INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH AND ANALYSIS

ISSN(print): 2643-9840, ISSN(online): 2643-9875

Volume 08 Issue 04 April 2025

DOI: 10.47191/ijmra/v8-i04-79, Impact Factor: 8.266

Page No. 2235-2242

Holistic Health Management: Religion, Vegetarianism and Exercise

Lung-Tan Lu
Fo Guang University

ABSTRACT: Lu (2022) proposed a holistic health model that examines the impact of religion, exercise, and Western medicine on various health dimensions. This paper aims to explore how religious beliefs, vegetarianism, and exercise influence health. Religion significantly shapes global culture and health behaviors, particularly through dietary norms like vegetarianism, which is promoted in Hinduism, Buddhism, and Jainism, reflecting ethical and spiritual values with potential health benefits. Exercise, especially post-meal, aids in blood glucose regulation, crucial for diabetes management, a growing global concern, notably in China. The paper reviews literature on vegetarianism's promotion by religions and its ethical, spiritual, and ecological foundations, compares intestinal flora differences between vegetarians and non-vegetarians, and explores exercise mechanisms in blood glucose regulation. Vegetarianism, rooted in non-violence and ecological protection in Hinduism and Buddhism, alongside exercise, offers non-drug interventions for diabetes. Vegetarians have lower type 2 diabetes risk, and exercises like walking and Tai Chi aid in blood glucose control.

KEYWORDS: Holistic Health, Religion, Vegetarianism, Exercise, super slow jogging

I. MAJOR WORLD RELIGIONS

As an important part of human society, religion has always been a core research topic in fields such as religious studies, sociology, and demography. Religion not only affects people's belief system and values, but also shapes social culture, political structure and even economic development to a certain extent. There are more than 4,000 different religions, faith groups and sects in the world, but the religions with the greatest influence and the largest number of believers include Christianity, Islam, Buddhism, Hinduism, etc. These religions have demonstrated enormous influence in terms of both geographical coverage and number of believers. According to statistics, the world's population is about 8.1 billion, of which there are about 1.5 billion atheists. Among religious believers, the largest number of Christians is close to 2.64 billion, followed by Muslims, about 1.9 billion, then Hindus, about 1.2 billion, and the number of Buddhists is about 600 million.

Christianity originated in Palestine in the 1st century AD and is a branch of Judaism. It takes the Bible as its classic and worships Jesus as its savior. After thousands of years of development, Christianity has split into major denominations such as Catholicism, Protestantism, and Eastern Orthodoxy, with believers spread all over the world. As of 2025, the number of Christians is estimated to be 2.64 billion, accounting for approximately 33% of the world's population. Among them, there are about 1.2 billion Catholics, about 900 million Protestants, and about 300 million Orthodox Christians. Christians are widely distributed in Europe, America, sub-Saharan Africa and Oceania. Especially in America and Europe, the proportion of Christian believers in the local total population is relatively high. Despite its large global following, Christianity's growth has been slowing. Especially in developed countries such as Europe and the United States, the number of Christian believers has even declined to a certain extent due to the aging population and the increase in the number of people without religious beliefs. However, in parts of Africa and Asia, the number of Christians continues to grow due to factors such as population growth and the spread of religion (Johnson & Grim, 2013).

Islam originated in the Arabian Peninsula in the early 7th century AD and was founded by Muhammad. It takes the Quran as its basic scripture and its believers are called Muslims. Islam advocates belief in the only true God, Allah, and believes that Muhammad is the messenger of the true God. Islam is mainly divided into two major sects: Sunni and Shia. As of 2025, there are approximately 1.9 billion Muslims, accounting for approximately 24% of the world's population. Muslims are mainly concentrated in the Middle East, North Africa, South Asia and Southeast Asia. Among them, Sunni believers are the larger, accounting for about

85% of the world's Muslims, while Shiites account for about 15%. Islam is the second largest religion in the world and its number of followers continues to grow. This is mainly due to factors such as the high fertility rate and religious spread in Islamic countries. Especially in the Middle East and North Africa, the number of Muslims has grown rapidly, which has had an important impact on the local political, economic and cultural landscape (Esposito, 2010). Hinduism is a native religion of India, with the Vedas at its core, integrating the worship of multiple gods and philosophical thoughts. Hinduism is centered on the caste system, which holds that people are born with different social status and responsibilities. Hinduism has had a profound impact on the culture, politics and society of India and its surrounding areas. As of 2025, there are approximately 1.2 billion Hindus, accounting for approximately 15% of the world's population. Hindu believers are mainly concentrated in India, Nepal and Mauritius. In addition, there are also some Hindu believers in Southeast Asia, Europe and the United States. The number of Hindus continues to grow in India and surrounding areas (Flood, 1996).

