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THE HEALTH BELIEF MODEL OF ASTHMA CONTROL AMONG ADULT ASTHMATIC PATIENTS IN YOGYAKARTA INDONESIA

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Abstract
Background : Asthma is a chronic respiratory disease which affects daily life of people. The ultimate target of health care for adult people living with asthma is to control their asthma. It is important to keep asthma under control in order to avoid impact of uncontrolled asthma.
Objective : The purpose of this study was to examine factors related to asthma control among adult asthmatic patients based on the Health Belief Model (HBM).
Methods : This was a descriptive study with cross-sectional design, which conducted in Pulmonary Primary Health Center (PPHC) Yogyakarta on April 2016. There were 397 participants selected using simple random sampling. Asthma control was measured using Asthma Control Questionnaire (ACQ). The Rossenstock for Health Belief Model (HBM) was used to guide this study. Descriptive statistic was performed for data analysis.
Results : Findings showed that age ($p > .05$), gender ($p > .05$), sufficiency of income ($p > .05$), educational level ($p > .05$), and occupation ($p > .05$) were not significantly related to asthma control. There was a significant correlation among perceived susceptibility ($p < .05$), perceived severity ($p < .05$), perceived benefit ($p < .05$), and perceived barrier ($p < .05$) with asthma control.
Conclusion : It is concluded that asthma control of adult asthmatic patients is influenced by their perception of control their asthma. The study suggests that nurses in the community should increase health promotion to change health perceptions to keep asthma control status in adult asthmatic patients.

Keywords: asthma control, health belief model, asthmatic patients

INTRODUCTION

Asthma is a common respiratory disease in general population (National Asthma Council Australia, 2013). Asthma is an inflammatory disease of the airways which cause by an obstruction of blood vessels ((Bateman et al., 2008). According to Global Asthma Report, asthma is one of the major global public health problems in 21st century, because of the number increasing at 235 million in 2000-2002 to 334 million in 2008-2010 (Global Initiative for Asthma, 2011). In Southeast Asia region, the estimated of deaths caused by asthma was 10% in 2007 ((Bateman et al., 2008). WHO reported that asthma death in Indonesia were 24,773, 1.77% from total death (WHO, 2013). In Yogyakarta, asthma is the 3 top ranked diseases in Pulmonary Public Health Center (Dinkes Kota Yogyakarta, 2015).

Although many studies examine age, gender, income, educational level, and occupation associated with asthma control, but the result

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is still inconsistent (Atmoko, Faisal, Bobian, Adisworo, & Yunus, 2011; Fuhlbrigge et al., 2009; Kusuma, 2014; Priyanto, Yunus, & Wiyono, 2011). Most of asthmatic patients face difficulty to take control their asthma (Fuhlbrigge et al., 2009). Patients with uncontrolled asthma showed more frequent getting asthma symptoms. These conditions affect their living such as lost time to work and missed their school ((Bateman et al., 2008). Uncontrolled asthma can lead the patients to get complications to other respiratory disease, such as status asthmaticus, atelectasis, pneumonia, and respiratory failure (Smeltzer et al., 2010), and also developed other disease like chronic kidney disease (Huang et al., 2014).

Moreover, studies on perception and asthma control are not investigated specifically in the adult people living with asthma. Furthermore, factors related to asthma control have been studied, but little is known in Indonesia, particularly in Yogyakarta. Yogyakarta has a unique characteristic of the adult people. The majority of young adult live in urban area with high life expectancy than they do in rural area, and the majority of the middle adult live in rural area for working in the fields (BPS Kota Yogyakarta, 2017). Yogyakarta is the urban area where a number of the adult people with health problems increase yearly, and also the incident of the adult people with asthma found in this area is higher than other area in Daerah Istimewa Yogyakarta province (Dinkes Kota Yogyakarta, 2015). Thus, the current need in this area is to find the relationship between demographic characteristics, health perception, and asthma control in the adult people living with asthma in Yogyakarta.

The original Health Belief Model (HBM) for asthma control was used to guide for selecting variables, and also as theoretical framework in this study. This study focuses on four constructs of HBM including perceived susceptibility, perceived severity, perceived benefit, and perceived barrier (Glanz, Rimer, & Viswanath, 2008). By understanding these constructs, it would be useful for health care provider to improve adult people's asthma control. The individual's asthma control will increase when the individual has a good perception. Therefore, the individual perceptions are important to prevent their asthma from incurring uncontrolled asthma as their health problem. The aim of this study was to examine the relationship between age, gender, income, educational level, occupation, perceived susceptibility, perceived severity, perceived benefit, perceived barrier, and asthma control.

METHODS

Study design

Cross sectional study was applied to examine the hypothesis in this study.

