Memory, Health Locus of Control and Adherence in Type II Diabetic Patients in Iran – Tabriz
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Abstract
This study aimed to find out the relationship between memory, health locus of control, and adherence. One hundred twenty patients with type II diabetes were selected. The findings showed that there was a significant negative relation between memory slips with adherence, also there was a significant positive correlation between internal, external health locus of control (other-powerful), with adherence. The result showed that the type II Diabetic patients who did have less memory slips, and know powerful individuals like physician responsible for their health and then they believe in own roles to control their health, display more adherence.

1. Introduction
Diabetes is one of the chronic diseases that body does not make enough insulin or use it properly. Without insulin, the body cannot utilize food for energy. People with diabetes have high blood glucose levels and many have high blood cholesterol and triglyceride levels. This disease requires long-term therapies and daily self-management. It is now regarded as a global epidemic and more than 230 million people worldwide are living with diabetes (Uchenna, Ijeoma, Pauline & Sylvester, 2010). Diabetes type Π is treated with an individualized diet plan that usually restricts calories, especially calories from fat. So, adherence diet plan is important in maintain healthy body in diabetic patient. Issues about adherence became topic considerable by multidisciplinary teams beginning of the 1970 when studies showed that as many as 50% of patients diagnosed with hypertension were not taking sufficient amounts of their medications and non adherence was common in diabetes (Morisky, 2009).

Adherence refers to how closely patients follow a prescribed treatment regimen. It includes patient willingness to start treatment and their ability to take medications exactly as directed (Horne and et al, 2005). Adherence is a affected by different factors, it can be referred to effective psychological factors an adherence like memory and health locus of control.
Memory is central in our daily life activities, not only to build relationship with friends, create our identity or reminisce about the past but also to drive our attention toward the most important tasks to perform and to manage our lives (Cohen, 1996). Memory is a storage, where memory traces are collected and later on retrieved and is an active process of constructing according the past (Neisser, 1967). Clearly, memory for medical information is a prerequisite for good adherence to recommended treatment. Ley’s model (Ley’s model of compliance), on effective communication in medical practice stresses the importance of memory next to factors such as the understanding of information and satisfaction with the treatment. 40–80% of medical information provided by healthcare practitioners is forgotten immediately. The greater the amount of information presented, the lower the proportion correctly recalled furthermore, almost half of the information that is remembered is incorrect (Anderson, Dodman, Kopelman, Fleming, 1979). In recalling medical prescriptions, cognitive slips are considered as an effective factor as well (Ogden, 2007). According to Ley (1989) memory and power of regimes recalling affect on adherence. Insel and Cale (2005) intervened in cognitive processing and integration phases to improvement of adherence, they showed that improve the memory function related with adherence.

Health locus of control refers to individual’s characteristic attribution of responsibility for their health. Individuals differ in the extent to which they believe that their health outcomes are determined primarily by their own behavior or by external forces. Individuals are described as “internal” if they believe that they are primarily in control of their health or as “external” if they believe that powerful others, such as doctors and other health professionals, or chance is primarily responsible for their health outcomes. The theory of health locus of control was proposed by Wallston (1970) that was derived from social learning theory developed by Rotter in 1966 (Wallston, and Devellis, 1978). It seems that there is a positive relation between internal health locus of control and adherence of diabetes regime and there is a negative relation between external health locus of control and adherence of diabetes regime (Morowati Sharifabad, Mazlomy, Baghiani, and Rouhani, 2009). According to Leong, Molassiotis, and Marsh (2004) the external health locus of control shows itself by lose of weight and anxiety, and internal health locus of control by physical activity and reduction of depression related with adherence.

This research aim to response to these questions: 1. is there any relationship among memory, health locus of control and adherence in the type II diabetic patients. 2. Which one of the factors of memory and health locus of control can predict adherence in the type II diabetic patients.

2. Materials and methods

2.1. Sample

The population of the present study was type II diabetic patients, literate who were between 15 to 70 years old, and were being considered as the members of the east Azerbaijan diabetes society. Patients were chosen from this population which had been diagnosed as patients 12 month ago and native of Tabriz town ship. Patients which were illiterate, or which had some serious kinds of health problem unless diabetes, were excluded. Considering the inclusion and exclusion criteria, 120 diabetic patients were chosen.

2.2. Instruments

General Adherence Scale (GAS): This scale was introduced by Hays (1994). Internal consistency of this questionnaire is (α= 0.81) and its reliability based on correlation of the test- retest score in interval of two years N=2181, GAS= 0.60 (Hays, 1994). In this research Cronbach’s coefficient alpha for GAS were 0.69.

