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ORIGINAL PAPER

"A Divine Infection": A Systematic Review on the Roles of Religious Communities During the Early Stage of COVID-19

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Abstract
The objective of this systematic review was to summarize the roles that religious communities played during the early stage of COVID-19 pandemic. Seven databases were searched and a total of 58 articles in English published between February 2020 and July 2020 were included in evidence synthesis. The findings of the literature showed diverse influences of religion as a double-edged sword in the context of COVID-19 pandemic. Religious communities have played detrimental and/or beneficial roles as a response to COVID-19 pandemic. A collaborative approach among religious communities, health science, and government is critical to combat COVID-19 crisis and future pandemics/epidemics.

Keywords Coronavirus SARS-CoV-2 · Pandemic · Social determinants of health · Faith communities

Introduction

COVID-19 is rapidly spreading worldwide, and one of the main avenues that have contributed to outbreaks and community transmissions is religion, particularly religious communities and their spaces, and religious beliefs/disbeliefs of COVID-19 itself. Religion is "[…] a complex of culturally prescribed practices" that depend on "supernatural powers." Religion often serves as a basis for social organizations, such as communities and institutional spaces, that may involve the performance of

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individual and collective ritual practices, beliefs, and actions (Smith, 2019, p.22). As a social determinant of health, religion largely shapes public health issues such as epidemics and pandemics (Idler, 2014). Indeed, religion and infectious diseases have historically been deeply entangled (Idler, 2014). In the history of epidemics, in particular, religious communities have played an intimate role in shaping collective beliefs or theological systems which inform responses to health crises. Some religious practices and rituals have also been known to pose a risk for infection and have put people within the religious communities particularly at risk of contracting infectious diseases.

As witnessed thus far with COVID-19 pandemic, religious spaces (e.g., churches and mosques) and rituals (e.g., pilgrimages and funerals) have been drastically altered or halted due to restrictions imposed on any social gatherings. Concurrently, some religious communities, particularly those with a tendency to be politically conservative (e.g., evangelical Christians), have defied government-suggested quarantine rules. Some religious communities also have continued to hold large services, which have gone on to further increase the spread of COVID-19 among those in the community and beyond. In such instances, religion is positioned against the virus, and broadly science, as a deceptive evil from which true faith and trust in *God* will protect (or spiritually vaccinate) true believers. Such trends have been noted in South Korea, Trinidad, the USA, and other countries (Quadri, 2020; Wildman et al., 2020). The latter instance raises questions of religious freedom and liberties, which are tied to rights discourses in neoliberal secular states. Furthermore, the impact of COVID-19 on one's physical, mental, social, and emotional health can be more harmful when one's religious identity or belonging intersects with other marginalized identities (e.g., women, people of color, socioeconomic status).

Religion has played a significant role in public health crises, such as with the spread and mitigation of HIV/AIDS and other infectious diseases (Blevins et al., 2019; Idler, 2014; Pugh, 2010). However, the complex dynamics between religion and infectious diseases has been largely overlooked and understudied (Kawachi, 2020; Ransome, 2020), especially within an interdisciplinary framework. In this context, more research on clarifying the association between health and religion as an important social determinant of health is needed to provide a deeper understanding of religion's role in individual and community health (Kawachi, 2020; Ransome, 2020). As we are currently living in the COVID-19 era, addressing the role of religion in the context of COVID-19 is timely and necessary (Carey, 2020; Hart & Koenig, 2020). Therefore, the objective of this systematic review was to summarize the roles religious communities play in the transmission, mitigation, and/or adaptation during the early stage of COVID-19 pandemic (from December 2019 to July 2020).

Methods

This study used a systematic review study design to summarize the literature. Systematic review is a structured literature review that provides a comprehensive synthesis of data that are extracted from relevant studies. It is beneficial for readers

who want to look at objective and unbiased data for a certain research question in each article selected for the review (Aromataris & Pearson, 2014). Reporting guidelines from the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) were used to describe the process of conducting a systematic review and results of the review as transparent as possible (Page et al., 2021). The review protocol was also registered on the international prospective register of systematic reviews, PROSPERO, at the beginning of the review process for transparency (https://www.crd.york.ac.uk/prospero/display_record.php?RecordID=182884).

Eligibility Criteria

There were no restrictions on the types of study design eligible for inclusion. Quantitative and qualitative studies, commentaries, editorials, and news articles were all included. Specific inclusion criteria included the following: (1) all human population of any age in any country; (2) both peer-reviewed and grey literature published in English; (3) empirical studies that report the epidemiological evidence of transmission, mitigation, and/or adaptation of COVID-19 due to religious communities, institutions, ritual practices and/or activities; and (4) analyses that discuss COVID-19 in relation to religious practices or activities. Exposures that were considered to be eligible were practices and activities related to religious communities, New Religious Movements (or cults), and/or theology inclusively.

Articles were excluded if they were thesis dissertations, pharmacological or biochemical studies. The indiscriminate nature of the eligibility criteria was due to the concurrent and evolving nature of the pandemic. The primary outcomes prioritized in this study were the incidence, outbreak, spread, and mitigation of COVID-19, inclusively and the role of religion in this process.

Information Sources and Search Strategy

The following seven electronic databases were used for literature searches in English: ATLA Religion, BioRxiv, CINAHL, LitCOVID, MEDLINE, PsycINFO, and Web of Science. A manual search of the reference lists of included papers was also completed to investigate whether any further relevant papers have been missed. Searches were limited to English language articles, peer-reviewed, refereed publication and grey literature, and studies on human. There were no search limitations regarding the year of publication; however, the start date was set at December 01, 2019. The initial searches were conducted on June 1, 2020, and top-up searches were followed on July 22, 2020, to capture all available up-to-date evidence. Keywords that were used for searches in each database are described in Appendix 1.

Study Selection

The primary investigator (EL) developed a search protocol and used Covidence (www.covidence.org) to manage references and remove duplicates. Article screening for title/abstract (Level 1) and full text (Level 2) was done by two independent

reviewers. In cases where a decision for exclusion or potential inclusion cannot be made by the title/abstract, the full text was retrieved. After completing the Level 1 screening, full text of the included articles was retrieved and further screened based on inclusion and exclusion criteria. Two reviewers independently read full text of the articles to verify eligibility and complete inclusion/exclusion checklists. During the screening process, any disagreements were resolved through a consensus discussion, and if consensus cannot be reached, the final inclusion of articles was then decided by a third reviewer. Inter-rater reliability between two reviewers was Cohen's $\kappa = 0.77$ (substantial agreement) at Level 1 and Cohen's $\kappa = 0.61$ (substantial agreement) at Level 2.

Data Collection Process and Data Items

Data extraction was completed using the Excel sheet to gather relevant information from included studies by two reviewers. The data extracted from all relevant studies included: bibliographic information of studies (i.e., authors and year of publication); study design (e.g., quantitative, qualitative, correspondence, editorial, research letter); research location; exposure and outcome measurements (if available); and the results reported. One researcher extracted data from all included studies then reviewed by another researcher. Discrepancies were resolved through consensus discussion. The relationships between religion and transmission, mitigation, and/or adaptation of COVID-19 indicated in each article were extracted.

Summary of Measures and Synthesis of Results

The summary of findings included design, country (geographical location), population, sample size (if available), analytic method, reported outcomes of interest, reported relationships between religion and COVID-19, and relevant inferential statistical results, if available. Conclusions of included opinion literature were grouped into statements that comment on relationships between religion and COVID-19 outcomes, and statements that make explicit policy recommendations for mitigating COVID-19 pandemic. Findings were summarized narratively in terms of the role religion has played and their implications for the decisions of governments and health care organizations in responding to COVID-19 pandemic.

Results

Study Selection

The number of studies that was included in the title/abstract screening and full text screening by language are provided in the PRISMA flowchart for study selection (Fig. 1). After removing duplicates, 542 articles were found during the initial search on June 3, 2020, then 297 more articles during the top-up search on July 23, 2020. A total of 839 articles were screened for title/abstract. Of these, 728 articles were

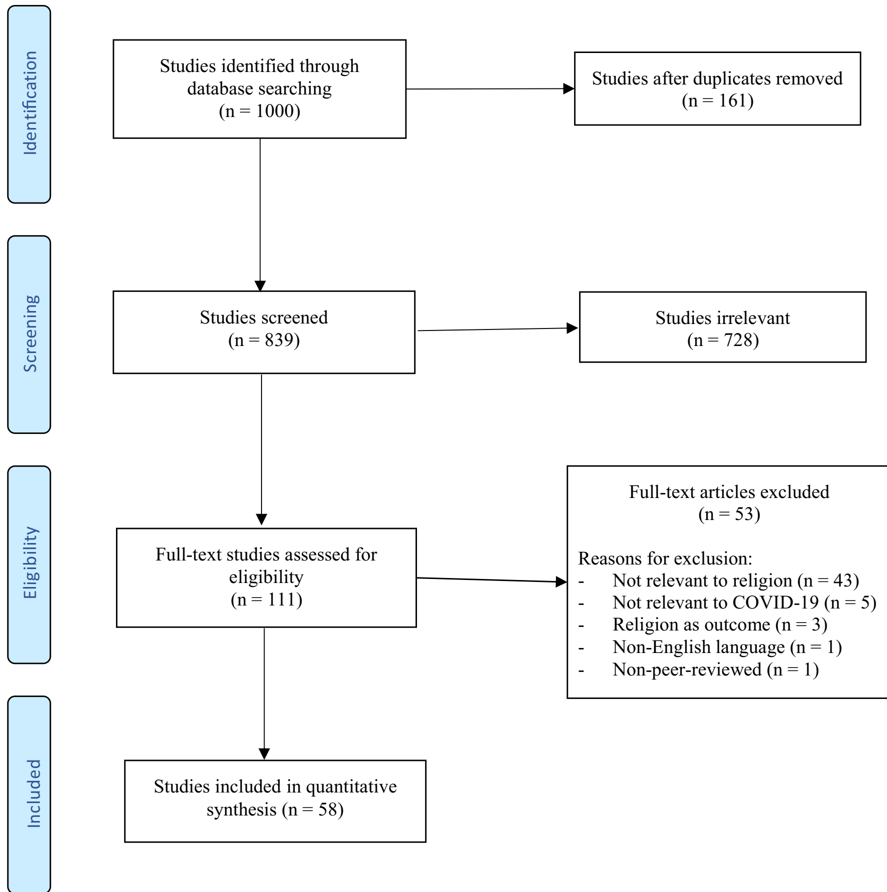

Fig. 1 PRISMA flow chart for systematic searches

excluded based on the eligibility criteria, leaving a total of 111 articles for full text screening. After removing 53 irrelevant articles, 58 articles in English were included in this review.

Characteristics and Epidemiological Statistics of Included Articles

As outlined in Fig. 2 which illustrates descriptive characteristics of the included articles, the most common study type among included articles was commentary (n = 12) followed by the cross-sectional design (n = 8). As for religious groups of interest, Islam was mentioned most frequently (n = 29), followed by Christianity (n = 12). In addition, mitigation (n = 26) was the most addressed role of religion in response to COVID-19, followed by adaptation (n = 20) and transmission (n = 18).

