TOFIQ Journal of Medical Sciences, TJMS, Vol. 3, Issue 1, (2016), 47-63 ISSN: 2377-2808

TOFIQ Journal of Medical Sciences

DEPRESSION & TREATMENT ADHERENCE AMONG IRAQI IMMIGRANTS WHO IMMIGRATED TO UNITED STATE

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Acknowledgements

Drs. Jamil and Arnetz were partly supported by Award Number R01MH085793 from the National Institute of Mental Health. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institute of the Mental Health or the National Institutes of Health. The authors thank Pfizer Corporation for providing financial support to collect the original survey data (Health Assessment of Iraqi People Residing in Southeast Michigan 2004. Thanks goes to Pierre Yaldo who reviewed the manuscript grammar.

Abstract

The study objective was to estimate the rate of adherence to treatment among depression patients, and to determine the possible factors in non-adherent. We sampled 337 random participants of Iraqi descent, who live in Michigan. Of all the participants, 93 reported forms of depression. Of those 93 people, 36.6% are non-adherent to anti-depressants. There were significant differences among those who are adherent with treatment and those who were not. We noted that Participants with chronic disease were adherence to treatment of chronic illness more than adherence to antidepressants. A non-adherent participant tends to have poorer health compared to his or her health in the previous year. In conclusion the prevalence of medication adhering participants was 63.4%.

Key Words:

Depression**,** Adherence, Chronic diseases, Self-rated health, Arabs, Chaldeans

Introduction:

Depression is next only to hypertension as the most common chronic medical illness seen in daily medical practice. In a study done by the Global Burden of Disease Study, it has been shown that the fourth leading cause of disability worldwide is major depression (Finley, 2002, WHO, 2011). Studies have shown that up to 70% of participants who have been diagnosed by a physician as depressed and are treated with antidepressants are not adherent with taking their antidepressants in one way or another (Katon, 1992, Lin, 1995). Depression is one of the diseases that is frequently coupled with patient reports of forgetting to take medications (Gehi, 2005, Gonzalez, 2007). Response to treatment can be affected by many factors, such as side effects and medications activity; in addition, patient's preference to method of treatment can affect the response to treatment (Churchill, 2009). Adherence to the treatment can play a role in the response to treatments; "adherence" is the degree of correspondence between the patient's genuine dose history and the prescribed treatment.

The model of adherence denotes a joint interactive patient-doctor relationship. When the patient is a passive responder to the authorized physician, orders will be adherent (Beena, 2011).

Controlling chronic medical conditions such as mental health disorders like depression needs active decision making and promise to be adherent to the medication regime (Donovan, 1992, Meredith, 1999, Beena, 2011). About 30% to 50% of participants who are using antidepressants, stop taking their treatment prematurely (Lin, 1995, Melfi, 1998, Peveler, 1999, Bultman, 2002). A study by RAND (2011) showed that depression participants have fewer adherences to their depression medication than chronic illness medications. Non-adherence to treatment regimens has a significant effect on raising the cost of health care in the United States of America (McDonnell, 2002) from 33% to 69% of hospital admission due to medical cause are namely medications non adherence, which costs about $100 billion a year (Senst, 2001).

In the developing countries where no insurance coverage is available, this cost has been studied. A study in Pakistan showed that 16.32% participants stopped their treatment due to lack of finances. As a result information about the causes that affects the participant's adherence and non-adherence with the medications are important (Cramer, 1998). Non–adherence to medication limits the advancements in the treatment of mental disorders as it decreases the beneficial effect even from the best and most effective medicine. The World health organization published a guide to improve the methods of treatment adherent (Sabaté, 2003). Low adherence to medications may be found among refugees and immigrants population in the United States, Lee found that only 12% of the south east Asian refugees adhere to their prescribed medications (Lee, 1993), while Kinzie (2007) found that 15% of south east Asian refugees are adherent to their anti-depressant medication. Sleath (2003) found that Hispanics are significantly non-adherent to their anti-depressants when compared to non-Hispanic whites.

