

## BARRIERS AFFECTING COMPLIANCE OF PATIENTS WITH CHRONIC DISEASES : A PRELIMINARY STUDY IN UNITED ARAB EMIRATES (UAE) POPULATION

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### ABSTRACT

Medication non-compliance is an ignored health problem in developing countries, which have an alarming average of less than 50% of patients complying with medication instructions. Such non-compliance is considered a major challenge to effective management of most chronic diseases such as diabetes mellitus, hypertension, and dyslipidemia.

Objective: To evaluate the factors affecting patient compliance and the impact of better compliance on the control of chronic diseases. Another objective is to measure the prevalence of intentional and non-intentional non compliance and their causes.

Method: A cross-sectional study was conducted for 240 patients with chronic diseases who are followed up at Al-Qassimi Hospital, Sharjah, United Arab Emirates (UAE) during the period of September 2008 until March 2009. The hospital ethical committee approval was obtained before the commencement of the study.

A validated data collection form and questionnaire were used to collect patients' demographics, degree of knowledge about their medications and concurrent diseases. Patients were selected based on inclusion and exclusion criteria which include chronic diseased adult patients who have one or more of the following chronic conditions (Diabetes, hypertension and/or dyslipidemia) confirmed in the patients' medical file (not on their initial diagnosis). Participants should have an active prescription without changes for at least 90 days at the time of study recruitment. Descriptive statistics were reported and statistical analysis using SPSS software version 18 was done to correlate patient demographics and patient compliance and to measure the correlation of patient compliance and the control of chronic diseases using chi square test.

Results: The mean age of participants was  $56.6 \pm 12.4$  years. Most of participants were illiterate (62.5%). Most of them had family history with chronic disease (69.2%). Most patients have more than one chronic disease (86.7%). More than three quarters of participants (77.5%) do not control one or more of their diseases. Also high percentage of participants (76.7%) was on polypharmacy regimen (mean number of drug used  $7.0 \pm 3.0$ ). The most prominent complication related to chronic diseases that participants suffered from is cardiovascular diseases (27.6%).

Forgetfulness is the main reason for non-intentional non-compliance (75%), while polypharmacy was considered the main causes for intentional non-compliance (13.3%). The current study revealed that there is significant association between patients' young age, having family member with chronic disease, having complications and good compliance ( $p$ -value  $< 0.05$ ). Also, there is a statistically significant association between good compliance and better achievement of chronic diseases control ( $p$ -value  $< 0.05$ ). It was also found that level of education and number of chronic diseases have no correlation with compliance ( $P$ -value  $> 0.05$ )

Conclusion: Medication compliance is very important to control chronic diseases such as diabetes mellitus, hypertension and/or dyslipidemia and decrease their complications. Results of the study showed that there is a positive association between good compliance and achievement of better control of chronic diseases. The current study also revealed that there is significant association between patients' young age, having family member with chronic disease, having complications and good medication compliance.

**Key words:** Medication compliance, United Arab Emirates, Polypharmacy, Intentional non-compliance.

### INTRODUCTION

While medication non-compliance is most prevalent in developing countries, developed countries face this problem as well, but at a lower rate<sup>1</sup>. Medication non-compliance is considered a major challenge to effective management of most non-communicable chronic diseases, such as diabetes mellitus, hypertension and dyslipidemia<sup>2-4</sup>. This increasing problem may lead to a failure of a medical plan and a rise in the cost of treatment, especially for long-term therapies.

The World Health Organization (WHO) defines compliance as "the extent to which a person's taking medication behavior, following a diet and/or executing lifestyle changes, corresponds with agreed recommendations from a health care provider."<sup>1</sup>

Compliance with medication regimens is crucial for achieving disease control in patients with chronic diseases. The ratio of patients' compliance is different from disease to disease and among the countries. For example, in China, Gambia and Seychelles, only 43%, 27% and 26%, respectively, of patients with hypertension adhere to their antihypertensive medication regimen<sup>1</sup>. Likewise, across Europe the pattern of reported compliance showed large variation. Non-compliance with the latest prescribed drug varied from 6.4% in Portugal to 24.9% in Luxemburg<sup>5</sup>.

Compliance to medical therapy is a complex and dynamic behavioral process that is strongly influenced by the patient, his/her support environment, practices of health care providers, and the characteristics of care delivery systems<sup>6</sup>.

As many as 200 factors have been hypothesized to influence compliance<sup>7, 8</sup> and these factors can be classified as either intentional or unintentional. Intentional non-compliance is associated with motivation and patients' beliefs about taking medications. Conversely, unintentional non-compliance is related to patients' understanding of instructions or their ability to take their medication. There may be an overlap between these categories (e.g., people who have a low perceived necessity for their medication may see it as less salient and may be more likely to forget to take their medications)<sup>9</sup>.

