

# Relationship of Socioeconomic Status with Exacerbation Frequency among Children with Asthma in Malaysia

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**Abstract—** Background: Less than 25% of asthmatic children are well controlled. Little is known about how parental socioeconomic status affects the level of control of their children suffering Asthma. This may contribute to the successfulness of universal coverage. Objective: To determine the relationship of socioeconomic status with exacerbation frequency among children with asthma in Malaysia. Method: A cross-sectional study was carried out among 140 children with asthma aged 7 to 17 years old attending government primary health care clinics in Malaysia from December 2015 to June 2016. The respondents were selected via convenient random sampling. The survey was conducted via a face-to-face interview using a standardized self administered questionnaire. Result: The results showed that majority of the respondent showed mean age of 10.7 years and most were males (55.0%) with secondary level of education (33.6%). Mean exacerbation of disease was  $4.9 \pm 1.9$ . 60% respondent's caregiver had background of secondary level with majority (44.3%) of their family income ranging between (RM2300 - 5599) per month. There was no association was found between the frequency of asthma exacerbation with level of education among respondent's caregiver ( $t=-1.38$ ,  $p=0.17$ ) and with level of family income ( $F=0.25$ ,  $p=0.96$ ). Conclusion: The socio demographic factor has no relationship with asthma exacerbation. The findings added to the latest knowledge and information of asthma in Malaysia.

**Keywords—** asthma, children, socioeconomic, government primary clinics

## I. INTRODUCTION

Asthma is a serious public health problem globally, with an estimated 300 million affected individuals and great variations between countries [1]. The prevalence of asthma is increasing in most countries, especially among children and adolescents [2].

In Malaysia, Asthma was also noted to be among the commonest medical conditions treated in health clinics, giving rise to considerable morbidity and

mortality [3]. About 73% of outpatients that attended primary health care clinics were treated for respiratory symptoms, where asthma was one of the cases that needed to be closely treated [4].

Despite advances in asthma management, acute exacerbation continues to occur and impose considerable morbidity on patients and constitute a major burden on health care resources. Other than genetic contribution, there are several social and environmental factors involved in the cause and exacerbation of childhood Asthma. This was included the socioeconomic status (measured by family income, parental education and parental occupation) of the family itself, have an association of the acute exacerbation of asthma among children [5].

This problem is able to impact the patients, their families, and the community as a whole in terms of lost work and school days, poor quality of life, increased use of expensive emergency services, hospitalizations, and deaths [6]. Reducing SES disparities in health will require policy initiatives addressing the components of SES as well as the pathways by which these affect health.

However, there are still few studies done to examine the association of SES with the exacerbation frequency among childhood asthma. Quality in addition, little is known about the factor associated among asthmatic children that could impact their asthma control.

Hence, by doing this study, we aimed to determine whether the SES factor (family income, parental education level and parental occupation)

were associated with exacerbation frequency among children with asthma attending to primary health clinics. This could eventually improve the plan of management in children with asthma through conclusive recommendations.

## II. METHODOLOGY

A cross-sectional survey was conducted in two large urban government primary health care centres located in South Malaysia from December 2015 to June 2016, using a convenient sampling strategy. Both government primary health care centres, equipped with all basic amenities of safe water supply, electricity and proper sanitation, has a population of about 16000 with mainly Malay ethnicity.

All asthmatic children aged 7 to 17 years old who registered at the selected settings for follow-up visits during the study period and fulfilled the inclusion criteria were included. A sample size of 140 samplings was estimated using Fleiss J.L formula to detect a prevalence of children with Asthma. An individual was considered asthmatic when medically certified by a physician. The respondents were selected via convenient random sampling. The inclusion criteria were Malaysian citizens and accompanied by his or her caregiver who consented for participating in this study. The exclusion criteria were asthmatic children aged below 7 years or above 17 years, have concomitant illnesses other than asthma, suspicion of having an alternative cause for recurrent wheezing other than asthma, illiterate or refused to participate.