Buddhism originated in ancient India between the 6th and 5th centuries BC and was founded by Gautama Siddhartha (Shakyamuni). Buddhism emphasizes personal practice and enlightenment, and the pursuit of inner peace and liberation. After thousands of years of development, Buddhism has differentiated into major schools such as Mahayana Buddhism, Theravada Buddhism (Southern Buddhism) and Tibetan Buddhism. As of 2025, there are approximately 600 million Buddhists, accounting for approximately 7% of the world's population. Buddhists are mainly distributed in China, Japan, Thailand, Myanmar and Sri Lanka. Among them, China is one of the countries with the largest number of Buddhists, with a long history of Buddhism and a profound Buddhist cultural heritage. Although Buddhism has a relatively small number of followers worldwide, its influence on the East Asian cultural circle cannot be ignored. Especially in countries such as China, Japan, and South Korea, Buddhist culture has been deeply integrated with local traditional culture and has become an important part of national culture (Wallace, 2009).

In addition to Christianity, Islam, Hinduism and Buddhism, there are many other religions and faith groups around the world, such as Judaism, Sikhism, Taoism, Shintoism, etc. Although these religions are not as numerous as the first four religions and have less influence, they reflect the diversity of the global religious ecology (Barrett, Johnson, & Johnson, 2001). Non-religious people are those who have no clear religious beliefs or do not believe in any religion. According to statistics, there are about 1.5 billion people without religious beliefs in the world, accounting for about 19% of the world's population. People without religious beliefs are mainly concentrated in China, Japan and some European countries. In developed countries such as Europe and the United States, the proportion of people without religious beliefs is gradually increasing (Zuckerman, 2009; Pew Research Center, 2024).

II. RELIGIONS AND VEGETARIANISM

As an important part of human civilization, religious dietary norms not only reflect human beings' profound understanding of life, but also shape human eating behavior to a certain extent. Vegetarianism is regarded as a moral practice in many religions, which is supported by religious doctrines as well as shaped by history and culture. By comparing and analyzing the doctrines and practices of major religions such as Buddhism, Hinduism, Taoism, Christianity, and Islam, this paper introduces the religious advocacy of vegetarianism and the ethical, spiritual, and ecological foundations behind it. Hinduism advocates "not killing" (Ahimsa) and reincarnation of the soul, and believes that vegetarianism can reduce bad karma and promote spiritual growth. Therefore, most Hindus are strict vegetarians and avoid animal foods such as meat, fish, and eggs. Furthermore, vegetarianism is widely accepted in Indian society and is closely tied to religious rituals. Hinduism advocates vegetarianism, which is deeply rooted in Hinduism and an important part of the doctrine of "non-violence" (Ahimsa). The Hindu classic "Manu's Law" clearly stipulates: "Meat cannot be obtained without killing. Since killing violates the principle of Ahimsa, people should give up meat." This doctrine directly links vegetarianism with the concept of "non-violence" and requires believers to avoid harming any life. There are differences in the extent to which different castes in Hinduism follow a vegetarian diet. Higher castes (such as Brahmins) strictly adhere to a vegetarian diet, and about 30%-40% of Hindus call themselves vegetarians. Vegetarianism is associated with status and honor in Indian society and is seen as a symbol of purity and nobility. The vegetarian tradition of Hinduism is not only a religious practice, but also reflects respect for life and awe of nature. This concept is in line with modern concepts of environmental protection and healthy eating (Lipner, 1994).

Jainism's strict vegetarianism stems from its core belief in Ahimsa, which is absolute respect for and non-harm to all forms of life. This teaching permeates diet, lifestyle and spiritual practice, forming a unique vegetarian culture. Jainism believes that all life - whether human, animal or plant - possesses a soul and that any form of harm should be avoided. It is strictly forbidden to eat meat, fish, eggs and root vegetables (such as potatoes, onions, garlic, etc.) in the diet, because picking root vegetables will damage their root systems and indirectly harm the microorganisms in the soil. The vegetarian tradition of Jainism can be traced back to the 6th century BC and is closely related to the teachings of the leader Mahavira. This tradition has existed for a long time in Indian society and has become an important symbol of Jain identity. Vegetarianism is considered a part of tapas, which reduces harm to life by restraining appetite, while purifying the mind and approaching liberation. Jainism's vegetarian teachings

