (ANOVA).

3. Results

3.1. Comparison of Patients' Baseline Information

The difference between the general information of the two groups of patients was not statistically significant (*P*>0.05), and is comparable, Table 1. Comparison of the baseline information of the two groups of patients, sex(X^2=0.000, *P*=1.000), age (*t*=-0.876, *P*=0.383), Level of education(X^2=0.802, *P*=0.849), Monthly per capita household income (X^2=1.341, *P*=0.719), Methods of payment for medical expenses (X^2=1.162, *P*=0.281), Comorbidities(X^2=0.148, *P*=0.700) were comparable.

Table 1. Comparison of the general data of the two groups of patients (N=114).

Variable	intervention group Frequency (n=57)	control group Frequency (n=57)	X^2/t	*P*
Sex			0.000	1.000
Male	11	11		
Female	46	46		
Age ($\overline{x}\pm S$,)	74±9	76±9	-0.876	0.383
Level of education (n)			0.802	0.849
No formal education	7	6		
Primary	25	22		
Junior high school	12	12		
Secondary	13	17		
Monthly per capita household income (n)			1.341	0.719
≤¥2000	1	2		
¥2001-¥4000	11	13		
¥4001-6000	19	14		
≥¥6000	26	28		

Variable	intervention group Frequency (n=57)	control group Frequency (n=57)	X^2/t	P
Methods of payment for medical expenses (n)			1.162	0.281
medical insurance for residents	21	12		
medical insurance for workers	20	27		
self-financed	2	1		
commercial insurance	1	0		
other	13	17		
Comorbidities (n)			0.148	0.700
Yes	36	34		
No	21	23		

3.2. Comparison of Medication Adherence Between Two Groups of Patients

The difference in medication adherence between the two groups during hospitalization was not statistically significant (P>0.05), and the medication adherence in the intervention group was higher than that of the control group in the 1st and 3rd months after discharge (P<0.05), which was statistically significant. Analysis of variance using repeated measures showed a statistically significant time effect (F=43.720,

P<0.01), indicating that medication adherence changes over time. The time and intervention interaction effect was also statistically significant (F intra*intergroup=7.725, P<0.05), which means that the medication adherence scores of the two intervention effects had different development trends, analyzed by the between-subjects effect, we obtained the intergroup effect(F =14.196, P<0.05), which indicated that there was a statistically significant difference between the two groups in terms of medication adherence, and that the intervention group's medication adherence scores were higher than those of the control group. (Table 2, Figure 1)
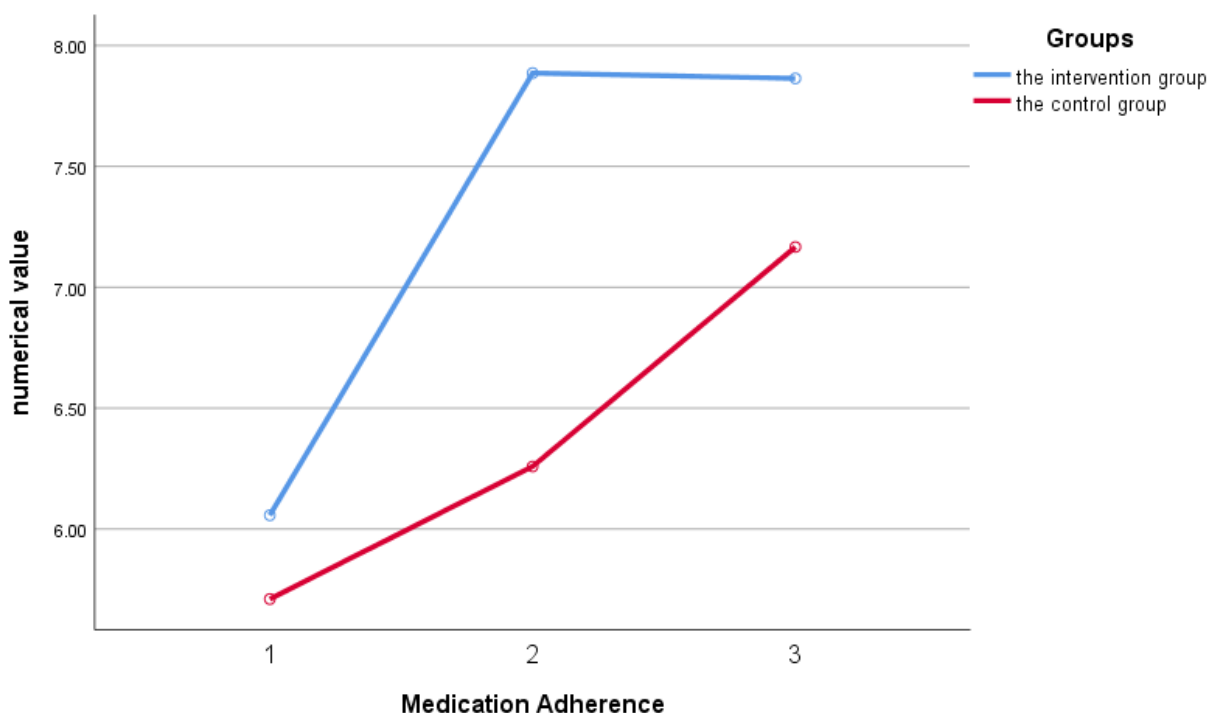

Figure 1. Medication adherence.