Information was retrieved from the patients and their caregiver. The survey was conducted via a face-to-face interview using a standardized self administered questionnaire. It included data concerning socio-demographic factors such as sex, age, educational level, paternal educational level, paternal occupation and family income.

The approval for this study had been obtained from the Research Ethics Committee, Medical Faculty Universiti Kebangsaan Malaysia (FF-425-2012), Medical Centre as well as the National Medical Research Register, National Institute of Health, Malaysia.

Data was analysed using SPSS (Statistical Package for Social Sciences) version 20 (Chicago,

IL, USA). Descriptive data was presented as frequencies and percentages and continuous variables as means with standard deviation (SD). Differences between normally distributed continuous data were analyzed using the independent t-test and one way ANOVA. All tests were two-tailed with significance defined as the p-value of less than 0.05.

## III. RESULTS

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### A. Socio-Demography Characteristics Of Respondents

A total of 140 caregivers agreed to their child's participation in the study. Table 1 shows the respondents' socio-demography characteristics. The age of the respondents ranged from 7 to 17 years with the mean age of children at 10.7 years  $\pm$  2.66. Boys were 77(55.0%) and girls were 63(45.0%). Ninety-three (66.4%) of the respondents were in primary school and 47 (33.6%) in secondary school.

TABLE I  
SOCIO-DEMOGRAPHY CHARACTERISTICS OF RESPONDENTS  
(N=140)

Parameter		Frequency (n)	Percentage (%)
Age (years)		Mean : 10.7 years $\pm$ 2.66	
Exacerbation of Asthma		Mean : 4.9 $\pm$ 1.9	
Level of Education			
	Primary	93	66.4
	Secondary	47	33.6
Gender			
	Male	77	55.0
	Female	63	45.0

### B. Socio-Demography Characteristics of Respondent's Caregiver

Table 2 delineates the socio-demography characteristics of the respondents' caregivers. Majority of the respondents' paternal educational levels have primary education level. The technical work was the main paternal occupation (50.0%) in the studied sample. Otherwise others included in the professional 931.4%) and self employed (18.6%). Sixty-two (44.3%) of the respondents' caregivers had their family income ranging between (RM2300 - 5599).

### B. Association of Socio-Demography Characteristics of Respondents with Exacerbation of Asthma

Surprisingly, there was no association between all socio-demography characteristics of the respondents with exacerbation of asthma frequency (Table 3).

TABLE II  
SOCIO-DEMOGRAPHY CHARACTERISTICS OF RESPONDENT'S CAREGIVER (N=140)

Parameter	Frequency (n)	Percentage (%)
Paternal Education Level		
Primer	84	60.0
Secondary/Tertiary	56	40.0
Paternal occupation		
Nil/self-employed	26	18.6
Technical	70	50.0
Professional	44	31.4
Family income (RM)		
< RM 2300	35	25.0
RM 2300 – 5599	62	44.3
≥ RM 5600	43	30.7

RM: Ringgit Malaysia

TABLE III  
ASSOCIATION OF SOCIO-DEMOGRAPHY CHARACTERISTICS OF RESPONDENTS WITH EXACERBATION OF ASTHMA

Parameter	Mean exacerbation of Asthma		T-test	P value
	Mean	SD		
Age (years)	10.71	2.65	-0.02*	0.79
Gender				
Boys	5.06	1.79	0.89	0.37
Girls	4.79	1.77		
Level of Education				
Primary	4.78	1.65	-1.53	0.13
Secondary	5.30	1.85		

SD=Standard deviation; T-test=Student-t test; \*= simple linear regression: (b slope = -0.02, constant= 5.07);  $p < 0.05$  was considered significant

### C. Association of Socio-demography Characteristics of respondents' caregivers with Exacerbation of Asthma

The same finding was observed for the association with the socio-demography characteristics of the respondents' caregivers with exacerbation of Asthma (Table 4). There was no effect of paternal level of education and occupation on the exacerbation frequency of Asthma ( $p > 0.05$ ). Similarly, family income did not affect the respondents frequency of Asthma exacerbation ( $F = 1.69$ ,  $p = 0.19$ ).

