



Religious Practices and Self-Care in Iranian Patients with Type 2 Diabetes

Saeide Heidari¹ · Mahboubeh Rezaei² · Mahbobeh Sajadi³ ·
Neda Mirbagher Ajorpaz² · Harold G. Koenig^{4,5,6}

Published online: 25 October 2016

© Springer Science+Business Media New York 2016

Abstract This study aimed to examine the relationship between religious practices and self-care of patients with type 2 diabetes. A descriptive cross-sectional survey was conducted on 154 diabetic patients who were referred to two general teaching hospitals in Qom City (Iran). Data were collected using demographic questionnaire, private and public religious practices, and summary of diabetes self-care activities questionnaires. Data were analyzed using descriptive statistics and statistical tests including independent *t* test, and Pearson correlation coefficient. Significant positive correlations were observed between religious practices and self-care activities in diabetic patients ($p < 0.05$). Significant positive correlations were also found between some religious practices and self-care

✉ Mahboubeh Rezaei
M4.rezaei@gmail.com

Saeide Heidari
sheidari@muq.ac.ir

Mahbobeh Sajadi
sajadimahbobeh@yahoo.com

Neda Mirbagher Ajorpaz
Mirbagher_n@kaums.ac.ir

Harold G. Koenig
harold.koenig@duke.edu

- ¹ Department of Nursing, School of Nursing and Midwifery, Qom University of Medical Sciences, Qom, Iran
- ² Autoimmune Disease Research Center, School of Nursing and Midwifery, Kashan University of Medical Sciences, Qotb-e Ravandi Boulevard, Kashan 8715981151, Iran
- ³ School of Nursing and Midwifery, Arak University of Medical Sciences, Arāk, Iran
- ⁴ Department of Psychiatry and Behavioral Sciences, Duke University Medical Center, Durham, NC, USA
- ⁵ Department of Medicine, King Abdulaziz University, Jeddah, Saudi Arabia
- ⁶ Department of Public Health, Ningxia Medical University, Yinchuan, People's Republic of China

activities subscales ($p < 0.05$). Healthcare providers should be aware of the role that religion plays in the lives of diabetic patients and be able to take religious factors into account when developing care plans. Doing so will enhance a more patient-centered approach and thereby support patients in their role as self-care decision-makers.

Keywords Religious practice · Religiosity · Self-care · Diabetic patients

Introduction

Diabetes is one of the most common metabolic disorders in the world, and the prevalence of diabetes in adults has been increasing in the last few years (Guariguata et al. 2014). The countries of Middle East and North Africa (MENA) region now have among the highest rates of diabetes (mostly type 2 diabetes) in the world (Majeed et al. 2014). Iran as one of the MENA region countries has a high prevalence of diabetes (8.4 % in 2013), which is estimated to rise to 12.3 % in 2035 (Guariguata et al. 2014). People with type 2 diabetes are vulnerable to many complications such as blindness, lower limb amputation, and renal and cardiac diseases (McDowell et al. 2005). These complications can be reduced by improvements in self-care that lead to improved glycemic control (Samuel-Hodge et al. 2000; Ebrahimi et al. 2016). “Self-care” refers to patients’ performance of activities that enhance health promotion and maintenance, including activities specific to acute and chronic health conditions (Richard and Shea 2011). Diabetes self-care is the diabetes-related tasks that patients do (Haas et al. 2014). Self-care is an integral aspect of comprehensive care for patients with type 2 diabetes and includes exercise, diet, blood sugar testing, foot care, and adherence to oral medications (American Diabetes Association 2015; Centers for Disease Control and Prevention 2011). However, these activities are often not performed despite their value (Harvey and Lawson 2009). Some studies indicated that the chronic nature of the disease and the severe complications result in lifestyle disruption (Whittemore et al. 2002) and detract away from self-care behaviors (Helgeson et al. 2010; Lloyd et al. 2005). Also, many people with diabetes have or are at risk of developing comorbidities that may interfere with self-care. In addition, the diagnosis, progression, and daily work of managing the disease can impose an emotional burden on patients that makes self-care even more difficult (Haas et al. 2014). Hence, it is important to know more about factors associated with self-care in diabetic patients (Bai et al. 2009). It will also help healthcare professionals to manage the disease better and reduce the risk of disease-related complications (Didarloo et al. 2012).

One factor that is seldom studied in this area is religious practice. Religious practice has been defined as “the degree of participation in and adherence to the teaching and the organized activity of a particular religion” (Emblem 1992). Religion shapes followers’ health-related behaviors and their adherence to medical recommendations (Padela and Curlin 2013). Religious practices act as a buffer when individuals are faced with negative life events (Scarinci et al. 2009) and can help patients cope with chronic illnesses (How et al. 2011; Boudreaux et al. 2002). Religious practices can be useful for patients by providing comfort, increasing knowledge about their disease, and encouraging greater treatment adherence, thereby enhancing motivation for self-care and preventing serious illnesses (Stewart et al. 2013; Koenig et al. 2014). Religious activities have been associated

with reduced anxiety, positive changes in health behaviors, and better physical health (Shreve-Neiger and Edelstein 2004; Strawbridge et al. 2001; Campbell et al. 2010).

