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THE EFFECT OF HEALTH INSURANCE ON ASTHMA CONTROL IN RESPONDENTS WITH ASTHMA IN YOGYAKARTA, INDONESIA

PENGARUH ASURANSI KESEHATAN TERHADAP PENGENDALIAN ASMA PADA RESPONDEN ASMA DI YOGYAKARTA, INDONESIA

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ABSTRACT

Asthma is a chronic disease with recurrent breath shortness. Until now, there is no particular therapy to cure the disease and long-term treatment is needed to control the disease. Health insurance has the benefit to support the asthma therapy. This study aimed to assess the effect of health insurance on the asthma control based on Asthma Control Test (ACT) score. The study was done with a cross-sectional design on respondents with asthma who agreed to sign informed consent forms in Yogyakarta. The asthma respondents (n=36) were selected non-randomly, consisting of 23 respondents with health insurance, including universal health coverage or UHC (n=15), UHC and private insurance (n=7), and private insurance only (n=1). The ratio and categorical data were analyzed with the independent T-test or Mann-Whitney test and chi-square statistics, respectively. The study demonstrated that the profiles and number of medicines were similar between groups, except for lower smoking proportion among health insurance groups; the respondents with and without health insurance had the median ACT score at 22 (partial control) and 15 (bad control) respectively, though the scores were not statistically different. Conclusion: the asthma respondents with and without health insurance were not statistically different in the asthma control.

***Keywords**: asthma, asthma control, Asthma Control Test (ACT) score, health insurance*

ABSTRAK

Asma merupakan penyakit kronis dengan gejala serangan sesak nafas berulang yang belum ada penyembuhannya, dengan demikian diperlukan penatalaksanaan terapi jangka panjang yang efektif dan aman. Asuransi kesehatan bermanfaat mendukung terapi pasien asma. Penelitian ini dilakukan dengan tujuan mengevaluasi pengaruh asuransi kesehatan terhadap pengendalian asma berdasarkan skor Asthma Contol Test (ACT). Penelitian observasional ini dilaksanakan dengan rancangan potong lintang pada responden di Provinsi Yogyakarta yang pernah atau sedang mengalami asma serta bersedia mengisi informed consent. Responden dipilih menggunakan metode sampling nonrandom. Dari 36 responden asma, sebanyak 23 responden memiliki asuransi kesehatan yang meliputi JKN-BPJS (n=15), JKN-BPJS dan asuransi swasta (n=7), dan hanya asuransi swasta (n=1). Data rasio dianalisis dengan uji-T atau Mann Whitney, sedangkan data kategorikal dianalisis menggunakan uji chi-square. Hasil penelitian menunjukkan karakteristik responden dan jumlah obat asma responden tidak berbeda kecuali faktor merokok dengan proporsi yang lebih sedikit secara bermakna pada responden yang memiliki asuransi kesehatan. Responden dengan asuransi kesehatan memiliki median skor-asma ACT 22 (terkendali sebagian) dibandingkan tanpa asuransi dengan skor ACT 15 (pengendalian yang buruk) meskipun secara statistik berbeda tidak bermakna. Kesimpulan: responden dengan dan tanpa asuransi kesehatan memiliki pengendalian asma yang berbeda tidak bermakna secara statistik.

***Kata kunci**: asma, pengendalian asma, skor Asthma Control Test (ACT), asuransi kesehatan*

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INTRODUCTION

Asthma, a major non-communicable disease, has the clinical characteristics of chronic inflammation in the respiratory tract and recurrent breath shortness (WHO, 2017a). The prevalence of asthma in Yogyakarta Province in 2013 was 6.9%, and the incidence was higher than national data at 4.5% (BPDANP *Kesehatan Kemenkes* RI). The inflammation process in asthmatic patients involves increased numbers of cells and cell elements, including mast-cells, eosinophils, lymphocyte-T cells, macrophages, neutrophils, and epithelia cells. Until now, there are no primary cures nor prevention for asthma. Patients with asthma depend on a long-term asthma therapy, and they need therapy with efficacy and safety to control the disease or to prevent the exacerbations (Kelly and Sorkness, 2008). Uncontrolled asthma will lead to the increase in mortality rate among the patients and the mortality rate due to asthma at 80% happens in low and middle-low income countries (WHO, 2017b).