## IV. DISCUSSION

140 of children aged 7 to 17 years old with Asthma were involved in this study. This study aimed to determine factors associated with exacerbation frequency among children with Asthma and specifically the factors of socioeconomic status (SES) in the family.

TABLE IV  
ASSOCIATION OF SOCIO-DEMOGRAPHY CHARACTERISTICS OF RESPONDENTS' CAREGIVERS WITH EXACERBATION OF ASTHMA

Parameter		Mean exacerbation of Asthma		T-test F value	P value
		Mean	SD		
Paternal Education Level					
	Primary	4.78	1.79	-1.53	0.13
	Secondary/Tertiary	5.30	1.71		
Paternal occupation					
	self-employed	4.46	1.63	1.49*	0.23
	Technical	5.14	1.78		
	Professional	4.82	1.85		
Family income (RM)					
	< RM 2300	5.26	1.63	1.69*	0.19
	RM 2300 – 5599	4.98	1.81		
	> RM 5600	4.53	1.82		

RM= Ringgit Malaysia; SD=Standard deviation; T-test=Student-t test; \*F=ANOVA;  $P < 0.05$  is considered significant

Asthma had been found to affect all social classes for various reasons, in both developed and developing countries as reported by GINA [2]. Interestingly, this study showed all the examined factors not associated with the exacerbation frequency among the children with Asthma. Our finding was supported by the reviews conducted by Rona et al [7]. The effect of SES on the asthma control among children has been observed in hospital setting [8]. However, it was less study done to relate the SES in primary health care setting. Despite, the association between the SES and asthma control have been previously characterized more towards preschool age compared older children [9]. Parent with lower age may seek early treatment for their child in primary care services. Thus, the age-varying factor on SES remains a challenge in this study.

The possibility of the parental healthcare seeking behaviour also may contribute the negative association of the study finding. There was lacking information on family choice of healthcare-related

cost over time. Parent with higher income may seek treatment from general practitioner or private specialist care where as more inpatient care for those from the lower income group [10]. Besides, children with uncontrolled asthma also will seek treatment in the emergency department at hospital level compared to the primary health care services. There was also lack of data regarding the time of asthma exacerbation. According to the recent literature showed children will have more asthma exacerbation at night. So the possibility of the parent to get treatment for their child will be more towards the hospital compared to primary health care services [9].

The high paternal level of education had been associated with the ability to care properly, a greater appreciation of scientific knowledge, and the ability to articulate resources for the needs of the child [11]. Once the caregivers have a higher level of education, they will tend to have more knowledge about asthma and its evolution, what to do when symptoms appear, and how to prevent crises, minimizing the damage to the quality of life of the child. The low level of caregiver education was highly correlated with the socio-economic background of the family, where they have more risk of environmental exposures, access to healthcare facilities, stress, and cultural factors [12]. Our finding also indicated there was no effect of parental education level on exacerbation of asthma frequency. There are potential factors that contributing to this finding such as family life style [8], diet [10], medication compliance [6] and stress level [9]. However these factors are difficult to measure in this study. Asthma education need to be given continuously to reduce Asthma exacerbation although the finding was inconsistent with the previous study [6]. This will help to reduce the increment of healthcare cost.

Among children with Asthma involved in this study, we found that parental occupation also did not have any association on the exacerbation of Asthma. Occupational status is a complex variable and its measurement varies depending on one's theoretical perspective. Parent who classified as professional may have poor health status compared to self employed [7].

This study has limitation as it only involved primary health care setting. It also had recall bias where the parent and children with asthma need to give information of Asthma exacerbation within six month of duration. Parent who self-employed would result in underestimation of income and this may contribute to wrongly classification. These diverse of results could also be due to different study design, small sample size and varying measures of SES.

## V CONCLUSIONS

In conclusion, our study shows that the socioeconomic factor has no relationship with asthma exacerbation. The findings added to the latest knowledge and information of asthma in Malaysia.

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