In terms of epidemiological statistics, nine studies reported epidemiological statistics regarding COVID-19 in Middle East (n = 3) (Al-Rousan & Al-Najjar, 2020;

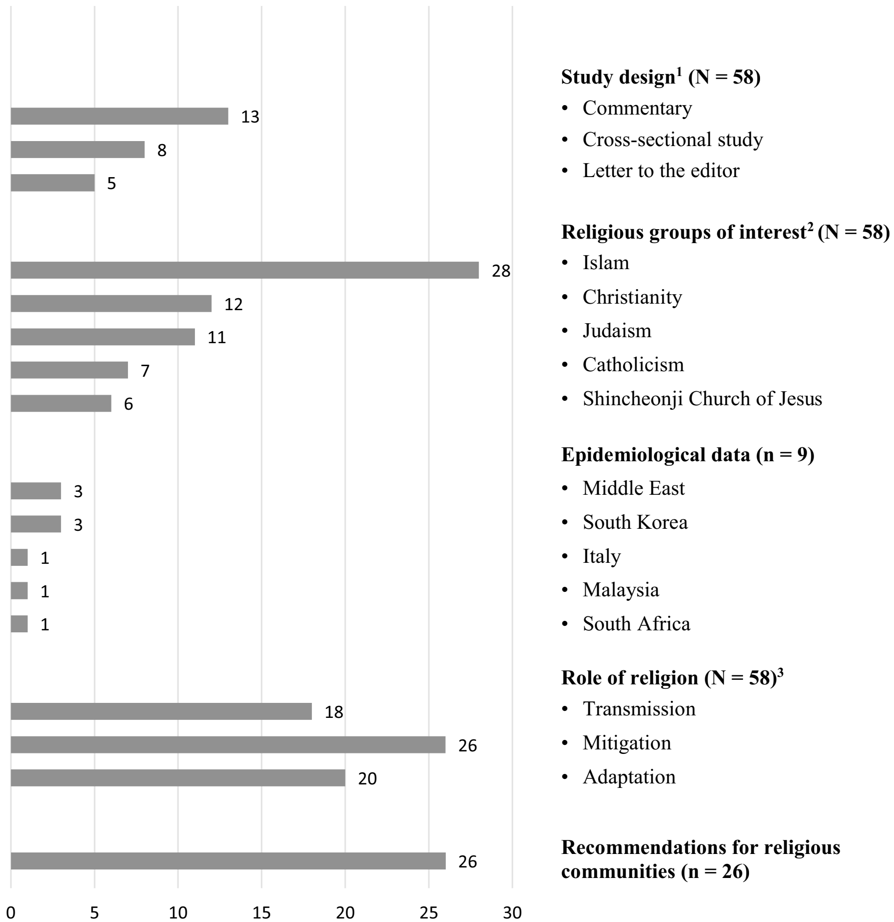

Fig. 2 Descriptive characteristics of the articles included **(N = 58).** [1]Other study designs included Letter (n = 3), Editorial (n = 3), Perspective (n = 3), Short communication (n = 1), Special section article (n = 2), Rapid communication (n = 2), Impressionistic reporting (n = 2), Original paper (n = 2), Correspondence (n = 2), Retrospective analytic epidemiology (n = 1), Case study (n = 1), Community trial (n = 1), Psychological exploration (n = 1), Brief report (n = 1), Observational study (n = 1), Preliminary report (n = 1), Philosophical exploration (n = 1), Opinion (n = 1), Review (n = 1), Qualitative study (n = 1), Policy recommendation (n = 1), Unsure (n = 1). [2]Other religion included Hinduism (n = 5), Buddhism (n = 4), Maronite (n = 2), Neo-Pentecostal Churches (n = 1), Afro-Brazilian Candomblé (n = 1), Umbanda (n = 1), Shinto (n = 1), New religions (n = 1). [3]Eight out of 58 included articles addressed ≥ one role that religion plays during the early stage of the COVID-19 pandemic

Atique & Itumalla, 2020; Yezli & Khan, 2020b), South Korea (n = 3) (Choi et al., 2020; Ha, 2020; Kang, 2020), Italy (n = 1) (Chirico & Nucera, 2020), Malaysia (n = 1) (Mat et al., 2020), and South Africa (n = 1) (Jaja et al., 2020).

The epidemiological statistics reported in the Middle East were addressed between countries, rather than in one country, regarding international pilgrimage practice as a main topic. Atique and Itumalla (2020) showed the COVID-19 cases

transmitted between the Kingdom of Saudi Arabia and Bahrain, indicating the confirmed case of 2,795 that were related to religious ritual traveling as of April 2020 (Atique & Itumalla, 2020). Al-Rousan and Al-Najjar (2020) reported the COVID-19 cases transmitted between Iran and Israel through Jewish pilgrimages whereby 6 confirmed cases in the beginning of March became 193 cases by March 15, 2020 (Al-Rousan & Al-Najjar, 2020).

The epidemiological statistics reported in South Korea were primarily addressed the first "super-spreader," known as "patient 31," who transmitted COVID-19 to many people among the Sincheonji religious group. The severity of large religious gatherings was also highlighted with statistics showing that approximately 60% of the confirmed cases nationwide were linked to Sincheonji religious group as of March 2020 (Choi et al., 2020; Kang, 2020; Kim et al., 2020). The statistics reported in Malaysia also revealed the severe impact of mass religious gatherings, of which more than 35% of COVID-19 cases were related to the mass Sri Petaling Muslim missionary gathering between February 27, 2020, and March 1, 2020 (Mat et al., 2020). In Italy, it was reported that 60 priests have died in March 2020 (Chirico & Nucera, 2020). The statistics reported in South Africa indicated that 80 people tested positive for COVID-19 after a single religious event which led to 1,600 potential cases among those who attended the event (Jaja et al., 2020). The detailed descriptive characteristics and epidemiological reporting of the included articles are displayed in Appendix 2.

Findings on Transmission

A total of 18 studies (Agley, 2020; Ali & Alharbi, 2020; Al-Rousan & Al-Najjar, 2020; Alzoubi et al., 2020; Atique & Itumalla, 2020; Capponi, 2020; Choi et al., 2020; Chukwuorji & Iorfa, 2020; Freeman et al., 2020; Hill et al., 2020; Jaja et al., 2020; Kang, 2020; Kim et al., 2020; Lan et al., 2020; Lorea, 2020; Mat et al., 2020; Shah et al., 2020; Wildman et al., 2020) have addressed religion as a cause for transmission, of which religious gatherings and practices contributed to the outbreak and spread of COVID-19. COVID-19 was predominantly spread through religious gatherings without adhering to the physical distancing recommendation. These types of gatherings included rituals (e.g., pilgrimages and funerals) and travelling to shrines (e.g., a monument to Mary, mother of Jesus and Kaaba).

Religious institutions or communities were identified as spaces where misinformation about the infection proliferated which further cultivated mistrust towards science and health care directives among religious adherents of these communities (Appendix 3). Specifically, studies mainly discussed how religious gatherings spread COVID-19 and the negative association between religiosity and trust in science and public health guidelines (Agley, 2020; Ali & Alharbi, 2020; Al-Rousan & Al-Najjar, 2020; Alzoubi et al., 2020; Atique & Itumalla, 2020; Capponi, 2020; Choi et al., 2020; Chukwuorji & Iorfa, 2020; Freeman et al., 2020; Hill et al., 2020; Jaja et al., 2020; Kang, 2020; Kim et al., 2020; Lan et al., 2020; Lorea, 2020; Mat et al., 2020; Shah et al., 2020; Wildman et al., 2020).

With respect to the association between religiosity and trust in science, and public health guidelines, Agley (2020) indicated that a higher score in religious commitment was associated with lower overall trust in science (Agley, 2020). Furthermore, Hill and colleagues (2020) demonstrated that more religious states in the USA tended to show a higher average mobility score and more public resistant to public health recommendations (Hill et al., 2020). Similarly, a study that explored the relationship between religiosity and beliefs in the COVID-19 conspiracy showed that general COVID-19 conspiracy beliefs were positively associated with a higher level of religiosity (Freeman et al., 2020).

In summary, transmission (e.g., outbreak, spread) of COVID-19 has been enacted mainly through religious gatherings and practices. Furthermore, proliferated misinformation on COVID-19 within religious communities and mistrust based on misinformation were attributable to COVID-19 transmission.

Findings on Mitigation

Twenty-six studies reported on the mitigating role of religion during the early stage of COVID-19 (Ahmed & Memish, 2020; Al-Rousan & Al-Najjar, 2020; Ali & Alharbi, 2020; Atique & Itumalla, 2020; Crubézy & Telmon, 2020; Ebrahim & Memish, 2020a, 2020b; Escher, 2020; Frei-Landau, 2020; Gautret et al., 2020; Ha, 2020; Hong & Handal, 2020; Iqbal et al., 2020; Kim et al., 2020; McCloskey, et al., 2020a, 2020b; Memish et al., 2020; Muurlink & Taylor-Robinson, 2020; Quadri, 2020; Tarimo & Wu, 2020; Waitzberg et al., 2020; Weinberger-Litman et al., 2020; Wildman et al., 2020; Wong et al., 2020; Yezli & Khan, 2020a, 2020b) (Appendix 3).

These articles mainly discussed an urgent need to cancel religious gatherings and events to mitigate the transmission and outbreak of COVID-19, even though they can be understood as a significant opportunity for its believers. These articles also highlighted the importance of institutional and intersectoral collaborative work among science, religion, and government to prevent and control the spread of COVID-19 (Hashmi et al., 2020; Hong & Handal, 2020). It was also reported that several countries (e.g., South Korea and Italy) have enacted national laws that ban religious gatherings and mandated testing and quarantining of suspected individuals with COVID-19 to prevent further spread of the virus (Chirico & Nucera, 2020; Kim et al., 2020).

In summary, cancelling religious gatherings and events was discussed as a main COVID-19 mitigation strategy that various religious communities have already implemented. Furthermore, collaborative work with science and government was addressed as a potential mitigation strategy.

Findings on Adaptation

Adaptation as a role of religion during the early stage of COVID-19 was addressed in 20 articles (Chirico & Nucera, 2020; Frei-Landau, 2020; Galiatsatos et al., 2020; Greene et al., 2020; Hashmi et al., 2020; Hong & Handal, 2020; Koenig, 2020a, 2020b; Lee, 2020; Lee et al., 2020; Levin, 2020; Modell & Kardia, 2020; Nahandi

et al., 2020; Peteet, 2020; Prime et al., 2020; Thompkins et al., 2020; Tootee & Larijani, 2020; Umucu & Lee, 2020; Waitzberg et al., 2020; Waqar & Ghouri, 2020) (Appendix 3). These articles primarily addressed new ways of performing religious practices (e.g., online gatherings, broadcasting religious ceremonies) and religious leaders and communities' appropriate response to COVID-19 and positive coping strategies (Koenig, 2020a, 2020b; Peteet, 2020; Umucu & Lee, 2020). Conversely, two studies explored negative religious outlooks where believers wondered whether they were abandoned by *God* at the time of COVID-19 (Lee, 2020; Lee et al., 2020). Supporting religious leaders and religious medical professionals who are suffering from psychological stressors during COVID-19 was also discussed in two studies (Greene et al., 2020; Nahandi et al., 2020).

In summary, studies have highlighted that religious practices and events now must be conducted in a way that is considered a "new normal" (e.g., online gatherings, broadcasting religious ceremonies).

Roles of Religion Summary

Out of 58 articles that were included in this review, eight articles addressed more than one role that religion has played during the early stage of COVID-19 (Al-Rousan & Al-Najjar, 2020; Atique & Itumalla, 2020; Frei-Landau, 2020; Hill et al., 2020; Hong & Handal, 2020; Kim et al., 2020; Waitzberg et al., 2020; Wildman et al., 2020) while two articles did not indicate any role but reported epidemiological evidence in relation to religious communities (McLaughlin, 2020; Safdar & Yasmin, 2020) (Appendix 3).

Out of 64 observations in 54 articles of which varying roles of religion were addressed, 28.1% (n = 18) were related to the detrimental role of religion such as outbreaks of COVID-19 through religious gatherings as well as mistrust/misinformation towards science and public health guidelines among religious groups. More importantly, most articles (71.9%; n = 46) have addressed the beneficial roles of religion where different religious communities have contributed to mitigating the infection and adapting safe approaches to organize religious practices. Various roles of religion during the early stage of COVID-19 are summarized in Fig. 3.

Policy Recommendations

Findings on policy recommendations for religious groups to combat COVID-19 are summarized in Table 1. A total of 26 articles provided recommendations on controlling and managing COVID-19 (Ahmed & Memish, 2020; Al-Rousan & Al-Najjar, 2020; Atique & Itumalla, 2020; Chirico & Nucera, 2020; Crubézy & Telmon, 2020; Ebrahim & Memish, 2020a, 2020b; Escher, 2020; Gautret et al., 2020; Greene et al., 2020; Ha, 2020; Hashmi et al., 2020; Hong & Handal, 2020; Iqbal et al., 2020; Jaja et al., 2020; Kang, 2020; Koenig, 2020b; Mat et al., 2020; McCloskey, et al., 2020b; Memish et al., 2020; Quadri, 2020; Tarimo & Wu, 2020; Thompkins et al., 2020; Wong et al., 2020; Yezli & Khan, 2020a, 2020b).

