

Relationship between Medication Adherence, Self-consciousness, and Asthma Control and Severity among Patients with Asthma

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Abstract: controlling asthma severity and exacerbations among patients with asthma is very important. Adherence to therapy and self-consciousness factors could be responsible for this issue. Suboptimal adherence to asthma therapy is a major contributor to poor asthma outcomes. Self-conscious emotions can also prevent healing from traumatic events. People may delay or avoid medical care if they feel certain self-conscious emotions. Aim of the study: to determine the relationship between medication adherence, self-consciousness, and asthma control and severity among patients with asthma. Design: A descriptive correlational design was utilized. Setting: Outpatient Clinic of Chest Diseases, Main University Hospital, Alexandria, Egypt. Subjects: These comprised 90 patients with asthma attending the pre-mentioned health setting. Tools: Socio demographic characteristics and clinical data structured interview schedule, Modified Morisky Medication Adherence Scale, Assessment of Asthma Control and Severity scale, The Self-consciousness Scale. Results: 37.8% of the studied patients were medium adherents, while one third were low adherents, the majority of the studied patients had not controlled asthma, while the rest had a reasonably controlled asthma, the majority of patients had medium and simple continuous degrees of asthma severity, and they had low levels of self-consciousness as well as low levels of its subscales, there is no statistically significant relationship between degree of asthma severity and level of medication adherence; as well as between level of medication adherence and level of asthma control. There is a statistically significant negative relationship between degree of asthma severity and level of asthma control; as well as between degree of asthma severity and level of self-consciousness among patients with asthma. Conclusion: patients with asthma are medium and low adherents to medication, their asthma is not controlled and they had medium and simple degrees of asthma severity. Regardless of their illness, they had low levels of self-consciousness; as well as its subscales. High levels of asthma control and self-consciousness result in decrease severity of asthma. Patients having an increase in self-consciousness have increase degrees of medication adherence as well as asthma control. Recommendations: Developing educational programs to promote medication adherence and self-management among patients with asthma, developing psycho-educational intervention programs that scope and address self-conscious emotions and investigate their effects on medication adherence among patients with asthma in Egypt, nurses and other health care professionals should make great emphasis on psychological, as well as physical aspects of patients with asthma as important factors that enhance medication adherence.

Keywords: Asthma control, Asthma severity, Medication adherence, Self-consciousness.

1. INTRODUCTION

Asthma is a common and potentially serious chronic disease that imposes a substantial burden on patients, their families, and their communities. It affects an estimated 300 million individuals worldwide. It is a global health problem affecting all age groups, with increasing prevalence in many developing countries. Asthma may be crucial if the patient is not able to judge the severity of his/her disease or symptoms or does not know the proper way to managing their symptoms⁽¹⁻³⁾.

Management of asthma becomes suboptimal due to poor adherence to evidence-based guidelines. Non adherence to therapeutic regimens is a constant challenge to nurses and other health professionals. Understanding the benefits of adherence and the risks of non-adherence will increase patients' motivation and confidence and improve their self-management practices and control of asthma ⁽⁴⁾. Asthma control is defined as "the extent to which the various manifestations of asthma have been reduced or removed by treatment". This includes two components including the level of clinical asthma control and the risk of future adverse events. The level of clinical asthma control is gauged from features such as symptoms and the extent to which the patient can carry out activities of daily living and achieve optimum quality of life. The second component is risk of future adverse events including loss of control, exacerbations, accelerated decline in lung function, and side-effects of treatment. On the other side, the difficulty in controlling asthma with treatment will increase its severity. After exclusion of modifiable factors such as poor adherence, smoking, and comorbidities, asthma severity largely reflects the required level of asthma control, which may vary depending on the underlying phenotype, environmental factors, and comorbidities ^(5, 6).

Moreover, the effect of medication depends on its efficacy and the patient's adherence to the intended regimen. Adherence to a medication regimen is generally defined as "the extent to which patients take medications as prescribed by their health care providers". Medication adherence is essential for attaining maximum therapeutic benefits. It is one of the pillars for proper asthma management and control. Medication adherence is affected by patients' knowledge about their medications, dose and methods of administration, duration of treatment and dangers of under-use or over-use of their medication. In asthma, adherence to treatment tends to be poor, with rates of less than 50% in children and from 30 to 70% in adults; depending on country, age, sex and ethnicity. Non-adherence to asthma treatment leads to increased emergency care and mortality ^(1, 2). It attenuates optimum clinical benefits and therefore reduces the overall effectiveness of health systems. It is estimated that in developed countries, only 50% of patients who suffer from chronic diseases adhere to treatment recommendations ⁽⁷⁾.

Another important factor that may present significant barriers to adherence and can affect control and severity of asthma, number of its exacerbations and the therapeutic outcomes of patients is self-consciousness. Self-consciousness is the awareness that one exists as an individual being. It is a heightened sense of self-awareness, the preoccupation with oneself, as opposed to the philosophical state of self-awareness ⁽⁸⁾. When speaking of a trait, psychologists use the term self-consciousness, which they distinguish from self-awareness, the term reserved for a state ⁽⁹⁾. However, these phenomena are connected, and individuals high in self-consciousness tend to be more prone to the activation of self-awareness, though the two terms are commonly used interchangeably or synonymously. Self-consciousness and self-awareness are sometimes healthy signs of emotional maturity ⁽¹⁰⁾.

