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Original Article

Effect of targeted nursing intervention plus psychological counseling on quality of life, negative emotions, and complications in patients with extensively drug-resistant tuberculosis

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Abstract: Purpose: To evaluate the effects of targeted nursing intervention plus psychological counseling on the life quality, negative emotions, and complications in patients with extensively drug-resistant tuberculosis (XDR-TB). Methods: In this prospective study, 88 patients with XDR-TB admitted to Hebei Chest Hospital from Jan 2017 to Dec 2020 were enrolled. All patients were grouped according to RANDBETWEEN (1, 2) function in Excel, assigning 1 to the control group (n=41) for every 2 in the research group (n=44). The control group received routine nursing, while the research group received targeted nursing intervention plus psychological counseling. The self-rating anxiety scale (SAS) score, self-rating depression scale (SDS) score, self-management ability score, treatment compliance, sputum negative conversion rate, re-examination rate, life quality, complications, and nursing satisfaction of the two groups were compared before and after intervention. Results: After intervention, the research group had significantly higher SAS, SDS, self-management ability scores, compliance rate, sputum negative conversion rate, re-examination rate, and life quality compared to the control group (all $P<0.05$). The research group showed a lower incidence of complications and higher nursing satisfaction than the control group (both $P<0.05$). Conclusion: Compared to routine nursing, targeted nursing intervention combined with psychological counseling substantially ameliorates the life quality and negative emotions of patients with XDR-TB and lowers the incidence of complications.

Keywords: Targeted nursing, psychological counseling, extensively drug-resistant tuberculosis, life quality, negative emotion

Introduction

Tuberculosis (TB) is an infectious disease worldwide triggered by mycobacterium tuberculosis (MTB) infection, which mainly is transmitted through the respiratory tract. There were over one million deaths from TB in 2015 [1, 2]. As TB is highly contagious, one untreated TB patient may infect 10-15 people per year [3]. Isoniazid and rifampicin are the first-line drugs for TB at the current stage, with resistance observed in some patients. Patients with resistance to isoniazid, rifampicin, all fluoroquinolones, and at least one drug among all second-line anti-TB injection drugs are considered to have extensively drug-resistant tuberculosis (XDR-TB) [4-6]. Currently, the treatment of XDR-TB remains a challenge due to the lack of effective drugs [7], which highlights the significance of exploration of effective clinical nursing methods to ameliorate the life quality and negative emotions of patients with XDR-TB.

TB heavily compromises the mental and physical health of patients [8], and amelioration of the psychological health of TB patients is crucial. An increasing number of studies have indicated effective nursing measures may improve the prognosis of patients with TB [9-11]. However, the efficacy of traditional nursing mode is unsatisfactory due to its slow information transfer and low nursing quality, which is insufficient

for the majority of patients' care needs [12]. Accordingly, high-quality nursing methods to meet patients' care needs and promote recovery are greatly desired. High-quality nursing has been reported [13, 14] to improve the confidence of patients and their families, thereby enhancing the patients' compliance and life quality after treatment. Consequently, high quality postoperative nursing is crucial to improve the postoperative results of cancer surgery, avoid both complications and the delay in subsequent radiotherapy and chemotherapy, and boost recovery. At the current stage, there are few studies of targeted nursing combined with psychological counseling intervention in XDR-TB so this is still poorly understood.

Accordingly, this study probed the effects of targeted nursing intervention combined with psychological counseling on the life quality, negative emotions, and complications in patients with XDR-TB.

Materials and methods

Patients' clinical data

In this prospective study, a total of 85 patients with XDR-TB were admitted to Hebei Chest Hospital from Aug. 2018 to Jun. 2020. All patients were grouped according to RANDBETWEEN (1, 2) function in Excel, in which 1 patient was assigned to the control group (n=41) for every 2 in the research group (n=44). All patients and their families signed informed consent forms. This study was conducted with approval from the Ethics Committee of Hebei Chest Hospital (approval number: LC2017-1125).