Many factors can cause non-response to treatment regarding refugees. Considering the medicine as stigma (cultural belief), medication shape, patient questioning the dose, no access to medications, are all factors. Gender preference is also a factor; males prefer male doctors and females prefer female doctors. Illiteracy and low literacy, low health literacy, time, Interpretation, trust and Communication (Avery, 2008)… The factors are very numerous. As treatment progresses depressed participants will have different causes to justify their non-adherence to these medications. Whether the patient will inform the physician that he/she will discontinue the medication depends on the approach of the physician and what information he or she provided the patient about that medicine (Demyttenaere, 2001). Maintenance of adherence can be developed through giving strong verbal and written educational explanations about the medications (CIGNA, 2011). In addition the presence of medical or mental comorbid disease, drug abuse or alcohol abuse (Kaplan, 2000) lack of English language proficiency may be a cause of the patient to not adhere with their medications (Lanouette, 2009). A study by Katon (2001) showed that educating participants, frequent meetings with depression specialists, telephone follow-ups and frequent monitoring over a period of at least one year drastically enhanced adherence to anti-depressants.

Ethnic variation can affect the preference of the treatment modality and thus will affect the treatments response; a study by Givens showed that ethnic and racial differences greatly affect responses and choice. Ethnic minorities prefer counseling for the depression treatment much more that what has been observed in white Americans (Givens, 2007). Ten Doesschate (2009) found that higher education level and high level of personality pathology are baseline predictive factors for non-adherence to depression treatment.

Since the US civil war, syndromes in veterans have appeared but are not well understood. Syndromes include forgetfulness, impaired concentration, depression and more. These can all be causes of non-adherence to medicine (Hyams, 1996). Regarding the relationship of demographic profiles of the patient and the risk of non-adherence, some studies demonstrated some characteristics correlate with non-adherence, one of which is age; younger participants are usually at greater risk of non-adherence than other participants (Sirey, 2001, Sirey, 2001, Goethe, 2007). While other studies showed the impact of gender on adherence in such way that women are more adherent compared to men (Melartin, 2005, Goethe, 2007, Chakraborty, 2009), other studies showed that the difference is not significant.

A study by Sirey (2001) found that race, marital status and living arrangements were not significant predictors of adherence. Goethe (2007) reported that non-adherence was more common in employed than non-employed individuals, but that it was not associated with race, ethnicity, marital status or education. High cost service utilization is an important cause of medication non-adherence problems in depressed participants (Julian, 2010). A 77% increase in the relapse risk and recurrence has been shown in a study and it contributes to potentially increasing health care costs (Melfi, 1998). Different interventions directed toward improving patient adherence to the anti-depressants have been tried worldwide. Most of them are not successful; however, counseling about the medication showed significant improved adherence, while the informational leaflets related to the participant's anti-depressant therapy had a very non-significant effect on the adherence of the patient to the anti-depressants (Peveler, 1999). Depressed patients who are at risk of non-adherence will need to understand the cause for poor adherence to these medications (Stephenson, 1993).

The aim of this study is to compare those self-reporting that they have depression and are adherent with their medication versus those who have depression but are not adherent to their medication (from a random sample of two different ethnic groups sharing same background). The study also aims to predict the risk factors that affect medical adherence.

Methods:

In 2004-05 this study was conducted as part of large survey that targeted Iraqi immigrants who are residents in the metropolitan Detroit area. Ethical clearance for this study was granted through Wayne state university, Human Investigation Committee [WSU/IRB/HIC# 086903B3E]. This cross sectional study was announced among the Iraqi community through different channels e.g. media, flyer and social community meeting. A comprehensive standardized questionnaire was used. This questionnaire initially developed through the collaboration between IOWA Persian Gulf war study group and the Center of Disease Control. Data of this study was used in several studies (Koslowe, 1998, Jamil, 2006, Jamil, 2007). The final random sample was driven from a list of 5,490 residents in the metropolitan Detroit area. The sample was drawn from 24 cities, which includes 55 zip codes within the metropolitan Detroit area. From this study sample we excluded those who were not Arab or Chaldean because their numbers were very small (13 participants). The end sample was 337. From the 337 only 93 have self-reported depression, from them only 59 reported that they are adherent to the treatment and the other 34 self-reported that they were non-adherent. A structural interview was planned to administer the questionnaire. The questionnaire was written in Arabic and English, and if the participant can't read Arabic or English, the questions were verbally addressed during the interview. The questionnaire included different types of questions, some examples follow: demographic characteristics, medical conditions, and self-rated health of the participants.

Questions regarding the demographic characteristic are presented in table 1 & 2, e.g.: age , gender, date of arrival to United States (US). Also questionnaires include data on environmental exposure (chemical and non-chemical/stressors) variables, as well as questionnaires on depression and other medical condition such as hypertension, diabetes mellitus, heart disease & asthma. The study questionnaires were based on self-reported medical conditions; so to classify a participant as depressed or having a chronic disease, the person had to state that he/she both had been diagnosed by physician and that he/she received treatment. The questionnaire also included questions about adherence with treatment, based on the fact that adherence is a group of actions taken by patients, such as diet restrictions, medications intake, healthy life style changes, etc. corresponding with health care provider recommendations (CDC, 2013, WHO, 2013), the questionnaire asked the patient if they really and correctly followed the medical advice. In addition, self-rated health status was attained (SRH) by asking questions and comparing the current SRH to health one year ago.

