

ORIGINAL ARTICLE

**ANXIETY AND DEPRESSION AMONG
ASTHMATIC PATIENTS IN MALAYSIA**

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Abstract

Objective: Patients with bronchial asthma are at risk of mental disorders, particularly anxiety and depression. This study aimed to explore the factors associated with anxiety and depression among asthmatic patients. **Methods:** A cross-sectional study was conducted among 202 confirmed asthmatic patients from the chest clinic at the Medical Outpatient Department (MOPD) in a Malaysian public hospital. A self-administered questionnaire was used to collect information on the socio-demographic factors and clinical health information. The validated Hospital Anxiety and Depression Scale (HADS) were used to assess anxiety and depression. Descriptive statistics, t-test, ANOVA and multiple logistic regression analyses were conducted using SPSS software version 18. **Results:** Moderate anxiety and depressions were found in 24.3% and 21.3% of the patients respectively. Severe anxiety and depression were found in 4.4% and 3.5% of the patients respectively. Factors associated significantly with anxiety were patient's age and newly referred cases. Factors associated significantly with depression were patient's age, race, monthly household income, and employment status. **Conclusion:** Socio-demographic factors are important correlates of anxiety and depression among asthmatic patients. Early recognition of anxiety and depression symptoms is necessary to promote patient's adherence and compliance to asthma control. *ASEAN Journal of Psychiatry, Vol. 17 (1): January – June 2016: XX XX.*

Keywords: Anxiety, Bronchial Asthma, Depression, Malaysia, Mental Health, Psychology

Introduction

Bronchial asthma is one of the most frequently diagnosed medical conditions causing significant morbidity, mortality and rising

health care expenditure [1]. The Center for Disease Control (CDC) reported that 34 million people worldwide in 2007 were diagnosed with asthma [2], and this figure is projected to increase to over 300 million

across all ages by 2025 [3]. In Malaysia, an estimated 4.1% of adult population suffers from bronchial asthma [4].

Many observational studies have reported that asthma was associated with psychological conditions such as anxiety and depression. Pulmonary functionality is impaired during asthmatic attacks, thereby causing significant respiratory distress among patients [5, 6]. Intense fear, reduced productivity and quality of life due to frequent hospital walk-ins and dependency on the health care personnel pose significant psychological co-morbidities [e.g. anxiety and depression] among asthmatics [7, 8]. Clinical trials further documented the relationship between asthma and psychogenic factors [7, 8]. Anxiety is defined as an apprehensive anticipation of danger associated with an excessive feeling of dysphoria due to an illness or tension [9]; while depression is a condition which renders a person to feel discouraged, sad or uninterested in life [10]. Prevalence of anxiety and depression in asthmatics is higher due to dyspnea causing reduced effort intolerance, noncompliance to medications and cholinergic bronchospasm [1]. Almost 24% of adults exhibited anxiety due to asthma in Iran [11]. Comparatively, depression was reported in 40-80% of asthmatic patients in the United Kingdom [12]. The increased risk of psychological co-morbidities in asthmatics posed significant threat to patient adherence for asthma control [11]. This study was conducted to explore factors associated with anxiety and depression among asthmatic outpatients in Malaysia.

Methods

Ethical statement

This study complied with the guidelines in the Helsinki Declaration. The study protocol was approved by the Medical Research Ethics Committee (MREC), Ministry of Health Malaysia (NMRR-13-643-14711). Objectives and benefits of the study were explained to all the enrolled patients, and a written consent of participation was obtained from them. Patients were also assured of confidentiality, and that they would not be affected by the study outcomes.

Study setting and population

This cross-sectional study was conducted among asthmatic patients at the Medical Outpatient Department (MOPD) of Tengku Ampuan Rahimah Hospital (HTAR), Selangor, Malaysia. This study was part of a larger study that assessed patient's satisfaction in a Malaysian medical outpatient setting [13].

A total of 202 patients diagnosed with asthma, visiting the outpatient clinic in a government hospital were recruited for the study by using purposive sampling. Inclusion criteria for the study were; consecutive adult patients, aged > 18 years with diagnostic symptoms, consistency of asthma and documented findings of airflow limitation in spirometry with a significant response to bronchodilators resulting more than 12% increase of forced expiratory volume in one second (FEV1) over the past four weeks were recruited in this study [8, 14].