Being self-conscious goes beyond just being aware of oneself, self-conscious emotions are those affected by how persons see themselves and how they constantly thinking about how they appear to others and what others think of or perceive them ⁽¹¹⁾. Psychologists frequently distinguish between two basic forms of self-consciousness, which stem from the fact that persons can perceive themselves from two perspectives: their own and that of others. The first form called private self-consciousness which is the tendency to introspect and examine one's inner self and feelings. It involves a focus on personal self-beliefs and a preoccupation with the inner world of feelings and thoughts which enhances insight and increases the degree to which one is guided by personal standards. The other form is called public self-consciousness, which is an awareness of the self as it is viewed by others. It can be understood as person's general awareness of him/herself as a social individual /object which has an effect on others. It involves the focus on those aspects of the self that are shown to others and on external standards. This kind of self-consciousness can result in self-monitoring and social anxiety ⁽¹²⁻¹⁴⁾.

An unpleasant feeling of self-consciousness may occur when one realizes that one is being watched or observed, the feeling that "everyone is looking" at oneself. When feeling self-conscious, one becomes aware of even the smallest of one's own actions. Such awareness can impair one's ability to perform complex actions. Self-consciousness often stems from persons' worry that others will confirm their negative self-talk or fixate on those things about which they feel insecure. These feelings are sometimes associated with shyness and embarrassment in which case a lack of pride and low self-esteem can result ⁽¹⁵⁾. Having self-conscious emotions in moderate amounts is healthy. Excessive self-conscious emotions can be extremely unhealthy. Unhealthy and overwhelming self-consciousness can result in social anxiety. This can lead to isolation, which in turn increases the social anxiety further ⁽¹⁶⁾.

For a person who is self-conscious, the focus of attention gets “stuck” on him/herself, i.e. self-consciousness mode. Unlike most other people, whose focus is outward, for the self-conscious persons their focus is inward. Being self-conscious makes it harder for the person to be aware of what is going on around him /her. This can cause the person to think that other people are judging him /her negatively; in reality, they likely aren't paying attention at all. Psychologists have given a name to this phenomenon: the "spotlight" effect, in which people believe they are the center of attention. They feel too concerned about what others are thinking or might think of their actions and initiate the behavior of self-sabotage^(13,14).

Self-conscious is used to describe someone who is ill, at ease, or uncomfortable with himself. Being excessively conscious of one's appearance or manner, can be a problem at times. It can cause severe stress which can cause negative health consequences. It can affect individual's immune system and consequently affects asthma control and severity. Self-conscious emotions can also prevent healing from traumatic events. People may avoid medical care if they feel certain self-conscious emotions. These emotions can cause people to delay or avoid getting the treatment they need^(11, 15).

Patients with asthma should be made aware about the positive attitude towards treatment, which is needed for proper disease management. So, understanding the relation between medication adherence practice and self-consciousness is crucial for patients' improvement and wellbeing as well as for preventing them from complications. Therefore, this study aims to determine the relation between medication adherence, self-consciousness, and asthma control and severity among patients with asthma.

2. MATERIALS AND METHOD

MATERIALS

Research questions: What are the levels of medication adherence and self-consciousness among patients with asthma? What are the relation between medication adherence, self-consciousness, and asthma control and severity among patients with asthma?

Design: A descriptive correlational design was utilized for this study.

Settings: This study was conducted at Outpatient Clinic of Chest Diseases of Main University Hospital, Alexandria, Egypt.

Subjects:

The Epi info program was used to estimate the sample size based on using 5% acceptable error, 95% confidence coefficient, 50% expected frequency and population size of 90 patients over 3 months. The program revealed that a minimum sample size was 88. Accordingly, a convenient sample of 90 patients was included in the present study.

The inclusion criteria of the study were patients with asthma, both males and females, above 20 years of age, are taking an asthma treatment for at least two weeks.

Tools: Data of the present study was collected using the following tools:

Tool I: Socio demographic characteristics and clinical data structured interview schedule:

It includes questions to obtain baseline data about the studied patients. It consisted of two parts:

A: Socio demographic characteristics: as age, sex, and marital status, level of education, residence and occupation.

B: Clinical data: as smoking habits, duration of illness, previously taken medication, currently taking medication, and previous hospitalization.

Tool II: Modified Morisky Medication Adherence Scale (MMS):

This tool was developed by Morisky (2008) to determine medication adherence in asthmatic patients⁽¹⁷⁾. It consists of 7 items in which patient was asked and the researchers circle the corresponding “yes” or “no” response for each question (no=0, and yes=1). The Modified Morisky scale yields a total score with a range of 0–7, with higher scores indicating higher adherence to medication. The total score of the scale is categorized as: low compliers (<6), medium compliers (=6) and high compliers (=7).

Tool III: Assessment of Asthma Control and Severity scale:

This tool is used to assess the extent to which asthmatic patients control their disease and to assess asthma severity. It consists of two parts as follows:

Part I: Asthma Control Test (ACT):

This test was developed by Nathan *et al* (2004) to assess asthma control⁽¹⁸⁾. It consists of 5 items that assess the frequency of shortness of breath, general asthma symptoms, use of rescue medications, and overall self-assessment of asthma control. Each item was scored from one "poor control" to five "good control" and the scores were added to give a total score that ranges from 5 to 25, with a score less than 20 indicating "Off target" asthma appears not controlled, from 20-24 indicating "On target" asthma appears to be reasonably controlled, and 25 indicating "Well done" asthma appears to be well controlled.