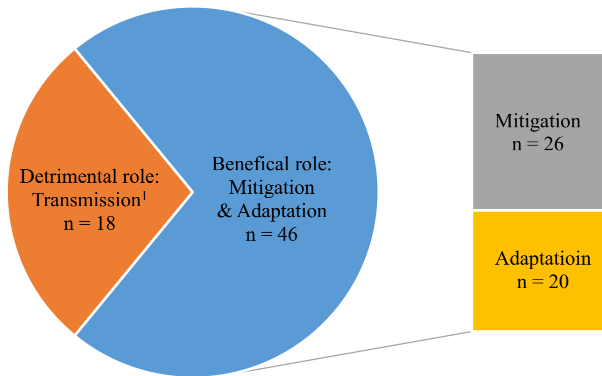

Fig. 3 Beneficial (mitigation & adaptation) and detrimental roles (transmission) of religion during the early stage of the COVID-19 pandemic discussed in the included articles (n = 56). [1]Transmission included outbreak and spread of COVID-19 and mistrust/misinformation towards science and public heath guidelines. *Note*: A total of 64 observations were made from 56 articles

The majority of the articles unanimously recommended that religious events and rituals should be suspended or cancelled to contribute to the safety of communities (Ahmed & Memish, 2020; Atique & Itumalla, 2020; Crubézy & Telmon, 2020; Ebrahim & Memish, 2020a, 2020b; Kang, 2020; Mat et al., 2020; McCloskey, et al., 2020a; Memish et al., 2020; Quadri, 2020; Tarimo & Wu, 2020; Yezli & Khan, 2020a). Similarly, three articles suggested to promote religious gatherings and rituals in accordance with newly implemented travel restrictions (Al-Rousan & Al-Najjar, 2020; Gautret et al., 2020; Jaja et al., 2020). Furthermore, two articles specifically recommended and addressed the importance of a collaborative approach among religious communities, science, healthcare providers, and policymakers (Hashmi et al., 2020; Hong & Handal, 2020).

All in all, policy recommendations in response to COVID-19 were in line with the mitigation and adaptation roles of religion found in this review, of which primarily included cancelling religious gatherings and events to mitigate transmission and collaborating with science and government to develop effective strategies for both mitigation and adaptation to COVID-19 and subsequent lockdowns and restrictions.

Discussion

Roles of Religion During the Early Stage of COVID-19

This was the first systematic review summarizing the role of religious communities in the transmission, mitigation, and adaptation during the early stage of COVID-19 pandemic. There is no doubt that several religious gatherings and practices have accelerated the transmission of the COVID-19 virus and endangered people around the world. Having said that, religion has played an important role in mitigating the infection and its impacts as well as helping people to cope with trauma

Table 1 Practical recommendations to control and manage COVID-19 (n = 26)

Author and publication year	Recommendations to control and manage COVID-19
Ahmed and Memish (2020)	The authors recommended Hajj to be cancelled; "KSA in canceling Hajj 2020 well in advance of the events would be very much in line with Islamic ideals and would contribute greatly to the safety of humanity" (p. 2)
Al-Rousan and Al-Najjar (2020)	As visiting Qom and other shrines in Iran is the main transmission route for CoVID-19 in the Gulf countries, "this study thus suggests closure of borders between Gulf countries, Lebanon and Iran" (p. 5817)
Atique and Itumalla (2020)	"We urge the Ministry of Hajj and Umrah, and with the assistance of leading religious scholars, should investigate the potential issues related to Hajj and propose feasible solutions to contain the prevailing situation. The Saudi government should seriously consider the option of a complete lockdown in the country until the pandemic is under control" […] "the government may focus on awareness drive among people, including social media" (p. 2)
Chirico and Nucera (2020)	"[…] spiritual skills should be recognized as "core" skills for healthcare professionals and be implemented in all medical curricula" (no page number available)
Crubézy and Telmon (2020)	The authors' recommendations for funerary rituals: "Jewish religion the "tahara", the rite of purification of the body of the deceased, must be prohibited; no embalming; for Muslim religion, the Tayammum (dry toilet by placing both hands on a stone or earth) may be sufficient" (p. 22)
Ebrahim and Memish (2020a)	The authors recommended Umrah to be cancelled and "KSA (Kingdom of Saudi Arabia) also has to manage diplomatic challenges with large pilgrim volume countries and manage requests for exemptions" (p. 2)
Ebrahim and Memish (2020b)	"Cancellation of suspension of mass gatherings be critical to pandemic mitigation" including Hajj based on the past experiences with respiratory diseases (p. 2). "Institutions with the mandates for outbreak monitoring and response should keep an inventory of mass gatherings and provide advance warnings and recommendations about outbreaks to the organizer including information on event cancellation, crowd size limitations, or alternatives" (p. 3)
Escher (2020)	The author recommended to follow the existing WHO mass gathering guidelines and "educate its population on best practices for infection control: consistent hand hygiene, social distancing, respiratory hygiene, testing and the use of quarantine" (p. 3)
Gautret et al. (2020)	The authors recommended "If travel restrictions are successful in avoiding the extension of the outbreak to the Kingdom of Saudi Arabia in the following months, authorities may have to restrict temporarily the entry of pilgrims from affected countries into KSA" (p. 1)
Gautret et al. (2020)	Recommendations to religious leaders who has affected by moral injury: "(1) self-care; (2) spirituality; (3) acknowledge moral conflicts; (4) purpose; (5) supervision and peer support; (6) social support; and (7) professional support." (p. 2)
Ha (2020)	"Religious organizations should maintain bipartisanship with science by prohibiting close proximity among believers" (p. 2)

Table 1 (continued)

Author and publication year	Recommendations to control and manage COVID-19
Hashmi et al. (2020)	The authors proposed “a collaborative model between religious communities and healthcare providers/policymakers to manage the COVID-19”. (p. 2)
Hong and Handal (2020)	The author recommended for science, religion, and government to work together “to cope with this worldwide pandemic” as “pitting religious truth against scientific truth is only a path to failure”. (p. 5)
Iqbal et al. (2020)	The author argued that “One possible solution to this religious cliché is to engage the religious leaders of the respective societies.”. (p. 278)
Jaja et al. (2020)	The author recommended that “Religious and cultural activities of any form must be restricted at this time. […] The government must intensify the enforcement of lockdown measure and promptly identify miscreants with dubious travel permit documents and those who travel with empty caskets to evade police arrest”. (p. 1078)
Kang (2020)	“When a new infectious disease is spreading, the government should sharply curtail group gatherings and religious events.” (p. 170)
Koenig (2020a, 2020b)	The author made seven recommendations to help older adults to protect themselves and cope with difficulties during the COVID-19 pandemic: “(1) spend time developing a deeper religious faith; (2) stay physically healthy (e.g., to care for the “temple of Holy Spirit” follow by the Christian tradition); (3) care for your neighbour emphasized by Jesus, Moses, theProphet Muhammad, the Buddha, Hindu sages, and other greater religious figures); (4) care for neighbour by meeting emotional needs; (5) care for neighbour by meeting physical needs; (6) follow by social distancing guidelines; and (7) taking advantage of technology (e.g., social and spiritual hugs and handshakes)” (p. 1–3)
Mat et al. (2020)	The authors recommended that “mass gatherings, be it for religious or other purposes, should be cancelled and banned throughout the period of the COVID pandemic.” (p. 4)
McCloskey et al. (2020a, 2020b)	Even though a precautionary approach is often used to explain MG cancellations, “events should be cancelled or postponed on the basis of a context-specific risk assessment” as “these cancellations have social and economic impact on public morale, on national economies and on individual livelihoods.” (p. 1098)
Memish et al. (2020)	The author argued that “premature promotion of mass gatherings can only lead to re-ignition of the pandemic.” (p. 1192). Therefore, the author recommended that “mass gatherings must be suspended.” (p. 1191)
Quadri (2020)	The author argued that “prompt responses such as suspension of communal gatherings must be promulgated to ensure social distancing.” (p. 220)
Tarimo and Wu (2020)	“This letter calls upon the government of Tanzania to immediately suspend not only schools and colleges as it has been successfully done but also all religious and any other social gatherings.” (p. 2)

Table 1 (continued)

Author and publication year	Recommendations to control and manage COVID-19
Thompkins et al. (2020)	The authors argued that "the ultimate decision in this regard would be made by each individual person (according to the fatwas) based on the recommendations of the physician in charge." (p. 3)
Wong et al. (2020)	The authors recommended for the "widespread testing at mass gatherings in areas of known community transmission." (p. 2)
Yezli and Khan (2020a)	"We believe, for the time being, temporary closure of places of worship for group prayers and religious services should be implemented by countries around the word (especially those with local COVID-19 transmission) regardless of faiths involved, with alternatives offered if possible, to help fight the pandemic." […] "for such measures to be effective and not be counterproductive, risk communication and educating the public regarding the reasoning behind and aim of such actions are crucial." (p. 1)
Yezli and Khan (2020b)	The author highlighted that despite the current suspension or cancellation of religious mass gatherings such as the Umrah, "further bold and probably unpopular measures are likely to be introduced in the future" which include 2020 Hajj (p. 1)

during COVID-19 crisis. According to previous studies, religious beliefs and practices can positively influence individuals' psychological well-being by helping them relieve psychological stress and cope with trauma not only during COVID-19 but also during many other unprecedented times such as pandemic and/or disasters (e.g., terrorists attacks) (Blevins et al., 2019; Peteet, 2020; Pugh, 2010; Schuster et al., 2001; Umucu & Lee, 2020).

Religion has acted as an important platform for intersectoral collaboration with science and government to combat COVID-19 as shown in the findings of our review on mitigation and adaptation. During the early stage of COVID-19, various religious institutions have collaborated with science sector and government authorities to innovate new measures of continuing religious commitments and rituals through social networks, TV channels, or live streaming (Capponi, 2020; Frei-Landau, 2020). These new innovative measures following public health information have been effectively implemented by religious leaders as some religious believers tend to have more faith in religious leaders than science or public health guidelines (Kim et al., 2020; Quadri, 2020; Weinberger-Litman et al., 2020). This clearly demonstrates how powerful religious leaders can be in delivering public health messages and highlights the importance of collaborating with religious sectors when facing public health crises.

All in all, despite the harmful impacts on COVID-19 by certain religious groups, religious communities have been serving as a critical source for managing and controlling COVID-19 in multiple regions of the world while taking collaborative approaches with other sectors.

COVID-19, Religion, and Vaccine Hesitancy

In December 2020, the first COVID-19 vaccine, Pfizer, rolled out, mainly in high income countries, which gave the global population hope that the pandemic will finally be under control, given that vaccine is considered the most promising strategy for eradicating the pandemic (Fisher et al., 2020). However, vaccine hesitancy which is defined as a "delay in acceptance or refusal of vaccination despite availability of vaccination services" (MacDonald et al., 2015, p. 4163) has been reported around the world and served as a main challenge in achieving community immunity. Historically, vaccination has been challenged for religious, scientific, and political reasons (Larson et al., 2014) and COVID-19 vaccination rollout has not been an exception.

Vaccine hesitancy due to religious reasons (e.g., false claims around religious permissibility of the vaccine or "infidel vaccine") is prevalent. According to a cross-sectional study on COVID-19 vaccine acceptance with 2,058 Chinese respondents in March 2020 (Wang et al., 2020), 52.2% of respondents reported that they would be willing to get vaccinated as soon as the vaccine is available while the remainder would delay the vaccination until the safety of the vaccination is verified and confirmed. A similar survey was conducted among 991 U.S. adults in April 2020 and showed that 57.6% of participants would be willing to take the COVID-19 vaccine, while the remaining 42.4% of the respondents reported that they were either not sure about getting vaccinated (31.6%) or had no intention to be vaccinated (10.8%) (Fisher et al., 2020). Compared to the surveys which have been conducted in the U.S. and China, survey results in Saudi Arabia represented a slightly higher percentage of vaccine hesitancy where more than half of the survey respondents (55.3%, 1,715 out of 3,101) were hesitant to accept the COVID-19 vaccination (Magadmi & Kamel, 2020).