Study instruments

A self-administered questionnaire was used to collect data from the recruited participants. The socio-demographic data was collected using questions pertaining to gender, age, ethnicity, marital status, household income, employment status, education level and area of residence. A single question was used for assessing the overall health perception. Anxiety and depression were assessed using the validated Hospital Anxiety and Depression Scale (HADS) [15]. HADS is a widely used self-reported tool that screens psychiatric morbidity in various clinical settings, including asthmatic patients [8, 16]. It comprises of fourteen items, seven of which measures anxiety (HADS-A) and the remaining measure depression (HADS-D). These items are scored on a four-point likert scale ranging from 0-3 [not present to considerable]. Item scores were totaled to provide sub-scaled scores of anxiety and depression, ranged between 0-21. A higher score represents higher anxiety or depression. As suggested by Zigmond and Snaith, 1983, a score of 0-7 indicates mild or non-caseness, 8-10 indicate moderate or borderline caseness and ≥ 11 indicates caseness [15]. The questionnaire was administered in English.

Statistical analysis

Analysis was performed using Statistical Package of Social Sciences (SPSS®) (version 18.0, IBM, Armonk, NY). Descriptive analysis was performed for all variables in this study. Anxiety and depression scores were expressed as mean and standard deviations. Test of normality was performed for total anxiety and depression sub-scale scores. T-test and ANOVA were applied to compare anxiety and depression across socio-demographic variables. In case of ANOVA, post hoc test was applied. Multiple linear regression analysis using “Enter” technique was employed to obtain significant factors associated with anxiety and depression among asthmatic patients. The accepted level of significance was set below 0.05 ($p < 0.05$). Multi-collinearity was checked between independent variables.

Results

Socio-demographic factors and clinical health information

Two hundred and two asthmatic patients were included in this study. Of the total, 127 (62.9%) were males and 75 (37.1%) were females. The mean ($\pm$ SD) age of the patients was 41.4 ($\pm$ 20.5) years and majority (44.1%) were less than 30 years old. The ethnic distribution of the participants revealed that 60.4% of them were Chinese. Mild anxiety and depression were found in 71.3% and 75.2% of the patients respectively. Moderate anxiety and depression was found in 24.3% and 21.3% of the patients respectively. Severe anxiety and depressive symptoms were detected in 4.4% and 3.5% of the patients respectively. Other socio-demographic information is presented in Table 1.

Table 1. Socio-demographic factors and clinical health information (n=202)

Socio-demographics	N	Percentage [%]
Gender		
Male	127	62.9
Female	75	37.1
Age (years)		
< 30	89	44.1
30-49	61	30.2
$\geq$ 50	52	25.7
Ethnicity		
Malay	56	27.7
Indian	24	11.9
Chinese	122	60.4
Marital status		
Single	57	28.2
Married	145	71.8
Monthly household income (MYR)		
< 3000	25	12.4
$\geq$ 3000	177	87.6
Current employment status		
Employed	128	63.4
Unemployed	5	2.5
Student	40	19.8
Retired	29	14.4
Highest education level		
High school	82	40.6
Tertiary education	120	59.4
Residence		
Urban	164	81.2
Rural	38	18.8
Clinical Health Information		
Purpose of visit to clinic		
Follow-up treatment	170	84.2
Newly referred case	32	15.8
Overall health perception		

Very good	2	1.0
Good	165	81.7
Fair	32	15.8
Bad	3	1.5
Very bad	0	0
Mental health		
Anxiety		
Mild	144	71.3
Moderate	49	24.3
Severe	9	4.4
Depression		
Mild	152	75.2
Moderate	43	21.3
Severe	7	3.5

Association between anxiety and depression and patient socio-demographic factors and clinical health information

Table 2 shows the association between anxiety and depression with patient socio-demographic factors and clinical health information. There was a significant association between patient's anxiety and age ($p=0.003$); a post-hoc test revealed that patients aged 50 years or older had greater anxiety (7.7 ± 3.4) as compared to patients aged 30 years (6.4 ± 1.7 , $p=0.002$). There was a significant association between anxiety and employment status ($p=0.004$), post hoc tests showed that retired patients (8.2 ± 3.0) were more anxious as compared to employed patients (6.5 ± 1.8 , $p=0.002$). Regarding depression, there was a significant association between depression and patient's age

($p=0.005$); a post-hoc test revealed that patients aged 50 years or more exhibited higher depression scores (6.7 ± 3.1) in comparison to those aged less than 30 years (5.3 ± 2.2 , $p=0.004$). Significant associations were observed between depression and patient's ethnicity ($p<0.001$), post hoc tests showed that Indian patients exhibited higher depression (7.6 ± 2.7) in comparison to Chinese (5.3 ± 2.3 , $p<0.001$). Patients with a monthly household income of less than MYR3000 had higher depression score (8.2 ± 3.4) compared to those with higher income (5.5 ± 2.3 ; $p<0.001$). There was a significant association between depression and employment status ($p<0.001$), a post-hoc test found students (7.4 ± 3.1) to be more depressed than employed patients (5.3 ± 2.2 , $p<0.001$).

