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RESEARCH ARTICLE

A STUDY OF MEDICATION USE WITHIN INSURED PATIENTS WITH CHRONIC DISEASES

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ABSTRACT

Background: A key component in the management of a patient with chronic health problem is the assessment of its adherence with therapeutic regimen. Low levels of patient adherence with disease plans compromise the effectiveness of the therapies and have been associated with an increased risk of adverse health outcomes**.** Improving medication adherence with chronic diseases has been historically challenging due to its complex and patient-specific nature.

Methods: Prospective evaluation of medications for187 insured patients with chronic diseases were included in the present study at the time of their visit to outpatient clinics at 48 model hospital (from October to December, 2017).The Morisky Medication Adherence 4-item Scale (Morisky *et al.,* 1986) (MMAS-4) was used to measure patients' self-reported adherence to their medications. The instrument has been widely used and it has been demonstrated to be accurate to assess medication adherence in patients with chronic diseases.

Results: Among 187 of patients, 51.9% have more than five types of drugs and 86.1% of them were high adherence to use the drugs. Up to half of patients (52.9%) were non-educated, 88.8% of patients take of medication according to prescription, 86.1% of total patients were full compliance and 89.9% of these patients recognized their medication.

Conclusion: The results of this study provided evidence about the high prevalence of adherence to prescribed medications in insured individuals affected by chronic diseases**.** This suggested the positive role of insurance coverage in increasing the compliance rate among patients with chronic diseases at health care organizations.

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INTRODUCTION

In 2003, the World Health Organization (WHO) reported that approximately 50% of patients with chronic illnesses in developed countries do not take medications as prescribed, ultimately leading to increased morbidity, mortality, and costs (Sabaté, 2003). In the United States, 33–69% of all medication related hospitalizations are linked to poor medication adherence (Alvin *et al.,* 2017). A key component in the management of a patient with chronic health problem is the assessment of its adherence with therapeutic regimen. Low levels of patient adherence with disease plans compromise the effectiveness of the therapies and have been associated with an increased risk of adverse health outcomes, an increased health care expenditure through hospital admissions and hospital care, a lower quality of life, and a higher rate of mortality (Napolitano *et al.,* 2016).

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Improving medication adherence with chronic diseases has been historically challenging due to its complex and patient-specific nature. Even in well controlled clinical trials for the treatment of chronic conditions, medication adherence has ranged from 43–78%. Results from the National Health and Nutrition Examination Survey revealed an increase in the percentage of adults in the United States (US) using any prescription drugs, from 51% to 59% between 1990–2000 and 2011–2012. Similarly, the prevalence of polypharmacy, defined as the use of ⩾5 prescription drugs, increased from an estimated 8.2% to 15%. As the use of medications rises, there is a growing need to understand and improve medication adherence (Kantor *et al.,* 2015). Previous literature has repeatedly shown the inverse relationship between multiple chronic stressors, such as financial hardship, and medication adherence (Osborn *et al.,* 2014). Reasons for nonadherence are complex, multifactorial, and largely patient specific. Thus, it is important that healthcare providers develop patient-specific, effective strategies that help assess and promote medication adherence (Alvin *et al.,* 2017). There are limited data evaluating medication adherence within the insured patients and even less in the setting of a military hospital. Thus, this

study was conducted to evaluate medication use for chronic diseases in insured recipient's receiving care within a military hospital in Yemen.

METHODS

Prospective evaluation of medications for187insured patients with chronic diseases were included in the present study at the time of their visit to outpatient clinics at 48 model hospital (from October to December, 2017).Patients were eligible if they were aged 18 years and above and if they had evidence of at least one chronic disease. Patients with cognitive impairment and psychiatric diseases have been excluded. Data were collected using a face to face structured interview of the subject at the time of their visit to the hospital by using a questionnaire by investigators who were trained to understand the purpose and meaning of the study, be familiar with the contents, and be skilled with interview techniques. Prior to answering the questionnaire, the interviewer explained at each patient the intention of the study and the importance of their contribution, the pertinent information of the study, and allowed the subjects to ask any question. The patients were also informed that their participation was voluntary and that they could withdraw from the interview at any stage without any penalty if they did not wish to participate. The interview addressed five primary themes:

a) Basic information (gender, age, and level of education)
b) Drugs/drug groups used, the dosage and the length of medication;
c) Adherence to prescribed medications;
d) Taking medication according to prescription; and
e) Recognition of medication

