**Name of Journal:** *World Journal of Clinical Cases*

**Manuscript NO:** 76824

**Manuscript Type:** REVIEW

**Assisting individuals with diabetes in the COVID-19 pandemic period: Examining the role of religious factors and faith communities**

Eseadi C *et al.* Assisting individuals with diabetes

Chiedu Eseadi, Osita Victor Ossai, Charity Neejide Onyishi, Leonard Chidi Ilechukwu

**Chiedu Eseadi,** Department of Educational Psychology, University of Johannesburg, Johannesburg 2006, Gauteng, South Africa

**Osita Victor Ossai,** Department of Childhood Education, University of Johannesburg, Johannesburg 2006, Guateng, South Africa

**Charity Neejide Onyishi,** Educational Psychology, University of Johannesburg, South Africa, Johannesburg 2006, Guteng, South Africa

**Leonard Chidi Ilechukwu,** Department of Arts Education, University of Nigeria, Nsukka 410001, Enugu, Nigeria

**Author contributions:** Eseadi C, Ossai OV, Onyishi CN, and Ilechukwu LC conceived the study; Eseadi C, Ossai OV, Onyishi CN, and Ilechukwu LC designed the study, conducted the literature review and were responsible for the analysis, drafting, editing, and approval of the final version of this manuscript.

**Corresponding author: Leonard Chidi Ilechukwu, PhD, Senior Lecturer,** Department of Arts Education, University of Nigeria, Bab Fafunwa Building Faculty of Education, Room 102, Nsukka 410001, Enugu, Nigeria. leonard.ilechukwu@gmail.com

**Received:** April 1, 2022

**Revised:** May 4, 2022

**Accepted:** August 16, 2022

**Published online:** September 16, 2022

**Abstract**

With the onset of the coronavirus disease 2019 (COVID-19) pandemic, diabetes management has become more challenging than it has ever been. Studies on the management of diabetes during this time are required. Unfortunately, the lack of information on the potential role of religious factors and faith communities in diabetes management during the COVID-19 era prevents us from fully understanding the issue of diabetes management during the COVID-19 pandemic period. People with chronic conditions such as diabetes may benefit from some form of religious support from faith communities and their ability to cope could be fostered by some religious factors. It is unclear how religious factors and faith communities contribute to diabetes management. In this article, the authors examine how people with diabetes can be aided in the COVID-19 pandemic period from the perspective of religious factors and faith communities. Based on the studies identified, it appears that religious factors and faith communities play an important role in managing diabetes among patients during the COVID-19 pandemic.

**Key Words:** COVID-19; Diabetes; Faith communities; Religious factors

**©The** **Author(s) 2022.** Published by Baishideng Publishing Group Inc. All rights reserved.

**Citation:** Eseadi C, Ossai OV, Onyishi CN, Ilechukwu LC. Assisting individuals with diabetes in the COVID-19 pandemic period: Examining the role of religious factors and faith communities. *World J Clin Cases* 2022; 10(26): 9180-9191

**URL:** <https://www.wjgnet.com/2307-8960/full/v10/i26/9180.htm>

**DOI:** https://dx.doi.org/10.12998/wjcc.v10.i26.9180

**Core Tip:** Diabetes is a common comorbidity among coronavirus disease 2019 (COVID-19) patients. At this time of COVID-19 pandemic, it is necessary to research the management of diabetes. In this article, the authors examine how people with diabetes can be aided in the COVID-19 pandemic from the perspective of religious factors and faith communities. The identified studies suggested that religious factors and faith communities play an important role in diabetes management during the COVID-19 pandemic.

**INTRODUCTION**

The prevalence of diabetes is increasing worldwide and is one of the leading causes of morbidity and mortality[1]. Diabetes mellitus is a long-term condition in which blood sugar levels are out of balance due to insufficient insulin[2]. Type 1 diabetes and type 2 diabetes (T2D) are the most common, but the condition can appear in many different forms[3]. Diabetes type 1 occurs when the immune system attacks insulin-producing B-cells in the pancreas; T2D results from insulin resistance and B-cell failure[4]. The worldwide prevalence of diabetes is high, 9.3% of people have diabetes and 463 million people are affected[2,3]. According to prevalence data, diabetes and obesity accounted for 43.4% of all deaths worldwide in 2012, while human immunodeficiency virus/acquired immunodeficiency syndrome and tuberculosis combined accounted for 33.6%[5,6]. The long-term complications include obesity, hypertension, vasculopathy, inflammatory and hypercoagulable states, and cardiovascular disease[4,7].

Diabetes mellitus patients in countries hardest hit by the pandemic have been associated with increased morbidity and mortality from coronavirus disease 2019 (COVID-19)[5,8]. Those with chronic conditions such as high blood pressure, diabetes and heart disease may be at high risk for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection[5,9]. Consequently, diabetics have a higher chance of catching COVID-19 and a higher chance of getting sick or dying from it[10]. SARS-CoV-2 can affect the pancreas and endocrine pancreas in people with diabetes, making glycemic control more difficult[11]. The prevalence of diabetes in COVID-19 patients varies widely, depending on the local area in which they reside, the age of the population in that area, and the severity of their disease[5,11]. The prevalence of diabetes was found to be 10.3% among patients with COVID-19, which is similar to the overall prevalence of diabetes in the general population[11,12]. Conversely, patients with diabetes had a much worse condition and a higher death rate associated with COVID-19[13]. COVID-19 patients admitted to the intensive care unit had a 22% higher risk of death due to diabetes, according to Yang *et al*[14]. A study found that the overall mortality rate is 2.3%. Among diabetics, the mortality rate is 7.3% greater than that of the general population[15,16].

Some consequences of this pandemic include that people with diabetes have a harder time living a normal life in society, are more dependent on medical and nursing care, have fewer opportunities to socialize with friends and family, and have to adjust their lifestyle[4,17]. Unlike other diseases that only require medication, diabetes has a number of complex physiological, psychological, and social consequences that make it difficult to manage[17,18]. Managing diabetes is made easier by medication and lifestyle changes, such as reducing calorie intake or exercising more often[5]. However, psychological and spiritual supports are also crucial in managing diabetes[19,20]. The physical, mental, and spiritual effects of diabetes (especially physical and mental discomfort) are many (especially since diabetes can cause amputations)[17,20].

A growing body of research has been conducted to find new ways to help diabetics, particularly for those who suffer from COVID-19-related complications[2,21]. Around the world, discussions have taken place regarding the role of religion and spirituality in the care of diabetic patients[18,22]. Also, as diabetes is a potentially fatal and long-term condition, patients must take an active role in their own treatment[23]. Considering faith communities' management methods, such as prayer and meditation, are highly recommended[24,25]. Unfortunately, the lack of information on the potential role of religious factors and faith communities in diabetes management during the COVID-19 era prevents us from fully understanding the issue of diabetes management during the COVID-19 pandemic period. This article adds to the body of knowledge in this field. In this review, we examine the role of religious factors and faith communities in assisting diabetics during the COVID-19 era.

**Literature Search Strategy**

For the literature search, the authors utilized a variety of databases and sources including Google Scholar, PubMed, MEDLINE, Proquest, Scopus, JSTOR, *Reference Citation Analysis* (https://www.referencecitationanalysis.com/), and APA PsycNet to retrieve peer-reviewed journal articles, student dissertations, and books on diabetes management and the COVID-19 pandemic. Search terms included COVID-19 and diabetes; COVID-19 and religion; diabetes and religion; and diabetes and faith communities. Qualitative and quantitative papers and materials published in English were searched for, appraised, selected and synthesized by the authors.

