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Faculty of Graduate Studies

Analysis of beliefs about medicines and medication adherence in patients with chronic diseases at the Military Medical Services, Nablus, Palestine

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Dedication

To my lovely parents

To my precious husband

To my adorable daughters

To my brothers and sisters

To all whom I love

Acknowledgment

I can find no words to express my sincere appreciation and gratitude to my supervisor Prof Waleed Sweileh for his endless support, continual encouragement and help throughout the course of this study.

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My thanks also go to all people who have in some way helped me to continue this work.

الإقرار

أنا الموقعة أدناه، مقدمة الرسالة التي تحمل عنوان:

Analysis of beliefs about medicines and medication adherence in patients with chronic diseases at the Military Medical Services, Nablus, Palestine

دراسة تحليلية للمعتقدات حول الأدوية والانضباط الدوائي لدى المرضى ذوي الأمراض المزمنة في الخدمات الطبية العسكرية، نابلس، فلسطين

اقر بأن ما اشتملت عليه هذه الرسالة إنما هو نتاج جهدي الخاص، باستثناء ما تمت الإشارة إليه حيثما ورد، وأن هذه الرسالة كاملة، أو أي جزء منها لم يُقدم من قبل لنيل أي درجة أو لقب علمي أو بحثي لدى أي مؤسسة تعليمية أو بحثية أخرى.

Declaration

The work provided in this thesis, unless otherwise referenced, is the researcher's own work, and has not been submitted elsewhere for any other degree or qualification.

Student's name: **اسم الطالب:**

Signature: **التوقيع:**

Date: **التاريخ:**

Abbreviations

BAASIS	Basel Assessment of Adherence to Immunosuppressive Medications Scale
BMQ	Beliefs about Medicines Questionnaire
GAM	Global Adherence Measure
HBM	Health Belief Model
ICS	Inhaled Corticosteroids
IPQ-R	Illness Perception Questionnaire-Revised
IRB	Institutional Review board
MARS	Medication adherence Rating Scale
MMAS-8	8-item Morisky Medication Adherence Scale
MOH	Ministry of Health
RA	Rheumatoid Arthritis
REALM	Rapid Estimate of Adult Literacy in Medicine
SIMS-D	Satisfaction with Information about Medicines Scale
SPSS	Statistical Package for Social Sciences
SRM	Self-Regulatory Model
UK	United Kingdom
WHO	World Health Organization

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Analysis of beliefs about medicines and medication adherence in patients with chronic diseases at the Military Medical Services, Nablus, Palestine

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Abstract

Background: very few studies in the Arab world investigated patients' behavior toward medications, particularly in those with multiple co-morbid and different chronic diseases. Furthermore, most studies in this field were carried out among patients with governmental insurance which could affect the reliability and validity of the results since medications are not always available in governmental pharmacies.

Objective: to investigate how the presence of multiple chronic illnesses could affect the association between attitudes toward medicines and adherence practices in a non-governmental settings.

Methodology: **T**he Palestinian Medical Military Services in Nablus, Palestine was the main setting for the study. Presence and number of multiple chronic diseases were obtained from patients through interview setting and were confirmed by information available at the medical files. Attitudes toward medicines were evaluated by the Beliefs about Medicines Questionnaire (BMQ) while compliance / adherence behavior was evaluated by Morisky Medication Adherence Scale (MMAS-8).

Results: One hundred and eighty seven patients were interviewed. Most participants (79.6%) had positive attitude that their medicines were necessary to maintain their good health status while 58.2% of the study sample were afraid and had negative attitude or concern about taking medicines on regular basis and 57.8% were afraid that they will get addicted and become dependent on their medicines. In the presence of multiple chronic diseases, demographic and clinical factors were not significantly associated with adherence practices. However, in patients with multiple chronic diseases, those who had higher positive attitudes and feeling of necessity had higher odds [1.4 (1.1 - 1.9)] of having adherence practices while those who had higher negative attitudes or concerns or fear about medicines had lower odds [0.8 (0.65 – 0.98)] of having adherence practices.

Conclusions: In patients with multiple chronic diseases, positive and negative attitudes toward medicines are significant determinant of adherence practices.

Chapter One

Introduction

Chapter One
Introduction

1.1 Background

It is well known that the majority of patients, particularly elderly ones have multiple chronic diseases. The presence of multiple chronic illnesses will assumingly mean that patients will have to take several different medications which might affect their attitudes toward medications and consequently their adherence practices. Adherence, compliance or concordance has been defined by several researchers and different international health authorities as the degree to which a patient abides by recommendations delivered to him/her by healthcare providers. Compliance or adherence is applied not only to medicines but also to other behaviors like following a particular diet, and/or changing and implementing specific lifestyle changes [1]. Compliance in general is a detrimental factor in obtaining expected therapeutic outcome in patients with multiple overlapping chronic diseases like hypertension and diabetes mellitus or rheumatoid arthritis (RA) and peptic ulcer disease or ischemic heart disease and over-reactive urinary bladder [2]. Lesser than expected therapeutic outcome in patients with multiple chronic diseases due to poor compliance/ adherence practices have been reported to increase risk of money loss, morbidity and mortality [3, 4]. It has been a real challenging situation for many researchers in health field to measure the impact of multiple chronic diseases on attitude, beliefs, fears, behavior, compliance of this category of patients who are being exposed to multiple advices,

