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Identifying Predictor Factors of Adherence in Patients with Multiple Sclerosis, Tehran MS Society 2013

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ABSTRACT

Multiple sclerosis is a disease of the central nervous system that cause major psychological challenging in the patient all over the world. In this case, psychological interventions can be useful this study was aimed to predictor factors of adherence to treatment in patient with multiple sclerosis. This was on descriptive study with questionnaire. One hundred – twenty patients were selected through accessible sampling method from MS society of Tehran. They completed all administered demographic questionnaire, Multiple Sclerosis Treatment Adherence Questionnaire (MSTAQ), General Self efficacy (GSE), NEO five factor inventory (NEO-FFI), Beck Depression Inventory (BDI), Short Form health survey questionnaire (SF-36), Kattle Anxiety Inventory (KAI), Positive And Negative Affect Scales (PANAS), Philips Social Support Questionnaire (SSQ) and Feedback. Data was analyzed using MONOVA repeated measure design, discriminant analysis and logistic regression. The finding of this study indicated that there is a significant difference in adherence in Multiple Sclerosis with depression, neuroticism, introversion, conscientiousness, quality of life, family social support and anxiety ($\alpha=0/05$). The Results show that adherence has direct relationship with psychological factors. Better treatment for this patient in addition to medication should also be psychological counseling. This method can reduce anxiety and depression and increase self efficacy and improve quality of life.

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INTRODUCTION

The disease multiple sclerosis which is called MS is a chronic disease of nerve system which involves parts of brain and spinal cord. The MS patients may lose some of their capabilities due to this disease. This disease mostly involves young, smart and active members of society. The cause of the disease is not known completely and no precise cure is suggested for it. However, some information about disease, knowing the personal aspect of the patients and supportive actions can be effective in bringing the patients back to the active life). The symptoms are different considering the place and intensity of attacks. Symptom intensity can cause attacks to be better or worse. Intensity of symptoms can last for days, weeks or months and they can be worst. The return of the disease is common. Although it is possible that the disease periods are without improvement and attacks are increased.

Research Background:

MS disease is one of the diseases related to central nerve system. Myelin is a combination of fat which act as a cover for nerves and facilitates the fast transform of the nervous messages. The feature of MS is inflammation, myelin and gliosis. The disease is forerunner. Damages of MS emerge in different times and places in central nerve system. 350000 of people in United States and 2.5 million all over the world have MS. In western societies MS is the second most common cause of neurologic disability. Appearance of MS can be from benign to the fast speed which makes basic changes in life style of the patients. A study in 2013 in America about the relationship between constant and varied following for post treatment changes in MS patients showed that evaluation and constant adherence of the patients in taking medicine significantly decreased the treatment adherence. A study in 2014 about predicting the life quality of MS patients based on disease perception was done on 100 patients. The results showed that disease perception predicts physical and mental dimensions.

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Statement of the Problem:

MS is one of the chronic and disabling diseases which cause a lot of disabilities in young and middle age patients. This disease is common among young adults and appears with various pathologic signs in central nerve system. There is no precise statistics about the disease in Iran but the MS society stated that MS patients in Iran are about 70000. The disease has different treatments but it is still one of the most disabling diseases which affect different aspects of human life and specially their life quality. Based on the importance of treatment adherence and the studies which have been done about not adherence, it is clear that mental-social factors are effective in adherence. So, the mental aspects are investigated in this research.

Social support: it is related to the actions taken for an upset person by family members, friends and colleagues and these actions include helping tools, social-emotional help and informational help. **Self-efficacy:** it includes the beliefs or judgments of a person and his abilities in doing the tasks and responsibilities. With regard to the issues raised, are the characteristics on adherence to MS treatment effective?

The research aims to identify predictors of adherence and non-adherence to treatment in patients with multiple sclerosis.

Research hypothesis:

There are significant differences between the independent variables (self-efficacy, personality traits, positive and negative affect, satisfaction with services, social support, anxiety, quality of life, depression, and medications feedback MS) in a predictable and non-predictable group dependence.

There are significant differences between self-efficacy and adherence and non-adherence to treatment in multiple sclerosis patients.

Descriptive findings:

To learn more about this the study population, some demographic characteristics collected by demographic questionnaire are presented and discussed using tables and graphs.