Inclusion and exclusion criteria

Inclusion criteria: (1) Patients with positive MTB in sputum culture within 60 days before treatment; (2) Patients whose drug sensitivity test met the WHO diagnostic criteria for XDR-TB [15]; (3) Patients ≥18 years old; (4) Patients with detailed clinical data; (5) Patients with multiple previous anti-tuberculosis treatments; (6) Patients with irregular anti-tuberculosis treatment lasting longer than 1 month.

Exclusion criteria: (1) Patients with other respiratory tract infections, nerve-related disorders, autoimmune diseases, malignant tumors, or hepatic or renal insufficiency; (2) Patients with poor treatment compliance which prevented research cooperation; (3) Women of childbearing age who were pregnant, breast-feeding, or trying to conceive; (4) Patients who participated in other clinical trials within the last three months.

Nursing methods

Control group: The patients were given routine nursing, including observation of changes in body temperature, sputum color, and sputum volume, medication instruction, proper exercise instruction, and psychological support to alleviate negative emotions.

Research group: Patients were given targeted nursing combined with psychological counseling based on the routine nursing for the control group. The measures were specifically as follows:

Disinfection and isolation: Patients with positive sputum bacteria were arranged in the same room with good ventilation and an ultraviolet lamp irradiation. Irradiation was performed twice a day with 1 h per time, and the patients were regularly given 0.5% 84 liquid disinfectants and disposable paper cups to collect their sputum that were then recycled and incinerated.

Drug treatment: Patients were given medication instructions, and their adverse drug reactions were monitored. Given the long course of TB, especially a medication duration of 12-24 months in multi-drug resistant patients, the patients were taught about medication methods to strengthen their self-management ability.

Health education: The patients and their families were educated about the hazards of XDR-TB, the importance of treatment, its etiology, symptoms, prevention and treatment measures, and nursing measures, and nursing staff patiently addressed the patients' questions. The patients were encouraged to understand the disease, to establish self-confidence in overcoming the disease, actively cooperate with treatment, and improve their compliance.

Diet nursing: A well-designed diet schedule was developed for patients during the treatment to

enhance their appetite. Patients were instructed to eat more high-protein, high-calorie, vitamin-rich, and micronutrient-rich foods to improve their immunity, and were encouraged to adhere to regular and quantitative meals. Patients with adverse reactions were instructed to follow a day long stream of mini-meals.

Exercise guidance: The patients were required to exercise under the guidance of medical staff to improve immunity and recovery. In the developing stage of the disease, patients were required to rest in bed, and instructed to perform pursed-lip breathing and abdominal breathing to enhance the heart and lung function. After alleviation of the disease, the patients were allowed to perform exercises including walking, jogging, mountain climbing, and ball games according to their recovery.

Psychological counseling: The nursing staff were arranged to communicate with patients and help them build confidence in active treatment. The patients were prone to negative emotions and loss of confidence in treatment due to the long-lasting disease, long-term medication of drugs, and negative factors including social discrimination. Accordingly, the nursing staff was required to actively encourage the patients to eliminate their negative feelings and introduce effective drugs, advanced treatment methods and equipment to the patients to enhance their confidence in treatment.

Discharge guidance: At discharge, the patients were taught about disease-related knowledge, and were required to take timely medication and follow a high-protein diet. Patients were also required to maintain isolation from individuals around them. Individuals around them who have cough and fever for more than 2 weeks should be checked immediately at a specialized TB facility.

Regular reexamination: The patients were instructed to receive a monthly review in which they were informed about their medication use and the presence of adverse reactions. Follow up visits were conducted by telephone or home visit.

Outcome measures

Primary outcome measures: Changes in adverse emotions of patients before and after intervention were evaluated. The self-rating anxiety scale (SAS) and self-rating depression scale (SDS) were adopted to evaluate and compare negative emotions between the two groups before and after nursing [16, 17]. A total score of SAS/SDS lower than 50 points is considered as a normal emotional condition, and a higher SAS/SDS score indicates more serious anxiety/depression. The life quality of the two groups was evaluated using the MOS 36-Item Short-Form Health Survey (SF-36) with a total score of 100 points. A higher SF-36 score indicates a higher life quality. Complications of the two groups during nursing were recorded.