**Discussion**

***Relationship between diabetes and COVID-19***

COVID-19 and diabetes mellitus are correlated in a bidirectional manner, according to research[26]. Diabetes mellitus is a common comorbidity among COVID-19 patients[27]. Diabetes exacerbates disease severity and mortality, increasing the probability of infection with SARS-CoV-2[28]. COVID-19-associated complications and mortality are more common among people with diabetes mellitus[29,30]. Coronaviruses, which are human pathogens, interact with target cells *via* the angiotensin-converting enzyme whose expression may be increased in diabetics' epithelial cells and intestines, kidneys, and blood vessels[10]. COVID-19 infection and subsequent development of severe disease have been associated with individuals with T2D[31,32]. There is evidence that COVID-19 may increase the risk of hospitalization and mortality in individuals with T2D[31,33]. It has been determined that T2D is a sole risk factor for COVID-19 severity[34]. A higher incidence of severe COVID-19 in diabetic patients is attributed to the deregulated renin-angiotensin-aldosterone system, deterioration of the inflammatory response, hypercoagulability, and physiological and structural changes that result from elevated blood sugar[35]. The impaired glucose control may lead to angiotensin-converting enzyme-2 glycosylation, which may act as a portal for the transmission of SARS-CoV-2[36]. In another study, the authors found that uncontrolled diabetes is a significant risk factor for COVID-19 patients, especially when it is associated with substantial blood glucose variability[15]. In a study of 52 intensive care patients in China, diabetes was present in 22% of the 32 non-survivors[37]. An analysis of COVID-19 using intensive care patients compared with non-intensive care patients found that the incidence of diabetes was twofold higher in intensive care patients[34].

Studies concerning Chinese, Italian, and American patients found that a non-critical form of the infection was present in 3% to 25% of cases[38,39]. In a meta-analysis of Chinese studies, the overall prevalence of diabetes was between 8% and 10% among COVID-19 patients[12]. Italian researchers have found that COVID-19 is prevalent in 8.9% of hospitalized patients in Europe[12]. Conversely, diabetes and its complications increase the risk of contracting a more severe strain of COVID-19 and may result in death[2,14]. Diabetic patients have a wide range of risk factors for infection, including hyperglycemia that causes immune dysfunction[40,41].

As a result of severe SARS-CoV-2 infection and its associated inflammation, hyperglycemia can also occur either through a negative indirect effect on insulin target tissues or a direct toxic effect on pancreatic B-cells[42]. As a result of hyperglycemia, the prognosis of COVID-19 can be exacerbated[43,44]. In patients with impaired glucose regulation or diabetes mellitus, COVID-19 is frequently associated with glycemic disorders[45]. Patients with insulin dependence requiring high doses of insulin have been associated with SARS-CoV-2 infection[45]. There is a possibility that diabetic patients are more likely to become infected due to a defect in innate immunity affecting phagocytosis, neutrophil chemotaxis, and cell-mediated immunity[21]. The development of complications related to diabetes such as coagulation dysfunction, inflammatory tissue status, nephropathy, and cardiovascular disease is associated with predisposing factors[2,21]. The mortality rate for COVID-19 patients with diabetes was found to be three times higher than that of patients without diabetes according to a large epidemiological study of 72314 COVID-19 patients conducted in China[43].

The mortality rate for COVID-19 is 0.7% to 10.8%[46,47]; thus, the relationship between diabetes and COVID-19 may be detrimental. Advanced age populations and patients with comorbidities experience a decline in survival and complications[48]. People with chronic diseases, such as type 1 diabetes mellitus, are concerned about this negative trend[49], as metabolic inflammation impairs the immune system, reducing its ability to fight infections. This results in a slowed healing process, resulting in a delayed recovery. According to the literature[50], COVID-19 is more likely to cause death among diabetic patients. Diabetes should be studied further as a prognostic risk factor or marker, as most patients with severe and critical COVID-19 have multiple comorbidities which have also been linked to an increased risk of COVID-19 infection or death[11,51]. The management of patients with diabetes who contract COVID-19 may require modification of the treatment plan to accommodate the possibility of adverse effects[52].

Patients with COVID-19 who suffer from diabetes, which is a chronic condition, must both receive medical and therapeutic care. Religious factors and faith communities must be considered in the development of management strategies. In studies, adherence to religious doctrines in faith communities has been shown to be effective in managing diabetes[23,53]. Several religious doctrines and practices have been proven to improve acceptance and self-care behavior in diabetes and other psychologically threatening diseases[23]. Religious practices and doctrines in faith communities have assisted married people with T2D in managing their blood sugar levels[54].

***Role of religious factors in diabetes management during the COVID-19 period***

Research has found that religious practices can be useful in managing diabetes[55]. Several religious practices such as praying, meditation, singing, wearing talismans, reading the Koran, reciting Bible verses, or even belonging to a faith-based community can improve the health of persons with chronic diseases and illnesses, according to research[56]. Religious practices are fundamental and critical in diabetes management especially during the COVID-19 period. Individuals' physical and mental health benefit significantly from religious factors such as meditation, and prayers[17,25,57]. Several religious factors, such as religious practices and religious values, may make an impact on patients with serious health conditions, such as diabetes and complications due to COVID-19[58,59]. Religious practices can help with depression, desolation and hopelessness and other psychological challenges associated with diabetes in the pandemic period. Religious practices are the levels of engagement in and compliance to a religion's teachings and organized activities; it involves factors such as religious orientation, commitment, and affiliations[60].

Religious orientation includes beliefs about the existence and nature of God or gods, religious moral prescriptions, and collective and individual mysticism[60]. There are two types of religious orientations that people can have: intrinsic and extrinsic orientations[61]. Intrinsic religious orientation is a personal, non-instrumental motivation for religion that is characterized by strict adherence to religious doctrine, integration of religion into everyday life, and trying to seek deep significance *via* religious activities orientations[61]. Research indicates that people with intrinsic religious orientation experience greater subjective well-being than people who are extrinsically oriented[62].

Religion is a goal or end in and of itself for those with an intrinsic religious orientation, rather than being a means to achieving safety and comfort[61]. Despite the fact that an intrinsic religious orientation is associated with feelings of anxiety and distress, it is also associated with feelings of well-being and happiness[63–66]. In contrast, extrinsically religious people use religion as a means of connecting with others or expressing sympathy[61]. Negative emotions[67] such as anxiety, guilt[68], depression[69], and shame[70] have been associated with individuals' external religious orientation. Findings point to the importance of religious commitment in an individual's overall well-being[71,72]. Religious commitment refers to how involved a person is in their religion[60]. An individual's commitment to and application of religious values, beliefs, and practices in their daily lives can be defined as their religious commitment. The interaction between people's religious awareness and participation is termed "religious commitment." It is a way to find out how deeply a person believes in his or her religion.

Individuals who identify themselves as members of one or more religious groups, such as the Methodists, are referred to as members of a "religious affiliation." Religions like Judaism, Islam, and Christianity are practiced by some people. Health-related behaviors and guidelines adhered to by religious adherents are influenced by their affiliations' religious beliefs, practices and doctrines[73]. Patients can benefit from religious practices in a variety of ways, including comfort, increased knowledge about their disease[74–76], and increased adherence to treatment, all of which can lead to better self-care and the prevention of chronic conditions[77,78].

Those with chronic health conditions such as diabetes mellitus can benefit from religious activities[79], which can help them accept and cope with the reality of living with an incurable disease[80]. People often turn to faith communities for meaning, hope, comfort, and inner peace when confronted with stressful and unstable situations, such as a long-term illness like diabetes. The physical and emotional well-being of those who follow a religious path is also considered to be enhanced[81,82]. An increasing number of studies[83,84] have shown that these three practices can be effective coping mechanisms for both physical and mental health issues, especially in the context of chronic illness[85]. This is known as spiritual-religious coping when religious ideas, attitudes, or practices are used to alleviate emotional stress caused by life events beyond one's control[86]. Having a purpose gives suffering meaning and makes it easier to bear. Some previous studies[87,88] looked at religious activities and T2D patients' management. Health outcomes such as diabetes management, coping skills, wellness, emotional stress, health-related quality of life and glycemic control have been linked to these variables[18,89]. It has been found that religious practices have a positive impact on the quality of life of people with chronic conditions, as well as on their outlook on life[90]. Emotional well-being can be enhanced by a person's religious or spiritual beliefs[17,91]. Diabetes management is viewed as a daily battle that can only be fought with God's help; God is frequently invoked for assistance; and a strong belief in God, as well as prayer and meditation, in addition to support from faith communities, provided comfort.

