

Review

## Faith, Food and Fettle: Is Individual and Neighborhood Religiosity/Spirituality Associated with a Better Diet?

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**Abstract:** Diet is an important contributor to many non-communicable diseases. Religion and spirituality (R/S) has a salutary effect on physical health, and one of the possible links between R/S and positive health outcomes is a better diet. Religious neighborhoods might also play a role in influencing the adoption of a healthier diet. Suggestions for future research in R/S and diet are included.

**Keywords:** religion; religiosity; spirituality; health; diet

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### 1. Introduction

Research has shown that religion/spirituality (R/S) might have a salutary effect on physical health [1]. Studies have shown a positive association between R/S and lower all-cause mortality [2], and lower risks of cardiovascular diseases [3], cancers [4], and hypertension [5]. One of the possible links between R/S and positive health outcomes is the adoption of religious practices that are also health-promoting [6]. Many religions view the human body as sacred that has to be taken care of carefully, and in many religions there are specific prohibitions against irreverent behaviors which are not only harmful physically but also detrimental to spiritual development. In fact, some evidence has shown that R/S is negatively associated with many harmful behaviors such as smoking,

alcohol and substance abuse [7,8], suggesting that R/S may play a protective role in engaging in health-promoting behaviors.

One of the religious practices that is common in many religions is diet; many religions believe that the food one partakes affects both body and mind, and most religions have specific dietary guidelines regarding what food to eat or avoid. These dietary guidelines fall into two categories: (1) “a temporal abstinence from all or certain foods (fasting)”, e.g., Muslim fasting during Ramadan, Oriental Orthodox Christian fasting before Holy Communion; and (2) “stable and distinctive dietary habits that differ from the general population”, e.g., Muslims consume halal meat, Jews consume Kosher meat [9]. The main purposes of these dietary guidelines are for spiritual advancement rather than health *per se*. However, since these dietary practices are usually long term, they might be influencing the outcomes of diet-related diseases.

Diet plays an important role in maintaining health and is a major contributor to many non-communicable diseases (NCDs). In 2008, about 36 million of the 57 million deaths were due to NCDs, which include cardiovascular diseases, stroke, cancers, diabetes, and chronic respiratory diseases [10]. Four of the NCDs are diet-related and could be easily prevented by adopting a healthy diet. Given the importance of food in religions and diet in the development of NCDs, there is surprisingly scarce research on the relationship between R/S and diet, compared with other areas in R/S and health. Before 1990, there were only seven studies on R/S and diet [11], and between 2000 to 2012 there were only 21 such studies [12].

This paper provides an overview of the research evidence on R/S and diet. The possible role that R/S may play in influencing diet is discussed and the effect of religious neighborhood is considered.

## 2. An Overview of Research in Religion, Spirituality and Diet

The earlier studies of R/S and diet focused on religious/denominational differences; they compared dietary intake between different religions or different denominations within the same religion. For example, in 1956, a study compared Italian, Jews and other ethnicity of a group of garment workers and found that even though Italians and Jews did not differ in fat intake, Jews consumed more animal fats [13]. A number of studies compared the Seventh-Day Adventists with other denominations or religions or the general population and found that Adventists have a better diet [14,15] (see Groan and Van Der Heid [16]; Shatenstein and Ghadirian [17]; and Sarri, Higgins, and Kafatos [18] for reviews of denominational comparison studies on R/S and diet).

The degree of religiosity and spirituality rather than the actual denomination of religion may be more critical in explaining dietary behaviors. More recent studies on R/S and diet have investigated the level of religiosity/spirituality instead of only comparing denominations or religions. The majority of these studies pointed towards a positive direction, where a higher level of religiosity/spirituality is associated with a better diet [12]. R/S is positively associated with a higher fish intake [3,19], regular breakfast [20] and lower soft drinks consumption among adolescents [21], healthy nutrition [22–24], healthy food choices and eating patterns [25], and less dietary restriction (eating less than two meals a day) [26]. A recent systematic review supported the relationship between R/S and intake of fruit and vegetable and showed that in the majority of the studies a higher level of religiosity or spirituality is associated with a higher intake of fruit and vegetable [27].

A few studies that examined indirectly the relationship between R/S and diet by using other measures also showed a positive association between R/S and diet. In the Third National Health and Nutrition Examination Survey in the U.S. of 3194 elderly, religious attendance was included as one of the five measures of social contact, and it was found that elderly with four or more social contacts have better healthy eating index than those with fewer than four social contacts [28]. In another study, also conducted in the U.S. of 1000 elderly by the University of Alabama at Birmingham, religious attendance was one of the measures of social capital; and among African American men, not attending religious services regularly was associated with higher nutritional risk [29].