Financial support for long-term therapy is one of the important factors to control the disease among the subjects. Patients are concerned about the affordability aspect of the medicine; therefore, they expect to be able to communicate with healthcare providers for more effective and efficient therapy (Patel and Wheeler, 2014). Lack of health access contributes to the increase of hospitalization and mortality rate in asthma patients (Kelly and Sorkness, 2008). A study of therapy cost showed that the health burden of asthma is likely to affect the therapy outcome of the disease. Children whose parents believe that asthma therapy is an economic burden will have more emergency visits to health care and school absence due to the disease (Patel et al., 2012). Health financing support including health insurance is considered as a solution for most disease control including asthma.

Recently, the greatest health financing support system in Indonesia is the Universal Health Coverage (UHC) or according to the Indonesian terminology it is called as *Jaminan Kesehatan Nasional*. The UHC is managed by the social (health) insurance management agency or *Badan Pengelola Jaminan Sosial (BPJS) Kesehatan* with the principle of cooperation. Data in November 2017 indicated the UHC covered more than 183.5 million population and involved 21,771 health facilities. The UHC has the target of 100% coverage of the Indonesian population, and the UHC aims to support population welfare with qualified and continuous health care including for asthma patients. The UHC covers the management of asthma in the primary care and the secondary care (BPJS Kesehatan).

Besides the health financing support, the patients' knowledge contributes to asthma control. A cross-sectional study done in Cipto Mangunkusumo Hospital in Jakarta among uncontrolled asthmatic patients showed that patients' knowledge was the most influential factor on treatment adherence, whereas the health insurance and other factors had an insignificant effect on the disease control (Ferlani et al., 2015). Poor asthma control causes depression, frequently found in geriatric patients, and decreases patient's quality of life.

The Asthma Control Test (ACT) is a tool to measure asthma control (American Thoracic Association, 2017; GSK, 2017). Some studies using ACT demonstrated the correlation between ACT score and asthma control. A longitudinal study done in 1-year duration showed the increase of asthma control was equal to the increase of ACT score (Afandi et al., 2013). Another study on occupational asthma patients showed that the patients have statistically and clinically worse ACT score at work than the ACT score outside the work (Quirce et al., 2013).

Studies on the asthma control due to the disparity of health insurance in Yogyakarta population were not found during the literature review. Whereas, a study related to the health insurance in hypertension patients in Yogyakarta Province was found that showed patients with insurance had better awareness and higher therapy proportion than those without insurance. Nonetheless, the insurance was not successful to increase the blood pressure control (Suhadi et al., 2015). Based on the above description, a study was done among the population in Yogyakarta to evaluate the effect of the insurance ownership, therapy, and respondent profiles on asthma control using ACT.

METHODS

This study was an observational research conducted with the cross-sectional design with the study permit No. 070/01008 issued by *Dinas Penanaman Modal dan Perizinan Pemerintah Kota Yogyakarta.* The study protocol was approved by The Ethics Commission of the Medical Faculty, *Universitas Kristen Duta Wacana* with the Ethical Clearance No. 405/C.16/FK/2017. This study was part of the

main study about Improving the Role of the Indonesian Pharmacists on Asthma Management through "*Pelayanan Kefarmasian Pasien Asma* or *PKPA*" (Pharmaceutical Care on Asthma Patients).

Selection of the Subjects

The subjects were recruited from people who live in Yogyakarta Province. The inclusion criteria were those who were experiencing and/or recently suffered from asthma for both with or without routine therapy of asthma, and signed the informed consent for the willingness to participate in the study. The respondents were selected with non-proprietary sampling. Respondents were obtained from private clinics, hospitals, and community. Furthermore, some respondents were recommended by other respondents.

Procedures

The independent variable of the study was the ownership of health insurance for asthma therapy divided into the UHC, private/voluntary insurance, and without health insurance coverage, whereas the dependent variable was asthma control measured by ACT. Additional variables included sociodemographic profiles of age, gender, education background, and occupation; weight; medication history including non-pharmacology; etiology and history of asthma. Data collection was done by direct interview guided with open-ended questionnaire. The interview appointment was done at the time and place agreed by the respondents. The data collectors consisted of the interviewer and the note documenter who guided the respondents in answering the questionnaires. All interviews were recorded with a voice recorder. The ACT score was measured using ACT in the Indonesian version (Zaini, 2011). The children respondents were accompanied by their parents during the interview. The questionnaires for the interview have been translated into the Indonesian language. All data collectors were trained for their reliability in understanding the questions and the respondents' answers before the interview.