Many factors can affect general poor compliance such as: misunderstanding of prescribed instructions, frequent changes to drug regimens, multiple health care providers prescribing medications, limited faith in the medications, forgetfulness, physical difficulties limiting access to or use of medication, limited education about the illness or the need for medication, few symptoms, chronic illness, a complicated regimen, polypharmacy (use of multiple medications for the treatment of a patient's medical conditions), cost of drugs, and real or perceived adverse drug reactions<sup>10, 11</sup>, etc.

Although the benefits of treating chronic conditions such as diabetes mellitus, hypertension and dyslipidemia are clear, many patients fail to adhere to regimens repeatedly. Patient compliance to medication shown to slow the progression of their disease's course, reduces the development of complications, or prevents morbidity and mortality. For example, in a review of information for 5,590 patients who experienced a first myocardial infarction (MI), those who had less than 80% compliance to statin therapy had a more than fourfold

increase in risk for a recurrent MI and a more than twofold higher risk for all causes of mortality compared with those whose compliance equaled or exceeded 80%<sup>10</sup>. Moreover, uncontrolled hyperglycemia and continued high blood pressure due to medication non-compliance can be very dangerous, and can be one important reason for progression diseases and increase in mortality and morbidity rates. In addition, many studies worldwide consistently show non-compliance with drugs as a common cause of hospital admission with a range of 5.5 – 11.4%<sup>12-14</sup>.

The prevalence of the three chronic diseases, diabetes mellitus, hypertension and dyslipidemia, in United Arab Emirates (UAE) is considered as a big health problem due to high ratio of patients with these chronic diseases. UAE is ranked as the second diabetes mellitus country around the world, with 17 - 21% of UAE population has diabetes<sup>15, 16</sup>. Also, hypertension prevalence among UAE population is high and ranged between 33.1 - 36.3%<sup>17, 18</sup>. Likewise, the prevalence of lipid disorders around the UAE population is considered one of the highest prevalence around the world with 47.3 – 53.6%<sup>19, 20</sup>.

Due to lack of data about patients' compliance in UAE and possible effect of compliance on control of their chronic diseases, this study is discussing the effect of compliance on control of chronic in a sample of UAE population.

### Objective

To evaluate the factors affecting patient compliance and the impact of better compliance on the control of chronic diseases. Another objective is to measure the prevalence of intentional and non-intentional non compliance and their causes.

### Method

A cross-sectional study was conducted on 240 patients with chronic diseases who are followed up at outpatient Clinics at Al-Qassimi Hospital, Sharjah, UAE during the period of September 2008 until March 2009. The hospital ethical committee approval was obtained before the commencement of the study.

A validated data collection form was used to collect the latest laboratory results that are related to the study's objective. In addition, the form was used to collect patients' sociodemographic data and data about patients' chronic diseases and the medication they are using for these diseases. A validated questionnaire form has been developed to assess the compliance of the patients and causes and types of non-compliance.

Patients were selected based on inclusion and exclusion criteria which include chronic diseased adult patients who have one or more of the major chronic conditions (diabetes, hypertension and dyslipidemia) confirmed in the patients' medical file (not on their initial appointment). Participants should have an active prescription without changes for at least 90 days at the time of inclusion in study. Age of patients should be between 18 – 80 years. The study excluded patients who have recently changed their prescription medications and patients whose medications are used for short term, pregnant women, emergency patients and patients with mental problems.

Data were analyzed by using Statistical Package for Social Science software (SPSS) version 18. Descriptive statistics was used to describe the data while non-parametric test (Chi square) was used to test for possible significant correlation between different variables. Statistical level of significance was accepted at P-value < 0.05.

### RESULTS

A total of 240 interviews were completed. The mean age of participants was 56.6 ± 12.4 years (range 21-86 years). Table (1) shows the demographic data of the participants.

Most patients have more than one chronic disease (86.7%); about half of participants have diabetes mellitus, hypertension and dyslipidemia together (52.5%). Disease prevalence is described in table (2).