The Morisky Medication Adherence 4-item Scale (Morisky *et al.,* 1986) (MMAS-4) was used to measure patients' self-reported adherence to their medications. The instrument has been widely used and it has been demonstrated to be accurate to assess medication adherence in patients with chronic diseases. This scale measures adherence through four questions: (a) Do you ever forget to take your medicine? (b) Are you careless at times about taking your medicine? (c) When you feel better do you sometimes stop taking your medicine? (d) Sometimes, if you feel worse when you take your medicine, do you stop taking it? Each item has a no/yes response option, and to each 'yes' response is assigned a score of one and to each 'no' response a score of zero, allowing a total possible score ranging from zero (full compliance) to four (worst compliance). A patient was considered to be adherent to the medications if there was a lack of a 'yes' response, and non-adherent if the score ranged from one to four. Patient reported that he recognized the medication if he knew the name of all his medication or the indication of all these medication. The study protocol was approved by the Ethics Committee of Al-Razi University and 48 Model Hospital.

RESULTS

Table1 was indicated that the mean age was 60.33 ± 10.1 and ranged between 35 and 85 years. Out of the patients, (64.2%) were males and (35.8%) of them was female. Among 187 of patients, (32.6%) had HTN, (26.7 %.) had HTN+DM and (20.3%) had HTN+IHD. However, only (1.1%) of patients have IHD+CVA. Up to half of patients (52.9%) were non-educated. 88.8% of patients take of medication according to prescription with 89.9% medication recognition.