Data Analysis

The ACT scores were categorized based on clinical asthma outcomes into 3 levels, namely: uncontrolled asthma at ACT score less or equal to 19, partially controlled asthma at ACT score 20-24, and perfect controlled asthma at ACT score 25 (Zaini, 2011). The data analysis was done both in total respondents and categorical groups (with and without health insurance). Categorical data included gender, family history, history of hospitalization due to asthma, routine visit to health care facilities were analyzed using chi-square 2x2 statistics. Meanwhile, the smoking status of active, passive, and non-smoker was analyzed with Gamma test. The ratio data of age, age with the initiation of asthma, item of medicines administered by the respondents, and ACT score were analyzed for its distribution, followed by Mann-Whitney or T-test analysis depending on normal distribution of data. Statistical data analyses were done with 95% confidence level. The conclusions were drawn from both statistics and clinical outcomes.

RESULTS AND DISCUSSION

From 36 eligible asthma respondents, 23 were covered with health insurance, namely UHC or JKN-BPJS (n=15), both UHC and private insurance (n=7), and private insurance only (n=1). The total of respondents in this study had more females than males, but the gender characteristics were similar between groups. This finding was similar to the asthma prevalence in adults which is higher in females (Kelly and Sorkness, 2008). Profiles of respondents between groups were not significantly different except for lower smoking status in respondents with insurance (p=0.03). (Table I).

There were 4 respondents in the group with insurance making routine doctor visits for asthma therapy, whereas none from the without insurance group had this routine habit. In comparison, the routine therapy was not statistically different. This finding was similar with the result from a study that showed the effect of health insurance on the greater proportion of patients seeking chronic disease therapy in Sleman District of Yogyakarta Province (Suhadi et al., 2015). For the lower proportion of routine therapy among without insurance subjects, asthma will become health burden and they will likely have a poorer outcome in the future (Patel et al., 2012). Hospitalization due to asthma was not different between groups.

Table I. Comparison of asthma respondent's profiles in categorical data based on the ownership of health insurance/ financial support

Characteristics	Sub-group	Ownership of health insurance/ financial support Yes n=23 (proportion %)	 No n=13 (proportion %)	*p* value OR (95%CI)
Gender	Male Female	6 (26.1) 17 (73.9)	3 (23.1) 10 (76.9)	0.84 1.18(0.24-5.8)
Visit to health care sites	Routine Not-routine	4 (17.4) 19 (82.6)	0 (0) 13 (100.0)	0,11 n.a.
Family History of asthma	Yes No	13 (56.5) 10 (43.5)	5 (38.5) 8 (61.5)	0.30 2.08 (0.52-8.34)
Hospitalized experience due to Asthma	Yes No	8 (34.8) 15 (65.2)	5 (38.5) 8 (61.5)	0.83 0.85 (0.21-3.49)
Smoking status	Active Passive No	0 (0.0) 5 (21.7) 18 (78.3)	3 (8.3) 4 (30.8) 6 (46.2)	0.03*

Note: respondents with health insurance (n=23) including UHC or *JKN-BPJS* (n=15); UHC and private insurance (n=7); private insurance only (n=1); p-value with *Chi-square;* OR (95% CI) = *odds ratio* (95% *confidence interval*); *=gamma test; n.a.= *not applicable* cannot be calculated due to 0% in one group.

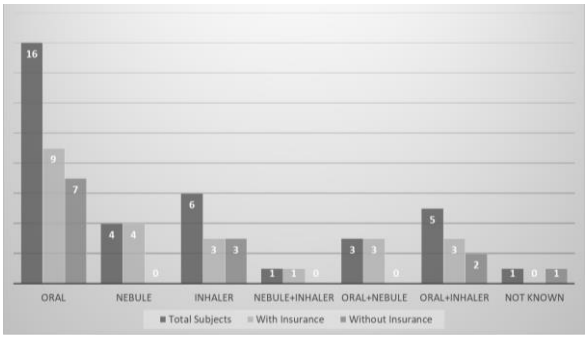


Figure 1. Profiles of dosage forms of the medicine used by the total asthma respondents, groups with and without health insurance

