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Original Article

Intervention of high-quality nursing care in combination with transitional care in the treatment of COPD patients

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Abstract: Objective: To evaluate the application value of high-quality nursing care in combination with transitional care in the treatment of patients with chronic obstructive pulmonary disease (COPD). Methods: A retrospective analysis was conducted on 141 COPD patients in which 79 patients underwent high-quality nursing care (control group) and additional 62 patients received high-quality nursing care in combination with transitional care (care (combined group). The patients in both groups were evaluated as follows: Self-Rating Depression Scale (SDS), Self-Rating Anxiety Scale (SAS), six-minute walk test (6MWT), vital capacity (VC), forced expiratory volume in the first second (FEV1), FEV1/FVC ratio, maximum mid-expiratory flow (MMEF), peak expiratory flow (PEF), quality of life (QOL), compliance to self-management, and satisfaction with nursing care. Results: After intervention, differences in the emotional, functional, cognitive, physiological, and social functions between the two groups are statistically significant ($P < 0.05$). After treatment, the patients in the combined group showed more significant decreases in SDS and SAS scores ($P < 0.05$). Compliance to the rehabilitation, oxygen therapy, and medication of the patients in the two groups before treatment showed no statistically significant differences ($P > 0.05$), and after treatment, these values were significantly improved in the two groups (< 0.05), with greater improvements in the combined group ($P < 0.05$). Moreover, satisfaction with nursing care in the combination group was much higher than that in the control group ($P < 0.05$). Conclusion: High-quality nursing care in combination with transitional care improve the self-management compliance of patients with COPD, bringing significant improvement in pulmonary function, psychological status, life quality, and satisfaction with nursing care.

Keywords: High-quality nursing care, transitional nursing care, COPD, pulmonary function

Introduction

Chronic obstructive pulmonary disease (COPD), is a type of chronic respiratory disease with partial irreversible airway obstruction and exacerbation of pulmonary function; it results in restricted motion and regular activity, severely affecting quality of life of patients and also making them more susceptible to psychological disorders, such as anxiety or depression [1-3]. COPD affects about 8% to 10% of the population aged above 40 years globally, becoming the fourth cause of death in the urban population in China [4, 5]. After discharge from the hospital, patients in the acute phase also suffer from recurrent COPD owing to the lack of knowledge on the disease and corresponding measures for emergencies [6, 7]. Thus, rational and efficient nursing care is crucial for COPD patients.

High-quality nursing care is a type of patient-centered scientific nursing protocol that emphasizes the professional care methods, enhances fundamental nursing care, and implements primary nursing comprehensively [8]. Transitional nursing care refers to a series of nursing activities that, conforming to evidence-based medicine principles, aids the patients and their family to improve their self-nursing ability, thereby enabling continuous nursing care for patients in different situations. High-quality nursing care and transitional nursing care have been reported to yield promising outcomes for COPD [9-11]. Few studies have focused on the combined application of these two strategies in the recovery of COPD patients.

Thus, this study aimed to investigate the efficacy of the combined application of high-quality nursing care and transitional nursing care for

Table 1. General information

	Control group (n=79)	Combined group (n=62)	X^2/t	P
Sex			0.122	0.727
Men	50 (63.29)	41 (66.13)		
Women	29 (36.71)	21 (33.87)		
Age (year)	58.42 ± 5.93	59.73 ± 6.02	1.353	0.178
Temperature (°C)	37.69 ± 0.37	37.58 ± 0.42	1.651	0.101
Duration of disease (year)			0.029	0.986
< 5	22 (27.85)	18 (29.03)		
≥ 5, < 10	32 (40.51)	25 (40.32)		
≥ 10	25 (31.65)	19 (30.65)		
Smoking history			2.213	0.137
Yes	58 (73.42)	52 (83.87)		
No	21 (26.58)	10 (16.13)		
Per capita household Income (¥)			0.243	0.622
≤ 2000	26 (32.91)	18 (29.03)		
> 2000	53 (67.09)	44 (70.97)		
Education level			0.878	0.645
College and above	4 (5.06)	2 (3.23)		
Technical secondary school or high school	24 (30.38)	23 (37.10)		
Junior high school and below	51 (64.56)	37 (59.68)		
Weight [n (%)]			1.515	0.218
< 50 Kg	24 (30.38)	25 (40.32)		
≥ 50 Kg	55 (69.62)	37 (59.68)		
Nation [n (%)]			2.375	0.123
Han nationality	64 (81.01)	56 (90.32)		
Minority	15 (18.99)	6 (9.68)		
Domicile [n (%)]			0.496	0.481
Urban	49 (62.03)	42 (67.75)		
Rural	30 (37.97)	20 (32.26)		

COPD patients, providing references for clinical nursing care.

