

Associations between Child Gender, Severity of Illness, Social Support, and Self-management of Vietnamese School-age Children with Asthma

นิพนธ์ต้นฉบับ

Original Article

ลี งอก เมา เอียน¹, นุจรี ไชยมงคล^{2*} และ ยูนี พงศ์จตุรวิทย์²

¹ นิสิตหลักสูตรพยาบาลศาสตรมหาบัณฑิต (หลักสูตรนานาชาติ) คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา จ.ชลบุรี 20131

² สาขาวิชาพยาบาลเด็ก คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา จ.ชลบุรี 20131

* ติดต่อผู้พิมพ์: nujjaree@buu.ac.th

วารสารไทยเภสัชศาสตร์และวิทยาการสุขภาพ 2558;10(3):98-104

Le Ngoc Bao Yen¹, Nujjaree Chaimongkol^{2*} and Yune Pongjaturawit²

¹ Student in Master of Nursing Science (International Program), Faculty of Nursing, Burapha University, Chon Buri 20131, Thailand

² Pediatrics Nursing Division, Faculty of Nursing, Burapha University, Chon Buri 20131, Thailand

* Corresponding author: nujjaree@buu.ac.th

Thai Pharmaceutical and Health Science Journal 2015;10(3):98-104

บทคัดย่อ

วัตถุประสงค์: เพื่อศึกษาระดับการจัดการตนเอง และความสัมพันธ์ระหว่างเพศของเด็ก ความรุนแรงของการป่วย การสนับสนุนทางสังคม กับการจัดการตนเองในเด็กวัยเรียนชาวเวียดนามที่มีภาวะหอบหืด **วิธีการศึกษา:** การศึกษาแบบพรรณนาเชิงทำนาย แบบภาคตัดขวาง กลุ่มตัวอย่างเป็นเด็กวัยเรียนชาวเวียดนามจำนวน 76 ราย ที่มารับบริการที่แผนกผู้ป่วยนอก โรงพยาบาลหินหนืดวนประเทศเวียดนามเพื่อรักษาติดตามภาวะหอบหืด เก็บรวบรวมข้อมูลระหว่าง ธันวาคม พ.ศ. 2557 ถึงกุมภาพันธ์ พ.ศ. 2558 เครื่องมือวิจัยประกอบด้วย 1-แบบสอบถามข้อมูลทั่วไป 2-แบบวัดการจัดการตนเองสำหรับเด็ก 3-แบบวัดความรุนแรงของการป่วยภาวะหอบหืด และ 4-แบบสอบถามการสนับสนุนทางสังคมสำหรับเด็ก ซึ่งแบบสอบถาม 2 - 4 มีค่าสัมประสิทธิ์ความเชื่อมั่นเท่ากับ 0.83, 0.81 และ 0.90 ตามลำดับ วิเคราะห์ข้อมูลโดยใช้สถิติพรรณนาและการวิเคราะห์พหุคูณแบบขั้นตอน **ผลการศึกษา:** ค่าเฉลี่ยของคะแนนการจัดการตนเองเท่ากับ 47.55 (S.D. = 5.76) ซึ่งจัดอยู่ในระดับปานกลางค่อนข้างสูง เพศของเด็ก (ชาย) มีความสัมพันธ์และเป็นตัวทำนายที่ดีที่สุด สามารถทำนายการจัดการตนเองในเด็กวัยเรียนได้ร้อยละ 27.5 ($\beta = -0.506, P < 0.001$) รองลงมาคือความรุนแรงของการป่วย ($\beta = -0.374, P < 0.001$) และการสนับสนุนทางสังคม ($\beta = 0.201, P < 0.05$) มีความสัมพันธ์และสามารถทำนายการจัดการตนเองในเด็กวัยเรียนได้เพิ่มขึ้นอีกร้อยละ 15.5% และ 4.0% ตามลำดับ ตัวทำนายที่มีนัยสำคัญทางสถิติทั้งสามนี้สามารถอธิบายความแปรปรวนในการจัดการตนเองในเด็กวัยเรียนชาวเวียดนามได้ร้อยละ 47.0% ($F_{3,72} = 21.241, P < 0.001$) สรุป: พยาบาลและผู้ให้การดูแลสุขภาพเด็กที่มีภาวะหอบหืดสามารถเพิ่มการจัดการตนเองในเด็กวัยเรียนที่มีภาวะหอบหืดโดยการส่งเสริมและสนับสนุนการสนับสนุนทางสังคม โดยเฉพาะในเด็กผู้ชาย และในเด็กที่มีความรุนแรงของการป่วยน้อย

