The Association between Spiritual Health and Blood Sugar Control in Elderly Patients with Type 2 Diabetes

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ABSTRACT

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Introduction: Spirituality is taken deeply into consideration as a part of health because of its role in the control of chronic diseases and its importance in determination of life purpose in the elderly. This study aimed to investigate the association between spiritual health and blood sugar control in elderly patients with type 2 diabetes.

Methods: This cross-sectional study was conducted on 200 elderly patients with type 2 diabetes from 10 rural health centers of Urmia city, north west of Iran. These patients were selected by cluster random sampling. Data were collected by Spiritual Well-Being Scale of Paloutzian and Ellison. Glycated hemoglobin (HbA1c) was used to measure blood sugar control status of diabetic patients. Data were analyzed using descriptive statistics and chi-square test and Pearson correlation coefficient in SPSS software.

Results: The spiritual health score in 43% of the elderly with diabetes was moderate and 57% had high spiritual health level. There was statistically significant relationship between spiritual health and gender, age, education, occupation and economic status. The results also showed that there was no significant correlation between spiritual health and its subdomains with HbA1c (r = 0.07).

Conclusion: In this study, there was no statistically significant difference between spiritual health scores in patients with uncontrolled and controlled blood sugar. It is suggested to conduct case-control study with larger sample size on factors affecting blood sugar control.

Keywords: Spiritual Health, Blood Glucose, Aged, Diabetes Mellitus


Introduction

The diabetes epidemic is now one of the main causes of attenuation and disability and one of the concerns are exacerbated public health in the world, based on the current trend, approximately 75% of cases in the world in 2025 will be identified in developing countries (1). In addition to the high incidence of diabetes mellitus in throughout the world and an increase of prevalence from 4% in 1995 to 4.5% in 2025, serious complications are the causes of special attention of governments to the disease such as retinopathy, nephropathy, neuropathy, diabetic foot, non-traumatic amputation, kidney disorders and atherosclerosis (2). The prevalence of diabetes was 7.7% in Iran in 2005, approximate 2 million people and is projected to be in case of the continuation of the current trend, reach nearly to 5.2 million cases in 2025 (3). The prevalence of diabetes is extrapolated to the Iranian population aged 25–64 years and the
prevalence in aged 55–64 years is 16.8% (4). Considering that the present recovery in diabetic people is almost impossible, in conclusion the therapeutic care is the control of disease.

The use of religious beliefs and spirituality is often considered as a strategy of constructive confrontation in psychological health improvement of individuals. The importance of morality and spiritual growth in human beings, in the past few decades are increasingly taken psychology and mental health professionals into consideration that the World Health Organization in defining the dimensions of human points physical, mental, social and spiritual dimensions (5). Spiritual health is the newest dimension which places beside other dimensions; physical, mental and social health. Some even believe that without the spiritual health, other health dimensions cannot have the desired maximum yield and it is not possible to reach high quality of life (6). Spiritual health is one of the fundamental concepts about how the stress-induced problems and indeed with the disease that includes two existence and religious dimensions. Religious health is defined as a connection and commitment to a particular religious belief and existence health is defined to reach the meaning of life and how to achieve perfection (7).

When spiritual health of person goes to the serious risk, it may be experiencing the feelings of loneliness, depression and the feeling of not having a meaning in life. As well as spiritual health plays a vital role in coping with stress and has positive effect on health promotion (8). The researchers emphasized that the increased level of meaning and spirituality in the life not only overcome conflicts but also increases life satisfaction (9).

The American Diabetes Association has emphasized cultural factors may be uniquely effective on blood sugar control. Spirituality and religion as one of the prominent and important cultural factors have a significant role in dealing with the problems and emotional support (4). Whelan-Gales et al. on a study on the elderly in 2009 in the United States showed a reduced amount of spiritual health causes depression. They suggested that you should have holistic view about elderly and especially pay attention to their spiritual health (9). The results of You et al. have shown that elderly people with strong religious beliefs have optimal health compared with others. In addition, elderly people with faith suffering with certain physical disease had better performance compared with elderly with weak faith and experienced better results from treatment (10). The results of Arcury et al. on elderly patients with diabetes showed that, there are relationship between religious activity and mental health, physical health and mortality, but poor health with levels of religious activities especially like to pray or use of the media were not associated (11). The results of Campbell et al. in 2010 showed that patients with cancer, stroke and rehabilitation phase after head trauma did not support the hypothesis, and there was no correlation between individual religious activity and physical health (12). In the study of Shahdadi et al. results showed that spirituality rate of diabetes patients were high but there was no association between spirituality and type 2 diabetes (13).