Gender:

As it is seen in Table 1-4, out of 120 respondents, 5/17% are male respondents and 5/82% are female. Therefore, the proportion of female is more than male respondents.

Table 1-4: Gender frequency of the respondents.

	frequency	percent frequency
male	21	17.5
female	99	82.5
Total	120	100.0

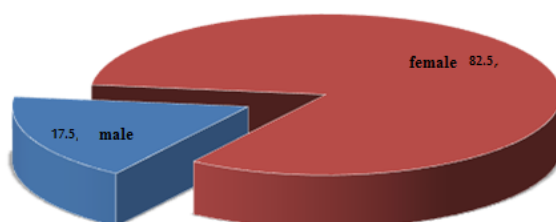


Fig. 1-4: Frequency diagram of Respondents by Gender.

Age group:

The age of subjects was calculated per year and an average and standard deviation based on the questionnaire. Respondents' age *average as 31 years old* and a standard deviation is 45/8. The mean age of the sample shows that most patients are at a young age. The minimum age of the respondents was 17 years *old* and the maximum age is 58 years old.

.Table 2-4: the statistics related to group age.

Number of responses	Min age	Max age	Mean age	SD
120	17	58	31.90	8.45

In order to obtain better results in this case, the age of the respondents was classified into different categories. As it is seen in Table 3-4, maximum age groups are less than 25 years. So that, 32 (7/26 percent) of respondents are under 25 years of age. 3/23 percent of respondents are between 30 and 35 years, 7/21% between 25 to 30 years, 5/12% between 40 to 45 years and 5/12% are between 35 to 40 years old. The age group over 45 years is the least abundant with 9 patients (5/7 per cent).

Table 3-4: frequency of respondents' age

	frequency	Frequency percent	Cumulative percent
Less than 25	32	26.7	26.7
25-30	26	21.7	48.3
30-35	28	23.3	71.7
35-40	10	8.3	80.0
40-45	15	12.5	92.5
More than 45	9	7.5	100.0
Total	120	100.0	

Low numbers of each interval are in the same category and the top number is on the next category.

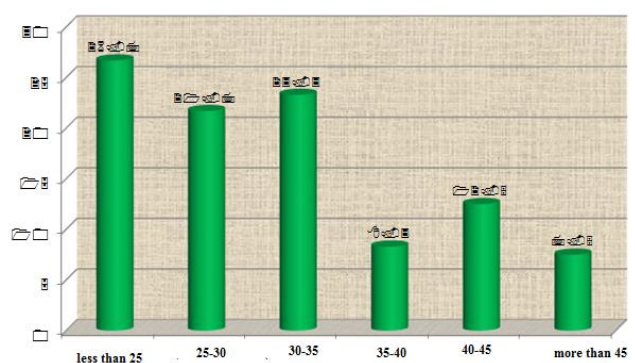


Fig. 2-4:

Marital Status:

Table (4-4) among respondents under review, 65 (2/54 percent) were married and 48 (40%) were single. Also 4.2 of respondents are divorced, 8/0 and 8 percent are widowed. Most of the respondents *are married*.

Table 4-4: Frequency of marital state among the respondents.

	frequency	frequency percent
Single	48	40.0
married	65	54.2
separated	1	0.8
Divorced	5	4.2
widowed	1	0.8
Total	120	120

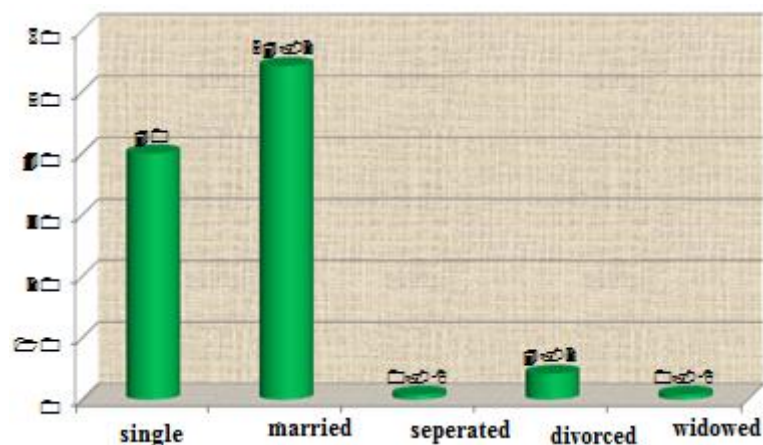


Fig. 3-4: Frequency marital status of respondents.