multiple medications, multiple risks of death and multiple types of physicians with different specializations who need to monitor those patients [5]. It is a naïve thinking to assume that patient' attitudes and practices toward medicines are mainly influenced by age, gender, marital status, residence and other demographic factors [6, 7]. Definitely, personal attitude toward disease and medicines can influence patient's compliance and practices. Actually, there exist a multi-factorial model including demographic, clinical, attitude/ behavioral, compliance practices and cultural that could ultimately influence therapeutic outcome in patients with more than one chronic illness [8]. The psychological and mental status and their impact on patient's practices have not been well investigated or seriously considered among patients from Arabic race or ethnicity. In contrast, such factors have been of great consideration in other cultures particularly European and American cultures. Another real challenge was how to measure attitude and how to measure compliance and is there really a difference in attitude and compliance practices among patients based on number or type of chronic disease? Compliance which is interchangeably used for the word adherence could be measured by sophisticated and expensive techniques and could be measured simply and inexpensively by narrative or self-reporting methods like the one developed by professor Morisky D. and translated and used in different clinical settings with high accuracy and validity [9-12]. The other challenge facing health researchers is how to measure attitude or belief or positivity or negativity toward medicines and how ultimately this is influenced by number or type of

chronic illness. Part of this challenge was solved by development of a special tool to measure attitude/ belief in a narrative estimative way. This tool is called “Beliefs about Medicines Questionnaire (BMQ)” [7, 13]. This tool is comprehensive in terms of measuring attitude. Thus it can measure attitude toward specific medicines or attitude toward medicines in general. It also can measure positive attitude as measured by necessity feelings and can also measure negative attitude by measuring fears from medicines. All this is carried out in a simple format that can be applied in any setting and be interpreted to help improve patient’s practices and therefore expected therapeutic outcomes [14].

One might ask if it is really true that attitude and practices of patients from different cultures and races are different. Actually this is a valid question given that the attitude of people from different cultures toward health and their understanding of disease and treatment might be different. No doubt that religion, alternative medicine, herbal therapy and even magic are common practices in Arab world. People in this region do seek for any traditional medicine either along with modern medicine or as an alternative to modern medicine. This simply means that in Arabic culture, attitude toward medicines and diseases are not the same as those in Asia, China, Canada, France or Australia [15]. Studies about beliefs in medicines in general and particularly its association with medication adherence are very few in the Arab world [16, 17]. Therefore, studies that explore attitude, belief, concern, medication compliance and adherence practices are needed in the Arab world. No doubt that all these factors have been carried out as

separate studies and as studies that took into consideration each factor alone. For example, compliance or adherence has been investigated in the Arab world, but in a particular and well known disease setting like diabetes [18] and not in multiple chronic disease settings regardless of the type of the disease. Furthermore, the investigation was carried out using a single dimension, which is demographic and clinical dimension. The psychological dimension as defined by attitude or belief was ignored. This made all previously published studies had 2 drawbacks: (1) investigation of a single type of diseases, and (2) negligence of the attitude factor. Actually, only one study from Arab countries partially avoided the above drawbacks which investigated attitude and practices in a single disease setting which was depression [16].

1.2 Objectives

Therefore, based on the background the objectives of the study were to investigate the interrelation cycle between psychological factors; defined at attitude or belief; with compliance practices and therapeutic outcomes. Particularly, (1) to assess attitude and belief toward medicines and its interrelation with compliance/ adherence practices; (2) to investigate the interrelationship between attitude and medication compliance practices in a multiple chronic disease settings.; and (3) to develop a model with strong predictors for this interrelation which can serve in any disease setting rather than in a specific type of disease.

1.3 Statement of the Problem

Studies about adherence in the Arab world have the shortcomings of being carried out in a single disease setting not in chronic diseases in general, and negligence of the psychological variables that may affect adherence. Our study included patients with chronic diseases in general and assessed the relationship between adherence and the psychological dimension (medication beliefs/attitude).

1.4 Significance and Expected outcome of the Study

Developing an interrelation model between all expected psychological and non-psychological variables and in any disease setting will serve as tool for clinical pharmacists in various clinical settings to improve therapeutic outcomes through intervention that is directed toward significant predictors. Furthermore, this model will serve as a research tool for further research and investigation to reach an optimum model to be implemented for purposes of improving health status of patients and improve healthcare services in Palestine and other Arab countries. This study might sound theoretical in its approach but once clinical pharmacy counseling services start to be implemented in Palestine and other Arab countries, the conclusion of this study can be adapted and implemented through patient counseling sessions and will help make the efforts of clinical pharmacists directed and individualized. Finally, we assume that this study will give a global model for Palestinians and Arabs regardless of the disease and therefore no need to have a model for each type of chronic

illness. This is considered an ultimate goal and will make our approach in clinical pharmacy counseling more collective, comprehensive and unified. If we could prove the efficacy and validity of such model, then our next step in improving the pharmacy profession will be easier. It will ultimately create better dialogue among healthcare professionals regarding the role of clinical pharmacists in Palestine and how to invest in those professional people in a more economic and scientific way. Pharmacists are the cornerstone to improve patient education and knowledge especially for patients with chronic diseases. This in turn will improve their medication practices and ultimately therapeutic outcomes and economic health burden. Last but not least, focus on clinical pharmacy studies should be shifted from patients with governmental insurance to those with other types of insurance or to those having no insurance at all. Governmental Palestinian insurance is not perfect. This makes all conclusions drawn from studies on patients with governmental studies imperfect too and an alternative category of patients must be sought.

Chapter Two
Literature Review

Chapter Two
Literature review

Many studies were carried out internationally, regionally and locally that investigated the interrelationship between patient's attitude, belief, compliance practices and therapeutic outcome. At least, those carried out regionally and locally have the following major drawbacks that we tried to avoid in the current project:

1. Use of a single disease setting like diabetes mellitus or hypertension or schizophrenia or asthma …. etc

2. Use of a single set of variables like demographic or clinical and the absence of the psychological dimension in the analysis

3. Focus on patients with governmental medical insurance and it is known that medicines are not always available in the governmental stores and pharmacies which will affect the results of the study and make results vary from one author to another.

