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# A scoping review and systematic mapping of health promotion interventions associated with obesity in Islamic religious settings in the UK

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## Summary

Islamic religious settings (IRS) may be useful places to implement obesity interventions for Muslims. However, little is known about the level and nature of such activity in these settings. We searched bibliographic databases and grey literature, and requested grey information from Muslim organizations, local councils, and mosques in 13 selected areas in the United Kingdom. Thirty-five interventions were identified; most were poorly described and not evaluated. Twenty-seven interventions focused on physical activity behaviours, four on diet behaviours, one on both behaviours, and seven addressed long-term conditions associated with obesity. Most interventions were led by volunteers from the congregation/faith leaders and were funded through donations from congregants or charity organizations. The evidence suggests that health promotion interventions in IRS have a relatively high reach. Obesity interventions are commonly delivered in UK IRS. Most target physical activity behaviours, are instigated and led by volunteers from the congregation or faith leaders, receive no public funding, and are only recorded in people's memories. High-quality evaluations of well-specified interventions in this context are needed. We suggest that the methods used in this review, including the learning around positionality of researchers, could be adopted by other researchers as a way to locate opportunities for effective community-level interventions.

## KEYWORDS

health promotion, interventions, Islamic religious settings, obesity

The “Childhood Obesity Prevention in Islamic Religious Settings” Programme Management Group includes Mohammed Arshad, Rosie McEachan, Emma Frew, Catherine Hewitt, Laura Sheard, Kamran Siddiqi, Judith Watson, and John Wright.

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## 1 | INTRODUCTION

Almost three million Muslims live in England and Wales and are a diverse population. The largest group of Muslims living in England and Wales are Asians (68%), primarily Pakistani (38%), and Bangladeshi (15%) Asians.<sup>1</sup> The majority of Pakistanis and Bangladeshis living in the United Kingdom are Muslim, but not all. Pakistan and Bangladesh are two of the eight countries which make up South Asia; the others are Afghanistan, Bhutan, Sri Lanka, India, the Maldives, and Nepal. Much of the work in the scientific literature on health promotion in Muslims living in the United Kingdom refers to South Asians. Other ethnic groups with significant Muslim subpopulations include black African/Caribbean (10%), white (8%), and Arab (7%).

Although data on the prevalence of obesity by religious status (eg, Muslims) in the United Kingdom are not available, data on the prevalence of obesity by ethnicity are available. The same is true for data on dietary and physical activity behaviours. As such, we present data for South Asians and, where available, Pakistani and Bangladeshi populations, living in the United Kingdom. El-Sayed et al found no consensus about obesity prevalence among South Asian children or South Asian adults relative to Caucasians in their systematic review of ethnic inequalities in the United Kingdom.<sup>2</sup> However, their findings suggested a possible sexual dimorphism with regard to obesity risk. They found that South Asian boys may have higher risk for obesity relative to Caucasians, while South Asian girls may have lower risk for obesity relative to Caucasians. This dimorphism seems to shift among South Asian adults. Several of the studies suggest a sexual dimorphism in risk for obesity among South Asian adults relative to Caucasian adults that is opposite to the dimorphism observed among children. El-Sayed et al also observed that the choice of obesity metrics may bias estimates of obesity prevalence among South Asian children and adults. The authors suggest that weight-for-height metrics, such as the BMI, may systematically underestimate obesity relative to adiposity metrics, such as DXA or skin-fold measurements among South Asian children and adults in the United Kingdom. South Asian adults in the United Kingdom may accumulate more weight around the abdomen and have greater adiposity in general, than Caucasians, as all of the studies concerned with ethnic differences in obesity between South Asian adults and Caucasian adults in the United Kingdom which measured waist circumference or waist/hip ratio as metrics of obesity found that South Asian adults had significantly larger waists and higher waist/hip ratios than their Caucasian counterparts.

Muslims, in general, share many health beliefs, values, and experiences that impact on energy balance (dietary and physical activity) behaviours related to obesity across ethnic and racial lines.<sup>3</sup> For example, one UK study found that after adjusting for deprivation and other sociodemographic characteristics, South Asian children were three times more likely to have an obesogenic lifestyle than white children.<sup>4</sup> Research has shown substantial higher intakes of sugar and fat and greater levels of sedentary behaviour amongst Pakistani compared with white British Infants.<sup>5,6</sup> These obesogenic behaviours persist into childhood. For example, in the Child Heart Health Study in England, substantial differences in diet (higher total energy, fat, and protein intake) and

physical activity (lower levels) were found in South Asian compared with white European children age 9 to 10, with particularly low levels of physical activity in South Asian girls.<sup>7</sup> In adults, physical activity levels were consistently lower in UK South Asians than in white participants, when assessed from the Health Survey for England.<sup>8</sup> Also in adults, the average consumption of fruit and vegetables, and fat intake, was lower among South Asian than in white participants, when assessed from this survey.<sup>9</sup> Leung and Stanner provide a comprehensive and informative review of the limited data available on diets of South Asians in the United Kingdom and the challenges and opportunities for health promotion.<sup>9</sup> Ethnic inequalities in health, including obesity, in the UK result from a combination of metabolic, socioeconomic, cultural, and implementation (of interventions) factors.<sup>10,11</sup> Deprivation is associated with inequalities in health, and in the United Kingdom, Muslim children and their families are over-represented in such areas. A report from the Social Mobility Commission found that Muslims experience the greatest economic disadvantages of any group in UK society.<sup>12</sup> They are more likely than non-Muslims to experience neighbourhood deprivation, housing, educational and health disadvantage, and unemployment. The report concluded that there was a “broken social mobility promise” for young Muslims where educational success did not translate into good labour market outcomes.

There is also evidence that universal health promoting interventions are taken up more effectively by white compared with ethnic minority groups and therefore further widen ethnic inequalities in health.<sup>13</sup> There is reasonable evidence that access and recruitment to universal interventions is a significant issue for some ethnic populations and can contribute to health inequalities.<sup>14</sup> Bhopal also argues that approaches to, and characteristics of, the intervention itself can contribute to differential effectiveness.<sup>15</sup> Differential effectiveness may arise at a number of points in the implementation of an intervention, including intervention efficacy, service provision or access, uptake, and compliance.<sup>16</sup> A common assumption is that health promotion interventions found to be effective in the general population are also, if appropriately adapted, likely to prove effective when provided to ethnic minority populations, but there is limited evidence available to verify this claim.<sup>13</sup>

A UK government report published in 2007 acknowledged the possible role that places of worship could have in promoting health, listing faith groups as potentially important partners.<sup>17</sup> In 2015, the Muslim Council of Britain stated that Muslim opinion makers such as mosque imams have a responsibility to promote health messages to their networks and congregations.<sup>18</sup> A recent study by Maynard et al provides some evidence that health promotion interventions for children delivered in mosques may be more successful in terms of reach, compared with schools.<sup>19</sup>

Reasons why Islamic religious settings (IRS) may be particularly useful for targeted health promotion interventions for Muslims include (1) capitalizing upon the social support that the setting provides for adoption of healthy lifestyle behaviours<sup>20</sup>; (2) trust placed by the target population in religious leaders which may promote willingness to take part in advocated behaviours (such as physical activity) and to allay concerns relating to faith and cultural appropriateness<sup>21</sup>; (3) availability of tangible resources to support the delivery of an intervention (eg, a space to host an intervention, a volunteer base to facilitate and deliver an

intervention<sup>22</sup>; (4) the stable nature of IRS in the lives of the community they serve and frequent attendance,<sup>23</sup> which facilitates sustainability of adopted behaviours; and (5) access to and opportunity to engage with hard-to-reach groups who may not access health services.<sup>24</sup> In the current times of austerity where local authorities in the United Kingdom have sparse resources to direct towards pressing public health issues, it is timely to explore how community-level settings, such as IRS, can contribute towards health promotion.

The aim of this scoping review and systematic mapping was to identify and describe the level and nature of health promotion interventions associated with obesity in IRS in the United Kingdom, and evaluations of them where available. From an initial search of bibliographic databases for relevant information, we identified only one intervention. However, in discussion with our project steering group, that included faith leaders, we understand that such interventions are common place in IRS in the United Kingdom.

The question of why research on health promotion interventions in IRS in the United Kingdom has been relatively uncommon compared with other settings is a potential cause for concern.<sup>25</sup> Understanding reasons for the relative lack of research in this context could address a hidden area of generation and perpetuation of health inequalities and disparities. Sheikh asks those with the power to change the way in which research is conducted to translate the important insights around willingness to participate in research into significantly more invitations extended to minority ethnic and racial groups to participate.<sup>25</sup> Thomas et al, in their paper entitled *Toward a Fourth Generation of Disparities Research to Achieve Health Equity*, suggest that the reductionist nature of randomized controlled trials as the gold standard for scientific evidence has advanced our mechanistic and biomedical understanding of obesity at the expense of understanding social and environmental determinants of the obesity epidemic.<sup>26</sup> Paeratakul et al predict that the absence of evidence-based studies and interventions for minority populations will perpetuate the problem of disproportionate burden of obesity among ethnic minorities compared with the white population.<sup>27</sup> Thomas et al state that the opportunity is to recognize health disparities as an ethical issue of justice because specific groups were subjected to systematic racial discrimination and denied the basic benefits of society, a violation of the social contract.<sup>26</sup> As Powers and Faden<sup>28</sup> state,

*One critical moral function of public health...is to monitor the health of those who are experiencing systematic disadvantage as a function of group membership, to be vigilant for evidence of inequities relative to those in privileged social groups and to intervene to reduce those inequalities. (p. 88)*

Thomas et al argue that, because this situation places health disparities in a category of injustices deemed morally problematic, it demands achieving what we have thus far failed to do adequately, such as critically examine racism and race in a meaningful way and develop interventions that allow us to take direct action to eliminate health disparities.<sup>26</sup>

Given the relative lack of research on health promotion interventions in IRS in the United Kingdom that has been published in peer

review journals and subject to systematic review, we used a broad approach to searching, and our inclusion criteria, for this review compared with a conventional systematic review. We did not aim to collate a comprehensive list of every relevant intervention in the United Kingdom at one point in time. Rather, we reviewed all available evidence that we could find through searching bibliographic databases and the grey literature and scoped for grey information from a targeted selection of Muslim organizations, local councils, mosques, and local health authorities and local councils.

## 2 | METHODS

We undertook a scoping review and systematic mapping of the evidence, using methods adapted from previously published literature.<sup>29,30</sup> Ethical approval for our searching for relevant grey information was granted by the Research Ethics Panel, University of Bradford, UK (ethics application: E645 approved on 9 October 2017).