emphasize living in harmony with nature, avoiding over-exploitation of resources, and protecting ecological balance. Vegetarianism reduces the exploitation of animals, advocates equal treatment of all lives, and embodies the Jain doctrine of "equality of all beings" (Dundas, 2002). Buddhism advocates "compassion" and "non-killing", believing that eating meat will harm life and violate the spirit of compassion. Since the Northern and Southern Dynasties, Chinese Buddhism has strictly promoted vegetarianism, and Emperor Wu of Liang's promotion laid the foundation for the vegetarian tradition of monks. Although Tibetan Buddhism and Theravada Buddhism do not require vegetarianism, some believers choose to be vegetarian to practice the spirit of compassion. Among them, Mahayana Buddhism emphasizes vegetarianism, while Theravada Buddhism is relatively flexible (Chapple, 1993).

Christianity does not have a unified attitude towards vegetarianism, and different denominations and theological traditions have different understandings and practices. Whether to be a vegetarian or not depends more on one's personal understanding of the faith than on the requirements of core doctrines. Some Eastern Orthodox monasteries practice a strict vegetarian diet (avoiding meat, eggs, and dairy) during Lent as a spiritual practice, but lay believers usually reduce animal products only during Lent. Catholic tradition requires believers to abstain from meat on certain days, such as Fridays, but modern rules have been relaxed to allow other forms of penance. The Seventh-day Adventist Church explicitly advocates a vegetarian diet, believing that it is a "revelation of the Holy Spirit" to maintain good health, but not a necessary condition for salvation. Most other Protestant denominations believe that dietary choices are a personal freedom, but in recent years some evangelical believers have turned to vegetarianism for environmental protection or animal ethics reasons (Wirzba, 2011). Islam allows the consumption of halal meat, but it is prohibited during the fasting month of Ramadan. In non-Muslim countries, some Muslims choose to be vegetarian or only eat fish if they cannot find meat that meets Islamic slaughter standards. Some Islamic groups promote vegetarianism to reduce violent tendencies. Sufis purify their body and mind and enhance their spirituality through a vegetarian diet (Foltz, 2005). Although different religions promote vegetarianism in different forms, they all embody the following core concepts: first, the ethical basis, non-violence and compassion are the common starting points; second, spiritual pursuit, vegetarianism helps to purify the body and mind and enhance spirituality; third, ecological care, reducing damage to nature and promoting sustainable development.

III. GUT FLORA OF VEGETARIANS AND NON-VEGETARIANS

There are significant differences in the intestinal flora between vegetarians and non-vegetarians, and these differences are mainly reflected in the composition of the flora, metabolic function, and health-related indicators. Vegetarians have higher numbers of bacteria from the phyla Bacteroidetes and Firmicutes in their guts, which are involved in fiber fermentation and help produce short-chain fatty acids (such as butyrate). The non-vegetarians (omnivores) had increased numbers of bacteria associated with meat digestion, such as Alistipes putredinis, in their guts, as well as more bacteria associated with inflammatory bowel disease and colon cancer risk, such as Ruminococcus twists and Bilophila wadsworthia. The intestinal flora of vegetarians is better at fiber fermentation, and the short-chain fatty acids produced help reduce inflammation and maintain the stability of metabolism and immune function. The intestinal flora of non-vegetarians is more inclined to protein fermentation, which may increase the production of harmful metabolites and be negatively correlated with cardiometabolic health. Vegetarians have a gut microbiota associated with favorable cardiometabolic markers and a lower risk of inflammatory bowel disease and colon cancer. Gut microbiota profiles in non-vegetarians were negatively associated with cardiometabolic health, with red meat consumption being the main driver. A recent study analyzed the gut microbiota of 21,561 participants and found that vegetarians and vegans had higher numbers of bacteria involved in fiber fermentation in their gut microbiota, while omnivores had higher numbers of bacteria associated with meat digestion and inflammation in their gut microbiota. Conclusions: Dietary patterns significantly influence gut microbiota composition, and a plant-based diet is associated with a healthier gut microbiota (Fackelmann et al., 2025).