Below is a summary of most important relevant studies carried out internationally or at the regional and local level focusing on the concept stated above. The list is not a comprehensive one, rather, it is meant to focus and expose the drawbacks listed above and how our project will differ from the published ones. The single disease state in each study was written in bold and underlined.

1. A study carried out in **Palestine which focused on patients with diabetes** mellitus and those with governmental insurance assessed

attitude and medication practices and found that positive and negative attitudes were significantly associated with non-adherence [19].

2. A study carried out in Egypt to assess attitude, belief and practices among **Egyptian patients with depression** using Medication Adherence Rating Scale (MARS) and a Global Adherence Measure (GAM) found that belief in necessity and concerns highly correlated with adherence [16].

3. A study conducted on **diabetic patients** in Iran using the Illness Perception Questionnaire-Revised (IPQ-R), the BMQ, and the MARS found that illness perception predicted higher level of adherence while high concerns about medicines predicted low levels of adherence [20].

4. A study carried out on **asthma patients** using inhaled corticosteroids found out that beliefs about medication necessities were highly correlated with adherence practices [21].

5. A study carried out **on patients with diabetes mellitus** using MARS scale found that necessity beliefs weren't strongly associated with adherence practices while concerns were highly associated with intentional non-adherence [22].

6. A study carried out in USA using (MMAS-8) BMQ, and Rapid Estimate of Adult Literacy in Medicine (REALM) found that negative attitude about medications and younger age were significant predictors of non-adherence [23].

7. A study conducted on patients with **mental illnesses** using BMQ and serum concentration of medications found that non-adherent patients had less necessary feelings about medications and were more concerned and afraid about medications [24].

8. A longitudinal study on patients with **multiple illnesses** found that adherence in older adults with multiple chronic diseases were affected by psychological attitude and belief [25].

9. A study conducted on patients with **depression** using the BMQ found that adherence and severity of depressive symptoms were significantly affected by attitudes and beliefs about medicines [26].

10. A study on **bipolar patients** using the BMQ found that non-adherence was associated with patients' fears and concerns and with doubts about the individual need for such medications [27].

11. A study on **HIV patients** found that non-adherence was associated with poor symptoms, concerns and fears while positive attitude predicted better adherence [28].

12. A study conducted in Germany among patients with **chronic illnesses** using the Medication Adherence Report Scale (MARS-D) and the Satisfaction with Information about Medicines Scale (SIMS-D) found that most patients had positive beliefs about their medications and that high concerns were associated with higher non-adherence [29].

13. A study used the General-BMQ and the MARS to assess beliefs and adherence found that general harm was associated with adherence and that general beliefs about medicines were influenced by country of birth, medicine use and education [30].

14. A study about ICS in **asthma patients** using pharmacy refill records and the MARS found that adherence was correlated with the necessity and concern beliefs about ICS [31].

15. A cross-sectional study using BMQ and the MMAS-8 found that specific concerns, general harm and general overuse were positively associated with non-adherence while specific necessity was negatively associated with non-adherence [32].

16. A study about **antiepileptic drugs** found that non-adherence was related to general beliefs about medicines [33].

17. A cross-sectional study used the brief illness perception questionnaire found that non-adherent patients had lower scores on positive beliefs about medicines, higher scores on negative beliefs, and non-adherent patients believed that their treatment is less useful [34].

18. A cross-sectional study conducted on **hypertensive patients** using BMQ and the Brief Illness Perception Questionnaire found that concerns, necessity and general overuse were significantly correlated with adherence [35].

19. A cohort study conducted on patients with **mood disorders** found that adherence was related to low scores of general harm and specific concern scores of the BMQ [36].

20. A study to examine adherence to and beliefs about **immunosuppressants** using the Basel Assessment of Adherence to Immunosuppressive Medications Scale (BAASIS) found that the only factor that was related to non-adherence was lack of social support [37].

21. A study about **cardiovascular medicines** following coronary artery bypass surgery found that non-adherent patients were in stronger agreement with the general harm and the general overuse scales [38].

22. A pilot study about **anti-hypertensive medications** found that non-adherence was related to concerns about medications and adherence was related to beliefs about medication necessity [39].

Chapter Three

Methodology

Chapter Three
Methodology

3.1 Study design

In contrast to most regional, local and international studies, this study was carried out on patients with Military medical insurance which is well known with its strong affordability of all types of medications most of the time. So, shortage of medications is not considered a confounder variable that would affect the attitude, belief or adherence practices of patients toward medications. The study was carried out in Military Medical Services primary healthcare clinic in Nablus, Palestine. This clinic is the main provider of medications for military personnel and their families in Nablus city which is the major city in northern West-Bank of Palestine with approximately more than 200,000 inhabitants. The clinic where the study took place offers medical services and dispenses medications free of charge for Palestinian military personnel and their families.

3.2 Study Sample

Sample size was calculated using Raosoft sample size calculator (http://www.raosoft.com/samplesize.html) assuming a margin of error of 5%, a total population of patients with chronic illness of approximately 2000 and a response rate of 90% based on researcher's observation during the pilot study. The estimated sample size will be a minimum of 130 patients. Convenience sampling method was used to recruit the required sample size.

3.3 Data Collection

Recruitment was carried out by a pharmacist who works at the Military Medical Services and is aware of the working system at the clinic. The recruitment process was carried out two days per week for 2 consecutive months in 2011. The pharmacist who was in charge of patient recruitment process and data collection visited the clinic and stayed in the clinic between 10 am and 1 pm. Inclusion criteria for the study were the followings: having at least one chronic illness for at least one year, taking at least one medication on regular basis, and have not changed their medication in the past three months. The exclusion of patients whose prescription medications have been changed more than once in the past three months was based on the idea that too many changes in prescribed medicines during a short period of time suggest that patients' therapeutic regimen has not been stabilized yet and the patient is not familiar with his medications yet. In this study, chronic illness was defined as the presence of one or more of the followings: diabetes mellitus, cardiovascular diseases, rheumatoid arthritis or osteoarthritis. Median duration of chronic illness for the study sample was calculated based on the longest duration of chronic disease in each participant.

