ABSTRACT

Many chronic diseases like diabetes, cancer, cardiovascular diseases affect the health of the individual. Diabetes mellitus is one of the largest health care problem in the developing countries in terms of prevalence, cost and the physical and psychological burden it places on individual living with illness. So the present study aimed to find out the predictors of healthiness among diabetics. 61 diabetics and 61 Non-Diabetics were randomly selected from Baba Banda Bhadur charitable trust clinic (Rohtak). The data were collected by the Healthiness scale by Leddy (1997), General self-efficacy scale by Jerusalem and Schwarzer (1992), Resilience scale by Wagnild and Young (1993), Multidimensional Health locus of control scale by Wallston et al., (1976). The data were analyzed by using Pearson’s product moment method to see the correlation among these variables along with descriptive statistics. The data was also analyzed by regression analysis. Results revealed that resilience, chance (MHLC) and self-efficacy were significant predictors contributing 39.1% of variance in healthiness.

Key Words: Healthiness, Self-Efficacy, Resilience, Health locus of control, Diabetes, BMI

Diabetes mellitus (DM) is one of the largest healthcare problem worldwide in terms of prevalence, cost, and the physical and psychological burden it places on individual living with the illness. Diabetes is also one of the most challenging of the chronic diseases from a psychosocial and behavioral perspective. There is no cure, diagnosis can occur at any stage of life, and after diagnosis, daily treatment is required for the remainder of the lifespan, which may or may not successfully prevent the development of serious long-term complications, such
as cardiovascular and kidney diseases. Every person is concerned about health. Many chronic diseases like diabetes, cancer, cardiovascular diseases are affecting the health of the individual. Chronic illness is the main contributor to disability and death, especially in developing countries. Diabetes is by far, the most common of all endocrine disorder and its incidence is increasing in developing countries. Diabetes mellitus is a serious condition associated with significant morbidity and mortality because of its short and long term complications. Diabetes is estimated to cause approximately 41000 cases of kidney failure, 24000 cases of blindness and 82000 amputations yearly.

Health is difficult to define. In many definitions, physiological and psychological components of health are dichotomized. Other sub-concepts that might be included in the definitions of health include environmental and social influences, freedom from pain or disease, optimum capability, ability to adapt, purposeful well-being. World health organization (1948) defined health, “A complete state of physical, mental & social well-being and not merely the absence of disease or infirmity”. Within the disease perspective, health has been defined as a state or condition of integrity of functioning (functional capacity or ability) and perceived well-being (feeling well). The term, health, has been derived from word ‘hoelth’ means sound, and ‘hale’ means strength. Consequently a person is able to:

- Function adequately (can be objectively observed),
- Adapt adequately to the environment, &
- Feel well (as subjectively assessed).

Health locus of control is the degree to which an individual feels that their health is within their own control or within the control of external factors such as chance, luck, and other people. Several studies have demonstrated that preventive self-efficacy greatly influenced actual behavior and health locus of control (Bandura,1986). Alogna (1980) identified that the complaint subjects were significantly older and viewed their illness as significantly more severe than the noncompliant patients. Additionally, they tended to exhibit more of an internal locus of control than the noncompliant patients.

- Externals: Individuals who feel that their health is the result of outside factors(i.e. health professionals, God, chance events).
- Internals: Individuals who feel that their health is the result of their own actions (i.e. diet, exercise).

Perceived self-efficacy is defined as people’s beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives. Self-efficacy beliefs determine how people feel, think, motivate themselves and behave. Such beliefs produce these diverse effects through four major processes. They include cognitive, motivational, affective and selection processes. A strong sense of efficacy enhances human accomplishment and personal well-being in many ways. People with high
assurance in their capabilities approach difficult tasks as challenges to be mastered rather than as threats to be avoided. Such an efficacious outlook fosters intrinsic interest and deep engrossment in activities. They set themselves challenging goals and maintain strong commitment to them. They heighten and sustain their efforts in the face of failure. They quickly recover their sense of efficacy after failures or setbacks. They attribute failure to insufficient effort or deficient knowledge and skills which are acquirable. They approach threatening situations with assurance that they can exercise control over them. Such an efficacious outlook produces personal accomplishments, reduces stress and lowers vulnerability to depression. Sacco et al., (2005) found that the effects of higher BMI and poor adherence on depression are mediated by lower self-efficacy perceptions.