**Table 1: Demographic Data**

Variable	Percentage	
Gender	Female	56.6%
	Male	43.4%
Age (years)	21 – 40	9.2%
	41 – 60	47.5%
	61 - 80	43.3%
Education Status	Non-educated	62.5%
	Primary	16.7%
	Secondary	13.3%
	College	6.7%
Occupation	Post graduate	0.8%
	Retried	15%
	House wife	53.3%
Family history of chronic diseases	Working	13.3%
	Not working	18.3%
	Yes	69.2%
Marital Status	No	30.8%
	Married	70.8%
	Single	3.3%
	Widow	24.2%
	Divorce	1.7%

In general, most of the participants (77.5%) do not control one or more of their diseases. High percentage of diabetic patients did not control their blood glucose level; 78.4% with HbA1c > 7%.

**Table 2: Disease prevalence.**

Disease	Percentage	Type of disease	Percentage
Diabetes	74.1%	Type II	92.2 %
		Type I	7.7 %
Hypertension	80.8%		
Dyslipidemia	84.1%	Hypercholesterolemia	92%
		High triglyceride level	1%
		Both	7%
More than one diseases	86.7 %	Diabetes and Dyslipidemia	6.0 %
		Diabetes and Hypertension	13.2 %
		Hypertension and Dyslipidemia	15 %
		Diabetes, Hypertension and Dyslipidemia	52.5 %

About 76.7% of participants used more than five medications (Polypharmacy; the use of five or more drugs)<sup>21</sup>, mean number of drug used 7.0 ± 3.0. The maximum number of medication is 16 medications (only one patient), while four patients used only one medication. Most of participants (64.17%) are using their medications for more than 5 years, followed by 25.83 % of participants between 1 – 5 years, 10 % of participants are using their medications for less than 1 year.

Most of participants were non-compliance (83.3%), about 33.3 % of the non-compliant participants reported intentional non-compliance. Table (3) describes the causes and different types of non-compliance behavior.

There was a significant correlation between having a family member suffering from chronic disease and participants medication compliance (P value = 0.042).

**Table 3: Types and causes of medication non-compliance.**

			Percentage
Non-Compliance 83.3%	Non-intentional (66.7%)	Forgetfulness	60.3%
		Misunderstanding of medication instructions	6.4%
	Intentional (33.3%)	Polypharmacy	23.3%
		Fear from medication side effect	6.7%
		Limited faith in the medications effectiveness	3.3%

Our data indicated that there is significant association between participants with complications related to the chronic diseases and good compliance (P value < 0.05).

Most of our participants are illiterate (62.5%), but this did not affect on medication compliance. Also, There is a significant relationship between medication non compliance and polypharmacy (P value = 0.006).

Study results revealed there significant relationship between participants' forgetfulness and polypharmacy (P value =0.049).

### DISCUSSION

Many factors can generally affect medication compliance. These factors can be classified into two classes: a) non-intentional non-compliance behavior such as forgetfulness and misunderstanding of prescribing instructions and b) intentional non-compliance behavior such as avoiding the administration of some medications due to polypharmacy, fear from medications side effects and loss of faith in medication effectiveness.

Other factors can also affect the two previous non-compliance behaviors such as education level, other family member with chronic diseases, limited knowledge about the illness, limited understanding about the need for medications, long duration of chronic illness and age<sup>22</sup>, etc.

From study results it can be concluded that there is significant relationship between increasing in age and medication non-compliance (P value = 0.043). The younger participants had more compliance than the elder participants. This may be due to most of elder participants were illiterate.

There was no significant relationship between medication compliance and educational level. This comes in agreement with results from Sabate study in 2003 that found no effect of educational on compliance<sup>23</sup>. Although, Nichols-English study in 2000, indicated that patients with low literacy skills are less likely to adhere to their medication regimens<sup>24</sup>.

Although many studies found that compliance decreased with increased duration of the treatment<sup>25-27</sup>, in the current study there was no significant relationship between duration of medication treatment and level of compliance. Also, study results revealed that there is a significant correlation (P-value < 0.05) between medication non compliance (either intentional or non-intentional) and participants' lack of control of studied chronic diseases (diabetes, hypertension and dyslipidemia).

In many studies, the medication non-compliance is claimed to be the main reason to fail control the diseases<sup>28-31</sup>.

This study have some limitations such as difficulties in obtaining complete information from patients files, some questions were not answered by participants and relatively small sample size. A larger multicenter study should be done to confirm the results of the current study.

### CONCLUSION

Medication compliance is very important to control chronic diseases such as diabetes mellitus, hypertension and/or dyslipidemia and decrease their complications. Results of the study showed that there

is a positive association between good compliance and achievement of better control of chronic diseases. The current study also revealed that there is significant association between patients' young age, having family member with chronic disease, having complications and good medication compliance.