Islam and Health Issues

One of the most common religions in the world is Islam, with Iran representing one of the largest Islamic countries where Muslims represent 99 % of the population (Rezaei et al. 2008). Islam provides a God-centered framework for interpreting health and illness and an ethico-legal framework for clinical decision-making (Padela and Curlin 2013). Islamic teachings encourage Muslims to seek treatment when they fall sick (Al-shahri and Al-Khenaizan 2005). The Holy Prophet Muhammad (PBUH) said that: “*your body has rights over you*” and “*Ask Allah for forgiveness and well-being.*” Islam prohibits lifestyle and behaviors which are hazardous to health and prescribes behaviors that promote health. For example, the individual must abstain from alcohol and tobacco consumption, eat in moderation, perform regular exercise, and avoid obesity. The model framework of Muslims’ lifestyle and religious practices are: shahadah, prayer, self-purification (Zakat), fasting (ramadhan), and pilgrimage (Hajj) to Makkah. In illness, the awareness of God increases and Muslims become closer to God by realizing their own weaknesses. The worldview of Muslim patients toward health issues incorporates the notion of tolerating illness and death with patience, meditation, and prayers (Rassool 2000). Muslims may believe that health results from following the teachings and practices of Islam. Accordingly, Muslim patients may turn to religious practices in order to restore their health and thereby achieve health benefits from religious social support (Padela and Curlin 2013). The Holy Quran says: “*Howa al-shafi,*” which means the curer is God (Iranian Institute for Science and Research Expansion 1992) or “*Call on me; I will answer your prayer*” (Translation of Quran 2015). Some Muslim patients experience physical and psychological benefits from practices such as prayer, fasting, and recitation of the Qur’an (Carroll et al. 2007; Morioka-Douglas et al. 2004; Rezaei et al. 2008). Muslims may use Islamic healing practices to supplement the treatments offered by the healthcare professionals, or as an alternative to those treatments (Padela and Curlin 2013). Most researches examining religious involvement and self-care in diabetic patients have been conducted in Christian majority countries (Newlin et al. 2008; Samuel-Hodge et al. 2000; Arcury et al. 2007; How et al. 2011). Much less research on this topic has been done in Muslim majority countries particularly in patients with chronic conditions (Koenig and Alshohaib 2014). Little is known about religiosity and health in Iran, one of the most religious countries in the world. Diabetes is of great concern in Iran, and level of diabetic control in this country is often unacceptable (Esteghamati et al. 2008). Despite this, few studies have examined the relationship between religious practices and self-care in diabetic patients in Iran. The purpose of this study is to explore the relationship between religious practices and self-care in Iranian patients with type 2 diabetes.

Methods

Using a descriptive cross-sectional design, participants with type 2 diabetes were identified from two main general teaching hospitals in Qom (a city in the center of Iran). These hospitals were major centers for referral of diabetic patients and had two day clinics specialized for diabetic patients.

Inclusion criteria were:

- Aged ≥ 18 years,
- Use of anti-diabetic drugs,
- No drug addiction and use of psychedelic drugs,
- Ability to speak Persian language,
- Muslim religion.

A total of 154 patients were recruited and completed the study questionnaires.

Data Collection Instruments

Demographic Questionnaire

Information regarding gender, age, marital status, educational level, economic status, type of treatment, duration of disease, and fasting blood sugar was collected.

Private and Public Religious Practices Questionnaire (PPRP)

The PPRP consisted of two parts: private religious practices and public religious practices (Fetzer Institute/National Institute on Aging Working Group 1999; Arcury et al. 2007). The measure of private religious practices was based on the responses to four items. The first three items had 8 Likert-type response options ranging from 7 (several times a day) to 0 (never). The fourth item had 5 Likert-type response options ranging from 4 (at all meals) to 0 (never).

Public religious practices were measured by four subscales: mosque and religious ceremonies attendance, religious support provided, religious support received, and subjective religiosity. The items on the mosque and religious ceremonies attendance subscale had 8 Likert-type response options ranging from 7 (several times a week) to 0 (never). The religious support provided and received subscales had 4 Likert-type responses ranging from 3 (very often) to 0 (never), and subjective religiosity item had 4 Likert-type responses ranging from 3 (a great deal) to 0 (not at all).

Total scores were computed for each subscale by adding the item scores. Possible subscale scores ranged from 0 to 25 for private religious practices and 0–35 for public religious practices. Total scores for PPRP were computed for each subscale by adding the two subscale scores and ranged from 0 to 60. High scores indicated a higher degree of religious practice.

