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Research Article

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Prevalence of Depression among Asthmatic Patients in Pakistan: Challenges for Integrated Team Care

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ABSTRACT

Asthma is associated with various psychological symptoms leading to decrease in compliance of patient. Asthmatic patients who reported depression had more respiratory problems. Depression is known to have poor effects on the cognitive behavior, motivation and energy. Objective: The present study was designed to assess depression among asthmatic patients in twin cities of Pakistan.Methodology: A descriptive cross-sectional study design was used. A pre-validated tool PHQ-9 was self-administered to a sample of 382 asthmatic patients treated in public and private healthcare facilities in two cities of Pakistan. After data collection, data was cleaned coded and entered in SPSS version 21.0. Descriptive statistics comprising of frequency and percentages was calculated. The non-parametric tests including Mann-Whitney and Kruskal-Walis ($p \geq 0.05$) were performed to find out the difference among different variables. Results: The results of the current study reported moderate depression among asthmatic patients. A significant difference ($p \leq 0.05$) in age, marital status, qualification, job satisfaction and monthly income was observed among asthmatic patients. The results highlighted that depression was the highest in adult patients aged >50years (16.96, ± 8.02) while the lowest was seen in patients aged between 18-30 years (11.39, ±6.59). The mean scores highlighted that those patients who were highly qualified (10.12, ± 6.65) had the lowest depression while illiterate patients had the highest depression level (16.59, ±8.64). Conclusion: The results of the present study concluded moderate depression among asthmatic patients in Pakistan. Focused psychosocial interventions by healthcare personnel for asthmatic patients as well as their caregivers are required. Evidence has proved that exercise and life style modification can improve depression, HRQOL and pulmonary function in patients with moderate and severe bronchial asthma. There is dire need for inclusion of pulmonary rehabilitation programs in asthma treatment protocols by healthcare professionals.

Keywords*: Bronchial Asthma, depression, PHQ-9, psychotherapy, chronic diseases, Pakistan*

INTRODUCTION

Psychological factors are now considered as important determinants of general health. An important mental health disorder i.e. depression usually occurs as a comorbidity with chronic diseases such as asthma, cancer and epilepsy [1]. Chronic diseases and depression have additive poor effects on the patient's health and functional status [2,3]. The relationship between asthma and depression is known for centuries [4]. Asthma is long been known as 'psychosomatic disease', and during the 1930's to 1950's era, it was one of the 'holy seven psychosomatic illnesses'

[5]. The prevalence of depression among asthmatic patients has been reported nearly 1% to 45% of the total asthmatic patients [6-13]. The relationship between asthma and depression is complex and controversial. Some researchers state that depression develops as a result of asthma, while other state common physiological etiologies [14-15]. Despite of the unclear association between asthma and depression, patients who suffer from asthma and depression both have worse outcomes, as measured by conventional means, such as need for more therapy and mortality [14, 16]. Asthma patients who suffer from depression report more respiratory problems [14, 16, 17]. Depression is known to have poor effects on the cognitive behaviour, motivation and energy, and has been highlighted as one of the factors that is responsible for lowering effectiveness of compliance and asthma self-management. Furthermore, a meta analysis reported that patients who were suffering from chronic diseases and depression exists as a co morbidity were three times more likely to be noncompliant to treatment than those who were not depressed [18]. Pakistan has the 6th largest population in the world and approximately more than 20 million Pakistanis suffer from asthma exacerbation. Nearly 15% of the patients in Pakistan with respiratory issues have also been reported with depression [19]. Limited studies have been conducted on assessment of depression in asthmatic patients in Pakistan. Therefore, this study was designed to assess depression among asthmatic patients in twin cities of Pakistan.

METHODOLOGY

A descriptive cross-sectional study design was used to assess the depression among asthmatic patients in Pakistan. National bioethical committee is present for this type of research and it states that only institutional head approval is required for this type of study (20). Moreover, in Pakistan, questionnaire-based studies do not need any endorsement from Ministry of Health. Despite that, prior information was sent to the Ministry of Health, Government of Pakistan for the execution of this research. For data collection, approval from MS of the hospitals was taken. Informed and verbal consent for participation was also taken from the respondents. Respondents were ensured for the confidentiality of information verbally as well as confidentiality under taking was signed by the principal investigator. Study site for this research was out-patients' departments located in public and private healthcare facilities treating asthma in twin cities of Pakistan. The sampling frame comprised of asthmatic patients treated in public and private healthcare facilities in two cities of Pakistan. Patients suffering from bronchial asthma, aged 18 years or above, smokers and non-smokers and patients of any disease such as hypertension, diabetes or any other disease that has no remarkable effect on the asthmatic condition were included in the study. Patients aged less than 18 years and with any co morbidity that interferes or worsens the condition of asthmatic patients such as pneumonia, lungs cancer and patients were excluded from this study.