A recent study reviewed the effects of different dietary patterns on intestinal flora and found that vegetarians had increased numbers of Lactobacillus and decreased numbers of Enterococci in their intestines, and these changes were associated with reduced levels of intestinal inflammation. Vegetarians (including vegans and lacto-ovo vegetarians) have lower gut microbiota diversity than omnivores, but their microbiota is of higher quality and more correlated with health indicators. Vegetarian diets may reduce the risk of chronic inflammation and immune-related diseases by regulating intestinal flora. Vegetarian diets increase fiber intake, promote the growth of beneficial bacteria (such as Bacteroidetes and Firmicutes), and produce more short-chain fatty acids, thereby reducing inflammation and improving metabolic and immune function. Non-vegetarian diets, especially high red meat consumption, may increase the number of bacteria associated with inflammation and cancer, negatively affecting cardiometabolic health. Studies have shown that dietary patterns are a key factor affecting the composition and function of intestinal flora, and differences in intestinal flora further affect the health status of the host. Therefore, optimizing intestinal flora by adjusting the dietary structure (such as increasing the intake of plant-based foods) may become a new strategy for preventing

and treating a variety of diseases (Yan et al., 2022). There are significant differences in the intestinal flora between vegetarians and non-vegetarians, and these differences are closely related to the dietary structure. Vegetarians have gut microbiota that is more conducive to healthy metabolism and immune function, whereas omnivores' gut microbiota is associated with a higher risk of chronic diseases. Related research provides scientific evidence for regulating intestinal flora through diet.

IV. POST-MEAL EXERCISES AND BLOOD GLUCOSE LEVELS

We investigated the mechanism by which exercise affects postprandial blood glucose regulation, specifically through its effects on the activation of glucose transporter 4 (GLUT-4) in skeletal muscle. To investigate the effects of different types of exercise (including aerobic exercise, resistance training, and flexibility and balance training) on GLUT-4 expression and translocation, and to further analyze the effects of these exercises on postprandial blood glucose regulation. By integrating existing literature data, the importance of post-meal exercise as a non-drug treatment in the prevention and control of type 2 diabetes is proposed. Diabetes is a global chronic metabolic disease. The number and prevalence of patients with diabetes and prediabetes are gradually increasing. Studies have pointed out that China has the largest number of diabetes patients in the world, and the number of people with prediabetes is also extremely large. Aging, rising obesity rates, changes in dietary structure and lack of exercise are major risk factors (GBD 2021 Diabetes Collaborators, 2023). China has approximately 141 million adults (20-79 years old) suffering from diabetes, ranking first in the world. According to IDF data from 2021, the diabetes prevalence among China's adult population is approximately 10.6%. Over the past decade, the prevalence of diabetes in China has shown a rapid growth trend. In some areas, the prevalence of diabetes is as high as 12.4%. About 350 million adults in China are in a prediabetic state, with blood glucose levels between normal and diabetic, including impaired fasting glucose or impaired glucose tolerance. The survey found that the prevalence of prediabetes in the Chinese adult population is about 35-38% (Jia et al., 2025). The number of diabetes patients in China accounts for about a quarter of the total number of diabetes patients in the world, and the number of people with prediabetes is even larger, highlighting the severe challenges China faces in diabetes prevention and control. Aging, rising obesity rates, changes in dietary structure (high-sugar, high-fat diet) and lack of exercise are the main factors driving the increase in the prevalence of diabetes and prediabetes in China. The current prevalence of diabetes and prediabetes in China is not optimistic. The high incidence and large patient population have put tremendous pressure on the public health system. Preventive medical measures should be taken to reduce the incidence of diabetes and its complications and improve the health level of the entire population (Chinese Diabetes Society, 2022).

A recent study tracked 2,918 Buddhists who did not smoke, drink, or has diabetes, cancer, or cardiovascular disease for an average of five years, during which 183 cases of diabetes confirmed. After adjusting for age, sex, education, physical activity, family history of diabetes, tracking method, use of lipid-lowering medications, and baseline BMI, adherence to a vegetarian diet was associated with a 35% lower risk of diabetes, whereas switching from a non-vegetarian to a vegetarian pattern was associated with a 50% lower risk of diabetes, while switching from a non-vegetarian to a vegetarian pattern was associated with a CI075% lower risk of diabetes, compared with non-vegetarians. The study conclusions suggest that vegetarianism and switching to a vegetarian diet may have a preventive effect on diabetes in Taiwanese people, independent of BMI (Chiu, et al., 2018). A large prospective cohort study of UK adults investigated the association between vegetarianism and the risk of diabetes hospitalization or death. During a mean follow-up of 17.6 years, 1224 incident cases of diabetes were recorded. People who eat less meat, more fish and vegetarian diets are less likely to develop diabetes than those who eat meat regularly. These associations were significantly attenuated after adjustment for body mass index (BMI). The conclusions suggest that people who eat little or no meat may have a lower risk of diabetes, in part because of their lower BMI (Papier, et al., 2019).