Secondary outcome measures: The self-management ability of the two groups was evaluated using a 4-point Likert scale [18]. The scale covers drug management, diet management, psychological and social adaptability, and symptom management. A higher score indicates better self-management ability. The treatment compliance rate of the two groups was evaluated, and their sputum negative rate and re-examination rate were recorded. In addition, a self-made Nursing Satisfaction Questionnaire of our hospital was adopted to evaluate the nursing satisfaction of the two groups. Nursing satisfaction = (the number of patients with high satisfaction + the number of patients with satisfaction)/the total number of cases ×100%.

Statistical analyses

SPSS 20.0 (Chicago SPSS, USA) was used to perform statistical analysis on the collected data, and GraphPad Prism 8 (Graphpad Software Co., Ltd., San Diego, USA) was used to visualize the data as required. The utilization rate of counted data (%) was analyzed by chi-square test and expressed by x^2. Measured data are expressed as (mean ± standard deviation). All measured data conformed to the normal distribution. The paired t test was used for comparison within groups, and the independent sample t test was used for comparison between groups. Significance was set at $P< 0.05$.

Results

Comparison of baseline data

No significant difference was found between the two groups in baseline data such as gender,

Table 1. Baseline data

	Control group (n=41)	Research group (n=44)	χ^2/t	*P*-value
Gender			1.500	0.221
Male	25 (60.98)	21 (47.73)		
Female	16 (39.02)	23 (52.27)		
BMI (kg/m^2)	20.75±2.13	20.16±2.06	1.298	0.198
Age (Years old)	40.6±6.4	39.3±5.8	0.982	0.329
Course of disease (Y)	2.8±0.7	2.7±0.6	0.709	0.481
Involved site			0.962	0.327
Lung	31 (75.61)	29 (65.91)		
Lung + others	10 (24.39)	15 (34.09)		
Pulmonary cavity			1.149	0.284
Yes	33 (80.49)	31 (70.45)		
No	8 (19.51)	13 (29.55)		
Place of residence			1.385	0.239
Urban area	22 (53.66)	18 (40.91)		
Rural area	19 (46.34)	26 (59.09)		
Smoking history			0.337	0.562
Yes	17 (41.46)	21 (47.73)		
No	24 (58.54)	23 (52.27)		
Alcohol abuse history				
Yes	19 (46.34)	18 (40.91)		
No	22 (53.66)	26 (59.09)	0.255	0.614
Complication			1.988	0.370
Diabetes mellitus	15 (36.59)	10 (22.73)		
Hypertension	14 (34.14)	19 (43.18)		
Extrapulmonary tuberculosis	12 (29.27)	15 (34.09)		
Basic culture results of mycobacterium tuberculosis			0.446	0.504
Positive	28 (68.29)	27 (61.36)		
Negative	13 (31.71)	17 (38.64)		

body mass index (BMI), age, course of disease, involved site, pulmonary cavity, place of residence, smoking, drinking, complications, and basic culture results of MTB (all P>0.05, **Table 1**).

Comparison of SAS and SDS scores

Before intervention, the two groups did not differ significantly in terms of SAS and SDS scores (both P>0.05), while after intervention, SAS and SDS scores of both groups decreased (both P<0.001), with lower scores in the research group than those in the control group (both P<0.001) (**Figure 1**).

Comparison of self-management ability scores

Comparison of self-management ability between the two groups after intervention revealed markedly higher scores of drug management, diet management, psychological and social adaptability, and symptom management in the research group than in the control group (all P<0.001, **Table 2**).

Comparison of treatment compliance

After nursing intervention, the research group showed a significantly higher treatment compliance than the control group (P<0.05, **Table 3**).

Comparison of sputum negative rate and re-examination rate

After nursing intervention, the research group showed a significantly higher sputum negative rate and a significantly higher re-examination rate than the control group (both P<0.05, **Table 4**).