คำสำคัญ: การจัดการตนเอง, การสนับสนุนทางสังคม, ภาวะหอบหืด, เด็กวัยเรียน, เวียดนาม

Abstract

Objective: To examine self-management and determine associations between child gender, severity of illness, social support and self-management of Vietnamese school-age children with asthma. **Method:** A descriptive predictive cross-sectional design was used. Sample included 76 Vietnamese school-age children who came to the outpatient department of the NinhThuan general hospital, Viet Nam to follow up asthma treatment. Data were collected from December 2014 to February 2015. Research instruments included 1-demographic questionnaire, 2-the asthma self-management inventory for children, 3-the severity of illness scale for asthma, and 4-the social support questionnaire for children. Cronbach's alphas for internal consistency reliability of questionnaires 2 - 4 were 0.83, 0.81, and 0.90, respectively. Data were analyzed by using the descriptive statistics and stepwise multiple regression analysis. **Results:** Mean total score of self-management was 47.55 (S.D. = 5.76), which was at a moderate approaching to high level. Child gender (boys) was the best predictor accounting for 27.5% in the prediction of self-management ($\beta = -0.506, P < 0.001$), followed by severity of illness ($\beta = -0.374, P < 0.001$) and social support ($\beta = 0.201, P < 0.05$) accounting for 15.5% and 4.0%, respectively. The 3 significant predictors accounted for 47.0% of variance in asthma self-management ($F_{3,72} = 21.241, P < 0.001$). **Conclusions:** Nurses and health care providers in relation to children with asthma could increase self-management of children with asthma through promote and strengthen social support, especially for boys and less illness severity.

Keywords: self-management, social support, asthma, school-age children, Viet Nam

Introduction

Asthma is a highly prevalent health problem and is the most common chronic illness of children.¹ Impact of asthma on children is further evidenced by the fact that approximately 29% of all asthma hospital discharges in 2006 were children younger than 15 years of age.² Asthma represents an increasingly serious health problem in young people with rapidly rising mortality and morbidity over the past 2 decades.³ In Viet Nam, the incidence of asthma has tended increasing an average annual from 4% to 6%.⁴ The Viet Nam Ministry of Health⁵ estimated that 4 million persons

have been diagnosed with asthma, accounting for 5% of the population. A study evaluated the children with asthma aged between 6 - 15 years old showing that 42.1% of children with asthma have had asthma prevention. However, 52.2% of these children have withdrawn from asthma prevention. Most of children with asthma have had a short time of prevention, with 50% of them have used preventive medications for less than 6 months, and only 17.4% of children have completed their appointments.⁶ The rate of hospital and emergency room visits due to asthma was 19%.

In addition, school absence due to asthma was 27.7% in a southern province of Ho Chi Minh area.⁷

Unlike acute illness that can be managed in a healthcare setting, chronic illness is managed largely by individuals and families at home as part of their daily lives.⁸ Studies have shown the significant effect of self-management among chronic patients especially in asthma patients.^{9,10} School-age children are able to start using logical thinking to understand cause and effect of an illness.¹¹ They could understand that if airway inflammation is present, then asthma symptoms will develop. Having this understanding permits them to accept the need for long-term control medications to prevent inflammation and reduce future symptoms.¹² According to Pradel, Hartzema, and Bush,¹³ they reported that school-age children perceived benefits of their asthma medicines and self-management asthma medications. Thus, the child with this age can realize and participate to manage their daily activity and health problems.