Part II: Assessment of Asthma severity:

This part was developed by Global Initiative for Asthma (GINA) (2015)⁽¹⁹⁾. It is used to assess severity of asthma based on three categories: frequency of asthma symptoms per day, frequency of asthma symptoms per night and pulmonary function test results (PEF: Peak Expiratory Flow and FEV1: Forced Expiratory Volume in the first second). The presence of one of these categories is sufficient to assess patient's severity of asthma. Each participant took one of the following scores: one which means Mild Intermittent asthma, two indicates Mild Persistent asthma, three reflects Moderate Persistent asthma or, four denotes Severe Persistent asthma (as shown in the following table).

Table 1: Asthma severity

Items	Symptoms/Day	Symptoms/Night	PEF or FEV ₁	PEF variability
STEP 1 Intermittent	< 1 time a week Asymptomatic and normal PEF between attacks	<= 2 times a month	>= 80%	< 20%
STEP 2 Mild Persistent	> 1 time a week but < 1 time a day Attacks may affect activity	> 2 times a month	>= 80%	20-30%
STEP 3 Moderate Persistent	Daily Attacks affect activity	> 1 time a week	60%-80%	> 30%
STEP 4 Severe Persistent	Continuous Limited physical activity	Frequent	<= 60%	> 30%

PEF=Peak expiratory flow.

FEV1=Forced expiratory volume in 1st second.

Tool IV: The Self-consciousness Scale (SCS):

This scale is a questionnaire developed by Fenigstein et al (1975)⁽⁹⁾. It is designed to measure individual differences in private and public self-consciousness, which also incorporates a measure of social anxiety. It was revised by Scheier and Carver (1985) who proposed a version that would be suitable for use with general samples⁽¹³⁾. The scale consists of 22 statements, that participants respond to on a four-point Likert-type scale indicating how accurately a given statement describes their experiences and behaviors that ranges from 0 (not like me at all) to 3 (a lot like me). The questionnaire is divided into three sub-scales, relating to "private self-consciousness" represented by nine statements, "public self-consciousness" represented by seven statements, and "social anxiety" represented by six statements. Two statements from the scale are negatively stated and reversely scored. The possible total score ranges from 0 to 66, with a score ranging from 45 -66 indicating high, from 22 -44 indicating moderate, and from 0 -21 indicating low levels of self-consciousness.

The scale was applied on a group of asthmatic patients and it has been tested for its reliability. The revised version seems to be suitable for application. For asthmatic patients three separate Cronbach alphas were computed for the internal consistency of each subscale (Public $\alpha = 0.73$, Private $\alpha = 0.94$ and Social Anxiety $\alpha = 0.81$)⁽²⁰⁾.

Method

1. Approval was obtained from Ethical committee, Faculty Of Nursing, Alexandria University.
2. An official letter from the Faculty of Nursing was submitted to the general director and to the head of the Chest Department of Alexandria Main University Hospital for obtaining permission to carry out the study. A Socio demographic and clinical characteristics structured interview schedule (tool I) was developed by the researchers.
3. The Modified Morisky Medication Adherence Scale (MMS) (Tool II), Part I (Asthma Control Test) (ACT) and Part II (Assessment of Asthma severity) of Tool III were translated into Arabic language, then submitted to a jury composed of five experts in the field of medical surgical nursing to test translation and content validity. Tools proved to be valid.
4. The Self-consciousness Scale (SCS) (tool IV) was translated into Arabic language, then submitted to a jury composed of five experts in the field of psychiatric nursing to test translation and content validity of the scale. Tool proved to be valid.
5. **Pilot study:** Before embarking on the actual study, a pilot study was carried out on 9 patients with asthma who were excluded from the actual study to ascertain the clarity and applicability of the study tools and to identify obstacles that might be faced during data collection. The pilot study revealed that tools were clear, understood and applicable. After analyzing the data obtained from the pilot study, necessary modifications were done accordingly.
6. The Cronbach's Alpha method was done on 9 patients with asthma to measure the internal consistency of the study tools (II, III, and IV). The tools proved to be reliable ($\alpha = 0.905$, 0.928 and 0.975 respectively).
7. **Actual study:** Patients' records were checked and then patients meeting the inclusion criteria were selected randomly by the researchers (through systematic random sampling technique) after excluding the patients who participated in the pilot study and the reliability test.
8. The researchers collected the data by interviewing every patient individually in the waiting place at the outpatient clinic. They gave the patients a brief explanation of the aims of the study. Every patient was interviewed for an average period of 30 minutes.
9. Data were collected over a period of 3 months starting from 1st of May to end of July 2019.

Ethical considerations:

Throughout the study, the followings ethical steps were followed:

1. Informed written consent was obtained from each patient after explaining the importance and aims of the study. Participation in the research was voluntary and patients were free to withdraw from the study at any time.
2. Confidentiality of the obtained information was ensured and the patients' privacy and anonymity were respected.

Statistical analysis:

1. After data collection, it was coded, transferred into a specially designed format to be suitable for computer feeding, then entered, checked, and verified to avoid any error during data entry.
2. Statistical analysis was done using Statistical package for Social Sciences (SPSS version 20).
3. Data were analyzed descriptively to obtain number and percentage, means, and standard deviations. Then bivariate analysis was done using t-test. Multivariate analysis was done using ANOVA.
4. The correlations between two quantitative variables were assessed using Pearson coefficient. The level of significance selected for this study was p equal to or less than 0.05.