Studies have shown that people turn to religious practices and beliefs when they are going through a difficult time or are ill[92,93]. By encouraging positive mental treatments, religious practices aid in the management of patients' health[93]. Diabetes acceptance and self-care behavior have been improved by religious activity-based support and a holistic approach to coping with diabetes can be achieved by integrating religious coping strategies with other psychosocial support strategies[92]. In a group of 51 diabetic patients, researchers in India studied how spirituality and religious activities were used as coping mechanisms[94]. It showed that dietary support from spouses is important for both sexes, with women believing religion and spirituality can help them control their blood sugar levels[94]. Conversely, Quinn *et al*[95] believe that religious beliefs can hinder successful coping, even though religious activities have been shown in several studies to be effective in the management of chronic health conditions. Only a few studies have examined the role of religious practices on diabetic self-management[22], despite evidence that they are linked[96]. Table 1 shows some studies related to the role of religious factors in diabetes management. It can be seen from Table 1 that a number of studies found that religious factors performed well in the management of diabetes.

***Role of faith communities in the management of diabetes during the COVID-19 period***

Faith-based organizations, through adjustment of their doctrinal positions, can encourage people who have chronic health conditions in their organization, to adopt and maintain certain healthy and safe behaviors during the pandemic in order to cope with the challenges that it brings[101]. Churches, synagogues, mosques, assembly halls, and other places of worship are examples of faith-based institutions. They can take the form of congregations, regional networks, or stand-alone organizations. Faith communities can make a significant contribution to the lives of those who belong to them[102]. The shared trust in information offered by faith-based groups has the potential to be quite effective. Faith and spirituality have a crucial impact on people's conceptions of health, disease, and healing, according to healthcare professionals[20]. Faith-based groups can help members learn about diabetes, promote healthy surroundings, and participate in diabetes prevention and control activities.

A recent study has highlighted the critical importance of religious faith communities in promoting members' health and well-being[103], as they can significantly determine health promotion behaviors and the concept of health education and promotion[87]. The religious leaders of faith communities encourage their congregations to adopt healthy habits and take care of their health through advice and guidance, by focusing on health as a whole and by integrating health and wellbeing[87,104]. Research by Newlin *et al*[59] discovered that faith communities can be a tremendous source of support for diabetic patients, especially when it comes to glycemic management. According to Darvyri *et al*[57], patients with type 2 diabetes mellitus who have an extensive and dynamic faith in God are more likely to be well-managed. Similarly, Jafari *et al*[90] found that inner serenity and vigor protect diabetics from unpleasant emotions, resulting in improved management and glucose control. When additional religious disciplines were investigated, it was discovered that participating in religious activities in faith groups reduced stress levels[105], which influenced glycemic control directly[105]. The complications of diabetes may lead to amputation of the patients’ body parts, this makes patients physically and mentally disabled[54]. It predisposes them to severe stress, depression and they explore different ways to cope and adapt to life[106]. Koenig *et al*[106] believes that religious teachings among the community members creates a positive attitude towards the world and makes the patients surmount the challenges associated with such chronic diseases. This increases their ability to tolerate and accept the fact that some medical conditions cannot be changed. Table 2 summarizes some of the studies related to the role of faith communities in the management of diabetes. According to Table 2, faith communities contribute significantly to the management of diabetes through programmes within religious groups.

***Implications and suggestions for further studies***

People with chronic illnesses can cope better when religious factors and faith communities are present as they can provide them with hope, confidence, and support[53,111]. Religious factors and faith communities can promote a positive outlook on diabetes complications[112]. Often, patients and physicians turn to prayer and faith-based approaches to alleviate chronic illness (as is common with diabetes) when conventional medicine fails to provide relief[44,113]. This study has provided insight into how religious factors and faith communities can be beneficial to people with diabetes. It is recommended that further study be conducted into the positive influences of religious factors and faith communities on diabetes management. There may be a need for further research in order to develop and validate an effective faith-based and spiritual intervention model that is applicable to a wide range of religious groups. It is imperative that researchers employ a faith-based paradigm in order to expand diabetes management access across religious denominations and communities. Diabetic patients have religious beliefs, which are crucial to reducing the level of stress and emotional distress related to diabetes treatment in the COVID-19 era. It is important to examine the relationship between religious variables and health-related issues in order to understand the impact of religious factors and faith communities in diabetes management[57]. More research is needed to understand how beliefs, religious considerations, and faith-based therapies interact with diabetes management. As religious factors such as prayer, meditation, and scripture reading are linked to diabetes management, and the present study only analyzed existing studies regardless of flaws in methodology, correlational studies are recommended to investigate the impact of religious beliefs and doctrinal teachings on diabetes management. Studies need to be conducted to determine a more dynamic and pragmatic approach to diabetes care, by utilizing experimental methodologies. It is hoped that this will help identify which religious elements contribute to better diabetes management in faith communities. Diabetes management can be highly optimized by synergizing the beneficial effects of religious factors and the support of faith communities during a pandemic such as COVID-19. There is a need for further studies to also examine these issues through a systematic review approach in order to provide more insights on how religious factors and faith communities impact the extent to which diabetic patients manage their condition during a pandemic.

If clinicians hope to achieve effective outcomes in the management of diabetes, they must consider factors such as patients' comorbidities, gender, age, and educational level that may affect perceptions of diabetes management on the part of patients and their relatives. As reported by Ciarambino *et al*[114] in a retrospective study, there were differences between male and female patients with hypertension and diabetes who contracted SARS-CoV-2. There was a longer hospital stay, an increased number of admissions to the intensive care unit, and an increased death rate for male patients compared to female patients, according to their findings. In a prospective observational study of 148 family members of 151 patients with suspected COVID-19, Ciarambino *et al*[115] found that older women and low educational levels influence perceived satisfaction with COVID-19 management. Their research indicates that age, gender, and education level matter in the satisfaction of family members of patients with suspected COVID-19. On the other hand, it was found in another study that men and younger COVID-19 patients felt more apprehensive of probable clinical errors, but that the level of satisfaction with the care they received improved with their educational level as well[116]. Research also indicates that the immune response to COVID-19 differs with gender and age; testosterone, for example, decreases the vaccination response and delays the cytokine response in male individuals[117]. Also, evidence indicates that the immune system's function declines with age, especially in older female patients[117]. Therefore, in order to properly assist diabetic patients with COVID-19, it is necessary to take into account the gender, educational level and age of the patient.

**CONCLUSION**

One of the most serious threats to global health in human history is the COVID-19 pandemic. While adapting to this new normal, it is imperative that individuals remain aware of the ways in which certain behaviors may increase their risk of infection or exacerbate COVID-19 issues. Chronic disease patients, such as those with diabetes, were severely affected by this pandemic. The identification of appropriate treatment and coping options is crucial, particularly for individuals suffering from chronic conditions such as diabetes. COVID-19 may impair the efficacy of diabetic medications, thus putting diabetics at risk. In this study, the researchers examined the role of religious factors and faith communities in the management of diabetic conditions. The literature suggests that religious factors and faith communities play a crucial role in managing diabetes.