Material and methods

Subjects

A retrospective analysis was conducted in 141 COPD patients who received treatment between April 2013 and May 2017. Of them, 79 patients received high-quality nursing care (control group), and the other 62 patients, the combination of high-quality and transitional care (combined group). All patients conformed to the indications in *Guidelines for Diagnosis and treatment of COPD* (2013 Revision) [12]. The following inclusion criteria were observed: in the stationary phase, with stable vital signs and basic self-maintenance ability; no history of tumors; completion of examination and therapy in this hospital following diagnosis; and cooperation with the medical staff. The following were the exclusion criteria: diagnosis of severe pulmonary artery hypertension, bronchial asthma, cerebrovascular or cardiovascular diseases, or other respiratory diseases, or osteoarthrosis affecting motion, or tuberculosis; discharged aberrantly during the study or transferred to other hospitals; mental disorders or difficulty in communication. This study was approved by the ethics committee of Yantai Hospital of Traditional Chinese Medicine; informed consent was obtained from patients and their family.

Protocol of nursing care

High-quality nursing care was implemented for patients in the control group, including providing excellent nursing care, for example, instructing assisted breathing training, urging patients to take oxygen every day and carry out physical

Table 2. Changes in pulmonary function indexes in both groups before and after treatment

		Control group (n=79)	Combined group (n=62)	t	P
6MWT (m)	Pre-therapy	264.39 ± 20.13	268.42 ± 20.37	1.174	0.243
	Post-treatment	327.12 ± 24.74***	358.69 ± 25.77***	7.385	< 0.001
VC (L)	Pre-treatment	1.49 ± 0.24	1.52 ± 0.23	0.750	0.454
	Post-treatment	2.14 ± 0.32***	2.69 ± 0.38***	9.326	< 0.001
FEV1 (L)	Pre-treatment	1.21 ± 0.22	1.24 ± 0.21	0.820	0.414
	Post-treatment	1.59 ± 0.23***	1.84 ± 0.24***	6.285	< 0.001
FEV1/FVC (%)	Pre-treatment	40.47 ± 5.18	41.69 ± 5.32	1.372	0.172
	Post-treatment	68.44 ± 6.35***	79.21 ± 6.85***	9.656	< 0.001
MMEF (L/s)	Pre-treatment	1.04 ± 0.17	1.06 ± 0.18	1.689	0.093
	Post-treatment	1.24 ± 0.23***	1.47 ± 0.22***	6.007	< 0.001
PEF (L/s)	Pre-treatment	4.13 ± 0.48	4.25 ± 0.44	1.528	0.129
	Post-treatment	4.39 ± 0.37***	4.67 ± 0.39***	4.355	< 0.001

Note: ***P < 0.05.

exercise such as slow walking, jogging, etc., strengthening health education and providing corresponding disease explanations according to the patient's educational level, providing psychological care and answer patients' questions, thereby increasing patient confidence in treatment.

For the combined group, patients received, in addition to high-quality nursing care, transitional care guided by evidence-based medicine, including medication and diet guidance specific to patients' needs, healthcare guidance including training of respiratory muscles or rehabilitation exercise, regular follow up, evaluation of the symptoms, the incidence of complications and corresponding measures, and home care for patients and their family. Transitional nursing care lasted for six months.

Observation indexes

Before and after implementation of nursing care, the patients in the two groups were evaluated according to the following: Self-Rating Depression Scale (SDS), Self-Rating Anxiety Scale (SAS), six-minute walk test (6MWT), vital capacity (VC), forced expiratory volume in the first second (FEV1), FEV1/FVC ratio, maximum mid-expiratory flow (MMEF), peak expiratory flow (PEF), quality of life (QOL), compliance to self-management, and nursing care satisfaction [13-18].

Statistical methods

SPSS 22.0 software (IBM, New York, USA) was applied for statistical analyses of data. Enumeration data, presented in the form of n (%), were compared with chi-squared tests, whereas measurement data, in the form of mean ± standard deviation (Mean ± SD), were compared with *t* tests. The threshold of P < 0.05 suggested statistical significance in the differences.