Sample Size and Sampling Procedure

Calculation of sample size was performed by using Rao soft sample size calculator to determine the size of sample representing the population of asthmatic patients. Sample size was calculated as 382 to achieve 95% confidence interval with 5% margin of error. As no list of asthmatic patients was available, convenience sampling technique was used to select the respondents. According to convenience sampling, all the respondents that were available at time of data collection were selected.

Data Collection Tool

Data collection tool used in this study was Patient Health Questionnaire (PHQ-9). Written permission had been obtained from Pfizer Inc. for using PHQ-9. The tool was slightly modified according to study objectives and socio demographics of our country. Respondent was greeted and evaluated. If the respondent did not read English or was bilingual, approved language version to use was determined or interviewer administration was used. If visual problems existed, a large-font form was administered or interviewer administration was used. The survey was introduced. Survey form was given to the respondent. Respondent was instructed on how to fill out the form. Any respondent questions were answered before, during or after the administration. Form was retrieved upon completion and checked for completeness before the respondent left. Finally, respondent was thanked for completing the form.

Scoring of the Tool

If there were at least 4 3s in the shaded section (including Questions #1 and #2), a depressive disorder was considered. Score was added to determine severity. Major Depressive Disorder was considered if there were at least 5 3s in the shaded section (one of which corresponds to Question #1 or #2). Other Depressive Disorders were considered if there were 2-4 3s in the shaded section (one of which corresponds to Question #1 or #2). Column scores were added to get a total score and results were interpreted from PHQ-9 scoring box.

Reliability and Validity of Tool

PHQ-9 is a pre-validated tool but still two focus group discussions had been conducted at different time intervals with experts from hospitals, academia, regulatory and pharmaceutical industries for face and content validation of the tool. Beside this, pilot testing had been conducted at 10 % of the sample size to test the reliability of the tool after data collection. The value of Cronbach's alpha was 0.918 for PHQ-9, which was satisfactory considering that 0.68 is the cutoff value being disapproved.

Data Collection and Analysis

Data was collected by the principal investigator. The respondents were identified and after obtaining written/ verbal consent from them, the questionnaire was hand delivered to them. The questionnaire was collected back on the same day to avoid study biasness. After data collection, data was cleaned coded and entered in SPSS version 21.0. Skewness test was performed and histograms with normal curves were used to check the normal distribution of data. Descriptive statistics comprising of frequency and percentages was calculated. The non-parametric tests including Mann-Whitney and Kruskal-Wallis ($p \geq 0.05$) were performed to find out the difference among different variables.

RESULTS

Demographic Characteristics

Out of 382 respondents, 51.8% (n=198) were male while 48.2% (n=184) were female. Seven percent of the respondents were undergoing treatment from private sector health care facilities while 92.4% (n=353) from public sector health care facilities. Of the total respondents, 8.1% (n=31) had duration of illness <1Y, 13.9% (n=53) had duration of illness of 1.1-2Y, 17.0% (n=65) had duration of illness of 2.1-3Y, 23.3% (n=89) had duration of illness of 3.1-5Y, 8.4% (n=32) had duration of illness of 5.1-10Y while 29.3% (n=112) had a duration of greater than 10Y. Regarding their treatment phase 13.4% (n=51) were undergoing baseline treatment, 33.5% (n=128) were undergoing initial treatment and 53.14% (n=203) were undergoing continuation phase. A detailed description is given (Table 1).

Table 1 Demographic Characteristics

Indicators		Frequency (%)
Age	18-30Y	90 (23.6)
	31-40Y	71 (18.6)
	41-50Y	80 (20.9)
	>50Y	141 (36.9)
Gender	Male	198 (51.8)
	Female	184 (48.2)
Marital status	Married	216 (56.5)