**REFERENCES**

1 **Orioli L**, Hermans MP, Thissen JP, Maiter D, Vandeleene B, Yombi JC. COVID-19 in diabetic patients: Related risks and specifics of management. *Ann Endocrinol (Paris)* 2020; **81**: 101-109 [PMID: 32413342 DOI: 10.1016/j.ando.2020.05.001]

2 **Landstra CP**, de Koning EJP. COVID-19 and Diabetes: Understanding the Interrelationship and Risks for a Severe Course. *Front Endocrinol (Lausanne)* 2021; **12**: 649525 [PMID: 34220706 DOI: 10.3389/fendo.2021.649525]

3 **Peters A**, Laffel L; American Diabetes Association Transitions Working Group. Diabetes care for emerging adults: recommendations for transition from pediatric to adult diabetes care systems: a position statement of the American Diabetes Association, with representation by the American College of Osteopathic Family Physicians, the American Academy of Pediatrics, the American Association of Clinical Endocrinologists, the American Osteopathic Association, the Centers for Disease Control and Prevention, Children with Diabetes, The Endocrine Society, the International Society for Pediatric and Adolescent Diabetes, Juvenile Diabetes Research Foundation International, the National Diabetes Education Program, and the Pediatric Endocrine Society (formerly Lawson Wilkins Pediatric Endocrine Society). *Diabetes Care* 2011; **34**: 2477-2485 [PMID: 22025785 DOI: 10.2337/dc11-1723]

4 **Saeedi P**, Petersohn I, Salpea P, Malanda B, Karuranga S, Unwin N, Colagiuri S, Guariguata L, Motala AA, Ogurtsova K, Shaw JE, Bright D, Williams R; IDF Diabetes Atlas Committee. Global and regional diabetes prevalence estimates for 2019 and projections for 2030 and 2045: Results from the International Diabetes Federation Diabetes Atlas, 9th edition. *Diabetes Res Clin Pract* 2019; **157**: 107843 [PMID: 31518657 DOI: 10.1016/j.diabres.2019.107843]

5 **Coetzee A**, Taljaard JJ, Hugo SS, Conradie M, Conradie-Smit M, Dave JA. Diabetes mellitus and COVID-19: A review and management guidance for South Africa. *S Afr Med J* 2020; **110**: 761-766 [PMID: 32880304]

6 **GBD 2017 Causes of Death Collaborators**. Global, regional, and national age-sex-specific mortality for 282 causes of death in 195 countries and territories, 1980-2017: a systematic analysis for the Global Burden of Disease Study 2017. *Lancet* 2018; **392**: 1736-1788 [PMID: 30496103 DOI: 10.1016/S0140-6736(18)32203-7]

7 **Iglay K**, Hannachi H, Joseph Howie P, Xu J, Li X, Engel SS, Moore LM, Rajpathak S. Prevalence and co-prevalence of comorbidities among patients with type 2 diabetes mellitus. *Curr Med Res Opin* 2016; **32**: 1243-1252 [PMID: 26986190 DOI: 10.1185/03007995.2016.1168291]

8 **Pititto BA**, Ferreira SRG. Diabetes and covid-19: more than the sum of two morbidities. *Rev Saude Publica* 2020; **54**: 54 [PMID: 32491053 DOI: 10.11606/s1518-8787.2020054002577]

9 **Abbas AM**, Sayad R, Omar FA, Ahmed L. Bidirectional Relationship between COVID-19 and Diabetes. *Am J Biomed Res* 2020; **9**: AJBSR.MS.ID.001442 [DOI: 10.34297/AJBSR.2020.09.001442]

10 **Shang J**, Wang Q, Zhang H, Wang X, Wan J, Yan Y, Gao Y, Cheng J, Li Z, Lin J. The Relationship Between Diabetes Mellitus and COVID-19 Prognosis: A Retrospective Cohort Study in Wuhan, China. *Am J Med* 2021; **134**: e6-e14 [PMID: 32653423 DOI: 10.1016/j.amjmed.2020.05.033]

11 **Singh AK**, Gupta R, Ghosh A, Misra A. Diabetes in COVID-19: Prevalence, pathophysiology, prognosis and practical considerations. *Diabetes Metab Syndr* 2020; **14**: 303-310 [PMID: 32298981 DOI: 10.1016/j.dsx.2020.04.004]

12 **World Health Organization.** WHO delivers advice and support for older people during COVID-19. April 3, 2020. [cited 1 April 2022]. Available from: https://www.who.int/news-room/feature-stories/detail/who-delivers-advice-and-support-for-older-people-during-covid-19

13 **Deng F**, Gao D, Ma X, Guo Y, Wang R, Jiang W, Gong S. Corticosteroids in diabetes patients infected with COVID-19. *Ir J Med Sci* 2021; **190**: 29-31 [PMID: 32588377 DOI: 10.1007/s11845-020-02287-3]

14 **Yang X**, Yu Y, Xu J, Shu H, Xia J, Liu H, Wu Y, Zhang L, Yu Z, Fang M, Yu T, Wang Y, Pan S, Zou X, Yuan S, Shang Y. Clinical course and outcomes of critically ill patients with SARS-CoV-2 pneumonia in Wuhan, China: a single-centered, retrospective, observational study. *Lancet Respir Med* 2020; **8**: 475-481 [PMID: 32105632 DOI: 10.1016/S2213-2600(20)30079-5]

15 **Wu Z**, McGoogan JM. Characteristics of and Important Lessons From the Coronavirus Disease 2019 (COVID-19) Outbreak in China: Summary of a Report of 72 314 Cases From the Chinese Center for Disease Control and Prevention. *JAMA* 2020; **323**: 1239-1242 [PMID: 32091533 DOI: 10.1001/jama.2020.2648]

16 **Zhou F**, Yu T, Du R, Fan G, Liu Y, Liu Z, Xiang J, Wang Y, Song B, Gu X, Guan L, Wei Y, Li H, Wu X, Xu J, Tu S, Zhang Y, Chen H, Cao B. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. *Lancet* 2020; **395**: 1054-1062 [PMID: 32171076 DOI: 10.1016/S0140-6736(20)30566-3]

17 **Onyishi CN**, Ilechukwu LC, Victor-Aigbodion V, Eseadi C. Impact of spiritual beliefs and faith-based interventions on diabetes management. *World J Diabetes* 2021; **12**: 630-641 [PMID: 33995850 DOI: 10.4239/wjd.v12.i5.630]

18 **Blonde L**. Current challenges in diabetes management. *Clin Cornerstone* 2005; **7** Suppl 3: S6-17 [PMID: 16545737 DOI: 10.1016/s1098-3597(05)80084-5]

19 **Korsah KA**, Domfeh KA. Research Topic: The realities of religious coping experiences of patients with diabetes mellitus: Implications for policy formulation in Ghana. *Int J Afr Nurs Sci* 2020; **13**:100245 [DOI: 10.1016/j.ijans.2020.100245]

20 **Sukarno A**, Pamungkas RA. Religiousness Associated with Type 2 Diabetes Care Management: A Concept Analysis. *Int J Nurs Health Serv* 2020; **3**:462-470

21 **Vitiello A**, Ferrara F. The impact of COVID-19 in diabetic patient. *Arch Med Health Sci* 2020; **8**: 167-171

22 **Polzer RL**, Miles MS. Spirituality in African Americans with diabetes: self-management through a relationship with God. *Qual Health Res* 2007; **17**: 176-188 [PMID: 17220389 DOI: 10.1177/1049732306297750]

23 **Gupta PS**, Anandarajah G. The role of spirituality in diabetes self-management in an urban, underserved population: a qualitative exploratory study. *R I Med J (2013)* 2014; **97**: 31-35 [PMID: 24596928]

24 **Vitorino LM**, Lucchetti G, Leão FC, Vallada H, Peres MFP. The association between spirituality and religiousness and mental health. *Sci Rep* 2018; **8**: 17233 [PMID: 30467362 DOI: 10.1038/s41598-018-35380-w]

25 **Permana I**. How Religosity and/or spirituality might influence self-Care in Diabetes Management: a structured review. *Bangladesh J Med Sci* 2018; **17**:185–193 [DOI: 10.3329/bjms.v17i2.35869]