Results

Comparison of general data

The control group consisted of 50 male and 29 female patients, with an average age of 58.42 ± 5.93 years. The combined group had 41 male and 21 female patients, with an average age of 59.73 ± 6.02 years. Differences in gender and age showed no statistical significance between the two groups (P > 0.05). Comparisons of other data, including body temperature, disease course, smoking history, education, weight, nationality, and residence, showed that differences had no statistical significance, either (P > 0.05; **Table 1**).

Changes in lung function indicators of patients in the two groups before and after treatment

Prior to the treatment, comparisons of lung function indicators, namely, 6MWT, VC, FEV1, FEV1/FVC, MMEF, and PEF of the patients between the two groups showed no statistically significant differences (P > 0.05). After treatment, these indicators were increased to varying degrees (P < 0.001) in two groups; nevertheless, patients in the combined group had more significant increases (P < 0.001; **Table 2**).

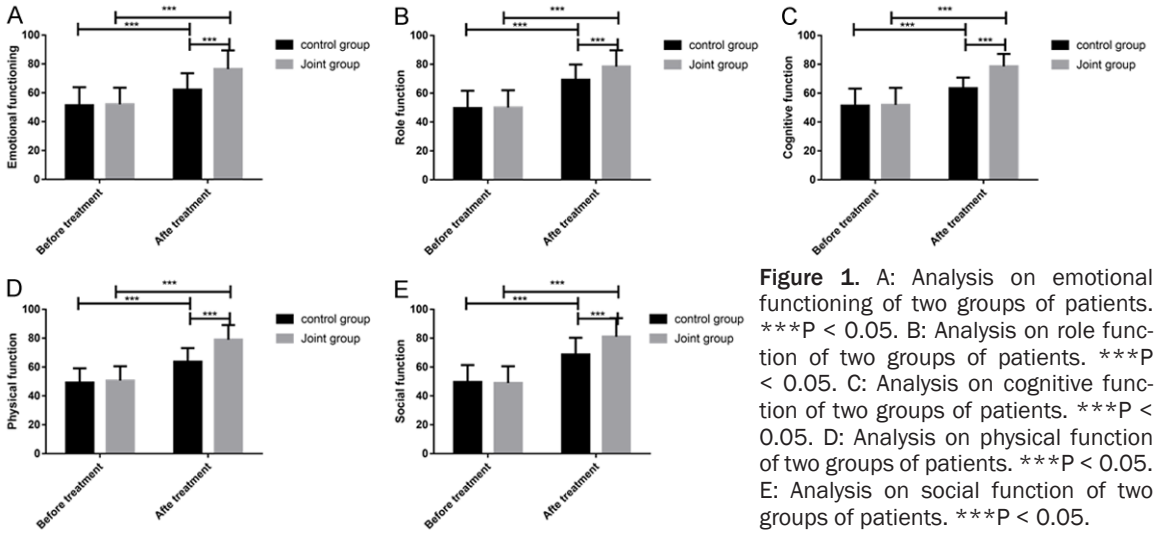

Figure 1. A: Analysis on emotional functioning of two groups of patients. ***P < 0.05. B: Analysis on role function of two groups of patients. ***P < 0.05. C: Analysis on cognitive function of two groups of patients. ***P < 0.05. D: Analysis on physical function of two groups of patients. ***P < 0.05. E: Analysis on social function of two groups of patients. ***P < 0.05.