3. RESULTS

Table 2 shows the socio-demographic characteristics and clinical data of the studied patients.

Regarding socio-demographic characteristics (Part A), more than half of the studied subjects (55.5%) aged between 40 and 60 years. Nearly two thirds of them were females (63.3%) and the highest percentage (70.0%) was married, while 7.8% were singles. Concerning their educational level, 27.8 % of the studied patients were read and write, 24.4% of them were illiterate and 23.3 % of them had preparatory level of education. It is also noticed that, more than half of the studied patients (52.2%) were living in rural areas and nearly half of them (47.8%) were housewives.

As regards clinical data (Part B), 44.4% of the studied patients were negative smokers, while 37.8% of them were smokers and 60.0% of them had duration of illness of less than 10 years. The table also reveals that nearly half of the studied patients (46.7% and 44.4% respectively) were taking expectorants and bronchodilators while other half of them (46.7%) did not know their previously taken medication. Regarding currently taking medication, the majority of the studied subjects (78.9%) were taking bronchodilators, and about three quarters of them (66.7% and 60.0% respectively) were taking expectorants and inhaled corticosteroids. Studied patients who were previously hospitalized for less than 5 times amounted to 53.3%, while 23.3% of them were not previously hospitalized.

Table (2): Distribution of the studied patients according to their socio-demographic characteristics and clinical data (n=90)

A- Socio demographic Characteristics	No.	%
Age (years)		
20<30	13	14.4
30<40	27	30.0
40<50	29	32.2
50≤60	21	23.3
Sex		
Male	33	36.7
Female	57	63.3
Marital status		
Single	7	7.8
Married	63	70.0
Divorced	8	8.9
Widow	12	13.3
Level of Education		
Illiterate	22	24.4
Read and write	25	27.8
Preparatory	21	23.3
Secondary	13	14.4
University	9	10.0
Residence		
Urban	43	47.8
Rural	47	52.2
Occupation		
Does not work	7	7.8
Office Work	15	16.7
Craft work	21	23.3
housewives	43	47.8
Others	4	4.4
B- Clinical Data	No.	%
Smoking Habits		

Yes	34	37.8
No	8	8.9
Ex-smoker	8	8.9
Negative smoker	40	44.4
Duration of Illness		
Since childhood	11	12.2
Less than 10 years	54	60.0
From 10 to less than 20	23	25.6
From 20 to 30 years	2	2.2
Previously Taken Medication *		
Expectorant	42	46.7
Bronchodilators	40	44.4
Antibiotics	8	8.9
Cortisone	7	7.8
inhaled corticosteroid	11	12.2
Don't know	42	46.7
Currently Taken Medication *		
Expectorant	60	66.7
Bronchodilators	71	78.9
Antibiotics	20	22.2
Cortisone	19	21.1
inhaled corticosteroid	54	60.0
Don't know	15	16.7
Previous Hospitalization		
No	21	23.3
Less than 5 Times	48	53.3
From 5-10 times	13	14.4
More than 10 times	8	8.9

*Responses are not mutually exclusive

Table 3 represents distribution of the studied patients according to their level of medication adherence. It can be noted that 37.8% of the studied patients were medium adherent, while one third (33.3%) were low adherent with a total mean score of 5.89 ± 0.90 and with a total mean percent of 84.13 ± 12.93 .

Table (3): Distribution of the studied patients according to their level of medication adherence (n = 90)

level of medication adherence	No.	%
Low adherence <6	30	33.3
Medium adherence 6	34	37.8
High adherence 7	26	28.9
Total score		
Min. – Max.	4.0 – 7.0	
Mean \pm SD.	5.89 ± 0.90	
% score		
Min. – Max.	57.14 – 100.0	
Mean \pm SD.	84.13 ± 12.93	

Table 4 illustrates distribution of the studied patients according to their level of asthma control. It appears from this table that, the majority of the studied patients (84.4%) had "Off target" i.e. their asthma appears to be not controlled, while the rest of them (15.6%) had "On target" i.e. their asthma appears to be reasonably controlled with a total mean score of 14.79 ± 4.24 and with a total mean percent of 48.94 ± 21.18 .

Table (4): Distribution of the studied patients according their level of Asthma Control (n = 90)

level of Asthma Control	No.	%
<20 "Off target" asthma appears not controlled	76	84.4
20-24 "On target" asthma appears to be reasonably controlled.	14	15.6
25 "Well done" asthma appears to be well controlled.	0	0.0
Total score		
Min. – Max.	7.0 – 23.0	
Mean \pm SD.	14.79 ± 4.24	
% score		
Min. – Max.	10.0 – 90.0	
Mean \pm SD.	48.94 ± 21.18	

Table 5 represents distribution of the studied patients according to their degree of asthma severity. It can be noticed from the table that more than half of the studied patients (54.4%) had medium continuous degree of asthma severity, while 37.8% of them had simple continuous degree of asthma severity.