Respondents with health insurance had fewer smoking subjects than the without insurance subjects. The better smoking status was related to better awareness among the group with insurance. Smoking is an unfavorable factor for asthma control (Stapleton et al., 2011). Smoking status influenced the asthma control through the increase of anxiety and sensitivity among the asthma patients significantly (Avallone et al., 2015). Asthma has a close relationship with genetic factors or family history. Both groups of subjects had similar profiles for family history. Based on the ACT, both groups with and without insurance did not reach the ideal asthma control. This finding was likely related to smoking habit, both active and passive smoking, found in both groups of respondents. (Table II) Based on evidence-based medicine, it is crucial the smoking respondents become involved in the smoking cessation program for better asthma control (Saba et al., 2014).

Respondents in the groups of with and without health insurance were statistically similar in age, history of first asthma occurrence, items of asthma therapy, and ACT score. The ACT score indicates the asthma control, though the ACT score was not significantly different between groups, the respondents with insurance had ACT score at 22 (ACT 19-24) categorized as partial control of asthma. Meanwhile, the respondents without insurance had ACT score at 15 (ACT <19) categorized as poor control of asthma. Higher median ACT score among the respondents with insurance was related to the more frequent visits to health care center, therefore the appropriate therapy could prevent the asthma recurrence (Patel et al., 2012).

Respondents in with and without insurance groups had the median value of 1 and 2 items of medicine, respectively. Respondents with insurance had higher median ACT score with fewer items of medicine (Table II). The better ACT score was also supported by more proportion of subjects with routine therapy. Knowledge level of the subjects was also considered as an important factor in asthma therapy (Ferlani et al., 2015) but this factor could not be evaluated in this study because the subjects were from a wide age range from youth to elderly and thereby, the knowledge level was difficult to measure.

Table II. Comparison of age profile, asthma history, ACT score, and item of medicine among the total asthma respondents and within the group with and without health insurance

Characteristics	Subjects with health insurance		
	Yes	**No**	**p-value***
	n=23	**n=13**	***t-test***
	Mean ± SD (Median)	**Mean ± SD (Median)**	**(Mann-Whitney)**
Age (years)	31.0±17.5	35.0±19.0	0.53
	(27.0)	(27.0)	(0.67)
Asthma history (at years)	13.8±14.1	11.2±10.5	0.56
	(7.0)	(10.0)	(0.90)
Item of medicine	1.7±1.0	2.2±1.3	0.28
	(1.0)	(2.0)	(0.26)
ACT score	18.7±7.4	15.8±6.7	0.25
	(22.0)	(15.0)	(0.09)

Note**:** ACT: *Asthma Control Test;* fixed combination medicine was calculated as 1 single item;
**p*-value between subjects with and without health insurance analyzed with T-test and Mann-Whitney due to not normally distribution of data.

Drug selection was not further discussed in this study. The effect of drug selection and dosage form on the asthma control could not be evaluated in this study due to the variety of drug selection and limited subjects for each drug selection, furthermore some respondents did not recognize the composition of the medicine but they only knew the dosage form of the medicine used in the asthma therapy. The most frequently used dosage form of medicine in both with and without insurance groups was single oral preparation because oral single dosage form was more affordable (Figure 1).

Limitation of the study

The study showed the clinically better effect of the health insurance on ACT score. The result cannot be generalized to another population with different population setting because the baseline level of asthma severity of the respondents was not known. Asthma control is a result of multi-dimensions of patient, disease progress, medication, health-care provider, environment, and social background. The single factor of health insurance is likely not enough to affect the control of the disease. The study also has the limitation in the small number of respondents, therefore further research with more respondents is needed to confirm the results of the study.

CONCLUSION

The research of the asthma control in the respondents in Yogyakarta based on the ACT score can be concluded that the respondents with and without health insurance were not statistically different in asthma control.

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REFERENCES

Afandi, S., Yunus, F., Andarini, S. and Kekalih, A., 2013. Tingkat Kontrol Pasien Asma di Rumah Sakit Persahabatan Berdasarkan *Asthma Control Test* Beserta Hubungannya dengan Tingkat Morbiditas dan Faktor Risiko. Studi Longitudinal di Poli Rawat Jalan Selama Satu Tahun. *Jurnal Respirasi Indonesia*. 33(4), 230-243.