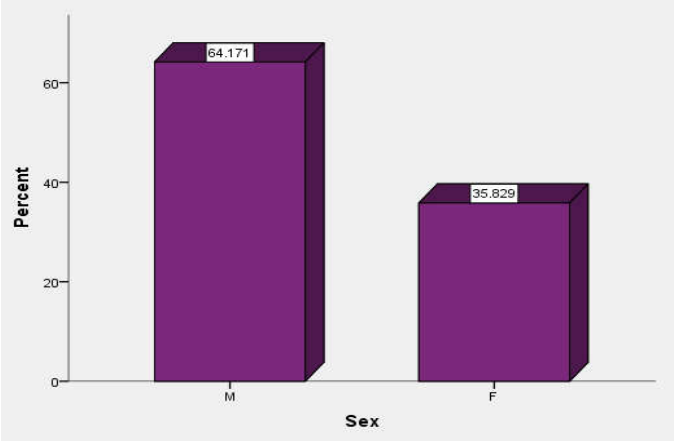

Figure 1. Distribution of Patients According to Sex

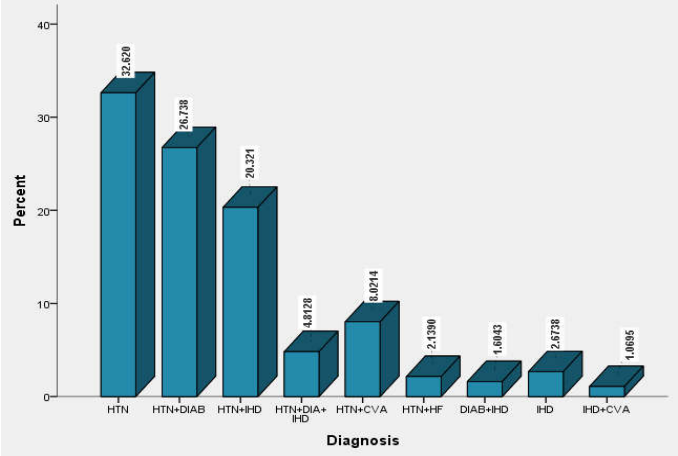

Figure 2. Distribution of Patients According to Diagnosis

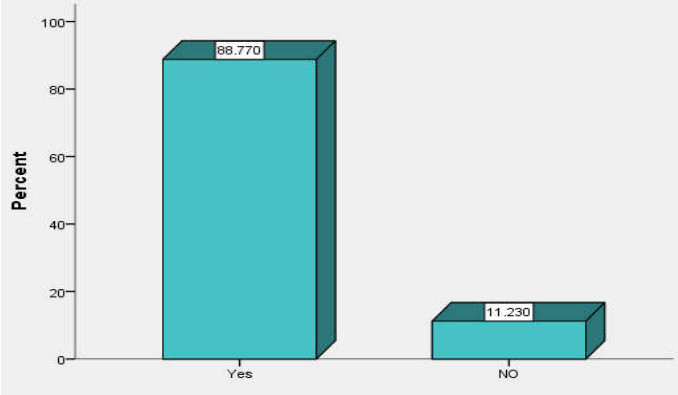

Figure 3. Taken of Medication According to Prescription

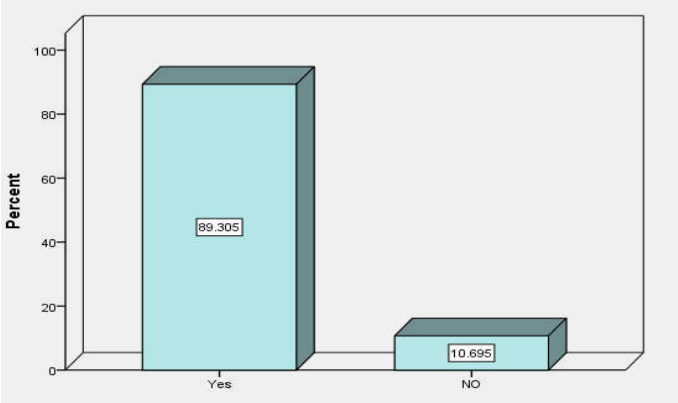

Figure 4. Recognition of Medication

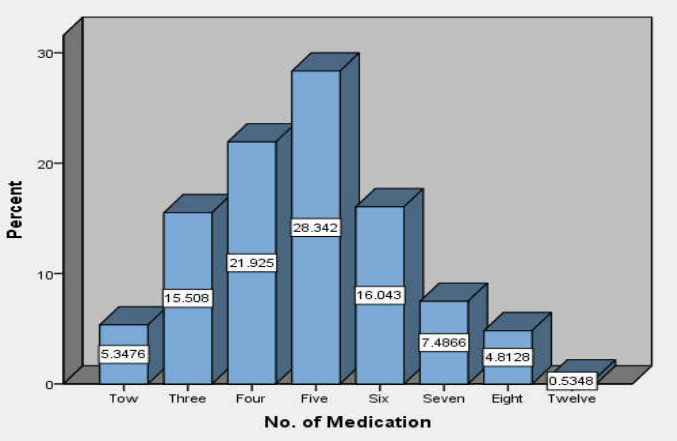

Figure 5. Distribution of Medication Number

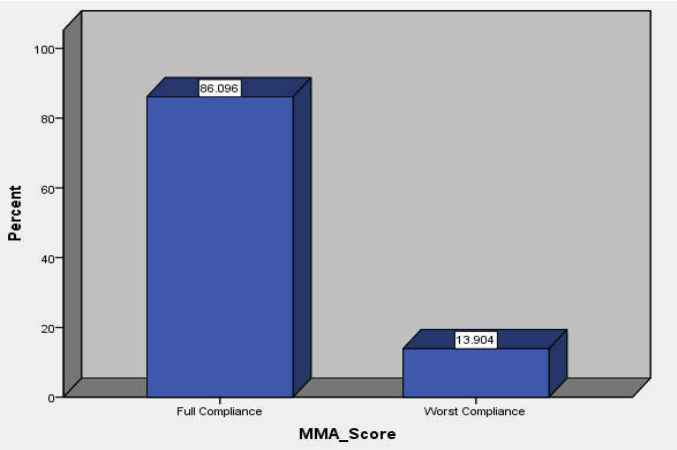

Figure 6. Distribution of Compliance Status According to MMA Score

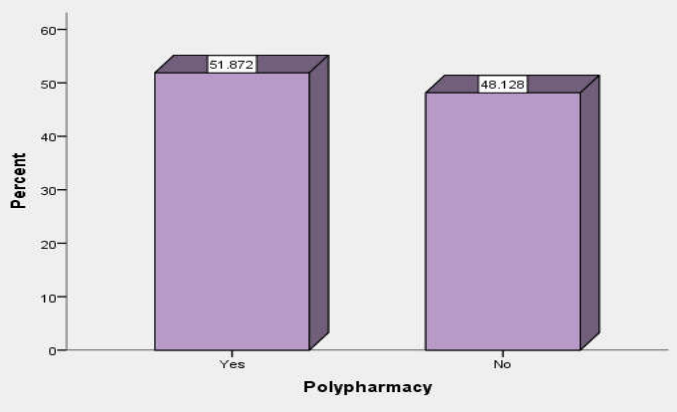

Figure 7. Distribution of polypharmacy among the patients

Among 187 of patients, 51.9% have more than five types of drugs and 86.1% of them were high adherence to use the drugs. In the present study, the relationship between medication recognition and take of medication according to prescription was statistically significant (*P-value*= 0.001), out of 187 patients, 165 patients taken the medication according to prescription and recognized their medications (Table 2). X^2 test between MMA score and medication recognition shown statistically significant association (*P-value* = 0.001), 161 of patients were full compliance and 149 of them were recognized their medication (Table 3). Table 4 showed the relationship between medication recognition and number of medication was not statistically significant (*P-value* = 0.094), 167 of patients recognized their medication.

Table 1. Frequency of study variables

Variable*	Level of variable	Frequency	Percent (%)
Sex	Male	120	64.2
	Female	67	35.8
	Total	187	100
Diagnosis	HTN	61	32.6
	HTN+DM	50	26.7
	HTN+IHD	38	20.3
	HTN+DM+ IHD	9	4.8
	HTN+CVA	15	8
	HTN+HF	4	2.1
	DM+IHD	3	1.6
	IHD	5	2.7
	IHD+CVA	2	1.1
	Total	187	100
Education Status	Yes	88	47.1
	No	99	52.9
	Total	187	100
Take of Medication According to Prescription	Yes	166	88.8
	No	21	11.2
	Total	187	100
Recognition of Medication	Yes	167	89.3