26 **Koneru G**, Sayed HH, Abd-Elhamed NA, Elsedfy N, Mohamed AH, Abdellatif HA, Mohamed FF, Bahnasawy EH, Mousa NK, Eisa A, Elshenawy EA, Basheer YZ, Sayed EH, Mohamed FF, Ali WR, Soliman HA, Eltabary AA, Sayed NM, Nasr NH, Khairallah NS, Hetta HF. COVID-19 and Diabetes Mellitus: A Complex Interplay. *J Pure Appl Microbiol* 2021; **15**: 512–524 [DOI:10.22207/JPAM.15.2.16]

27 **Leon-Abarca JA**, Portmann-Baracco A, Bryce-Alberti M, Ruiz-Sánchez C, Accinelli RA, Soliz J, Gonzales GF. Diabetes increases the risk of COVID-19 in an altitude dependent manner: An analysis of 1,280,806 Mexican patients. *PLoS One* 2021; **16**: e0255144 [PMID: 34343179 DOI: 10.1371/journal.pone.0255144]

28 **Bornstein SR**, Dalan R, Hopkins D, Mingrone G, Boehm BO. Endocrine and metabolic link to coronavirus infection. *Nat Rev Endocrinol* 2020; **16**: 297-298 [PMID: 32242089 DOI: 10.1038/s41574-020-0353-9]

29 **Onder G**, Rezza G, Brusaferro S. Case-Fatality Rate and Characteristics of Patients Dying in Relation to COVID-19 in Italy. *JAMA* 2020; **323**: 1775-1776 [PMID: 32203977 DOI: 10.1001/jama.2020.4683]

30 **Guan WJ**, Ni ZY, Hu Y, Liang WH, Ou CQ, He JX, Liu L, Shan H, Lei CL, Hui DSC, Du B, Li LJ, Zeng G, Yuen KY, Chen RC, Tang CL, Wang T, Chen PY, Xiang J, Li SY, Wang JL, Liang ZJ, Peng YX, Wei L, Liu Y, Hu YH, Peng P, Wang JM, Liu JY, Chen Z, Li G, Zheng ZJ, Qiu SQ, Luo J, Ye CJ, Zhu SY, Zhong NS; China Medical Treatment Expert Group for Covid-19. Clinical Characteristics of Coronavirus Disease 2019 in China. *N Engl J Med* 2020; **382**: 1708-1720 [PMID: 32109013 DOI: 10.1056/NEJMoa2002032]

31 **Wang B**, Glicksberg BS, Nadkarni GN, Vashishth D. Evaluation and management of COVID-19-related severity in people with type 2 diabetes. *BMJ Open Diabetes Res Care* 2021; **9** [PMID: 34493495 DOI: 10.1136/bmjdrc-2021-002299]

32 **Apicella M**, Campopiano MC, Mantuano M, Mazoni L, Coppelli A, Del Prato S. COVID-19 in people with diabetes: understanding the reasons for worse outcomes. *Lancet Diabetes Endocrinol* 2020; **8**: 782-792 [PMID: 32687793 DOI: 10.1016/S2213-8587(20)30238-2]

33 **Holman N**, Knighton P, Kar P, O'Keefe J, Curley M, Weaver A, Barron E, Bakhai C, Khunti K, Wareham NJ, Sattar N, Young B, Valabhji J. Risk factors for COVID-19-related mortality in people with type 1 and type 2 diabetes in England: a population-based cohort study. *Lancet Diabetes Endocrinol* 2020; **8**: 823-833 [PMID: 32798471 DOI: 10.1016/S2213-8587(20)30271-0]

34 **Liang X**, Xu J, Xiao W, Shi L, Yang H. The association of diabetes with COVID-19 disease severity: evidence from adjusted effect estimates. *Hormones (Athens)* 2021; **20**: 409-414 [PMID: 33236191 DOI: 10.1007/s42000-020-00259-x]

35 **Brufsky A**. Hyperglycemia, hydroxychloroquine, and the COVID-19 pandemic. *J Med Virol* 2020; **92**: 770-775 [PMID: 32293710 DOI: 10.1002/jmv.25887]

36 **Arias-Reyes C**, Carvajal-Rodriguez F, Poma-Machicao L, Aliaga-Raduán F, Marques DA, Zubieta-DeUrioste N, Accinelli RA, Schneider-Gasser EM, Zubieta-Calleja G, Dutschmann M, Soliz J. Decreased incidence, virus transmission capacity, and severity of COVID-19 at altitude on the American continent. *PLoS One* 2021; **16**: e0237294 [PMID: 33780470 DOI: 10.1371/journal.pone.0237294]

37 **Alhazzani W**, Møller MH, Arabi YM, Loeb M, Gong MN, Fan E, Oczkowski S, Levy MM, Derde L, Dzierba A, Du B, Aboodi M, Wunsch H, Cecconi M, Koh Y, Chertow DS, Maitland K, Alshamsi F, Belley-Cote E, Greco M, Laundy M, Morgan JS, Kesecioglu J, McGeer A, Mermel L, Mammen MJ, Alexander PE, Arrington A, Centofanti JE, Citerio G, Baw B, Memish ZA, Hammond N, Hayden FG, Evans L, Rhodes A. Surviving Sepsis Campaign: Guidelines on the Management of Critically Ill Adults with Coronavirus Disease 2019 (COVID-19). *Crit Care Med* 2020; **48**: e440-e469 [PMID: 32224769 DOI: 10.1097/CCM.0000000000004363]

38 **Bai Y**, Yao L, Wei T, Tian F, Jin DY, Chen L, Wang M. Presumed Asymptomatic Carrier Transmission of COVID-19. *JAMA* 2020; **323**: 1406-1407 [PMID: 32083643 DOI: 10.1001/jama.2020.2565]

39 **Goyal P**, Choi JJ, Pinheiro LC, Schenck EJ, Chen R, Jabri A, Satlin MJ, Campion TR Jr, Nahid M, Ringel JB, Hoffman KL, Alshak MN, Li HA, Wehmeyer GT, Rajan M, Reshetnyak E, Hupert N, Horn EM, Martinez FJ, Gulick RM, Safford MM. Clinical Characteristics of Covid-19 in New York City. *N Engl J Med* 2020; **382**: 2372-2374 [PMID: 32302078 DOI: 10.1056/NEJMc2010419]

40 **Critchley JA**, Carey IM, Harris T, DeWilde S, Hosking FJ, Cook DG. Glycemic Control and Risk of Infections Among People With Type 1 or Type 2 Diabetes in a Large Primary Care Cohort Study. *Diabetes Care* 2018; **41**: 2127-2135 [PMID: 30104296 DOI: 10.2337/dc18-0287]

41 **Luk AOY**, Lau ESH, Cheung KKT, Kong APS, Ma RCW, Ozaki R, Chow FCC, So WY, Chan JCN. Glycaemia control and the risk of hospitalisation for infection in patients with type 2 diabetes: Hong Kong Diabetes Registry. *Diabetes Metab Res Rev* 2017; **33** [PMID: 28731281 DOI: 10.1002/dmrr.2923]

42 **Yang JK**, Lin SS, Ji XJ, Guo LM. Binding of SARS coronavirus to its receptor damages islets and causes acute diabetes. *Acta Diabetol* 2010; **47**: 193-199 [PMID: 19333547 DOI: 10.1007/s00592-009-0109-4]

43 **Wu J**, Huang J, Zhu G, Wang Q, Lv Q, Huang Y, Yu Y, Si X, Yi H, Wang C, Liu Y, Xiao H, Zhou Q, Liu X, Yang D, Guan X, Li Y, Peng S, Sung J, Xiao H. Elevation of blood glucose level predicts worse outcomes in hospitalized patients with COVID-19: a retrospective cohort study. *BMJ Open Diabetes Res Care* 2020; **8** [PMID: 32503812 DOI: 10.1136/bmjdrc-2020-001476]