Epidemiologic data on asthma prevalence, mortality, and asthma impairment point to gender differences that compound the problem of asthma management. A study indicated that gender was found to be a major factor influencing physical activity among asthmatic children.¹⁴ Asthma hospitalization rate for boys was significantly higher than girls between 6 - 12 years.¹⁵ The prevalence of asthma in school age children was 22.3 % in boys and 11.8 % in girls.¹⁶ In addition, studies indicated that gender difference emerged where girls perceived significantly lower total barrier to asthma self-management than boys.¹⁷ Other reported that there was no significant difference in asthma management based on child gender.¹⁸ However, in Viet Nam, there were limited studies indicating the relationship between gender and asthma self-management.

Asthma's symptoms have powerful influence on all aspects of children's life. More than 10.5 million school days are missed annually because asthma.^{3,19} School-age children with asthma experienced nighttime sleep disturbance, emergency visits and overall decrease quality of life.¹⁹ Asthma control is the key strategy for managing asthma and prevention of its complication.²⁰ However, the number of asthma patients who can control asthma disease still limited. A study in Canada showed that the percentage of school-age children controlled asthma was 25%, and 75% poorly controlled asthma.²¹ In Viet Nam, there were only 18.7% of school-age children having controlled asthma,

59.8% partly controlled, and 21.5% uncontrolled.²² A study demonstrated that self-assessed severity of asthma symptoms is related to self-management.^{23,24} Children who had increased severity and persistence of asthma symptom were often leading to poor self-management.¹²

Social support refers to availability of instrumental/informational support and emotional support from parents, relatives, peers, siblings and other adults in relation to perform asthma self-management of children. The importance of social support in affecting self-management behavior via its influence on human beliefs and attitude has been increasingly recognized in health psychology.²⁵ Social support may play an importance role in the children readiness to take care of themselves. Therefore, the support from parents and peers could improve self-care skills and self-confidence.²⁶ The strong association of healthy lifestyle for asthma management with asthma-specific parental support and peer support in acute exacerbation management, trigger avoidance, and physical activity.²⁷ Sin, Kang, and Weaver²⁸ also found that social support had significant positive relationships with asthma self-management behavior.

There were many studies examining related factors of self-management with asthmatic patients. However, the difference in culture such as Vietnamese school-age children do not usually depend on their families, and society between Viet Nam and other countries may limit generalizability of those studies across Vietnamese asthmatic patients. Most studies about asthma self-management have focused on adolescents or adults. There were limited studies of asthma self-management of school-age children especially in Vietnamese children. Outcomes of this study would be beneficial to nurses and health care personal relevant to caring for children's health in development of activities or an intervention program to further enhance and promote self-management in school-age children with asthma, specifically in Viet Nam.

Methods

The objectives of this descriptive predictive cross-sectional study were to examine self-management and determine associations between child gender, severity of illness, social support and self-management of Vietnamese

school-age children with asthma in NinhThuan general hospital, NinhThuan province, Viet Nam.

A convenience sampling was used for recruitment. There were children aged 8 - 12 years who visited the Outpatient Pediatric Department (OPD), NinhThuan general hospital to follow up by medical appointment. The researcher selected participants by the inclusion criteria, including being diagnosed with asthma at least 6 months, being able to communicate and read Vietnamese language, and having no any other serious physical and mental problems.

Sample size in this study was calculated based on the formula by Soper²⁹ for an anticipated effect size (r^2) of 0.15, a desired statistic power level of 0.80, with number of predictors of 3, and a type I error probability level of 0.05. By using these necessary parameter values, a minimum required sample size for this study was 76.

Research instruments

A demographic questionnaire was developed by the researcher. It included child and parent characteristics. For the child, there were gender, age, number of siblings, and grade point average. For the parents, there were age, education and occupation. The researcher interviewed the children and their parents to obtain the information.