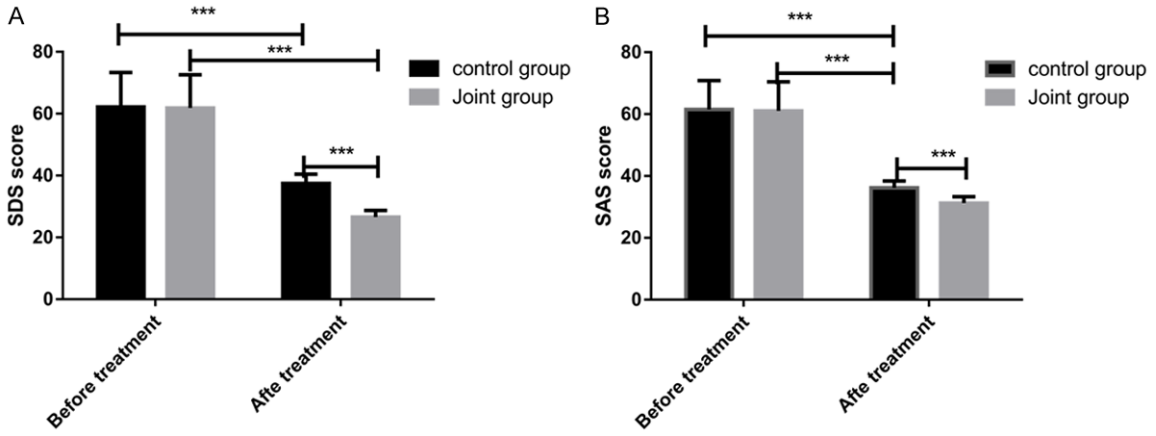

Figure 2. A: Analysis on SDS of two groups of patients. ***P < 0.05. B: Analysis on SAS of two groups of patients. ***P < 0.05.

Alterations in QOL scores of patients in the two groups before and after treatment

Comparisons of the emotional, role, cognitive, physiological, and social functions between the two groups before treatment showed that differences had no statistical significance (P > 0.05); after treatment, these functions were all ameliorated to varying degrees (P < 0.001), but to a much more significant degree in the combined group (P < 0.001; **Figure 1**).

Psychological changes in patients in the two groups before and after treatment.

No statistically significant differences were observed in the comparison of SDS and SAS scores between the two groups prior to the treatment (P > 0.05). Patients in the two groups all had decreases in SDS and SAS scores to varying degrees (P < 0.001), with patients in the combined group gaining more significant decreases (P < 0.001; **Figure 2**).

Evaluation of self-management compliance of patients in the two groups.

Compliance to the rehabilitation, oxygen therapy, and medication of the patients in the two groups before treatment showed no statistically significant differences (P > 0.05). After treatment, these indicators were much more improved in the two groups (P < 0.001), with much more significant improvement in the combined group (P < 0.001; **Table 3**).

Table 3. Evaluation of self-management compliance between both groups of patients [n (%)]

		Control group (n=79)	Combined group (n=62)	X^2	P
Compliance rate of rehabilitation training	Pre-treatment	16 (20.25)	14 (22.58)	0.122	0.737
	Post-treatment	49 (62.05)***	55 (88.71)***	12.780	< 0.001
Oxygen compliance rate	Pre-treatment	25 (31.65)	22 (35.48)	0.230	0.631
	Post-treatment	55 (69.62)***	53 (85.48)***	4.876	0.027
Drug compliance rate	Pre-treatment	37 (46.84)	31 (50.00)	0.139	0.709
	Post-treatment	58 (73.42)***	60 (96.77)***	13.882	< 0.001

Note: ***P < 0.05.

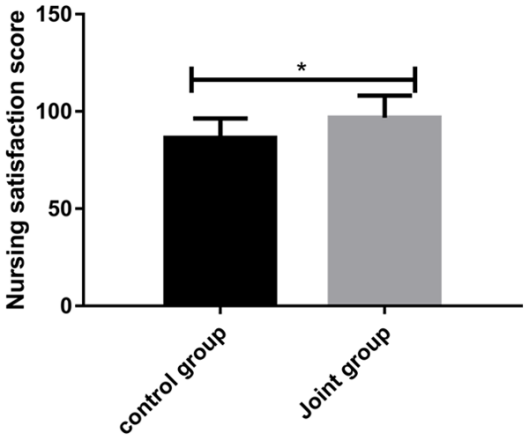

Figure 3. Analysis on nursing satisfaction of two groups of patients. *P < 0.05.

Analysis of patient satisfaction with nursing care in the two groups

The score for patient satisfaction with nursing care in the control group patients was 86.42 ± 10.03, whereas that of their combined group counterparts was 96.77 ± 11.42. Satisfaction in the combined group was much higher than that in the control group (P < 0.001; **Figure 3**).

Discussion

COPD patients tend to suffer from the long course of disease. After hospital discharge, the lack of scientific guidance for rehabilitation and poor compliance to self-management result in delayed recovery and disease migration and recurrence, which further affect life quality of patients as well as lead to varying degrees of psychological dysfunction in patients [19, 20]. Nursing care plays an important role in the recovery of patients after discharge. With the transition in health outlook and medical pattern, nursing care focuses not only on prolonging the survival of patients but also on improving quality of life and physical and mental health of patients. Transitional nursing care, as a supplement to hospitalization nursing care, has been verified for its efficacy [21]. In the present study, we analyzed the efficacy and value of the combined application of high-quality nursing care and transitional nursing care in COPD patients.