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### REFERENCES

1. World Health Organization. Adherence to long term-therapies, evidence for action. Noncommunicable Diseases and Mental Health Adherence to long-term therapies project, WHO report. Geneva, Switzerland: World Health Organization, 2003; 3-5.
2. Touchette, Daniel R and Shapiro, Nancy L. Medication compliance, adherence, and persistence: current status of behavioral and educational interventions to improve outcomes. *Journal of Managed Care Pharmacy*, 2008; 14(6):S2-S10.
3. Larsen J, Vaccheri A, Andersen M, Montanaro N and Bergman U. Lack of adherence to lipid-lowering drug treatment - A comparison of utilisation patterns in defined populations in Funen, Denmark and Bologna, Italy. *British journal of clinical pharmacology*, 2000; 49(5):463-471.
4. Rubin, Richard R. Adherence to pharmacologic therapy in patients with type 2 diabetes mellitus. *The American Journal of Medicine*, 2005; 118(5A):27S-34S.
5. Larsen J, Stovring H, Kragstrup J and Hansen Dorte G. Can differences in medical drug compliance between European countries be explained by social factors: analyses based on data from the European Social Survey, round 2. *BMC Public Health*, 2009; 9:145-148.
6. Miller N, Hill M, Kottke T, Ockene I. Expert Panel on Compliance. The multilevel compliance challenge: recommendations for a call to action. A statement for healthcare professionals. *Circulation*, 1997; 95:1085-1090.
7. Haynes R. A critical review of the "determinants" of patient compliance with therapeutic regimens. In: Sackett D, Haynes R, editors. Compliance with therapeutic regimens. Baltimore: The Johns Hopkins University Press, 1976:26-39.
8. Meichenbaum D, Turk DC. Factors affecting adherence. In: Facilitating Treatment Adherence. A Practitioner's Guidebook—Meichenbaum D, Turk DC, eds. (1987) New York: Plenum Press. 41-68.
9. Horne R. Compliance, adherence and concordance. In: Taylor K, editor. Pharmacy practice. London: Taylor and Francis, 2001; 165-84.
10. Vlasnik J, Aliotta S and DeLor B. Medication adherence: factors influencing compliance with prescribed medication plans. *Case Manager*, 2005;16(2):47-51.
11. Rottlaender D, Scherner M, Schneider T and Erdmann E. Polypharmacy, compliance and non-prescription medication in patients with cardiovascular disease in Germany. *Deutsche Medizinische Wochenschrift*, 2007; 132(4):139-144.
12. Sullivan S, Kreling D and Hazlet T. Noncompliance with medication regimens and subsequent hospitalization; Literature analysis and cost of hospitalization estimate. *Journal research of Pharmacoeconomic*, 1990;2(2):19-33.
13. Col N, Fanale J and Kronholm P. The role of medication noncompliance and adverse drug reactions in hospitalizations in the elderly. *Archives of internal medicine*, 1990; 150(4):841-845.
14. Billups S, Malone D and Carter B. Relationship between drug therapy noncompliance and patient characteristics, health-related quality of life, and health care costs. *Pharmacotherapy*, 2000; 20(8), 941-949.

15. International Diabetes Federation. Diabetes Atlas, 4<sup>th</sup> ed. Brussels, Belgium. International Diabetes Federation, 2009; 114-116.
16. Saadi, H. Prevalence of diabetes mellitus and its complications in a population-based sample in Al Ain, United Arab Emirates. *Diabetes Research and Clinical Practice*, 2007;78(3):369-377.
17. World Health Organization. Work plan of the Diabetes Program for 2004 - 2006, WHO report. Geneva, Switzerland: World Health Organization 2004; 38-43.
18. El-Shahat Y, Bakir S, Farjou N, Hashim T, Bohaliga A, Al-Hossani H and Jaffar A. Hypertension in UAE citizens – Preliminary results of a prospective study. *Saudi Journal of kidney diseases and transplantation*, 1999; 10(3):376-381.
19. Al-Kaabi J, Al-Maskari F, Saadi H, Afandi B, Parkar H and Nagelkerke N (2008) Assessment of dietary practice among diabetic patients in the United Arab Emirates. *The Review of Diabetic Studies*, 2008; 5(2), 110-115.
20. Agarwal M, Hughes P, Haliga A, Newman P, Sheekh-Hussen M and Shalabi A. Relevance of cholesterol screening in the United Arab Emirates a preliminary study. *European Journal of Epidemiology*, 1995; 11(5):581-585.
21. Hilmer SN, Mager DE, Simonsick EM, Cao Y, Ling SM, Windham BG. A drug burden index to define the functional burden of medications in older people. *Arch Intern Med*, 2007; 167(8):781-787.