The SRH question was based on a Liker t-type scale which ranging from 5, excellent health to 1, poor health. The SRH scale is well used to predict future health and mortality in currently healthy person (Templin, 2003, Skrondal, 2008). Data analysis was obtained by using the SPSS 21.0 for windows. To see the difference between the categorical variables (E.g. age, gender, occupation), Chi Square was used for categorical variables while t-test was used for the continuous variables. Binary logistic regression was used to predict the significant risk factors for those who were adherent to treatment or not and also for the current SRH.

Results:

Result showed that 36.6% of 93 participants who reported depression were not adherent to treatment of anti-depressants. Tables 1 show the prevalence of participant who have and do not have depression by different variables. It is of interest to find significant differences between the two groups in subcategory of each demographic variable, e.g. ethnicity, years in the US, gender, marital status, employment status and income.

Table 1: Prevalence of participants who have and do not have depression by demographic variables

Variable		No Depression (n=244)	Have Depression (n=93)	Total (n=337)
Age Group	32-44 Y	107(43.9)	42(45.2)	149(44.2)
	40-49 Y	137(56.1)	51(54.8)	188(55.8)
Ethnicity ***	Chaldean	137(56.1)	16(17.2)	153(45.4)
	Arab	107(43.9)	77(82.8)	184(54.6)
Years in USA ***	2-5 Years	12(4.9)	13(14)	25(7.4)
	6-9 Years	47(19.3)	27(29)	74(22)
	10 + Years	185(75.8)	53(57)	238(70.6)
Gender ***	Male	150(61.5)	40(43)	190(56.4)
	Female	94(38.5)	53(57)	147(43.6)
Gender ***	Single	37(15.2)	4(4.3)	41(12.2)
	Married	207(84.8)	89(95.7)	296(87.8)
Employment Status ***	have work	25(10.2)	33(35.5)	58(17.2)
	Don't have	219(89.9)	60(64.5)	279(82.8)
Health insurance	Don't have	86(35.2)	21(22.6)	107(31.8)
	Have	158(64.8)	72(77.4)	230(68.2)
Annual Income ***	$10,000 or less	21(21.2)	14(58.3)	35(28.5)
	$19,000 +	78(78.8)	10(41.7)	88(71.5)
Smoking Status	Do not smoke	160(65.6)	66(71)	226(67.1)
	Current smoker	84(34.4)	27(29)	111(32.9)

*** P < 0.05 ; ** P < 0.01 ; *** P < 0.001**

Table 2 shows the prevalence of participants who have and do not have treatment for depression by different variables. It also shows that there is similar pattern among those who adhere to their treatment and those who do not adhere to it, irrespective of gender, age, education, smoking status & years in US. It also shows that older participants were have more tendency to adhere to the medications. It also shows that for those who had treatment for depression, ethnicity, education and employment status were significant. Being married, female gender and being in us for more than 10 years showed higher prevalence.

Table 2: Prevalence of participants who have and do not have treatment for depression by demographic variables.

Variable		No treatment (n=34)	Have treatment (n=59)	Total (n=93)
Age groups	32-44 Y	20(55.6)	22(37.3)	42(44.2)
	40-49 Y	16(44.4)	37(62.7)	53(55.8)
Ethnicity **	Chaldean	11(32.4)	5(8.5)	16(17.2)
	Arab	23(67.6)	54(91.5)	77(82.8)
Years in USA	2-5 Y	2(5.6)	11(18.6)	13(13.7)
	6-9 Y	11(30.6)	16(27.1)	27(28.4)
	10 + Y	23(63.8)	32(54.2)	55(57.9)
Gender	Male	16(44.4)	24(40.7)	40(42.1)
	Female	20(55.6)	35(59.3)	55(57.9)
Marital Status	Single	3(8.3)	2(3.4)	5(5.3)
	Married	33(91.7)	57(96..6)	90(94.7)
Education ***	< High School	27(75)	19(32.2)	46(48.4)
	High School & >	9(25)	40(67.8)	49(51.6)
Employment Status **	Don't have	7(19.4)	27(45.8)	34(35.8)
	have work	29(80.6)	32(54.2)	61(64.2)
Health insurance *	Don't have	13(36.1)	9(15.3)	22(23.2)
	Have	23(63.9)	50(84.7)	73(76.8)
Annual Income	$10,000 or less	4(40)	10(71.4)	14(58.3)
	$19,000 +	6(60)	4(28.6)	10(41.7)
Smoking Status	Do not smoke	25(69.4)	42(71.2)	67(70.5)
	Current smoker	11(30.6)	17(28.8)	28(29.5)