Data collection form included demographic and clinical information about the patients, in addition to (MMAS-8) and Beliefs about Medicines Questionnaire (BMQ). (Appendices 1, 2, and 3). The interview of each patient took to least 15 minutes. A pilot test on 30 patients was carried out

to optimize the Arabic phrasing of the BMQ and MMAS-8© questions. All other demographic variables like sex, age, social status, educational level, duration, number and types of chronic illness, and number of medications used regularly were obtained directly from the patient.

3.4 Study Tools

Appendix 2 contains the tool used to assess compliance or adherence to medications. This tool is known as Morisky Medication Adherence Scale (MMAS-8©) [12]. Details of use, approval, translation were described and published in previous study [19]. MMAS-8 is an 8-items questionnaire, the first 7 questions are Yes/No questions while the 8th question is a multiple choice questions with answers of (Never/Rarely, once in a while, sometimes, usually, all the time). Each No answer is scored with 1 point except for the fifth question where the Yes answer is scored with 1 point. The 8th question is scored from 4-0 respectively, and then the answer is divided by 4 to get the question score. The total MMAS-8 score is calculated by the sum of the 8 questions scores. According to the scores adherence is classified into 3 categories: Low adherence (score <6), Medium adherence (6<score<8) and high adherence (score = 8). Based on adherence levels, patients classified as adherent (MMAS-8 score = 8) and Non-adherent (MMAS-8 score <8).

Attitude about Medicines was assessed using Beliefs about Medicines Questionnaire (BMQ) shown in appendix 3 [40]. Description of the use, translation and validity of BMQ were described in a previously

published study [19]. The BMQ consists of two parts, BMQ-specific which assesses the patients" beliefs about their own medications and BMQ-general which assess the patients' beliefs about medications in general. BMQ-specific consists of two domains: specific-necessity (5 statements) which measures how much the patient believes that his/her own medications are necessary for their health, and specific-concerns (5 statements) which assesses how much the patient is concerned from taking his/her medications. The general part of BMQ also consists of two domains: General-overuse (4 statements), which describes the patients' beliefs about the overuse of medications by doctors, and General-harm (4 statements) which describes the beliefs held by patients about the harm of the medications in general. Each sentence of the BMQ is answered with strongly agree. Agree, uncertain, disagree, or strongly disagree and scored from 5 to 1 respectively. The score of each domain is calculated by the sum of the sentences score. In BMQ, higher scores means higher or stronger attitude. The specific BMQ measures necessity and concern attitudes or beliefs.

3.5 Conceptual Framework

Figure 1 represents the proposed suggested model for medication practices among patients with chronic illness. The model is unadjusted for confounding and represents the univariate relationship with medication compliance (adherence).

Figure (1): Unadjusted model for interrelationship of demographic, psychological and clinical variables with medication adherence

3.6 Ethical Approval

The study objective and protocol was explained to the patients and an informed consent was obtained. All aspects of the study protocol, including access to, use of the patient clinical information, and interview were authorized by the institutional review board (IRB) and the faculty of graduate studies before initiation of this study.

3.7 Statistical analysis

Data obtained were coded; entered and analyzed using Statistical Package for Social Sciences (SPSS; SPSS Inc., Chicago, IL, USA) program version 17. Descriptive analysis was carried out using median (lower – upper quartiles (Q1- Q3) or mean ± standard deviation (SD). Categorical data were expressed as numbers with percentages. Association between demographic/ clinical variables and level of compliance/adherence was tested using Pearson Chi-square test while associations between individual

BMQ items and medication adherence level were assessed with Mann-Whitney U test and Wilcoxon z scores. Multivariable logistic regression was conducted using variables which showed a $p < 0.05$ in bivariate analyses. Odds ratios (OR) with 95% confidence intervals (CIs) were calculated. Significance level for all analyses was set to be < 0.05.

Chapter Four

Results

Chapter Four
Results

4.1 Demographic and Clinical Characteristics of Studied Patients

The investigator met 220 patients and invited them to participate in the study. The response rate was 100%. One hundred and eighty seven met the inclusion criteria while 33 were excluded mostly because their medication regimen has been changed several times in the past 3 months. Those who met the inclusion criteria were interviewed privately and their medication attitude and practices along with their clinical conditions were obtained and analyzed.

The mean ± SD age of the studied patients was 58.6±10.5 with a median of 60 and a range of 30 – 87 years. Two thirds of the participants were males (n=123; 65.8%). Less than one third of the participants (n=56; 29.9%) were elderly (age >65 years). Participants reported an average of 1.9 ± 0.7 chronic illness (median = 2; Q1 - Q3: 1 – 2); more than two thirds (n= 128; 68.4%) had multiple chronic illnesses. Hypertension (136; 72.7%), type 2 diabetes mellitus (DM) (98; 52.4%), and cardiac insufficiency (52; 27.8%) were the most frequently reported chronic illness in the study sample. There were 62 (32.6%) patients who had both DM and HTN. Patients reported an average of 5.6 ± 2.7 (median= 5; Q1-Q3: 4 – 7) medications taken on regular basis. The mean ± SD and median (Q1-Q3) duration of chronic disease/s for all patients was 8.1±6.9 and 6 (3 – 11) years respectively. More than half of the participants had less than high school education (n=99; 52.9%).