### 2.1 | Inclusion criteria

This review was part of a larger research project, funded by the National Health Research Institute (UK) [Programme Development Grant award RP-DG-1215-10002], which aimed to assess the feasibility of developing interventions to tackle obesity in IRS. At the protocol development stage, and in discussion with the project steering group<sup>31</sup> which included Muslim faith leaders, it was agreed to broaden the search for evidence for our scoping review to include any health promotion intervention in IRS for two reasons: first, to gain learning and understanding of factors relating to health promotion intervention development and implementation in IRS, which could potentially be translated for interventions which aim to tackle obesity in these settings and second, to ensure that we included interventions which may help tackle obesity but are not labelled as such. An example was project number 53's stated aim, which was to promote healthy living, but the intervention content specifically focused on promoting physical activity and an awareness of obesity.

We defined IRS to include mosques (predominately attended by men), madrasas (Islamic schools where children are taught daily), halaqas (group meetings to study Islam, also sometimes called women's circles when these meetings are exclusively for females), Muslim charity organizations, and Muslim sports or physical activity groups. We also included in our definition those interventions that were organised by local Islamic religious communities but were delivered beyond the mosque, madrasa, or halaqas (eg, physical activity interventions which took place in public spaces such as local parks and leisure centres). Quantitative and qualitative evidence was considered. Evidence in the context of this scoping review was defined as published research, grey literature, and grey information (which included written and spoken word, evidence not available online).

## 2.2 | Searching for evidence

A search was conducted using the methods described by Adams et al.<sup>29</sup> This approach is particularly useful when searching for information around public health interventions, which have traditionally not been subject to scientific study, but are relatively common in practice. It includes searching for (1) published research (bibliographic databases), (2) grey literature (websites), and (3) grey information (contacting relevant organizations and individuals for information which is recorded only on paper or in a person's memory).

Published research was searched using bibliographic databases (Assia, CINAHL, Embase, MEDLINE, PsycInfo, SSCI, and The Cochrane Library). We did not restrict our search of bibliographic databases to interventions in IRS in the United Kingdom, but we did restrict our search for such evidence to the United Kingdom when searching the grey literature and grey information. Grey literature was searched using Google, the NIHR portfolio and website, and health websites (NICE and Public Health England (PHE)). These searches were initially conducted in October 2017 and updated in October 2018 so that we could include the most up-to-date evidence. The combination of keywords used for these searches can be found in Table S1.

For the bibliographic databases, one reviewer (KR) screened all search results on titles and abstracts and subsequently the full-text articles of those search results which were considered candidates for inclusion. For the grey literature, one reviewer (KR) screened for IRS from the first 100 results from each website searched. A shortlist of interventions was independently assessed by another reviewer (CS), and the list of interventions included in this review was agreed on by KR and CS. Evidence included in this scoping review was extracted by KR using an agreed upon data extraction form.

For the grey information, one reviewer (SD) conducted the majority of information requests. KR conducted a few information requests in Birmingham. As suggested by one of the journal reviewers for this paper, we here describe the positionality of these researchers relative to the religious, ethnic, and linguistic status of the UK communities we attempted to contact. SD is male, Muslim, Pakistani, of Punjabi origins, and is fluent in Punjabi, Urdu, Arabic, Farsi, and English. KR is female, Sikh, British Indian, and is fluent in Punjabi and English. First, relevant Muslim charity organizations and Muslim community organizations that operate in the UK were contacted (by email initially and then by phone if they did not reply to the email) for information on any relevant local or national interventions in the United Kingdom. Details for persons and/or organizations to be contacted were initially scoped from the expert knowledge of members of the project steering group and also a simple Google search. A snowballing approach to identifying information was used, by requesting details of other relevant organizations from initially identified Muslim charity and community organizations.

We also directly contacted local councils, mosques, and local health authorities (by email initially and then by phone if they did not reply to the email). When contacting local councils, we requested to speak with Muslim councillors where possible. Given that the aim of our research was to primarily identify and describe health promotion

interventions in IRS in the United Kingdom, rather than collate a comprehensive list of every relevant intervention in the United Kingdom at one point in time, we used a targeted approach and focused our efforts only on areas in the United Kingdom with the highest Muslim populations (extracted from the most recent UK census data on ethnicity<sup>32</sup>). At the protocol development stage, we decided to target only the top 10 areas in the United Kingdom. However, we found that all of these areas were in England. In order to include information from across the United Kingdom, in discussion with the project steering group, we agreed to additionally include the area with the highest Muslim populations in Scotland, Northern Ireland, and Wales (Table S2). One reviewer (SD) assessed all grey information received for relevance. A shortlist of interventions was independently assessed by another reviewer (KR), and any queries discussed with CS. The final list of interventions included in this review was agreed on by SD, KR, and CS. Literature included in this scoping review was extracted by SD using an agreed-upon data extraction form and checked by KR.

We acknowledge that, for information found in grey literature and grey information, there is a potential risk of bias and thus value of that information. As suggested by Adams et al,<sup>29</sup> we assumed that the risk of bias relating to the description of interventions was low—there is little reason why such information would be misrecorded. In contrast, we assumed that the risk of bias of evaluations of interventions was high, due to methodological weakness and conflicts of interest.

## 2.3 | Data extraction

Data were extracted for each intervention using standardised forms, which were pilot tested using five (randomly selected) of the included interventions identified from five different sources (bibliographic databases, Google search, website search, email information request, and telephone call information request). The format of the forms was then revised, in discussion with KR, SD, and CS. An example of a revision we made to the form was the inclusion of the collection of information for impetus of the intervention. [The data extraction form can be requested from the authors.] Information extracted included:

- The funding source for the intervention
- The aim(s) of the intervention
- The impetus for the intervention
- Target population and recruitment methods
- Topic/area focus of the intervention
- Intervention content
- Intervention setting
- Intervention duration and frequency
- Intervention delivery team (and any training and support they had or received).
- Evaluation of the intervention.

## 2.4 | Systematic mapping

We define systematic mapping in this context as checking for any duplicate interventions identified by more than one method of searching. As we anticipated, some of the included interventions were identified by more than one method of searching. All interventions were systematically mapped by KR and SD, and duplicates removed. Results of the scoping review and systematic mapping were synthesized narratively.

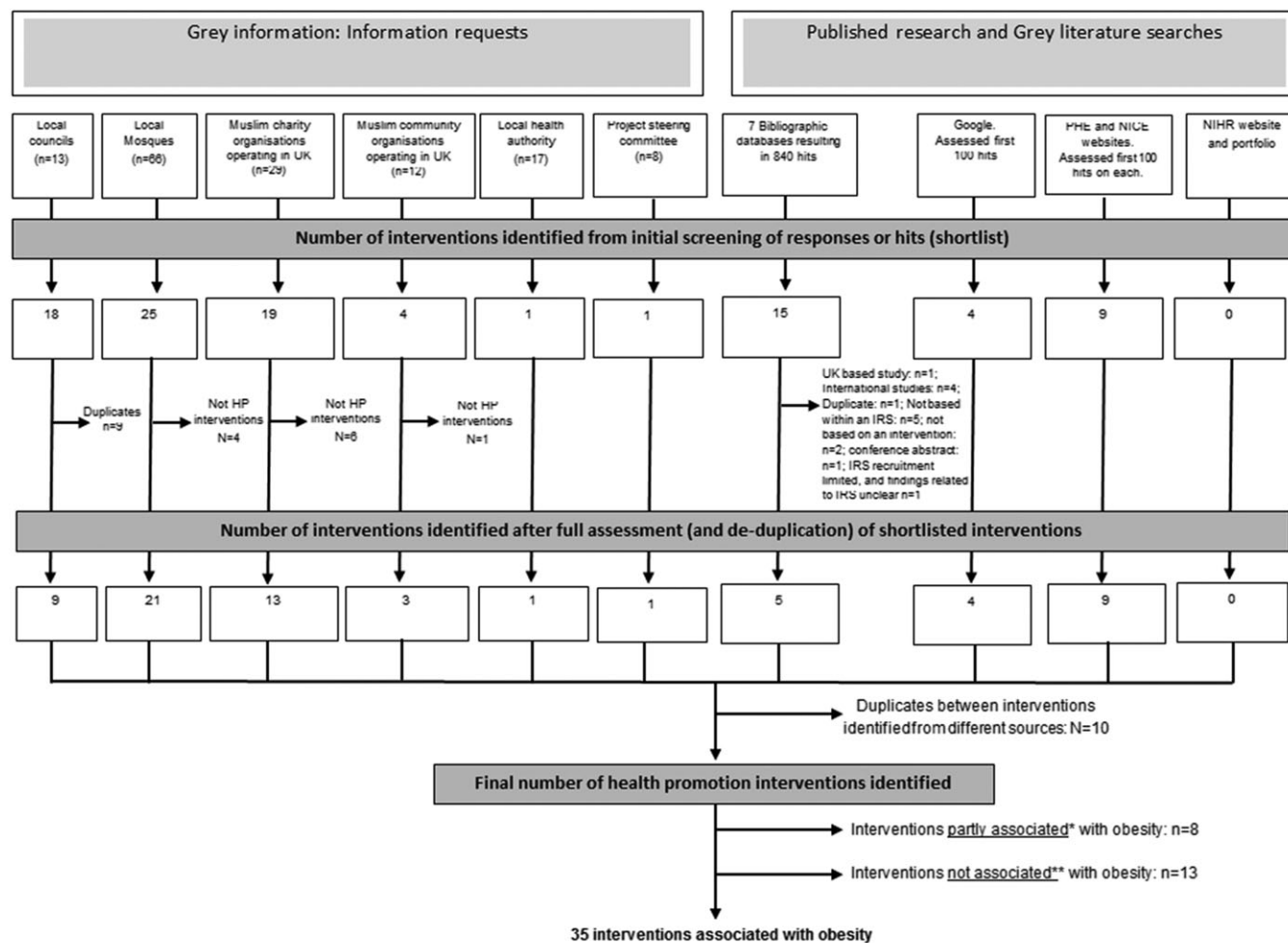
## 3 | RESULTS

Thirty-five health promotion interventions that were directly associated with obesity were identified from the systematic search and mapping process (Figure 1). Interventions were categorised as being directly associated with obesity where they aimed to specifically improve physical activity and/or dietary intake behaviours, or improve long-term conditions associated with obesity. The stated aim of most of the 35 interventions was to simply increase physical activity, promote healthy

eating, or both. However, for 7 of the 35 interventions, the stated aim was to improve long-term chronic conditions associated with obesity (project numbers 6, 27, 31, 34, 38, 51, and 52). After deduplication, 1 of these 35 interventions was identified from bibliographic databases, 9 from grey literature (seven of which were also identified from grey information), and 25 from only grey information. Brief details of these 35 interventions can be found in Table 1, and a concise description of these interventions can be found in Table 2.