According to the above research that some have confirmed positive effects of religious health on physical and mental health, in other cases such effects are not found. So far, there is no study on the relationship between blood sugar control and spiritual health in the elderly, as one of the dimensions of physical health, in Iran. This study aimed to investigate the association between spiritual health and blood sugar control in elderly patients with type 2 diabetes.

**Methods**

**Subjects**

In this cross-sectional study, study population was consisted of diabetic elderly over age 60 referred to rural health centers of Urmia city, north west of Iran, in 2016. According to recent studies and estimation of the average amount of spiritual health of the elderly (9-14), considering confidence level of 95%, d = 0.6, z = 1.96 and p = 0.3, required sample size was determined 200 subjects by Cochran formula. At first 10 of 35 health centers of rural health centers were selected by random sampling and after informed consent, diabetic elderly from each center were included to study according to the population of diabetic elderly.

The patients excluded if there were history of mental diseases such as depression or handicap in their file as well as patients who were not done HbA1c test in the past month were excluded.

**Procedure**

At first, the subjects that were randomly selected for participating in the study through a phone call were invited to the health center. Objectives of the study were described to them, and then they were asked to complete the questionnaires. In case of low or illiteracy or inability to complete the questionnaire, interview was applied by an educated staff. Glycated hemoglobin (HbA1c) of patients was extracted by an educated staff from the stored files in the center. HbA1c 6-4% was considered good control, 8-6% weak control and more than 8% unacceptable control (15).

**Measures**

In this study two questionnaires were used; demographic characteristics and spiritual health questionnaire. Personal characteristics included age, education and occupation and spiritual health. Spiritual health questionnaire is consists of 20 questions about Spiritual Well-Being Scale of Paloutzian and Ellison (SWBS) (16-17). In this 20-item questionnaire for spiritual well-being, there were 10 questions for religious and 10 for existence health. The score of spiritual health is the sum of these two
subscores that has a range 20 to 120. The range of six-
point Likert scale was classified from strongly
disagree until completely agree. Each question score
is 1-6. In negative questions, scoring is done in reverse
shape and in the end, the spiritual health classified in
three level, low 20-40, moderate 41-99 and high 100-
120. This questionnaire was used in the study of
Jadidi in Iran and its validity and reliability was
confirmed (18). In the study of Seyed et al. also the
content validity and reliability of spiritual health
questionnaire was determined and confirmed (19).

Ethical considerations

The objectives of the study were explained to all
participants and all of them accepted to participate and
were assured of the confidentiality of their individual
information as well as the voluntary nature of
participating in the study.

Data analysis

Data was analyzed using the SPSS software and
using the Pearson and Chi-square tests. Significance
level was considered less than 0.05.

Results

The mean age of participants was 70.51 ± 8.7 that
(62.5%) 125 subjects were female. In terms of
education level, most of the patients were illiterate
(71.5%) and housewife (56%). In terms of marital
status, 146 subjects (73%) were married and 50 cases
(25%) were widow and 4 subjects (2%) were living
alone. In terms of the type of diabetes treatment, most
participants (77.5%) took the pill. In terms of taking
smoking, 178 cases (89%) were not smoker. In terms
of the economic status, 132 subjects (66%) were on
average level.

The results of this study showed that the average
score for the spiritual health of the elderly was 95.85
± 14.3 of the total score of 120. In spiritual health
section, 43% of patients had moderate spiritual health
and 57% had high spiritual health and none of the
samples had low spiritual health. The spiritual
dimensions of health indicated that the average score
for religious health (51.28 ± 8.14) is higher than the
average score for physical health (44.57 ± 7.69). The
mean HbA1c of diabetic patients was 7.87 ± 1.9.
About half of the participants had more poorly
controlled blood sugar (47%). (Table 1)

Relationship between demographic variables and
spiritual health was examined using Chi-square. The
results showed that the spiritual health had a
significant relationship with sex, age, education,
occupation, economic status (p < 0.05). But spiritual
health had not significant relationship with marital
status, blood lipids, diabetes complication and body
mass index. (Table 2)

In the present study the weak reverse correlation
between spiritual health and its domain with blood
sugar control was observed so that the diabetic elderly
blood sugar decreases, not statistically significant
though, when spiritual health increases proportionally.
(p < 0.05, r = -0.07). (Table 3)