44 **Bode B**, Garrett V, Messler J, McFarland R, Crowe J, Booth R, Klonoff DC. Glycemic Characteristics and Clinical Outcomes of COVID-19 Patients Hospitalized in the United States. *J Diabetes Sci Technol* 2020; **14**: 813-821 [PMID: 32389027 DOI: 10.1177/1932296820924469]

45 **Wu L**, Girgis CM, Cheung NW. COVID-19 and diabetes: Insulin requirements parallel illness severity in critically unwell patients. *Clin Endocrinol (Oxf)* 2020; **93**: 390-393 [PMID: 32683745 DOI: 10.1111/cen.14288]

46 **Pal R**, Yadav U, Grover S, Saboo B, Verma A, Bhadada SK. Knowledge, attitudes and practices towards COVID-19 among young adults with Type 1 Diabetes Mellitus amid the nationwide lockdown in India: A cross-sectional survey. *Diabetes Res Clin Pract* 2020; **166**: 108344 [PMID: 32710997 DOI: 10.1016/j.diabres.2020.108344]

47 **Pal R**, Yadav U, Verma A, Bhadada SK. Awareness regarding COVID-19 and problems being faced by young adults with type 1 diabetes mellitus amid nationwide lockdown in India: A qualitative interview study. *Prim Care Diabetes* 2021; **15**: 10-15 [PMID: 32660907 DOI: 10.1016/j.pcd.2020.07.001]

48 **Ruan S**. Likelihood of survival of coronavirus disease 2019. *Lancet Infect Dis* 2020; **20**: 630-631 [PMID: 32240633 DOI: 10.1016/S1473-3099(20)30257-7]

49 **Muniyappa R**, Gubbi S. COVID-19 pandemic, coronaviruses, and diabetes mellitus. *Am J Physiol Endocrinol Metab* 2020; **318**: E736-E741 [PMID: 32228322 DOI: 10.1152/ajpendo.00124.2020]

50 **Huang I**, Lim MA, Pranata R. Diabetes mellitus is associated with increased mortality and severity of disease in COVID-19 pneumonia - A systematic review, meta-analysis, and meta-regression. *Diabetes Metab Syndr* 2020; **14**: 395-403 [PMID: 32334395 DOI: 10.1016/j.dsx.2020.04.018]

51 **Ye Q**, Wang B, Mao J. The pathogenesis and treatment of the `Cytokine Storm' in COVID-19. *J Infect* 2020; **80**: 607-613 [PMID: 32283152 DOI: 10.1016/j.jinf.2020.03.037]

52 **Papadokostaki E**, Tentolouris N, Liberopoulos E. COVID-19 and diabetes: What does the clinician need to know? *Prim Care Diabetes* 2020; **14**: 558-563 [PMID: 32654982 DOI: 10.1016/j.pcd.2020.06.010]

53 **Williams L**, Gorman R, Hankerson S. Implementing a mental health ministry committee in faith-based organizations: the promoting emotional wellness and spirituality program. *Soc Work Health Care* 2014; **53**: 414-434 [PMID: 24717187 DOI: 10.1080/00981389.2014.880391]

54 **Fincham FD**, Seibert GS, May RW, Wilson CM, Lister ZD. Religious Coping and Glycemic Control in Couples with Type 2 Diabetes. *J Marital Fam Ther* 2018; **44**: 138-149 [PMID: 28589560 DOI: 10.1111/jmft.12241]

55 **Davies DJ**, Thate MJ, editors. Religion and the individual: Belief, practice, and identity. Multidisciplinary Digital Publishing Institute Basel, 2017 [DOI: 10.3390/books978-3-03842-467-3]

56 White P. The concept of diseases and health care in African traditional religion in Ghana. *HTS Theol Stud* 2015; **71:** 1–7 [DOI:10.4102/HTS.V71I3.2762]

57 **Darvyri P**, Christodoulakis S, Galanakis M, Avgoustidis AG, Thanopoulou A, Chrousos GP. On the role of spirituality and religiosity in type 2 diabetes mellitus management—A systematic review. *Psychology* 2018; **9**:728–744 [DOI: 10.4236/psych.2018.94046]

58 **Samuel-Hodge CD**, Headen SW, Skelly AH, Ingram AF, Keyserling TC, Jackson EJ, Ammerman AS, Elasy TA. 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* 2000; **23**: 928-933 [PMID: 10895842 DOI: 10.2337/diacare.23.7.928]

59 **Newlin K**, Melkus GD, Tappen R, Chyun D, Koenig HG. Relationships of religion and spirituality to glycemic control in Black women with type 2 diabetes. *Nurs Res* 2008; **57**: 331-339 [PMID: 18794717 DOI: 10.1097/01.NNR.0000313497.10154.66]

60 **Ilechukwu LC**. Religious Orientation and Religious Commitment among University Students from Christian Homes. *Int J Psychosoc Rehabil* 2020; **24**: 7621-7629 [DOI: 10.37200/IJPR/V24I10/PR300689]

61 **Allport GW**, Ross JM. Personal religious orientation and prejudice. *J Pers Soc Psychol* 1967; **5**: 432-443 [PMID: 6051769 DOI: 10.1037/0022-3514.5.4.432]

62 **Moltafet G**, Mazidi M, Sadati S. Personality traits, religious orientation and happiness. *Procedia-Soc Behav Sci* 2010; **9**: 63-69 [DOI: 10.1016/j.sbspro.2010.12.116]

63 **Byrd KR**, Hageman A, Isle DB. Intrinsic motivation and subjective well-being: The unique contribution of intrinsic religious motivation. *Int J Psychol Relig* 2007; **17**: 141-156 [DOI: 10.1080/10508610701244155]

64 **You S**, Lim SA. Religious orientation and subjective well-being: The mediating role of meaning in life. *J Psychol Theol* 2019; **47**: 34-47 [DOI: 10.1177/0091647118795180]

65 **Jo H**, Son EJ. Religious orientation and anxiety: The mediating roles of religious coping and optimism. *Korean J Couns Psychol* 2008; **20**: 773–793

66 **Tix AP**, Frazier PA. Mediation and moderation of the relationship between intrinsic religiousness and mental health. *Pers Soc Psychol Bull* 2005; **31**: 295-306 [PMID: 15657446 DOI: 10.1177/0146167204271592]

67 **Kim M**.The effect of spiritual maturity and religious orientation on psychological well-being of youth: Focusing on Catholic Youth. M.Sc. Thesis, Dongguk University, Seoul, South Korea. 2013

68 **Choi JY**, Lee HK. Effect of religious orientation on posttraumatic growth: mediating effect of rumination, active coping and meaning in life: focusing on christianity. *Korean J Relig Educ* 2015; **47**: 137-153

69 **Oh IG**. The effect of depression on religious orientation in Christian university students: With a focus on the mediation effect of stress. *Church Soc Work* 2014; **28**: 7-32

70 **El-Jamil FM**. Shame, guilt, and mental health: A study on the impact of cultural and religious orientation. St. John’s University (New York). Dissertation Abstracts International: Section B: The Sciences and Engineering, 64, 1487

71 **Je SB**. Religious coping and mental health. *Korean Relig Study* 2002; **26**:25-42

72 **Tix AP**, Johnson ME, Dik BJ, Steger MF. Religious Commitment and Subjective Well-Being across Christian Traditions. *J Psychol Christ* 2013; **32**: 20-30

73 **Padela AI**, Curlin FA. Religion and disparities: considering the influences of Islam on the health of American Muslims. *J Relig Health* 2013; **52**: 1333-1345 [PMID: 22653653 DOI: 10.1007/s10943-012-9620-y]

74 **Holt CL**, Roberts C, Scarinci I, Wiley SR, Eloubeidi M, Crowther M, Bolland J, Litaker MS, Southward V, Coughlin SS. Development of a spiritually based educational program to increase colorectal cancer screening among African American men and women. *Health Commun* 2009; **24**: 400-412 [PMID: 19657823 DOI: 10.1080/10410230903023451]