In addition, the systematic search and mapping process identified 8 health promotion interventions which were partly associated with obesity and 13 which were not associated with obesity. Brief details and a concise description of these interventions are provided in Tables S3 to S6.

In total, 137 grey information requests for relevant information were made to local councils, local mosques, Muslim charity organizations operating in the United Kingdom, Muslim community organizations operating in the United Kingdom, and local health authorities and eight requests to the project steering group. Only three (2%) of the email requests resulted in a response: One local health authority and one Muslim charity organization provided information on one



\*\*Not associated with obesity: health promotion interventions that did not focus wholly or partly on behaviour or conditions associated with obesity

\*Partly associated with obesity: health promotion interventions that were multifocal, and included at least one component targeting behaviours or conditions associated with obesity

**FIGURE 1** Systematic search and mapping of interventions of health promotion interventions within Islamic religious settings

**TABLE 1** Characteristics (study design, intervention description, method of identification, data source, and outcome measures) of health promotion interventions associated with obesity (n = 35)

Project Reference Number	Authors or Organization Which Provided Information	Study Design (If Applicable), Name or Description of Intervention and Location	Method of Identification	Participant Characteristics, Description of Outcome Measure and Data Source (If Applicable)
3	Banerjee et al <sup>a</sup>	Pre and post intervention study Mosque-based physical activity intervention Canada	Bibliographic databases	Characteristics N = 28 Female (%): 100 Mean age (SD): 51.0 (12.0) Ethnicity (%): Indian: 82.0% Pakistani: 18% Outcome measures <ul style="list-style-type: none"> <li>• Feasibility: class attendance</li> <li>• Acceptability: readiness, importance, and self-efficacy to exercise</li> <li>• Acceptability: participant experience of the exercise intervention</li> <li>• Exploratory outcomes assessing effectiveness: exercise capacity measure by the Duke activity status index (DASI) and international physical activity questionnaire (IPAQ)</li> </ul>
6	East London Mosque, London Muslim Centre and NHS Tower Hamlets <sup>b</sup>	Faith in health East London	<ol style="list-style-type: none"> <li>1. Google</li> <li>2. Muslim charity organization</li> </ol>	Website address: <a href="http://www.eastlondonmosque.org.uk/content/faith-health">http://www.eastlondonmosque.org.uk/content/faith-health</a>
8	Streatham mosque <sup>c</sup>	No specific name, physical activity classes Streatham	Google	Website address: <a href="http://www.streathammosque.org/">http://www.streathammosque.org/</a>
9	Ipswich mosque <sup>d</sup>	No specific name, physical activity classes Ipswich	Google	Website address: <a href="http://www.ipswichmosque.org/our_aims.php">http://www.ipswichmosque.org/our_aims.php</a>
10	KSIMC Birmingham Mosque <sup>e</sup>	Community salad for Iftar Birmingham	<ol style="list-style-type: none"> <li>1. Public health England website</li> <li>2. Local +council</li> </ol>	Website address: <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/619891/Guide_to_Healthy_Living_Mosques.PDF">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/619891/Guide_to_Healthy_Living_Mosques.PDF</a>
11	Ghamkol Sharif Central Jamia Mosque <sup>e</sup>	Children's healthy eating and sports Birmingham	<ol style="list-style-type: none"> <li>1. Public health England website</li> <li>2. Local council</li> </ol>	Website address: <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/619891/Guide_to_Healthy_Living_Mosques.PDF">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/619891/Guide_to_Healthy_Living_Mosques.PDF</a>
12	KSIMC Birmingham Mosque <sup>e</sup>	Health and well-being champion Birmingham	<ol style="list-style-type: none"> <li>1. Public health England website</li> <li>2. Local council</li> </ol>	Website address: <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/619891/Guide_to_Healthy_Living_Mosques.PDF">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/619891/Guide_to_Healthy_Living_Mosques.PDF</a>
13	KSIMC Birmingham Mosque <sup>e</sup>	Volunteer sports committee Birmingham	<ol style="list-style-type: none"> <li>1. Public health England website</li> <li>2. Local council</li> </ol>	Website address: <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/619891/Guide_to_Healthy_Living_Mosques.PDF">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/619891/Guide_to_Healthy_Living_Mosques.PDF</a>
14	Ghamkol Sharif Central Jamia Mosque <sup>e</sup>	Park walks in-between prayers Birmingham	<ol style="list-style-type: none"> <li>1. Public health England website</li> <li>2. Local council</li> </ol>	Website address: <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/619891/Guide_to_Healthy_Living_Mosques.PDF">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/619891/Guide_to_Healthy_Living_Mosques.PDF</a>
17	Birmingham Central Mosque <sup>e</sup>	Health-exchange signposting Birmingham	<ol style="list-style-type: none"> <li>1. Public health England website</li> <li>2. Local council</li> </ol>	Website address: <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/619891/Guide_to_Healthy_Living_Mosques.PDF">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/619891/Guide_to_Healthy_Living_Mosques.PDF</a>

(Continues)

TABLE 1 (Continued)

Project Reference Number	Authors or Organization Which Provided Information	Study Design (If Applicable), Name or Description of Intervention and Location	Method of Identification	Participant Characteristics, Description of Outcome Measure and Data Source (If Applicable)
19	Bikeworks	Bikeworks Tower Hamlets, London	Community organization	Personal communication (telephone)
20	East London Mosque	Muslim charity run London	Mosque	Personal communication (telephone)
23	Jamiyat Tabligh-ul-Islam Mosque	No specific name, group walking Bradford	Mosque	Personal communication (telephone)
24	Madni Masjid	No specific name, education on healthy eating Bradford	Mosque	Personal communication (telephone)
27	Luton Central Mosque	No specific name, education on long-term conditions, health assessments, advice and signposting to services Luton	Mosque	Personal communication (telephone)
30	Active Luton	Active Luton Luton	Community organization	Personal communication (telephone)
31	Bury Park Masjid	Bury Park Masjid Luton	Mosque	Personal communication (telephone)
32	Unknown	The Big Iftaar Luton	Muslim charity organization	Personal communication (telephone)
34	Jamea Masjid and Islamic Centre	Bowel cancer screening project Slough	Mosque	Personal communication (telephone)
35	Jamea Masjid and Islamic Centre	No specific name, various physical activities Slough	Mosque	Personal communication (telephone)
38	Oldham Central Mosque	No specific name, education on chronic disease Greater Manchester	Mosque	Personal communication (telephone)
39	Oldham Central Mosque	No specific name, education on healthy eating Greater Manchester	Mosque	Personal communication (telephone)
41	Social Justice Charity	No specific name, physical activity Newport	Muslim charity organization	Personal communication (telephone)
42	Belfast Islamic Centre	No specific name, physical activity Belfast, Northern Ireland	Mosque	Personal communication (email)
43	Belfast Islamic Centre	No specific name, physical activity Belfast, Northern Ireland	Mosque	Personal communication (email)
46	Ilford Central Mosque	No specific name, physical activity Redbridge	Mosque	Personal communication (telephone)
47	Seven Kings Mosque	No specific name, physical activity Redbridge	Mosque	Personal communication (telephone)
48	Muslim Youth Community Centre	Muslim Youth Foundation Manchester	Muslim charity organization	Personal communication (telephone)
49	Ashton Central Mosque	No specific name, physical activity Manchester	Mosque	Personal communication (telephone)
50	Active Sisters	Active sisters London	Muslim charity organization	Personal communication (telephone)
51	Birmingham Central Mosque	No specific name, increasing awareness of chronic conditions and screening programme Birmingham	Mosque	Personal communication (telephone)

(Continues)

TABLE 1 (Continued)

Project Reference Number	Authors or Organization Which Provided Information	Study Design (If Applicable), Name or Description of Intervention and Location	Method of Identification	Participant Characteristics, Description of Outcome Measure and Data Source (If Applicable)
52	Sufi Trust	No specific name, education on chronic conditions Birmingham	Muslim charity organization	Personal communication (telephone)
53	Sufi Trust	Active weekends Birmingham	Muslim charity organization	Personal communication (telephone)
54	Association of Muslim Schools	Interfaith games Birmingham	Muslim charity organization	Personal communication (email)
55	Ghausia Mosque	No specific name, physical activity Pendle, Lancashire	Mosque	Personal communication (telephone)

<sup>a</sup>Banerjee ET, Landry M, Zawi M, Childerhose D, Stephens N, Shafique A, et al. A pilot examination of a mosque-based physical activity intervention for South Asian Muslim women in Ontario, Canada. *Journal of Immigrant and Minority Health*. 2017;19 (2):349–57.

<sup>b</sup>East London Mosque, London Muslim Centre. Faith in Health 2017. Available from: <http://www.eastlondonmosque.org.uk/content/faith-health>.

<sup>c</sup>Streatham Mosque. Daily activities at Masjid 2017. Available from: <http://www.streathammosque.org/>.

<sup>d</sup>Ipswich mosque. Activities 2017. Available from: [http://www.ipswichmosque.org/our\\_aims.php](http://www.ipswichmosque.org/our_aims.php).

<sup>e</sup>Public Health England. Guide to Healthy Living: Mosques 2017. Available from: [www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/619891/Guide\\_to\\_Healthy\\_Living\\_Mosques.PDF](http://www.gov.uk/government/uploads/system/uploads/attachment_data/file/619891/Guide_to_Healthy_Living_Mosques.PDF).

intervention each (project numbers 40, 54), and one mosque provided information on two interventions (project numbers 42, 43). Due to this low response rate, a follow-up telephone call (by SD) was made to those who did not respond. This method of searching for grey information was more successful, and 33 additional interventions were identified: 19 from mosques (one mosque provided information on four different interventions, and another mosque provided information on three interventions), 11 from Muslim charity organizations (one of these organizations provided information on two interventions), 3 from Muslim community groups, and 1 from a project steering group member. One telephone call request to a Muslim charity organization resulted in a request from them for SD to visit them face to face for a conversation, and this resulted in the identification of one additional intervention.

## 4 | DESCRIPTION OF INTERVENTIONS

We first describe the specific content, duration, and frequency for those interventions which were directly associated with obesity (n = 35).