	No	20	10.7
	Total	187	100
Polypharmacy	Yes	97	51.9
	No	90	48.1
	Total	187	100
MMA-Score	Full Compliance	161	86.1
	Worst Compliance	26	13.9
	Total	187	100
Age	Mean	Std. Deviation	Std. Error of Mean
	60.33	10.099	0.739

Table 2. Distribution of medication recognition according to take of medication

Variable		Medication Recognition		Total	*P-value*
		Yes	No		
Take of Medication according to Rx	Yes	165	1	166	0.001
	No	2	19	21	
	Total	167	20	187	

Table 3. Distribution of Medication Recognition according to MMA Scale

Variable		MMA Scale		Total	*P-value*
		Full Compliance	Worst Compliance		
Medication Recognition	Yes	149	18	167	0.001
	No	12	8	20	
Total		161	26	187	

Table 4. Distribution of medication recognition according to medication number

Variable		Medication Recognition			*P-value*
		Yes	No	Total	
Number of Medication	Tow	10	0	10	0.094
	Three	29	0	29	
	Four	33	8	41	
	Five	44	9	53	
	Six	29	1	30	
	Seven	13	1	14	
	Eight	8	1	9	
	Twelve	1	0	1	
	Total	167	20	187	

In this study, there was no relationship between MMA Score and medication number (*P-value* = 0.411). However, 161 patients were full compliance and 94 of them were taken ⩾5 type of drugs (Table 5).

Table 5. Distribution of Medication Number According to MMA Score

Variable		MMA Score (Compliance)		Total	*P-value*
		Full Compliance	Worst Compliance		
No. of Medication	Tow	10	0	10	0.411
	Three	26	3	29	
	Four	31	10	41	
	Five	46	7	53	
	Six	26	4	30	
	Seven	13	1	14	
	Eight	8	1	9	
	Twelve	1	0	1	
Total		161	26	187	

Table 6. Distribution of Number of medication according to diagnosis

Variable		No. of Medication								Total	*P-value*
		Tow	Three	Four	Five	Six	Seven	Eight	Twelve		
Diagnosis	HTN	8	16	16	16	5	0	0	0	61	0.001
	HTN+DM	0	3	11	16	8	8	4	0	50	
	HTN+IHD	0	4	11	12	6	3	2	0	38	
	HTN+DM+ IHD	0	1	0	1	4	1	1	1	9	
	HTN+CVA	0	3	3	4	3	1	1	0	15	
	HTN+HF	1	1	0	0	1	1	0	0	4	
	DM+IHD	0	0	0	1	1	0	1	0	3	
	IHD	0	1	0	2	2	0	0	0	5	
	IHD+CVA	1	0	0	1	0	0	0	0	2	
	Total	10	29	41	53	30	14	9	1	187	