* P < 0.05 ; ** P < 0.01 ; *** P < 0.001

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Table 3a shows binary logistic regression analysis for that likelihood for having depression; the predicted risk factors are: being females and unemployed (higher likelihood of having depression), females were about 7 times more likely to have depression, on the other hand, being unemployed increased the depression likelihood by about 6.5 times.

Also table 3b shows binary logistic regression analysis for that likelihood for those having treatment for Depression; the predicted risk factors are those being (After excluding all non-compliant participants from those who takes treatment for depression) female and unemployed.

Table 3: Binary logistic regression analysis to predict factors for those (a) with depression (b) having treatment for depression

Binary logistic regression analysis *	**Sig.**	**Odds Ratio**	**95% C.I.f or OR**	
			Lower	**Lower**
(a) **Likelihood for having Depression**				
Male (Reference)	**0.006**	**6.968**	**1.732**	**28.035**
Have work (Reference)	**0.018**	**6.453**	**1.385**	**30.074**
(b) **Likelihood for those having treatment for Depression**				
Male (Reference)	**0.022**	**20.693**	**1.544**	**277.413**
Have work (Reference)	**0.007**	**40.07**	**2.771**	**579.464**

***Adjusted for:: Age, Years in US, Ethnicity, Marital, Education, health Insurance, Income, Smoking, chemical and non-chemical(stressor) exposure.**

Table 4 shows the prevalence rate of chronic diseases among participants who reported depression. In this table we see that the percentage of participants who were adherent to their chronic illness medicine but non adherent to the depression medicine is much higher than the percentage of the participants who are not adherent to medicine of depression and chronic illnesses. So it is quite obvious from table 4 that adherence to treatment of chronic illness is much higher than adherence to treatment of depression. It also shows that people who are adherent to their chronic illness medications are also adherent to their medications in depression. This pattern was significantly observed in diseases like asthma & diabetes.

Table 4. Prevalence of chronic diseases among participants who reported depression

Chronic disease		Participants with		
		No Depression [n=244]	Depression but compliance with treatment [n=59	Depression but do not compliance treatment [n=34]]
		No.(%)	No.(%)	No.(%)
Hypertension	No	208(85.2)	44 (74.6)	29(85.3)
	Yes with treatment	30(12.3)	15(25.4)	4(11.8)
	Yes without treatment	6(2.5)	0(.0)	1(2.9)
heart disease	No	238(97.5)	54(91.5)	33(97.1)
	Yes with treatment	5(2.0)	5(8.5)	1(2.9)
	Yes without treatment	1(.4)		
Asthma (P < 0.01)	No	236(96.7)	48(81.4)	33(97.1)
	Yes with treatment	7(2.9)	10(16.9)	0(.0)
	Yes without treatment	1(.4)	1(1.7)	1(2.9)
Diabetes (P < 0.01)	No	220(90.2)	43(72.9)	28(82.4)
	Yes with treatment	20(8.2)	16(27.1)	3(8.8)
	Yes without treatment	4(1.6)		3(8.8)

Table 5a shows that about 70% of those who have self-reported depression and non-adherent to their medicine reported their health as poor or fair compared to 60% one year ago (table 5b). While about 84% (table 5a) of those who have depression and they are adherent to their medication reported their health as fair or poor compared to about 56% one year before (table 5b).

Table 5: Self-rated Health (SRH) by those who reported depression

SRH / Liker Scale	No treatment for depression [n=34]	Have treatment for depression [n=59]	Total [n=93]
	No. (%)	No. (%)	No. (%)
(a) Currently SRH ***			
excellent	1(2.9)		1(1.1)
very good	4(11.8)	1(1.7)	5(5.4)
good	5(14.7)	8(13.6)	13(14.0)
fair	19(55.9)	24(40.7)	43(46.2)
poor	5(14.7)	26(44.1)	31(33.3)
(b) Compared SRH today to one year ago			
Much better than one year ago,	1(2.9)	1(1.7)	2(2.2)
Somewhat better now,	5(14.7)	10(16.9)	15(16.1)
About the same,	7(20.6)	15(25.4)	22(23.7)
Somewhat worse now,	16(47.1)	-30.5	34(36.6)
Much worse now than one year ago	5(14.7)	15(25.4)	20(21.5)

***p < 0. 001

A binary logistic regression analysis for current SRH among those who reported depression to predict risk factors after adjusting to demographic variables and chronic diseases was conducted. Result show that only those who have more years in US reported their health as excellent/good 1.16 times more than those who reported their health as poor.