Table 2. Medication adherence scores for both groups($\overline{x} \pm S$, scores).

Groups	Hospitalization	1 month after discharge	3 month after discharge	F	P
intervention group (n=57)	6.06±2.77	7.89±0.42	7.86±0.54		
Control group (n=57)	5.71±1.87	6.26±1.83	7.17±1.41		
t	0.783	6.527	3.487		
P	0.435	0.000	0.001		
time effect				43.720	0.000
between-group effect				14.196	0.000
Intra*intergroup effects				6.725	0.010

4. Discussion

The results of this study showed that the therapeutic communication model led by orthopedic specialty nurses significantly improved patients' medication adherence ($P<0.05$), which can be popularized and applied in clinical practice. Therapeutic communication is a verbal therapeutic modality following surgical treatment and medication, and it is a therapeutic means in psychology. It has been applied to clinical work because of its advantages of improving patients' negative psychology, increasing patient satisfaction and knowledge of disease, and improving patient compliance [7]. Chen Z [8] used therapeutic communication to improve medication adherence in patients with chronic heart failure and achieved significant results ($P<0.05$). Zheng MQ et al [9] used therapeutic communication to improve treatment adherence in children with allergic rhinitis with successful results ($P<0.05$). Lee et al [10] applied therapeutic communication methods to the treatment of hematology patients to promote a harmonious relationship between nurses and patients. Song M, et al [11] stated that psychiatric nurses used therapeutic communication strategies to discuss decision-making with patients, which significantly improved the adherence to medication for patients with alcohol use disorder patients' medication adherence. In this study, the therapeutic communication system consists of three links, always throughout the whole process of fragility fracture patient management, orthopaedic specialist nurses firstly, establish a trusting relationship with the patient (relational communication); secondly, applying their own professional knowledge and skills, and auxiliary tools, comprehensively assess the patient's physiological, psychological, cognitive, behavioral, attitudinal, and social support system aspects (evaluative communication); and then this, according to the existence of the severity of the problems Then, according to the severity of the problem and the patient's needs, condense the key 1-2 problems and find information to solve the problem (therapeutic assessment), the three steps are repeated week after week, and can be repeated cycle. In this study, orthopedic nurse specialists established a good therapeutic relationship with patients during hospitalization, and gave appropriate therapeutic guidance through subsequent and continuous assessment, and achieved good results in improving patients' adherence to medication after discharge ($P<0.05$).

Orthopedic specialty nurses also play an important role in the management of fragility fracture-related diseases. Zhao Y et al [12] established a multidisciplinary team based on geriatric orthopedic specialist nurses as coordinators of the whole process, which improved the diagnosis and treatment rates of osteoporosis patients. Wei F et al [13] showed that the "1+2+x" collaborative service model led by specialist nurses could improve the standardization rate of anti-osteoporosis medication, the compliance rate of dietary regimen implementation, the implementation rate of low back muscle balance training, and the compliance rate of behavioral habit change in osteoporotic compression fracture patients. Orthopaedic nurse specialists are literally nursing staff with orthopaedic nurse specialists' certificates, but in the course of clinical practice, they show skillful communication skills and good medical expertise, and are "senior nursing experts" who can give timely guidance to deal with complex clinical problems. As the results of this study show, in the therapeutic communication model led by orthopaedic nurses, orthopaedic nurses played a decisive role, especially in the post-discharge telephone follow-up process, skillfully utilizing therapeutic communication skills to solve the patient's problems, enhance the therapeutic relationship with the patient, increase the "degree of adhesion" with the patient, and avoid the loss of the patient's visit, thus avoiding the loss of the patient. In the process of post-discharge telephone follow-up, we skillfully used therapeutic communication skills to solve patients' problems, enhance the therapeutic relationship with patients, and increase the "bonding" with patients, which prevented the loss of patients' visits, and also improved patients' adherence to medication.

5. Conclusions

The establishment of Fracture Liaison Services (FLS) has demonstrated significant potential in reducing morbidity, recurrent fractures, and mortality among patients with fragility fractures. However, the lack of uniform standards for the qualifications and number of fracture liaison personnel, both in China and internationally, presents a challenge to the effective implementation of FLS. In most countries, fracture liaison roles are predominantly filled by trained medical professionals, such as registered nurses or allied health professionals, due to considerations of labor costs and scope of work. In China, where FLS is still in its initial stages, specialty nurses—equipped with specialized knowledge, skills, and credentials—emerge as the most suitable candidates for fracture liaison roles.