The asthma self-management inventory for children was developed by the American Institute for Research and further tested by Kieckhefer³⁰ and Horner⁹. It was used to measure frequent behaviors of the child performing asthma self-management. It was a self-reported Likert scale with 13 items. Each item score ranged from 1 - 5, with 1-never, 2-once in a while, 3-about half of the time, 4-most of the time, and 5-always. The highest score was 65 and the lowest score was 13. The more the score, the higher the self-management the child had. The scale was also classified into 3 levels which were calculated by taking the highest score (65) minus the lowest score (13) and divided by 3. Therefore, levels of self-management were interpreted as low (13 - 30.33), moderate (30.34 - 47.67), and high (47.68 - 65.00). In this study, internal consistency reliability of the scale was high with a Cronbach's alpha coefficient of 0.83.

The severity of illness scale for asthma in school-age children was modified by the researcher based on the instrument of Jacobs.³¹ It was used to measure a disease severity appropriate for asthma by self-report. It consisted of 18 items covering 3 domains: symptom, function, and parent

impact. Four items were deleted from the original tool because their meanings were not suitable for school-age children. Each item was rated on a 4-point scale ranging from 0 to 3, with 0-no problem, 1-minor, 2-moderate, and 3-major problem. The higher the score, the more severe the illness. The mean scores were also classified into 3 levels, which were calculated by taking the highest score (42) minus the lowest score (0) and divided by 3. Therefore, levels of severity of illness were interpreted as mild (0 - 14.00), moderate (14.01 - 28.00), and severity (28.01 - 42.00). In this study, the scale had a high internal consistency reliability with a Cronbach's alpha coefficient of 0.81.

The social support questionnaire for children (SSQC) was developed by Gordon.³² It was used to measure the social support to the school-age children. It comprised 7 subscales to yield a total score. Five of the subscales were based on the delineated sources of support from parents, relatives, adults (such as teacher, neighbor, police, nurse, and doctor), peers and siblings. Each item score ranged from 0 to 3, where 0-never or rarely true, 1-sometimes true, 2- often or very true, and 3-always true. However, for sibling items, if a child did not have any sibling, he could select the N/A (not applicable) option. In this study, internal consistency reliability was high with a Cronbach's alpha coefficient of 0.90.

Data collection procedure

Data collection was carried out from December 2014 to February 2015. The researcher explained the purpose of the study and method of collecting data to the director and staff of the OPD in NinhThuan general hospital before collecting the data. Data were then collected only by the researcher on Monday to Friday from 8 AM to 4 PM. The researcher contacted school-age children and their parents who met the study's inclusion criteria from a list of follow-up patients. Then, the researcher self-introduced and provided to school-age children and their parents the purpose and method of the study, and explained their right to participate or withdraw from the research. After they agreed to join the research, the researcher made an appointment with them after they finished the doctor's examination. The researcher invited them to the room nearby together with their parents to sign an informed consent. Later, the researcher gave the children all questionnaires and explained how to complete them, and allowed the children about 20 - 25 minutes to fill out the

questionnaires. At that time, the researcher was available for the children to ask, if they have questions or problems about the questionnaire. After they finished, the researcher checked for the completeness of the questionnaire. Data were later entered into an electronic file for further analyses.

Data analyses

Descriptive statistics in terms of frequency, percent, mean, and standard deviation were calculated to describe demographic information of school-age children and their parents, asthma self-management, severity of illness and social support. Multiple regression analysis was used to analyze associations between child gender, severity of illness, social support and self-management of the sample. Statistical significance level was set at 0.05.

Results

A total of 76 Vietnamese school-age children were recruited in the study. Their mean age was 9.18 years old (*S.D.* = 1.07) ranging from 8 to 12 years. There were 47.4% of boys. Regarding their education, the majority of children were in grade 4 (39.5%), followed by grade 3 (28.9%), grade 5 (19.7%), grade 6 (9.2%), and grade 7 (2.6%). Most of them were the first- and the second-born children (40.8% and 51.3%, respectively). Mean mother's age was 38.70 years (*S.D.* = 2.89) ranging from 35 to 45 years old, and mean father's age was 40.04 years (*S.D.* = 2.55) ranging from 37 to 45 years old. Most of the mothers completed diploma /college degree (53.9 %), and most of the fathers completed university bachelor degree or higher (46.1%) and diploma/college degree (31.6%). In terms of occupation, government officers and industrial workers were the most common career among the mothers (44.7% and 23.7%, respectively), and similarly, government officers and farmers were the most common among the fathers (52.6% and 22.4%, respectively).