### 4.1 | Content of obesity interventions

The majority of the 35 interventions focused on changing physical activity behaviours (n = 23). Most of these interventions included group sessions around sport, exercise, or physical activity. Sporting activities included many different types of sports, but football was particularly popular, and also boxing and kick boxing. Football and boxing sessions for adults and children, and males and females, were common. Other sports included swimming, badminton, netball, cycling, table tennis, and golf. Exercise sessions included aerobic, strength, self-defence, walking, resistance training, relaxation, chair, Jiu-Jitsu,

Zanga Zanga, and general sessions in a commercial gym. Seven of the 23 physical activity interventions were targeted at children (including one in toddlers) and three at women. The remaining 13 interventions focused specifically on physical activity for all the community, but often included separate classes for women and separate classes and age-appropriate exercises for children.

Four interventions specifically focused on diet (including one targeting children). Two of these interventions simply focused on health eating, and one focussed on healthy eating practices during Ramadhan. The other diet intervention focused on women preparing salads at home and bringing them to the mosque for informal “salad of the month” competitions. One intervention specifically focused on diet plus physical activity, where the diet component was simply healthy eating. The intervention content of the remaining seven obesity interventions was unclear.

Our main interest in collecting data on content of obesity interventions was to assess for any themes or examples of differences in content compared with what might normally be contained in interventions aimed at the general public in the United Kingdom. From the information available, the content of the interventions appeared to be similar to those contained in health promotion interventions for the general public in the United Kingdom.

### 4.2 | Duration and frequency of obesity interventions

Some of the obesity interventions we identified took the form of a one-off health fair/event (project number 34), an annual event (annual run, project number 20; annual sports gala, project number 54), a residential active weekend for Muslim mothers and children (project number 53), or a regular drop in clinic (held every 2 weeks, project

**TABLE 2** Aim and characteristics of health promotion interventions associated with obesity, and their evaluation where available (n = 35)

Project Reference, Dates of Project <sup>f</sup> , and Funding Source	Aim	Target Population and Recruitment Methods	Intervention	
			Topic/Area	Intervention Content
3 <sup>a</sup> Year: 2014 Funding: part funded by a research grant.  One author working at the Women's Xchange (research centre) at Women's College Hospital was supported by a research funding body (Canadian Institute for Health Research) via a postdoctoral fellowship award.	To assess the feasibility, acceptability, and effectiveness of a mosque-based physical activity program for South Asian women  The Women's Xchange (research centre) at Women's College Hospital. One author was supported by a research funding body (Canadian Institute for Health Research) via a postdoctoral fellowship award.	South Asian women in Ontario, Canada.  • Invitation flyer posted to local mosque and distributed during prayer services by community outreach worker and kinesiologist  Inclusion criteria: South Asian (originated from India, Sri Lanka, Pakistan or Bangladesh), member of the Islamic faith and mosque community and ≥18 years.	Physical activity	The intervention involved:  • Group training exercise • Consisted of aerobic and strength training • Examples of the activities: walking, resistance training, relaxation and chair exercises
6 <sup>b</sup> Project dates unclear Funding: unknown	To increase awareness in the community of the available health services	Those living in Tower Hamlets Recruitment methods unclear	Health promotion related to long-term conditions	Unclear. However, some information on  • Training for imams • Roadshows • Health fairs
8 <sup>c</sup>  Project dates unclear Funding: unknown	Unclear (not stated)	Those attending Streatham mosque Recruitment methods unclear	Physical activity	• Ladies exercise classes • Kick-boxing classes for children • Self-defence classes for males (adult and child)
9 <sup>d</sup> Project dates unclear Funding: unknown	Unclear (not stated)	Those attending Ipswich mosque Recruitment methods are unclear	Physical activity	• Swimming sessions organised by mosque • Badminton sessions organised by mosque • Football organised by mosque • Ladies exercise class at the mosque
10 <sup>e</sup> Project dates unclear Funding: unknown	Unclear (not stated)	Mosque attendees Recruitment methods are unclear	Diet	• Encouraging congregants to bring in salads from home, to be shared when opening the fast • Informal competitions of best salad of the month
11 <sup>e</sup>	Unclear (not stated)		• Diet	

(Continues)

**TABLE 2** Aim and characteristics of health promotion interventions associated with obesity, and their evaluation where available (n = 35)

Project Reference, Dates of Project <sup>f</sup> , and Funding Source	Intervention			
	Setting	Intervention Duration and Frequency	Intervention Delivery Team (and Training)	Evaluation Results
<p>3<sup>a</sup> Year: 2014 Funding: part funded by a research grant.</p> <p>One author working at the Women's Xchange (research centre) at Women's College Hospital was supported by a research funding body (Canadian Institute for Health Research) via a postdoctoral fellowship award.</p>	<p>Mosque in Ontario, Canada.</p> <p>Activities were carried out in the women's' prayer area</p>	<p>Intervention was carried out between June and December 2014.</p> <p>The 24-wk program was offered to three times a week (evenings only) to the participants.</p> <p>Duration of the session: 1 h</p>	<p>Health professionals/workers</p> <p>Kinesiologists delivered the intervention alongside a female community member.</p> <p>Kinesiologists were trained by physiotherapists, a kinesiologist, and a nurse practitioner.</p> <p>Study investigators observed the sessions on a number of occasions to assess the delivery of the program</p>	<p>Feasibility</p> <p>Class attendance:</p> <p>Average number attending each session (range): 13 (3-28)</p> <p>Average number of classes attended (range): 20 (1-51)</p> <p>Acceptability median readiness towards exercise score (IQR): Pre: 80 (60-100) Post: 100 (70-100) P value: .29</p> <p>Median importance of participating in exercise score (IQR): Pre: 90 (50-100) Post: 100 (90-100) P value: .004</p> <p>Median confidence related to exercise participation score (IQR): Pre: 90 (70-100) Post: 100 (80-100) P value: .013</p> <p>Overall experience: Participants completed 12 questions (5-point Likert scale) which indicated participants had a positive experience of the program: convenient, easy to follow, educational, helpful, and supportive.</p> <p>International Physical Activity Questionnaire (IPAQ) score (n, %): 1. Inactive pre: n = 8 (42%); post: n = 2 (10%)</p>

(Continues)

TABLE 2 (Continued)

Project Reference, Dates of Project <sup>f</sup> , and Funding Source	Aim	Target Population and Recruitment Methods	Intervention	
			Topic/Area	Intervention Content
Project dates unclear Funding: unknown		Children attending the madrassa classes at the mosque Recruitment methods are unclear	<ul style="list-style-type: none"> <li>Physical activity</li> </ul>	Limited details provided. Healthy eating and sports initiative mentioned.
12 <sup>e</sup> Project dates unclear Funding: unknown	Unclear (not stated)	Unclear	Limited details. Physical activity mentioned.	Limited details. <ul style="list-style-type: none"> <li>Health and well-being champion</li> <li>One example of an initiative included encouraging the community to walk 10000 steps per day.</li> </ul>
13 <sup>e</sup> Project dates unclear Funding: unknown	Unclear (not stated)	Unclear	Physical activity	<ul style="list-style-type: none"> <li>Volunteer women's sports committee</li> <li>Football</li> <li>Swimming</li> <li>Netball</li> <li>Badminton</li> </ul>
14 <sup>e</sup> Project dates unclear Funding: unknown	Unclear (not stated)	Mosque attendees Recruitment methods unclear	Physical activity	<ul style="list-style-type: none"> <li>Group walking club</li> <li>Carried out in-between prayers (note: appears to be mainly in the winter months due to the shortened time between prayers)</li> </ul>
17 <sup>e</sup> Project dates unclear Funding: unknown	Improve the health and well-being of the community	Unclear (presume mosque community) Recruitment via announcements during Friday sermons	Mental health Physical health Raising awareness of diabetes	Limited details but included physical activity
Project reference, dates of project and funding source	Aims and (where information forthcoming) impetus for intervention	Population and recruitment	Topic or area	Intervention description
19 Project name: Bikeworks Dates: Unknown Funding: Bikeworks is a social enterprise funded by a number of organizations (eg, Barclays Bank [primary funder], local authorities, businesses)	To encourage cycling within the community and improve physical health	Project recruited those living within Tower Hamlets Recruitment: volunteers and/or activists within mosques recruited those who attend the mosques(s)	Physical activity	<ul style="list-style-type: none"> <li>Cycling training for novices</li> <li>Group and individual cycling sessions (although group sessions were encouraged)</li> </ul>

TABLE 2 (Continued)

Project Reference, Dates of Project <sup>f</sup> , and Funding Source	Intervention			
	Setting	Intervention Duration and Frequency	Intervention Delivery Team (and Training)	Evaluation Results
				2. Meet the Canadian Physical Activity Guidelines (CPAG) pre: n = 10 (53%); post: n = 10 (53%) 3. Exceed the CPAG pre: n = 1 (5%); post: n = 7 (37%) P value: .006  Duke Activity Status Index (DASI) mean score (SD) pre: 39.2 (12.1) post: 44.6 (10.9) P value: .06
6 <sup>b</sup> Project dates unclear Funding: unknown	Mosques (n = 45) and GP surgeries (? N = unclear) in Tower Hamlets	Unclear.	Unclear	No evaluation reported
8 <sup>c</sup>  Project dates unclear Funding: unknown	Streatham mosque	Unclear	Unclear	No evaluation reported
9 <sup>d</sup> Project dates unclear Funding: unknown	At Ipswich mosque or another location(s)	Unclear	Unclear	No evaluation reported
10 <sup>e</sup> Project dates unclear Funding: unknown	KSIMC Birmingham Mosque	Limited details, but appears to be during the month of Ramadhan.	Unclear	No evaluation reported
11 <sup>e</sup> Project dates unclear Funding: unknown	Unclear where the physical activity sessions are carried out.	Unclear	Unclear Sports initiative run by youth volunteers, but no detail of where these volunteers were drawn from.	No evaluation reported
12 <sup>e</sup> Project dates unclear Funding: unknown	Unclear Mentions community setting.	Unclear	Unclear	No evaluation reported
13 <sup>e</sup> Project dates unclear Funding: unknown	Some sessions held at Bordesley Green school, Birmingham	Unclear	Unclear	No evaluation reported
14 <sup>e</sup> Project dates unclear Funding: unknown	Local park in Birmingham	Unclear	Unclear	No evaluation reported

TABLE 2 (Continued)