75 **Basu-Zharku IO**. The influence of religion on health. *Inq J* 2011; **3**: 1-3

76 **Hvidt NC**, Hvidtjørn D, Christensen K, Nielsen JB, Søndergaard J. Faith Moves Mountains-Mountains Move Faith: Two Opposite Epidemiological Forces in Research on Religion and Health. *J Relig Health* 2017; **56**: 294-304 [PMID: 27541015 DOI: 10.1007/s10943-016-0300-1]

77 **Stewart WC**, Adams MP, Stewart JA, Nelson LA. Review of clinical medicine and religious practice. *J Relig Health* 2013; **52**: 91-106 [PMID: 23484213 DOI: 10.1007/s10943-012-9578-9]

78 **Koenig HG**. Is religion good for your health? The effects of religion on physical and mental health. Routledge, 1997

79 **Tse S**, Lloyd C, Petchkovsky L, Manaia W. Exploration of Australian and New Zealand indigenous people’s spirituality and mental health. *Aust Occup Ther J* 2005; **52**:181-187 [DOI: 10.1111/j.1440-1630.2005.00507.x]

80 **Hampton JS**, Weinert C. An exploration of spirituality in rural women with chronic illness. *Holist Nurs Pract* 2006; **20**: 27-33 [PMID: 16428969 DOI: 10.1097/00004650-200601000-00007]

81 **Miller L**, Gur M. Religiosity, depression, and physical maturation in adolescent girls. *J Am Acad Child Adolesc Psychiatry* 2002; **41**: 206-214 [PMID: 11837411 DOI: 10.1097/00004583-200202000-00015]

82 **Levin JS**. God, faith, and health: Exploring the spirituality-healing connection. Turner Publishing Company

83 **Sulmasy DP**. Spirituality, religion, and clinical care. *Chest* 2009; **135**: 1634-1642 [PMID: 19497898 DOI: 10.1378/chest.08-2241]

84 **Koenig HG**, George LK, Peterson BL. Religiosity and remission of depression in medically ill older patients. *Am J Psychiatry* 1998; **155**: 536-542 [PMID: 9546001 DOI: 10.1176/ajp.155.4.536]

85 **Ano GG**, Vasconcelles EB. Religious coping and psychological adjustment to stress: a meta-analysis. *J Clin Psychol* 2005; **61**: 461-480 [PMID: 15503316 DOI: 10.1002/jclp.20049]

86 **Koenig HG**. Spirituality in patient care: Why, how, when, and what. Templeton Foundation Press, 2002

87 **Rivera-Hernandez M**. Religiosity, Social Support and Care Associated with Health in Older Mexicans with Diabetes. *J Relig Health* 2016; **55**: 1394-1410 [PMID: 26316196 DOI: 10.1007/s10943-015-0105-7]

88 **Casarez RL**, Engebretson JC, Ostwald SK. Spiritual practices in self-management of diabetes in African Americans. *Holist Nurs Pract* 2010; **24**: 227-237 [PMID: 20588132 DOI: 10.1097/HNP.0b013e3181e903c6]

89 **Newlin K**, Melkus GD, Peyrot M, Koenig HG, Allard E, Chyun D. Coping as a mediator in the relationships of spiritual well-being to mental health in black women with type 2 diabetes. *Int J Psychiatry Med* 2010; **40**: 439-459 [PMID: 21391414 DOI: 10.2190/PM.40.4.g]

90 **Jafari N**, Farajzadegan Z, Loghmani A, Majlesi M, Jafari N. Spiritual well-being and quality of life of Iranian adults with type 2 diabetes. *Evid Based Complement Alternat Med* 2014; **2014**: 619028 [PMID: 24600478 DOI: 10.1155/2014/619028]

91 **Irajpour A**, Moghimian M, Arzani H. Spiritual aspects of care for chronic Muslim patients: A qualitative study. *J Educ Health Promot* 2018; 7: 118 [PMID: 30271803 DOI: 10.4103/jehp.jehp\_199\_17]

92 **Sridhar GR**. Diabetes, religion and spirituality. *Int. J. Diabetes Dev. Ctries.* 2013; **33**:5-7 [DOI: 10.1007/s13410-012-0097-8]

93 **Puchalski CM**. Spirituality in the cancer trajectory. *Ann Oncol* 2012; **23** Suppl 3: 49-55 [PMID: 22628416 DOI: 10.1093/annonc/mds088]

94 **Lager JM**.Relationship among religious coping, psychosocial factors, and quality of life in individuals with type 2 diabetes. Texas A&M University, 2010. Available from: https://core.ac.uk/download/pdf/147133494.pdf

95 **Quinn MT**, Cook S, Nash K, Chin MH. Addressing religion and spirituality in African Americans with diabetes. *Diabetes Educ* 2001; **27**: 643-644, 647-648, 655 [PMID: 12212014 DOI: 10.1177/014572170102700505]

96 **Giaquinto S**, Spiridigliozzi C. Possible influence of spiritual and religious beliefs on hypertension. *Clin Exp Hypertens* 2007; **29**: 457-464 [PMID: 17994355 DOI: 10.1080/10641960701615683]

97 **Watkins YJ**, Quinn LT, Ruggiero L, Quinn MT, Choi YK. Spiritual and religious beliefs and practices and social support's relationship to diabetes self-care activities in African Americans. *Diabetes Educ* 2013; **39**: 231-239 [PMID: 23411653 DOI: 10.1177/0145721713475843]

98 **Ahmad A**, Khan MU, Aslani P. The Role of Religion, Spirituality and Fasting in Coping with Diabetes among Indian Migrants in Australia: A Qualitative Exploratory Study. *J Relig Health* 2022; **61**: 1994-2017 [PMID: 34617198 DOI: 10.1007/s10943-021-01438-9]

99 **How CB**, Ming KE, Chin CY. Does religious affiliation influence glycaemic control in primary care patients with type 2 diabetes mellitus? *Ment Health Fam Med* 2011; **8**: 21-28 [PMID: 22479289]

100 **Fatima H**, Oyetunji TP, Mishra S, Sinha K, Olorunsogbon OF, Akande OS, Srinivasan, Kar SK. Religious coping in the time of COVID-19 Pandemic in India and Nigeria: Finding of a cross-national community survey. *Int J Soc Psychiatry* 2022; **68**: 309-315 [PMID: 33356731 DOI: 10.1177/0020764020984511]

101 **Sulkowski L**, Ignatowski G. Impact of COVID-19 pandemic on organization of religious behaviour in different Christian denominations in Poland. *Religions* 2020; **11**: 254 [DOI:10.3390/rel11050254]

102 **Simmons D**, Voyle JA, Fou F, Feo S, Leakehe L. Tale of two churches: differential impact of a church-based diabetes control programme among Pacific Islands people in New Zealand. *Diabet Med* 2004; **21**: 122-128 [PMID: 14984446 DOI: 10.1111/j.1464-5491.2004.01020.x]

103 **Webb B**, Bopp M, Fallon EA. A qualitative study of faith leaders' perceptions of health and wellness. *J Relig Health* 2013; **52**: 235-246 [PMID: 21409482 DOI: 10.1007/s10943-011-9476-6]

104 **Stansbury KL**, Harley DA, King L, Nelson N, Speight G. African American clergy: what are their perceptions of pastoral care and pastoral counseling? *J Relig Health* 2012; **51**: 961-969 [PMID: 20978845 DOI: 10.1007/s10943-010-9413-0]

105 **Devlin H**, Roberts M, Okaya A, Xiong YM. Our lives were healthier before: focus groups with African American, American Indian, Hispanic/Latino, and Hmong people with diabetes. *Health Promot Pract* 2006; **7**: 47-55 [PMID: 16410420 DOI: 10.1177/1524839905275395]

106 **Koenig HG**. Spirituality, wellness, and quality of life. *Sex Reprod Menopause* 2004; **2**: 76-82 [DOI: 10.1016/j.sram.2004.04.004]