A recent study evaluated the efficacy of vegetarian (including vegan and lacto-ovo vegetarian) dietary patterns on adult patients with type 2 diabetes mellitus (T2DM) by systematically reviewing and meta-analyzing randomized controlled trials (RCTs) to provide evidence. The main analysis indicators of the study include glycosylated hemoglobin (HbA1c), body mass index (BMI), diabetes medication needs, insulin sensitivity, fasting blood glucose, fasting insulin and low-density lipoprotein cholesterol (LDLC). The study found that a vegetarian dietary pattern can significantly reduce HbA1c, with an average reduction of 0.40%, showing moderate certainty of evidence. Vegetarians had an average BMI reduction of 0.96 kg/m². Vegetarian diets may improve insulin sensitivity, on average by 10%, but the certainty of the evidence is very low. A vegetarian diet did not show significant effects on indicators such as fasting blood glucose, fasting insulin and LDL-C. Conclusions: This study supports the inclusion of a vegetarian or vegan dietary pattern in the nutritional care plan of patients with T2DM as an option to improve glycemic control and weight management (Guest, et al. 2024). Controlling post-meal blood glucose levels is an important part of diabetes management, and exercise, as a lifestyle intervention, is widely believed to have a positive effect on improving blood glucose regulation. GLUT-4 is the main glucose transporter in skeletal muscle and adipocytes, and its activation state directly affects the cell's ability to uptake glucose. GLUT-4 is a key protein responsible for transporting glucose from the blood into cells and plays a vital role in maintaining

blood glucose homeostasis. Under normal physiological conditions, GLUT-4 is mainly stored in specific vesicles within cells. When stimulated by insulin or other signals, GLUT-4 rapidly translocates to the cell membrane, increasing the cell's uptake of glucose. However, in diabetic patients, the expression and translocation function of GLUT-4 may be impaired, resulting in decreased blood glucose regulation ability (Alam et al., 2016).

Aerobic exercise refers to physical exercise performed by the human body with sufficient oxygen supply. It is characterized by relatively low exercise intensity and long duration, and can fully mobilize the body's aerobic metabolic system. Common aerobic exercises include walking, ultra-slow jogging, swimming, cycling, etc. These exercises can promote cardiovascular health, enhance cardiopulmonary function, and have a positive impact on blood glucose regulation. Studies have shown that aerobic exercise can promote the transfer of GLUT-4 from intracellular storage pools to the cell membrane, thereby increasing the cell's ability to uptake glucose. This process is independent of the action of insulin, but is achieved through muscle contraction and related signaling pathways (such as AMPK activation). In addition, long-term aerobic exercise can also increase the total protein content of GLUT-4 in skeletal muscle, further improving the muscle's ability to absorb glucose (Colberg, et al. 2016). Aerobic exercise can effectively lower blood glucose levels and improve insulin sensitivity by promoting the translocation and expression of GLUT-4. Studies have shown that after an aerobic exercise, GLUT-4 levels can reach a peak within 3-16 hours after exercise, and this effect can last for several hours after exercise. For people with diabetes, low- to moderate-intensity aerobic exercise (such as walking) after a meal can significantly reduce post-meal blood glucose peaks. For example, a short walk (10-15 minutes) after a meal can reduce blood glucose excursions by promoting glucose uptake by skeletal muscle and effects of different types of exercise on GLUT-4 and blood glucose regulation (Flores-Opazo, et al., 2020). Studies have shown that aerobic exercise is most effective in regulating postprandial blood glucose. Twenty minutes of voluntary walking shortly after a meal resulted in lower blood glucose levels at the end of the exercise compared to the same time point when the subjects walked before dinner (Colberg et al., 2009). Later studies compared the recommendation of 30 minutes of walking per day with 10 minutes of walking after each main meal. Blood glucose was measured using continuous glucose monitoring for 7 days. The results showed that the GI values of participants were significantly lower when they took a walk after a meal, compared with a single walk after a meal each day. Improvements were particularly pronounced after the evening meal, when carbohydrate intake and sedentary behavior are greatest. It is suggested that walking for 10 minutes after a meal can reduce post-dinner high blood glucose better than exercising before a meal (Reynolds, et al., 2016).