Sample

There were 397 participants recruited from Pulmonary Primary Health Center (PPHC) in Yogyakarta, Indonesia between April-May 2016. Simple random sampling method was employed for sample selection. The sample in this study were adult asthmatic patients aged 18-59 years, diagnosed as having asthma by physicians at least six months, able to read and write in Indonesia, willing to participate in this study, and able to complete the questionnaire independently.

Instrument

The data demographic form was designed by the researcher including age, gender, income, educational level, and occupation. The patient's perception includes perceived susceptibility measured by perceived susceptibility questionnaire modified from (Rakinaung, Jerayingmongkol, & Sanguanprasit, 2015). It is composed of 4 items and rated on 5-point scale, with responses ranging from 0 to 4. The reliability of the present study was 0.863. Perceived severity measured by perceived severity questionnaire modified from (Rakinaung et al., 2015). It is composed of 16 items and rated on 5-point scale, with responses ranging from 0 to 4. The reliability of the present study was 0.782. Perceived benefit measured by perceived benefit questionnaire modified from

(Octavia, Thongpat, & Khumsean, 2015). It is composed of 9 items and rated on 5-point scale, with responses ranging from 0 to 4. The reliability of the present study was 0.822. Perceived barrier measured by perceived barrier questionnaire modified from (Octavia et al., 2015). It is composed of 10 items and rated on 5-point scale, with responses ranging from 0 to 4. The reliability of the present study was 0.802. The Asthma Control Questionnaire (ACQ) used the original version from Juniper (Juniper, O'byrne, Ferrie, King, & Roberts, 2000). It is composed of 7 items and rated on 7-point scale, with responses ranging from 0 to 6. The reliability of the present study was 0.843. All instruments were translated in Indonesia version and had permission from the original authors. Data were collected by researchers and three trained research assistants.

Ethical consideration

This study has been approved by the Ethics Review Boards (ERB) Committee for Research Involving Human Research Subjects, Boromarajonani College of Nursing Nopparat Vajira (BCNNV) Bangkok, Thailand, and permission from Department of Health of Yogyakarta, with the approval number: 01/2559 on 20 April 2016. The participants were freely to choose to participate in this study or not. The information provided by the participants were assured and confidentially protected. The participants got the information clearly about the objective, procedure, and benefit of this study. The participants also were given the opportunity to ask the questions regarding to research study. After they clearly understood, participants were asked to sign informed consent form.

Data analysis

Descriptive statistic was used to determine the characteristics of participants and variables. Age, gender, income, educational level, occupation, perceived susceptibility, perceived severity, perceived benefit, and perceived barrier and asthma control were calculated by using percentage and frequency. Bivariate analysis was used to find the relationship between variables by using Chi square test. Statistical Package for the Social Sciences (SPSS) version 20 for windows (SPSS Inc., Kasetsart University, Thailand) was used for statistical analysis.

RESULTS

All of the participants completed questionnaires and their demographic characteristics were analyzed.

Table 1 Distribution of number and percentage of demographic data of participants (n=397)

Characteristics	N	%
Age (years)		
Young adult (18-35) years	175	44.1
Middle adult (36-59) years	222	55.9
Gender		
Male	163	41.1
Female	234	58.9
Sufficiency of income		
Not sufficient	206	51.9
Sufficient	191	48.1
Level of education		
Basic education	206	51.9
Advance education	191	48.1
Occupation		
Unemployed	118	29.7
Employed	279	70.3

More than half of the participants (55.9%) were at middle adult age (36 to 59 years old), and more than half of the participants (58.9%) were females, which is higher than the numbers of males. Almost half of the participants (48.10%) had sufficient income. The result showed that more than a half of the participants (51.90%) had finished their basic education. The majority of the participants (70.30%) were employed (See **Table 1**). While **Table 2** shows that 71.50% of participants were at the low-fair in perceived susceptibility, 64.00% of them were at the low-fair in perceived severity, 66.50% were at the low-fair in perceived benefit, and 71.80% of participants were at the low-fair in perceived barrier.

Table 2 Distribution of number and percentage of the perceptions of participants (n=397)

Characteristics	N	%
Perceived susceptibility		
Low	284	71.5
High	113	28.5
Perceived severity		
Low	254	64.
High	143	36.
Perceived benefit		
Low	264	66.5
High	133	33.5
Perceived barrier		
Low	285	71.8
High	112	28.2

Table 3 Relationships between demographic factors and asthma control status (n=397)

Variables	χ^2	p-value
Age	0.224	0.636
Gender	0.344	0.558
Sufficiency of income	4.875	0.027*
Educational level	4.875	0.027*
Occupation	0.007	0.931

* p < .05; ** p < .01

Table 4 Relationships between the perceptions and asthma control status (n=397)

Variables	χ^2	p-value
Perceived susceptibility	1.289	0.256
Perceived severity	14.384	0.000**
Perceived benefit	6.221	0.013*
Perceived barrier	0.569	0.450

* p < .05; ** p < .01

The result as shown in the **Table 3** showed there was a positive relationship between sufficiency of income and asthma control (p = < .05), with the strength of the relationship was weak (r = 0.111). There was a positive relationship between educational level and asthma control (p = < .05), the strength of the relationship was weak (r = 0.111). But there was no significant relationship among age, gender, occupation and asthma control among asthmatic patients in this group.