Table 2. Association between anxiety and depression with socio-demographic factors and health characteristics (n=202)

Characteristics	Anxiety		Depression	
	Mean (SD)	P-value	Mean (SD)	P-value
Gender				
Male	6.9 (2.5)		6.1 (2.8)	
Female	6.7 (1.8)	0.757	5.5 (2.3)	0.115
Age (years)				
< 30	6.4 (1.7)		5.3 (2.2)	
30-49	6.8 (1.5)		6.0 (2.5)	
≥ 50	7.7 (3.4)	0.003	6.7 (3.1)	0.005
Ethnicity				
Malay	6.8 (2.8)		6.2 (2.8)	
Indian	7.2 (2.5)		7.6 (2.7)	
Chinese	6.7 (2.0)	0.716	5.3 (2.3)	<0.001
Marital status				
Single	6.7 (2.3)		6.1 (2.6)	
Married	6.8 (2.2)	0.824	5.8 (2.6)	0.430

Monthly household income (MYR)				
< 3000	7.4 (4.3)		8.2 (3.4)	
≥ 3000	6.7 (1.9)	0.172	5.5 (2.3)	<0.001
Current employment status				
Employed	6.5 (1.8)		5.3 (2.2)	
Unemployed	7.0 (1.9)		5.8 (3.3)	
Student	6.8 (2.8)		7.4 (3.1)	
Retired	8.2 (3.0)	0.004	6.0 (2.5)	<0.001
Highest education level				
High school	7.1 (3.1)		6.1 (2.9)	
Tertiary education	6.6 (1.6)	0.203	5.7 (2.3)	0.232
Residence				
Urban	6.9 (2.3)		5.7 (2.6)	
Rural	6.4 (2.4)	0.215	6.4 (2.4)	0.180
Purpose of visit to clinic				
Follow-up treatment	6.9 (2.3)		5.8 (2.7)	
Newly referred case	6.1 (2.4)	0.065	5.9 (2.4)	0.848
Overall health perception				
Very good	9.0 (0.0)		4.5 (0.7)	
Good	6.7 (2.2)		5.8 (2.6)	
Fair	7.4 (2.8)		6.2 (2.7)	
Bad	6.3 (1.2)	0.200	5.0 (2.6)	0.707

Factors associated with anxiety among asthmatic patients by multiple linear regressions

The factors associated with anxiety among asthmatic patients are presented in Table 3. Patients aged ≥50 years had on the average 1.4

(95% CI 0.6-2.2) higher anxiety score in comparison to patients aged less than 30 years (p=0.001). Newly referred cases had on the average one unit (95% CI 0.2-1.9) lower anxiety score as compared to patients acquiring “follow-up” (p=0.021).

Table 3. Factors associated with anxiety among asthmatic patients by multiple linear regression (n=202)

Factors	B	SE	Beta	P-value	95% CI	
					Lower	Upper
Age (Years)						
< 30	Ref	Ref	Ref	Ref	Ref	Ref
30-49	0.6	0.4	0.1	0.151	-0.2	1.4
≥ 50	1.4	0.4	0.3	0.001	0.6	2.2
Monthly household income (MYR)						
< 3000	0.4	0.5	0.1	0.429	-0.6	1.5
≥ 3000	Ref	Ref	Ref	Ref	Ref	Ref
Current employment status						
Employed	Ref	Ref	Ref	Ref	Ref	Ref
Unemployed	-0.2	0.7	-0.1	0.782	-1.6	1.2
Student	0.5	1.0	0.1	0.667	-1.6	2.5
Retired	0.2	0.4	0.1	0.672	-0.7	1.1
Purpose of visit to clinic						
Follow-up treatment	Ref	Ref	Ref	Ref	Ref	Ref
Newly referred case	-1.0	0.4	-0.2	0.021	-1.9	-0.2

Table 4. Factors associated with depression among asthmatic patients by multiple linear regression (n=202)