In strict accordance with the inclusion and exclusion criteria, we collected case data from 141 COPD patients, and differences in the general data between the two groups showed no statistical significance, suggesting that the data for the two groups were comparable. We assessed the pulmonary function of the patients in the two groups: prior to the treatment, there was no statistically significant difference in the pulmonary function indicators between the two groups; after treatment, amelioration was identified in the patients of the two groups, with improvements in the combined group being more significant. The QOL analysis of the patients in the two groups also revealed that following treatment, quality of life of patients in the combined group was much better compared with the control group. Indeed, QOL was correlated not only with the ameliorated pulmonary function but also with the psychological status of patients in the two groups. After treatment, patients in the combined group had more significant decreases in SDS and SAS scores, compared with their counterparts in the control group, which clarifies the definite efficacy of better psychological status on the improvement of QOL [22]. Compliance is also one of the key factors affecting treatment efficacy and recovery of patients [23, 24]. The present results indicate that after treatment, patients in the combined group had higher

compliance rates to the rehabilitation, oxygen therapy, and medication than those in the control group, thereby facilitating in the recovery of pulmonary function of the patients in the combined group. These chain reactions also improved the satisfaction with nursing care of the patients in the combined group.

Transitional nursing care supplements hospitalization nursing care, particularly in spreading awareness of diseases and providing direct, dynamic, continuous, and effective guidance for rehabilitation of patients [25, 26]. It is usually implemented after evidence-based nursing care to avoid delayed rehabilitation, disease recurrence, or recurrent hospitalization that can be attributed to the lack of professional knowledge on the disease or influences of objective factors.

Airway obstruction is a major clinical feature of COPD patients, and the pulmonary function test is a key objective indicator in evaluating such airway restriction in patients. Nursing care for COPD thus aims at the protection and improvement of pulmonary function; a better pulmonary function is a major prerequisite for improvement in motion and life quality of COPD patients [27, 28]. The results of this study suggest that transitional nursing care could improve the pulmonary function of COPD patients efficiently. Indeed, the increased compliance rate to rehabilitation among the patients of the combined group indicated the amelioration in their pulmonary function.

Accumulating evidence suggests that COPD patients suffer from poor survival quality [29, 30]; the transition in outlook on nursing care (one of the major components of nursing care) in recent years makes improvement in this area. In this study, transitional nursing care increased life quality of COPD patients. In addition to the influence of disease on life quality of COPD patients, the psychological status of patients is also one of the factors contributing to the deterioration of QOL. Experts have reported that COPD patients show extremely poor psychological behaviors and manifestations, especially anxiety and depression. COPD-induced inflammation also produces adverse effects on the brain region dominating emotions as well as on the use of glucocorticoid that may give rise to depression, which, together, aggravates the psychological burden of patients and hampering the treatment of COPD [31, 32].

The present results revealed the ameliorating effect of transitional nursing care on anxiety and depression of COPD patients, and certified the application value of transitional nursing care in the treatment of COPD. However, there is little information regarding the application of transitional nursing care in the treatment of COPD patients, and the results of this study should be verified in further studies. Thus, we hope that more scholars will focus on the application of transitional nursing care in COPD treatment to facilitate the development of this intervention.

In conclusion, in the treatment of COPD patients, high-quality nursing care in combination with transitional nursing care can increase the compliance of patients to self-management, ameliorate the pulmonary function and psychological status of patients, improve quality of life of patients, and increase satisfaction with nursing care.

Disclosure of conflict of interest

None.

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References

[1] Pascoe S, Locantore N, Dransfield MT, Barnes NC, Pavord ID. Blood eosinophil counts, exacerbations, and response to the addition of inhaled fluticasone furoate to vilanterol in patients with chronic obstructive pulmonary disease: a secondary analysis of data from two parallel randomised controlled trials. Lancet Respir Med 2015; 3: 435-442.

[2] Lange P, Celli B, Agustí A, Boje Jensen G, Divo M, Faner R, Guerra S, Marott JL, Martinez FD, Martinez-Camblor P, Meek P, Owen CA, Petersen H, Pinto-Plata V, Schnohr P, Sood A, Soriano JB, Tesfaigzi Y, Vestbo J, Martinez-Camblor P. Lung-function trajectories leading to chronic obstructive pulmonary disease. N Engl J Med 2015 373: 111-22.