Discussion

This study showed that the majority of diabetic
elderly have high spiritual health (95.85 ± 14.3) and
the rest have moderate score. This point according to
religious and cultural beliefs of rural elderly is
justifiable. In the study of Whelan-Gales et al. (9) the
average score of spiritual health in the elderly with
heart disease in the United States and in the study of
Jadidi et al. (18) the spiritual health of elderly in
nursing home of Tehran’s Kahrizak and in the study of
Shahdadi et al. (13) the spiritual health of patients
with diabetes in Ghoochan city were reported from
moderate to high. One possible explanation is that the
elderly mostly tend to religion and spirituality for
seeking power and protection of spiritual force.

The results of this study represents a higher
religious health score compared with existence health
that were compatible with the results of the study of
Jadidi et al. and Khalili et al. in a study of the spiritual
health of elderly (18-20) that maybe the cause of it as
being higher role of religious beliefs in stressful
situations such as disease control. On the other hand,
the result of this study was inconsistent with the study
of Alahbakhshian et al. that represents higher role of
existence health in patients with multiple sclerosis (6).
In justifying the cause, it can be said that individuals
in order to control their stress in chronic diseases, use
different ways related to social and psychological
concerns (existence health) and being compatible with
the environment and their community.

In the present study the spiritual health of male
subjects were greater than females’ that is consistent
with the study of Khalili et al. (20) and Sadrollahi et
al. (21) but is inconsistent with the study of
Kandasamy et al. (22) in India that the spiritual health
of women were greater than men. The spirituality
difference between men and women could be
attributed to cultural and social factors and the kind of
view to spirituality. Because men compared with
women have more opportunity to participate in the
rites and mosques and religious ceremony, it is
expected that the rate of spiritual health and
satisfaction of this health dimension in men be greater
than women.

There was significant relationship between spiritual
health and age so that spiritual health rises with
increasing age and this is consistent with the study of
Saydshohadai et al. (23) and is inconsistent with the
study of Jadidi et al. and Sadrollahi et al. (18, 21) .
Pulling towards spirituality is considered as yield of
increasing age because it is a way by which a person
face with death reality.

The results indicated that with increasing the status
of education in elderly, their spiritual health rises that
is consistent with the results of Seyed Fatemi et al.
(19) and Khalili et al. (20) and is inconsistent with the
study of Jadidi et al. (18) and Saydshohadai et al. (23).

Table 1. The status of spiritual health and glycated hemoglobin in elderly with diabetes

<table>
<thead>
<tr>
<th>Spiritual health</th>
<th>N</th>
<th>%</th>
<th>Mean ± SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate(41-99)</td>
<td>86</td>
<td>43</td>
<td>95.85 ± 14.03</td>
<td>64-119</td>
</tr>
<tr>
<td>High (100-120)</td>
<td>114</td>
<td>57</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blood Sugar</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good control(4-6)</td>
<td>30</td>
<td>15</td>
<td>7.87 ± 1.9</td>
<td>4-15</td>
</tr>
<tr>
<td>Weak control(6-8)</td>
<td>94</td>
<td>47</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unacceptable control (more than 8)</td>
<td>76</td>
<td>38</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2. The relationship between demographic variables and spiritual health in elderly with diabetes