Project Reference, Dates of Project <sup>f</sup> , and Funding Source	Aim	Target Population and Recruitment Methods	Intervention	
			Topic/Area	Intervention Content
20 Project name: Muslim charity run Dates: annual event (start date unknown) Funding: Muslim charity organizations (eg, Islamic Relief Worldwide, Muslim Aid, Muslim Hands)	To promote healthier lifestyles and help with fundraising for other Muslim charities	Open to all those within the UK; however, majority of participants included Muslims living within Tower Hamlets Recruitment methods unclear	Physical activity	<ul style="list-style-type: none"> <li>• 5k run</li> </ul>
23 Project name: no name available Dates: ongoing project (start date unknown) Funding: donations from mosque attendees	Improve physical fitness	Those attending Jamiyat Tabligh-ul-Islam Mosque, Bradford Recruitment methods unclear	Physical activity	<ul style="list-style-type: none"> <li>• Group brisk walking sessions take place after prayer</li> </ul>
24 Project name: no name available Dates: 2007 (one-off event) Funding: donations from mosque attendees	Promote healthy eating during Ramadhan	Mosque attendees at Madni Masjid, Bradford Recruitment methods unclear	<ul style="list-style-type: none"> <li>• Increasing awareness of healthy eating</li> <li>• Education on healthy eating</li> </ul>	<p>Specific details about the intervention were unavailable. Some components included:</p> <ul style="list-style-type: none"> <li>• Increasing awareness of the importance of healthy eating</li> <li>• Education on healthy eating practices</li> <li>• Posters containing health messages (however a clear description of this was unavailable)</li> </ul>
27 Project name: no name available Dates: ongoing (start date unknown) Funding: no funding, intervention carried out on a voluntary basis by a mosque attendee	To promote general health and well-being among those who attend the mosque	Those who attend Luton Central Mosque, Luton  Recruitment: mosque attendees informed by mosque volunteers about the GP drop-in clinics. Congregation informed by announcement after prayer; however, the frequency of these announcements is unknown	<ul style="list-style-type: none"> <li>• Education on long-term conditions</li> <li>• Health assessment</li> <li>• Health advice</li> <li>• Signposting to health services</li> </ul>	<p>General practitioner (GP) drop-in clinic: Trained GP provides regular drop-in clinics at the mosque, and the following services: (a) education on long-term conditions, (b) medical check-up (for example, blood pressure measurements), and (c) health advice</p>

Project Reference, Dates of Project <sup>f</sup> , and Funding Source	Intervention			
	Setting	Intervention Duration and Frequency	Intervention Delivery Team (and Training)	Evaluation Results
17 <sup>e</sup> Project dates unclear Funding: unknown	Mosque in Birmingham	Unclear	Health professionals/workers Health trainer Limited details, about other members involved in this intervention.	No evaluation reported
Project reference, dates of project and funding source	Setting	Intervention duration	Details of intervention team	Evaluation results
19 Project name: Bikeworks Dates: Unknown Funding: Bikeworks is a social enterprise funded by a number of organizations (eg, Barclays Bank [primary funder], local authorities, businesses)	Cycling outdoors within Tower Hamlets. Exact location (eg, cycling routes or parks) was unclear	<ul style="list-style-type: none"> <li>• Training sessions were 20 min</li> <li>• Length of cycling sessions unclear</li> <li>• Frequency of sessions unclear</li> </ul>	Social enterprise Bikeworks delivered intervention	Evaluation of process or implementation only: Project team mentioned Muslim males attended in groups, whereas Muslim females took part in the individual cycling sessions
20 Project name: Muslim charity run Dates: annual event (start date unknown) Funding: Muslim charity organizations (eg, Islamic Relief Worldwide, Muslim Aid, Muslim Hands)	Victoria Park, London	<ul style="list-style-type: none"> <li>• Annual event</li> <li>• Duration dependent on physical fitness and age</li> </ul>	Islamic faith leaders <ul style="list-style-type: none"> <li>• East London Mosque management committee</li> <li>• Volunteers and activists from various Muslim charity organizations</li> </ul>	No evaluation reported
23 Project name: no name available Dates: ongoing project (start date unknown) Funding: donations from mosque attendees	<ul style="list-style-type: none"> <li>• Sports field located near Jamiyat Tabligh-ul-Islam Mosque, Bradford</li> </ul>	Sessions took place once a day and length of session were 15 to 30 min, but unclear whether participants were expected at all sessions.	<i>Islamic faith leaders</i> <ul style="list-style-type: none"> <li>• Imam</li> <li>• Mosque volunteers</li> </ul>	No evaluation reported.
24 Project name: no name available Dates: 2007 (one-off event) Funding: donations from mosque attendees	Madni Masjid, Bradford	Education provided daily during the month of Ramadhan in 2007. However, frequency and lengths of the sessions were unclear.	Islamic faith leader <ul style="list-style-type: none"> <li>• Mosque volunteers</li> <li>• Healthcare professionals who attend the mosque</li> </ul>	No evaluation reported.
27 Project name: no name available Dates: ongoing (start date unknown)	The clinics are held at Luton Central Mosque, Luton	<ul style="list-style-type: none"> <li>• Drop-in clinic held every 2 wks on Tuesdays</li> <li>• Each session lasts up to 2 h</li> </ul>	Combination <ul style="list-style-type: none"> <li>• Volunteers at the mosque</li> </ul>	No evaluation reported.

(Continues)

TABLE 2 (Continued)

Project Reference, Dates of Project <sup>f</sup> , and Funding Source	Aim	Target Population and Recruitment Methods	Intervention	
			Topic/Area	Intervention Content
30 Project name: active Luton Dates: ongoing (start date unknown) Funding: charity organizations (Team Beds and Luton, Sports England, and The British Lung Foundation)	To promote physical activity	Project recruits those living within Luton Recruitment: The Council of Mosques in Luton encourages mosques within Luton to inform mosque attendees about this programme. Mosque volunteers are also involved in recruiting people to take part	Physical activity	<ul style="list-style-type: none"> <li>The programme consists of various physical activity sessions some of which include swimming, football, golf, and access to the gym</li> <li>There are also sessions for children</li> <li>Other physical activity sessions are arranged, but the details of these are unknown</li> <li>Further details about the sessions (components and those involved) are unknown</li> </ul>
31 Project name: Bury Park Masjid Dates: started 2016 and ongoing Funding: donations from mosque attendees and voluntary support from health professionals	To improve the health and well-being of those who attend the mosque	Those who attend the mosque (Bury Park Masjid, Luton) Recruitment: congregation are informed about the sessions through announcement after prayer. However, the frequency of the announcements and when they are delivered are unknown.	<ul style="list-style-type: none"> <li>Increasing the awareness of diabetes</li> <li>Education on diabetes</li> </ul>	<p>Qualified doctors provide the following services to those attending the mosque:</p> <ul style="list-style-type: none"> <li>Blood glucose test</li> <li>Dietary advice and diabetes education provided; however, it is unclear who this is provided to</li> <li>Details of advice and education are unknown</li> <li>Education about diabetes medication provided; however, in-depth details are unknown</li> </ul>
32 Project name: The Big Iftaar Dates: started 2015, and held once a year Funding: voluntary support from health professional and charity organizations (eg, Luton foodbank)	To encourage social cohesion amongst the community Impetus: a qualified doctor (mosque attendee) raised the importance of educating the community about healthy eating with the mosque management committee	Those who live within Luton Recruitment methods unclear	Dietary education	<p>Qualified doctors provided group education on healthy dietary practices for the month of Ramadhan.</p> <p>Details about the educational session (eg, content or topics covered) are unknown.</p>
34 Project name: Bowel cancer screening project	To increase the awareness of bowel cancer and bowel cancer screening programmes	Those living within Slough. However, the majority of participants included mosque	<ul style="list-style-type: none"> <li>Increased awareness of bowel cancer</li> </ul>	<ul style="list-style-type: none"> <li>Doctors provided education on healthy lifestyles.</li> </ul>

(Continues)

TABLE 2 (Continued)

Project Reference, Dates of Project <sup>f</sup> , and Funding Source	Intervention			
	Setting	Intervention Duration and Frequency	Intervention Delivery Team (and Training)	Evaluation Results
Funding: no funding, intervention carried out on a voluntary basis by a mosque attendee			<ul style="list-style-type: none"> <li>Qualified GP</li> </ul>	
30 Project name: active Luton Dates: ongoing (start date unknown) Funding: charity organizations (Team Beds and Luton, Sports England, and The British Lung Foundation)	The interventions are carried out in various venues within Luton. Details about these venues are unknown.	<ul style="list-style-type: none"> <li>It is unclear whether some of these activities form part of a specific programme, and the length of the programme</li> <li>Activity frequency and the length of the sessions are unknown</li> </ul>	Health professionals/workers <ul style="list-style-type: none"> <li>Staff members at active Luton</li> <li>It is unclear whether mosque volunteers also form part of the intervention team for any of the physical activity sessions.</li> </ul>	No evaluation reported.
31 Project name: Bury Park Masjid Dates: started 2016 and ongoing Funding: donations from mosque attendees and voluntary support from health professionals	Bury Park Masjid	Frequency and duration of sessions are unknown.	Combination <ul style="list-style-type: none"> <li>Mosque volunteers</li> <li>Trained doctors</li> </ul>	No evaluation reported.
32 Project name: The Big Iftaar Dates: started 2015, and held once a year Funding: voluntary support from health professional and charity organizations (eg, Luton foodbank)	Education delivered in a public space outdoors, within city Centre Luton	Length of group education session unknown.	Islamic faith leaders <ul style="list-style-type: none"> <li>Muslim charity organization volunteers</li> <li>Mosque volunteers</li> </ul>	No evaluation reported.
34 Project name: Bowel cancer screening project Dates: 3 June 2016 (one-off event) Funding: Slough CCG and Macmillan Cancer Support	Jamea Masjid and Islamic Centre, Slough	One off-event: 1400 to 1700. Unclear about the frequency and length of the educational sessions provided by the doctors.	Combination <ul style="list-style-type: none"> <li>Qualified doctors</li> <li>Volunteers from the mosque</li> </ul>	No evaluation reported
35 Project name: no name available Dates: ongoing (start date unknown) Funding: donations from mosque attendees	Unclear	Activity club occurs every Sunday, after mosque attendance. Duration: 2 h	<i>Islamic faith leaders</i> <ul style="list-style-type: none"> <li>Volunteers from the mosque management committee</li> </ul>	No evaluation reported.
38 Project name: no name available Dates: started 2015 and ongoing Funding: no funding, intervention carried out on a voluntary basis	Education session within Oldham Central Mosque, Greater Manchester	Duration of the education session: unknown. Advised frequency of hospital visits: unknown.	<i>Islamic faith leaders</i> <ul style="list-style-type: none"> <li>Qualified doctor who was a member of the Mosque community</li> </ul>	No evaluation reported.