4.2 Compliance (Adherence) and Attitude Toward Medications

In our study, the internal consistency of the MMAS-8© was satisfactory (alpha = 0.7). Fifty seven (30.5%) patients were adherent (MMAS-8© adherence score = 8) while 130 (69.5 %) were non-adherent (MMAS-8© adherence score < 8). Univariate analysis showed no significant association between adherence level and any of the tested demographic and clinical variables (Table 1). Reported answers to MMAS-8© are presented in Table 2. Internal consistency for the BMQ scales showed values between alpha = 0.7 – 0.8. The majority of the patients endorsed the attitude that their good current health is due to their medications which they believe that they kept them from getting worse. Concerns about medicines were also reported. Many participants indicated that they are worried about being obliged to take their medicines (109, 85.2%) and about becoming too much dependent on their medications (108, 57.8%). Many patients endorsed the belief that physicians have too much trust in medicines (124, 66.3%) and that most medicines are addictive (103, 55.1%). However, few patients endorsed beliefs that medications were harmful (54, 28.9%) (Table 3).

Table (1): Patient characteristic by adherence level

Variable	Total (n=187) Statistics: n (%)	Adherence level		O.R (95% C.I)	*P value*
		(non-adherent) Statistics: n (%)	(adherent) Statistics: n (%)		
Age (years) < 65 ≥ 65	 131 (70.1%) 56 (29.9%)	 96 (73.8) 34 (26.2)	 35 (61.4%) 22 (38.6%)	Reference 1.8 (0.92 – 3.4)	0.09
Gender Male Female	 123 (65.8%) 64 (34.2%)	 82 (63.1%) 48 (36.9%)	 41 (71.9%) 16 (28.1%)	Reference 0.67 (0.34 – 1.3)	0.24
Duration of chronic illness (years) < 5 ≥ 5	 77 (41.2%) 110 (58.8%)	 59 (45.4%) 71 (54.6%)	 18 (31.6%) 39 (68.4%)	Reference 0.6 (0.29 – 1.1)	0.08
Marital status Married Single/divorced/ widowed	 163 (87.2%) 24 (12.8%)	 117(90.0%) 13 (10.0%)	 46 (80.7%) 11 (19.3%)	Reference 2.2 (0.9 – 5.1)	0.09
Educational Level < college education ≥ college education	 149 (79.7%) 38 (20.3%)	 100(76.9%) 30 (23.1%)	 49 (86.0%) 8 (14.0%)	Reference 0.5 (0.23 – 1.3)	0.16
Number of chronic illness 1 ≥ 2	 59 (31.6%) 128 (68.4%)	 41 (31.5%) 89 (68.5%)	 18 (31.6%) 39 (68.4%)	Reference 0.99 (0.5 – 2)	0.99
Diabetes Mellitus No Yes	 89 (47.6%) 98 (52.4%)	 57 (43.8%) 73 (56.2%)	 32 (56.1%) 25 (43.9%)	Reference 0.6 (0.33 – 1.14)	0.12
Hypertension No Yes	 51 (27.3%) 136 (72.7%)	 33 (25.4%) 97 (74.6%)	 18 (31.6%) 39 (68.4%)	Reference 0.74 (0.37 – 1.5)	0.38
Ischemic Heart Disease No Yes	 135 (72.2%) 52 (27.8%)	 91 (70%) 39 (30%)	 44 (77.2%) 13 (22.8%)	Reference 0.69 (0.33 – 1.4)	0.31
Number of medications ≤ 5 >5	 99 (52.9%) 88 (47.1%)	 67 (51.5%) 63 (48.5%)	 32 (56.1%) 25 (43.9%)	Reference 1.2 (0.64 – 2.25)	0.56

*Note: other diseases like RA weren't included in the analysis because of small number of patients.

Table (2): Self-reported medication adherence behavior of study participants as determined by the Morisky 8-Item Medication Adherence Scale (MMAS-8©)

Item*	Number (%) of patients who answered yes
Do you sometimes forget to take your [health concern] pills?	68 (36.4%)
People sometimes miss taking their medications for reasons other than forgetting. Thinking over the past two weeks, were there any days when you did not take your [health concern] medicine?…..	58 (31.0%)
Have you ever cut back or stopped taking your medication without telling your doctor, because you felt worse when you took it?……..	24 (12.8%)
When you travel or leave home, do you sometimes forget to bring along your [health concern] medication?……	12 (6.4%)
Did you take your [health concern] medicine yesterday?……..	72 (92.0%)
When you feel like your [health concern] is under control, do you sometimes stop taking your medicine?……	26 (13.9%)
Taking medication every day is a real inconvenience for some people. Do you ever feel hassled about sticking to your [health concern] treatment plan? ……	60 (32.1%)
How often do you have difficulty remembering to take all your medications? (never/ rarely)	164 (87.7%)

Table (3) Response to BMQ items and participants' scores for each item by adherence level

Statement	Code	Agree / Strongly Agree N (%)	Adherence Level		Wilcoxon Z scores	*P value*
			Non-adherent	adherent		
Specific- Necessity			**Mean Rank**			
My life would be impossible without my medicines	N1	122 (65.3%)	86.92	110.14	-2.9	0.004
Without my medicines, I would be very sick	N2	133 (71.1%)	90.54	101.89	-1.4	0.15
My health, at present, depends on my medicines	N3	149 (79.6%)	93.13	95.97	-0.4	0.71
My medicines protect me from becoming worse	N4	147 (78.6%)	90.53	101.92	-1.5	0.12
My health in the future will depend on my medicines	N5	111 (59.3%)	92.53	97.34	-0.6	0.55
Specific- Concerns						
I sometimes worry about the long-term effects of my medicines	C1	87 (46.8%)	99.82	80.72	-2.3	0.02
Having to take medicines worries me	C2	109 (58.2%)	96.21	88.96	-1.0	0.37
I sometimes worry about becoming too dependent on my medicines	C3	108 (57.8%)	95.36	90.89	-0.6	0.58
My medicines disrupt my life	C4	43 (23.0%)	98.08	84.70	-2.0	0.05
My medicines are a mystery to me	C5	41 (22.0%)	94.82	92.13	-0.3	0.73
General -overuse						
If doctors had more time with patients, they would prescribe fewer medicines	O1	69 (36.9%)	99.20	82.13	-2.0	0.042
Doctors use too many medicines	O2	70 (37.5%)	95.21	91.25	-0.5	0.64
Doctors place too much trust in medicines	O3	124 (66.3%)	92.91	96.48	-0.5	0.66
Natural remedies are safer than medicines	O4	74 (45.0%)	96.66	87.93	-1.0	0.30
General –harm						
Medicines do more harm than good	H1	54 (28.9%)	93.66	94.78	-0.1	0.9
People who take medicines should stop their treatment for a while every now and again	H2	38 (20.4%)	99.07	82.45	-2.0	0.04
Most medicines are addictive	H3	103 (55.1%)	94.95	91.84	-0.4	0.71
All medicines are poisons	H4	67 (41.2%)	91.80	99.03	-0.9	0.37