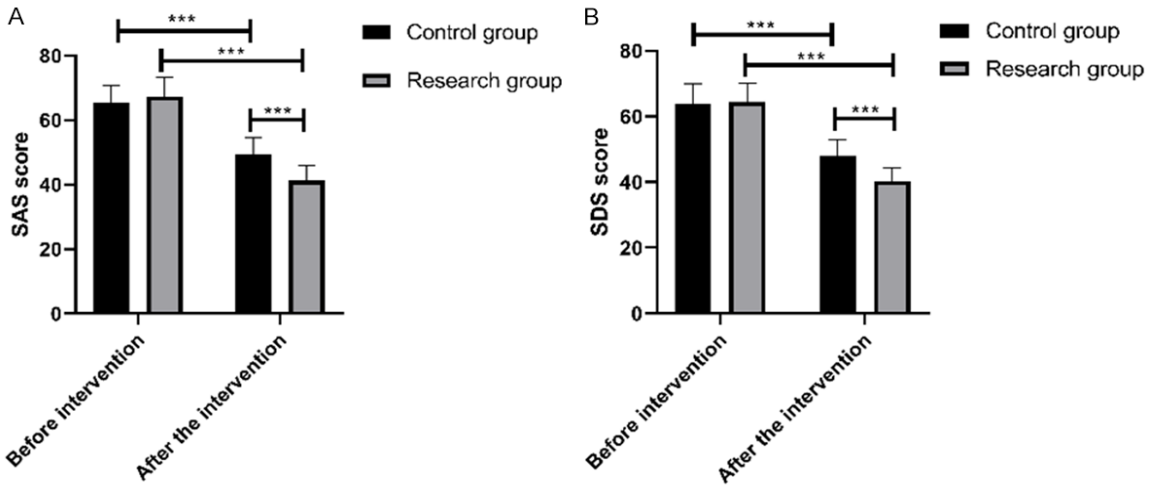

Figure 1. Comparison of SAS and SDS scores between the two groups before and after nursing intervention. Before intervention, the two groups were not greatly different in SAS and SDS scores, while after intervention, SAS and SDS scores of both groups decreased, with much lower scores in the research group than in the control group. ***indicates P<0.001.

Table 2. Self-management ability scores of the two groups after intervention

Group	Drug management	Diet management	Psychological and social adaptability	Symptom management
Control group (n=41)	12.15±1.08	11.24±0.89	11.36±1.24	12.07±1.02
Research group (n=44)	15.34±1.23	13.45±1.12	16.75±1.42	14.92±1.27
t	12.67	10.02	18.58	11.36
P-value	<0.001	<0.001	<0.001	<0.001

Table 3. Comparison of treatment compliance between groups

Group	Complete compliance	General compliance	Non-compliance	Total compliance rate
Control group (n=41)	18 (43.90)	15 (36.59)	8 (19.51)	33 (80.49)
Research group (n=44)	25 (56.82)	17 (38.64)	2 (4.55)	42 (95.45)
χ^2				4.580
P-value				0.032

Table 4. Comparison of sputum negative rate and re-examination rate between groups

Group	Sputum negative conversion	Re-examination
Control group (n=41)	28 (68.29)	34 (82.93)
Research group (n=44)	38 (86.36)	43 (97.73)
t/χ^2	3.993	5.453
P-value	0.046	0.020

Comparison of life quality

Before intervention, the two groups showed no significant difference in the SF-36 scores, while after intervention, the SF-36 scores of both groups increased (both P<0.001), with significantly higher SF-36 scores in the research group than in the control group (P<0.01) (**Figure 2**).

Comparison of complication rate

The research group showed a markedly lower incidence of complications than the control group (P<0.05, **Table 5**).

Comparison of nursing satisfaction

Comparison of nursing satisfaction between the two groups revealed a significantly higher nursing satisfaction in the research group than that in the control group (93.18% *vs.* 75.61%, P<0.05, **Table 6**).