Table 7. Distribution of education status according to sex, taken of medication according to prescription, and medication recognition

Variable		Education Status		Total	*P-value*
		Yes	No		
Sex	M	78	42	120	0.001
	F	10	57	67	
	Total	88	99	187	
MMA Scale	Worst Compliance	12	14	26	
	Full Compliance	76	85	161	0.55
	Total	88	99	187	
Take of Medication According to Prescription	Yes	78	88	166	0.96
	No	10	11	21	
	Total	88	99	187	
Recognition	Yes	78	89	167	0.78
	NO	10	10	20	
	Total	88	99	187	

Table 8. Distribution of education status according to age group

Variable		Take of Medication according to prescription		Total	*P-value*
		Yes	No		
Age group	35-44	4	0	4	0.758
	45-54	42	4	46	
	55-64	63	7	70	
	65-74	38	7	45	
	75-85	19	3	22	
	Total	166	21	187	

Table 9. Distribution of medication recognition according to age group

Variable		Medication Recognition		Total	*P-value*
		Yes	No		
Age group	35-44	4	0	4	0.872
	45-54	42	4	46	
	55-64	63	7	70	
	65-74	39	6	45	
	75-85	19	3	22	
	Total	167	20	187	

The relationship between type of diagnosis and medication number was analyzed in the table 6. Results in this table showed statistically significant relationship (P-value = 0.001). 61 of patients had HTN and taken 2-6 type of drugs, 50 of patients have HTN+DM with 3-8 types of drug. The relationship between education status and sex was statistically of 67 female patients were educated. However, the relationship between education, take of medication according to prescription, and medication recognition was not observed (P – value 0.96 and 0.78 respectively). Also there was no statistically significant difference was observed between education status and MMA Scale (*P-value*= 0.55) (Table 7).

Table 10. Distribution of age group according to type of diagnosis

Variable		Age Group					Total	*P-value*
		35-44	45-54	55-64	65-74	75-85		
Type of Diagnosis	HTN	0	14	25	11	11	61	
	HTN+DM	2	15	13	18	2	50	
	HTN+IHD	1	8	14	9	6	38	
	HTN+DM+ IHD	1	2	4	2	0	9	
	HTN+CVA	0	4	7	2	2	15	0.503
	HTN+HF	0	1	3	0	0	4	
	DM+IHD	0	0	1	2	0	3	
	IHD	0	2	2	1	0	5	
	IHD+CVA	0	0	1	0	1	2	
	Total	4	46	70	45	22	187	

Table 11. Distribution of compliance according to diagnosis

Variable		MMA-Scale (Compliance)		Total	*P-value*
		Full Compliance	Worst Compliance		
Diagnosis	HTN	53	8	61	
	HTN+DM	44	6	50	
	HTN+IHD	31	7	38	
	HTN+DM+ IHD	9	0	9	
	HTN+CVA	11	4	15	0.531
	HTN+HF	4	0	4	
	DM+IHD	2	1	3	
	IHD	5	0	5	
	IHD+CVA	2	0	2	
	Total	161	26	187	

Table 12. Distribution of patients with polypharmacy according to diagnosis

Variable		Polypharmacy		Total	*P-value*
		Polypharmacy	Non-polypharmacy		
Diagnosis	HTN	21	40	61	
	HTN+DM	31	19	50	
	HTN+IHD	21	17	38	
	HTN+DM+ IHD	8	1	9	
	HTN+CVA	9	6	15	
	HTN+HF	1	3	4	0.01
	DM+IHD	2	1	3	
	IHD	4	1	5	
	IHD+CVA	0	2	2	
	Total	97	90	187	

Table 13. Distribution of taken of medication according to prescription according to diagnosis

