Factors Related to Quality of Life among Patients with Asthma*

Le Thu Hoai[1], Wimolrat Puwarawuttipanit, RN, PhD[1], Wallada Chanruangvanich, DNS[1]

Abstract

Purpose: To investigate the relationships between level of dyspnea, FEV1, social support and QOL in persons with asthma.

Design: A descriptive correlational study.

Methods: The sample composed of 115 persons with asthma who received treatment in Bach Mai Hospital, Hanoi, Vietnam. Data were collected by using 4 questionnaires and lung function test (FEV1): 1) Demographic data and health information, 2) The Borg scale, 3) Social support, and 4) Quality of Life (QOL). Spearman's Rho was employed to test the relationships among studies variables.

Main findings: The level of dyspnea was negatively correlated with QOL (r_s = - .788, $p < .05$). FEV1 and social support were positively correlated with QOL (r_s = .674, r_s = .244, $p < .05$).

Conclusion and recommendations: It is recommended that nurses should assess and suggest patients to manage their symptoms; and help them to seek social support; in order to enhance quality of life of persons with asthma.

Keywords: quality of life, asthma, social support, dyspnea, FEV1

ปัจจัยที่มีความสัมพันธ์กับคุณภาพชีวิตในผู้ป่วยหอบหืด*

Le Thu Hoai[1] วิมลรัตน์ ภู่วราวุฒิพานิช, PhD[1] วัลย์ลดา ฉันท์เรืองวณิชย์, พย.ด.[1]

บทคัดย่อ

วัตถุประสงค์: เพื่อศึกษาความสัมพันธ์ระหว่าง ระดับการหายใจลำบาก ความสามารถในการทำงานของปอด (FEV1) การสนับสนุนทางสังคม และคุณภาพชีวิต ในผู้ป่วยโรคหอบหืด

รูปแบบการวิจัย: การศึกษาเชิงสหสัมพันธ์

วิธีดำเนินการวิจัย: กลุ่มตัวอย่าง คือ ผู้ป่วยโรคหอบหืดจำนวน 115 ราย ที่ได้รับการรักษาในโรงพยาบาลบาคมาย เมืองฮานอย ประเทศเวียดนาม เก็บรวบรวมข้อมูลโดยใช้แบบสอบถาม และการทดสอบความสามารถในการทำงานของ ปอด (FEV1) ประกอบด้วย 1) ข้อมูลประชากรและข้อมูลด้านสุขภาพ 2) Borg scale 3) การสนับสนุนทางสังคม และ 4) คุณภาพชีวิต วิเคราะห์ข้อมูลทั่วไป โดยใช้สถิติเชิงบรรยายและวิเคราะห์ความสัมพันธ์ โดยใช้สถิติ Spearman's Rho

ผลการศึกษา: ระดับการหายใจลำบากมีความสัมพันธ์ทางลบกับคุณภาพชีวิต (r_s = - .788, p < .05) ความสามารถ ในการทำงานของปอด (FEV1) และการสนับสนุนทางสังคมมีความสัมพันธ์ทางบวกกับคุณภาพชีวิต (r_s = .674, r_s = .244, p < .05)

สรุปและข้อเสนอแนะ: พยาบาลควรประเมินระดับการหายใจลำบาก และความสามารถในการทำงานของปอด แนะนำให้ผู้ป่วยจัดการอาการของตนเอง และช่วยผู้ป่วยในการแสวงหาการสนับสนุนทางสังคม เพื่อเพิ่มคุณภาพชีวิตใน ผู้ป่วยโรคหอบหืด

คำสำคัญ: คุณภาพชีวิต หอบหืด การสนับสนุนทางสังคม การหายใจลำบาก FEV1

Background and Significance

Bronchial asthma is a chronic lung disease commonly found in all ages and its prevalence continues to rise worldwide. Global Initiative for Asthma (GINA) reported that approximately 300 million people around the world suffered from asthma and 250,000 people died from asthma annually.[1] In Hanoi, Vietnam, the prevalence of asthma was reported in 2011 as 5.6%.[2]

Asthma is a progressive disease with serious effects to those who experienced the disease; such as physical function, psychological well-being, and social behaviors. Finally, it might affect quality of life (QOL) of patients with asthma.