Resistance training is a form of training that increases muscle strength, endurance, and size by working against external resistance. Research suggests that resistance training may increase basal metabolic rate by increasing muscle mass, thereby improving insulin sensitivity in the long term. However, compared with aerobic exercise, resistance training has less acute effects on blood glucose after a single meal. Research suggests that post-meal exercise may be an effective way to improve blood glucose control in people with type 2 diabetes. The most sustained benefits were seen with prolonged (≥ 45 minutes), moderate-intensity aerobic exercise. Resistance training also appears to be an effective approach. We recommend that people with type 2 diabetes focus on increasing energy expenditure to lower blood glucose after their largest meal of the day (Borror et al., 2018).

Flexibility and balance training (such as yoga and tai chi) have a weak direct effect on postprandial blood glucose. A previous study showed that no significant changes were found in the tai chi group compared with the resistance training group or the control group. Among the primary outcomes, only improvement in the insulin sensitivity index differed, with improvements in the insulin sensitivity index being significantly greater in the resistance training group than in the control group and trending toward greater improvements in the insulin sensitivity index than in the Tai Chi group. The study concluded that simplified Yang style Tai Chi had no effect on insulin sensitivity in the elderly (Thomas et al., 2005). However, Tai Chi may improve insulin sensitivity indirectly by regulating the autonomic nervous system and reducing stress. For example, yoga's relaxation response can reduce the secretion of stress hormones such as cortisol, thereby improving autonomic regulation. Tai Chi improves joint mobility and muscle flexibility through its slow, fluid movements and may be similar to low-intensity aerobic exercise to boost cardiopulmonary function. Later studies showed that Tai Chi improved fasting blood glucose and total cholesterol compared with traditional clinical treatment; most indicators did not support that Tai Chi was more effective than aerobic exercise (Guo et al., 2021).

A recent study used a systematic review and meta-analysis to explore the effects of Tai Chi on patients with type-2 diabetes mellitus (type-2 DM). It included 14 studies related to Tai Chi intervention for diabetes. The results showed that compared with non-exercise, Tai Chi has the effect of lowering fasting blood glucose, and the subgroup effect size decreases with the increase of total exercise volume. There is no significant difference between Tai Chi and other aerobic exercises. Compared with no exercise, Tai Chi can lower HbA1c, and the within-group effect size decreases with the increase of total exercise volume. Tai Chi is more effective in lowering HbA1c than other aerobic exercises. Compared with no exercise, Tai Chi can lower blood glucose 2 hours after a meal. There is no significant difference between Tai Chi and other aerobic exercises in lowering blood glucose 2

hours after a meal. Conclusions suggest that Tai Chi can effectively affect the management of blood glucose and glycosylated hemoglobin in patients with type 2 diabetes. Long-term practice of Tai Chi has a good effect on lowering blood glucose and glycosylated hemoglobin (HbA1c) levels in patients with type 2 diabetes (Chao et al., 2018). Another study used a systematic review and meta-analysis and included 16 studies in which 1,820 participants were assigned to one of the following interventions: yoga, walking, and no regular exercise (control group). Compared with the control group, the yoga group had a significant decrease in fasting blood glucose (FBG) by 31.98 mg/dL, a significant decrease in postprandial blood glucose (PPBG) by 25.59 mg/dL, a significant decrease in glycation by 0.73%, a significant decrease in fasting insulin by 7.19 µIU/mL, and a significant decrease in homeostasis model assessment of insulin resistance (HOMA-IR) by 3.87. Compared with the walking group, the yoga group had a significant decrease in FBG by 12.07 mg/dL, fasting insulin by 10.06 µIU/mL, and HOMA-IR by 5.97. Research conclusion: Practicing yoga or walking combined with OHA has a positive effect on blood glucose control. For the management of type 2 diabetes, yoga is more effective than walking in improving blood glucose control (Dhali, et al., 2023).