Resilience in psychology is the positive capacity of people to cope with stress and catastrophe. It is also used to indicate a characteristic of resistance to future negative events. In this sense resilience corresponds to cumulative protective factor and is used in opposition to cumulative risk factor. The phrase, risk and resilience, in this area of study is quite common. Commonly used terms, essentially synonymous, within psychology are resilience, “psychological resilience”, “emotional resilience”, “hardiness” and “resourcefulness”. Wright et al., (2008) stated that resilience’s effect on pain was mediated through self-efficacy, suggesting that higher self-efficacy was linked to lower pain and better physical functioning.

In the national survey 54.1% of diabetes developed it in the most productive years of their lives i.e. before the age of 50 years and they also had a higher risk of developing chronic complications of diabetes. The prevalence of Type 2 diabetes is 4-6 times higher in the urban areas as compared to rural areas. The prevalence of impaired glucose tolerance (IGT) in the rural population is also high at 7-8%, which indicates presence of a genetic basis for Type 2 diabetes in ethnic Indian population. In India nearly 75% of the Type 2 diabetics have first degree family history of diabetes indicating a strong familial aggregation (Davey et al., 2000).

Recent review in the field of diabetes by Naers et al., (2004) found that people with diabetes reported significantly lower well-being than people with no reported diabetes. Some of the recent study by McCullam et al., (2007) also pointed that people with DM and minor depression have lower mental score, more cognitive limitations, and lower self reported health status score compared with people with DM and without depression, differences that may adversely affect self care activities.

The present study is designed to examine the healthiness of diabetics in relation to self efficacy, health locus of control, resilience and BMI. Related review revealed that most of the studies have investigated the association between diabetes, healthiness (i.e., quality of life, well-being) and locus of control. However
in this study the importance of patient self efficacy, locus of control, resilience and BMI will also be intended to focus on the aspect of management, which is crucial for the improvement in the healthiness, physical, psychological and social well-being of every patient suffering from this disease.

Objectives

- To study the relationship among the measures of Healthiness, Self-Efficacy, Health Locus of Control, Resilience and BMI.
- To find out the predictors of healthiness in diabetics and non diabetics.

Hypotheses

- Internal Locus of Control is likely to show positive relationship with measure of healthiness in diabetics.
- Resilience is likely to show positive relationship with healthiness in diabetics.

METHODS

Sample

The present study was conducted on a sample of 122 (61 Diabetics & 61 Non Diabetics) subjects in the age range between 45 to 70 years. The diabetics were taken from out and in patients at Banda-Bahadur Charitable Trust, Rohtak. The normal subjects were freely drawn from general population of Rohtak city. All the subjects belonged to more or less same socio-cultural background and all non-diabetics reported themselves to be in a good health and were free from any chronic disease and physical ailment.

Tools

Healthiness Scale: “Healthiness reflects a human being’s perceived involvement in shaping change experienced in living. Therefore, Healthiness is a resource that influences the ongoing patterning reflected in health” (Leddy, 1997). Healthiness Scale was developed by Leddy (1996). This is a 6 point rating scale having 26 items ranging from strongly agree to strongly disagree. The summative score can range from 26 to 156 with higher score indicating higher healthiness. In this scale 18 items were positive and other 8 items were negative. Scoring weights were 6,5,4,3,2,1 for positive items and 1,2,3,4,5,6 for negative items, respectively.

Self-Efficacy Scale: General self-efficacy scale (G.S.E.) by Schwarzer and Jerusalem (1992). This self administering 4 point rating scale contains 10 items. All the 10 items yield the final composite score with a range from 10 to 40. It requires 4 minutes on average for administration.

Resilience Scale: This scale is developed by Wagnild and Young’s (1993). The original Resilience scale has 26 items but in this study used the shorter
version of that scale 14 items. The shorter versions are derived from a factor analysis reported in Neill & Dias (2001). The reliability and validity of resilience scale are well established.

Multidimensional Health Locus of Control Scale: Multidimensional Health Locus of Control Scale (MHLC) is developed by Wallston et al., (1976). This was a forced choice instrument which consisted of 18 (6 statements of internal, 6 of chance & 6 statements of powerful others) statements with 6 alternative responses. Separate score was obtained for each of the components of the MHLC.

Body Mass Index (BMI): A measure of physiqueHeight and Weight of the subjects was taken for the purpose of BMI. Standard metric scale and weighing machine were used. It was scaled as popularly and accepted notion.

\[
\text{BMI} = \frac{\text{WEIGHT (Kg.)}}{\text{Height (M)}^2}
\]

Ratio of weight in Kg. was divided by the height in meter squared.