<table>
<thead>
<tr>
<th>Variable</th>
<th>High</th>
<th>Moderate</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>61(48.8)</td>
<td>64 (51.2)</td>
<td>0.02</td>
</tr>
<tr>
<td>Male</td>
<td>53(70.7)</td>
<td>22 (29.3)</td>
<td></td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>3 (75)</td>
<td>1 (25)</td>
<td>0.75</td>
</tr>
<tr>
<td>Married</td>
<td>83(56.8)</td>
<td>63 (43.2)</td>
<td></td>
</tr>
<tr>
<td>Dead husband</td>
<td>28(56)</td>
<td>22 (44)</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60-70</td>
<td>65(53.7)</td>
<td>56 (46.3)</td>
<td>0.03</td>
</tr>
<tr>
<td>70-80</td>
<td>34(65.4)</td>
<td>18 (34.6)</td>
<td></td>
</tr>
<tr>
<td>More than 80</td>
<td>19(70.3)</td>
<td>8 (29.7)</td>
<td></td>
</tr>
<tr>
<td>Education level</td>
<td></td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Illiterate</td>
<td>71(49.7)</td>
<td>72 (50.3)</td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>39(79.6)</td>
<td>10 (20.4)</td>
<td></td>
</tr>
<tr>
<td>Diploma and more</td>
<td>5(62.5)</td>
<td>3 (37.5)</td>
<td></td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farmer/rancher</td>
<td>44(78.6)</td>
<td>12 (31.4)</td>
<td>0.001</td>
</tr>
<tr>
<td>Housekeeper</td>
<td>57(50.9)</td>
<td>55 (49.1)</td>
<td></td>
</tr>
<tr>
<td>Self-employment</td>
<td>8(53.3)</td>
<td>7 (46.7)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>5(29.4)</td>
<td>12 (70.6)</td>
<td></td>
</tr>
<tr>
<td>Triglyceride</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>41(51.2)</td>
<td>39 (48.8)</td>
<td>0.11</td>
</tr>
<tr>
<td>No</td>
<td>73(60.8)</td>
<td>47 (39.2)</td>
<td></td>
</tr>
<tr>
<td>Complication of diabetes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>13(52)</td>
<td>12 (42.3)</td>
<td>0.37</td>
</tr>
<tr>
<td>No</td>
<td>101(57.7)</td>
<td>74 (42.3)</td>
<td></td>
</tr>
<tr>
<td>Economic status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>22(68.8)</td>
<td>10 (20.4)</td>
<td>0.013</td>
</tr>
<tr>
<td>Moderate</td>
<td>79(59.8)</td>
<td>53 (40.2)</td>
<td></td>
</tr>
<tr>
<td>Weak</td>
<td>13(36.1)</td>
<td>23 (63.9)</td>
<td></td>
</tr>
<tr>
<td>BMI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18.5-24.9</td>
<td>26(55.3)</td>
<td>21 (44.7)</td>
<td>0.54</td>
</tr>
<tr>
<td>25-29.9</td>
<td>47(61.8)</td>
<td>29 (38.2)</td>
<td></td>
</tr>
<tr>
<td>≥ 30</td>
<td>41(53.2)</td>
<td>36 (46.8)</td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Correlation between spiritual health dimensions and blood sugar in elderly with diabetes

<table>
<thead>
<tr>
<th>Spiritual health dimensions</th>
<th>Blood sugar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical health</td>
<td>p = 0.31</td>
</tr>
<tr>
<td>Religious health</td>
<td>p = 0.35</td>
</tr>
<tr>
<td>Spiritual health(total)</td>
<td>p = 0.27</td>
</tr>
</tbody>
</table>

Some possible reasons are the higher rate of spiritual health in literate people, more knowledge about the concepts of the meaning of spiritual health and employing them in daily life.

Farmers and ranchers have the highest spiritual health that is consistent with the study of Sadrollahi et al. (21) that showed employed elderly have high spiritual health. The main reason for this is the feeling of being useful and higher life satisfaction.

There was a significant relationship between economic status and spiritual health of elderly. The elderly, who had good economic status, had higher level of spiritual health. These findings were consistent with the study of Saydshohadai et al. (23) and Lynch et al. (24) that showed a significant relationship between the spiritual health and financial income situation of elderly.
Finally, to answer the question, weak reverse correlation observed between spiritual health with blood sugar control that means although spiritual health increases, when blood sugar of diabetic elderly decreases but this is not statistically significant. The results of the studies of Newlin et al. (14), Shahdadi et al. (13) and Heidari et al. (25) showed that there was no significant relationship between HbA1c and spiritual health and dimensions of religious and existence health that is consistent with the results of present study and is inconsistent with the study of Ramazankhani et al. (26) indicated that there is a significant relationship between spiritual health and controlled blood sugar in diabetic patients.

Conclusion

Although in the present study there was no significant relationship between spiritual health and blood sugar control but the spiritual health is unique force that cooperates physical, mental and social dimension of human. When spiritual health seriously is compromised, individuals may encounter with mood disorders, such as loneliness, depression and loss of meaning in life.

Study limitations

Being cross-study and data collection based on self-reporting are limitations of this study. It is suggested to conduct case-control and longitudinal studies with greater sample size associated with the evaluation of the effective control of blood sugar such as self-care, mental health status and social support of the patients and so on.

Conflict of interest

The authors declared that there are no conflicts of interest in this study.

Acknowledgment

The authors would like to thank all responsible of health centers of the city of Urmia for suitable cooperation and especially of the diabetic elderly participating in the study.

References