Dyspnea is the major symptom among persons with chronic respiratory diseases. It was a broad term that described a subjective breathing sensation of difficulty. In a study by Silva et al., it was indicated that QOL is directly influenced by the intensity of dyspnea in persons with asthma.[3]

The evidence indicated that active asthma exerted a harmful influence on pulmonary function with long term changes.[4] Information about pulmonary function (Forced Expiratory Volume in 1 second, FEV1) in patients with asthma might help determine patients requiring additional care with respect to QOL.

Persons with chronic illnesses are usually in demand of specific types of social support, and the sources of support need to be unique to the stressor. In chronic illnesses such as asthma and allergies, social support has been indicated to have beneficial effects on coping with synmptoms[5] and enhancing the effects of behaviors on health promotion.[6]

In Vietnam, the number of persons with asthma admitted to hospitals is increasing. Most of admitted patients have insufficient and inappropriate knowledge and understanding about asthma. Furthermore, there is inadequate scientific evidence to support the phenomena of persons with asthma. In particular, little if any studies on the factors related to quality of life among persons with asthma was found in Vietnam. Therefore, this study aimed to investigate factors related to QOL among persons with asthma. It is expected that the results of the study would be able to guide nurses to provide appropriate nursing care to promote QOL of those persons who are suffered from asthma in Vietnam.

Objective

To investigate the relationships between level of dyspnea, FEV1, social support, and QOL in patients with asthma.

Hypotheses

1. Level of dyspnea was negatively correlated to QOL in patients with asthma.

2. FEV1 and social support were positively correlated to QOL in patients with asthma.

Methodology

Population and Sample

Population was persons who have been diagnosed with asthma and treated at the Allergy and Clinical Immunology Centre of Bach Mai Hospital, Hanoi, Viet Nam.

Sample was selected from the population based on the following inclusion criteria: 1) were male and female both in-patients and out-patients with age 18 years and older, 2) was able to verbally communicate in the Vietnamese language. The exclusion criteria were: 1) had critical illnesses such as respiratory failure; unstable vital signs; respiratory rates > 30/ minute, heart rate > 90/minute; SpO2 < 80%; purple lips, fingers, or body; 2) had severe pain; and 3) increased dyspnea during the interview process.

Sample size was calculated using the G*power program to determine the minimum number of subjects needed for the correlational design.[6] The level of significance was .05; the power of test was .80. There were three independent variables in the study and the medium effect size was used (r = .30, f^2 = .099).

The total number of sample was 115 subjects.[7]

The study was conducted from 1 August 2016 to 30 October 2016.

Research Instruments

The research instruments were as follows:

1. Demographic data and health information: The demographic data included age, gender, occupation, marital status, current residence, educational level, and medical payment method. The health information included weight, height, BMI, date of admission, diagnosis and duration of illness, co-morbidity, and medical history.

2. Forced Expiratory Volume in 1 second, FEV1: The FEV1 was measured by the lung function test machine administered by a physician. According to GINA1, spirometry is a simple test to measure the amount of air a person can exhale and the amount of time taken to do so.

3. The Modified Borg Scale, MBS: The MBS identified subjective perception of dyspnea (rating of perceived dyspnea). The subjects were asked to rate their perceptions of dyspnea severity levels. The scoring for the scale ranged from 0 to 10.[8]

4. The Multidimensional Scale of Perceived Social Support, MSPSS: Social support was measured by the MSPSS[9] which identified the perception of social support of subjects from three sources: Family, friends, and significant others. This instrument was originally developed by Zimet et al.[9], the MSPSS is a short scale with 12 items. Each item was scored on a Likert scale ranging from 1 (very strongly disagree) to 7 (very strongly agree). The total score ranged from 12 to 84 points with higher scores suggesting higher levels of perceived social support.

5. Quality of Life, QOL: Health-related QOL was measured by the AQ-20[10] with 20 items. The response was "yes" (scored as 1), and "no" or "not applicable" (scored as 0). The total score ranged from 0 (best health) to 20 (worst health). Higher scores indicated lower QOL due to asthma symptoms.

Three instruments included MBS, MSPSS, and AQ-20; get permission to use and translate to Vietnamese language. The content validities were confirmed by 5 experts in the area of asthma including physicians, head nurses, and staff nurses. The reliability with Cronbach's alpha coefficient in the whole subjects was .899 for the MSPSS, and .803 for the AQ-20.