	Unmarried	94 (24.6)
	Divorced	38 (9.9)
	Widowed	34 (8.9)
Qualification	Illiterate	117 (30.6)
	Primary	93 (24.3)
	Matriculation	62 (16.2)
	Intermediate	34 (8.9)
	Bachelors	47 (12.3)
	Masters	26 (6.8)
	Ph.D.	3 (0.8)
Job status	Employed	157 (41.09)
	Unemployed	104 (27.2)
	House keeper	89 (23.3)
	Retired	32 (8.4)
City	Rawalpindi	233 (60.9)
	Islamabad	149 (39.1)
Cigarette smoking	Yes	104 (27.2)
	No	278 (72.8)
Salary	<Rs. 10,000	169 (44.2)
	Rs. 10,000-20,000	133 (34.8)
	Rs. 21,000-35,000	45 (11.8)
	Rs. 36,000-50,000	15 (3.9)
	>Rs. 50,000	20 (5.23)
Sector of treatment	Public	353 (92.40)
	Private	29 (7.6)
Duration of illness	<1 Y	31 (8.1)
	1.1-2 Y	53 (13.9)
	2.1-3 Y	65 (17.0)
	3.1-5 Y	89 (23.3)
	5.1-10 Y	32 (8.4)
	>10Y	112 (29.3)

Treatment phase	Baseline	51 (13.4)
	Initial phase	128 (33.5)
	Continuation phase	203 (53.14)
Family history	Yes	206 (54)
	No	176 (46)
Co morbidity	Yes	257 (67.28)
	No	125 (32.72)
Medicines were purchased	Yes	272 (71.2)
	No	110 (28.8)
Medicines were provided	Yes	312 (81.7)
	No	70 (18.3)

Assessment of Depression among Asthmatic Patients

The results highlighted that most of the respondents were of the view that several days, they felt little interest or pleasure in doing things (n=178, 46.6%), felt down, depressed or hopeless (n=179, 46.9%), had trouble falling asleep, staying asleep or sleeping too much (n=159, 41.6%), felt tired or having little energy (40.6%) n=155, had poor appetite or overeating (n=128, 33.5%), felt bad about themselves- or that they had a failure or had let themselves or their family down (n=135, 35.3%), had trouble concentrating n things, such as reading the newspaper or watching television (n=136, 35.6%), moving or speaking so slowly that other people could have noticed or, the opposite- being so fidgety or restless that you have been moving around a lot more than usual (n=143, 37.4%), had thoughts that you would be better off dead or of hurting yourself in some way (n=112, 29.3%).While majority of the respondents (n=158 , 41.4%) stated that if they checked off any problems it is somehow difficult to do their work, take care of things at home, or get along with other people. A detailed description is given in (Table 2).

Table 2 Assessment of Depression among Asthmatic Patients

Indicators		**n (%)**
Little interest or pleasure in doing things	Not at all	90 (23.6)
	Several days	178 (46.6)
	More than half the days	55 (14.4)
	Nearly every day	59 (15.4)
Feeling down, depressed or hopeless	Not at all	53 (13.9)
	Several days	179 (46.9)
	More than half the days	85 (22.3)
	Nearly every day	65 (17)

Trouble falling asleep, staying asleep or sleeping too much	Not at all	55 (14.4)
	Several days	159 (41.6)
	More than half the days	91 (23.8)
	Nearly every day	77 (20.2)
Feeling tired or having little energy	Not at all	40 (10.5)
	Several days	155 (40.6)
	More than half the days	110 (28.8)
	Nearly every day	77 (20.2)
Poor appetite or overeating	Not at all	71 (18.6)
	Several days	128 (33.5)
	More than half the days	101 (26.4)
	Nearly every day	82 (21.5)
Feeling bad about yourself- or that you are a failure or have let yourself or your family down	Not at all	77 (20.2)
	Several days	135 (35.3)
	More than half the days	91 (23.8)
	Nearly every day	79 (20.7)
Trouble concentrating n things, such as reading the newspaper or watching television	Not at all	86 (22.5)
	Several days	136 (35.6)
	More than half the days	81 (21.2)
	Nearly every day	79 (20.7)
Moving or speaking so slowly that other people could have noticed OR, the opposite- being so fidgety or restless that you have been moving around a lot more than usual	Not at all	80 (20.9)
	Several days	143 (37.4)
	More than half the days	78 (20.4)
	Nearly every day	81 (21.2)
Thoughts that you would be better off dead or of hurting yourself in someway	Not at all	104 (27.2)
	Several days	112 (29.3)
	More than half the days	85 (22.3)
	Nearly every day	81 (21.2)
If you checked off any problems, how difficult have those problems made it for you to, Do your work, take care of things at home, or get along with other people?	Not difficult at all	34 (8.9)
	Somewhat difficult	158 (41.4)

	Very difficult	130 (34)
	Extremely difficult	60 (15.7)

Comparison of Depression in Asthma by Demographic Characters

A significant difference ($p \geq 0.05$) in age, marital status, qualification, job satisfaction and monthly income was observed among asthmatic patients. However, no significant difference ($p \geq 0.05$) was seen in terms of gender and cigarette smoking status. A detailed description is given in (Table 3).