TABLE 2 (Continued)

Project Reference, Dates of Project <sup>f</sup> , and Funding Source	Aim	Target Population and Recruitment Methods	Intervention	
			Topic/Area	Intervention Content
Dates: 3 June 2016 (one-off event) Funding: Slough CCG and Macmillan Cancer Support		attendees (Jamea Masjid and Islamic Centre, Slough) Recruitment methods unclear	<ul style="list-style-type: none"> <li>Bowel cancer screening</li> </ul>	<p>However, details of this are unknown</p> <ul style="list-style-type: none"> <li>Education also included the installation of a walk-through bowel model at the mosque</li> <li>Leaflets about bowel cancer and the importance of bowel cancer screening were provided</li> <li>Bowel cancer screening kit provided</li> </ul>
35 Project name: no name available Dates: ongoing (start date unknown) Funding: donations from mosque attendees	Promote outdoor physical activity	Children who attend the madrassa (Jamea Masjid and Islamic Centre, Slough) Recruitment methods unclear	Physical activity	<p>Weekly outdoor activity club, which includes the following components:</p> <ul style="list-style-type: none"> <li>Sports, eg, football</li> <li>Physical exercise sessions</li> </ul> <p>Limited details about the exercise sessions (eg, content and equipment) and other sports activities.</p>
38 Project name: no name available Dates: started 2015 and ongoing Funding: no funding, intervention carried out on a voluntary basis	Enhanced management of those with chronic disease posthospitalization	<ul style="list-style-type: none"> <li>Mosque attendees or linked to a mosque attendee</li> <li>Relative with a chronic condition, who has been hospitalised due to their chronic condition</li> </ul> <p>Recruitment: Mosque volunteers involved in recruiting participants to the programme</p>	<ul style="list-style-type: none"> <li>Education on chronic conditions</li> </ul>	<ul style="list-style-type: none"> <li>Qualified doctor provides education to mosque attendees who are linked to someone with a chronic condition</li> <li>Pain management discussed at the education session; however, no further details about the session are available</li> <li>Participants are encouraged to visit their relatives in hospital to further understand possible issues related to pain management, medication administration, care plans, and personal hygiene.</li> </ul>
39 Project name: no name available Dates: ongoing (start date unknown)	Promote good dietary practices	Children attending madrassa at Oldham Central Mosque, Greater Manchester (Age undefined)	Dietary education	<ul style="list-style-type: none"> <li>Madrassa teacher and mosque volunteers educate children about healthy dietary</li> </ul>

(Continues)

TABLE 2 (Continued)

Project Reference, Dates of Project <sup>f</sup> , and Funding Source	Intervention			
	Setting	Intervention Duration and Frequency	Intervention Delivery Team (and Training)	Evaluation Results
39 Project name: no name available Dates: ongoing (start date unknown) Funding: donations from mosque attendees	Madrassa at Oldham Central Mosque, Greater Manchester	Education sessions occur once weekly.	<i>Islamic faith leaders</i>  • Madrassa teacher • Mosque volunteers	No evaluation reported.
41 Project name: no name available Dates: January 1991-ongoing Funding: Sports Wales	Physical activity This is carried out outside of the mosque, however the venues are unknown Increasing awareness of physical activity Various mosques within Newport, Wales.	Physical activity Unclear: whether the activities happen over a particular period, sports activities frequency and duration. Increasing awareness of physical activity It is unclear how often the imams and volunteers carry out their sessions to raise awareness	<i>Islamic faith leaders</i>  • Imams • Mosque volunteers • Mosque management committee	No evaluation reported.
42 Project name: no name available Dates: ongoing (start date unknown) Funding: donations from mosque attendees	Belfast Islamic Centre, Northern Ireland	Sessions occur every Monday, between 1030 and 1200	<i>Islamic faith leaders</i>  • Session supervised by a female mosque volunteer, however further details about the individual are unknown • Mothers of children are also involved in supervising the sessions	No evaluation reported.
43 Project name: football coaching Dates: ongoing (start date unknown) Funding: donations from mosque attendees	Outdoor pitches at the QUB Sports Centre, Northern Ireland	Sessions occur every Sunday, between 1200 and 1300	<i>Islamic faith leaders</i>  • Mosque volunteers	No evaluation reported.
46 Project name: no name available Dates: ongoing (start date unknown) Funding: donations from mosque attendees	Classes held at a pre-arranged sport venue (specific location unknown)	Classes held once a week (Sundays), for 1 h.	<i>Islamic faith leaders</i> Mosque volunteers arrange and conduct the sessions	No evaluation reported.
47 Project name: no name available Dates: September 2013 and ongoing Funding: donations from mosque attendees	Local park (specific area unknown)	Training sessions occur once a week (Sundays), for 2 h (1000-1200)	<i>Islamic faith leaders</i> Mosque volunteers arrange and conduct the sessions	No evaluation reported.

TABLE 2 (Continued)

Project Reference, Dates of Project <sup>f</sup> , and Funding Source	Aim	Target Population and Recruitment Methods	Intervention	
			Topic/Area	Intervention Content
Funding: donations from mosque attendees		Recruitment methods unclear		<p>practices during the madrasa session</p> <ul style="list-style-type: none"> <li>• Specific topics unclear; however, the teacher and volunteers informed students about the associations between particular foods and preventing/reducing the risk of disease</li> <li>• The source of the educational materials and content are unknown</li> <li>• It is unknown whether the teacher and volunteers have received education or training to deliver this intervention</li> </ul>
41 Project name: no name available Dates: January 1991-ongoing Funding: Sports Wales	To improve access to sports activities and highlight its association with better physical health	<p>Aimed at various populations living in Wales (ethnic minority, asylum seekers, survivors of sexual violence, disabled, travellers, and those who have experienced hate crimes)</p> <p>Charity working with various mosques in Newport, Wales, to encourage the uptake among the Welsh Muslim population</p> <p>Recruitment: Mosque volunteers involved in recruiting participants to the programme</p>	<ul style="list-style-type: none"> <li>• Physical activity</li> <li>• Increasing awareness of physical activity</li> </ul>	<p>Physical activity</p> <ul style="list-style-type: none"> <li>• Mosque attendees encouraged to participate in the charity arranged sports activities</li> <li>• Various sports activities take place outside the mosque grounds such as football and cricket. However, there are limited details about the variety of activities</li> <li>• Activity session content: unknown</li> </ul> <p>Increasing awareness of physical activity</p> <ul style="list-style-type: none"> <li>• Imams and mosque volunteers involved in raising the</li> </ul>

(Continues)

TABLE 2 (Continued)

Project Reference, Dates of Project <sup>f</sup> , and Funding Source	Intervention			
	Setting	Intervention Duration and Frequency	Intervention Delivery Team (and Training)	Evaluation Results
48 Project name: Muslim Youth Foundation Dates: ongoing (start date unknown) Funding: donations from mosque attendees	Muslim Youth Community Centre, Manchester	<ul style="list-style-type: none"> <li>• Boxercise classes</li> </ul> <p>Four times a week (Monday to Thursday), 2000-2100</p> <ul style="list-style-type: none"> <li>• Aerobic classes (for women)</li> </ul> <p>Once a week (Wednesday), 2000-2100</p> <ul style="list-style-type: none"> <li>• Table tennis</li> </ul> <p>Every day, 1200-onwards (specific timings unknown)</p> <ul style="list-style-type: none"> <li>• Football</li> </ul> <p>Once a week (Sunday), 2000-2100</p>	Islamic faith leaders Community centre volunteers arrange and conduct the sessions	No evaluation reported.
49 Project name: no name available Dates: ongoing (start date unknown) Funding: donations from mosque attendees	Exercise held in a premises owned by Ashton central Mosque in greater Manchester	Twice a week (Monday and Wednesday), 1300-1430	<p><i>Islamic faith leaders</i></p> <ul style="list-style-type: none"> <li>• Mosque volunteer (who was a qualified trainer)</li> </ul>	No evaluation reported.
50 Project name: active sisters (a Muslim charity) Dates: ongoing (start date unknown) Funding: sporting equal	Various venues throughout London	Daily/weekly classes, duration of 1 to 2 h each. Specific session details are unknown	<p><i>Muslim charity</i></p> <ul style="list-style-type: none"> <li>• Muslim charity organizations (deliver sessions)</li> <li>• Active sisters (also deliver sessions)</li> </ul>	No evaluation reported.
51 Project name: no name available Dates: since 2007 and onwards Funding: NHS	Birmingham Central Mosque, Birmingham	These sessions are held a few times a year (exact number unknown), and for a few hours during the day.	<p><i>Health professionals/workers</i></p> <ul style="list-style-type: none"> <li>• Qualified doctors</li> <li>• Details of other healthcare professionals involved in delivering the programme are unknown</li> </ul>	No evaluation reported.