Mean total score of self-management was 47.55 (*S.D.* = 5.76, range = 35-57), which was at a moderate level approaching to high (Table 1). Most of the participants had a high level of self-management (55.3%). Mean total score of severity of illness was 20.70 (*S.D.* = 4.51, range = 15 - 36), which was at a moderate level (Table 2). Most of the participants had a moderate level (92.1%) of illness severity.

Mean total score of social support was 79.32 (*S.D.* = 21.09) (Table 3).

Table 1 Frequency and percent of the level of self-management (N = 76)

Level	Mean score	N	%
Low	13 - 30.33	0	0
Moderate	30.34 - 47.67	34	44.7
High	47.68 - 65.00	42	55.3

Table 2 Frequency and percent of the level of severity of illness (N = 76)

Level	Mean score	N	%
Mild	0 - 14.00	0	0
Moderate	14.01 - 28.00	70	92.1
Severe	28.01 - 42.00	6	7.9

Table 3 Mean, standard deviation, and range of social support for total and subscale scores (N = 76)

Social support	M	SD	Range	Possible range
Total	79.32	21.09	42 - 120	0 - 150
Subscale				
Parents	19.75	3.87	13 - 28	0 - 30
Relatives	14.53	4.60	6 - 23	0 - 30
Adults	16.32	4.29	8 - 24	0 - 30
Peers	17.72	4.83	8 - 26	0 - 30
Siblings	19.90	5.40	12 - 29	0 - 30

Assumptions of multiple regression analysis were tested before running the test, including normality of dependent and independent variables, linearity relationships, homoscedasticity, no multicollinearity between pairs of independent variables, no autocorrelation and no outlier. Stepwise multiple regression analysis was performed to determine associations between child gender, severity of illness, social support and self-management of Vietnamese school-age children with asthma. Results revealed that child gender (boys), severity of illness, and social support together explained 47.0 % of variation in self-management ($F_{3,72} = 21.241$, P -value < 0.001) (Table 4). Child gender (boys) was the best predictor accounting for 27.5% in the prediction of self-management ($\beta = -0.506$, P -value < 0.001), followed by severity of illness ($\beta = -0.374$, P -value < 0.001) and social support ($\beta = 0.201$, P -value < 0.05) accounting for 15.5% and 4.0%, respectively.

Table 4 Stepwise multiple regression analysis for self-management (N = 76)

Variable	ΔR^2	b	SE	Beta	t
Constant		55.829	3.130		
Child gender (boys)	0.275	-5.805	0.990	-0.506	-5.861†
Severity of illness	0.155	-0.478	0.111	-0.374	-4.320†
Social support	0.040	0.055	0.024	0.201	2.326*

F_{3,72} = 21.241†, R² = 0.470, R² Adjusted = 0.447

* P-value < 0.05

† P-value < 0.001

Discussion and Conclusion

The results of this study showed that Vietnamese school-age children had mean total score of self-management was 47.55 (S.D. = 5.76, range = 35 - 57), which was at a moderate level approaching to high, and most of them had a high level of self-management (55.3%). It could be explained that the period development of school-age children which the children really mature and have capacity of performing certain self-management. The structure of children's thinking has an important impact on their problem-solving and decision-making abilities. Decision-making was crucial effective self-management especially in patients with chronic disease.³³ The brain size of school-age children was about 90% of adult size. The increasing maturation of the brain allowed children to complete increasingly complex skills and have greater control over their bodies.³⁴ It also allowed school-age children for increasing responsibility for problem solving judgment, and decision-making.³⁴ They began to have reasons about the correctness or incorrectness of actions and the effects of actions on others.³⁵ In addition, asthma is a chronic disease; the children who have asthma must live everyday of their life with its symptoms. Therefore, the Vietnamese school-age children have experienced performing to self-management behavior. This finding was supported by other studies which were conducted to identify the measured asthma self-management behavior.^{9,36} By using the same instrument to measure asthma self-management behavior, Kaul showed that most children had a moderate level of self-management.³⁶ Horner⁹ also reported that children diagnosed with asthma aged from 7 to 11 years old had a moderate level of self-management.