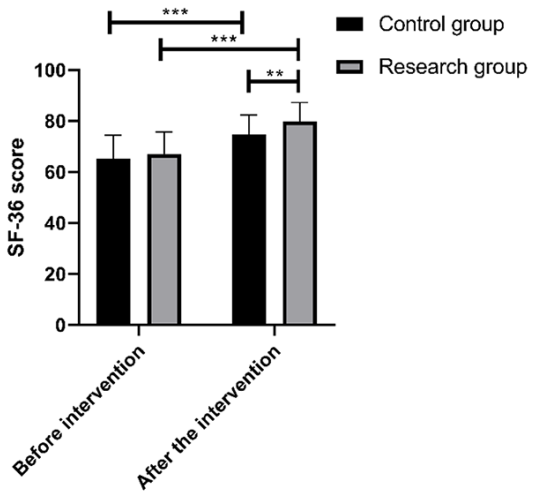

Figure 2. Comparison of SF-36 score between the two groups. Before intervention, the two groups were not greatly different in SF-36 score, while after intervention, the SF-36 score of both groups increased, with a notably higher SF-36 score in the research group than that in the control group. **indicates P<0.01 and ***indicates P<0.001.

Discussion

Despite the slight decrease in the incidence of TB worldwide, TB remains uncontrollable in some areas of Africa and Asia and has evolved into extensively drug-resistant (XDR-TB), or even incurable completely drug-resistant TB [19]. The treatment of XDR-TB has always been a challenge in light of its high cost, various side effects, and long treatment duration [20]. Therefore, patients with XDR-TB are desirous of personalized management for control of the disease spread [21], in which targeted high-quality nursing is a crucial intervention measure.

With the rapid development of modern medicine and the economy, patients put forward gradually higher requirements for nursing quality, which accounts for the extensive application of high-quality nursing mode in clinical practice. Different from the traditional nursing mode, the high-quality nursing mode is a systematic people-centered nursing mode that clarifies nursing philosophy and responsibilities and applies professional knowledge, practices, and attitudes to provide a scientific and efficient nursing for patients to accelerate recovery [22-24]. Targeted nursing is a high-quality nursing mode. Mental health is also crucial to TB patients. Therefore, this study applied targeted nursing combined with psychological counseling to intervene with patients with XDR-TB to investigate the application value of this nursing mode. This study evaluated the adverse emotions of patients before and after intervention, and found a significant alleviation of anxiety and depression in the two groups after intervention, with a more remarkable outcome in the research group than that in the control group. The results imply that targeted nursing combined with psychological counseling can effectively alleviate the negative emotions of patients with XDR-TB, which contributes to the enhancement of patients' confidence in treatment. The self-management ability of the two groups was also evaluated, and a markedly stronger self-management ability was found in the research group than that of the control group. The data suggest that targeted nursing combined with psychological counseling effectively improves the self-management ability of the patients, and thus exerts positive effects on disease control and recovery promotion. Patients with TB mostly experience impaired mental health, social stress, and poor life quality, especially in those with drug-resistant TB, which underlines the management of the mental health of patients [25]. Depression is a common adverse reaction in patients with MDR-TB [26]. Therefore, psychological counseling serves to eliminate the patients' negative emotions and reinforce treatment efficacy [27]. Nepalese scholars indicate the considerable merit of psychological counseling for MDR-TB patients, especially married women [28]. In this study, patients in the research group were given active psychological counseling and targeted health education, which enhanced their awareness of the disease and their confidence and self-management ability. Moreover, this study evaluated the treatment compliance, sputum negative rate, and re-examination rate of the two groups, and found significantly higher levels in the research group than in the control group. The results suggest that compared to routine nursing, targeted nursing combined with psychological counseling more effectively improves the treatment compliance, sputum negative rate, and re-examination rate of patients. Treatment compliance refers to the behavior of patients in receiving treatment according to the doctor's advice, including accurate medication time, medication dosage,

Table 5. Complications of the groups

Group	Cross infection	Anemia	Pressure sore	Hemoptysis	Total
Control group (n=41)	1 (2.44)	3 (7.32)	4 (9.76)	3 (7.32)	11 (26.84)
Research group (n=44)	0 (0.00)	1 (2.27)	1 (2.27)	0 (0.00)	2 (4.54)
t/χ^2					8.135
P-value					0.004

