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The Level of Knowledge on Asthma and its Management among Primary School Teachers in Penang, Malaysia

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Research Article

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Abstract

This study was designed to determine the level of knowledge on asthma and its management and factors associated with knowledge about asthma among primary school teachers in Penang, Malaysia. A cross-sectional observation study was carried out among teachers from 32 randomly selected primary schools out of 114 schools in Penang, Malaysia. A questionnaire was used for data collection which comprised of 47 statements about cause, symptoms, management and exercise-induced asthma. Respondents marked either yes, no, true and false. Each correct answer was worth one point and no point was given for incorrect answer and no response. The final scores were totally 47. The score categories were poor knowledge (≤ 50% of correct answer), moderate knowledge (50% < x ≤ 75% of correct answer) and good knowledge (≥ 75% of correct answer). A total of 813 teachers participated in this study. Majority were 77.7% female and 89.9% Malay. The mean age and mean teaching experience were 36.85 ± 7.88 and 12.56 ± 8.17, respectively. The primary school teachers knowledge about asthma and its management was generally categorized in moderate knowledge with mean score was 34.53 of 47 scores (73.46%). Knowledge on cause of asthma and asthma symptoms were categorized in good knowledge (75.87% and 79.7%, respectively). However, knowledge on asthma management and exercise-induced asthma were categorized in moderate knowledge (73.17% and 64.0%, respectively). The teachers' asthma knowledge were significantly higher among teachers who are suffering from asthma, have child with asthma and who have read a book or article about asthma. The study concluded that primary school teachers in Penang have moderate level of knowledge on asthma and its management. Teachers who have asthma or having child with asthma or have read about asthma generally have better knowledge on asthma and its management.

Keywords: *Asthma, Management of asthma, Asthma knowledge, Primary school teacher, Level of knowledge.*

Introduction

Asthma is one of the most common chronic illness among school children and an important cause of school absenteeism and lack participation in sports and other activities [(1, 2)]. The prevalence of childhood with asthma in Malaysia has been reported to range from 4.9 % to 13.8 % [(3-5)].

Next to home, school is the most important environment in childhood. From the age of five years, children spend up to 30 % of their day at school under the care and supervision of teachers. Teachers are primarily responsible on school children with asthma during school hours. Physical education activities may put school children with asthma at risk, since the attacks are likely to occur during or immediately after exercise [(6,7)]. Therefore, it is important that these children are given proper prophylactic asthma management prior to exercise, since children with asthma spend most of their time at school under the care of teachers. Consequently, the degree of knowledge of asthma among teachers is vital in ensuring that the disease does not inhibit the activities of the child at school. Therefore it is important for school teachers to understand the causes of asthma and its management to the student [(8-13)]. Teachers should know the type of action needed when their student having asthma attack. The actions including knowing the symptoms, the type of medications, when to administer them, how to administer the medications, whom needed to call in an emergency and when to call a doctor or send the student to hospital [(14)].

The level of asthma knowledge has been identified as one of the factor determining asthma management difficulties among children with asthma. Adams et.al assessed the knowledge of the

patient, family or other community. The asthma management measurement should identify the community's knowledge of precipitating factor of asthma exacerbation, asthma management, information about the type of asthma medication and recall of the dose and frequency of medication [15]. Inadequate knowledge of teachers would lead to inappropriate management when asthma attack is occured at school.

There are studies on the level of knowledge on asthma among teachers in Hong Kong, Bahraini, Turkey and Malaysia [8-11]. Previous study in Kelantan, Malaysia showed no difference of knowledge level about asthma among school teachers with other countries. Authors found that school teachers were less informed about the management and treatment of asthma. They were quite knowledgeable about the risk factors and symptoms of asthma, despite these teachers still lack of understanding that rain, smoking and cold weather could induce asthma attack [9].
Since schools in Malaysia do not have full time nurse, teachers are responsible for management of asthma student at school. Therefore, asthma knowledge among primary school teachers is very important to help asthma student with asthma attack at school.

The objective of this study was to assess the level of knowledge of the school teachers on asthma and its management and factors associated with knowledge about asthma among primary school teachers in Penang, Malaysia.

Material and Method

Study Design
The study was a cross-sectional observation study to assess the level of knowledge on asthma and its management among teachers from Primary schools in Penang. The study was done using a validated questionnaire.