Variable		Take of Medication according to Rx		Total	*P-value*
		Yes	No		
Diagnosis	HTN	56	5	61	
	HTN+DM	44	6	50	
	HTN+IHD	31	7	38	
	HTN+DM+ IHD	8	1	9	
	HTN+CVA	13	2	15	0.819
	HTN+HF	4	0	4	
	DM+IHD	3	0	3	
	IHD	5	0	5	
	IHD+CVA	2	0	2	
Total		166	21	187	

Table 14. Distribution of medication recognition according to diagnosis

Variable		Medication Recognition		Total	*P-value*
		Yes	No		
Diagnosis	HTN	57	4	61	
	HTN+DM	44	6	50	
	HTN+IHD	31	7	38	
	HTN+DM+ IHD	8	1	9	
	HTN+CVA	13	2	15	0.720
	HTN+HF	4	0	4	
	DM+IHD	3	0	3	
	IHD	5	0	5	
	IHD+CVA	2	0	2	
Total		167	20	187	

Table 15. Distribution of polypharmacy according to MMA scale, take of medication according to prescription, and medication recognition

Variable		Polypharmacy		Total	*P-value*
		Yes	No		
MMA-Scale (Compliance)	Full Compliance	84	79	161	0.84
	Worst Compliance	13	13	26	
	Total	97	92	187	
Take of Medication according to Rx	Yes	88	78	166	0.38
	No	9	12	21	
	Total	97	92	187	
Medication Recognition	Yes	87	0.86	167	0.86
	No	10	10	20	
	Total	97	90	187	

Table 16. Distribution of Morisky scale according to medication recognition and take of medication according to prescription

Variable		MMA-Scale (Compliance)		Total	*P-value*
		Full Compliance	Worst Compliance		
Take of Medication According to Prescription	Yes	149	17	166	0.001
	No	12	9	21	
	Total	161	26	187	
Medication Recognition	Yes	149	18	167	0.001
	No	12	8	20	
	Total	161	26	187	

Table 17. Distribution of polypharmacy according to age groups

Variable		Polypharmacy		Total	*P-value*
		Yes	No		
Age Group	35-44	3	1	4	0.5
	45-54	27	19	46	
	55-64	32	38	70	
	65-74	25	20	45	
	75-85	10	12	22	
Total		97	90	187	

Table 18. Distribution of polypharmacy according to sex

Variable		Polypharmacy		Total	*P-value*
		Yes	No		
Sex	M	60	60	120	0.5
	F	37	30	67	
Total		97	90	187	

According to the study results, statistically significant relationship between take of medication according to prescription and patient age was not observed. However, 63 of patients were taken of medication according to prescription aged 55-64 years (Table 8). Also the relationship between medication recognition and age group was not statistically significant. However, only 20 patients were not recognized their medication and high medication recognition was observed in patients aged 55-64 years (Table 9). The relationship between type of diagnosis and age group was not statistically significant. However, 70 of total patients were aged 55-64 years, 25 of them have HTN and 14 patients have HTN+IHD (Table 10). Because we have 139 combination of drug that used to treatment the patients so large frequency distribution table and cross table in analyze type of medication, this variable had statistically significant relationship with type of diagnosis, X2=1273.43 (P<0.001). The relationship between MMA-Scale and diagnosis was not statistically significant. However, 44 of total full compliance patients had diagnosis of HTN+DM (Table 11). According to the study findings, the relationship between polypharmacy and diagnosis was statistically significant (*P-value* = 0.01). 97 of total patients were polypharmacy and 31 of them had HTN+DM. However, 40 of total non-polypharmacy patients were HTN (Table 12). The relationship between take of medication according to prescription and diagnosis was not statistically significant (*P-value*= 0.819). However, 166 of total patients were taken medication according to prescription and 56 of them had HTN (Table 13). The relationship between take of medication according to prescription and diagnosis was not statistically significant (P-*value* = 0.720). However, 167 of total patients recognized their medication and 57 of them had HTN (Table 14). The relationship between recognition of medication and patients with polypharmacy was not statistically significant (*P-value* = 0.86). However, 167 of total patients recognized their medication and 87 of them had polypharmacy. In addition, there were not statistically significant differences between the polypharmacy, Morisky scale score (*P-valu*e = 0.84), and taken of medication according to prescription (*P-value* = 0.38) (Table 15). The relationship between MMA Scale, take of medication according to prescription, and medication recognition were statistically significant (*P-value* = 0.001), 149 of patients who taken of medication according to

prescription recognized their medication (Table 16). The relationship between polypharmcy and age group was not statistically significant (*P-value*= 0.5). According to patients with polyparmacy factor, 70 of total patients were aged between 55-64 years and 32 of these patients were polypharmacy. Also 69.1 % (n=67/97) of total polypharmacy patients were aged ≥ 55 (Table 17). Also the relationship between polypharmcy and sex was not statistically significant (*P-value*=0.5). According to patients with polyparmacy, 61.9 % (n=60/97) of these patients were males. However, 37 (38.1%) of patients were females (Table 18).