Prospective and Retrospective memory (PRMQ): This questionnaire was prepared by Crawford, Smith, Maylo, Sala, Logie (2003) that involved 16 questions. It involves a main criterion as Prospective/retrospective memory and two sub criteria as short term/ long term memory and self cue/ envier cue memory and finally it has general memory as a general criterion. This test shows memory slips. In calculation of the validity Crawford and et al (2003) using internal consistency as a investigation of the subscales scores correlation with total score, that was r=0.95. For calculation of the reliability we used Cronach’s coefficient alpha that was 0.80, 0.84, and 0.89 respectively for
Prospective, retrospective and general memory (Crawford and et al, 2003). And this study Cronbach coefficient alpha was obtained 0.77, 0.81, and 0.88 respective for Prospective, retrospective and general memory

**Multidimensional Health Locus of Control (MHLC):** This scale was proposed by Wallston (1992). It involves 18 question with three component of internal health locus of control (IHLC), power- other external health locus of control (PHLC) and chance external health locus of control (CHLC).the validity of the health locus of control has been calculated by criterion-related validity, that for C, P, I components 0.67, 0.55, 0.59 were obtained. Calculation of reliability, used Kuder-Richardson reliability coefficient that was reported 0.77, 0.61 and 0.50 for C, P, I (Wallston, 1992). In this research Cronbach’s coefficient alpha for C, P, I was 0.81, 0.70, and0.72.

2.3. Data analysis

The data were analyzed by software SPSS 17 by using Pearson’s correlation coefficient method and multiple regression analysis.

3. Result

Pearson’s correlation coefficient was used for study of the relationship between criterion and predictor variable involving adherence, health locus of control and memory slips. The result is presented in Table 1.

<table>
<thead>
<tr>
<th>variables</th>
<th>mean</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>adherence</td>
<td>20.53</td>
<td>5.21</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>internal health locus of control</td>
<td>27.90</td>
<td>6.32</td>
<td>0.24**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>chance external health</td>
<td>18.88</td>
<td>6.56</td>
<td>0.057</td>
<td>0.042</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>locus of control</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>power- other external health</td>
<td>25.30</td>
<td>5.59</td>
<td>0.29**</td>
<td>0.45**</td>
<td>0.25**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>locus of control</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Memory slips</td>
<td>39.14</td>
<td>9.46</td>
<td>-0.34**</td>
<td>-0.17</td>
<td>-0.21*</td>
<td>-0.18</td>
<td></td>
</tr>
</tbody>
</table>

** P<0.01  
* P<0.05

According to Table 1, based an the Pearson’s correlation coefficient scores there is a negative and significant relation among memory slips (r= - 0.34,  P < 0.01) and adherence, also there is a positive and significant relation among internal health locus of control (r = 0.24, P < 0.01), power – others external health locus of control (r= 0.29, P < 0.01), and adherence in type II diabetic patients.

In order to consider this question that which variable predict adherence criterion among physician-patient relationship, memory slips and health locus of control, stepwise multiple regression analysis was employed. The results are shown in Table 2.

<table>
<thead>
<tr>
<th>predictors variable</th>
<th>R²</th>
<th>F</th>
<th>Sig</th>
<th>B</th>
<th>β</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>General memory slips</td>
<td>0.12</td>
<td>16.10</td>
<td>0.001</td>
<td>- 0.15</td>
<td>- 0.30</td>
<td>- 3.55</td>
<td>0.001</td>
</tr>
</tbody>
</table>
The results of the regression analysis indicates shown 0.12 coefficient of determination ($R^2 = 0.12$) for memory slips and 0.17 coefficient of determination ($R^2 = 0.17$) for power- other external health locus of control. It means that 12% of adherence variable is predicted by Memory slips and 17% of adherence variable is predicted by power- other external health locus of control.

According to $\beta$ coefficient in table 2, between predictor variable components, General Memory slips ($\beta= - 0.30$, $P< 0.001$) and power- other external health locus of control ($\beta= 0.23$, $P< 0.005$), explain the adherence significantly. So health locus of control and memory of type II diabetic patient are predicted adherence.

4. Discussion and Conclusion

The result of this research based on the relation memory and adherence and prediction of adherence by the patient memory function are in agreement with finding of Ley (1989) and Insel and Cale (2005). Memory function and level of recalling medical recommendation are related to adherence in diabetic patient. It seems that desired memory function and low level of memory slips cause to better recalling so it affects on adherence, of course the physician and patient are responsible for memory function slips. The result of this research based on the relation between internal health locus of control, power- other external health locus of control and adherence is in agreement with finding of Leong, and et al (2004) and Morowati Sharifabad et al (2009). It seems that health locus of control is related to adherence, thus diabetic patients who know powerful individuals like physician responsible for their health and then they believe in own roles to control their health increase high adherence. Because the participants are patients with diabetic II in Iran- Tabriz, the results can be affected by special regional and cultural characteristics. So this research is limited in generalization of the results in other region. Thus it is recommended to conduct similar research in other cities of Iran. Also according to this fact that patients with different cognitive capabilities like memory function refer to physician, considering this issue in prescription is recommended for increase adherence in the patients.

Reference