Table (5): Distribution of the studied patients according to their degree of asthma severity (n = 90)

Degree of Asthma Severity	No.	%
Intermittent	4	4.4
Simple continuous	34	37.8
Medium continuous	49	54.4
Severe (serious) continuous	3	3.3

Table 6 shows distribution of the studied patients according to their level of self-consciousness. It can be noted that two thirds of the studied patients (66.7%) had low level of total score of self-consciousness; while only 10.0% of them had high level with a total mean score of 18.07 ± 16.32 . Regarding the three subscales of self-consciousness (private self-consciousness, public self-consciousness and social anxiety), 72.2% of the studied patients had low scores of private self-consciousness, 66.7% of them experienced low public self-consciousness and low social anxiety. The mean scores of the three subscales were 7.06 ± 5.89 , 4.96 ± 6.52 , and 6.06 ± 4.29 respectively.

Table (6): Distribution of the studied patients according to their level of self-consciousness (n = 90)

level of Self-consciousness	Degree	Range	No.	%	Mean \pm SD.
Private self-consciousness	Low	0–8	65	72.2	7.06 ± 5.89
	Moderate	9–18	19	21.1	
	High	19–27	6	6.7	

Public self-consciousness	Low	0–6	60	66.7	4.96 ± 6.52
	Moderate	7–14	21	23.3	
	High	15–21	9	10.0	
Social anxiety	Low	0–5	60	66.7	6.06 ± 4.29
	Moderate	6–12	22	24.4	
	High	13–18	8	8.9	
Total score of self-consciousness	Low	0–21	60	66.7	18.07 ± 16.32
	Moderate	22–44	21	23.3	
	High	45–66	9	10.0	

Table 7 represents the relation between studied patients’ socio demographic characteristics & clinical data and their level of medication adherence & level of Asthma Control.

Regarding socio-demographic characteristics (Part A), the table reveals that there is a statistically significant relation at level of 0.001 between patients’ level of education and their total scores of Modified Morisky Scale & Asthma Control Test ($f = 5.927$ and 10.084 respectively). Patients having university education show significantly higher degrees of medication compliance and asthma control than those who were illiterate, read & write, having preparatory or secondary education. The table also reveals that there is no statistically significant relation between other socio demographic characteristics (age, sex, & marital status) and total scores of Modified Morisky Scale & Asthma Control Test.

As regards clinical data (Part B), the table shows that there is no statistically significant relation between smoking habits, duration of illness, or previous hospitalization and patients’ total scores of Modified Morisky Scale & Asthma Control Test.

Table (7): Relation between studied patients’ socio demographic characteristics & clinical data and their level of medication adherence & level of asthma control (n = 90)

A- Socio-demographic Characteristics	Categories	No.	%	level of medication adherence		level of Asthma Control	
				Mean	SD.	Mean	SD.
Age (years)	20<30	13	14.4	6.0	1.0	16.31	4.59
	30<40	27	30.0	6.0	1.04	15.41	4.65
	40<50	29	32.2	5.86	0.83	14.21	4.22
	50<60	21	23.3	5.71	0.78	13.86	3.28
F(p)				0.462(0.710)		1.282(0.286)	
Sex	Male	33	36.7	5.97	0.92	15.64	4.62
	Female	57	63.3	5.84	0.90	14.30	3.95
t(p)				0.642(0.522)		1.453(0.150)	
Marital status	Single	7	7.8	6.14	0.69	14.43	4.96
	Married	63	70.0	5.87	0.89	14.94	4.14
	Divorced	8	8.9	6.38	1.19	15.38	6.23
	Widow	12	13.3	5.50	0.80	13.83	3.01
F(p)				1.741(0.165)		0.290(0.833)	
Level of Education	Illiterate	22	24.4	5.45	0.67	13.18	2.48
	Read and write	25	27.8	5.96	0.89	14.04	4.33
	Preparatory	21	23.3	5.90	0.89	14.38	3.11
	Secondary	13	14.4	5.69	1.03	14.77	5.0
	University	9	10.0	7.00	0.0	21.78	1.09
F(p)				5.927*(<0.001*)		10.084*(<0.001*)	

B- Clinical Data	Categories	No.	%	level of medication adherence		level of Asthma Control	
				Mean	SD.	Mean	SD.
Smoking Habits	Yes	34	37.8	6.03	0.90	15.91	4.71
	No	8	8.9	6.25	0.89	14.25	2.87
	Ex-smoker	8	8.9	5.63	1.30	16.63	3.93
	Negative smoker	40	44.4	5.75	0.81	13.58	3.82
F(p)				1.249(0.297)		2.564(0.060)	
Duration of Illness	Since childhood	11	12.2	6.09	0.70	15.36	4.37
	Less than 10 years	54	60.0	5.80	0.92	14.61	4.30
	From 10 to less than 20	23	25.6	5.96	0.98	15.35	4.07
	From 20 to 30 years	2	2.2	6.50	0.71	10.0	1.41
F(p)				0.711(0.548)		1.088(0.359)	
Previous Hospitalization	No	21	23.3	5.81	0.81	15.81	3.71
	Less than 5 Times	48	53.3	5.79	0.97	14.96	4.38
	From 5-10 times	13	14.4	6.08	0.95	14.0	3.85
	More than 10 times	8	8.9	6.38	0.52	12.38	4.87
F(p)				1.203(0.314)		1.471(0.228)	

t: Student t-test

F: ANOVA test

p: p value for association between different categories

*: Statistically significant at $p \leq 0.05$

Table 8 represents the relation between studied patient’s socio demographic characteristics & clinical data and their level of self-consciousness.