DISCUSSION

This study determined the level of adherence to prescribed medications and its predictors among adult insured patients with chronic diseases and it has important implications to clinical practice. The comparison in the level of adherence with similar international literature from both developed and developing countries is difficult and the differences could be explained by the characteristics of the population, the data collection tools, operational definitions and measurements of adherence, and the disparities in health care systems such as, for example, access to health care and drug dispensing regulations. Comparisons with previous research across countries that have used the MMAS-4 indicated that the prevalence of adherence of 86.1% found in this study was higher than 39.3 % of medication adherence among patients with chronic conditions in Italy, the 18% in patients with chronic conditions in Spain (Jansa *et al.,* 2010), and the 4.6% in adults with epilepsy in China (Shalansky, 2012). According to the study results, the relationship between medication recognition and take of medication according to prescription was statistically significant (*P-value* = 0.001). This may be related to the fact that older people usually make use of continuous medications, which might be associated with greater knowledge (Cruzeta *et al.,* 2010). Shalansky found that patients in long-term treatment for cardiac disease had better adherence with more prescriptions (Shalansky, 2012). A distinct result was found in another study, carried out with Unified Health System users in the municipality of Tubarao, Santa Catarina, Brazil, in which younger people understood the medication prescription better, when compared with older people (Mengue *et al.,* 2016). The relationship between type of diagnosis and medication number was statistically significant relationship (*P-value*= 0.001). The explanation is that the simultaneous treatment of many chronic health conditions can result in polypharmacy, complex regimens in which medicine is taken many times a day, involving drug risks and predisposition to non-adherence (Sabaté, 2003). The demographic transition we are currently experiencing, with an increase in the number of chronic diseases, has led to a growing use of medicines, especially among older adults [12].According to the study findings, polypharmacy was significantly associated with chronic disease. In addition, 97 of total patients were polypharmacy and 31 of them had HTN+DM. The co-occurrence of HTN with DM and HTN with IHD increased the risk of polypharmacy in comparison with the single diseases. Extensive use of multiple drugs is common in these patients and is recommended by international guidelines. In diabetics, polypharmacy is often unavoidable, since multiple drug therapy has become the standard for most of its common comorbidities, and the potential for marked polypharmacy is likely continue to rise as more therapeutic options become available.

Advances in cardiovascular drug treatment have increased life-expectancy. However, polypharmacy is neither always efficacious nor safe, and often leads to inappropriate drug use, poor compliance, increased morbidity and costs (Volpe *et al.,* 2010). A new approach to reducing the risks and maximizing the benefits of polypharmacy might include the identification of patient groups particularly at risk of being prescribed with polypharmacy. Furthermore, the next step in this field should be the identification of the optimal treatment, in term of both number of medications and most important appropriateness of prescription for each cluster of diseases. This finding should not prompt health care providers to advocate polypharmacy, of course, because multiple drug interactions are a significant concern. However, when multiple drugs are clinically indicated, one can be cautiously optimistic about a patient's ability to adhere to treatment, given appropriate instruction and support. Another factor described as one of the most important related to treatment adherence is medication costs (Maciejewski *et al.,* 2014).

In Brazil study, the highest prevalence of low adherence to treatment was found among individuals who had to pay part of their treatment compared to those who had free access to all medicines needed to treat reported chronic diseases. This finding supports the fact that drugs not insured coverage can lead users to abandon prescribed treatments for not being able to buy them in the private sector with their own resources (Mendes *et al.,* 2014). The complexity of the therapy schedule also seems to contribute greatly to adherence to treatment (Iskedjian *et al.,* 2012). Regarding sex, most national and international surveys (Charlesworth *et al.,* 2015; Silveira *et al.,* 2014) indicate that women seek more health services and that condition inherent to their reproductive role, such as pregnancy and contraception, may explain the increased use of medicines. In contrast, 61.9 % (n=60/97) of polyphaarmacy patients were males and 37 (38.1%) of patients were females in the present study. However, this study did not observe association between gender and polypharmacy. In this study, there was not statistically significant between education status and patient compliance. Similarly, the study by O'Dwyer *et al.* 2016 reported no significant relationship between medication compliance and educational level.