The findings of this study highlight the critical role of specialty nurses in bridging the "management gap" in osteoporosis care, particularly in the context of fragility fractures. By leveraging their expertise, specialty nurses can not only enhance patient outcomes through effective communication and follow-up but also contribute to the broader goals of reducing recurrent fractures and improving long-term quality of life. This study underscores the importance of expanding the scope of practice for specialty nurses in orthopedic settings, providing a strong foundation for integrating FLS into routine clinical care. Moving forward, these insights can guide the development of standardized training programs and protocols for fracture liaisons, ultimately advancing orthopedic nursing practices and improving patient care on a global scale.

This revised conclusion emphasizes the clinical implications of your findings, particularly for orthopedic nursing practices, and highlights the potential for specialty nurses to play a pivotal role in the implementation and success of FLS. It also ties the study's outcomes to broader goals in patient care and healthcare system improvement.

Abbreviations

FLS   Fracture Liaison Services

Author Contributions

Yanfei Li: Formal Analysis, Writing – original draft, Writing – review & editing
Wenyan Chen: Conceptualization, Investigation
Yinxia Hong: Investigation
Jie Hong: Data curation
Huixuan Chen: Investigation

Funding

Conflicts of Interest

The authors declare no conflicts of interest.

References

[1] Weily Wang. Therapeutic communication system [M]. Beijing: People's Health Publishing House, 2013.

[2] Moykari MJ, Sinaga MR, Sakke' V, Patrisia I, Sinaga CRA. Nurses' knowledge and therapeutic communication in hospital. Rev Bras Enferm. 2023 Nov 27; 76(5): e20220617. https://doi.org/10.1590/0034-7167-2022-0617

[3] Kudubes AA, Ayar D, Zengin H. Therapeutic communication skills level among students undertaking the pediatric nursing course and the associated influencing factors. J Pediatr Nurs. 2023 Nov-Dec; 73: 34-43. https://doi.org/10.1016/j.pedn.2023.08.015

[4] Shen XQ, Zhang W, Wang JJ. Conceptual analysis of orthopedic specialty nurse liaison in fracture liaison services [J]. Journal of Nurse Advancement, 2024, 39(11): 1127-1131+1137. https://doi.org/10.16821/j.cnki.hsjx.2024.11.002

[5] Zeng J, Gao Y, Hou C, Liu T. The impact of doctor-patient communication on medication adherence and blood pressure control in patients with hypertension: a systematic review. PeerJ. 2024 Nov 28; 12: e18527. https://doi.org/10.7717/peerj.18527

[6] Elmore CE, Elliott M, Schmutz KE, etal. Assessing Patient Readiness for Hospital Discharge, Discharge Communication, and Transitional Care Management. J Am Board Fam Med. 2024 Jul-Aug; 37(4): 706-736. https://doi.org/10.3122/jabfm.2023.230172R3

[7] Zhang, S. Y., Bai, L. Q., Tan, H. Z., et al. Application of Morisky Medication Adherence Scale in Patients with Pulmonary Tuberculosis [J]. Chinese Journal of Antituberculosis, 2010, 32(09): 527-530. https://doi.org/10.19982/j.issn.1000-6621.2010.09.014

[8] Xue W, Heffernan C. Therapeutic communication within the nurse-patient relationship: A concept analysis. Int J Nurs Pract. 2021, 27(6): e12938. https://doi.org/10.1111/ijn.12938

[9] Chen, Z. Analysis of the Impact of Therapeutic Communication on Medication Adherence in Patients with Chronic Heart Failure. Clinical Medicine Literature Electronic Journal, 2020, 7(30), 60. https://doi.org/10.16281/j.cnki.jocml.2020.30.057

[10] Zheng, M. Q., Li, Z. M., Yu, R. W., et al. Impact of Picture-Text Communication Education Combined with Therapeutic Communication on Symptom Relief Time and Treatment Adherence in Children with Allergic Rhinitis. Chronic Diseases Journal, 2024, 25(01), 129-132. https://doi.org/10.16440/J.CNKI.1674-8166.2024.01.34

[11] Lee HJ, Park BM, Shin MJ, Kim DY. Therapeutic Communication Experiences of Nurses Caring for Patients with Hematology. Healthcare (Basel). 2022 Nov 30; 10(12): 2403. https://doi.org/10.3390/healthcare10122403

[12] Song M, Song YM. The Effect of Shared Decision-Making by Mental Health Nurses on Medication Adherence in Patients with Alcohol Use Disorders: Provider-Patient Communication Pathway Model. J Health Commun. 2023 Nov 2; 28(11): 777-788. https://doi.org/10.1080/10810730.2023.2268561

[13] Zhao, Y., & Peng, G. L. Observation on the Implementation Effect of Specialist Nurse-Led Fracture Liaison Service in Elderly Patients with Hip Fractures. Chinese Nursing Management, 2020, 20(12), 1893-1897.