Regarding socio-demographic characteristics (Part A), the table reveals a statistically significant relation was found between age and subscales of self-consciousness (private self-consciousness, public self-consciousness and social anxiety), as well as total score of self-consciousness; where (F=5.477, 6.648, 5.986 and 6.389 respectively), (P= 0.002, 0.001, 0.001 and 0.001 respectively) Patients who were aged between 20 and less than 40 years had significantly higher level of self-consciousness than those who were 40 to 60 years old. Additionally, there is a statistically significant relation at level of 0.001 between patients’ level of education and subscales of self-consciousness (private self-consciousness, public self-consciousness and social anxiety) as well as, their total score of self-consciousness where (F=15.611, 16.979, 23.085 and 19.275 respectively). Patients having university education show significantly higher level of self-consciousness than those who were illiterate read & write, having preparatory or secondary education. *As regards clinical data (Part B)*, the table shows no statistically significant relation between studied patients’ clinical data and subscales of self-consciousness and its total score.

Table (8): Relation between studied patients’ socio-demographic characteristics & clinical data and their level of Self-consciousness (n = 90)

A- Socio-demographic Characteristics	Categories	No.	%	level of Self-consciousness							
				Private self-consciousness		Public self-consciousness		Social anxiety		Total Score	
				Mean	SD.	Mean	SD.	Mean	SD.	Mean	SD.
Age (years)	20<30	13	14.4	9.31	6.06	7.92	6.86	8.08	4.63	25.31	16.99
	30<40	27	30.0	9.59	6.96	7.81	7.48	7.81	5.10	25.22	19.06
	40<50	29	32.2	6.07	5.20	3.90	5.71	5.31	3.61	15.28	14.09
	50≤60	21	23.3	3.76	2.62	0.90	2.64	3.57	1.66	8.24	6.71
F(p)				5.477*(0.002*)		6.648*(<0.001*)		5.986*(0.001*)		6.389*(0.001*)	

Sex	Male	33	36.7	6.94	5.87	6.03	7.07	6.76	4.94	19.73	17.22
	Female	57	63.3	7.12	5.96	4.33	6.16	5.65	3.85	17.11	15.85
t(p)				0.142(0.888)		1.193(0.236)		1.109(0.272)		0.733(0.466)	
Marital status	Single	7	7.8	7.14	5.43	6.71	7.13	7.0	5.10	20.86	17.0
	Married	63	70.0	7.03	6.0	5.02	6.65	6.06	4.38	18.11	16.62
	Divorced	8	8.9	10.13	6.77	7.13	7.10	7.50	4.75	24.75	18.50
	Widow	12	13.3	5.08	4.64	2.17	4.61	4.50	2.68	11.75	11.85
F(p)				1.179(0.322)		1.207(0.312)		0.941(0.424)		1.120(0.346)	
Level of Education	Illiterate	22	24.4	3.73	2.59	1.00	2.60	3.55	1.57	8.27	6.58
	Read and write	25	27.8	5.96	4.67	3.20	5.07	4.76	3.03	13.92	12.47
	Preparatory	21	23.3	7.14	5.78	5.38	6.75	6.29	3.95	18.81	15.94
	Secondary	13	14.4	7.23	5.45	6.23	5.60	6.46	3.45	19.92	13.68
	University	9	10.0	17.78	3.42	16.67	2.65	14.67	2.65	49.11	7.51
F(p)				15.611*(<0.001*)		16.979*(<0.001*)		23.085*(<0.001*)		19.275*(<0.001*)	
B- Clinical Data	Categories	No.	%	level of Self-consciousness							
				Private self-consciousness		Public self-consciousness		Social anxiety		Total Score	
				Mean	SD.	Mean	SD.	Mean	SD.	Mean	SD.
Smoking Habits	Yes	34	37.8	7.88	6.44	6.41	7.24	7.09	5.07	21.38	18.27
	No	8	8.9	5.13	4.09	1.88	4.12	4.25	2.43	11.25	10.53
	Ex-smoker	8	8.9	7.25	5.82	7.13	7.10	7.38	4.84	21.75	16.88
	Negative smoker	40	44.4	6.70	5.79	3.90	5.89	5.28	3.51	15.88	15.08
F(p)				0.552(0.648)		1.857(0.143)		1.881(0.139)		1.324(0.272)	
Duration of Illness	Since childhood	11	12.2	6.55	5.47	5.55	6.58	6.27	4.50	18.36	16.0
	Less than 10 years	54	60.0	7.15	6.04	4.78	6.31	5.94	4.15	17.87	16.16
	From 10 to less than 20	23	25.6	7.30	6.17	5.52	7.33	6.39	4.80	19.22	17.94
	From 20 to 30 years	2	2.2	4.50	0.71	0.0	0.0	4.0	1.41	8.50	0.71
F(p)				0.166(0.919)		0.478(0.699)		0.216(0.885)		0.264(0.851)	
Previous Hospitalization	No	21	23.3	5.86	5.68	3.62	6.36	5.48	4.27	14.95	16.08
	Less than 5 Times	48	53.3	8.02	6.22	6.19	6.78	6.81	4.65	21.02	17.13
	From 5-10 times	13	14.4	6.85	5.67	3.77	5.72	5.15	3.36	15.77	14.74
	More than 10 times	8	8.9	4.75	4.17	3.0	6.14	4.50	2.78	12.25	12.89
F(p)				1.138(0.339)		1.260(0.293)		1.177(0.323)		1.213(0.310)	