Procedure

First of all the purpose of the study was explained to the subjects which helped to get consent and establish a proper rapport. Healthiness scale, General self-efficacy scale, Resilience scale and Multidimensional health locus of control scale were administered, individually. Respondents were asked to fill the questionnaires according to instructions, with the request to respond honestly and truly. They were assured that their responses would be kept confidential. The answered questionnaires were collected and scored as per manuals.

RESULTS AND DISCUSSION

The objective of the study was to study relationships between Healthiness and Self-Efficacy, Health Locus of Control, Resilience and BMI in Diabetics and Non- Diabetics. The correlation with all the variables was computed by applying Pearson’s product moment method. The results are summarized in Table 1. It may be pointed out that degree of freedom being 59; a correlation coefficient of .250 and .325 was significant at .05 and .01 level, respectively.

**TABLE 1**

<table>
<thead>
<tr>
<th>Group</th>
<th>BMI</th>
<th>Internal (MHLC)</th>
<th>Chance (MHLC)</th>
<th>Powerful-others (MHLC)</th>
<th>Self-efficacy</th>
<th>Resilience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetics</td>
<td>.095</td>
<td>.295**</td>
<td>-.430*</td>
<td>-.070</td>
<td>.457*</td>
<td>.501*</td>
</tr>
<tr>
<td>Non-Diabetics</td>
<td>-.238</td>
<td>.468*</td>
<td>.082</td>
<td>.214</td>
<td>.25**</td>
<td>.488*</td>
</tr>
</tbody>
</table>

*P<0.01, **P<0.05
The correlation between Healthiness and BMI is .095 in diabetics. It is not significant. Significant positive correlation exists with internal locus of control, Self-Efficacy and Resilience at .05, .01 and .01 level, respectively. On the other hand, significant negative relationship was found between healthiness and Chance (component of Health locus of Control) as -.430 (p< .01 level). But there was non significant negative relationship between Healthiness and powerful-others i.e., -.07 in diabetics.

The correlation between healthiness and internal (component of MHLC) in Non-Diabetics is .468 and also between Healthiness and Self-efficacy (r = .25) were positive and significant at .01 and .05 level, respectively. This shows that individuals who were healthy were found to be high on self-Efficacy and internal locus of control. There was also a significant positive correlation between healthiness and resilience (r = .488) at .01 level. This revealed that healthy people show high resilience. Diabetics and healthy control, by and large, show similar intercorrections except chance factor of MHLC.

**Regression**

Stepwise multiple regression analysis was done to identify the role of Health Locus of Control (internal, chance, powerful others), Resilience, Self-Efficacy and BMI in the determination of healthiness of Diabetic. In case of total sample (61 Diabetics patients), when healthiness was studied as dependent variable, three i.e., Resilience, Chance and Self-efficacy emerged as significant accounting for 39.1% variance in healthiness predictors (Table2)

<table>
<thead>
<tr>
<th>Model</th>
<th>MultipleR</th>
<th>R Square</th>
<th>F</th>
<th>Level of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Resilience</td>
<td>.501</td>
<td>.251</td>
<td>19.77</td>
<td>.001</td>
</tr>
<tr>
<td>2. Resilience, Chance</td>
<td>.586</td>
<td>.343</td>
<td>15.15</td>
<td>.001</td>
</tr>
<tr>
<td>3. Resilience, Chance, self-Efficacy</td>
<td>.626</td>
<td>.391</td>
<td>12.22</td>
<td>.001</td>
</tr>
</tbody>
</table>

The equation revealed that in predicting healthiness in Diabetics, only 3 factors i.e., Resilience, chance and Self-efficacy were found to be significant predictors contributing 39.1% of variance, best of the factors determine the constant healthiness.

The table explains that 25% of variance is accounted for by Resilience and unknown variables which are most significant predictor of healthiness. Continuance model accounted for (.343-.251 = 0.92) 9.2% of variance is accounted for chance and only 4.8% (.391-.343=.048) of variance was accounted.
for by self efficacy. These findings are consistent with the finding of earlier study by Aljasem et al., (2001) who stated that self efficacy explained 4% to 10 % of the variance in Diabetics self care behavior.

\[
\bar{X}_H = b(R) + b(C) + b(S) + K
\]

\[
109.11 = .558(22.07) -.701(21.41) + .548(26.16) + 97.486
\]

\[
109.11 = 12.32 + (-15) + 14.33 +97.486
\]

Where:
- Mean, \( b = \) Regression Coefficient, \( K = \) Constant, \( R = \) Resilience, \( C = \) Chance, \( S = \) self-Efficacy, \( H = \) Healthiness

The equation has been derived from Table 3. The derived equation with the model is as follows:

**TABLE 3**

Describing regression coefficients of all the independent variables and their correlation (R) with Healthiness in Diabetics

<table>
<thead>
<tr>
<th>Dependent variable/criterion variable = Healthiness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean of Healthiness = 109.11</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable/predictors</th>
<th>Mean</th>
<th>Regression coefficients (b)</th>
<th>Level of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resilience</td>
<td>22.056</td>
<td>.558</td>
<td>.001</td>
</tr>
<tr>
<td>Chance</td>
<td>21.4098</td>
<td>-.701</td>
<td>.001</td>
</tr>
<tr>
<td>Self-Efficacy</td>
<td>26.1639</td>
<td>.548</td>
<td>.001</td>
</tr>
<tr>
<td>Constant (K)</td>
<td>97.486</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This table is a matrix constituting mean values, Regression coefficients (b) and its probability values. This matrix explains three models i.e., Resilience, Self-efficacy and Chance. The resilience model reflects that increment in resilience would lead to .558 increments in construct of global healthiness. In other words it can be stated that resilience plays a significant role in the enhancement of healthiness.

The continuance model reflect that increment in chance would lead to -.701 decrement in construct of global healthiness. In other words, it can be stated that chance plays a significant role in the decrement of healthiness. The Self-Efficacy model reflects that increment in Self-Efficacy would lead to .548 increments in construct of global healthiness. So, it can be stated that Self-Efficacy plays an important role in the enhancement of healthiness.

Overall it can de concluded that out of these three contributors the pivotal role is of resilience.

In the same way when healthiness was studied as dependent variable in non-diabetics, only two models i.e., resilience and internal emerged as significant predictors accounting for 48% and 59% of variance, respectively. The equation has been derived from Table no.5. The derived equation with the model is as follows.
\[ b(R) + b(I) + K \]

\[ 125 = 1.11(24.56) + 1.34(30.64) + 56.45 \]

\[ 125 = 27.45 + 41.05 + 56.45 \]

Where:
- \( \bar{x} \) = Mean, \( b \) = Regression Coefficient, \( K \) = Constant, \( R \) = Resilience, \( I \) = internal, \( H \) = Healthiness

The equation revealed that in predicting healthiness in Non- Diabetics, only 2 factors i.e., resilience and healthiness were found to be significant predictors internality contributing 34.8% of variance.

**TABLE 4**

Model wise multiple correlation and % of variance accounted for Healthiness in Non- Diabetics

<table>
<thead>
<tr>
<th>Model</th>
<th>MultipleR</th>
<th>R Square</th>
<th>F</th>
<th>Level of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Resilience</td>
<td>.488</td>
<td>.238</td>
<td>18.417</td>
<td>.000</td>
</tr>
<tr>
<td>2. Resilience, Internality</td>
<td>.590</td>
<td>.348</td>
<td>15.452</td>
<td>.000</td>
</tr>
</tbody>
</table>

The table explains that 25% of variance is accounted for by Resilience which is most significant predictor of healthiness. Continuance model accounted for total of 35%. 11% of variance is accounted for Internality component of MHLC.

**TABLE 5**

Describing regression coefficients of all the independent variables and their correlation (R) with Healthiness in Non- Diabetics

Dependent variable/criterion variable = Healthiness

Mean of Healthiness = 125

<table>
<thead>
<tr>
<th>Variable/predictors</th>
<th>Mean</th>
<th>Regression coefficients(b)</th>
<th>Level of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resilience internal</td>
<td>24.56</td>
<td>1.12</td>
<td>.001</td>
</tr>
<tr>
<td>Constant (K)</td>
<td>30.64</td>
<td>1.34</td>
<td>.001</td>
</tr>
<tr>
<td>Constant (K)</td>
<td>56.45</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This table is a matrix constituting mean values, Regression coefficients (b) and its probability values. This matrix explains two models i.e., resilience and internality. The resilience model reflects that increment in resilience would lead to 1.12 increments in construct of global healthiness. In other words it can be stated that resilience plays a significant role in the enhancement of healthiness in healthy people.

The continuance model reflects that increment in internality would lead to 1.34 increments in construct of global healthiness in healthy subjects. In other words, it can be stated that internal locus of control plays a significant role in enhancing healthiness.
the enhancement of healthiness in people. Overall out of these two contributors, the most significant predictor is of resilience.

It can, thus, be concluded that the healthiness of diabetics can be enhanced by enhancing their resilience and self-efficacy as well as by reducing their belief/cognition that health is a matter of chance. Whereas, healthiness in non-patients (controls) can be enhanced by enhancing their internality belief and resilience.

REFERENCES