Location of the Study
This study was performed in selected primary school in Penang-Malaysia. Based on the geography, Penang is divided into two sections which are Penang Island and Province Welleslay (Seberang Perai). Penang consists of five districts: 2 districts in Penang Island (South-West Penang Island and North-East Penang Island) and 3 districts in Seberang Perai (Northern Seberang Perai, Central Seberang Perai and Southern Seberang Perai).

Sample Size Study
There are 114 primary schools and 8000 teachers throughout the five districts in Penang. Based on the sample size calculation, the minimum sample size was 367 numbers of teachers out of 8000 teachers in Penang. The average number of teachers in each school is about 30-40 teachers. Therefore the total number of schools needed to give the required number of teachers is about 30-34 schools or 30% of the total number of schools in Penang. The schools were selected randomly stratified based on the districts in Penang from the list of primary schools provided by Education Department, Penang. All teachers in selected schools were eligible to participate in the study. Teachers who disagreed to participate in the study were excluded.

Pilot Study
Questionnaire
The questionnaire was written in Bahasa Malaysia. The questions and statements were adapted from previous studies on the asthma knowledge [8-9, 16-19]. The questionnaire consisted of demographic data, exposure of asthma and 4 sections on asthma knowledge. The demographic data included gender, race, age, marital status, teaching experience and education background of the teachers. The exposure of asthma included teachers' having asthma, having children with asthma, having relative with asthma, having students with asthma, having colleague with asthma, teacher's experience who have seen anyone having asthma attack, assisted anyone while having an asthmatic attack, attended seminar about asthma, read article about asthma and have seen anti asthma medication. Respondents marked for teachers' exposure of asthma either yes or no.

The asthma knowledge statement consisted of 4 sections. Section A consisted of 15 statements related to the teachers' knowledge on the causes of asthma, Section B consisted of 10 statements related to the teachers' knowledge on the symptoms of asthma, section C consisted of 10 statements related to the teachers' knowledge on exercise induced asthma and section D consisted of 12 statements related to the teachers' knowledge on the management of asthma. Respondents marked either true or false.

Reliability
Reliability test was done used test-retest reliability. The sample for reliability consisted of 33 primary school teachers which were selected conveniently from group of teachers attending off campus program. The questionnaire was administered on two occasions (separated by 5-10 days). Test-retest reliability was assessed with Spearman correlation coefficient for measuring agreement. Correlation coefficient that was greater than 0.80 indicated excellent agreement between two measurements, correlation coefficient that greater than 0.50 and lower than 0.80 indicated good agreement and correlation coefficient lower than 0.5 to 0.0 indicated disagreement [20]. Test-retest reliability was showed an excellent agreement with Spearman correlation coefficient value was 0.821. This result indicated that the questionnaire was reliable to use.

Data Collection Procedures

A total of 32 national primary schools participated in the study were selected randomly from the list of primary schools provided by Education Department, Penang. A visit to each individual headmaster of the selected school was done to brief about the study. All headmaster of the selected school agreed to participate in the study. Headmaster was then given with sets of questionnaires to be distributed to all the teachers in their respective school. Each set of questionnaire consisted of brief explanation about the study, objective of the study, instruction on how to complete the questionnaire and the questionnaire about asthma itself.

Data Analysis

Data was analysed using SPSS for Windows, version 15. Descriptive statistic was used appropriately and presented as percentages. Each correct answer was worth one point and no point was given for incorrect answer and no response. Therefore, the final scores were totally 47 the score categories were poor knowledge (equal and less than 50 % of correct answer), moderate knowledge (greater than 50 % of correct answer and equal or less than 75 % of correct answer) and good knowledge (greater than 75 % of correct answer).

Univariate analysis as Mann-Whitney U Test and Kruskal-Wallis Test were used to define predictors influencing the level of asthma knowledge with P value < 0.05 was considered significant. Mann-Whitney U Test was used to determine the influence of gender and teachers' exposure to asthma to the level of asthma knowledge. Kruskal-Wallis was used to determine the influence age, teaching experience, status, education background, and race to the level of asthma knowledge.

Results

Thirty two of 114 schools participated in the study. Eight hundred and thirteen (71.37%) questionnaires were completed and collected out of 1139 total questionnaires distributed. The majorities of teachers were female (77.7%), Malay (89.9%) and married (86.7%). The mean age of respondents was 36.85 ± 7.88 (range 20 – 55 years) and mean teaching experience was found to be 12.56 ± 8.17 years. Education background of the majority of the respondent was Diploma Education (Table 1).