Table 3 Comparison of Depression in Asthma by Demographic Characters

Indicators	**Depression**			
	n	**Mean ranks**	**Test statistics**	**p-value**
Age				
18-30 years	90	147.66	31.693 [b]	**0.021**
31-40 years	71	168.08		
41-50 years	80	201.09		
>50 years	141	225.84		
Gender				
Male	198	182.87	2.516 [a]	.113
Female	184	200.79		
Marital status				
Married	216	184.92	22.766 [b]	**0.002**
Un-married	94	168.86		
Divorced	38	217.30		
Widowed	34	267.06		
Qualification				
Illiterate	117	218.52	16.064 [b]	**0.013**
Primary	93	181.49		
Matriculation	62	192.22		
Intermediate	34	180.00		
Bachelors	47	186.53		
Masters	26	132.52		
Ph.D.	3	152.50		
Job status				
Employed	157	164.93	16.109 [b]	**0.001**
Un-employed	104	210.27		
House keeper	89	205.03		
Retired	32	223.20		
Cigarette smoking				
Yes	104	208.81	3.521 [a]	0.061
No	278	185.02		
Monthly income				
>10,000	169	208.47	19.673[b]	**0.006**
10,000-20,000	133	185.53		
21,000-35,000	45	200.79		
36,000-50,000	15	133.50		
>50,000	20	110.40		

Mann-Whitney[a];Kruskal Wallis Test[b] ($p \leq 0.05$)

DISCUSSION

Depression is a common psychological issue associated with asthma which leads to poor quality of life. The results of the present study reported moderate depression among asthmatic patients in twin cities of Pakistan. Depression is commonly reported in elderly patients having asthma along with other respiratory symptoms. The results of the current study highlighted moderately severe depression among asthmatic patients aged greater than 50 years and moderate depression was observed among patients aged 18-30 years. Result of the present study is in line with the study conducted in Norway which also reported increased depression with increasing age [21]. Furthermore, the findings of the current study revealed that female asthmatic patients were more likely to suffer from depression as compared to the opposite gender. A study conducted in USA also reported similar findings where psychological health was more deteriorated in females as compared to their male counterparts [22]. The present study reported moderate depression among widowed while relatively better psychological health was seen among unmarried respondent. Similar results were reported in Australia where married women were less depressed while separated and divorced were highly depressed [23]. The results of the present study revealed that depression was more prevalent among illiterate patients and was the lowest among individuals possessing master's qualification. A study conducted in USA reported that literacy can improve the depression status of individuals and patients with lower literacy level have greater depression [24].

Employment status has a direct impact on depression scale, the results of the current study showed patients who were employed were less depressed as compared to retired patients. In USA, it was also reported that retirement and depression are significantly associated [25]. Cigarette smoking seems to worsen respiratory diseases as smoking aggravates the condition. The results of the present study highlighted moderate depression among asthmatic patients who were smokers as compared to non-smokers. Results of the study are in line with the results of another study conducted in Korea which states that smoking status is strongly associated with depression and non-smokers are less depressed as compared to smokers [26]. The results of the present study highlighted that patients who had monthly income greater than 50,000 rupees were less depressed as compared to other groups. Similar findings were reported in USA which states that poorer the socioeconomic status of individuals, greater the depression [27].

CONCLUSION

The results of the present study concluded moderate depression among asthmatic patients in Pakistan. Depression was observed in females, elderly, widowed, illiterate, smokers, retired and patients with poor socio economic status and in continuous phase of treatment. Focused psychosocial interventions by healthcare personnel for asthmatic patients as well as their caregivers are required. Evidence has proved that exercise and life style modification can improve depression, HRQOL and pulmonary function in patients with moderate and severe bronchial asthma. Therefore, prescription including exercise should be integrated as an essential treatment for asthmatic patients. Thus, all healthcare professionals must collaborate for inclusion of pulmonary rehabilitation programs in asthma treatment protocols for appropriate control and management of asthma.