Table 6. Comparison of nursing satisfaction

Group	Very satisfied	Satisfied	Dissatisfied	Overall satisfaction
Control group (n=41)	15 (36.59)	16 (39.02)	10 (24.39)	31 (75.61)
Research group (n=44)	22 (50.00)	19 (60.98)	3 (6.82)	41 (93.18)
t/χ^2				5.541
P-value				0.019

medication method, administration route, re-examination time, and restrictions on diet, smoking, and drinking during administration of special drugs. Given the direct associations of treatment compliance of patients with medication safety, treatment efficacy, and recovery of patients, the enhancement of treatment compliance is of profound significance to their treatment outcome [29]. Amelioration of the psychological patient care improves quality of life and treatment compliance [30]. In the present study, targeted nursing combined with psychological counseling substantially improved the psychological state of patients with XDR-TB and contributed to higher treatment compliance and improved recovery, sputum negative rate, and re-examination rate. We evaluated the life quality of the patients after intervention. A higher life quality in the research group than that in the control group was observed, which suggested the effectiveness of targeted nursing combined with psychological counseling in ensuring better psychological health, treatment outcome, and life quality.

Furthermore, this study investigated the incidence of complications and nursing satisfaction between the two groups. The results showed that the research group showed a significantly lower incidence of complications and a significantly higher nursing satisfaction than the control group, indicating that targeted nursing combined with psychological counseling was well-recognized by most patients and is worthy of clinical promotion. High-quality nursing intervention can improve the patients' psychological state and life quality, intervene physiologically and psychologically in the daily diet and postoperative rehabilitation, strengthen patients' compliance and body function recovery, and improve the nursing satisfaction of patients and their families [31, 32]. The results of this study have also verified that targeted nursing combined with psychological counseling is superior to conventional nursing methods.

However, there were still some limitations. In this study, a single sample site was selected, and only patients from our hospital were chosen as study subjects, with a relatively small sample size and a short follow-up period. The lack of intervention in patients' families in this study compromised the effectiveness of the intervention. A multicenter, large sample size prospective study with follow-up management of long-term outcome after discharge will be conducted in the following study.

Conclusion

Compared with routine nursing, targeted nursing intervention combined with psychological counseling can substantially ameliorate the life quality and negative emotions of patients with XDR-TB and lower the incidence of complications.

Disclosure of conflict of interest

None.

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References

[1] GBD 2015 Mortality and Causes of Death Collaborators. Global, regional, and national

life expectancy, all-cause mortality, and cause-specific mortality for 249 causes of death, 1980-2015: a systematic analysis for the global burden of disease study 2015. Lancet 2016; 388: 1459-1544.

[2] Ioannidis P, van Soolingen D, Mokrousov I, Papaventsis D, Karabela S, Konstantinidou E, Marinou I, Nikolaou S, Kanavaki S, Mantadakis E, Samonis G, Anthony R and Vogiatzakis E. Multidrug-resistant/extensively drug-resistant tuberculosis in Greece: predominance of Mycobacterium tuberculosis genotypes endemic in the Former Soviet Union countries. Clin Microbiol Infect 2017; 23: 1002-1004.

[3] Alema HB, Hailemariam SA, Misgina KH, Weldu MG, Gebregergis YS, Mekonen GK and Gebremedhin KA. Health care seeking delay among pulmonary tuberculosis patients in North West zone of Tigrai region, North Ethiopia. BMC Infect Dis 2019; 19: 309.

[4] Page KR, Sifakis F, Montes de Oca R, Cronin WA, Doherty MC, Federline L, Bur S, Walsh T, Karney W, Milman J, Baruch N, Adelakun A and Dorman SE. Improved adherence and less toxicity with rifampin vs isoniazid for treatment of latent tuberculosis: a retrospective study. Arch Intern Med 2006; 166: 1863-1870.