One of the potential solutions to vaccine hesitancy is involving religious authorities in health awareness and vaccine promotion as they tend to have a powerful voice to their religious believers (Kim et al., 2020; Quadri, 2020; Weinberger-Litman et al., 2020). For example, in December 2020, The British Board of Scholars and Imams, a national board of Muslim, and other professional scholars made a statement that the COVID-19 vaccine is religiously permissible even though it contains haram ingredients or gelatine that Muslim people are obligated to avoid, as long as there are no medical alternatives (The British Board of Scholars & Imams, 2020). Similarly, the Catholic Church announced that it is "morally acceptable" to receive the COVID-19 vaccine, which was endorsed by Pope Francis, even though the vaccine development process included using cell lines from aborted fetuses (Ladaria Ferrer, 2020). These statements coming from religious authorities are the examples of promoting COVID-19 vaccination while neutralizing false conspiracy theories against the vaccination. Therefore, if the vaccine hesitancy is related to certain religious beliefs, working with religious scholars and leaders would be an effective strategy as they could serve as trusted messengers to their religious groups.

Religion and Previous Health Crises

Historically, religion has played a significant role in both threatening and improving public health during public health crises such as Ebola virus epidemic and the global HIV/AIDS epidemic (Blevins et al., 2019; Pargament et al., 2004; Pugh, 2010; VanderWeele, 2017). Before COVID-19, the Ebola virus disease was one of the most recent deadly epidemics that affected the West African region mainly in Guinea, Liberia, and Sierra Leone from December 2013 to June 2016. It caused 11,325 deaths with 40% of case fatality rate (Bell et al., 2016). Specifically, at the beginning of the epidemic, religious gatherings and practices that involved washing the body during burial practices accelerated the transmission of the Ebola virus, which is known to transmit through blood and bodily fluids. Furthermore, religious leaders refusing to adhere to public health guidelines imparted their understanding of the Ebola virus to their believers (Reichler et al., 2018). In response to this situation, the World Health Organization and several religious organizations such as the Catholic Agency for Overseas Development, Catholic Relief Services, and international faith-based organizations developed and disseminated a new protocol in November 2014 with the help of religious leaders, specifically with Muslim and Christian burial rituals and successfully controlled the epidemic by reducing cases in half (6,383 new cases in October 2014 whereas 3883 in November and 3060 in December) (Bell et al., 2016).

A similar impact of religion can be found with the HIV/AIDS epidemic. On the detrimental side, some religious groups have considered AIDS as a punishment for sins of homosexuality and/or adultery which, in turn, also made people with HIV/AIDS face great social stigma. On the beneficial side, religion has positively influenced psychological well-being including anxiety, depression, and quality of life among individuals who suffer from HIV/AIDS (Dalmida, Koenig, Holstad, & Thomas, 2015; Pargament et al., 2004; VanderWeele, 2017). Furthermore, religion has been a key provider for HIV prevention, education, care, and support services over the past three decades (Blevins et al., 2019; VanderWeele, 2017). For instance, in Sub-Saharan Africa, one of the largest HIV support providers are faith-based organizations (U.S. President's Emergency Plan for AIDS Relief, 2015). In addition, in the late 1980s, various religious groups such as the Episcopal Church and Catholic Church started to cooperate with public health authorities to provide HIV/AIDS care and raise awareness (VanderWeele, 2017). All in all, the examples of previous epidemics have indicated diverse influences of religion as a double-edged sword when it comes to public health crises.

Religion as a Social Determinant of Health and Intersectionality

Religion as a social determinant of health has been largely overlooked and understudied (Kawachi, 2020; Ransome, 2020). According to the Public Health Agency of Canada (PHAC), social determinants of health include income and social status; social support networks; education; employment/working conditions; social environments; physical environments; personal health practices and coping skills; healthy child development; gender; and culture (Public Health Agency of Canada, 2016).

Although religion is not mentioned as a social determinant of health in the PHAC report (2016), religion is encompassed in PHAC's conceptualization of social support networks presumably (Public Health Agency of Canada, 2016).

Our review demonstrated that religion plays a significant role in spreading as well as containing COVID-19, while potentially improving the health of religious population groups. This evidently indicates that religion is a definite social determinant of health and, thus, it is important to take religion into account when addressing public health issues. When social determinants of health including religion are addressed during public health crises such as COVID-19 pandemic, there are certain population groups that may need further attention, such as women, people of color, low-income families/individuals, or individuals at the intersection of these social identity variables (e.g., low-income, women of color). This is because when social determinants of health are interwoven with each other and jointly influence health, consequences can be more detrimental to their health.

The findings of our review indicated that culturally marginalized religious individuals experience religious stereotypes and stigma during COVID-19 which, in turn, influence their psychological health, thereby adding another layer of trauma to already overburdened individuals (Hashmi et al., 2020; Iqbal et al., 2020; Weinberger-Litman et al., 2020). For instance, such may be the case for some Muslim communities in North America, whose existence is at the nexus of racial and religious minorities. As evidently shown in our review, out of 10 studies that have provided epidemiological data on the outbreak and transmission of COVID-19, seven studies pertained to minoritized religious communities. Similar patterns were observed in the media where COVID-19 related outbreaks and transmission were more frequently reported in the minoritized faith communities globally (Jelowicki, 2020; Rahim, 2020; Wilson, 2020). Therefore, religion as a social determinant of health should be unquestionably but carefully addressed in the context of public health during COVID-19 pandemic.

Overall Summary

Religious groups have both accelerated and mitigated the spread of COVID-19 during the early stage of COVID-19 era. However, there are lessons to be learned from religious communities' endeavors to help people respond to and cope with COVID-19 and prevent further religious-related outbreaks and spread. Most importantly, as the pandemic has not yet been eradicated, reconciliation between the practice of religious gatherings and public health guidelines, and a collaborative and pragmatic approach among religious communities, science, and government are critical to combat the COVID-19 crisis (Hashmi et al., 2020; Hong & Handal, 2020).

This review summarized the literature addressing the varying roles of religion at the early stage of COVID-19 pandemic. Given that it only captures the roles of religion during the early stage of COVID-19 as the last search of literature was done in July 2020. A follow-up systematic review is warranted to further examine the roles of religion during the later stage of COVID-19. Furthermore, risk of bias for each article included in this review was not assessed given the emergency of the pandemic and to include all relevant literature available at the time of literature searches.

Conclusion

This review summarized the literature addressing the varying roles of religion at the early stage of the COVID-19 pandemic. However, it only captures the roles of religion during the early stage of COVID-19, as the last search of this literature was completed in July 2020 and it did not include, for example, the work of ’chaplains’ (e.g., ‘hospital chaplain’ or similar titles) who were undertaking duties on behalf of their religious organizations. A follow-up systematic review is warranted to further examine the roles of religion during the later stage of COVID-19. Furthermore, risk of bias for each article included in this review was not assessed given the emergency of the pandemic and to include all relevant literature immediately available at the time of literature searches. Understanding religion as a determinant of the transmission, mitigation, and/or adaptation of COVID-19 in the early stage is essential for collectively achieving success to end the pandemic. This review has provided information on religion and COVID-19 that can be used to develop pragmatic models and policies for future crises. As the pandemic has not yet been eradicated, there is an urgent need for further rigorous research on the role of religious communities during this time of COVID-19.

Studies on adaptation strategies that could be in place immediately are warranted to provide adequate and timely support for people when the COVID-19 pandemic is resolved as well as in preparation for future pandemics. Furthermore, as this review is focused on the roles of religious communities during the early stage of COVID-19, further research on how the roles have changed over time and how this alteration affected the transmission, mitigation, and/or adaptation of COVID-19 is needed.

Appendix 1: Key Terms and Search Strings Used in Database Searches

Database	Query
CINAHL	((MM "Coronavirus") OR (MM "COVID-19") OR " (((((((coronavirus or corona-virus) AND (wuhan or beijing or shanghai or Italy or South-Korea or korea or China or Chinese or 2019-nCoV or nCoV or COVID-19 or Covid19 or SARS-CoV* or SARSCov2 or ncov)) OR (pneumonia AND Wuhan) or "COVID-19" or "2019-nCoV" or "SARS-CoV" or SARSCOV2 or 2019-nCov or "2019 coronavirus" or "2019 corona virus" or covid19 or ncov OR "novel corona virus" or "new corona virus" or "nouveau corona virus" or "2019 corona virus" OR "novel coronavirus" or "new coronavirus" or "nouveau coronavirus" or "2019 coronavirus")) AND (relig* OR spriritual* OR cult OR "mass gathering*" OR christian* OR "religious practice*" OR "religious event*" OR ritual OR belief* OR supernatural OR myth OR "social determinant")" Limiters—Published Date: 20,200,601-; English Language; Peer Reviewed; Research Article; Human; Language: English Expanders—Apply related words; Apply equivalent subjects Search modes—Boolean/Phrase

Database	Query
PubMed	((((((((((((((((((((("coronavirus"[MeSH Terms] OR "coronavirus"[All Fields]) OR "coronaviruses"[All Fields]) OR "corona-virus"[All Fields]) AND ((((((((((((("Wuhan"[All Fields] OR (("beijing"[MeSH Terms] OR "beijing"[All Fields]) OR "beijing s"[All Fields])) OR ("shanghai"[All Fields] OR "shanghai s"[All Fields])) OR (("italy"[MeSH Terms] OR "italy"[All Fields]) OR "italy s"[All Fields])) OR (((("republic of korea"[MeSH Terms] OR ("republic"[All Fields] AND "korea"[All Fields])) OR "republic of korea"[All Fields]) OR ("south"[All Fields] AND "korea"[All Fields])) OR "south korea"[All Fields])) OR ((("korea"[MeSH Terms] OR "korea"[All Fields]) OR "korea s"[All Fields]) OR "koreas"[All Fields])) OR ((("china"[MeSH Terms] OR "china"[All Fields]) OR "china s"[All Fields]) OR "chinas"[All Fields])) OR (((("asian continental ancestry group"[MeSH Terms] OR ((("asian"[All Fields] AND "continental"[All Fields]) AND "ancestry"[All Fields]) AND "group"[All Fields])) OR "asian continental ancestry group"[All Fields]) OR "chinese"[All Fields]) OR "chineses"[All Fields])) OR (("severe acute respiratory syndrome coronavirus 2"[Supplementary Concept] OR "severe acute respiratory syndrome coronavirus 2"[All Fields]) OR "2019-nCoV"[All Fields])) OR "nCoV"[All Fields]) OR ((((((("COVID-19"[All Fields] OR "covid 2019"[All Fields]) OR "severe acute respiratory syndrome coronavirus 2"[Supplementary Concept]) OR "severe acute respiratory syndrome coronavirus 2"[All Fields]) OR "2019-nCoV"[All Fields]) OR "sars cov 2"[All Fields]) OR "2019ncov"[All Fields]) OR (("Wuhan"[All Fields] AND ("coronavirus"[MeSH Terms] OR "coronavirus"[All Fields])) AND (2019/12/1:2019/12/31[Date—Publication] OR 2020/1/1:2020/12/31[Date—Publication]))))) OR (("COVID-19"[Supplementary Concept] OR "COVID-19"[All Fields]) OR "covid19"[All Fields])) OR "sars cov*"[All Fields]) OR "sarscov2"[All Fields]) OR "nCoV"[All Fields])) OR ((((("pneumonia"[MeSH Terms] OR "pneumonia"[All Fields]) OR "pneumoniae"[All Fields]) OR "pneumonias"[All Fields]) OR "pneumoniae s"[All Fields]) AND "Wuhan"[All Fields])) OR "COVID-19"[All Fields]) OR "2019-nCoV"[All Fields]) OR "SARS-CoV"[All Fields]) OR "sarscov2"[All Fields]) OR (("severe acute respiratory syndrome coronavirus 2"[Supplementary Concept] OR "severe acute respiratory syndrome coronavirus 2"[All Fields]) OR "2019-nCoV"[All Fields])) OR "2019 coronavirus"[All Fields]) OR "2019 corona virus"[All Fields]) OR (("COVID-19"[Supplementary Concept] OR "COVID-19"[All Fields]) OR "covid19"[All Fields])) OR "nCoV"[All Fields]) OR "novel corona virus"[All Fields]) OR "new corona virus"[All Fields]) OR ("nouveau"[All Fields] AND (("corona"[All Fields] OR "coronae"[All Fields]) OR "coronas"[All Fields]) AND (((((("virology"[MeSH Subheading] OR "virology"[All Fields]) OR "viruses"[All Fields]) OR "viruses"[MeSH Terms]) OR "virus s"[All Fields]) OR "viruse"[All Fields]) OR "virus"[All Fields]))) OR "2019 corona virus"[All Fields]) OR "novel coronavirus"[All Fields]) OR "new coronavirus"[All Fields]) OR "nouveau coronavirus"[All Fields]) OR "2019 coronavirus"[All Fields]) AND ((((((((((("relig*"[All Fields] OR "spriritual*"[All Fields]) OR "cult"[All Fields]) OR "mass gathering*"[All Fields]) OR "christian*"[All Fields]) OR "religious practice*"[All Fields]) OR "religious event*"[All Fields]) OR ((((((((("ceremonial behavior"[MeSH Terms] OR ("ceremonial"[All Fields] AND "behavior"[All Fields])) OR "ceremonial behavior"[All Fields]) OR "ritual"[All Fields]) OR "rituals"[All Fields]) OR "ritualism"[All Fields]) OR "ritualization"[All Fields]) OR "ritualize"[All Fields]) OR "ritualized"[All Fields]) OR "ritualizing"[All Fields]) OR "ritually"[All Fields])) OR "belief*"[All Fields]) OR ("supernatural"[All Fields] OR "supernaturally"[All Fields])) OR "myth"[All Fields]) OR "social determinant"[All Fields])