Married respondents in this sample were asked about their age at marriage. The respondents' average age at marriage was 21.49. The minimum age at marriage among married was 11 years and the maximum age was 31 years. The standard deviation represents that the difference in age at marriage is almost 4 years.

Table 4.5: Statistics relating to marriage among married participants .

Number of responses	Min age	Max age	Mean age	SD
71	11	31	21.49	4.07

Age of divorced participants at the time of divorce was 35.83. Minimum age at separation was 26 years and maximum was 47 years.

Table 4.6: Shows the statistics related to age at the time of separation between the divorced and separated respondents.

Number of responses	Min age	Max age	Mean age	SD
6	26	47	35.83	7.27

The findings related to the research hypotheses:

First hypothesis: variables of positive and negative affect, anxiety, physical and mental quality of life, social support, depression, neuroticism, extraversion, flexibility, agreeableness, consciousness, self-efficacy and patient feedback to physicians (independent variables) can predict patient feeling about treatment (dependent variable).

In the stepwise regression, the independent variables entered the model and removed from the model at each phase. The following table is a summary of the variables and the variables removed out of the model.

Table 4-49: Variables entered and removed from the regression model.

model	Entered variables	Removed variables	Method
1	Physical performance		<= .050 entrance >= .100 removal
2	Positive emotion		<= .050 entrance >= .100 removal

As seen in the above table, stepwise regression has two phases. Firstly, the physical life is the first variable because of greater correlation with the dependent variable (feeling sick to treatment) and positive variable affect entered into the regression model as the second variable. So, from 14 independent variables, only two variables of life and positive affect physical performance entered the models and other variables remained outside of the model.

The summary of the fitted regression model are seen in tables' below. As it can be seen, the multiple correlation coefficients, R^2 Determination coefficient and modified correlation R_{adj}^2 and standard error are

represented. It should also be mentioned that the obtained output should always be based on findings and final digits of the model.

Thus, it can be stated that the correlation of feeling about treatment in a linear combination of the variables entered in row 1 (physical life) in the equation is equal to 0.297. The resulting coefficient of determination equals to 0.088 and the coefficient of determination equals to the discounted 0.080. More than 8% of the variance feeling about treatment can be explained and justified through the independent variable of life and physical functioning, and the rest belongs to other variables.

Table 4-5: Summary of model information.

row	Correlation coefficient	Determination coefficient	Modified determination coefficient	Measured SD	Change statistics				
					square R	F	df	df	F sig
1	0.297	0.088	0.080	1.203	0.088	11.397	1	118	0.001
2	0.346	0.120	0.105	1.187	0.32	4.212	1	117	0.042

The correlation of feeling about treatment in a linear combination of the second row, when the variables of physical performance and positive feeling enter into the model is 0,346. The adjusted coefficient of determination is 0.105, which explained and justified 10.5% of the variance in patient treatment by combining a sense of life and positive and affect physical performance variables.

Table 4-51: ANOVA

row	coefficients	squares	df	Mean square	F	sig
1	regression	14.497	1	16.497	11.397	0.001
	residual	170.803	118	1.447		
	total	187.300	119			
2	regression	22.433	2	11.216	7.960	0.001
	residual	164.867	117	1.409		
	total	187.300	119			

The table above shows the significance of the determination coefficient. In fact, when we want to know that the coefficient is significant or not, variance analysis is applied. So, F of the model for physical performance with the average variance regression to the left variance is 11.397 and significance level of 0.001. It shows that there is a linear correlation between the physical performance and patients feelings about treatment. In other words, regression is significant.

In addition the F statistics, when the emotional factor enters the model is 7.96 and the level of significance is 0.001. So, there is a linear relationship between linear combination of the physical performance and positive emotions and feeling of the patient about treatment. In other words, regression is significant.

The related statistics are shown in the table below.

Table 4-52: Regression coefficient.