Protection Right of Human Subjects

The proposal for this study was approved from the IRB, Faculty of Nursing, Mahidol University (COA No.IRB-NS 2016/346.0205), and the IRB, School of Medicine and Pharmacy, Viet Nam National University. The researcher recruited subjects to join the study followed the standard procedure set by the IRB; concerning independently consent to participate after getting information, confidentiality, and anonymity.

Data Collection Process

The data collection was performed as follows:

1. After receiving permission to collect data from the Bach Mai Hospital, the researcher met the director of Bach Mai Hospital, the head of the department, and a head nurse of the Allergy and Clinical Immunology Centre in order to explain the objectives of the research project and data collection process.

2. The head nurse introduced the researcher to the potential subjects. The researcher introduced herself, built rapport with the subjects, and informed the details of the study. The researcher invited the subjects to participate in the study. After the subjects agreed to join the study, they were asked to sign the consent forms.

3. The researcher arranged a private room to interview the subjects or have them completed five questionnaires by themselves which required approximately 30-45 minutes.

Data Analysis

1. Data were analyzed by using descriptive statistic such as frequency, percentage, mean, standard deviation, and range.

2. All studied variables were tested for normal distribution based on the assumption

of Pearson's product moment correlation coefficient. None of the studied variables showed normal distribution. Therefore, Spearman's Rho was employed to test relationships among the studied variables.

Findings

Demographic data and health information

The findings illustrated that 53.9% of subjects were females and 46.1% were males; 37.4% aged 41-60 years; 48.7% finished high school; 22.6% were self-employed; 73.9% had governmental insurance; 30% had income 100-200 USD.

Approximately 19% of subjects were current smokers. The percentage of subjects having drug, food, and weather allergies were 13.0%, 13.9%, and 50.4%, respectively. Co-morbidity is very common with diseases such as allergic rhinitis (38.3%). Approximately 60% used inhalers before admission. Common clinical symptoms were dyspnea (97.4%), cough (84.4%), and wheezing (53.0%), respectively.

Correlations between level of dyspnea, social support, FEV1 and QOL among patients with asthma

Hypotheses testing

1. Level of dyspnea was negatively correlated to QOL in patients with asthma.

2. FEV1 and social support were positively correlated to QOL in patients with asthma.

According to the findings the proposed hypotheses were supported, level of dyspnea was significant negatively correlated to QOL in patients with asthma ($r_s = -.788$, $p < .05$); while FEV1 and social support were significant positively correlated to QOL in patients with asthma ($r_s = .674$, $r_s = .244$, $p < .05$). (Table 1)

Table 1: Correlations between level of dyspnea, FEV1, social support, and quality of life among patients with asthma

Variable	1	2	3	4
1. Social support	1.00			
2. Level of dyspnea	- .071	1.00		
3. FEV1	.298*	- .755*	1.00	
4. Quality of life	.244*	- .788*	.674*	1.00

*$p < .05$, Spearman's Rho Correlation

Discussion

This study found that the mean QOL was 7.96 (SD = 4.10) and 34.8% of patients had QOL scores ranging from 0-5. This score was equal to the findings of a study by Win et al.[11], which found the mean AQ20 score to be 7.66 ± 4.69. A study by Tuomisto et al.[12], showed the mean AQ20 score among uncontrolled patients to be 8 poins.[13] This means that patients are unable to control their disease and health workers should notice and address urgent problems.

Hypothesis 1: Level of dyspnea was negatively correlated to QOL in patients with asthma.

The results supported hypothesis 1 that the level of dyspnea is negatively and significantly correlated with QOL ($r_s = -.788$, $p < .05$). This means that asthma patients with high level of dyspnea might have reduced quality of life. The moderately correlation between AQ20 and dyspnea was also illustrated in another study[14] ($r = .60$, $p < .05$). Dyspnea was the consequence of the dynamic hyperinflation and the impairment of lung mechanic in asthma, i.e. the increased resistance in the airways as well as the reduced elastic. At the onset of the disease, dyspnea only exists at strenuous effort, but it can be further impairment of lung mechanics. In that way, dyspnea has a significant effect on the

impairment of health related QOL of these patients.

Hypothesis 2: FEV1 and social support were positively correlated to QOL in patients with asthma.

The results showed that FEV1 was positively and moderately correlated with quality of life in patients with asthma (r_s = .674, p < .05), which means that patients who had high FEV1 demonstrated high QOL. This is similar to the findings of Aquiles et al.[13], which showed a correlation between FEV1 and AQ20 (p < .001). Again, it is important to note that FEV1 is only a marker, and not a clinical outcome of asthma. According to the findings, the present study indicates that clinical nurses should take monitoring FEV1 into account to better manage patients' symptoms.