By contrast, a small number of R/S and diet studies showed a negative association between R/S and diet. For example, in the 2004 Survey of Texas Adults of 1504 adults, a negative association was found between religious attendance and diet quality, *i.e.*, a monthly religious attendance was associated with reduced odds of sound diet quality [30]. Three R/S and fat intake studies also showed that a higher level of religiosity is associated with higher fat intake [27]. Some studies reported mixed association between different dimensions of R/S and diet, for example, in the study of 3620 African Americans adults aged 28–34 years, those who prayed regularly and placed more importance in religion were more likely to consume fast food, while those who attend religious services more were less likely to consume fast food [31].

Some R/S and diet studies reported no significant relationship between R/S and diet. In a study of 351 Jewish adolescents from a Jewish community in Chicago, self-reported religiosity was not associated with regular breakfast and soft drink and fast food consumption [32]. In a longitudinal study of 351 elderly women from Allegheny County, Pennsylvania, there was no association between level of spirituality and diet [33]. Seven out of the 12 studies on R/S and fat intake showed no significant relationship [27]. A web-based study of 886 Buddhists in the U.S also found no association between Buddhist devoutness and adopting a vegetarian diet [34]. The conflicting results in R/S and diet studies imply that the relationship between R/S and diet might not be straightforward and more careful considerations are needed to understand this relationship.

### **3. Possible Links between Religion, Spirituality and Diet**

As mentioned earlier, in many religions the human body is considered sacred and needs to be taken care of cautiously. In order to keep the body pure spiritually, there are religious guidelines that encourage or prohibit certain behaviors. Whether a religion promotes healthy or unhealthy behaviors depends on the normative practices of that particular religion; if the normative practices are health-promoting then it is likely that the adherents will enjoy a better health.

R/S might encourage a healthier diet because of specific doctrines of a particular religion. The majority of these doctrines deal with the intake of animal flesh. For example, the teaching of Ahimsa (do no harm) in Mahayana Buddhism and Hinduism encourages their adherents to be vegetarians in order to cultivate compassion, since eating animals requires slaughtering and shedding of blood. Non-vegetarian food is considered impure and could hinder one's spiritual development [35]. As a result, these doctrines might help to increase the intake of fruit and vegetable and decrease the intake of animal flesh. In fact, a study has shown that Buddhist monks and nuns, who are vegans, consumed more fruit and vegetable and lesser saturated fat than non-Buddhists [36,37]. The Mormons are

encouraged to eat more fruit and vegetable and to limit their intake of meat. For Catholics, abstinence from meat is a means to overcome gluttony and lust, two of the seven deadly sins [38]. The Seventh-Day Adventists are encouraged to be vegetarians because they believe that the original diet intended by God according to the Bible was vegetarian, and it is part of the religious duty to maintain a healthy body [39]. Even in religions that do not have specific dietary guidelines, for example, the majority of protestant denominations, the teaching that the body is the “temple of the Holy Spirit” (1 Corinthians 6:19–20) might encourage the adoption of a healthier diet.

However, strict dietary practice in certain religions might lead to poor intake of essential nutrients. In a study that compared Hindu and Muslim Indian men, it was found that vegetarian Hindu had a lower circulating concentration of vitamin B<sub>12</sub> [40]. Nutritional deficiencies were found in breast-fed infants of mothers who are practicing a strict vegetarian diet because of religious reason [41]. A woman who was on a strict Zen macrobiotic diet for months developed scurvy, and severe folic acid and protein deficiencies [42].

In addition, while R/S is associated positively with a better diet, R/S is also positively associated with overweight/obesity [43–47], which is closely associated with a poor diet [48]. However, it is possible that religious communities are more accepting towards people who are obese rather than R/S causing obesity [44]. The low cigarette smoking prevalence among religious communities might be another reason of a higher prevalence of obesity, since nicotine, found in cigarette, is an appetite suppressor that could contribute to poorer appetite and thus lesser food consumption among the less religious [46]. In fact, one study found that the positive relationship between R/S and greater body weight disappeared after controlling for health behaviors, particularly smoking [46]. Another possible reason is that gluttony is not condemned in certain religions as much as other “sins” and many religious functions involve food, which might be high in saturated fat and refined sugar [49]. The association between R/S and obesity could be related to more sedentary behaviors due to praying, fellowship gatherings with food, and we need to bear in mind that the relationship goes in both directions and there can be moderators (e.g., other health behaviors) which could affect the relationship between R/S and obesity.