Table 2 showed teachers exposure to asthma. Most of the teachers knew about asthma either by having seen child, relative, friend, students or other person suffering from asthma. Total of teachers suffering asthma were 63 (7.7%). Many teachers have seen anyone having an asthmatic attack (76.8%) but only 41.1% ever assisted anyone suffering from an asthmatic attack. Many teachers have read a book or article about asthma (73.6%) but only 19 (2.3%) teachers have attended a course or seminar on asthma.

The mean score for asthma general knowledge was 34.53 ± 3.67 (73.46%) of 47 total scores, only 1.1% of teachers have poor general knowledge and 31.4% of teachers have good knowledge on asthma. The mean score for teacher knowledge about asthma and its causes was 11.38 ± 1.81 (75.86%) of 15 total scores, majority 64.6% of teachers have moderate knowledge and 29.6% of teachers have good knowledge about cause of asthma. The mean score for teachers knowledge about asthma and its symptoms was 7.97 ± 1.29 (79.7%) with 59.3% have moderate knowledge and 37.4% of teachers have good knowledge on asthma and its symptoms. The mean score for teachers knowledge on asthma and sport was 6.40 ± 1.51 (64.0%) with 65.4% have moderate knowledge and 27.1% have poor knowledge but 7.5% of teachers have good knowledge on exercise induced asthma. The mean score for knowledge on the management of asthma was 8.78 ± 1.56 (73.17%) with 58.4% moderate knowledge and 33.6% of teachers have good knowledge on management of asthma. Further details are provided in Table 3.

Table 1: Description of teachers participating in the research

	No	%
Gender		
Female	628	77.7
Male	180	22.3
Race		
Malay	724	89.9
Chinese	28	3.5
India	48	6.0
Other	5	0.6
Status		
Married	697	86.7
Non married	90	11.2
divorced	17	2.1
Age		
Mean: 36.85± 7.875		
From 20 to 28 years old	117	15.0
From 29 to 37 years old	323	41.4
From 38 to 46 years old	242	31.0
From 47 to 55 years old	98	12.6
Field of education		
Science	174	24.2
Art	546	75.8
Teaching Experience		
Mean: 12.56± 8.166		
From 1 to 10 years	343	44.5
From 11 to 20 years	308	39.9
From 21 to 35 years	120	15.6
Education Background		
Postgraduate	17	2.1
Undergraduate	235	28.9
Diploma	423	52.0
Certificate	120	14.8

Table 2: Teachers exposure to asthma

	Yes (%)	No (%)
Suffering from asthma	63 (7.7)	750 (92.3)
Child having asthma	90 (11.1)	723 (88.9)
Relative having asthma	276 (34.0)	537 (66.4)
Seen anyone having an asthmatic attack	623 (76.8)	188 (23.2)
Assisted anyone having an asthmatic attack	333 (41.1)	478 (58.9)
Attended course or seminar in asthma	19 (2.3)	794 (97.7)
Read books or articles about asthma	595 (73.6)	213 (26.4)
Student having asthma	555 (68.7)	258 (31.3)
Colleague having asthma	469 (58.4)	344 (41.6)
Seen anti asthma medication	502 (61.9)	311 (38.1)

Table 3: Mean score of asthma knowledge and no. of respondents (%) based on level of asthma knowledge

Domain Knowledge	Total score	Mean (SD)	Poor Knowledge (≤ 50 % correct answer)	Moderate Knowledge (50 % < x ≤ 75 % correct answer)	Good Knowledge (> 75 % correct answer
Total score of asthma knowledge	47	34.53 (3.665)	9 (1.1)	549 (67.5)	255 (31.4)
Knowledge of teacher about asthma and its causes	15	11.38 (1.805)	47 (5.8)	525 (64.6)	241 (29.6)
Knowledge of teacher about asthma and its symptoms	10	7.97 (1.289)	27 (3.3)	482 (59.3)	304 (37.4)
Knowledge of teacher about exercise induced asthma	10	6.40 (1.512)	220 (27.1)	532 (65.4)	61 (7.5)
Knowledge on the management of asthma	12	8.78 (1.559)	65 (8.0)	475 (58.4)	273 (33.6)