TABLE 2 (Continued)

Project Reference, Dates of Project <sup>f</sup> , and Funding Source	Aim	Target Population and Recruitment Methods	Intervention	
			Topic/Area	Intervention Content
				<p>awareness of sports activities and its benefits related to improved health of mosque attendees</p> <ul style="list-style-type: none"> <li>• The content of these discussions are unknown</li> <li>• Imams inform mosque attendees after prayer(s)</li> <li>• Volunteers approach individuals and raise awareness through 1:1 discussions</li> </ul>
<p>42 Project name: no name available Dates: ongoing (start date unknown) Funding: donations from mosque attendees</p>	To promote physical activity among toddlers (age undefined by mosque)	Children of mosque attendees at Belfast Islamic Centre, Northern Ireland Recruitment: imam and mosque volunteers raise awareness of the session and recruit participants	Physical activity	<ul style="list-style-type: none"> <li>• Purpose developed room within the mosque to encourage physical activity among toddlers of parents who attend</li> <li>• Room contains various play equipment; however, further details are unknown</li> <li>• The sessions are supervised; however, further details are unknown</li> </ul>
<p>43 Project name: football coaching Dates: ongoing (start date unknown) Funding: donations from mosque attendees</p>	To promote physical activity among children aged 7 to 16 years	Children (7 to 16 years) attending Belfast Islamic Centre, Northern Ireland Recruitment methods unclear	Physical activity	<ul style="list-style-type: none"> <li>• Football coaching/training</li> <li>• Football matches among children who attend the mosque</li> </ul>
<p>46 Project name: no name available Dates: ongoing (start date unknown) Funding: donations from mosque attendees</p>	To promote physical fitness	Children attending Ilford Central Mosque, Redbridge. Recruitment methods unclear	Physical activity	<p>Boxing classes held for two groups:</p> <ul style="list-style-type: none"> <li>• Children aged 5 to 12 years</li> <li>• Females aged 8 to 13 years</li> </ul>
<p>47 Project name: no name available Dates: September 2013 and ongoing Funding: donations from mosque attendees</p>	To promote physical fitness	Children (6 to 16 years) attending Seven Kings Mosque, Redbridge. Recruitment methods unclear	Physical activity	<ul style="list-style-type: none"> <li>• Football, which involves training and match competitions</li> </ul>

TABLE 2 (Continued)

Project Reference, Dates of Project <sup>f</sup> , and Funding Source	Intervention			
	Setting	Intervention Duration and Frequency	Intervention Delivery Team (and Training)	Evaluation Results
52 Project name: no name available Dates: 2002 to 2005 Funding: Public Health England	It is unclear where the volunteers were trained. The education sessions were either delivered in the mosque, or in the home of those who have a family member with a chronic condition.	Six-week training programme for volunteers. Details about the education session(s) length and frequency are unknown.	<i>Combination</i> • PHE • Sufi Trust • Sufi Trust volunteers	Evaluation of process or implementation only: Number of volunteers trained: n = 6 Number of people who received education from volunteers trained: n = 400
53 Project name: Active weekends Dates: since 1998 and ongoing Funding: Sufi Trust (a Muslim charity)	The location of these residential weekends is unknown.	Sessions are carried out over 2 days (Saturday and Sunday), however the frequency of these residential weekends is unknown.	<i>Muslim charity</i>  • Sufi Trust volunteers	No evaluation reported.
54 Project name: Interfaith games Dates: since 2015 and ongoing Funding: Football Association of England, Islamic relief worldwide	Sports halls and play grounds at various locations in Birmingham	Sports gala occurs once a year. Duration of football training/practice unknown. Football match length: 50 min	<i>Islamic faith leaders</i> Muslim schools, in collaboration with the with the England Schools Football Association (ESFA)	No evaluation reported.
55 Project name: Youth project Dates: ongoing (start date unknown) Funding: donations from mosque attendees	A venue owned by the mosque, located close to Ghausia Mosque, Pendle.	Duration and frequency of classes/sessions are unknown.	<i>Islamic faith leaders</i> Mosque volunteers	No evaluation reported.

TABLE 2 (Continued)

Project Reference, Dates of Project <sup>f</sup> , and Funding Source	Aim	Target Population and Recruitment Methods	Intervention	
			Topic/Area	Intervention Content
48 Project name: Muslim Youth Foundation Dates: ongoing (start date unknown) Funding: donations from mosque attendees	To promote physical activity	Muslims attending Muslim Youth Community Centre, Manchester. Recruitment methods unclear	Physical activity	Various physical activity sessions are held by the volunteers from the community centre. These include the following: <ul style="list-style-type: none"> <li>• Boxercise classes</li> <li>• Aerobic classes (for women)</li> <li>• Table tennis</li> <li>• Football</li> </ul>
49 Project name: no name available Dates: ongoing (start date unknown) Funding: donations from mosque attendees	To promote physical fitness	Those who attend Ashton Central Mosque, Greater Manchester. Recruitment methods unclear	Physical activity	<ul style="list-style-type: none"> <li>• Qualified physical activity trainer supervises exercise sessions, which include stretching exercises, resistance training (using weights) and skipping.</li> <li>• Specific details of the content are unknown</li> </ul>
50 Project name: active sisters (a Muslim charity) Dates: ongoing (start date unknown) Funding: sporting equal	To improve physical fitness	Muslim women living within London Muslim charity organizations and active sisters are involved in raising awareness of the project and recruiting participants. Recruitment methods unclear	Physical activity	Organization has a number of premises/venues in London (number unknown). Physical activity equipment available at venue as well as various physical activity classes: <ul style="list-style-type: none"> <li>• Gym facilities</li> <li>• Exercise classes (eg, aerobic and Zanga Zanga classes)</li> <li>• Outdoor sports such as football, cycling, basketball, running</li> </ul>
51 Project name: no name available Dates: since 2007 and onwards Funding: NHS	Promote health awareness	Those who attend Birmingham Central Mosque, Birmingham  Recruitment: mosque volunteers are involved with recruitment	<ul style="list-style-type: none"> <li>• Screening for diabetes and cardiovascular disease</li> <li>• Increasing awareness</li> </ul>	<ul style="list-style-type: none"> <li>• Health stall setup by NHS healthcare professionals (doctors) within the mosque</li> <li>• Mosque attendees are invited to visit this stall for a diabetes and cardiovascular "check-up"</li> </ul>

(Continues)

TABLE 2 (Continued)

Project Reference, Dates of Project <sup>f</sup> , and Funding Source	Aim	Target Population and Recruitment Methods	Intervention	
			Topic/Area	Intervention Content
52 Project name: no name available Dates: 2002 to 2005 Funding: Public Health England	To enable members of the mosque to become active health champions and educate mosque attendees	Volunteers from the Sufi Trust, Birmingham, were approached to take part in the training programme. Volunteers delivered education to those who attended Birmingham Central Mosque, Birmingham. Recruitment methods to the education sessions were unclear.	<p>of these long-term conditions</p> <ul style="list-style-type: none"> <li>Education on chronic conditions</li> </ul>	<ul style="list-style-type: none"> <li>Further details about tests, equipment, or information provided to participants is unknown</li> <li>Public Health England provided a 6-week training programme to volunteers who were part of the Sufi Trust</li> <li>Training topics included medication management, terminal illness management, and pain management.</li> <li>Specific details of the training programme are unknown</li> <li>Trained volunteers provided education on these topic areas to those who attended the mosque</li> <li>Further details of the education session(s) are unknown (how they were delivered and what was included)</li> </ul>
53 Project name: Active weekends Dates: since 1998 and ongoing Funding: Sufi Trust (a Muslim charity)	To promote healthy living	Muslim mothers and children who live in Birmingham Recruitment methods unclear	<ul style="list-style-type: none"> <li>Physical activity</li> <li>Increasing the awareness of obesity</li> <li>Education on obesity</li> </ul>	<ul style="list-style-type: none"> <li>Weekend sessions are arranged, known as "residential weekends" for Muslim mothers and children</li> <li>Various physical activity sessions take place during these weekends, eg, running and sports</li> <li>Unclear what other information, content or activities take place during these weekend sessions</li> <li>Education on the benefits of physical activity; however, further details are unknown.</li> </ul>
54 Project name: Interfaith games Dates: since 2015 and ongoing	Promoting fitness and physical activity in children	Children who attend a Muslim school—predominantly those in Birmingham	Physical activity	<ul style="list-style-type: none"> <li>Football league</li> </ul>

(Continues)

TABLE 2 (Continued)

Project Reference, Dates of Project <sup>f</sup> , and Funding Source	Aim	Target Population and Recruitment Methods	Intervention	
			Topic/Area	Intervention Content
Funding: Football Association of England, Islamic relief worldwide		Recruitment methods unclear		<ul style="list-style-type: none"> <li>• Further details about the football league (who is involving, etc) are unknown</li> <li>• Annual sports gala, which includes various sports competitions (athletics, netball etc)</li> </ul>
55 Project name: Youth project Dates: ongoing (start date unknown) Funding: donations from mosque attendees	Unknown	Mosque attendees at Ghausia Mosque, Pendle, Lancashire. Recruitment methods unclear.	Physical activity	<ul style="list-style-type: none"> <li>• Mosque volunteers arrange physical activity classes which include boxing, jiu-jitsu, and table tennis</li> </ul>

<sup>a</sup>Banerjee ET, Landry M, Zawi M, Childerhose D, Stephens N, Shafique A, et al. A pilot examination of a Mosque-based physical activity intervention for South Asian Muslim women in Ontario, Canada. *J Immigr Minor Health* 2017;19(2):349–357.

<sup>b</sup>East London Mosque, London Muslim Centre. Faith in Health 2017. Available from: <http://www.eastlondonmosque.org.uk/content/faith-health>.

<sup>c</sup>Streatham Mosque. Daily activities at Masjid 2017. Available from: <http://www.streathammosque.org/>.

<sup>d</sup>Ipswich mosque. Activities 2017. Available from: [http://www.ipswichmosque.org/our\\_aims.php](http://www.ipswichmosque.org/our_aims.php).

<sup>e</sup>Public Health England. Guide to Healthy Living: Mosques 2017. Available from: [www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/619891/Guide\\_to\\_Healthy\\_Living\\_Mosques.PDF](http://www.gov.uk/government/uploads/system/uploads/attachment_data/file/619891/Guide_to_Healthy_Living_Mosques.PDF).

<sup>f</sup>“Ongoing” at the time of data collection.

number 27). Two projects (numbers 10 and 24), which focused on healthy eating, took place during Ramadhan.

Eight projects (35, 39, 42, 43, 46, 48, 49, 50) ran one or more weekly sessions, and these focused on physical activity and exercise; it was unclear for how many weeks these ran and some projects appeared to be ongoing (at the point of writing this manuscript). Three of these eight projects ran sessions to coincide with prayer attendance at the mosque or madrassa. For example, project number 35 aimed to promote outdoor physical activity in children through a weekly activity club every Sunday after mosque services. Project number 39 aimed to promote a healthy diet in children through a weekly activity club for children attending a madrassa. Project number 42 aimed to promote physical activity among toddlers during a weekly session for mothers in an Islamic centre.

Next, we describe a variety of generic intervention development and implementation factors for all of the health promotion interventions we identified ( $n = 56$ ): *funding source*, *impetus*, *target population and recruitment methods*, *intervention setting*, *intervention delivery team (and any training and support they received)*, and *evidence for intervention content being embedded in religious teaching*. Factors which appear to increase the acceptability and impact of a health promotion intervention in IRS may be usefully translated for interventions which aim to tackle obesity in these settings.

### 4.3 | Funding source for the intervention

Information on funding source was available for 40 of the 56 interventions. All five studies identified by searching the bibliographic databases were funded through, at least in part, research funding bodies. Interventions which were identified from grey literature or grey information were funded by donations from congregants ( $n = 12$ ) or by volunteering to organize and run the intervention ( $n = 3$ ), and one intervention was funded by the mosque. Nine interventions were funded by charity organizations (often a combination of charities, including Muslim charity organizations), and a further nine interventions were primarily funded by local health authorities or local councils. One intervention was funded by a number of organizations including a bank, local health authority, and local businesses. The funding source for the remaining interventions was unclear.