Factors	B	SE	Beta	P-value	95% CI	
					Lower	Upper
Age (Years)						
< 30	Ref	Ref	Ref	Ref	Ref	Ref
30-49	1.3	0.4	0.2	0.001	0.5	2.1
≥ 50	1.2	0.4	0.2	0.003	0.4	2.1
Ethnicity						
Malay	0.6	0.4	0.1	0.094	-0.1	1.4
Indian	1.3	0.5	0.2	0.016	0.2	2.4
Chinese	Ref	Ref	Ref	Ref	Ref	Ref
Monthly household income (MYR)						
< 3000	1.6	0.5	0.2	0.005	0.5	2.6
≥ 3000	Ref	Ref	Ref	Ref	Ref	Ref
Current employment status						
Employed	Ref	Ref	Ref	Ref	Ref	Ref
Unemployed	0.6	0.7	0.1	0.391	-0.8	2.0
Student	-0.3	1.1	-0.1	0.769	-2.5	1.8
Retired	2.0	0.5	0.3	<0.001	1.1	2.9

Factors associated with depression among asthmatic patients by multiple linear regressions

Patients aged 30-49 years, and ≥50 years had on the average 1.3 (95% CI 0.5-2.1) and 1.2 (95% CI 0.4-2.1) higher depression score respectively, as compared to patients aged less than 30 years (p=0.001, p=0.003). Indian patients had on the average 1.3 (95% CI 0.2-2.4) higher depression score as compared to Chinese (p=0.016). Patients with a monthly household income of less than MYR3000 had an average 1.6 (95% CI 0.5-2.6) higher depression score as compared to those with higher income (p=0.005). Retired patients had on the average 2.0 (95% CI 1.1-2.9) higher depression score in comparison to employed patients (p<0.001) (Table 4).

Discussion

Core summary findings

This study aimed to explore the factors associated with anxiety and depression among asthmatic outpatients. Of the 202 outpatients surveyed, only few patients had severe anxiety and depression respectively. The present findings were encouraging when compared to other studies, which reported higher prevalence of depression among asthmatics [11, 14, 17]. In the final model, age and

purpose of clinic visits were significantly associated with anxiety, while factors that significantly contributed to depression among asthmatics were age, ethnicity, household income and employment status.

Comparison with existing literature

Uncontrolled asthma triggering acute asthmatic attacks entails frequent hospital dependency, supplementary oxygenation and nebulizer administration for symptomatic reliefs [5]. This temporary reversible airway obstructive disease cause sudden onset of chest tightness and dyspnea as a consequence of an asthmatic insult, triggering severe psychogenic symptoms like anxiety due to fear of its severity and complications [1, 17, 18]. In this study, anxiety significantly increases by age, which is consistent with the findings in a similar population in the United Kingdom [19]. A significantly higher anxiety level among asthmatic patients attending chest clinic services as a “newly referred case” was also observed.

A population with poor socio-economic status has a higher risk of developing psychiatric disorders [20] The main result in our study was that depression was significantly higher among retirees and patients with low household income level. Similar findings were also found among asthmatics from different populations

[21, 22]. Reduced affordability and the requirement for long term pharmacotherapy in asthma control posed significant barriers towards patient adherence, prompting serious psychological repercussions like depression [23].

This study also found significant associations between patient's age and psychological depression. Similar associations were found by Bonsignore et al. (2001) [24]. Mullin et al. (2000) described that the level of depression among asthmatics was related to level of illness uncertainty due to the fact that older population may feel more uncertain about asthma control [25]. This study found significant associations between ethnicity and depression among asthmatics.

Study limitations

The cross-sectional nature of this study could not establish the causal relationships between variables. Further exploration is required through prospective and meta-analysis studies. The sample surveyed from a single-center may have possible selection bias, thus future studies are recommended to recruit a larger sample size. The duration of asthma needs to be captured, to explore the association between age and duration of illness. Use of beta-blockers, which may cause anxiety-like symptoms in some cases, was not investigated in this study.

Conclusion

This study found that age and purpose of clinic visits were significantly associated with anxiety. On the other hand, depression was significantly associated with age, ethnicity, household income and employment status. Early recognition of anxiety and depression symptoms through self-reported screening tools and physician assessment are necessary to promote patients adherence and compliance to asthma control, thus preventing psychogenic episodes of acute asthma exacerbations.

Conflict of interests

The authors declare that they have no conflicts of interest in relation to this article.

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