Database	Query
PsycInfo	1. (coronavirus or covid or sars-cov* or sarscov2).mp. [mp = title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh] (215) 2. limit 1 to (human and english language and yr = "2019 -Current") (59) 3. (relig* or spriritual* or cult or "mass gathering*" or christian* or "religious practice*" or "religious event*" or ritual or belief* or supernatural or myth or "social determinant").mp. [mp = title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh] (227,354) 4. limit 3 to (human and english language and yr = "2019 -Current") (6798) 5. 2 and 4 (5)
Web of Science	TOPIC: (((((((((((((((((((coronavirus OR corona-virus) AND ((((((((((((wuhan OR beijing) OR shanghai) OR Italy) OR South-Korea) OR korea) OR China) OR Chinese) OR 2019-nCoV) OR nCoV) OR COVID-19) OR Covid19) OR SARS-CoV*) OR SARSCov2) OR ncov)) OR (pneumonia AND Wuhan)) OR "COVID-19") OR "2019-nCoV") OR "SARS-CoV") OR SARSCOV2) OR 2019-nCov) OR "2019 coronavirus") OR "2019 corona virus") OR coviden) OR ncov) OR "novel corona virus") OR "new corona virus") OR "nouveau corona virus") OR "2019 corona virus") OR "novel coronavirus") OR "new coronavirus") OR "nouveau coronavirus") OR "2019 coronavirus") AND ((((((((((relig* OR spriritual*) OR cult) OR "mass gathering*") OR christian*) OR ramadan) OR "religious practice*") OR "religious event*") OR ritual) OR belief*) OR supernatural) OR myth) OR faith "social determinant")) Timespan: All years. Indexes: SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI
Similar search strings were used in LitCOVID, bioRXiv, and ATLA Religion databases	

Appendix 2: Descriptive Characteristics and Epidemiological Data of the Included Articles (N = 58)

Author and publication year	Study type	Country (geographical location)	Religious groups of interest	Epidemiological statistics reported (yes/no; if yes: incidence, outbreak, number infected, R0, etc.)
Agley (2020)	Cross-sectional study	US	N/A	N/A
Ahmed and Memish (2020)	Policy recommendation	International	• Islam	N/A

Author and publication year	Study type	Country (geographical location)	Religious groups of interest	Epidemiological statistics reported (yes/no; if yes: incidence, outbreak, number infected, R0, etc.)
Al-Rousan and Al-Najjar (2020)	Retrospective analytic epidemiology	Middle East	• Islam	"Six Jewish pilgrims were positively tested and confirmed by the beginning of March; therefore, 1,400 Italian and 200 Israeli visitors were quarantined. By March 15, 193 cases were confirmed in "Israel." It was reported that most of these cases may have been infected during the Jewish pilgrimages and other religious rituals." (p. 5815) "Approximately 68.5% of the confirmed CoVID-19 cases in the Middle East had visited Qom, whereas the rest of the confirmed cases visited other Shi'ite holy places, participated in Jewish pilgrimages, travelled as tourists, or flew in from Wuhan." (p. 5817)
Ali and Alharbi (2020)	Unsure	International	• Islam	N/A
Alzoubi et al. (2020)	Cross-sectional study	Jordan	N/A	N/A
Atique and Itumalla (2020)	Letter to the Editor	International	• Islam	"The first case of COVID-19 detected in a Saudi national who traveled from Iran to the Kingdom via Bahrain. Since then, COVID-19 cases have been increasing continuously and reached to 2795 cases as of 7 April 2020 [2]" (p. 2)
Capponi (2020)	Special Section article	Brazil	• Neo-Pentecostal Churches • Afro-Brazilian Candomblé • Umbanda	N/A

Author and publication year	Study type	Country (geographical location)	Religious groups of interest	Epidemiological statistics reported (yes/no; if yes: incidence, outbreak, number infected, R0, etc.)
Chirico and Nucera (2020)	Letter to the Editor	Italy	• Catholicism	"An emergency national law banned civil and religious ceremonies, including funerals, to prevent the spread of the virus (Larnaud 2020). However, officials have allowed priests to say a prayer at burials attended by just a few of the bereaved (Larnaud 2020). Unfortunately, an estimated 60 priests in Italy have died to date for the Coronavirus pandemic (Mares 2020), and 16 of them were just resident in the hard-hit Bergamo Diocese, which reported many more hospitalized priests (Cairns 2020)." (p. 2)

Author and publication year	Study type	Country (geographical location)	Religious groups of interest	Epidemiological statistics reported (yes/no; if yes: incidence, outbreak, number infected, R0, etc.)
Choi et al. (2020)	Case study	South Korea	• Shincheonji Church of Jesus (New Religious Movement) • Christianity	"On 18 February 2020, a "super-spreader" [5], attended a gathering of a religious sect called the Shincheonji. This 61-year-old woman, known as "Patient 31," was found to have transmitted SARS-CoV-2 to an unusually large number of people who attended religious events in the Shincheonji temple in the southeastern city of Daegu, home to 2.5 million people Approximately three-quarters of the total number of SARS-CoV-2 cases ended up being clustered in Daegu, and, as of March 2020, about 60% of the total infections nationwide were traced to this religious group. Daily infections rose exponentially, nearing 1000." (p. 3) "In March 2020, other clusters were reported outside of worst-hit Daegu. At River of Grace Community Church in Gyeonggi Province, more than 80 people tested positive." (p. 3)
Chukwuorji and Iorfa (2020)	Commentary	Nigeria	• Christianity • Islam	N/A
Crubézy and Telmon (2020)	Letter	France	• Judaism • Islam	N/A
Ebrahim and Memish (2020a)	Rapid communication	Saudi Arabia	• Islam	N/A
Ebrahim and Memish (2020b)	Commentary	International	• Islam • Catholicism	N/A

Author and publication year	Study type	Country (geographical location)	Religious groups of interest	Epidemiological statistics reported (yes/no; if yes: incidence, outbreak, number infected, R0, etc.)
Escher (2020)	Editorial	International	• Islam • Catholicism • Hinduism	N/A
Freeman et al. (2020)	Cross-sectional study	UK	N/A	N/A
Frei-Landau (2020)	Commentary	Israel	• Judaism	N/A
Galiatsatos et al. (2020)	Community trial	US	N/A	N/A
Gautret et al. (2020)	Letter to the Editor	International	• Islam	N/A
Greene et al. (2020)	Commentary	Not specified (written in UK)	N/A	N/A
Ha (2020)	Short Communication	South Korea	• Shincheonji Church of Jesus (New Religious Movement)	N/A
Hashmi et al. (2020)	Impressionistic Reporting	International	• Islam • Maronite	N/A
Hill et al. (2020)	Cross-sectional study	US	• Christianity	N/A
Hong and Handal (2020)	Psychological Exploration	US	• Christianity • Judaism	N/A
Iqbal et al. (2020)	Letter	International	• Islam • Maronite	N/A
JaJa et al. (2020)	Letter	South Africa	• Christianity	"In the Free state province, three church leaders have since tested positive after leading the church prayer service. Other church leaders and lay preachers who attend the prayer meeting have also tested positive. To date, over 80% of the Free State COVID emanated from this single religious event leading to the infection of over 80 persons and the further tracing of 1600 people who may have been exposed to the virus. [15]" (p. 1078)

Author and publication year	Study type	Country (geographical location)	Religious groups of interest	Epidemiological statistics reported (yes/no; if yes: incidence, outbreak, number infected, R0, etc.)
Kang (2020)	Perspective	South Korea	• Shincheonji Church of Jesus (New Religious Movement)	"On March 9, 2020, the cumulative number of confirmed cases reached 7382, with 51 deaths in South Korea. The Korean government, based on the church member registry of 244 743 believers it acquired from the Shincheonji authorities, analyzed connections among the church members and found 4212 confirmed COVID-19 cases by March 2, 2020. According to the analysis, 93% of the confirmed cases were related to the Shincheonji Church. [5]". (p. 169)
Kim et al. (2020)	Brief Report	South Korea	• Shincheonji Church of Jesus (New Religious Movement)	As of March 3, 2020, 2992 of 5621 cases were related to the Shincheonji religious group The authors "obtained data of laboratory-confirmed cases related to the Shincheonji religious group from press releases by Korean public health authorities and news reports. […] and analyzed data from 59 cases (median age, 30 years)." (p. 164) "The average period between the date of illness onset and the date of COVID-19 confirmation was 5.2 days, with a median of 4 days (range, 0–13)." (p. 165)

Author and publication year	Study type	Country (geographical location)	Religious groups of interest	Epidemiological statistics reported (yes/no; if yes: incidence, outbreak, number infected, R0, etc.)
Koenig (2020a)	Commentary	International	• Christianity • Judaism • Islam • Buddhism • Hinduism	N/A
Koenig (2020b)	Original Paper	International	• Christianity • Islam • Judaism • Buddhism • Hinduism	N/A
Lan et al. (2020)	Observational study	Hong Kong Japan Singapore Taiwan Thailand Vietnam	N/A	Religious professionals were one of the most common occupations during both early (3 out of 31) and late (3 out of 72) transmission (n = 6 out of 103) ($p = 0.362$)
Lee (2020)	Cross-sectional study	US	N/A	No
Lee (2020)	Cross-sectional study	US	N/A	No
Levin (2020)	Original Paper	US	• Evangelicalism and conservative Christianity • Judaism • Shia Islam • Buddhism • Catholicism	No
Lorea (2020)	Special Section Article	International (article written in Singapore)	• Islam • Catholicism • Hinduism • Greek Orthodox	No

Author and publication year	Study type	Country (geographical location)	Religious groups of interest	Epidemiological statistics reported (yes/no; if yes: incidence, outbreak, number infected, R0, etc.)
Mat et al. (2020)	Rapid communication	Malaysia with further international spread	• Islam	As of April 13, 2020, Malaysia had 4817 confirmed cases and 77 deaths due to COVID-19 "More than 35% of the COVID-19 cases in Malaysia were directly linked to the Sri Petaling mass gatherings that took place between February 27, 2020 and March 1, 2020. The Sri Petaling gathering is a Moslem missionary movement attended by more than 19 000 people, including 1500 from India, South Korea, Brunei, China, Japan, Vietnam, Philippines, Myanmar, Cambodia, Singapore, and Thailand." (p. 1)
McCloskey et al. (2020a)	Commentary	International (exemplified Umrah in Saudi Arabia)	• Islam	No
McCloskey et al. (2020b)	Correspondence	International (exemplified Hajj in Saudi Arabia)	• Islam	No
McLaughlin (2020)	Preliminary Report	Japan	• Buddhism • Shinto • New religions	No
Memish et al. (2020)	Correspondence	International	• Islam	No
Modell and Kardia (2020)	Philosophical Exploration	US (Detroit)	• Greek Orthodox • Judaism • Christianity	No
Muurlink and Taylor-Robinson (2020)	Opinion	International	• Islam • Traditionalist Christian Church • Ultra-Orthodox Judaism	No
Nahandi et al. (2020)	Commentary	Iran	• Islam	No
Peteet (2020)	Impressionistic Reporting	International	• Judaism	No
Prime et al. (2020)	Review	International	N/A	No