Summary of Diabetes Self-Care Activities (SDSCA)

The SDSCA is an 11-item self-report measure of diabetes self-management that includes items assessing the following aspects of the diabetes regimen: general diet (items 1 and 2), specific diet (items 3 and 4), exercise (items 5 and 6), blood glucose testing (items 7 and 8), foot care (items 9 and 10), and smoking (item 11) (Toobert et al. 2000). Diabetic patients report on the frequency with which they perform various self-care activities over the previous 7 days. The first 10 items of the SDSCA has 7 Likert-type response options ranging from 0 to 7. Last item (about smoking) has two Likert-type response options [0 = (No), 1 = (Yes)]. Negative items (4, 11) were reverse-coded for analysis, and total scores were computed for each subscale by adding the item scores (possible range 0–71). High scores indicated a high level of self-care.

The SDSCA has adequate internal and test–retest reliability and validity and can be generalized to different diabetes subpopulations (Toobert et al. 2000).

The English versions of PPRP and SDSCA were translated into Persian and pilot-tested with 20 diabetic patients. Moderate reliability of these instruments was demonstrated by Cronbach's alpha for the PPRP (0.87) and SDSCA (0.84). The content validity of the translated two instruments was established by 10 medical surgical nursing faculty members.

Procedure

After approval by institutional and human subject review committees (ethical code: MUQ.REC.1393.26), researchers distributed the questionnaires to diabetic patients. Data were collected in medical surgical inpatient wards. All patients signed an informed consent before participating in the study.

Data Analysis

Statistical analysis of data was performed using SPSS version 18 (PASW Statistics 18, SPSS Inc, Chicago, IL). Collected data were coded and analyzed using descriptive statistics and statistical tests including independent *t* test, and Pearson correlation coefficient.

Findings

More than half of the participants were women (61.7 %). The age range of the sample was between 30 and 90 years (mean 61.46, SD 12.7); 81.2 % of patients were married; and more than half of participants were illiterate (55.8 %). Economic status of 62.3 % of the patients was moderate; 40.3 % used oral anti-diabetic drug; and mean duration of disease was (10.54 ± 8.4) years (Table 1). Total scores on the questionnaires varied (Table 2). Response distributions for items contained in the religious practices questionnaire are presented in Table 3.

Statistically significant positive correlations were observed between the total religious practices score and its subscale scores with self-care activities ($p < 0.05$). Significant positive correlations were also found between some religious practices and self-care activities subscales. For instance, specific diet is positively associated with total score of public religious practices ($p < 0.05$). Also, significant positive correlations were found between non-smoking and religious support received ($p < 0.05$). Blood glucose testing and foot care subscales are positively associated with private and public religious practices subscales ($p < 0.05$). No significant correlations were observed between general diet and physical activity with private and all forms of public religious practices among the diabetic patients in this sample ($p \geq 0.05$) (Table 4).

Discussion

This study showed that Iranian diabetic patients engage in high levels of private and public religious practices. This reflects the traditional and religious norms that exist in Iran. Qom City is one of the most religious cities in Iran (Rastegar-Khaled and Mohammadi 2015)

Table 1 Characteristics of the sample

	<i>N</i>	<i>%</i>
<i>Gender</i>		
Male	59	(38.3)
Female	95	(61.7)
<i>Age (year)</i>		
30–49	35	(22.7)
50–69	78	(50.7)
≥70	41	(26.6)
<i>Marital status</i>		
Married	125	(81.2)
Single, widowed, and divorced	29	(18.8)
<i>Educational level</i>		
Illiterate	86	(55.8)
Primary school	57	(37)
Academic	11	(7.2)
<i>Economic status [salary (rials)/month]^a</i>		
Poor (<7,500,000 rials/month) ^b	53	(34.4)
Moderate (7,500,000–20,000,000 rials/month)	96	(62.3)
Good (>20,000,000 rials/month)	5	(3.3)
<i>Type of treatment</i>		
Oral anti-diabetic drug	62	(40.3)
Insulin	21	(13.6)
Oral anti-diabetic drug with insulin	59	(38.3)
Without any treatment	12	(7.8)
<i>Duration of disease (year)</i>		
<10	96	(62.3)
10–20	44	(28.6)
>20	14	(9.1)
<i>Fasting blood sugar (mg/dl)</i>		
110≤	66	(42.9)
>110	88	(57.1)

^a Rial is the basic monetary unit of Iran

^b Based on the minimum monthly salary determined by Ministry of Cooperative Labor and Social Welfare in Iran. It is determined at the end of each year (Ministry of Cooperative Labor and Social Welfare. Islamic Republic of Iran 2016)

and is considered a primary center for Shiite (one of the main branches of Islam) culture. Muslims with chronic illness may find that religious practices can be a source of comfort in alleviating physical and spiritual distress (Seyedfatemi et al. 2014). Being closer to God, believing in the mercy of God, and returning to religious practices may be important factors in the healing process for Iranian diabetic patients (Salehi et al. 2012).

Private religious practices were common among diabetic patients in this sample. Nearly half (45.6 %) prayed privately at least once a day. Aghamohammadi-Kalkhoran et al. (2012) reported that most diabetic patients have a close relationship with God and regularly perform private religious practices such as praying, reciting the Quran, Do'a, and Dhikr. Similarly, Arcury et al. (2007) found that 83.0 % of the diabetic patients prayed privately at least once a day.