[3] Siddiqui SH, Guasconi A, Vestbo J, Jones P, Agusti A, Paggiaro P, Wedzicha JA, Singh D. Blood eosinophils: a biomarker of response

to extrafine beclomethasone/formoterol in chronic obstructive pulmonary disease. Am J Respir Crit Care Med 2015; 192: 523-5.

[4] Celli BR, Decramer M, Wedzicha JA, Wilson KC, Agustí A, Criner GJ, MacNee W, Make BJ, Rennard SI, Stockley RA, Vogelmeier C, Anzueto A, Au DH, Barnes PJ, Burgel PR, Calverley PM, Casanova C, Clini EM, Cooper CB, Coxson HO, Dusser DJ, Fabbri LM, Fahy B, Ferguson GT, Fisher A, Fletcher MJ, Hayot M, Hurst JR, Jones PW, Mahler DA, Maltais F, Mannino DM, Martinez FJ, Miravitlles M, Meek PM, Papi A, Rabe KF, Roche N, Sciurba FC, Sethi S, Siafakas N, Sin DD, Soriano JB, Stoller JK, Tashkin DP, Troosters T, Verleden GM, Verschakelen J, Vestbo J, Walsh JW, Washko GR, Wise RA, Wouters EF, ZuWallack RL; ATS/ERS Task Force for COPD Research. An official American thoracic society/european respiratory society statement: research questions in chronic obstructive pulmonary disease. Am J Respir Crit Care Med 2015 191: e4-e27.

[5] Martinez FJ, Calverley PM, Goehring UM, Brose M, Fabbri LM, Rabe KF. Effect of roflumilast on exacerbations in patients with severe chronic obstructive pulmonary disease uncontrolled by combination therapy (REACT): a multicentre randomised controlled trial. Lancet 2015; 385: 857-866.

[6] Divo MJ, Casanova C, Marin JM, Pinto-Plata VM, de-Torres JP, Zulueta JJ, Cabrera C, Zagaceta J, Sanchez-Salcedo P, Berto J, Davila RB, Alcaide AB, Cote C, Celli BR; BODE Collaborative Group. Chronic obstructive pulmonary disease comorbidities network. Eur Respir J 2015; 46; 640-50.

[7] Kew KM and Seniukovich A. Inhaled steroids, risk of pneumonia for chronic obstructive pulmonary disease. Cochrane Database Syst Rev 2014; 3: CD010115.

[8] Renfrew MJ, McFadden A, Bastos MH, Campbell J, Channon AA, Cheung NF, Silva DR, Downe S, Kennedy HP, Malata A, McCormick F, Wick L, Declercq E. Midwifery and quality care: findings from a new evidence-informed framework for maternal and newborn care. Lancet 2014; 384: 1129-1145.

[9] Janssen DJA, Spruit MA, Schols JMGA, Wouters EFM. A call for high-quality advance care planning in outpatients with severe COPD or chronic heart failure. Chest 2011; 139: 1081-1088.

[10] Kangovi S, Grande D. Transitional care management reimbursement to reduce COPD readmission. Chest 2014; 145: 149-155.

[11] Fletcher MJ and Dahl BH. Expanding nurse practice in COPD: is it key to providing high quality, effective and safe patient care? Prim Care Respir J 2013; 22: 230.

[12] Association CBoCM. Guidelines for diagnosis and treatment of COPD (2013 revision). Chinese Journal of The Frontiers of Medical Science 2014; 6: 67-80.

[13] Sepehry AA. Self-rating depression scale (SDS). In: editors. encyclopedia of quality of life and well-being research. Springer; 2014. p. 5790-5798.

[14] Rodriguez-Morales A, Ocampo-Serna S, Meneses-Quintero O, Hoyos-Guapacha K, Botero-Castaño G, Gutiérrez-Segura J, Londoño J, Bedoya-Rendón H, Cárdenas-Pérez J, Cardona-Ospina J. Depression and anxiety screening using Zung Self-Rating Scales (SDS/SAS) among patients with post-Chikungunya chronic inflammatory rheumatism: a comparative study of a 2-year follow-up cohort in La Virginia, Risaralda, Colombia. International Journal of Infectious Diseases 2018; 73: 197.