American Thoracic Association, Asthma Control Test (ACT). Available from: http://www.thoracic.org/members/assemblies/assemblies/srn/questionaires/act.php. [Accessed 14 July 2017].

Avallone, K.M. and McLeish, A.C., 2015. Anxiety sensitivity as a mediator of the association between asthma and smoking. *Journal of Asthma*. 52(5), 498-504.

Badan Penelitian dan Pengembangan Kesehatan Kementerian Kesehatan RI (BPDANP Kesehatan Kemenkes RI),-. Riset Kesehatan Dasar (Riskesdas) 2013. Available from:

www.depkes.go.id/resources/download/general/Hasil%20Riskesdas%202013.pdf. [Accessed 7 Nov 2017].

BPJS Kesehatan, Jumlah Peserta dan Faskes. Available from: https://bpjs-kesehatan.go.id/bpjs/index.php/jumlahPeserta. [Accessed 9 Nov 2017].

Ferlani, Sundaru, H., Koesnoe, S. and Shatri, H., 2015. Kepatuhan Berobat pada Pasien Asma Tidak Terkontrol dan Faktor-Faktor yang Berhubungan. *Jurnal Penyakit Dalam Indonesia*, 2(3), 140-150.

Glaxo Smith Kline (GSK). Asthma Control Test. 2017. Available from: https://www.asthma.com/content/dam/NA_Pharma/Country/US/Unbranded/Consumer/Common/Images/MPY/documents/816207R0_asthmacontroltest_printable.pdf. [Accessed 14 July 2017].

Kelly, H.W. and Sorkness, C.A., 2008. Asthma. In: J.T. DiPiro, J.T., Talbert, R.L., Yee, G.C., Matzke, G.R., Wells, B.G., Posey, L.M. 2008. *Pharmacotherapy, a Pathophysiologic Approach* 7th Ed.. New York: McGraw Hill.

Patel, M.R., Brown, R.W. and Clark, N.M., 2012. Perceived Parent Financial Burden and Asthma Outcomes in Low-Income, Urban Children. *Journal of Urban Health*, 90(2), 329-342.

Patel, M.R. and Wheeler, J.R.C., 2014. Physician–Patient Communication on Cost and Affordability in Asthma Care Who Wants to Talk about It and Who Is Actually Doing It. *Annals of the American Thoracic Society*., 11(10), 1538–1544.

Quirce, S., Muñoz, X., Urrutia, I., Pérez-Camo, I., Sabadell, C., Domínguez-Ortega, J., Barranco, P., Plaza, V., 2013. Changes in the Asthma Control Test Score in Patients with Work-related Asthma. *Journal of Investigational Allergology and Clinical Immunology*. 23(4), 284-285.

Ross, J.A., Yang, Y., Song, P.X.K., Clark, N.M. and Baptist, A.P., 2013. Quality of life, health care utilization, and control in older adults with asthma. *The Journal of Allergy and Clinical Immunology: In Practice*, 1(2), 157-162.

Saba, M., Dan, E., Bittoun, R. and Saini, B., 2014. Asthma and smoking-healthcare needs and preferences of adults with asthma who smoke. *Journal of Asthma*. 51(9), 934–942.

Stapleton, M., Howard-Thompson, A., George, C., Hoover, R.M. and Self, T.H., 2011. Smoking and Asthma. *Journal of the American Board of Family Medicine.* 24, 313–322.

Suhadi, R., Linawati, Y., Virginia, D.M. and Setiawan, C.H., 2015. Early Implementation of Universal Health Coverage among the Hypertension Subjects In Sleman-District of Yogyakarta. *Acta Medica Indonesiana*. 47(4), 311-317.

World Health Organization (WHO), 2017a. Chronic respiratory diseases, Asthma. Available from: http://www.who.int/respiratory/asthma/en/. [Accessed November 9, 2017].

World Health Organization (WHO), 2017b. Fact Sheet on Asthma. Available from: http://www.who.int/features/factfiles/asthma/en/. [Accessed on November 9, 2017].

Zaini, J., 2011. Editorial Asthma Control Test: Cara Simpel dan Efektif untuk Menilai Derajat dan Respons. *Jurnal Respirologi Indonesia*. 31(2), 51-52.