Nearly half of the patients in the present study attended mosque and religious ceremonies at least weekly; most felt that they often provided and received support from

Table 2 Total scores on the questionnaires

	Potential score range	Range	Mean \pm SD	% from total score
<i>Religious practices</i>				
Private religious practices	0–25	0–25	15.21 \pm 6.34	60.84
Public religious practices	0–35	3–35	25.60 \pm 8.09	73.14
(a) Mosque and religious ceremonies attendance	0–14	0–14	8.22 \pm 4.81	58.71
(b) Religious support provided	0–6	0–6	4.69 \pm 1.95	78.16
(c) Religious support received	0–6	0–6	5.01 \pm 1.8	83.5
(d) Religiosity	0–9	0–9	7.66 \pm 1.88	85.11
Total score	0–60	3–60	40.81 \pm 12.93	68.01
<i>Self-care activities</i>				
General diet	0–14	0–14	8.74 \pm 5.27	62.42
Specific diet	0–14	3–14	10.58 \pm 2.75	75.57
Exercise	0–14	0–14	1.84 \pm 2.85	13.14
Blood glucose testing	0–14	0–14	7.12 \pm 5.34	50.85
Foot care	0–14	0–14	5.38 \pm 5.75	38.42
Smoking	0–1	0–1	0.95 \pm 0.22	95
Total score	0–71	6–71	34.64 \pm 13.20	48.78

members of their congregations and, over three quarters, believed that God gave them strength, support, and guidance. Attending religious activities, at the mosque, is often a way that Iranian diabetic patients cope with their illness (Aghamohammadi-Kalkhoran et al. 2012). Arcury et al. (2007) indicated that over half of the diabetic patients attended religious services at least weekly, and provided and received support from their fellow congregants. King et al. (2002) showed that diabetic patients who do not attend religious services were more likely than attenders to have elevated inflammatory markers such as C-reactive protein.

Patients in the present study scored particularly high on subscales assessing subjective religiosity and religious support received. Diabetes threatens the physical, social, functional, and emotional well-being of patients and must face many struggles associated with this diagnosis (Jafari et al. 2014; Karimi Moonaghi et al. 2014). Religion plays an important role in coping with diabetes by enhancing patients' empowerment (Abdoli et al. 2011). A "God-centered life" is one of the components of health according to Iranian diabetic patients' experience (Aghamohammadi-Kalkhoran et al. 2012). Ahmadi et al. (2016) showed that high intrinsic and extrinsic religiosities are associated with better treatment outcome in diabetic patients.

There was a direct and significant correlation between religious practices and self-care activities in patients in this sample. Patients, who reported more religious practices, participated in more self-care activities. Also, private and all forms of public religious practices among these patients were most strongly associated with self-care activities. Lundberg and Thrakul (2013) in their qualitative study found that religious and spiritual practices can be an effective means of helping Buddhist and Muslim women with type 2 diabetes to better manage their disease and change their lifestyles. Relationships with the

Table 3 Response distributions for items included in religious practices questionnaire

Scale and items	N	Responses—percent							
		Several times a day	Once a day	A few times a week	Once a week	A few times a month	Once a month	Less than once a month	Never
Private religious practices									
1. "How often do you pray privately in places other than at Mosque?"	154	32	13.6	4.5	6.5	4.5	5.2	20.1	
2. "How often do you watch or listen to religious programs on TV or radio?"	154	32	25.3	5.8	3.2	1.3	3.2	13.6	
3. "How often do you read the Holy Quran or other religious literature?"	154	15.6	12.3	5.3	1.9	3.2	5.2	44.2	
At all meals									
4. "How often are prayers or grace said before or after meals in your home?"	154	68.8	11.8	3.2	5.2	11			
Mosque and religious ceremonies attendance									
1. How often do you attend at Mosque & religious ceremonies?	154	29.9	11	9.2	7.8	7.1	1.9	7.8	25.3
2. Besides religious ceremonies, how often do you take part in other activities at a place of worship?	154	22.1	17.5	16.9	14.3	5.8	3.9	10.4	9.1
Religious support provided									
1. How often do you make the people in your congregation feel loved and cared for?	154	62.3	21.5	3.9	12.3				
2. How often do you listen to the people in your congregation talk about their private problems and concerns?	154	63	21.4	3.9	11.7				
Religious support received									
1. How often do the people in your congregation make you feel loved and cared for?	154	72.7	16.9	1.3	9.1				

Table 3 continued

	Very often	Fairly often	Once in a while	Never
2. How often do the people in your congregation listen to you talk about your private problems and concerns?	154	69.5	19.5	0.6
	154	69.5	19.5	10.4
Religiosity				
	A great deal	Quite a bit	Somewhat	Not at all
1. I think about how my life is part of a larger spiritual force	154	56.5	17.5	1.3
2. I work together with God as partners to get through hard times	154	79.3	16.2	1.3
3. I look to God for strength, support, and guidance in crises	154	74.8	16.2	8.4
				0.6