Author and publication year	Study type	Country (geographical location)	Religious groups of interest	Epidemiological statistics reported (yes/no; if yes: incidence, outbreak, number infected, R0, etc.)
Quadri (2020)	Perspective	International	• Islam • Shincheonji Church (New Religious Movement) • Hinduism	No
Safdar and Yasmin (2020)	Qualitative (semi-structured individual interview) study	Pakistan	• Islam	No
Shah et al. (2020)	Commentary	US	N/A	No
Tarimo and Wu (2020)	Letter to the editor	Tanzania	N/A	No
Thompkins et al. (2020)	Commentary	US	• Christianity	No
Tootee and Larijani (2020)	Editorial	International	• Islam	No
Umucu and Lee (2020)	Cross-sectional study	US	N/A	No
Waitzberg et al. (2020)	Commentary	Israel	• Ultra-Orthodox Judaism • Islam	No
Waqar and Ghour (2020)	Commentary	International	• Islam	No
Weinberger-Litman et al. (2020)	Cross-sectional study	US	• Modern Orthodox Jewish	No
Wildman et al. (2020)	Editorial	International	• Shincheonji Church (New Religious Movement) • Christianity	No
Wong et al. (2020)	Letter to the editor	International	• Islam	No
Yezli and Khan (2020a)	Perspective	International	• Various religious events (not specified) provided with countries	No

Author and publication year	Study type	Country (geographical location)	Religious groups of interest	Epidemiological statistics reported (yes/no; if yes: incidence, outbreak, number infected, R0, etc.)
Yezli and Khan (2020b)	Commentary	The Kingdom of Saudi Arabia	• Islam	"On the 2nd of March 2020, the first case of COVID-19 was reported by the Saudi authorities. The case was an exported case in a Saudi national returning from Iran via Bahrain." […] Up to the 9th of March 2020, only imported cases were reported in KSA (Kingdom of Saudi Arabia). On the 10th of March 2020, with a total of 20 COVID-19 cases and five new confirmed cases, local transmission was documented in the country." (p. 2)

N/A: Not available

Appendix 3: Summary of Findings of the Included Articles (N = 58)

Author and publication year	Key interest	Reported role of religion in COVID-19	Summary of the findings
Agley (2020)	Religious commitment	Mistrust	• "High religious commitment was associated with significantly less overall trust in science" (p. 122)
Ahmed and Memish (2020)	Banning of religious events (Hajj 2020 and Umrah)	Mitigation	• In July 2020, the Hajj was planned to receive pilgrims to Mecca, Kingdom of Saudi Arabia (KSA) from all over the world. The authors recommend Hajj to be cancelled; "KSA in canceling Hajj 2020 well in advance of the events would be very much in line with Islamic ideals and would contribute greatly to the safety of humanity" (p. 2)

Author and publication year	Key interest	Reported role of religion in COVID-19	Summary of the findings
Al-Rousan and Al-Najjar (2020)	Sunnis and Shi 'ites, Jewish pilgrimage to Israel	Spread, Mistrust/ Misinformation and Mitigation	• "Several cases visited Qom for spiritual treatment and recovery from coronavirus infection. This is because Shi 'ites believe that visiting shrines and performing religious rites help in healing coronavirus infection and prevent further transmission[23]." (p. 5816) • "Jewish pilgrims may have spread CoVID-19 to Israel via religious rituals as well. Jewish pilgrims who visited Italy or came from Italy had infected several individuals in Palestine" (p. 5817) • "Thus, we infer that visiting Qom and other Shi'ite sites, Jewish pilgrimages and open tourism are the three major factors that have facilitated the spread of CoVID-19 in the Middle East, whereas visiting Qom and other shrines in Iran is the main transmission route for CoVID-19 in the Gulf countries." (p. 5817)
Ali and Alharbi (2020)	Banning of religious events (Hajj 2020 and Umrah)	Mitigation	• "The Kingdom of Saudi Arabia has provisionally banned Umrah (pilgrimage) for the pilgrims to Mecca and Medina (the two holiest cities of the Islam religion)" (p. 5)
Alzoubi et al. (2020)	Religious belief	Mistrust/misinformation	• "Around 10% of students believed that their religious beliefs and body immunity might protect them from infection." […] "The main sources of knowledge were social media, Internet, and television." (p. 17)
Atique and Itumalla (2020)	Banning of religious events (Hajj 2020 and Umrah)	Spread and Mitigation	• "It is important to recognize that COVID-19 has infected the people who had a travel history and it may lead to local as well as global transmissions in the countries from where the people are coming to perform the religious rituals and vice versa" (p. 2) • "It is highly likely that the religious mass gatherings in terms of Umrah and Hajj may turn into potential superspreader of the pandemic [7] […]". (p. 2)

Author and publication year	Key interest	Reported role of religion in COVID-19	Summary of the findings
Capponi (2020)	Religious and scientific conflicts, Discrepancy in leadership among religions	Mistrust/Misinformation	• The author described different ways of elaborating beliefs and behaviors during COVID-19 between Neo-Pentecostal Churches (which endorsed the current president, Bolsonaro) and religious minorities like Afro-Brazilian Candomblé and Umbanda • "Afro-religious authorities gave practical information about sanitary prevention and social distancing, and some announced the temporary suspension of all public ritual activities. In addition, they suggested hygienic measure like avoiding kissing each other's hands (a common form for greeting and asking one's blessing)." (p. 1) • "Neo-Pentecostal churches proposed a very different narrative. […] not to fear the virus, as God would protect those who have faith." (p. 1) • "Neo-Pentecostal churches always displayed a privileged and sophisticated use of digital media (social networks, TV channels, live streaming sessions, etc.), they are now stressing the importance of in-presence attendance of services." […] "Conversely, Afro-religious practitioners, who value bodily engagement and physical presence more than abstract spiritual commitment, have been long reluctant to occupy online spaces and to post content online, […] The COVID-19 crisis allowed them to occupy online spaces they had avoided in the past." (p. 2)
Chirico and Nucera (2020)	Spiritual skills for healthcare workers	Adaptation	• "[…] spirituality has been already recognized as an essential part in certain medical fields like the palliative care (Pink et al. 2007)" (p. 2) • The authors argued that "spiritual skills for healthcare workers are even more important in a disaster scenario like this COVID 19 pandemic, to relieve stress and psychic sufferance of the same healthcare professionals as well as of patients and their families." (p. 2) • "For this reason, spiritual skills should be recognized as "core" skills for healthcare professionals and be implemented in all medical curricula." (p. 2)

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Choi et al. (2020)	Religious sect and gatherings	Outbreak and Spread	• "The Shincheonji super-spreader developed a fever on 10 February 2020 but attended four Shincheonji events before being diagnosed with SARS-CoV-2. Public health authorities determined that this huge transmission was due to the behavioral characteristics of the religious group: members sit side-by-side in a cramped space for a significant amount of time during their temple service. This reinforced awareness of the need for social distancing, and the importance of following SARS-CoV-2 guidelines to avoid such places." (p. 3) • "Due to the reclusive and secretive nature of the religious sect, uncertainty in tracking escalated the outbreak. Group members, including "Patient 31," tried to refuse diagnostic testing, thereby spreading the virus. While public health authorities have not found the precise epidemiological link between Patient 31 and her source of infection, further investigation by the Center for Disease Control showed that group members traveled between South Korea and their Wuhan, China fringe branches in January 2020." (p. 3) • "In March 2020, other clusters were reported outside of worst-hit Daegu. At River of Grace Community Church in Gyeonggi Province, more than 80 people tested positive. These cases drew international attention, as security camera footage showed church leaders spraying saltwater into followers' mouths, as they believed that this practice would protect them from SARS-CoV-2." (p. 3) • "Even in South Korean society, where in modern history citizens often had to cede control over their private information to government authorities, this aggressive system of contact tracing sparked fears and dissent, particularly among minorities, such as religious sects, foreigners, and LGBT people. These text messages, indicating precise knowledge of one's whereabouts at a specific day and time, were understandably ill-received, as was the knowledge of credit card monitoring." (p. 9)

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Chukwuorji and Iorfa (2020)	Religious belief	Misinformation	• "According to the chairman of the Nigerian Medical Association, many religious leaders in the predominantly Muslim northern part of Nigeria did not also believe in coronavirus spread (see https://www.youtube.com/watch?vKB7jww54OOs)." (p. 189) • "Nigeria is a country where church and mosque gatherings are a consistent part of everyday life, and some religious leaders preach that believers in these faiths are "immune" to the contagious disease (Lichtenstein, Ajayi, & Egbunike, 2020)." (p.189) • "Regarding personal measures, fear-induced behavioral changes such as heat therapy and consuming lemon, ginger, garlic, local herbs, and other substances for protection are becoming commonplace as reported by people in the social media." (p.189)
Crubézy and Telmon (2020)	Funerary rituals	Mitigation	• The authors made recommendations for funerary rituals during the pandemic to limit contagion while allowing families to grieve and preserving the dignity of the deceased such as minimal body washing (body wetting without manual scrubbing) • The authors added that "Jewish religion the "tahara", the rite of purification of the body of the deceased, must be prohibited; no embalming; for Muslim religion, the Tayammum (dry toilet by placing both hands on a stone or earth) may be sufficient." (p. 22)

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Ebrahim and Memish (2020a)	Banning of religious events (Hajj 2020 and Umrah)	Mitigation	• "Hajj pilgrims are exposed to didactic health education sessions as part of their preparedness package, but Umrah pilgrims do not received any." (p. 1) • "Because the Umrah crowd size in ritual sites are smaller than that during Hajj, more elderly and disabled persons would be seen during Umrah." (p. 1) • The authors recommended Umrah to be cancelled • The authors highlighted that "KSA's decision to suspend Umrah pilgrimage services comes with a huge cost to the economy of KSA including the airline, transport and hospitality sector, and adversely affects the employment and livelihood of the native and immigrant workforce of holy cities of KSA. […] "Above all, pilgrimage is lifetime dream of people of Muslim faith, and many save up money for their entire lives to achieve their eternal dream. Many even express preference to die at the holy sites and consider it as a blessing. Therefore, the emotional and mental challenges experienced by would-be pilgrims who are affected by the suspension are unquantifiable." (p. 1–2)
Ebrahim and Memish (2020b)	Banning of religious events (Hajj 2020 and Umrah)	Mitigation	• "Mass gatherings, both those are clearly defined and spontaneously occurring, are key determinants of epidemiologic expansion of disease outbreaks." (p. 3) • The authors argued "Cancellation of suspension of mass gatherings would be critical to pandemic mitigation" based on the past experiences with respiratory diseases (p. 2). Religion-related mass gatherings include Hajj, Arbaʿeen, Namugongo Martyrs Day and Qom Shia pilgrimage

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Escher (2020)	Banning of religious events (Hajj, Lourdes and Kumbh Mela)	Mitigation	• "The WHO defines a mass gathering as a "concentration of people at a specific location for a specific purpose over a set period of time which has the potential to strain the planning and response resources of the country or community."" (p. 2) • "Religious pilgrimages such as the Hajj in Islam and Lourdes in Catholicism draw millions of pilgrims every year. The triennial Kumbh Mela, the Hindu religious pilgrimage festival, can draw up to 120 million people over two months. The health and safety of vulnerable populations in such events are quiet challenging." (p. 2) • "Recent consequences of this standard have resulted in the cancellation of mass gatherings in Lourdes and the closure by Saudi Arabia of pilgrims to Umrah." (p. 2)
Freeman et al. (2020)	Religiosity and conspiracy beliefs	Mistrust/Misinformation	• "Holding specific or general coronavirus conspiracy beliefs was associated with higher levels of religiosity […]" (p. 12) • "Conspiracy beliefs are likely to be both indexes and drivers of societal corrosion. They matter in this context because they may well have reduced compliance with government social distancing guidelines, thereby contributing to the spread of the disease." (p. 12) • "We believe it is more likely that conspiracy beliefs drive behaviour or at the very least remove barriers to carrying out unhelpful behaviours." (p. 13)