[5] Lange C, Chesov D, Heyckendorf J, Leung CC, Udwadia Z and Dheda K. Drug-resistant tuberculosis: an update on disease burden, diagnosis and treatment. Respirology 2018; 23: 656-673.

[6] Migliori GB, Tiberi S, Zumla A, Petersen E, Chakaya JM, Wejse C, Muñoz Torrico M, Duarte R, Alffenaar JW, Schaaf HS, Marais BJ, Cirillo DM, Alagna R, Rendon A, Pontali E, Piubello A, Figueroa J, Ferlazzo G, García-Basteiro A, Centis R, Visca D, D'Ambrosio L and Sotgiu G; members of the Global Tuberculosis Network. MDR/XDR-TB management of patients and contacts: challenges facing the new decade. The 2020 clinical update by the global tuberculosis network. Int J Infect Dis 2020; 92S: S15-S25.

[7] Gillespie SH and Singh K. XDR-TB, what is it; how is it treated; and why is therapeutic failure so high? Recent Pat Antiinfect Drug Discov 2011; 6: 77-83.

[8] Laxmeshwar C, Stewart AG, Dalal A, Kumar AMV, Kalaiselvi S, Das M, Gawde N, Thi SS and Isaakidis P. Beyond 'cure' and 'treatment success': quality of life of patients with multidrug-resistant tuberculosis. Int J Tuberc Lung Dis 2019; 23: 73-81.

[9] Li W, Gao J, Wei S and Wang D. Application values of clinical nursing pathway in patients with acute cerebral hemorrhage. Exp Ther Med 2016; 11: 490-494.

[10] Rutherford MA, Pennock JM and Dubowitz LM. Cranial ultrasound and magnetic resonance imaging in hypoxic-ischaemic encephalopathy: a comparison with outcome. Dev Med Child Neurol 1994; 36: 813-825.

[11] Bjerkreim AT, Thomassen L, Waje-Andreassen U, Selvik HA and Næss H. Hospital readmission after intracerebral hemorrhage. J Stroke Cerebrovasc Dis 2016; 25: 157-162.

[12] Brusco NK, Taylor NF, Watts JJ and Shields N. Economic evaluation of adult rehabilitation: a systematic review and meta-analysis of randomized controlled trials in a variety of settings. Arch Phys Med Rehabil 2014; 95: 94-116, e114.

[13] Li X, Zhang Y, Gao H, Sun X, Lv W and Xu G. The value of extended nursing services on patients with bladder cancer after endoscopic bladder resection. Iran J Public Health 2016; 45: 48-53.

[14] Seibæk L, Jakobsen DH and Høgdall C. The Danish gynecological cancer nursing database: creating evidence for quality improvements in preoperative and postoperative cancer care. Int J Gynecol Cancer 2018; 28: 802-807.

[15] Centers for Disease Control and Prevention (CDC). Extensively drug-resistant tuberculosis--United States, 1993-2006. MMWR Morb Mortal Wkly Rep 2007; 56: 250-253.

[16] Phillips LH, Saldias A, McCarrey A, Henry JD, Scott C, Summers F and Whyte M. Attentional lapses, emotional regulation and quality of life in multiple sclerosis. Br J Clin Psychol 2009; 48: 101-106.

[17] Liu N, Liu S, Yu N, Peng Y, Wen Y, Tang J and Kong L. Correlations among psychological resilience, self-efficacy, and negative emotion in acute myocardial infarction patients after percutaneous coronary intervention. Front Psychiatry 2018; 9: 1.

[18] Zulman DM, Haverfield MC, Shaw JG, Brown-Johnson CG, Schwartz R, Tierney AA, Zionts DL, Safaeinili N, Fischer M, Thadaney Israni S, Asch SM and Verghese A. Practices to foster physician presence and connection with patients in the clinical encounter. JAMA 2020; 323: 70-81.