Child gender (boys) was negatively associated and significantly predicted asthma self-management ($\beta = -0.506$, P-value < 0.001). This finding was consistent with the social cognitive theory, of which Bandura described that gender

differentiation affected the difference of human experience such as how they perceived and processed experiences and how they performed their capabilities or self-management behavior.²² The result was also similar to the previous studies. Rhee and colleagues reported that gender difference was found with boys showing a higher tendency for denial to self-management than girls.¹⁷ From the other study, its result showed that girls were more motivated to learn new skill earlier and more independent in their self-management than boys at the same age.³⁸

Severity of illness was also negatively associated with and significantly predicted self-management ($\beta = -0.374$, P-value < 0.001). The children with high level of illness severity had low self-management. This finding was supported by the social cognitive theory of Bandura which addressed that severity of illness could affect physical and emotional states which influence abilities and judgments of a person.³⁹ This result was consistent with the previous studies.^{12,23,40} Bruzzese and colleagues concluded that children who had increased severity and persistence of asthma symptom were often leading to poor self-management.¹² The study by Raheison and colleagues described asthma exacerbation self-management in school-age children and adolescents by using a cross-sectional study.²³ They found that number of adolescent participants who took medication if the exacerbation of symptoms was long-lasting. The adolescents with moderate asthma (31.8%) were the highest category followed by those with mild asthma (20.7%) and only 4.8% of adolescents with severe asthma. Its result showed that self-assessed severity of asthma symptoms was related to low self-management²⁸. According to Motlow and Ozual, their findings showed that 33% of adolescents with daily symptoms and 24.5% of those with weekly symptoms were on inhaled steroids. However, adolescents with daily symptoms had poor self-management comparing to adolescents with weekly or monthly symptoms.⁴⁰

Social support was positively associated and significantly predicted asthma self-management ($\beta = 0.201$, P-value < 0.05). It could be implied that Vietnamese school-age children who had high social support had high self-management. This finding was consistent with the social cognitive theory of Bandura which highlighted that social support facilitates an individual to perform their specific self-management behavior.³⁹ This result was also consistent with several previous studies.^{27,28,41} Sin and colleagues presented

that there was a positive relationship between social support and asthma self-management behavior ($r = 0.34$, P -value < 0.01). They also reported that asthma knowledge and social support predicted asthma self-management behavior ($F = 4.05$, P -value = 0.024).²⁸ In addition, Yang and colleagues showed that there was a strong association of healthy lifestyle for asthma management with parental support and peer support in acute exacerbation management, trigger avoidance, and physical activity ($\beta = 0.45$, $\beta = 0.26$, respectively) among children aged 9 - 14 years old.²⁷ In another study conducted by Rhee and colleagues, they hypothesized that the greater levels of family support perceived by children associated with higher level of asthma control and quality of life, and that the relationship was mediated by barriers to adherence. They found a moderate positive association between family support and asthma control ($\beta = 0.16$, P -value = 0.05, $r^2 = 0.16$).⁴¹

These findings suggest that nurses and health care providers who work with school-age children with asthma could increase self-management of children with asthma through promoting and strengthening social support, especially for boys and those with less illness severity. In addition, they should educate school-age children with asthma and their family to contribute improving their knowledge and capability of the children self-management. Intervention studies need to be implemented to increase the children asthma self-management with support from family. Moreover, longitudinal research should be conducted to help better understanding the developmental processes of the asthma self-management.

Limitation of study

The study obtained a convenience sampling which could limit its result generalizability. In addition, the sample was primarily at school-age and in a setting of Viet Nam city. It should be cautious to use these findings to others. Moreover, items in the severity of illness scale for asthma were asked for perception of the children about general symptoms. In further studies, it would be more appropriate to use an instrument with more specific symptoms of asthma.