107 **Pengpid S**, Peltzer K, Skaal L. Efficacy of a church-based lifestyle intervention programme to control high normal blood pressure and/or high normal blood glucose in church members: a randomized controlled trial in Pretoria, South Africa. *BMC Public Health* 2014; **14**: 568 [PMID: 24906450 DOI: 10.1186/1471-2458-14-568]

108 **Sukarno A**, Pamungkas RA. Religiousness Associated with Type 2 Diabetes Care Management: A Concept Analysis. *Int J Nurs Health Serv* 2020; **3**: 462-470

109 **Heidari S**, Rezaei M, Sajadi M, Ajorpaz NM, Koenig HG. Religious Practices and Self-Care in Iranian Patients with Type 2 Diabetes. *J Relig Health* 2017; **56**: 683-696 [PMID: 27783261 DOI: 10.1007/s10943-016-0320-x]

110 **Dehning DO**, Nelson LA, Stewart JA, Stewart WC. Does Religious Adherence Help Diabetic Patients’ Well-Being? *J Christ Nurs* 2013; **30**: E1-E11

111 **Peach HG**. Religion, spirituality and health: how should Australia's medical professionals respond? *Med J Aust* 2003; **178**: 86-88 [PMID: 12526730 DOI: 10.5694/j.1326-5377.2003.tb05071.x]

112 **de Wit M**, Trief PM, Huber JW, Willaing I. State of the art: understanding and integration of the social context in diabetes care. *Diabet Med* 2020; **37**: 473-482 [PMID: 31912528 DOI: 10.1111/dme.14226]

113 **Jia X**, Yin C, Lu S, Chen Y, Liu Q, Bai J, Lu Y. Two things about COVID-19 might need attention. 2020 Preprint. Available from: Preprints:PPR114553 [DOI: 10.20944/preprints202002.0315.v1]

114 **Ciarambino T**, Ciaburri F, Paoli VD, Caruso G, Giordano M, D'Avino M. Arterial Hypertension and Diabetes Mellitus in COVID-19 Patients: What Is Known by Gender Differences? *J Clin Med* 2021; **10** [PMID: 34442038 DOI: 10.3390/jcm10163740]

115 **Ciarambino T**, Palmiero L, Bottone R, Schettini F, Adinolfi LE, Giordano M. Older female relatives of Covid-19 patients have an un-satisfactory perception of emergency room performance by clinical staff. *Aging Pathobiol Therapeut* 2021; **3**: 37-38 [DOI: 10.31491/APT.2021.06.058]

116 **Mazor KM**, Simon SR, Yood RA, Martinson BC, Gunter MJ, Reed GW, Gurwitz JH. Health plan members' views about disclosure of medical errors. *Ann Intern Med* 2004; **140**: 409-418 [PMID: 15023706 DOI: 10.7326/0003-4819-140-6-200403160-00006]

117 **Ciarambino T**, Para O, Giordano M. Immune system and COVID-19 by sex differences and age. *Womens Health (Lond)* 2021; **17**: 17455065211022262 [PMID: 34096383 DOI: 10.1177/17455065211022262]

**Footnotes**

**Conflict-of-interest statement:** Authors declare no conflict of interests for this article.

**Open-Access:** This article is an open-access article that was selected by an in-house editor and fully peer-reviewed by external reviewers. It is distributed in accordance with the Creative Commons Attribution NonCommercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: https://creativecommons.org/Licenses/by-nc/4.0/

**Provenance and peer review:** Invited article; Externally peer reviewed.

**Peer-review model:** Single blind

**Peer-review started:** April 1, 2022

**First decision:** April 25, 2022

**Article in press:** August 16, 2022

**Specialty type:** Behavioral sciences

**Country/Territory of origin:** Nigeria

**Peer-review report’s scientific quality classification**

Grade A (Excellent): A

Grade B (Very good): 0

Grade C (Good): C, C

Grade D (Fair): D, D

Grade E (Poor): 0

**P-Reviewer:** Ahmed S, Pakistan; Ciarambino T, Italy; Ozden F, Turkey **S-Editor:** Wang DM **L-Editor:** Webster JR **P-Editor:** Wang DM

**Table 1 Results on the role of religious factors in diabetes management**

|  |  |  |  |
| --- | --- | --- | --- |
| Ref. | Study objective | Method | Result |
| Watkins *et al*[97] | This study looked at how spiritual and religious beliefs, social support, and diabetes self-care activities among African Americans with type 2 diabetes are linked, and it was expected there would be a positive link | This was a cross-sectional study | According to the results, there was a significant association between spiritual and religious beliefs and practices and the general diet |
| Ahmad *et al*[98]  |  The purpose of this study was to identify the religious beliefs of Indian migrants in Australia and their impact on diabetes self-management practices | This was a qualitative exploratory study | The results indicated that prayers aided participants in relieving stress and improving their diabetes management. Additionally, the participant believed that receiving blessings/prayer from religious leaders aided in the prevention or cure of diseases such as diabetes |
| How *et al*[99]  | A central goal of this study was to determine the relationship between religiosity, religions, and type 2 diabetes mellitus glycemic control | This is a cross-sectional study conducted at an urban, university-based, teaching outpatient clinic | The results indicated a higher level of religiosity among Moslems was associated with significantly better glucose control. As compared to patients of other religions, those who attended church recorded better glycemic control |
| Darvyri *et al*[57]  | An evaluation of the impact of spirituality/religiosity on the management of T2DM was the goal of the study | This was a systematic review | A positive correlation was found between religiosity/spirituality and the improvement of T2DM management in this study |
| Fatima *et al*[100]  | In this study, the purpose was to evaluate religious coping in the time of the COVID-19 pandemic | It was an online survey | According to the study, it was found that positive religious coping in the Nigerian population was significantly higher than that in the Indian population |

T2DM: Type 2 diabetes mellitus; COVID-19: Coronavirus disease 2019.

**Table 2 Results on the role of faith communities in diabetes management**

|  |  |  |  |
| --- | --- | --- | --- |
| Ref. | Study objectives | Method/sample | Result |
| Pengpid *et al*[107]  | The purpose of this study was to determine the efficacy of a community (church)-based lifestyle intervention program in Gauteng, South Africa, to control high normal blood pressure and/or high normal blood glucose in church members | The study is a cluster randomized controlled evaluation of a group-based program | The results indicate that the church-based lifestyle intervention was effective in reducing participants' high normal blood pressure and/or high normal blood glucose |
| Sukarno and Pamungkas[108]  | The purpose of this study was to investigate the meaning of religiousness in relation to diabetes management in T2DM patients by selecting a concept, defining the analysis purpose, identifying a model case, examining attributes, antecedents, and consequences, and defining empirical referents | This research utilized a concept analysis method | The findings identified religiousness-related characteristics such as religious belief, religious practice, religious support, and religious coping in the context of diabetes care management |
| Heidari *et al*[109]  | Specifically, the purpose of this study was to investigate the relationship between religious practices and self-care among people who have type 2 diabetes | A descriptive cross-sectional survey was conducted on 154 diabetic patients |  The results showed significant positive correlations between religious practices and self-care activities in diabetic patients |
| Dehning *et al*[110]  | This survey was designed to assess how religious adherence affects patients' perceptions of disease and treatment | This was a descriptive survey at an ophthalmology clinic in Missouri | The researchers found that the more adherent a patient was to faith-based activities or exhibited knowledge of fundamental dogmas, the greater their feelings of well-being were |

T2DM: Type 2 diabetes mellitus.



Published by **Baishideng Publishing Group Inc**

7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA

**Telephone:** +1-925-3991568

**E-mail:** bpgoffice@wjgnet.com

**Help Desk:** https://www.f6publishing.com/helpdesk

https://www.wjgnet.com



**© 2022 Baishideng Publishing Group Inc. All rights reserved.**