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Frei-Landau (2020)	Religious ways of coping	Mitigation and Adaptation	• "In Israel, a quarantine policy was first announced on March 9, 2020; then, using emergency legislation, it was gradually made more restrictive, forbidding the gathering of more than two people, with the exception of funerals and circumcision ceremonies. Consequently, all synagogues were forced to close, and all religious interactions in the public sphere had to cease, including prayer rituals. This change had the potential to threaten religious Jews' sense of belonging and well-being." (p. 258) • "Jewish precepts require believers to pray three times a day within a minyan – a group of at least 10 men and women; consequently, Jewish individuals gather frequently in the synagogues, where they meet the same community members." (p. 258) • "In Israel, Jewish religious leaders established three novel adaptations to customary rituals performed in both the public and private arenas: 1) A "balcony" *minyan*; 2) Online *chavruta* video conferencing; and 3) broadcasting the Passover ceremony." (p. 259) • The authors suggested that the adaptations that Jewish religious leaders made to long-standing rulings to address the issues of belonging and resilience during the pandemic
Galiatsatos et al. (2020)	Developing medical-religious partnerships	Adaptation	• The authors initiated a community conference call series, twice a week, for 60 min. "The breakdown of the call's timeline generally included a 5-min introduction, 15 min of COVID-19 updates, 15–20 min on a specific COVID-19 health issues, 10 min of questions from callers, and a closing mediation for the final 5 min. On Friday calls, we invited community leaders to share their thoughts on their community needs and successes (5–10 min)." […] "Meditations were meant to be inclusive of all faith traditions and non-sectarian in their focus." (p. 2258) • "The community calls have identified the need for a significant role moving forward: assisting religious leaders in understanding how to assure the public safety of congregants as quarantine measures begin to be scaled back." (p. 2261)

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Gautret et al. (2020)	Banning of religious events (Hajj 2020 and Umrah)	Mitigation	• "If travel restrictions are successful in avoiding the extension of the outbreak to the Kingdom of Saudi Arabia in the following months, authorities may have to restrict temporarily the entry of pilgrims from affected countries into KSA as was done during the Evola outbreak 2016 [6]." (p. 1)
Greene et al (2020)	Religious leaders of faith-based communities	Adaptation	• "One area that has not yet been addressed in the academic literature, but may be particularly relevant in the COVID-19 pandemic, is that of moral injury in religious leaders. Moral injury has been defined as the psychological distress caused by actions, or their omission, that violate an individual's moral cold (Litz et al., 2009)." (p. 1) • The authors suggested recommendations regarding psychological stressors for religious leaders and ways to cope with moral injury, burnout, and secondary trauma due to the COVID-19 pandemic: "(1) self-care; (2) spirituality; (3) acknowledge moral conflicts; (3) purpose; (4) supervision and peer support; (5) social support; and (6) professional support." (p. 2)
Ha (2020)	Religious gatherings	Mitigation	• "A fringe religious cult, the Shincheonji Church of Jesus (or the Temple of the Tabernacle of the Testimony), has turned into a super spreader by allowing close proximity among believers in its study room or during prayer sessions." (p. 1) • The author argued that "religious organizations should maintain bipartisanship with science by prohibiting close proximity among believers." (p. 2)

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Hashmi et al. (2020)	Religious Cliché and Stigma, Institutional collaboration between religion and healthcare professionals	Adaptation	• "For decades, religion has provided explanations and answers to existential questions and queries that can emerge during a pandemic. This characteristic of religion has helped communities in finding answers and meanings to their confusions." (p. 1) • The authors argued that "healthcare professionals are often unprepared in answering the patients' religious beliefs regarding the diseases" and "patients are faced with religious clichés and stigma that results because of religious beliefs and practices." (p. 1) • "As community members listen to their religious leaders, healthcare organizations should take religious leaders on board while handling and managing the COVID-19." (p. 3). In this context, the authors proposed "a collaborative model between religious communities and healthcare providers/policymakers to manage the COVID-19." (p. 2)
Hill et al. (2020)	State religiosity and population mobility	Mistrust/Misinformation and Spread	• The author argued that "religious populations and communities may be especially likely to acquire and spread the coronavirus" based on recent media sources on religion and COVID-19 (p. 2230) • The author argued that "Our central argument is that more religious populations may be especially resistant to public health recommendations during the coronavirus pandemic (e.g., social distancing and staying at home) because they hold more negative views of science and scientists and strong religious beliefs concerning the pandemic itself." (p. 2230) • The study found that in the early weeks of the pandemic, more religious states tend to exhibit higher average mobility scores, slower average declines in mobility and religious states were more resistant to stay-at-home orders. Hence, these findings "seem to confirm the suspicion that religious populations and communities may be especially likely to acquire and spread the coronavirus." (p. 2240) • The author stressed that "we need to begin to think about ways of overcoming religious cultural barriers to critical pandemic responses. Potential strategies or interventions must systematically address obstacles related to the mistrust of science, religious authority, and religious liberty." (p. 2240)

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Hong and Handal (2020)	Institutional collaboration between Religion, science, and government	Mitigation and Adaptation	• "Religion, science, and government have been institutions throughout the ages that have helped us deal with fears and threats like SARS-CoV-2. However, reliance on any one of these institutions exclusively has limitations and therefore are sources of disappointments." (p. 3) • "From a broader perspective, even compliance with sheltering at home and social distancing can be seen as a religious response to the pandemic by not endangering others. For Christians, the principle of being your "brother's keeper" and for Jews, the message of Tikkun Olam (Cooper 2013) requires them to do acts of kindness "to heal a broken world." These statues are an embracement of religious values and devotion that support government requests during this pandemic." (p. 4) • The author highlighted that "Science, religion, and government each provide ways to cope with this worldwide pandemic, but they can exercise a much greater impact if they operate in unison for the common good and well-being of all." (p. 5)
Iqbal et al. (2020)	Religious cliché	Mitigation	• "The prevailing belief of life and death being controlled by the Almighty[4] is also becoming a religious stigma in adopting precautionary measures." (p. 278) • "Some Islamic faith believers did not follow the recommended precautions against COVID-19.[2] On being questioned, it has been quoted that, '*Allah is sufficient for us; and what an excellent guardian He is*.'[3] "(p. 278) • "Combining and consuming water and sacred soil found at the grave of Maronite monk Mar Charbel (Mount Lebanon) is also practised against COVID-19." (p. 278) • The author argued that engaging religious leaders is important to solve such religious cliché in the face of pandemic and this will help to overcome barriers for physicians in the optimal management of COVID-19
Jaja et al. (2020)	Religious gatherings	Spread	• "To date, over 80% of the Free State COVID emanated from this single religious event leading to the infection of over 80 persons and the further tracing of 1600 people who may have been exposed to the virus." (p. 1078) • The authors argued that "religious and cultural activities of any form must be restricted at this time." (p. 1078)

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Kang (2020)	Religious gatherings	Spread	• The Korean government, based on the church member registry of 244 743 believers it acquired from the Shincheonji authorities, analyzed connections among the church members and found 4212 confirmed COVID-19 cases by March 2, 2020. According to the analysis, 93% of the confirmed cases were related to the Shincheonji Church. [5]". (p. 169) • "Although religious services conducted in crowded spaces like churches and temples are vulnerable to infections, no specific prevention guides have been issued by the government." (p. 169) • "The temporary conclusion of this study based on limited epidemiological data and the currently available information on confirmed cases is that group meetings and religious services lead to massive infections of COVID-19. When a new infectious disease is spreading, the government should sharply curtail group gatherings and religious events." (p. 170)

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Kim et al. (2020)	Delay in confirming COVID-19 cases related to religious group	Spread and mitigation	• "In the secretive Shincheonji religious group, it is believed that the group's founder and leader can interpret the secret metaphors in the Holy Bible [6]. The members of the group believe that their spirit and bodies are immortal [7]. This belief may have led to their behaviour of not approaching public health authorities when they had COVID-19-related symptoms (e.g., fever or cough) and to their uncooperative attitude towards epidemiological investigations [8]. This is likely to have contributed to the delayed confirmation of cases, despite the massive nationwide public health campaign regarding COVID-19 that was implemented in early February 2020. […] Therefore, this delay may have resulted in the broad spread of COVID-19 related to the Shincheonji religious group." (p. 166) • "In response to the surge of cases of COVID-19 related to the Shincheonji religious group, the Korean National Assembly approved the Corona Three Act on February 26, 2020 [14]. This act encoded revisions of the Korean laws on infection prevention, quarantine, and medicine; specifically, the regulations regarding cases of infectious diseases were revised to mandate testing and quarantining of individuals suspected of having COVID-19 by national law. The enactment of the Corona Three Act was a significant event in Korea in that it was the first pan-governmental measure to prevent the spread of infectious diseases." (p. 166)
Koenig (2020b)	Protecting religious older adults	Adaptation	• The author made seven recommendations to help older adults to protect themselves and cope with difficulties during the COVID-19 pandemic: "(1) spend time developing a deeper religious faith; (2) stay physically healthy (e.g., to care for the "temple of Holy Spirit" follow by the Christian tradition); (3) care for your neighbour emphasized by Jesus, Moses, the Prophet Mohammad, the Buddha, Hindu sages, and other greater religious figures); (4) care for neighbour by meeting emotional needs; (5) care for neighbour by meeting physical needs; (6) follow by social distancing guidelines; and (7) taking advantage of technology (e.g., social and spiritual hugs and handshakes)" (p. 1–3)

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Koenig (2020a)	Developing spiritual resilience	Adaptation	• The author made six recommendations "for those who want to remain healthy and resilient–mentally, physically and spiritually–during this anxious time of the coronavirus pandemic: (1) Deepen Your Religious Faith; (2) Love Thy Neighbor as Thyself; (3) Use Technology; (4) Love and Care for Neighbor in Practical Ways; (5) Don't Be Reckless; (6) Pay Attention to Physical Health." (p. 2–7)
Lan et al. (2020)	Religious professionals as contributors to local transmission	Spread	• The study identified "the occupations at higher risk of COVID-19 transmission" and demonstrated that religious professionals were one of the "most common occupations in both early and late transmission periods." (p. 5)
Lee (2020)	Negative religious coping	Maladaptive coping	• The study explored the association between COVID-19 related anxiety and negative religious coping which was measured by the item, "After thinking about the coronavirus, I wonder if God was angry with or had abandoned some people" • The author found out that Coronavirus Anxiety Scale scores were strongly and positively associated with negative religious coping ($p < 0.001$)
Lee et al. (2020)	Negative religious coping	Maladaptive coping	• The study re-evaluated the Coronavirus Anxiety Scale and supported "these expectations with Coronavirus Anxiety Scale score being positively correlated with […] negative religious coping. ($p < 0.001$)" (p. 6)
Levin (2020)	Institutional collaboration between religion, health care	Adaptation	• The author asked religious institutions to be cooperative to the national health care – "Religion, in general, and religious institutions, more specifically, can contribute to the national health care response effort and is doing so, although perhaps invisibly to much of the public." (p. 8) • The author posed a question, "When the postmortems are written, will this outbreak be viewed as a case study in religious hatred, persecution, violence, and general stupidity, or as an exemplar of faith-based cooperation and communal solidarity?" (Levin, 2020)." (p. 10)