The asthma knowledge level was not related to gender, race, teachers' age, education background, teaching experience, and status (p = 0.638, p = 0.910, p = 0.209, p = 0.217, p = 0.935 and p = 0.074, respectively). The asthma knowledge level was also not related to teachers had attended on course or seminar of asthma and teachers' have students with asthma (p = 0.124 and p = 0.218, respectively). The asthma knowledge level was significantly related to teachers' having asthma, having children with asthma, having relative with asthma, teachers have seen anyone having an asthmatic attack, teachers have assisted anyone while having an asthmatic attack, teachers had read a book or article about asthma, teachers who have colleague having asthma and teachers had ever seen anti asthma medication (p <0.0001, p = 0.001, p <0.0001, p <0.0001, p <0.0001, p = 0.007, p = 0.003 and p <0.0001, respectively).

Discussion and Conclusion

The majority children spend their time at school and under teacher supervision. If the asthma attacks occur during school hour, management and administration of asthma medication are made by teachers and school staffs. Consequently, the degree of understanding of asthma among teachers is the most major important thing to help asthma student whom have asthma attack at school.

Previous studies reported that teachers have limited knowledge about asthma and its management [8-10, 12]. These studies reports were contra with our study result. Our study showed that the primary school teachers in Penang generally have moderate knowledge on asthma and its management (mean score of 34.53 of 47 or 73.46%). Similar result have been reported in Turkey (mean score 96.7 of 130 or 74.3 %) [11].

The level of teachers' knowledge on cause of asthma and symptoms of asthma in our study were categorized in good knowledge (see Table 3). This finding corresponded to study by Hussey J which found teachers knowledge on sign and symptoms were good with mean 6.14 from a maximum of 9

scores (68 %) and 5.74 from a maximum of 8 scores (72%), respectivelly[13].

The level of teachers' knowledge about management on asthma was categorized in moderate knowledge. This level are sufficient to enable them assisting student suffering from asthma. Study in Hong Kong found that teachers' knowledge about asthma management was very poor (39%) compared to our study 73% [8], it showed that our result is better than other study. This result could be associated to the exposure of teachers to asthma such as reading on asthma and have students with asthma because 73.6% of them said had read about asthma and 68.7% said they had students with asthma.

The level of teachers' knowledge about exercise induced asthma was categorized in moderate knowledge, with its mean of score 6.40 ± 1.51 of 10 scores (64.0%). Only 7.5% of teachers have good knowledge. Our results better than the studies done by Tse and by Kennet which found that knowledge of teachers about asthma and sport were 52% and 62%, respectively [8, 21]. Inadequate knowledge on asthma and sport may lead inappropriate advice to student having asthma for exercise management.

Some literatures commented about the factors associated with teachers' knowledge on asthma. Juhn Y. L et al [22] showed that gender, education level and age did not affect asthma knowledge. Ones U., et al [11] reported that the asthma knowledge level was not related to teachers' age, education level and length of tenure periods (teaching experience), location of primary school and country. But they found that gender was related to asthma knowledge. In our study, the asthma knowledge was not related to gender, race age, teaching experience, education level and status. These results showed that our study has similar result to previous study. One study in Bahraini showed that gender and status significantly related to asthma knowledge where single and women teachers have better knowledge than married and male [10]. This result showed a contra to our study result.
Our study identified that the asthma knowledge level was significant higher for the teachers' having asthma and teachers' who had contact with asthmatic individual (child and relative) or who had read a book or article about asthma. This result showed a similarity to previous study done by Getch & Neuharth-Pritchett that teachers' having asthma more knowledgeable about asthma and its management [12]. This phenomenon due to their own experience with asthma and they have received some information about their disease from medical professional. But, in our study showed that there were no significantly better knowledge on asthma for the teacher that had attended course or seminar asthma and teachers that have student with asthma in the class.

This study concluded that primary school teachers in Penang have moderate level of knowledge on asthma and its management. Teachers who have asthma or having child with asthma or have read about asthma generally have better knowledge on asthma and its management.

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AUTHORS' CONTRIBUTIONS

Authors contributed equally to all aspects of the study.

PEER REVIEW

Not commissioned; externally peer reviewed.

CONFLICTS OF INTEREST

The authors declare that they have no competing interests.