V. CONCLUSIONS

Regular exercise can significantly improve blood sugar control in people with diabetes, whether vegetarian or non-vegetarian. Different types of exercise, such as aerobic exercise, resistance training, flexibility and balance training, can promote the translocation and expression of GLUT-4 to varying degrees, thereby increasing the muscle's ability to absorb glucose. This not only helps reduce post-meal blood sugar peaks, but also reduces blood sugar fluctuations and improves overall blood sugar control (Wang, et al., 2020). Aerobic exercise can enhance cardiopulmonary function; improve blood lipid metabolism, lower blood pressure, etc., thereby effectively reducing the risk of cardiovascular disease in diabetic patients. In addition, resistance training and flexibility and balance training can also help improve physical fitness, enhance muscle strength and balance ability, and further reduce the incidence of accidents such as falls. Exercise not only improves blood sugar control and cardiovascular health in people with diabetes, but also improves their quality of life. Regular physical activity can help reduce stress, improve mood, and increase self-confidence and social skills. These positive psychological effects are particularly important for people with diabetes, who often face the psychological burden and lifestyle changes brought on by the disease. When formulating an exercise prescription, factors such as the individual's age, gender, weight, and exercise habits should be fully considered. For beginners, it is recommended to start with low-intensity, short-term exercise and gradually increase the amount and intensity of exercise, such as walking or ultra-slow jogging. It is also recommended to perform moderate exercise after meals, which can effectively lower blood sugar. During the implementation of exercise after meals, regular monitoring and evaluation should be carried out. It includes indicators such as exercise intensity, exercise time, exercise frequency, and changes in blood sugar after exercise. Ensure maximum exercise effect and safety by adjusting exercise prescriptions in a timely manner (OpenAI, 2023).

In order to improve the effect of exercise, it is recommended to provide professional exercise guidance and support. This includes developing personalized exercise plans, providing exercise technique training, and answering questions patients encounter during exercise. Taking religious and cultural factors into consideration, Hindus and Buddhists may prefer yoga, Chinese elderly people may prefer Tai Chi, middle-aged and older users in Europe and the United States are more likely to choose walking, and Japanese office workers are more accepting of ultra-slow jogging. It is also possible to promote communication and interaction among patients by establishing exercise groups or community support networks. Aerobic exercise increases muscle's ability to take up glucose by promoting the translocation and expression of GLUT-4, thereby effectively regulating postprandial blood sugar levels. Different types of exercise (such as aerobic exercise, resistance training, and flexibility and balance training) have different effects on GLUT-4 and blood sugar regulation, but they can all improve blood sugar control and quality of life in diabetic patients to varying degrees. As formulating and implementing exercise prescriptions, individual differences and needs should be fully considered to ensure the maximization of exercise effects and the guarantee of safety.

REFERENCES

1) Ding, W. and Marchionini, G. 1997 A Study on Video Browsing Strategies. Technical Report. University of Maryland at College Park.
2) Alam, F., Islam, M. A., Khalil, M. I., & Gan, S. H. (2016). Metabolic control of type 2 diabetes by targeting the GLUT4 glucose transporter: Intervention approaches. Current Pharmaceutical Design, 22(20), 3034–3049.
3) Barrett, D. B., Johnson, T. M., & Johnson, P. F. (2001). World Christian trends, AD 30–AD 2200: Sustained exponential growth. William Carey Library.
4) Borror, A., Zieff, G., Battaglini, C., & Stoner, L. (2018). The effects of postprandial exercise on glucose control in individuals with type 2 diabetes: A systematic review. Sports Medicine, 48(6), 1479–1491.