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Lorea (2020)	Return of religion and spirituality	Mistrust	• The author emphasized the importance of religion and spirituality during COVID-19.—"I portray this concocted mosaic of religious responses and ritual innovations at the time of COVID-19 pandemic in order to draw attention to the return of religion and spirituality in otherwise secularist spheres dominated by institutionally sanctioned biomedical worldview. Those who believed in the devolutionary theory by which education and technology will make religiosity disappear, as if they belonged to two fundamentally opposite categories of reality, are resorting to predictions and divinations that do not emerge from quantitative data and empirical lab-based rationalities. It is of fundamental importance in such an extraordinary time for social scientists to step aside from their niches of specialisation and take a post-secular view to look at the bigger picture of a dramatically changing world – a world of fragile certainties and desperate calls for comforting predictions." (p. 2)
Mat et al. (2020)	Religious gathering	Spread	• "The lag time between the Sri Petaling gathering and movement restrictions and social distancing allowed further spread of COVID-19." (p. 1) • "As the attendees of Sri Petaling gathering had returned to their respective hometowns in other parts of Malaysia, attended their local mosques for mass prayer and participated in various other cultural ceremonies, second generations of COVID-19 cases started to sprout linked to the Sri Petaling gathering." (p. 2)
McCloskey et al., (2020a)	Mass gatherings	Mitigation	• The authors described that "despite the development of the COVID-19 Risk Assessment for MGs (mass gathering) tool, events continue to be cancelled without this risk assessment being done and without clear communication of justification in terms of the expected impact on the spread of COVID-19. These cancellations have social and economic impact on public morale, on national economics and on individual livelihoods." (p. 1098) • The authors recommended "to consider the effects of MG cancellations on the future wellbeing of communities through economic recession or job losses, as well as through the spread, or otherwise, of COVID-19." (p. 1098)

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McCloskey et al., (2020b)	Mass gatherings	Mitigation	• The authors emphasized that their main argument in McCloskey et al., 2020b: "all mass gatherings to be considered in context, including the prevailing advice on physical distancing and movement restrictions." (p. 1256) • The authors argued that "we must look to the future. Whatever the course of the COVID-19 pandemic, countries, individually and collectively, will reach a point when they want to start removing restrictions and rebuild communities and economies. This will include decisions on re-starting mass gatherings. These decisions will need to be carefully reviewed and phased to ensure that the COVID-19 pandemic is not reignited; here, we advocate our risk-based approach as a sensible and rational way forward to consider those decisions." (p. 1256)
McLaughlin (2020)	Religious reactions to COVID-19	Report on how various religions reacted to COVID-19	• The author provided "an overview of early-stage reactions by individuals and organizations affiliated with Buddhism, Shinto, New Religions, and other religious traditions in Japan." (p. 1)
Memish et al. (2020)	Mass gatherings	Mitigation	• The authors responded to McCloskey et al., 2020a • As opposed to McCloskey et al. who recommended "to consider the effects of MG cancellations on the future wellbeing of communities through economic recession or job losses, as well as through the spread, or otherwise, of COVID-19." (McCloskey et al., 2020a, p. 1098), the authors argued that "there is hardly any lee way for choice." (p. 1192) • The authors described that "when governments and societal and economic systems are unanimously intensifying efforts toward the economically and personally challenging concept of social distancing, any call to consider mass gatherings sends a diametrically opposing and confusing message to the public." (p. 1192)
Modell and Kardia (2020)	Religion as a health promoter	Adaptation	• The authors explored the effort of religious community-based organizations including church-based health programs, providing hope and social services and religious faiths at the time of COVID-19 pandemic in Detroit, USA

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Muurlink and Taylor-Robinson (2020)	Religious clothing	Mitigation	• The author argued that "cultural factors may impact on the gender balance of reported COVID-19 infection prevalence in systematic ways, particularly in conservative societies whether religious or secular, around the world." (p. 2) • The authors provided an example of Muslim culture where "wearing a burka or niqab, providing full or particle coverage of the face, respectively, is relatively common in public, touching of mouth, nose and eyes by females is correspondingly restricted." (p. 1)
Nahandi et al. (2020)	Supporting religious medical professionals	Adaptation	• "Medical professionals working in the Islamic Republic of Iran are facing even more challenges compared to their colleagues in other countries when it comes to social support. […] cultural and religious gatherings in the Islamic Republic of Iran might increase the risk of the spread of communicable diseases." (p. 497) • "When considering the social restrictions imposed as a result of the efficiency of COVID19 transmission, virtual social networking might be the best replacement for traditional face-to-face psychological interventions." (p. 497) • Even though there are some mental health care for health professionals, the authors called for revised and focused guidelines for them
Peteet (2020)	Religion as a coping strategy for anxiety associated with COVID-19	Adaptation	• "Existential concerns raised by the pandemic suggest the importance of religious resources, as seen in research into the experience of patients dealing with advanced cancer." (p. 1) • "Anxiety caused by COVID-19 calls for optimal self-case and accessible mental health services, but also for serious attention to how we can pursue Peace (Shalom, Salaam)." (p. 2)

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Prime et al. (2020)	Keeping family resilience with religion	Adaptation	• The authors argued that "The COVID-19 pandemic poses an acute threat to the well-being of children and families due to challenges related to social disruption such as financial insecurity, caregiving burden, and confinement-related stress (e.g., crowding, changes to structure, and routine)." (p. 1) and "It is critical to consider the cultural, religious, and other sociological sources of variation in family beliefs (e.g., immigration and refugee history; Weine et al., 2006), given their undeniable role in processes of family resilience (Saltzman, Pynoos, Lester, Layne, & Beardslee, 2013)." (p. 9) • The authors also argued that family relationships/beliefs "will provide children with connection and growth during these emotionally difficult times, helping them to not only cope but thrive alongside their family members"
Quadri (2020)	Religious congregations	Mitigation	• The author described how religious congregations spread COVID-19 cases in various countries including Iran, Malaysia, Pakistan, India, South Korea, Israel, etc • The author argued that "prompt responses such as suspension of communal gatherings must be promulgated to ensure social distancing." (p. 220)
Safdar and Yasmin (2020)	Religious struggles during COVID-19	Revealing religiously inspired dominant patriarchal social behaviours	• The authors explored "how the lockdown/containment measures taken by the government during the COVID-19 pandemic have threatened educated Muslim women's negotiated identity regarding wifehood and motherhood in urban Pakistan and how they struggle to reposition to reconstruct it." (p. 1) • "This study indicates that if educated urban women feel the social pressure to step back to their traditional patriarchal roles while bearing domestic violence as well, the situation of those living in remote/rural areas or less empowered women could be much worse." (p. 10)

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Shah et al. (2020)	Religious norms	Misinformation Racial segregation	• The author discussed how Social Determinants of Health affected people during COVID-19 and argued that "Higher rates among black communities not only can be attributed to initial misinformation of the outbreak but are also suggestive of more deep-rooted issues such as deteriorating SES, nonconformity to preventive practices when they contradict social or religious norms, and a long-standing distrust toward health care institutions." (p. 317)
Tarimo and Wu (2020)	Religious gatherings	Mitigation	• The authors explored the first imported COVID-19 case to Tanzania and served several recommendations to mitigate potential spread • "This letter calls upon the government of Tanzania to immediately suspend not only schools and colleges as it has been successfully done but also all religious and any other social gatherings." (p. 2)
Thompkins et al. (2020)	Message to pastors	Adaptation	• "A serios of 15-min videos were produced to provide resources to pastors in African-American communities to aid them in conveying accurate public and mental health information about COVID-19." (p. 455) • "The pastors' video presentations not only provided accurate information about COVID-19 but described their evolving role as advocates. Because the two public health official video contributors were church members, they were able to effectively blend spiritual with public health messaging." (p. 456)
Tootee and Larijani (2020)	Ramadan during COVID-19	Adaptation	• "This time, arguably for the first time in the modern era, jurisprudence scholars, academics, and medical practitioners all seem perplexed as to whether temporary starvation and dehydration might increase the risk of contracting the circulating corona virus." (p. 2) • The authors argued that "the ultimate decision in this regard would be made by each individual person (according to the fatwas) based on the recommendations of the physician in charge." (p. 3)

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Umucu and Lee (2020)	Religion as a coping strategy	Adaptation	• The authors examined "(a) perceived stress related to COVID-19, (b) coping mechanisms related to COVID-19, and (c) the relationship between coping strategies related to COVID-19 and well-being in people with self-reported disabilities and chronic conditions." (p. 2) • The study has demonstrated that COVID-19-related perceived stress was positively associated with coping strategies including religion ($p < 0.01$) and religion is positively associated with participants' well-being ($p < 0.01$)
Waitzberg et al. (2020)	Tailored measures for minority populations (ultra-Orthodox Jewish and Arab population)	Mitigation and adaptation	• The authors argued that minority groups in Israel including ultra-Orthodox Jewish community and the Arab population have been encountered "greater challenges in adopting physical distancing measures", hence more vulnerable to the COVID-19. (p. 1) • In this context, the authors argued that "these populations require specially targeted and tailored responses that take into account their situation with regard to access to healthcare, living and working conditions, and ability to maintain physical distancing, so as not to become foci of infection that will ultimately affect all sectors of society." (p. 5)
Waqar and Ghouri (2020)	Ramadan during COVID-19	Adaptation	• The authors outlined some "practical tips for clinicians on how to counsel and manage Muslim patients who are fasting in Ramadan, with some consideration for the context of COVID-19." (p. 1) • The author highlighted that "some Muslim patients have a very strong motivation to fast in Ramadan, even if they have significant comorbidities such as cancer or advanced organ disease. Ignoring or being indifferent to this may lead to patients and their families losing trust in their clinicians, and possibly coming to harm from self-management and not seeking further counsel when needing advice." (p. 3)

Author and publication year	Key interest	Reported role of religion in COVID-19	Summary of the findings
Weinberger-Litman et al. (2020)	Role of religious institutions, stigma towards religion in the time of COVID-19	Mitigation	• The study explored "the ways in which the Modern Orthodox Jewish community, "as both the first one in the USA with known widespread transmission and one with a highly visible religious identity, experiences stigma in relation to COVID-19 and the extent to which that impact distress/anxiety." The study also examined "the ways in which the clarity of health information is related to distress/anxiety and how religious institutions play a role in conveying COVID-19-related information, which in turn may mitigate the psychological impacts of quarantine." (p. 2271) • The results have shown that 50.3% of participants were "anticipating stigma or actually experiencing stigma due to the association of their religious community with the pandemic." The study also showed that, "only 20% of the current sample found the information they received from local agencies to be adequate, while more than half (60%) reported that they found the clarity of information either completely inadequate or with significant gaps." […] "more participants reported that they completely trusted information provided by their local community institutions than from any other information source," (p. 2278–9) • The authors highlighted that "religious organizations should be viewed as valuable community partners in disseminating and supporting public health messaging," […] "as misinformation regarding COVID-19 and myriad other health-related issues abound, religious leaders have an opportunity and responsibility to provide scientifically informed health education." (p. 2280)

Author and publication year	Key interest	Reported role of religion in COVID-19	Summary of the findings
Wildman et al. (2020)	Role of religion in the time of COVID-19	Spread and mitigation	• The authors explored "the role of religious practices in spreading SARS-CooV-2, the virus responsible for the COVID-19 pandemic." (p. 115) • The authors asked a question; "Collective worship is an effective mechanism for accelerating its spread. Is religion, then, complicit in the most daunting global health crisis of our time?" (p. 116) and argued that "The behaviors of problematic churches are attracting the media's attention, but in many regions of the world religious communities are more beneficial than harmful." (p. 116)
Wong et al. (2020)	Religious gathering	Mitigation	• The authors explored asymptomatic transmission of COVID-19 from mass gatherings and highlighted their argument for "widespread testing at mass gatherings in areas of known community transmission." (p. 2)
Yezli and Khan (2020a)	Religious gathering	Mitigation	• The authors stated that "Recently, numerous COVID-19 cases were linked to places of worship and religious gatherings." (p. 1) • The authors recommended for religious services to be suspended- "It is then time to also temporarily close places of worship and suspend religious gatherings. […] "for such measures to be effective and not be counterproductive, risk communication and educating the public regarding the reasoning behind and aim of such actions are crucial. The latter should be done through both official authorities and religious and community leaders and organizations, as to avoid resentment and rebellion against these measures and prevent religious gatherings moving from the official places of worship to makeshift indoor or outdoor locations that could present a similar or greater risk for COVID-19 transmission." (p. 1)
Yezli and Khan (2020b)	Religious gathering	Mitigation	• The authors stated that even though religion is a major pillar of Saudi society, "the decision on the 2020 Hajj will be an informed weighing between the risk of the pilgrimage going ahead and the consequence of it being suspended. The priority will be protecting the public and ensuring global health security." (p. 3)

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Declarations

Conflict of interest The authors have no conflicts of interest.

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