Model		Non-standard coefficient		Standard coefficient	t	sig
		B	SD	Beta		
1	width	3.665	0.320		11.451	0.000
	Physical performance	-0.017	0.005	0.297	-3.376	0.001
2	width	4.511	0.519		80.688	0.000
	Physical performance	-0.013	0.005	-0.233	-2.531	0.013
	Positive emotion	-0.032	0.015	-0.189	-2.052	0.042

Table shows that there is significant relationship between independent physical performance and positive emotion in the model and also shows that the second model is significant and equals 4.511 and coefficient of physical performance of life and positive emotion as - 0.233 and -0.189. So, the following model can be introduced as regression model:

Patient's feeling about treatment = 4.511 - 0.233 * (physical performance of life) - 0.189 * (positive emotion).

How much is the predictor role between the variables of self-efficacy, personal features, positive and negative emotion, service satisfaction, social support, anxiety, feedback, life quality and depression in group adherence of patients ?

Recognition analysis is used for studying the question.

Table 4-70: The mean equality of the groups.

Predictor variable	Wilkes lambda	F	DF1	DF2	P
Positive emotion	0.98	1.89	1	118	0.17
Negative emotion	1.00	0.001	1	118	0.97
Hidden anxiety	0.99	0.51	1	118	0.58
Obvious anxiety	0.99	0.30	1	118	0.99

Total anxiety	1.00	0.00	1	118	0.99
Family support	0.96	4.48	1	118	0.03
Friends support	0.99	0.22	1	118	0.63
Others support	0.99	0.91	1	118	0.34
Total support	0.98	1.26	1	118	0.26
Physical pain	0.97	2.92	1	118	0.09
Social pain	1.00	0.00	1	118	0.09
Mental health	0.94	6.81	1	118	0.01
Total health	0.99	0.52	1	118	0.47
vitality	0.94	7.47	1	118	0.007
Limitation due to mental problems	0.92	10.00	1	118	0.002
Limitation due to physical problems	0.94	6.76	1	118	0.01
Physical performance	0.96	4.75	1	118	0.01
Physical dimension	0.94	6.31	1	118	0.01
Mental dimension	0.93	8.80	1	118	0.004
Self-efficacy	0.98	2.13	1	118	0.14
Moodiness	0.99	0.15	1	118	0.69
Extroversion	0.96	4.81	1	118	0.03
openness	0.98	1.70	1	118	0.19
Acceptability	1.00	0.004	1	118	0.94
Consciousness	0.95	6.14	1	118	0.01
Beck depression	0.96	4.76	1	118	0.03
Feedback	0.98	1.35	1	118	0.24
Patient satisfaction	0.98	1.37	1	118	0.24

As, it is seen in table 4-70, there is a significant difference among the equality test of family support ($f=4.48$, $p=0.3$), mental health ($f=0.94$, $p=0.01$), vitality ($f=7.47$, $p=0.007$), and lack of activity due to mental problems ($p=0.002$, $F=10.00$), physical problems ($f=6.67$, $p=0.01$), physical performance ($p=0.03$, $f=4.75$), physical dimension ($f=6.31$, $p=0.01$), mental dimension ($f=8.80$, $p=0.004$), extroversion ($f=4.81$, $p=0.03$), consciousness ($p=0.01$, $F=6/14$) and depression ($f=4.67$, $p=0.033$). But there is no significant difference in other variables.

Table 4-71: Input/output variable.

First step	Entered variable	F value	Sig
1	Limitation due to mental problems	10.004	0.002

According to table 4-71, the activity limitation due to mental problems with $F=10.004$ is significant at the level of 0.002 and is one of the most important variables of the research in recognizing the people attachment to adherence or non-adherence at first stage.

Conclusion:

In the preset study demographic, depression, personal characteristics, self-efficacy, patients' satisfaction, negative and positive emotion, anxiety, life quality, social support and feedback of the MS patients is studied in treatment adherence.

According to the findings of the study, it is concluded that : there is a significant difference between the self-efficacy, personal characteristics, positive and negative emotion, service satisfaction, social support, anxiety, life quality, depression, feedback and MS medicines in predicting and not predicting the group adherence.

The hypothesis is tested by the multivariate variance analysis and based on the indexed of variance analysis in adherence and non-adherence with significant level of 0.03 has significant difference with at least one of the variables. So, it can be concluded that there is a significant and positive relationship between all the variables.

It can be concluded that the variables of positive and negative emotion, anxiety, physical and mental quality of life, social support, depression, extroversion and others. It is found that there is a linear significant relationship between the physical life performance and positive emotion with the patients feeling about treatment. Jundarhan and colleagues (2002) found that physical problems have the highest effect on life quality of the MS patients.

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