5) Chao, M., Wang, C., Dong, X., & Ding, M. (2018). The effects of Tai Chi on type 2 diabetes mellitus: A meta-analysis. Journal of Diabetes Research, 2018, 7350567.
6) Chapple, K. C. (1993). Nonviolence to animals, earth, and self in Asian traditions. State University of New York Press.
7) Chinese Diabetes Society. (2022). Chinese guidelines for the prevention and treatment of type 2 diabetes. Chinese Medical Journal, 135(12), 1389–1405.
8) Chiu, T. H. T., Pan, W. H., Lin, M. N., & Lin, C. L. (2018). Vegetarian diet, change in dietary patterns, and diabetes risk: A prospective study. Nutrition & Diabetes, 8(1), 12.
9) Colberg, S. R., Sigal, R. J., Yardley, J. E., Riddell, M. C., Dunstan, D. W., Dempsey, P. C., Horton, E. S., Castorino, K., & Tate, D. F. (2016). Physical activity/exercise and diabetes: A position statement of the American Diabetes Association. Diabetes Care, 39(11), 2065–2079.
10) Colberg, S. R., Zarrabi, L., Bennington, L., Nakave, A., Somma, C. T., Swain, D. P., & Sechrist, S. R. (2009). Postprandial walking is better for lowering the glycemic effect of dinner than pre-dinner exercise in type 2 diabetic individuals. Journal of the American Medical Directors Association, 10(6), 394–397.
11) Dhali, B., Chatterjee, S., Sundar Das, S., & Cruz, M. D. (2023). Effect of yoga and walking on glycemic control for the management of type 2 diabetes: A systematic review and meta-analysis. Journal of the ASEAN Federation of Endocrine Societies, 38(2), 113–122.
12) Dundas, P. (2002). The Jains (2nd ed.). Routledge.
13) Esposito, J. L. (2010). Islam: The straight path (4th ed.). Oxford University Press.
14) Fackelmann, G., Manghi, P., Carlino, N., Heidrich, V., Piccinno, G., Ricci, L., ... & Segata, N. (2025). Gut microbiome signatures of vegan, vegetarian and omnivore diets and associated health outcomes across 21,561 individuals. Nature Microbiology, 10(1), 41–52.
15) Flood, G. (1996). An introduction to Hinduism. Cambridge University Press.
16) Flores-Opazo, M., McGee, S. L., & Hargreaves, M. (2020). Exercise and GLUT4. Exercise and Sport Sciences Reviews, 48(3), 110–118.
17) Foltz, R. C. (2005). Animals in Islamic tradition and Muslim cultures. Oneworld Publications.
18) GBD 2021 Diabetes Collaborators. (2023). Global, regional, and national burden of diabetes from 1990 to 2021, with projections of prevalence to 2050: A systematic analysis for the Global Burden of Disease Study 2021. The Lancet, 402(10397), 203–234.
19) Guest, N. S., Raj, S., Landry, M. J., Mangels, A. R., Pawlak, R., Senkus, K. E., Handu, D., & Rozga, M. (2024). Vegetarian and vegan dietary patterns to treat adult type 2 diabetes: A systematic review and meta-analysis of randomized controlled trials. Advances in Nutrition, 15(10), 100294.
20) Guo, S., Xu, Y., Qin, J., Chen, Y., You, Y., Tao, J., Liu, Z., & Huang, J. (2021). Effect of Tai Chi on glycaemic control, lipid metabolism and body composition in adults with type 2 diabetes: A meta-analysis and systematic review. Journal of Rehabilitation Medicine, 53(3), jrm00165.
21) Jia, W., Chan, J. C., Wong, T. Y., & Fisher, E. B. (2025). Diabetes in China: Epidemiology, pathophysiology and multiomics. Nature Metabolism, 7(1), 16–34.
22) Johnson, T. M., & Grim, B. J. (2013). The world's religions in figures: An introduction to international religious demography. Wiley-Blackwell.
23) Lipner, J. J. (1994). Hindus: Their religious beliefs and practices. Routledge.
24) Lu, L. (2022). A comprehensive healthcare model: Dimension, status, and approach. International Journal of Multidisciplinary Research and Analysis, 5(10), 2597–2602.
25) OpenAI. (2023). ChatGPT (Mar 14 version) [Large language model]. https://chat.openai.com/chat
26) Papier, K., Appleby, P. N., Fensom, G. K., Knuppel, A., Perez-Cornago, A., Schmidt, J. A., Tong, T. Y. N., & Key, T. J. (2019). Vegetarian diets and risk of hospitalisation or death with diabetes in British adults: Results from the EPIC-Oxford study. Nutrition & Diabetes, 9(1), 7.
27) Reynolds, A. N., Mann, J. I., Williams, S., et al. (2016). Advice to walk after meals is more effective for lowering postprandial glycaemia in type 2 diabetes mellitus than advice that does not specify timing: A randomised crossover study. Diabetologia, 59, 2572–2578.
28) Thomas, G. N., Hong, A. W., Tomlinson, B., Lau, E., Lam, C. W., Sanderson, J. E., & Woo, J. (2005). Effects of Tai Chi and resistance training on cardiovascular risk factors in elderly Chinese subjects: A 12-month longitudinal, randomized, controlled intervention study. Clinical Endocrinology, 63(6), 663–669.

29) Wallace, B. A. (2009). Buddhism and science. In P. Clayton (Ed.), The Oxford handbook of religion and science. Oxford University Press.
30) Wang, T., Wang, J., Hu, X., Huang, X. J., & Chen, G. X. (2020). Current understanding of glucose transporter 4 expression and functional mechanisms. World Journal of Biological Chemistry, 11(3), 76–98.
31) Wirzba, N. (2011). Food and faith: A theology of eating. Cambridge University Press.
32) Yan, J., Wang, L., Gu, Y., Hou, H., Liu, T., Ding, Y., & Cao, H. (2022). Dietary patterns and gut microbiota changes in inflammatory bowel disease: Current insights and future challenges. Nutrients, 14(19), 4003.
33) Zuckerman, P. (2009). Atheism, secularity, and well-being: How the findings of social science counter negative stereotypes and assumptions. Science, Religion and Culture, 1(1), 1-26.