Conclusion

School-age children with asthma in Viet Nam had generally a moderate to high level of self-management for their health problems. Social support, especially from

parents, siblings and peers, was crucial in enhancing and promoting the children capacity of their asthma medication management. Intervention and longitudinal studies focusing on boys and those with severe symptoms of asthma could improve understanding and result in increasing effective asthma self-management in school-age children.

References

1. World Health Organization. Asthma. 2013. (Accessed on Jun. 15, 2013, at <http://www.who.int/media centre/factsheets/fs307/en/>)
2. American Lung Association. Trends in Asthma Morbidity and Mortality. 2002. (Accessed on Jul. 20, 2014, at <http://www.lung.org/finding-cures/our-research/trend-reports/asthma-trend-report.pdf>)
3. Akinbami LJ, Moorman JE, Liu X. Asthma prevalence, health care use, and mortality: United States, 2005-2009. *National Health Statistics Reports* 2011;32:1-16.
4. Nguyen TV. Hen PQ. 2013. (Accessed on Jul. 20, 2014, at <http://www.ninhthuan.gov.vn/chinhquyen/soyt/Pages/HEN-PHE-QUAN.aspx>)
5. Vietnam Ministry of Health. Five percent of Vietnamese affected by asthma. 2009. (Accessed on Jul. 20, 2014, at <http://en.vietnamplus.vn/Home/Five-percent-of-Vietnamese-affected-by-asthma/20095/180.Vnplus/>)
6. Huong, LTM, Thuy NTD. Review on asthma prevention and following-up of the children with asthma aged between 6-15 years old at the national hospital of pediatric. *Medical Ho Chi Minh* 2013;17(2):101-108.
7. Tram TV. Actual situation of bronchial asthma in Tien Giang Province. *Med Ho Chi Minh* 2011;15(4):155-164.
8. Knight EP, Shea K. A patient-focused framework integrating self-management and informatics. *J Nurs Scholar* 2014;46(2):91-97.
9. Horner SD. Effect of education on school-age children's and parent's asthma management. *J Spec Pediatr Nurs* 2004;9(3):95-102.
10. Thoonen BPA, Schermer TRJ, van den Boom G, et al. Self-management of asthma in general practice, asthma control and quality of life: A randomized controlled trial. *Thorax* 2003;58(1):30-36.
11. De-Civita M, Regier D, Alamgir AH, Anis AH, Fitzgerald MJ, Marra CA. Evaluating health-related quality-of-life studies in paediatric populations: Some conceptual, methodological and developmental considerations and recent applications. *Pharmacoeconomics* 2005;23(7):659-685.
12. Bruzzese JM, Chew GL, Evans D. Asthma prevalence, severity, and management among New York City adolescents. *J Allergy Clin Immunol* 2002;109(1):S175.
13. Pradel FG, Hartzema AG, Bush PJ. Asthma self-management: The perspective of children. *Patient Educ Couns* 2001;45(3):199-209.
14. Chiang LC, Huang JL, Fu LS. Physical activity and physical self-concept: Comparison between children with and without asthma. *J Adv Nurs* 2006;54(6):653-662.
15. Debley JS, Redding GJ, Critchlow CW. Impact of adolescence and gender on asthma hospitalization: A population-based birth cohort study. *Pediatr Pulmonol* 2004;38(6):443-450.
16. Dung DQ, Ba NTT. The prevalence and risk factors for bronchial asthma in primary school pupils at Go Vap district. *Med Ho Chi Minh* 2008;12(4):162-166.