Table 4 Relationships between religious practices and self-care activities

Self-care activities and subscales	Private religious practices	Public religious practices				Public religious practices (total score)	Religious practices (total score)
		Mosque and religious ceremonies attendance	Religious support provided	Religious support received	Religiosity		
General diet	$r = 0.121$ $p = 0.09$	$r = 0.112$ $p = 0.16$	$r = 0.075$ $p = 0.35$	$r = 0.182$ $p = 0.06$	$r = 0.067$ $p = 0.41$	$r = 0.140$ $p = 0.08$	$r = 0.147$ $p = 0.06$
Specific diet	$r = 0.099$ $p = 0.28$	$r = 0.141$ $p = 0.08$	$r = 0.091$ $p = 0.25$	$r = 0.155$ $p = 0.05$	$r = 0.117$ $p = 0.14$	$r = 0.167$ $p = \mathbf{0.03^*}$	$r = 0.153$ $p = 0.05$
Exercise	$r = 0.028$ $p = 0.68$	$r = 0.044$ $p = 0.58$	$r = 0.021$ $p = 0.79$	$r = 0.013$ $p = 0.87$	$r = 0.006$ $p = 0.94$	$r = 0.036$ $p = 0.66$	$r = 0.008$ $p = 0.91$
Blood glucose testing	$r = 0.203$ $p = \mathbf{0.01^*}$	$r = 0.146$ $p = 0.07$	$r = 0.140$ $p = 0.08$	$r = 0.092$ $p = 0.25$	$r = 0.159$ $p = \mathbf{0.04^*}$	$r = 0.176$ $p = \mathbf{0.02^*}$	$r = 0.211$ $p = \mathbf{0.009^*}$
Foot care	$r = 0.026$ $p = \mathbf{0.001^*}$	$r = 0.158$ $p = 0.05$	$r = 0.191$ $p = \mathbf{0.01^*}$	$r = 0.111$ $p = \mathbf{0.01^*}$	$r = 0.225$ $p = \mathbf{0.005^*}$	$r = 0.217$ $p = \mathbf{0.007^*}$	$r = 0.264$ $p = \mathbf{0.001^*}$
Non-smoking	$t = 0.148$ $p = 0.06$	$t = 0.105$ $p = 0.19$	$t = 0.055$ $p = 0.49$	$t = 0.167$ $p = \mathbf{0.03^*}$	$t = 0.038$ $p = 0.64$	$t = 0.104$ $p = 0.20$	$t = 0.131$ $p = 0.10$
Self-care activities (total score)	$r = 0.263$ $p = \mathbf{0.001^*}$	$r = 0.214$ $p = \mathbf{0.008^*}$	$r = 0.193$ $p = \mathbf{0.01^*}$	$r = 0.195$ $p = \mathbf{0.01^*}$	$r = 0.213$ $p = \mathbf{0.008^*}$	$r = 0.266$ $p = \mathbf{0.001^*}$	$r = 0.296$ $p = \mathbf{0.000^*}$

* $p < 0.05$ is significant

divine are major sources of hope and strength in diabetes self-management (Gupta and Anandarajah 2014).

Results of the present study revealed that there was a direct and significant correlation between specific diet and total score of public religious practices. Also, significant positive correlations were found between non-smoking and religious support received. Blood glucose testing and foot care had the strongest positive correlations with religious practices subscales. Religious practices may lead to reduction in unhealthy behaviors such as excessive use of alcohol, nicotine, and drugs and positively correlating with health-enhancing behaviors (King et al. 2002; Olekno and Blacconiere 1991). Gutierrez et al. (2014) showed that a faith-based diabetes prevention program can lead to increasing physical activity, and eating more fruit and less fast food in diabetic patients. Muslims believe that God created human beings and gave them bodies that should be cared for (Aghamohammadi-Kalkhoran et al. 2012). Many diabetic religious patients believe their body is a divine gift from God, and so they have an obligation to care for their body by controlling their daily life (Abdoli et al. 2011). Religious beliefs are also a motivator to control diabetes and give patients the inner strength to take responsibility for their disease (Shakibazadeh et al. 2011; Abdoli et al. 2011). People who frequently attend religious services have been shown to have better health practices (Strawbridge et al. 1997; King et al. 2002). However, Swank et al. (2007) showed that attendance at religious services and having regular contact with a religious leader was not associated with HbA1c levels. Some Muslims believe in submitting to the will of God and so may not take care of their

glycemic control but rather leave it to fate (Bodenheimer et al. 2002). Naeem (2003) also found that Kashmiri Muslim men failed to self-manage their diabetes. The dominant attitude was to enjoy life and “leave the rest to God.”

Study Limitations

This study had several limitations that should be mentioned. The findings are limited by its cross-sectional design, which prevents us from making conclusions about cause and effect. Also, the results should not be generalized beyond Shiite Muslims in Iran. The small sample size is a limitation as well. The present findings must be confirmed in a larger study. Some results of this study are marginally significant [e.g., the correlation between specific diet and religious support received ($p = 0.05$)]. Increasing sample size may lead to statistically significant results.