Social support was positively correlated with quality of life in patients with asthma (r_s = .244, p < .05). These findings suggested that the level of social support among asthma patients was weak, possibly because the people surrounding patients do not have sufficient awareness about this disease. This finding indicated that nurses should notice this problem in practice and promote social support from family members, friends, other social acquaintances as well as the health care system for asthma patients.

Conclusion including Implications

In this study, social support score and FEV1 were found to be positively correlated with QOL while dyspnea scores were negatively correlated with QOL. It is expected that this research can be used as a nursing care plan to promote the QOL of patients with asthma by managing influencing factors. Moreover, identifying certain factors such as level of dyspnea, FEV1, social support and QOL as well as providing nursing care programs will assist Vietnamese patients with asthma improving their lives and quality of function as well as overall health. Additionally, clinical practice guidelines to improve QOL among patients with asthma should be developed and tested for effectiveness by using a quasi-experimental research design.

References

1. Global Initiative for Asthma (GINA). Global strategy for asthma management and prevention [Internet]. 2014 [cited 2014 Nov 12]. Available from: http://www.ginasthma.org.
2. Lâm HT, Rönmark E, Tường NV, Ekerljung L, Chúc NT, Lundbäck B. Increase in asthma and a high prevalence of bronchitis: results from a population study among adults in urban and rural Vietnam. Respir Med. 2011;105(2):177-85.
3. Silva KJ, Cordeiro GD, Rossinoli C, Galhardo ML, Faganello MM. Evaluation of life quality and dyspnea intensity on chronic airway diseases patients in pulmonary rehabilitation program. J Biosci Med (Irvine). 2015;4:10-5.
4. Ulrik CS. Outcome of asthma: longitudinal changes in lung function. Eur Respir J. 1999;13(4):904-18.
5. Cohen S, Wills TA. Stress, social support, and the buffering hypothesis. Psychol Bull. 1985;98(2):310-57.
6. Tulaimat A, Gueret RM, Wisniewski MF, Samuel J. Association between rating of respiratory distress and vital signs, severity of illness, intubation, and mortality in acutely ill subjects. Respir Care. 2014;59(9):1338-44.
7. Faul F, Erdfelder E, Buchner A, Lang AG. Statistical power analyses using G*Power 3.1: test for correlation and regression analyses. Behav Res Methods. 2009;41(4):1149-60.
8. Borg G. A category scale with ratio properties for intermodal and interindividual comparisons. In: Geissler HG, Petzold P, editors. Psychophysical judgment and the

process of perception. Berlin: VEB Deutscher Verlag der Wissenschaften; 1982. p.25-33.

9. Zimet GD, Powell SS, Farley GK, Werkman S, Berkoff KA. Psychometric characteristics of the multidimensional scale of perceived social support. J Pers Assess. 1990;55(3-4):610-7.

10. Hajiro T, Nishimura K, Jones PW, Tsukino M, Ikeda A, Koyama H, et al. A novel, short, and simple questionnaire to measure health-related quality of life in patients with chronic obstructive pulmonary disease. Am J RespirCrit Care Med. 1999;159(6):1874-8.

11. Win T, Pearce L, Nathan J, Cafferty F, Laroche C. Use of the Airway Questionnaire 20 to detect changes in quality of life in asthmatic patients and its association with the St George's Respiratory Questionnaire and clinical parameters. Can Respir J. 2008;15(3):133-7.

12. Tuomisto LE, Ilmarinen P, Niemelä O, Haanpää J, Kankaanranta T, Kankaanranta H. A 12-year prognosis of adult-onset asthma: Seinäjoki adult asthma study. Respir Med. 2016;117: 223-9. doi: 10.1016/j.rmed.2016.06.017.

13. Aquiles C, Fernanda R, Paul J, José Roberto J. Validation of the Airways Questionnaire 20 – AQ20 in patients with chronic obstructive pulmonary disease (COPD) in Brazil. Jornal de Pneumologia. 2003;29(1):28-35. (in Brazil).

14. Evren C, Çınar Ö, Güleç H, Çelik S, Evren B. The validity and reliability of the Turkish version of the Buss-Perry's aggression questionnaire in male substance dependent inpatients. Düşünen Adam. 2011;24(4):283-95.