17. Rhee H, Belyea M, Ciurzynski S, Brasch J. Barriers to asthma self-management in adolescents: Relationships to psychosocial factors. *Pediatr Pulmonol* 2009;44(2):183-191.
18. Horner SD, Surratt D, Smith SB. The impact of asthma risk factors on home management of childhood asthma. *J Pediatr Nurs* 2002;17(3): 211-221.
19. Loughheed MD, Lemiere C, Ducharme FM, et al. Canadian thoracic society 2012 guideline update: Diagnosis and management of asthma in preschoolers, children and adults. *Can Respir J* 2012;19(2):127-164.
20. National Heart, Lung, and Blood Institute [NHLBI]. National asthma education and prevention program expert panel report 3: Guidelines for the diagnosis and management of asthma. *J Allergy Clin Immunol* 2007;120(5):94-138.
21. McGhan S, MacDonald C, James D, Naidu P, & Wong E. Factors associated with poor asthma control in children aged five to 13 years. *Can Resp J* 2006;13(1):23-29.
22. Loan LTT, Hong PTM. Management of asthma adhered to GINA 2006 at children's hospital 2 in Ho Chi Minh City. *Medical Ho Chi Minh* 2010; 14(1):144-149.
23. Raherison C, Tunon-de-Lare M, Vernejoux JM, Taytard A. Practical evaluation of asthma exacerbation self-management in children and adolescents. *Resp Med* 2000;94(11):1047-1052.
24. Farber H, Oliveria L. Trial of asthma education program in an inner-city pediatric emergency department. *Ped Asthma, Allergy Immunol* 2004; 17(2):107-115.
25. Peters LW, Wiefferink CH, Hoekstra F, Buijs GJ, ten Dam GT, Paulussen TG. A review of similarities between domain-specific determinants of four health behaviors among adolescents. *Health Educ Res* 2009;24(2):198-223.
26. Stewart M, Letourneau N, Masuda JR, Anderson S, McGhan S. Online support for children with asthma and allergies. *J Fam Nurs* 2013;19(2): 171-197.
27. Yang TO, Sylva K, Lunt I. Parent support, peer support, and peer acceptance in healthy lifestyle for asthma management among early adolescent. *J Spec Pediatr Nurs* 2010;15(4):272-281.
28. Sin M, Kang D, Weaver M. Relationships of asthma knowledge, self-management, and social support in African American adolescents with asthma. *Int J Nurs Stud* 2005;42(3):307-313.
29. Soper DS. A prior-sample size calculator for multiple regression. 2013. (Accessed on Jul. 30, 2014, at <http://www.danielsoper.com/statcalc3/calc.aspx?id=1>)
30. Kieckhefer GM, Spitzer A. School-age children's understanding of the relations between their behavior and their asthma management. *Clin Nurs Res* 2001;4(2):149-167.
31. Jacobs B, Young N, Dick P, et al. Canadian acute respiratory illness and flu scale (CARIFS): Development of a valid measure for childhood respiratory infections. *J Clin Epidemiol* 2000;53(8):793-799.
32. Gordon TA. Assessing social support in children: Development and initial validation of the social support questionnaire for children (Doctoral dissertation). Department of Psychology, Graduate School Faculty, Louisiana State University and Agriculture and Mechanical College, 2011.
33. Clark NM, Gong M, Schork MA, et al. Impact of education for physicians on patient outcomes. *Pediatrics* 1998;101(5):831-836.
34. Burns CE, Dunn AM, Brady MA, Starr NB, Blosser CG. *Pediatric primary care* (5th ed). Philadelphia. Elsevier, 2013
35. Wadsworth BJ. Piaget's theory of cognitive and affective development: Foundation of constructivism (5th ed). White plains: Longman Publishers.1996
36. Kaul T. Helping African American children self-manage asthma: The importance of self-efficacy. *J School Health* 2011;81(1):29-33.
37. Bandura, A. Social cognitive theory. In *Annals of Child Development* (6th ed). Six theories of child development. Greenwich, CT. JAI Press, 1989.
38. Bjornson CL, Mitchell I. Gender differences in asthma in childhood and adolescence. *J Gend Specif Med* 2000;3(8):57-61.
39. Bandura A. *Self-efficacy: The exercise of control*. New York. W.H. Freeman, 1997.
40. Motlow F, Ozuah P. Use of anti-inflammatory medications by urban adolescents with asthma. *Einstein Quart J Biol Med* 2003;19(4):173-175.
41. Rhee H, Belyea MJ, Brasch J. Family support and asthma outcomes in adolescents: Barriers to adherence as a mediator. *J Adolesc Health* 2010;47(5):472-478.

Editorial note

*Manuscript received in original form on April 18, 2015;
accepted in final form on June 23, 2015*