Clinical Implications

Several implications for clinical practice can be drawn from this study. Healthcare providers should consider supporting patients’ religious belief because religious practice and self-care activities are related to each other. Healthcare professionals such as nurses should be knowledgeable about Islam and be able to take religious factors into account in their diabetes care plans. Taking a religious history, supporting religious beliefs, facilitating access to religious resources, and involving clergy in healthcare team are ways that healthcare providers can do this (Koenig et al. 2001).

Research Implications

We recommend that similar studies be performed in Iranian patients experiencing other chronic illnesses such as cardiovascular disease, cancer, and other disabling conditions. While this is a relatively small-scale study and conducted with one particular religious group of people diagnosed with diabetes, it would be interesting to explore the impact of religious practices on other groups of patients as well as in other religious groups in the Middle East.

Larger samples involving a variety of urban hospitals and representing different areas of Iran may be considered in attempts to replicate the findings of the present study.

Conclusion

This study found a relationship between religious practices and self-care in diabetic patients. Private and all forms of public religious practices among these patients are especially related to self-care activities in these Iranian patients.

Graduate and postgraduate training should address the importance of religious practices and self-care when working with diabetic patients. Currently, however, there is no provision to educate healthcare practitioners about religious practices and self-care within the Iranian nursing education curriculum. Perhaps there should be.

Acknowledgments The authors would like to acknowledge the help and support of all the participating patients. The authors also offer their heartfelt thanks to Qom University of Medical Sciences and Center for

Health and Religion Research for financial support of this study [this study has been approved at this research center as a research plan (Proposal Numbered P/34/26565)].

References

- Abdoli, S., Ashktorab, T., Ahmadi, F., Parvizy, S., & Dunning, T. (2011). Religion, faith and the empowerment process: Stories of Iranian people with diabetes. *International Journal of Nursing Practice, 17*(3), 289–298.
- Abstract's book of international congress of the history of medicine in Islam and Iran. *Iranian Institute for Science and Research Expansion, 1992*.
- Aghamohammadi-Kalkhoran, M., Valizadeh, S., Mohammadi, E., Ebrahimi, H., & Karimollahi, M. (2012). Health according to the experiences of Iranian women with diabetes: A phenomenological study. *Nursing and Health Sciences, 14*, 285–291.
- Ahmadi, K. U., Uwakwe, R., Odinka, P. C., Ndukuba, A. C., Muomah, C. R., & Ohaeri, J. U. (2016). Religion, coping and outcome in out-patients with depression or diabetes mellitus. *Acta Psychiatrica Scandinavica, 133*(6), 489–496.
- Al-Shahri, M. F., & Al-Khenaizan, A. (2005). Palliative care for Muslim patients. *The Journal of Supportive Oncology, 3*(6), 432–436.
- American Diabetes Association. (2015). Standards of medical care in diabetes—2015. *Diabetes Care, 38*(Suppl 1), S1–S94.
- Arcury, T. A., Stafford, J. M., Bell, R. A., Golden, S. L., Snively, B. M., & Quandt, S. A. (2007). The association of health and functional status with private and public religious practice among rural, ethnically diverse, older adults with diabetes. *The Journal of Rural Health, 23*(3), 246–253.
- Bai, Y. L., Chiou, C. P., & Chang, Y. Y. (2009). Self-care behaviors and related factors in older people with Type 2 diabetes. *Journal of Clinical Nursing, 18*(23), 3308–3315.
- Bodenheimer, T., Wagner, E. H., & Grumbach, K. (2002). Improving primary care for patients with chronic illness. *Journal of the American Medical Association, 288*(14), 1775–1779.
- Boudreaux, E. D., O'Hea, E., & Chasuk, R. (2002). Spiritual role in healing: An alternative way of thinking. *Primary Care: Clinics in Office Practice, 29*(2), 439–454.
- Campbell, J. D., Yoon, D. P., & Johnstone, B. (2010). Determining relationships between physical health and spiritual experience, religious practices, and congregational support in a heterogeneous medical sample. *Journal of Religion and Health, 49*(1), 3–17.
- Carroll, J., Epstein, R., Fiscella, K., Volpe, E., Diaz, K., & Omar, S. (2007). Knowledge and beliefs about health promotion and preventive health care among Somali women in the United States. *Health Care for Women International, 28*(4), 360–380.
- Centers for Disease Control and Prevention. (2011). *National diabetes fact sheet: national estimates and general information on diabetes and pre-diabetes in the United States*. Atlanta: Department of Health and Human Services, Centers for Disease Control and Prevention.
- Didarloo, A. R., Shojaeizadeh, D., Gharaaghaji, R., Habibzadeh, H., Niknami, Sh, & Pourali, R. (2012). Prediction of self-management behavior among Iranian women with type 2 diabetes: Application of the theory of reasoned action along with self-efficacy (ETRA). *Iranian Red Crescent Medical Journal, 14*(2), 86–95.
- Ebrahimi, H., Sadeghi, M., Amanpour, F., & Vahedi, H. (2016). Evaluation of empowerment model on indicators of metabolic control in patients with type 2 diabetes: A randomized clinical trial study. *Primary Care Diabetes, 10*, 129–135.
- Emblem, J. D. (1992). Religion and spirituality defined according to current use in nursing literature. *Journal of Professional Nursing, 8*(1), 41–47.
- Esteghamati, A., Gouya, M. M., Abbasi, M., Delavari, A., Alikhani, S., Alaadini, F., et al. (2008). Prevalence of diabetes and impaired fasting glucose in the adult population of Iran. *Diabetes Care, 31*(1), 96–98.
- Fetzer Institute/National Institute on Aging Working Group. (1999). *Multidimensional measurement of religiosity/spirituality for use in health research*. Kalamazoo, MI: Fetzer Institute.
- Guariguata, L., Whiting, D. R., Hambleton, I., Beagley, J., Linnenkamp, U., & Shaw, J. E. (2014). Global estimates of diabetes prevalence for 2013 and projections for 2035. *Diabetes Research and Clinical Practice, 103*(2), 137–149.
- Gupta, P. S., & Anandarajah, G. (2014). The role of spirituality in diabetes self-management in an urban, underserved population: A qualitative exploratory study. *Rhode Island Medical Journal, 97*(3), 31–35.