REFERENCES

1. Ettinger, A., M. Reed, and J. Cramer, Depression and comorbidity in community-based patients with epilepsy or asthma. Neurology, 2004. 63(6): p. 1008-1014.
2. Boran, P., et al., Assessment of quality of life in asthmatic Turkish children. The Turkish journal of pediatrics, 2008. 50(1): p. 18.
3. Weinmayr, G., et al., Atopic sensitization and the international variation of asthma symptom prevalence in children. American journal of respiratory and critical care medicine, 2007. 176(6): p. 565-574
4. Rosenzweig, J.R.C., et al., The relationship between health-related quality of life, lung function and daily symptoms in patients with persistent asthma. Respiratory medicine, 2004. 98(12): p. 1157-1165.
5. Riekert, K.A., et al., The association between depression, lung function, and health-related quality of life among adults with cystic fibrosis. Chest, 2007. 132(1): p. 231-237.
6. Strine, T.W., et al., Impact of depression and anxiety on quality of life, health behaviors, and asthma control among adults in the United States with asthma, 2006. Journal of Asthma, 2008. 45(2): p. 123-133.
7. Mancuso, C.A., M.G. Peterson, and M.E. Charlson, Effects of depressive symptoms on health-related quality of life in asthma patients. Journal of general internal medicine, 2000. 15(5): p. 301-310.

8. Sundberg, R., et al., Health-related quality of life in young adults with asthma. Respiratory medicine, 2009. 103(10): p. 1580-1585.
9. Vollmer, W.M., et al., Association of asthma control with health care utilization and quality of life. American Journal of Respiratory and Critical Care Medicine, 1999. 160(5): p. 1647-1652.
10. Jenkins, C., et al., Traditional and patient-centred outcomes with three classes of asthma medication. European Respiratory Journal, 2005. 26(1): p. 36-44.
11. Rand, C.S. and A.M. Butz, Psychosocial factors in chronic asthma. LUNG BIOLOGY IN HEALTH AND DISEASE, 1999. 138: p. 181-218.
12. Chen, H., et al., Asthma control, severity, and quality of life: quantifying the effect of uncontrolled disease. Journal of Allergy and Clinical Immunology, 2007. 120(2): p. 396-402.
13. Bellia, V., N. Scichilone, and S. Battaglia, Asthma in the elderly. EurRespir Mon, 2009. 43: p. 56-76.
14. Thompson, W.L. and T.L. Thompson, Treating depression in asthmatic patients. Psychosomatics, 1984. 25(11): p. 809-812.
15. Allen, G., et al., Impaired voluntary drive to breathe: a possible link between depression and unexplained ventilatory failure in asthmatic patients. Thorax, 1994. 49(9): p. 881-884.
16. Strunk, R.C., et al., Physiologic and psychological characteristics associated with deaths due to asthma in childhood: a case-controlled study. Jama, 1985. 254(9): p. 1193-1198.
17. Yellowlees, P.M. and R. Ruffin, Psychological defenses and coping styles in patients following a life-threatening attack of asthma. Chest, 1989. 95(6): p. 1298-1303.
18. Lehrer, P., et al., Psychological aspects of asthma. Journal of consulting and clinical psychology, 2002. 70(3): p. 691.
19. Motiani, B., F.R. Haidri, and N. Rizvi, Frequency of depression in Chronic Obstructive Pulmonary Disease (COPD) patients. Pakistan Journal of Medical Sciences, 2011.27(5).
20. NBC. NBC-ERC guidelines (2004). [cited 2017 5th January]; Available from: http://nbcpakistan.org.pk/guidelines.html.
21. Stordal, E., A. Mykletun, and A. Dahl, The association between age and depression in the general population: a multivariate examination. ActaPsychiatricaScandinavica, 2003. 107(2): p. 132-141.
22. Kornstein, S.G., et al., Gender differences in chronic major and double depression. Journal of Affective disorders, 2000. 60(1): p. 1-11.
23. ABS 2006. Australian Bureau of Statistics [ONLINE]. Available: http://www.abs.gov.au. [Accessed: 6th august 2017].
24. Francis, L., et al., Does literacy education improve symptoms of depression and self-efficacy in individuals with low literacy and depressive symptoms? A preliminary investigation. The Journal of the American Board of Family Medicine, 2007. 20(1): p. 23-27.
25. Doshi, J.A., L. Cen, and D. Polsky, Depression and Retirement in Late Middle-Aged US Workers. Health services research, 2008. 43(2): p. 693-713.
26. Yun, W.-J., et al., Association of smoking status, cumulative smoking, duration of smoking cessation, age of starting smoking, and depression in Korean adults. BMC public health, 2012. 12(1): p. 724.
27. Hudson, C.G., Socioeconomic status and mental illness: tests of the social causation and selection hypotheses. American journal of Orthopsychiatry, 2005. 75(1): p. 3.