[19] Dheda K, Gumbo T, Maartens G, Dooley KE, McNerney R, Murray M, Furin J, Nardell EA, London L, Lessem E, Theron G, van Helden P, Niemann S, Merker M, Dowdy D, Van Rie A, Siu GK, Pasipanodya JG, Rodrigues C, Clark TG, Sirgel FA, Esmail A, Lin HH, Atre SR, Schaaf HS, Chang KC, Lange C, Nahid P, Udwadia ZF, Horsburgh CR Jr, Churchyard GJ, Menzies D, Hesseling AC, Nuermberger E, McIlleron H, Fennelly KP, Goemaere E, Jaramillo E, Low M, Jara CM, Padayatchi N and Warren RM. The epidemiology, pathogenesis, transmission, diagnosis, and management of multidrug-resistant, extensively drug-resistant, and incurable

tuberculosis. Lancet Respir Med 2017; [Epub ahead of print].
[20] Shah I, Poojari V and Meshram H. Multi-drug resistant and extensively-drug resistant tuberculosis. Indian J Pediatr 2020; 87: 833-839.
[21] Alffenaar JC, Akkerman OW, Anthony RM, Tiberi S, Heysell S, Grobusch MP, Cobelens FG and Van Soolingen D. Individualizing management of extensively drug-resistant tuberculosis: diagnostics, treatment, and biomarkers. Expert Rev Anti Infect Ther 2017; 15: 11-21.
[22] Henke RM, Johann J, Senathirajah M, Crandell M, Parker L, Riley L, Adams G, Echoles F, Mack M, Donovan J, Fleming R and Tulloch W. Implementation of the patient-centered medical home model in facilities providing comprehensive care to medically underserved populations. J Health Care Poor Underserved 2016; 27: 1638-1646.
[23] Rosen MA, DiazGranados D, Dietz AS, Benishek LE, Thompson D, Pronovost PJ and Weaver SJ. Teamwork in healthcare: key discoveries enabling safer, high-quality care. Am Psychol 2018; 73: 433-450.
[24] Cohen BS and Boni R. Holistic nursing simulation: a concept analysis. J Holist Nurs 2018; 36: 68-78.
[25] Alene KA, Clements ACA, McBryde ES, Jaramillo E, Lönnroth K, Shaweno D, Gulliver A and Viney K. Mental health disorders, social stressors, and health-related quality of life in patients with multidrug-resistant tuberculosis: a systematic review and meta-analysis. J Infect 2018; 77: 357-367.
[26] Cao Y, Yu C and Wu Y. Incidence rate of depression as an adverse effect of multidrug-resistant tuberculosis treatment. J Infect 2019; 79: 61-74.
[27] Huque R, Elsey H, Fieroze F, Hicks JP, Huque S, Bhawmik P, Walker I and Newell J. "Death is a better option than being treated like this": a prevalence survey and qualitative study of depression among multi-drug resistant tuberculosis in-patients. BMC Public Health 2020; 20: 848.
[28] Khanal S, Elsey H, King R, Baral SC, Bhatta BR and Newell JN. Development of a patient-centred, psychosocial support intervention for multi-drug-resistant tuberculosis (MDR-TB) care in Nepal. PLoS One 2017; 12: e0167559.
[29] Intas G, Psara A, Stergiannis P, Chalari E, Sakkou A and Anagnostopoulos F. Compliance of patients with acute coronary syndrome with treatment following their hospitalization from the cardiac coronary unit. Adv Exp Med Biol 2020; 1196: 117-125.
[30] Gutiérrez-Gabriel I, Godoy-Guinto J, Lucas-Alvarado H, Pineda-Germán B, Vázquez-Cruz E, Hernández-De laRosa M and Sosa-Jurado F. Quality of life and psychological variables affecting adherence to antiretroviral treatment in Mexican patients with HIV/AIDS. Rev Chilena Infectol 2019; 36: 331-339.
[31] Arantes EC, Dessotte CAM, Dantas RAS, Rossi LA and Furuya RK. Educational program for coronary artery disease patients: results after one year. Rev Bras Enferm 2018; 71: 2938-2944.
[32] Zhang Z, Bai J, Huang Y and Wang L. Implementation of a clinical nursing pathway for percutaneous coronary intervention: a randomized controlled trial protocol. Medicine (Baltimore) 2020; 99: e22866.