#### **4. Religious Neighborhoods and Diet**

Neighborhood and health is a relatively new research field which emerged during the late 1980s and early 1990s and has grown exponentially during the last 10–15 years [50]. It has been thought that health is a personal responsibility; an individual’s health is dependent on his or her choices [51]. Indeed, numerous studies have shown that people who adopt a healthy lifestyle enjoy better health and longer lifespan. However, the “personal responsibility” paradigm ignores the social contexts within which people make decisions. There are circumstances when they may be unable to choose a healthy lifestyle. For example, those who live in an area that lacks of resources for exercise are more likely to not exercise [52]. Thus, individual-based explanation of health and illness are insufficient. It is now recognized that an individual’s social environment has an effect on health, illnesses, and health behaviors, hence the increased interest to study neighborhood and its influence on health [53].

Neighborhood characteristics have been found to be associated with dietary quality, for example increased availability and access to a supermarket in a neighborhood was positively related to healthier

diet and a lower risk of obesity; an increased availability of healthy food in supermarket was associated with a healthy diet [54]; and the presence of more fast food restaurant was associated with poorer diet [55]. Neighborhood and obesity studies also showed similar association between neighborhood and dietary qualities. Higher perceived neighborhood disorder is associated with poorer self-rated overall diet quality [56] and poor dietary quality in children [57]. These results indicate that neighborhood may play an important role in shaping dietary behaviors.

Even though religion is practiced individually, it is also a community activity, and each religious community is a miniature neighborhood by itself where adherents of the same faith gather regularly and interact with each other. Similar to other neighborhoods, different religious communities also vary in demographical mix such as socioeconomic status (SES), racial proportions, education *etc.* In addition, there is a variation in the degree of adherence to religious norms in different religious communities even within the same religion. Thus, as in other neighborhoods, the physical and social characteristics of a religious community might influence the health and health behaviors of its members. In one study, Israeli Jewish men and women living in more religiously affiliated neighborhood have a lower mortality than that of secular neighborhood, even after controlling for SES, age, country of origin, marital status, and education [58].

The religious neighborhood one belongs to might encourage or discourage healthy diet. There could be doctrinal differences regarding healthy eating in different religious neighborhoods. For example, healthy eating is part of the doctrine of the Seventh-day Adventist Church, and believers are encouraged to consume more fruit and vegetable and if possible, to be vegetarians. In fact, research has shown that Adventists consumed more fruit and vegetable compared with the Methodists [15] and Catholics [14].

However, even within a denomination, different congregations might have different level of adherence to their doctrine, and hence exhibit different congregational level of observance of dietary practices. A less adherent believer who is attending a more adherent congregation might practice a healthier diet because of more exposure to health messages. In a study that examined health and wellness activities in faith-based organizations, it was found that faith leaders' and congregational characteristics are associated with the number of health and wellness activities; a congregation that is large, located in urban areas, and have faith leaders who are physically active and consume more fruit and vegetable tend to have more health and wellness activities [59]. It is possible that a more adherent congregation might organize more health and wellness activities, which have been shown to be effective in promoting healthy diet [60]. In addition, a less adherent believer might see his or her faith leader as a role model and might experience social pressure from the congregation to conform to the diet of the more adherent congregation. The more health-conscious faith leaders are also more likely to promote health through sermons, health-promoting literature, and health information on notice boards.

On the other hand, when a more adherent believer attends a congregation that does not practice healthy diet, he or she might not be encouraged to adopt a healthy diet because a less observing congregation is less likely to promote healthy diet and serve healthy food during church functions. There is also less social pressure to conform to healthy diet and no role model to look up to.

## 5. Suggestion for Future Research

R/S is experienced differently in different groups of people: Africans in the U.S tend to be more religiously active than Whites [61]; females are more religious than males [62]; and older people are more religious than younger people [63]. Thus, R/S might influence health and health behaviors differently in different gender, age and ethnic groups. For example, overall African Americans have poorer health than the Whites; however, African Americans who are more religious have better health than African Americans who are less religious, and this correlation is not as strong as in Whites [47,64,65]. However, most of the previous studies on R/S and diet included samples from the U.S. and other Western countries, with only a handful of studies from Asia and Africa. It is unknown whether Asians and Africans, whose diets are different from those of Westerners, experience similar health benefits from R/S to people from Western countries, and whether there are any differences by gender and ethnic groups in Asia and Africa.