Analysis of belief scores using Mann-Whitney test showed that adherent participants had significantly higher specific-necessity belief (N1), lower specific-concern belief (C1), and lower general-overuse belief (O1), and lower general-harm belief (H2) compared to non-adherent participants (Table 3). The overall specific-necessity score was higher than the concerns score (P<0.001). None of the demographic and clinical variables was significantly associated with the level of adherence. However, multivariate analysis showed that patients who had higher necessity beliefs (N1) had higher odds [1.4 (1.1 - 1.9)] of being adherent. On the other hand, patients who had higher concern beliefs (C1) had lower odds [0.8 (0.65 – 0.98)] of being adherent (Table 4).

Table (4): Independent factors associated with adherence using binary logistic regression analysis

Variable	β	S.E.	Wald test	p-value	Odds Ratio (O.R)	95% C.I. for O.R	
						Lower	Upper
N1	0.321	0.128	6.254	0.012	1.378	1.072	1.772
C1	-0.226	0.099	5.238	0.022	0.798	0.657	0.968
O1	-0.169	0.122	1.919	0.166	0.845	0.665	1.073
H2	-0.123	0.135	0.826	0.363	0.884	0.679	1.152

Abbreviations**:** CI = confidence interval; β = the coefficient of the predictor variables; S.E. = standard error; N1= Specific-necessity item 1; C1= Specific-concern item 1; O1= General-overuse item 1; H2= General-harm item 2

4.3 Finally Adjusted Model

Figure 2 is the adjusted model taking into consideration all demographic, clinical and psychological factors represented as attitude or

belief in necessity and concern about medications based on our study results.

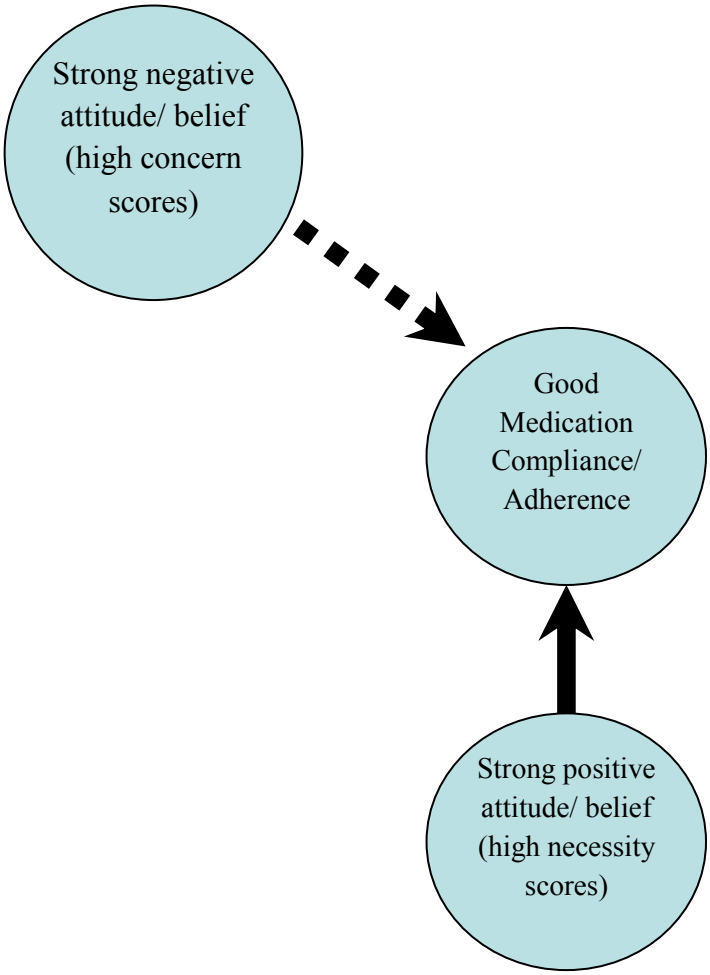

Figure (2): Adjusted model for medication practices

: negative effect on adherence

: positive effect on adherence

Chapter Five

Discussion

Chapter Five
Discussion

Medication adherence is extensively studies in the literature, mainly because it is a detrimental factor in decreasing mortality and morbidity in chronic diseases, also in decreasing hospitalization total health care costs [41]. A review published in the Middle East in 2010 showed only 19 studies about medication adherence [42]. The rate of medication nonadherence in this review ranged from 1.4% to 88% which necessitates the importance of more assessment of adherence predictors in the Middle East.