t: Student t-test

F: ANOVA test

p: p value for association between different categories

*: Statistically significant at $p \leq 0.05$

Table 9 displays the correlation between degree of asthma severity, level of medication adherence, level of asthma control, and level of self-consciousness among studied patients. The table reveals that a negative correlation was found between degree of asthma severity and level of asthma control, subscales of self-consciousness (private self-consciousness, public self-consciousness, social anxiety) & total score of self-consciousness ($r = -0.472, -0.446, -0.429, -0.477,$ and -0.458 respectively), ($P = 0.001$). It can also be noted that there were positive correlations between level of medication adherence and subscales of self-consciousness (private self-consciousness, public self-consciousness, social anxiety) & total score of self-consciousness ($r = 0.321, 0.302, 0.341,$ and 0.326 respectively), ($P = 0.002, 0.004, 0.001$ and 0.002 respectively). Additionally, a positive correlation was found between level of asthma control, and subscales of self-consciousness (private self-consciousness, public self-consciousness, social anxiety) & total score of self-consciousness ($r = 0.559, 0.551, 0.590,$ and 0.577 respectively), ($P = 0.001$). This table also reflects that a positive correlation was found at level of 0.001 between private self-consciousness and public self-consciousness, social anxiety & total score of self-

consciousness ($r= 0.913, 0.909$ and 0.965 respectively), between public self-consciousness and social anxiety & total score of self-consciousness ($r= 0.976,$ and 0.986 respectively), as well as between social anxiety and total score of self-consciousness ($r= 0.981$). From this table it can be concluded that there is no statistically significant relationship between degree of asthma severity and level of medication adherence; as well as between level of medication adherence and level of asthma control. On the other hand, there is a statistically significant negative relationship between degree of asthma severity and level of asthma control; as well as between degree of asthma severity and level of self-consciousness among patients with asthma.

Table (9) Correlation Matrix between degree of asthma severity, level of medication adherence, level of asthma control, and level of self-consciousness among studied patients (n=90)

Variables		degree of asthma severity	level of medication adherence	level of Asthma Control	level of Self-consciousness			
					Private self-consciousness	Public self-consciousness	Social anxiety	Total Score of self-consciousness
degree of asthma severity	r		-0.279	-0.472*	-0.446*	-0.429*	-0.477*	-0.458*
	p		0.008	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*
level of medication adherence	r			0.187	0.321*	0.302*	0.341*	0.326*
	p			0.077	0.002*	0.004*	0.001*	0.002*
level of Asthma Control	r				0.559*	0.551*	0.590*	0.577*
	p				<0.001*	<0.001*	<0.001*	<0.001*
Private self-consciousness	r					0.913*	0.909*	0.965*
	p					<0.001*	<0.001*	<0.001*
Public self-consciousness	r						0.976*	0.986*
	p						<0.001*	<0.001*
Social anxiety	r							0.981*
	p							<0.001*
Total Score of self-consciousness	r							
	p							

r: Pearson coefficient

*: Statistically significant at $p \leq 0.05$

4. DISCUSSION

Living with asthma is associated with a decrease in quality of life due to reductions in activities of daily living and an increase in psychological stress, all of which are known to negatively impact mental health. Additionally, psychological barriers, such as faulty symptom attribution, adoption or rejection of the sick role, low self-esteem, and self-consciousness may negatively impact treatment adherence^(21, 22). Patient’ adherence to medication, management plan and their self-consciousness are considered as important aspects in their treatment success⁽²³⁾. In Egypt, Self-conscious emotions, as well as its relation with medication adherence and asthma severity were not previously assessed objectively in patients with asthma. So, this study aims to determine the relation between medication adherence, self-consciousness, and asthma control and severity among patients with asthma.

Promoting adherence to treatment is an essential aspect of clinical practice. Non adherence to treatment might be associated with an increased risk of asthma exacerbations⁽²³⁾. Results of the present study showed that the majority of studied patients had low and medium levels of medication adherence. In the same line, Lilitwat and Vorakunthada (2018)

stated that, approximately 60% of asthmatic patients are non-adherent to asthma regimen, resulting in adverse outcomes and higher costs of care ⁽²⁴⁾. Similarly, a study done by Shamkuwar et al. (2016) showed that adherence was poor in asthmatic patients ⁽¹⁾. However, preliminary findings from a qualitative study into Australian's experiences of living with severe asthma suggest that most participants stressed the importance of adherence to medications, and fear of the unpredictable nature of their disease ⁽²⁵⁾.

Results of the present study revealed no statistically significant relationship between degree of asthma severity & level of asthma control and level of medication adherence. Also, a negative correlation between degree of asthma severity and level of asthma control was evident. Studied patients had medium and simple continuous degrees of asthma severity. The majority of the studied patients had "Off target" i.e. their asthma appears to be not controlled; while the rest of them had "On target" i.e. their asthma appears to be reasonably controlled. In contrary, Rifaat et al (2013) found that all patients with well controlled asthma were adherent to Inhaled Corticosteroids (ICS) ⁽⁷⁾.

In fact, there is limited evidence-based literature on mental and emotional health in people with severe asthma. However, there is growing awareness of a link between mental health, the course of asthma, and the outcomes of asthma treatment (increased symptoms, increased use of health care services, and frequent asthma attacks / exacerbations). Stress, anxiety, and depression are likely to interrupt a person's regular asthma self-management routines and increase the risk of an exacerbation ⁽²⁵⁾.