- Gutierrez, J., Devia, C., Weiss, L., Chantarat, T., Ruddock, C., Linnell, J., et al. (2014). Health, community, and spirituality: Evaluation of a multicultural faith-based diabetes prevention program. *The Diabetes Educator*, 40(2), 214–222.
- Haas, L., et al. (2014). National standards for diabetes self-management education and support. *Diabetes Care*, 37(Suppl 1), S144–S153.
- Harvey, J. N., & Lawson, V. L. (2009). The importance of health belief models in determining self-care behavior in diabetes. *Diabetic Medicine*, 26, 5–13.
- Helgeson, V. S., Escobar, O., Siminerio, L., & Becker, D. (2010). Relation of stressful life events to metabolic control among adolescents with diabetes: Five-year longitudinal study. *Health Psychology*, 29(2), 153–159.
- How, C. B., Ming, K. E., & Chin, C. Y. (2011). Does religious affiliation influence glycemic control in primary care patients with type 2 diabetes mellitus? *Mental Health in Family Medicine*, 8, 21–28.
- Jafari, N., Farajzadegan, Z., Loghmani, A., Majlesi, M., & Jafari, N. (2014). Spiritual well-being and quality of life of Iranian adults with type 2 diabetes. *Evidence-Based Complementary and Alternative Medicine*. doi:10.1155/2014/619028.
- Karimi Moonaghi, H., Namdar Areshtanab, H., Joibari, L., Arshadi Bostanabad, M., & McDonald, H. (2014). Struggling towards diagnosis: Experiences of Iranian diabetes. *Iranian Red Crescent Medical Journal*, 16(7), e16547.
- King, D. E., Mainous, A. G., III, & Pearson, W. S. (2002). C-reactive protein, diabetes, and attendance at religious services. *Diabetes Care*, 25(7), 1172–1176.
- Koenig, H. G., & Alshohaib, S. (2014). *Health and well-being in Islamic societies: Background, research and applications*. New York, NY: Springer.
- Koenig, H. G., Berk, L. S., Daher, N., Pearce, M. J., Belinger, D., Robins, C. J., et al. (2014). Religious involvement is associated with greater purpose, optimism, generosity and gratitude in persons with major depression and chronic medical illness. *Journal of Psychosomatic Research*, 77(2), 135–143.
- Koenig, H. G., McCullough, M. E., & Larson, D. B. (2001). *Handbook of religion and health*. Oxford: Oxford University Press.
- Lloyd, C., Smith, J., & Weinger, K. (2005). Stress and diabetes: A review of the links. *Diabetes Spectrum*, 18(2), 121–127.
- Lundberg, P. C., & Thrakul, S. (2013). Religion and self-management of Thai Buddhist and Muslim women with type 2 diabetes. *Journal of Clinical Nursing*, 22(13–14), 1907–1916.
- Majeed, A., El-Sayed, A. A., Khoja, T., Alshamsan, R., Millett, C., & Rawaf, S. (2014). Diabetes in the Middle-East and North Africa: An update. *Diabetes Research and Clinical Practice*, 103(2), 218–222.
- McDowell, J., Courtney, M., Edwards, H., & Shortridge-Baggett, L. (2005). Validation of the Australian/English version of the diabetes management self-efficacy scale. *International Journal of Nursing Practice*, 11(4), 177–184.
- Ministry of Cooperative Labor and Social Welfare. Islamic Republic of Iran. (2016). Retrieved from: http://www.mcls.gov.ir/icm_content/media/image/2016/03/86883_orig.pdf?t=635936377474487110.
- Morioka-Douglas, N., Sacks, T., & Yeo, G. (2004). Issues in caring for Afghan American elders: Insights from literature and a focus group. *Journal of Cross-cultural Gerontology*, 19(1), 27–40.
- Naeem, A. G. (2003). The role of culture and religion in the management of diabetes: A study of Kashmiri men in Leeds. *The Journal of the Royal Society for the Promotion of Health*, 123(2), 110–116.
- Newlin, K., Melkus, G. D., Tappen, R., Chyun, D., & Koenig, H. G. (2008). Relationships of religion and spirituality to glycemic control in black women with type 2 diabetes. *Nursing Research*, 57(5), 331–339.
- Olekno, W. A., & Blaconiere, M. J. (1991). Relationship of religiosity to wellness and other health related behaviors and outcomes. *Psychological Reports*, 68(3), 819–826.
- Padela, A. I., & Curlin, F. A. (2013). Religion and disparities: Considering the influences of Islam on the health of American Muslims. *Journal of Religion and Health*, 52(4), 1333–1345.
- Rassool, G. H. (2000). The Crescent and Islam: Healing, nursing and the spiritual dimension. Some considerations towards an understanding of the Islamic perspective on caring. *Journal of Advanced Nursing*, 32(6), 1476–1484.
- Rastegar-Khaled, A., & Mohammadi, M. (2015). Cultural changes and decrease fertility in Iran. *Applied Sociology*, 58(2), 159–180. (Persian).
- Rezaei, M., Adib-Hajbaghery, M., Seyedfeteimi, N., & Hoseini, F. (2008). Prayer in Iranian cancer patients undergoing chemotherapy. *Complementary Therapies in Clinical Practice*, 14, 90–97.
- Richard, A. A., & Shea, K. (2011). Delineation of self-care and associated concepts. *Journal of Nursing Scholarship*, 43(3), 255–264.
- Salehi, S., Ghodousi, A., & Ojaghloo, K. (2012). The spiritual experiences of patients with diabetes-related limb amputation. *Iranian Journal of Nursing and Midwifery Research*, 17(3), 225–228.