Table 4 shows that there was a positive relationship between perceived severity of asthma complication and asthma control (p = < .01), with the strength of the relationship was weak (r = 0.190). There was a positive relationship between perceived benefit of

asthma control and asthma control (p = < .05), the strength of the relationship was weak (r = 0.125). But there was no significant relationship among perceived susceptibility to develop the complication of asthma, perceived barrier of asthma control and asthma control among asthmatic patients in this group.

DISCUSSION

According to findings of this study, sufficient of income, level of education, perceived severity, and perceived benefit were positively significantly associated with asthma control. The results were expected with the objective of this study and supported by the HBM. The model illustrated that the characteristics of individual (sufficient of income and level of education), individual's perceptions (perceived severity and perceived benefit) influence the health status (Glanz et al., 2008). The results indicated that participants with sufficient income tend to provide the financial support, so they could completely deal with healthcare expenditures and living cost that affect to their status of asthma control, which is better than participants with low income. The findings are in line with the previous studies that was statistically having significant relationship between sufficiency of income and asthma control (Fuhlbrigge et al., 2009; Nguyen, Zahran, Iqbal, Peng, & Boulay, 2011). The present study claimed that participants with high education tend to get more information about their health and also had more understanding to their condition that affect to their status of asthma control better than participants with low education. The findings are consistent with the previous studies there was a statistically significant relationship between level of education and asthma control (Nguyen et al., 2011). The current study showed that participants with high perceived severity are more likely attention to their physic that influence to their status of asthma control better than participants with low perceived severity. The findings are in line with the previous studies showed that there was a statistically significant correlation between perceived severity and asthma control (Evers, Jones, Caputi, & Iverson, 2013). This study also showed that participants with high perceived benefit are more likely take care their health condition, because they realize about its advantages that influence to their status of asthma control better than participants with low perceived benefit. The findings are in line with the previous studies which indicated that there was a statistically significant relationship between perceived benefit and asthma control (Evers et al., 2013; Simon, 2013).

However, the present study found that age, gender, occupation, perceived susceptibility, and perceived barrier were not significantly associated with asthma control. The results were contradicted with the objective of this study and not supported by the HBM. The result implies that young adult or middle adult, male or female, unemployed or employed, low-fair or high perceived susceptibility and perceived barrier were not related with asthma control. The results indicated that participants with younger age and older age had different experience in controlling their status of asthma control. The findings were in contrast with the previous studies that show a statistically significant relationship between age and asthma control (Chapman, Boulet, Rea, & Franssen, 2007; Clatworthy, Price, Ryan, Haughney, & Horne, 2009). In addition, this study claims that male and female are equal to perform their status of asthma control. However, the findings contradicted with the several studies that show significant relationship between gender and asthma control (Andayani & Waladi, 2014; Chapman et al., 2007). Similar with occupation, the findings in this study were not in line with the several studies which revealed that there was a statistically significant relationship between having occupation and asthma control (Eagan, Gulsvik, Eide, & Bakke, 2004; Nguyen et al., 2011). Our study also showed that participants with low-fair and high perceived susceptibility had no difference in performing asthma control. This finding is not in line with the previous studies that show a statistically significant relationship between perceived susceptibility and asthma control (Evers et al.,

2013; Simon, 2013). Additionally, this study showed that participants with high perceived barrier had no difference in performing asthma control. The findings contradicted with the previous studies which indicated that there was a statistically significant correlation between perceived barrier and asthma control (Evers et al., 2013; Simon, 2013).

This study had strength and limitation. The strengths of study were (i) the participants were recruited from adult asthmatic patients using simple random sampling, and (ii) this study used the standardized questionnaire which had adequate validity from experts as well as good reliability. The limitations of this study were that this present study was only conducted at one place in collecting the data at one point in time, which is considered unable for generalization.

CONCLUSION

This study finding is useful to provide preliminary data about associated factors of asthma control in adult asthmatic patients in the Indonesian context. It is supported that age, gender, sufficient of income, level of education, occupation, individual's perception including perceived susceptibility, perceived severity, perceived benefit, and perceived barrier were correlated with asthma control. However, there may be indirect factors that can influence the adult patients' status of asthma control and therefore further studies are needed. The longitudinal study design should be considered and also an intervention study that focuses on health perception to reach asthma control in adult asthmatic patients. This finding suggests that healthcare providers as well as nurses in the community should do a promotion about health and asthma control to maintain health condition of adult patients with asthma.

Declaration of Conflicting Interest
None declared.

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Author Contribution
This study is the original work of the corresponding author.

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