



## Original Article

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

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## ABSTRACT

### Article history

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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

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### 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

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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

subscales 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  $70.51 \pm 8.7$  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  $95.85 \pm 14.03$  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 ( $51.28 \pm 8.14$ ) was higher than the average score for physical health ( $44.57 \pm 7.69$ ). The mean HbA1c of diabetic patients was  $7.87 \pm 1.9$ . 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 ( $95.85 \pm 14.3$ ) 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**

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

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

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

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

Spiritual health dimensions		Blood sugar	
<b>Physical health</b>	p = 0.31		r = -0.07
<b>Religious health</b>	p = 0.35		r = -0.06
<b>Spiritual health(total)</b>	p = 0.27		r = -0.07

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), Shadadi 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.

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