- Samuel-Hodge, C. D., Headen, S. W., Skelly, A. H., Ingram, A. F., Keyserling, T. C., Jackson, E. J., et al. (2000). Influences on day-to-day self-management of type 2 diabetes among African-American women: Spirituality, the multi-caregiver role, and other social context factors. *Diabetes Care*, 23(7), 928–933.
- Scarinci, E. G., Griffin, M. T. Q., Grogoriu, A., & Fitzpatrick, J. J. (2009). Spiritual well-being and spiritual practices in HIV-infected women: A preliminary study. *Journal of the Association of Nurses in AIDS Care*, 20(1), 69–76.
- Seyedfatemi, N., Rafii, F., Rezaei, M., & Kolcaba, K. (2014). Comfort and hope in the preanesthesia stage in patients undergoing surgery. *Journal of Perianesthesia Nursing*, 29(3), 213–220.
- Shakibazadeh, E., Larijani, B., Shojaeezadeh, D., Rashidian, A., Forouzanfar, M. H., & Bartholomew, L. K. (2011). Patients' perspectives on factors that influence diabetes self-care. *Iranian Journal of Public Health*, 40(4), 146–158.
- Shreve-Neiger, A. K., & Edelstein, B. A. (2004). Religion and anxiety: A critical review of the literature. *Clinical Psychology Review*, 24(4), 379–397.
- Stewart, W. C., Adams, M. P., Stewart, J. A., & Nelson, L. A. (2013). Review of clinical medicine and religious practice. *Journal of Religion and Health*, 52(1), 91–106.
- Strawbridge, W. J., Cohen, R. D., Shema, S. J., & Kaplan, G. A. (1997). Frequent attendance at religious services and mortality over 28 years. *American Journal of Public Health*, 87(6), 957–961.
- Strawbridge, W. J., Shema, S. J., Cohen, R. D., & Kaplan, G. A. (2001). Religious attendance increases survival by improving and maintaining good health behaviors, mental health, and social relationships. *Annual Behavioral Medicine*, 23(1), 68–74.
- Swank, A. M., Goldberg, R., Dickerson, F., Medoff, D., Wohlheiter, K., & Dixon, L. (2007). Correlates of religious service attendance and contact with religious leaders among persons with co-occurring serious mental illness and type 2 diabetes. *Journal of Nervous and Mental Disease*, 195(5), 382–388.
- Toobert, D. J., Hampson, S. E., & Glasgow, R. E. (2000). The summary of diabetes self-care activities measure. *Diabetes Care*, 23(7), 943–950.
- Translation of Quran. (2015). *Al-ghafir (the forgiver (God))*. <http://quran.com/search?q=call+on+me%2C+I+answer+your+prayer>.
- Whittemore, R., Chase, S. K., Mandl, C. L., & Roy, C. (2002). Lifestyle change in type 2 diabetes: A process model. *Nursing Research*, 51(1), 18–25.