Healthcare providers and researchers became more aware of the phenomenon of non-adherence long time ago and they tried several technologies and methods to improve adherence. In most of these published studies, emphasis was made on the relationship between demographic/ clinical variables and adherence. However, it seems that most demographic and clinical variables had no or limited predictive ability to explain variations in adherence [43]. The other approach which successfully explained a great portion of medication non-adherence among patients with chronic diseases was behavioral models. In our study, 2 main predictive factors should be considered in clinical pharmacy counseling settings: awareness about necessity of medications to one's health and fear from bad effects of medicines. Several studies have successfully shown good correlation between psychological factors toward medications and compliance. Few examples are listed here. All listed examples are

published data from USA or Japan or other no-Arab countries. A study by Phatak, et al., found that psychological aspects could explain a great deal of non-compliance to chronic drug therapy [43]. Similar findings were obtained by a study in Japan by Iihara, et al., [44]. Mardby, et al., [30] recommended an increased effort to improve awareness and encourage patients to talk about their fears and concerns about medicines in order to stimulate concordance and adherence to medication [30]. A study carried out in United States (USA) concluded that patients who had negative attitude about medications reported low medication adherence [45]. These findings along with the ones obtained in our study should set the stage in Palestine and other Arab countries for clinical pharmacists to initiate their counseling job which they are entitled to do. Clearly, psychological aspects, medication literacy are strong predictors of medication compliance and consequently therapeutic outcome and economic burden on health system.

In our study, Palestinian patients had strong positive attitude and belief that medications are important for good health, but also reported fears of consequences related to taking medications regularly. Since almost half of the patients had high fears and concerns scores about long-term side effects of taking medications chronically, it is mandatory for clinical pharmacists to be knowledgeable and fully aware of such fears and direct patients' education and intervention to minimize such concerns and consequently minimize non-adherence. For example, patients who take medications for chronic illness like hypertension or diabetes mellitus need

to know that their medications are not addictive and that medications have an acceptable safety profile for long-term use. A study investigated beliefs among people with rheumatoid arthritis (RA) found that age and level of formal education had a weak negative association with specific-concern scores [13].

In our model, medication adherence was not associated with the number of medications used or number of chronic illnesses. This might emphasize the idea that it is not the number per se that affects adherence; rather it is the belief that medicines are important for one's life which determines level of adherence. Therefore, assessment of medication beliefs may be important for success of medication improvement strategies. Clinical pharmacists should address the patient's beliefs about medications in the hope of improving medication adherence. Clinical pharmacists should expect to encounter many patients with multiple chronic diseases and multiple different medications. This should not confuse the patients or the clinical pharmacists. A good clinical pharmacy practitioner should understand that once the patients appreciate and understand and has no fears from medications, and then the number will not be an obstacle for compliance. In contrast, patients who are on top of all medication issues become more aware of the necessity of these medications and become lesser afraid of the consequences of chronic intake of medications. All this should help to improve patients' practices and attitude toward medications. The governmental and non-governmental health systems in Palestine and in most Arab countries have no clinical pharmacy services. Actually, some

might underestimate the influence of clinical pharmacy counseling services. It is time for such health systems to introduce clinical pharmacy survives and once introduced, clinical pharmacists must work on issues related to medication practices and attitudes. Such issued needs to be on top priority before issues related to drug appropriateness, dose, and drug interaction are discussed.

Study Limitations

1. A self-report method was used to assess medication practices and attitude. Although more precise estimates can be obtained through other methods like blood testing, the self-report assessment provided a practical measure for this study. Overestimation of adherence may have occurred because self-reporting was used for assessment.

2. Validity of Arabic version of scales used in this study need to be confirmed by other researchers in single disease and in multiple disease settings. Regardless, this is one of the few studies in the Arab world to investigate interrelationship between psychological factors expressed as attitude/ belief and medication practices.

3. The sample size used in our study was relatively small. No priori calculation of power was conducted which might affect the generalization of our findings.

All the above mentioned limitations need to be considered when interpreting the findings of our study.

Conclusions

As a conclusion, stronger positive attitude/belief in the necessity or of one's medications is significantly associated with high adherence and that assessment of medication attitude is important in understanding medication compliance/adherence among chronic medication users. At the same time, high fears and concerns are associated with high levels of non-adherence. These results are consistent with what was reported in the literature. The model concluded by this study can be implemented as an initial work for clinical pharmacists in Palestine in patient's counseling settings.

Recommendations

We recommend that more clinical pharmacists should be employed in all primary care clinics especially those that provide services to patients with chronic diseases, this investment will pay back on improving medication adherence and consequently improve therapeutic outcomes and total health care costs.

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Appendices

Appendix (1): Data Collection Form

يقوم مجموعة من الباحثين بتعبئة هذا الاستبيان لقياس مدى الانضباط الدوائي والمعتقدات حول الادوية لدى الناس ذوي الأمراض المزمنة، المعلومات الواردة في هذا الاستبيان ستستحدم لأغراض البحث العلمي فقط. شاكرين لكم حسن تعاونكم

القسم الأول: معلومات خاصة بالمريض

الجنس: 1، ذكر 2. أنثى

العمر .....

مدة المرض .....

الحالة الاجتماعية: 1. أعزب 2. متزوج 3. مطلق 4. أرمل

مستوى التعليم: 1. أمي 2. أساسي 3. ثانوي 4. جامعي

مكان السكن: 1 . مدينة 2. قرية 3. مخيم

الأمراض المزمنة: 1 . ..... 2. ..... 3. .....

4. ..... 5. .....

الأدوية المزمنة:

1. ..... 5. ..... 9. .....

2. ..... 6. ..... 10. .....

3. ..... 7. ..... 11. .....

4. ..... 8. ..... 12. .....