Contrary to expectations, the current results showed that two thirds of the studied patients had low level of self-consciousness; while the minority of them had high level of self-consciousness. Additionally, the majority of studied patients had low scores of the three subscales of self-consciousness (private self-consciousness, public self-consciousness and social anxiety). This finding can be explained by the fact that self-consciousness is a 'given' as it is the primary task of the frontal and prefrontal cortices. Persons are all aware of themselves operating in the world of others who can see, hear, know, and evaluate them (Brain injury and severe developmental disorder would be the exceptions). That said, some people 'appear' to lack self-consciousness because they are masterful extroverts (and some introverts) who possess great self-confidence, are spontaneous, and polished in their self-expression and presentation. But they are nonetheless keenly aware and dependent on their audience. A psychological view would note that human ego demands support and protect, and advanced brain regions provide the feedback loop for how well persons are thinking, performing and being regarded by others within any social context ⁽²⁶⁾.

It could also be assumed that self-consciousness is essentially an attention-based tendency. It directs the cognitive apparatus (attention, thinking) towards specific elements of the self, regardless of whether the person evaluates them as positive, negative, or neutral. As a result, neither public nor private self-consciousness exhibits strong associations with any of the evaluative self-related variables ⁽²⁶⁾. On the other hand, there is a statistically significant positive relationship between asthma severity and self-consciousness among asthmatic patients. In this respect, Harrison et. al (2017) reported that a number of self-conscious emotions including not only reported shame, guilt, and self-blame but also fear of negative evaluation, reduced self-compassion, and diminished pride were evident in the studied patients. He claimed that self-conscious emotions stem from individuals' perceptions of their disease. These emotions are also reported in conjunction with negative feelings of dependency on people and on devices, which force patients to reappraise their identity within the context of their disease. Such emotions were strongly associated with reduced mastery, a heightened emotional response, and elevated symptoms of anxiety and depression, detectable both by the general measures of self-consciousness and the disease-specific items ⁽²⁷⁾.

Results of the present study showed that two thirds of the studied patients were females who are assumed to be more emotionally concerned and sympathetic by nature than males. The majority of them was house wives and craft workers which makes them not interacting with large external social groups. In addition more than half of the studied patients aged between 40-60 years. In Eastern cultures including Egypt many variables as spirituality, presence of social network and social support, introjection of the values and believes that refer everything (including illness) to God affect peoples' view of themselves and their perception of others' view. They accepted themselves unconditionally. In the same line, Tartakovsky (2018) reported that, a person "who accepts him/herself unconditionally as a worthwhile human in spite of his/her faults and imperfections does not experience the stress of self-consciousness ⁽¹¹⁾.

The present study reveals that there is a statistically significant relation between patients' level of education and their level of medication adherence & level of asthma control. Patients having university education show significantly higher levels of medication adherence and asthma control than those who were not. These results can be explained by the fact that, highly educated patients may have more knowledge about asthma etiology, pathophysiology, precipitating factors, and dangers of underuse or overuse of medications which can enhance their medication adherence and control. However, Rifaat N et al (2013) found that, level of education had no significant relation with medication adherence ⁽⁷⁾.

The present study also revealed that statistically significant relations were found between patients' age & level of education and subscales of self-consciousness (private self-consciousness, public self-consciousness and social anxiety) as well as, their total score of self-consciousness. Patients who were aged between 20 and less than 40 years had significantly higher level of self-consciousness than older patients. Patients having university education show significantly higher level of self-consciousness than those who were not. This finding could be interpreted as self-consciousness is implicated in a host of social attitudes, emotions, and behaviors. Private self-consciousness is associated with better access to and a greater interest in new self-knowledge, regardless of whether that knowledge is positive. Public self-consciousness is associated with phenomena that involve perceptions of how other people view the self. These phenomena are more evident in young patients ^(9, 28).

As human beings existing in a highly social environment and living in a culture in which people are more visible than ever. Social media (that is easily accessible to young and highly educated individuals) and the new pressures that come with it can cause increased levels of anxiety and self-consciousness, people no longer just have concerns about how they are perceived face-to-face, but how they are represented virtually. While these new technological avenues for self-exposure can provide a springboard for self-consciousness, there are deeper roots for these feelings, a negative thought process which people referred to as their "critical inner voice." The most common "voice" listed is "you are not like other people." That feeling like there is something fundamentally wrong with them can come from early feelings of shame, fear, or frustration. This feeling can push people to keep themselves often equated with shyness. They may feel an exaggerated sense of shame or embarrassment when approaching certain tasks or interactions ^(9, 17, 29).

5. CONCLUSION

Based on the findings of the present study, it can be concluded that patients with asthma are medium and low compliers to medication, their asthma is not controlled and they had medium and simple degrees of asthma severity. Regardless of their illness, the majority of them had low levels of self-consciousness; as well as its subscales. Patients having an increased level of self-consciousness have increased levels of medication adherence, as well as increased levels of asthma control. High levels of asthma control and self-consciousness result in decrease degrees of asthma severity.

6. RECOMMENDATIONS

- Developing educational programs to promote medication adherence and self-management among patients with asthma.
- Developing psycho-educational intervention programs that scope and address self-conscious emotions and investigate their effects on medication adherence among patients with asthma in Egypt.
- Nurses and other health care professionals should make great emphasis on psychological, as well as physical aspects (body-mind relation) of patients with asthma as important factors that enhance medication adherence.
- Implementing further studies, using large samples from different settings.

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