Discussion:

This study is different from most of published studies in that its population was randomly selected, and all the participants originally emigrated from Iraq. All participants also share similar background and culture. However, the percentage of non-adherence of depression participants with their treatment is about 36.6%, which is in agreement with other studies that showed 30-50% of participants who are using antidepressants, stop taking their treatment prematurely (Lin, 1995, Melfi, 1998, Peveler, 1999, Bultman, 2002). The study shows that there is similar pattern among those who adhere to their treatment and those who do not adhere to it. Such adherence patterns can be seen in the adherence to treatment of chronic illness e.g. is much higher than adherence to treatment of depression which is similar to a RAND study (2011) which showed that participants of depression are less adherent to their depression medication than chronic diseases medication. Another pattern of non-adherence was clearly seen in that the older the participant's age, the more they tend to comply with treatments. Interestingly, the longer participants have lived in the US, the less compliant they tend to be. We also found that Arabs are more non-adherent than Chaldeans on average, which is similar to the findings in a *Givens* study (Givens, 2007). These patterns of non-adherence could be explained by the fact that Arabs of this study arrived to the U.S more recently as refugees after the Gulf War. On the other hand, Chaldeans mostly started their immigration much earlier as immigrants and not refugees, which is in agreement with a Lanouette study (2009) which showed that being refugees and an ethnic minority made them preferring of counseling rather than medication use alone. The Givens study (2007) showed that ethnic minorities prefer counseling for the depression treatment with medications rather than medications alone; more so than what has been observed among white Americans.

In this study, participants with health insurance were more non-adherent to their medication than those who lack health insurance; this could be explained by the lower direct cost of the medicine. Melfi (1998) disagrees with this study and shows that increasing health care cost and lack of health insurance causes 77% of relapses cases. This study shows that about 70% of those who have self-reported depression and are non-adherent to their medicine reported their health as poor or fair compared to 60% one year ago. About 84% of those who have depression and adhere to their medication reported their health as fair or poor compared to about 56% one year before. This might be due to the fact that depression participants may have different levels

of their illness according to different seasons of the year; this is in agreement with a Loy study (2011) which shows that episodes of depression occur more often in late fall and winter that alternate with normal mood periods for the rest of the year.

The deterioration in health may be due to lack of health education, lack of follow up visits, and non-frequent meetings with patients, which is similar to findings in a Katon study (2001) which shows that educating participants, frequent meetings with a depression specialist, and telephone follow-up and frequent monitoring over a period of at least one year drastically enhanced adherence to antidepressants. This study also shows that those who have higher educational level were 6 times more adherent than those who do not have higher education, which disagrees with the Ten Doesschate study (2011), which showed that higher education is a prediction sign of non-adherence. This study also showed that married people who have depression have much higher prevalence than non-adherent to their medication compared to singles that have depression, which can be explained by the marital stress and complexity of life which make people often feel hopeless. On the other hand our study did not show marital status as a predictor, which put us in agreement with what was shown by a Sirey study (2001) that showed that marital status has no significant effect as predictor for adherence. This study found that those who are unemployed have about 6.5 times more likelihood to have depression but about 16 % higher adherence than the employed, which shows that education and employment decrease the adherence of participants to their medications. However, employed people's ability to work tends to give them feelings of strength and feelings that cause them to think they do not need to use the medications, which is similar to a Goethe study (2007) that showed that employed people are more non adherent to their medication. Females showed more likelihood to have depression which may be due to hormonal swings as well as lack of support system for females in the Arabic and Chaldean cultures.

Conclusions:

The prevalence of depression patients who were adherent to treatments is 63.4%. Adherence to chronic diseases is higher than adherence to depression medications. In addition depressed but employed participants reported lower adherences to their medications. Therefore we recommend further studies to assess the effect of habits such as smoking, with the adherence to the medication in depression patients, and the effect of depression being a stigma on the adherence. We look forward to study ethnic minorities toward the goal of generalizing the results and improving accuracy.

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