Also this comes in agreement with results from Sabate study in 2003 that found no effect of educational on compliance. Although, Nichols-English study in 2000, indicated that patients with low literacy skills are less likely to adhere to their medication regimens (Nichols-English and Poirier, 2000). This study demonstrated the effectiveness of insured coverage for patients with chronic diseases in improving the knowledge and adherence of primary care patients, especially the elderly, towards their medications. This is important because adherence rates are typically lower among patients with chronic conditions, often dropping dramatically after the first six months of therapy (Goh *et al.,* 2014). According to MMAS-4 scale, this study has shown that about 13.9% of the study population reported non-adherence to chronic medications. This finding is lower than the rates (ranging from 30–60%) reported by the World Health Organisation (Sabaté, 2003). In study conducted in Saudi Arabia, patients with chronic diseases, multiple medications and complex regimens were more likely to adhere to their long-term medications (Alhewiti, 2014). However, the present study could not find any association between number of medications and adherence level.

The difference in the percentages of adherence rate between the literature and current study may be related to the difference in the study population, patients' knowledge, health literacy, and complexity of patients' regimens and health conditions. This indicates the health insurance scheme helps patients in compliance medications. Other studies showed that insurance make some patients completely dependent on this facility and they do not buy missing medications from outside which they would have done leading to non-compliance in medication (Mujtaba *et al.,* 2010) Many review reports showed that at least half of patients with chronic diseases did not adhere to their long-term therapies (Sabaté, 2003; Wang *et al.,* 2009). Studies of polypharmacy in the population have shown that it is most frequently observed among elderly people (Bjerrum *et al.,* 1997). Also the prevalence of polypharmacy was 27.8% with age group 45 - 54 and 33% with the age group of 55 – 64 years, while this percent declines to 25, 8 % among patients aged 65-74 years and 10.3 % with age group 75-85 years. The prevalence of polypharmacy among very old individuals (>80 years of age) was somewhat lower than among the elderly in general.

Helling *et al.* found that the mean number of prescription drugs increased with age until the age of 85 years for women, and the age of 80 years for men, after which the mean number of prescription drugs decreased (Helling *et al.,* 1987). The majority of the studies showed that age was related to compliance, although a few researchers found age not to be a factor causing non-compliance (Wild *et al.,* 2004; Wai *et al.,* 2005). In a study carried out in UK, patients over 60 years old were more likely to be always compliant with their antiepileptic tablets than patients under 60 years old (86% vs 66%, respectively) (Buck *et al.,* 1997). However, some studies found that advancing age affected compliance among elderly people in the opposite direction. The study by Balbay *et al.* was carried out in a rural area of Turkey among patients with tuberculosis and found that younger patients were more compliant to treatment than older patients (Balbay *et al.,* 2005) (Balbay *et al.,* 2005). This might be due to the low education level of older patients. In the present study, 69.1 % (n=67/97) of total polypharmacy patients (on ≥5 prescription medications) were aged ≥ 55(table 17). It was higher than study findings in USA by National Center for Health Statistics investigation that reported that approximately a third of persons over age 60 were on ≥5 prescription medications in 2007–2008.

Conclusion

The results of this study provided evidence about the high prevalence of adherence to prescribed medications in insured individuals affected by chronic diseases. Also the findings of this study, in these insured patients, reported not relationship between medication recognition and number of medication, compliance and number of medication, education and compliance, take of medication according to prescription and age group, medication recognition and age group, compliance and type of diagnosis, take of medication according to prescription and type of diagnosis, polypharmacy and compliance, polypharmacy and take medication according to prescription, polypharmacy and medication recognition, polypharmacy and age group, and polypharmacy and sex.This suggested the positive role of insurance coverage in increasing the compliance rate among patients with chronic diseases at health care organizations.

Conflict of interest: The authors declare that they have no competing interests.

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