[15] Heresi G, Rao Y, Minai O. The minimally important difference in the six-minute walk test predicts clinical worsening in pulmonary arterial hypertension. In: editors. A27. You got another thing coming: diagnosis and prognostication in pulmonary hypertension. American Thoracic Society; 2018. p. A1185-A1185.

[16] Yunani Y, Widiati A, Jamaluddin M. Respiratory muscle stretching toward pulmonary vital capacity for asthma patient. Health Notions 2017; 1: 308-310.

[17] Birren JE, Lubben JE, Rowe JC, Deutchman DE. The concept and measurement of quality of life in the frail elderly. Academic Press, 2014.

[18] Morgan HM, Entwistle VA, Cribb A, Christmas S, Owens J, Skea ZC and Watt IS. We need to talk about purpose: a critical interpretive synthesis of health and social care professionals' approaches to self-management support for people with long-term conditions. Health Expect 2017; 20: 243-259.

[19] Woodruff PG, Agusti A, Roche N, Singh D, Martinez FJ. Current concepts in targeting chronic obstructive pulmonary disease pharmacotherapy: making progress towards personalised management. Lancet 2015; 385: 1789-1798.

[20] Barrecheguren M, Esquinas C, Miravitlles M. The asthma-chronic obstructive pulmonary disease overlap syndrome (ACOS): opportunities and challenges. Curr Opin Pulm Med 2015; 21: 74-79.

[21] Feltner C, Jones CD, Cené CW, Zheng ZJ, Sueta CA, Coker-Schwimmer EJ, Arvanitis M, Lohr KN, Middleton JC, Jonas DE. Transitional care interventions to prevent readmissions for persons with heart failure: a systematic review and meta-analysis. Ann Intern Med 2014; 160: 774-784.

[22] D'Alberton F, Assante MT, Foresti M, Balsamo A, Bertelloni S, Dati E, Nardi L, Bacchi ML, Mazzanti L. Quality of life and psychological adjustment of women living with 46, XY differences of sex development. J Sex Med 2015; 12: 1440-1449.

[23] Di Stefano M, Paulsen J, Lien TG, Hovig E, Micheletti C. Hi-C-constrained physical models of human chromosomes recover functionally-related properties of genome organization. Sci Rep 2016; 6: 35985.

[24] de Souza SRS. Capital requirements, liquidity and financial stability: the case of Brazil. Journal of Financial Stability 2016; 25: 179-192.

[25] Pannill FC. In older hospitalized patients, adding transitional care to in-hospital geriatric assessment did not improve ADL. Ann Intern Med 2016; 164: JC63.

[26] Verhaegh KJ, MacNeil-Vroomen JL, Eslami S, Geerlings SE, de Rooij SE, Buurman BM. Transitional care interventions prevent hospital readmissions for adults with chronic illnesses. Health Aff (Millwood) 2014; 33: 1531-1539.

[27] Ha D, Ries AL, Mazzone PJ, Lippman SM and Fuster MM. Exercise capacity, cancer-specific quality of life following curative intent treatment of stage I-IIIA lung cancer. Support Care Cancer 2018; 26: 2459-2469.

[28] Fernandez M, Alberti M, Caro F, Miranda A, Ipuche F, Paulin F. Prevalence of anxiety and depression in patients with interstitial lung disease: correlation with quality of life and lung function. In: editors. A41. ild scientific abstracts: diagnosis, outcomes, and PPFE. American Thoracic Society 2018. p. A1609-A1609.

[29] Moy ML, Collins RJ, Martinez CH, Kadri R, Roman P, Holleman RG, Kim HM, Nguyen HQ, Cohen MD, Goodrich DE, Giardino ND, Richardson CR. An internet-mediated pedometer-based program improves health-related quality-of-life domains and daily step counts in COPD. Chest 2015; 148: 128-137.

[30] Brien SB, Lewith GT, Thomas M. Patient coping strategies in COPD across disease severity and quality of life: a qualitative study. NPJ Prim Care Respir Med 2016; 26: 16051.

[31] Huang S, Xiaohong H and Lu L. Effect of asarone injection combined with inhalation, psychological intervention on acute lung injury and its effect on pulmonary function. Chinese Journal of Biochemical Pharmaceutics 2017; 37: 199-201.

[32] Singh G, Zhang W, Kuo YF and Sharma G. Association of psychological disorders with 30-day readmission rates in patients with COPD. Chest 2016; 149: 905-915.