Appendix (2): Items in MMAS-8 scale

القسم الثاني: قياس مدى الانضباط الدوائي

السؤال	نعم	لا
هل تنسى أحيانا أن تتناول الدواء الخاص بمشكلتك الصحية؟		
لا يتناول الناس أحيانا الأدوية الخاصة بهم لأسباب أخرى غير النسيان. هل كان هناك أية أيام على مدى الأسبوعين الماضيين لم تتناول فيها الدواء الخاص بمشكلتك الصحية؟		
هل سبق لك أن خفضت أو توقفت عن تناول الدواء الخاص بمشكلتك الصحية دون أن تخبر طبيبك وذلك لأنك شعرت بأن حالتك الصحية أصبحت أسوأ عندما تناولت الدواء؟		
عندما تسافر أو تغادر المنزل، هل تنسى أحيانا اصطحاب الدواء الخاص بمشكلتك الصحية؟		
هل تناولت الدواء الخاص بمشكلتك الصحية بالأمس؟		
عندما تشعر بأن (المشكلة الصحية لديك) تحت السيطرة، هل تلجأ أحيانا إلى التوقف عن استعمال الدواء؟		
تناول العلاج بشكل يومي قد لا يروق لبعض الناس. هل تشعر بعدم رضا أو امتعاض أو تشويش بسبب التزامك اليومي بالدواء؟		

كم من الأحيان تواجه صعوبة في تذكر تناول جميع أدويتك؟	نادرا / أبدا	قليلا	أحيانا	عادة	دائما

Appendix (3): Items in BMQ scale

القسم الثالث: المعتقدات حول الأدوية

السؤال	أعارض بشدة	أعارض	غير متأكد	أوافق	أوافق بشدة
Specific- Necessity					
حياتي ستكون مستحيلة بدون أدويتي					
بدون أدويتي، سوف أكون مريضا جدا					
صحتي في الوقت الحالي تعتمد على أدويتي					
أدويتي تحميني من أن أصبح بحالة أسوأ					
صحتي في المستقبل سوف تعتمد على أدويتي					
Specific-Concerns					
أحيانا، أقلق بشأن الآثار طويلة المدى لأدويتي					
الحاجة إلى تناول الدواء تسبب لي القلق					
أحيانا أقلق من أن أصبح معتمدا جدا على أدويتي					
أدويتي تعطل حياتي					
أدويتي تعد لغزا بالنسبة لي					
General-Overuse					
إذا أمضى الأطباء وقتا أطول مع مرضاهم، لكانوا وصفوا لهم أدوية أقل					
الأطباء يستعملون أدوية كثيرة					
الأطباء يضعون كثيرا من الثقة في الأدوية					
العلاجات الطبيعية أكثر أمانا من الأدوية					
General-Harm					
الأدوية تسبب ضررا أكثر من النفع					

السؤال	أعارض بشدة	أعارض	غير متأكد	أوافق	أوافق بشدة
الناس الذين يستخدمون الدواء، علـــيهم أن يتوقفوا عن استخدامه بين الحين والآخر					
معظم الأدوية تسبب الإدمان					
كل الأدوية هي سموم					

جامعة النجاح الوطنية
كلية الدراسات العليا

دراسة تحليلية للمعتقدات حول الأدوية والانضباط الدوائي لدى المرضى ذوي الأمراض المزمنة في الخدمات الطبية العسكرية، نابلس، فلسطين

إعداد
رانيه ماجد فارس جاموس

إشراف
أ. د. وليد صوليح
د. أدهم أبو طه

قدمت هذه الأطروحة استكمالاً لمتطلبات الحصول على درجة الماجستير في الصيدلة السريرية في كلية الدراسات العليا في جامعة النجاح الوطنية في نابلس، فلسطين.
2014م

دراسة تحليلية للمعتقدات حول الأدوية والانضباط الدوائي لدى المرضى ذوي الأمراض المزمنة في الخدمات الطبية العسكرية، نابلس، فلسطين

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الملخص

المقدمة وهدف الدراسة: هناك دراسات قليلة في العالم العربي التي بحثت في تصرفات المرضى تجاه أدويتهم خاصة اولئك الذين يعانون من عدو أمراض مزمنة معا. أيضا معظم الدراسات في هذا المجال قد أجريت على المرضى الذين لديهم تأمين صحي حكومي مما قد يؤثر على واقعية هذه الدراسات لأن الأدوية ليست متوافرة دائما في الصيدليات الحكومية. أهداف هذه الرسالة تشمل دراسة تأثير وجود عدة أمراض مزمنة على العلاقة بين معتقدات المريض حول أدويته وبين الانضباط الدوائي.

المنهجية: أجريت هذه الدراسة في الخدمات الطبية العسكرية في نابلس. تم الحصول على المعلومات الخاصة بالأمراض المزمنة عن طريق مقابلة المرضى وتم تأكيد هذه المعلومات عير ملفات المرضى الطبية. تم تقييم معتقدات المرضى تجاه أدويتهم عبر استبيان المعتقدات حول الأدوية كما تم تقييم الانضباط الدوائي عبر مقابلة المرضى وسؤالهم.

النتائج: تم مقابلة 187 مريضا. كان لدى معظم المرضى (79.6%) معتقدات ايجابية تجاه ضرورة أدويتهم للمحافظة على صحتهم، بينما كان (58.2%) من المرضى قلقين من حاجتهم إلى تناول أدويتهم بشكل منتظم، و 57.8% كانوا قلقين من أن يصبحوا معتمدين على الأدوية. لا توجد علاقة بين أي من المتغيرات الديموغرافية أو السريرية والانضباط الدوائي لدى المرضى بشكل عام. أظهر التحليل الإحصائي أن المرضى الذين لديهم اعتقاد أكثر بأهمية

دوائهم هم أكثر انضباطا، والمرضى الذين لديهم اعتقاد أكثر بالقلق حـــول أدويـــتهم هـــم أقـــل انضباطا.

الخلاصة: المعتقدات السلبية والايجابية حول الأدوية هي عامل مهم يؤثر في الانضباط الدوائي لدى المرضى ذوي الأمراض المزمنة.