There is also a lack of R/S and diet studies that examined non-Christians. Spirituality is not necessarily exclusive to people who have religions and assessing spirituality among non-religious groups would provide comparative data on its relationship with dietary behaviors. There have not been many R/S and diet studies that include predominantly Hindus and Muslims, and Buddhists. Historically R/S and health research has been mainly conducted among believers of Judeo-Christian faith and in the U.S. As a result, the common measures of R/S have been developed for these contexts and may not be suitable for Eastern religions, especially those practiced outside the U.S. This might be the reason of the scarcity of R/S and health studies among religions other than Christianity. The concern necessarily raises the issue of whether it is possible to have a universal/global measure of faith (faith-neutral) or whether there is a need for specific measures for R/S (faith-specific) [66], since different religions might have a different understanding of a theological concept (e.g., devotion to God) and different practices for the same concept. For example, while weekly church attendance is encouraged in Christianity, in Hinduism and Buddhism temple worship could be done on any day and at any time during the week. Thus, future studies in R/S and diet should include samples from religions other than Christianity and use religious measures adapted for other religions.

A wide range of dietary assessments were used in the studies of R/S and diet, and the most common are scales that provide an overall dietary score. Dietary record, where the respondent records the amount of food and drinks consumed within a time frame, is considered the “golden standard” of dietary assessment method [67]. However, most of the R/S and diet studies did not use dietary records to measure dietary intake. Dietary scales, even though they are convenient to use, do not provide specific dietary intake. Thus, future studies in the area should consider using dietary record, such as the 24-hour dietary recall, in addition to other dietary assessment methods.

Most of the earlier studies on R/S and diet examined denominational differences *i.e.*, comparing different denominations within the same religions or comparing different religions. However, the study of R/S and dietary intake should also go beyond simple denominational comparisons. Many of the more recent studies that examined the degree of religiosity and spirituality instead of just denominational differences, included participants from many religions. Potentially insightful studies will be those that examine degree of religiosity and spirituality and healthy eating within a single denomination. Every

denomination has different teaching about diet, thus a single-denominational study eliminates the need to control for denominational differences [68].

In addition to individual religiosity, important insight could also be gained from multilevel studies that examine how the characteristics of a religious neighborhood may play a role in influencing individual dietary choices above and beyond individual characteristics. In the study of neighborhoods and health, the variations in mortality, morbidity and health behaviors could have two possible explanations: a compositional explanation, where the differences in health outcomes are due to the different composition of people (individual effect), and a contextual explanation, where the differences are due to differences between places (area/neighborhood/contextual effect) [69]. Multilevel analysis can examine contextual/area/neighborhood effect and it “seeks to explain individual outcomes in terms of both individual and environmental or aggregate variables” [70] and allows for the separation between individual and contextual effects and simultaneous examination of individual- and contextual-level variables on individual-level outcomes.

## 6. Conclusions

Religion is considered important by many people around the world. One recent survey estimated that 51% of the population in the world believe in god(s) [71]. Another survey conducted in 143 countries showed that the majority of people, especially those from Africa and Asia, held that religion is an important part of their lives [72]. It is possible that people who consider religion important will also follow the dietary guidelines of their religion and the long-term dietary practice required by certain religions might, in turn, influence the outcomes of diet-related diseases. For example, compared with non-Adventists, Adventists enjoyed a longer lifespan [73], lower risks of cancers and coronary heart diseases, lower all-cause and cancer mortality [74], and lower cardiovascular mortality [75]. Globally, low fruit and vegetable intake contributed to about 1.7 million NCD deaths a year [76]. Religions that encourage the consumption of fruit and vegetable might help to prevent NCD deaths.

Many methods have been used to reduce diet-related diseases, such as policy change and legislation, e.g., increasing taxes on unhealthy ingredients. However, R/S has not been explored more extensively for its potential to reduce diet-related diseases. Many faith-based health promotion projects have been conducted successfully in African churches in the U.S. [77–79], and it is unknown whether similar results could also be obtained in other populations. Given the importance of religion, especially among people from Africa and Asia, and the rise of NCDs in these developing regions [10,80], studies related to R/S and diet could help explore whether R/S could be one of the potential channels to promote healthy eating in addition to those that already exist.

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## Author Contributions

All authors contributed to the work reported in this paper. Min-Min Tan conducted literature search and wrote the paper; Daniel D. Reidpath and Carina K.Y. Chan participated in drafting and revising the manuscript. All authors read and approved the final version of the manuscript.

## Conflicts of Interest

The authors declare no conflict of interest.

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