### 4.4 | Impetus for the intervention

The impetus for the five interventions identified by the bibliographic databases was clear and is detailed in the published research papers. For all but five interventions identified by the grey literature search or information requests for grey information, the impetus for the intervention (ie, why was this particular intervention chosen, rather than a different intervention) was unclear.

For one intervention (project number 22), Islamic leaders, mosque volunteers, and the Council of Mosques wanted mosques to be viewed by Muslims as being involved in important activities other than prayer. For another intervention (project number 28), the suicide of

three community members led an imam to voluntarily undergo counselling training and provide counselling services for all mosque attendees. The impetus for projects 32 and 37 came from a physician congregant who raised the importance of educating the community about healthy eating, and sexual health and pregnancy, respectively, with the mosque management committee. The impetus for project 40 came from Public Health Wales that included a strategy to approach and educate mosque Imams in their Screening for Life programme.

### 4.5 | Target population and recruitment methods

The target population and recruitment methods for the five interventions identified by the bibliographic databases were clear and are detailed in the published research papers. For health promotion interventions that were relevant to the whole community, the target population was the congregation of the IRS (usually the mosque). Potential participants were recruited using posters and leaflets which were distributed in the IRS setting by faith leaders (and sometimes researchers directly), and announcements after communal prayers. The addiction recovery service intervention specifically targeted Muslims on a methadone treatment waiting list at a local hospital, and the awareness raising training programme on family health for Islamic religious leaders appeared to randomly select participants.

For interventions identified by the grey literature search or information requests for grey information, the target population and recruitment methods were generally unclear or not stated. However, where information was provided for health promotion interventions that were relevant to the whole community, the target population was the congregation of the IRS (usually the mosque). The most commonly reported method of recruitment was via an announcement after communal prayers. However, information about who carried out the announcement, its frequency, and whether it was carried out after a specific prayer was unavailable for most of the interventions. Potential participants were also recruited using posters and leaflets, which were distributed in the IRS by members of the mosque (and sometimes researchers directly). Various types of members of the mosque were reported as being involved, including mosque volunteers, a imam, religious teacher, or religious leader. One intervention (project number 37), which aimed to increase awareness of sexual health and which targeted women, also used an existing social media group (WhatsApp instant messaging) and approached mosque attendees in person during their visit to the mosque. A few of the interventions targeting children stated that they recruited participants through madrassa classes at the mosque, and one intervention targeted children attending an Islamic school.

### 4.6 | Intervention setting

Most interventions ( $n = 34$ ) were reported to be carried out in either a mosque (or a site owned by the mosque), madrassa, mens' or womens' halaqas, a Muslim youth centre, or a combination of these settings.

Thirteen interventions (mainly physical activity interventions) were reported to take place in a range of local outdoor (eg, parks) or indoor (eg, leisure centre, school) public spaces. For nine interventions, the exact setting was unclear.

#### 4.7 | Intervention delivery team (and any training and support they received)

Where stated ( $n = 45$  in total), interventions were delivered by Islamic faith leaders ( $n = 20$ ), health professionals/workers ( $n = 7$ ), Muslim charities ( $n = 2$ ), nonreligious charities or social enterprises ( $n = 2$ ), or by a combination of these individuals and organizations ( $n = 14$ ). No detailed information was provided about any training for nonhealth professionals/workers who were responsible for delivering the interventions.

The 20 interventions that were delivered by Islamic faith leaders were delivered by a range of members of the mosque community, including mosque volunteers, an imam, religious teacher, or religious leader. Four of these 19 interventions were delivered by an Islamic faith leader within the mosque community who was also a health professional/worker (project numbers 24, 37, 38, 49). One of these 19 interventions (project number 54) was delivered by teachers at Muslim schools in collaboration with the Football Association of England. Two interventions were delivered by Muslim charities (project numbers 50, 53).

The seven interventions that were delivered by health professionals/workers focused mostly on medical conditions or mental health. The two interventions that were delivered by nonreligious charities or social enterprises included one intervention which aimed to promote cycling and physical activity (project number 19) and one which aimed to promote health and well-being for people with disabilities (project number 45).

Fourteen interventions were delivered by a combination of Islamic faith leaders, Muslim charities, health professionals/workers, and nonreligious charities or social enterprises.

#### 4.8 | Evidence for intervention content being embedded in religious teaching

Where stated, interventions were usually delivered during or after prayers, halaqas meetings, Quran, or madrassa classes. One intervention (project number 1) assessed the acceptability and feasibility of using a tailored sermon that included theologically framed health messaging. Another intervention (on addiction treatment, project number 4) included a brief spiritual component of prayer and discussion on the Islamic view on addiction and how to use faith to manage addiction, delivered by an Imam. Another intervention, a training programme for religious leaders on family health (project number 5), was guided by the Religious Leaders' Training Manual on Family Health.<sup>33</sup> An intervention (project number 21) to improve the health and fitness of Muslim women included advice on issues relating to cultural and religious barriers to increasing physical activity levels. Project number 26 "Smile

with the Prophet" included a session delivered by the imam on the importance of dental hygiene linked to Islamic teaching.

#### 4.9 | Evaluation of the 56 health promotion interventions

Four evaluations (project numbers 2, 3, 4, 5) included preintervention and postintervention outcome assessments: two controlled trials and two pre and post studies. These four interventions were published in research journals and identified from bibliographic databases. All four of these interventions received research funding and included some process and outcome evaluation. For the purposes of this review, we were most interested in process evaluations and information which could be usefully translated to inform the design of interventions to tackle (prevent or treat) obesity in IRS. We were particularly interested in any information on the reach of interventions.

Only one of the four evaluations reported recruitment and retention rates, which appeared to be relatively high in IRS. In project number 2, conducted in the United Kingdom, 79% of IRS agreed to take part in the study, and 74% of households invited to participate agreed; 100% of IRS remained in the study throughout, as did 81% of households. From this one study (which was a smoke-free home intervention), recruitment and retention rates appear to be relatively high in IRS.

All four of the evaluations reported on some aspect of acceptability of the intervention, but the results from three of the evaluations were general and did not provide any useful information for the purposes of this review. One study (project number 2) conducted a separate qualitative study and highlighted a number of facilitators and barriers to the delivery of the intervention. The reported facilitators included the importance of flexibility in session delivery, having systems in place which involve women and children (if the intervention is targeted at these groups), independence of religious teachers and support of the mosque chair, and the correct personal characteristics (skills and motivation) of the religious leader to engage the mosque community with the intervention. Barriers to the delivery of the intervention included the diverse settings (eg, the culture/ethos or organizational structure of the setting), which led to difficulties in delivering a standardized intervention in the participating settings.

Another five interventions which included an evaluation (project numbers 7, 19, 22, 37, 52) were identified in the grey literature or grey information and reported very limited information on one or more of the following: numbers of participants taking part in the intervention, response or retention rates, numbers of measurements taken in total, and/or the acceptability of the intervention(s) to the participants. The data reported were not deemed to be of sufficient quality (and at high risk of bias) to provide any useful evidence that could be used to help inform intervention development or delivery.

## 5 | DISCUSSION

We found evidence of a variety of health promotion interventions associated with obesity in IRS in all areas of the United Kingdom that

were targeted for study. The majority of interventions were only identified in the grey literature and grey information, sometimes in locally produced reports that were not available on websites or the internet, but more often only in people's memories. We asked those people who had provided us with grey information if they thought it would be useful to record a detailed description of the content and delivery of their intervention, so that others could find it through searching the internet. Their view was that this was not a priority. Our findings support those of Adams et al,<sup>29</sup> who concluded that information on the nature and range of public health interventions, and evaluations of them, may be predominantly, or only, held in grey information.

The most successful approaches to organizations or individuals for relevant grey information were through telephone calls or face-to-face conversations, rather than emails. Using personal contacts (ie, knowing the name of the person being contacted and using their name when making a call or sending an e-mail) and exploiting existing connections were deemed to contribute to success. In addition, the positionality of the researchers relative to the ethnic, linguistic, and religious status of the UK communities we attempted to contact for this study was deemed to contribute to success. Using researchers who could be considered community insiders, who have a meaningful personal understanding of the culture and faith associated with IRS and the communities they serve, was deemed to contribute to success. SD was responsible for making most of the requests for information, and KR made a few requests in Birmingham. SD is male, Muslim, Pakistani, of Punjabi origins, and is fluent in Punjabi, Urdu, Arabic, Farsi and English. KR is female, Sikh, British Indian, and is fluent in Punjabi and English. It appeared to be the case that there was more success if the approach for information was made by a man rather than a woman. KR found that, on some occasions, she was required to have a male colleague with her to facilitate discussions or access.

The fact that we encountered significant difficulties in gaining access to the Muslim community, even as community insiders, has implications for the time, cost, and relevant skills and characteristics of project researchers. Our findings support those of others and underscore the importance of the positionality of researchers who are responsible for gaining access to mosque communities and in turn promoting and delivering projects for the Muslim community.<sup>34,35</sup>

We found that most interventions identified through the grey literature and grey information were poorly described and rarely evaluated. We appreciate that the Template for Intervention Description and Replication (TIDieR) framework\* is a very useful method for standardizing intervention description<sup>36</sup> and should be used where resource and skills are available. Where these are not available and/or those delivering the intervention do not consider this effort a priority, we suggest that researchers work alongside the delivery team to capture (for example, through conversation, as we did) the detail

required. Individuals in IRS that we spoke to were, without exception, willing to provide as much detail as they could through conversation.

The majority of health promotion interventions associated with obesity in IRS included at least some advice on physical activity and/or diet, with around half focusing specifically on these behaviours. Some, particularly those with a physical activity component, included separate classes and age-appropriate exercises for children, and separate sessions and sex-appropriate exercises for women. Most physical activity interventions were group based and many involved walking groups or informal (rather than competitive) team games. Indeed, Jepson and colleagues<sup>37</sup> found that Muslims living in Scotland described the main motivators for taking part in physical activity were external motivators (ie, undertaking physical activity as a means to an end, which included the opportunities that physical activity provided for social activity and enjoyment). Cross-Bardell and colleagues<sup>38</sup> reported similar findings from their qualitative study of Muslims living in East Midlands, UK; respondents emphasised using a social approach for potential physical activity and diet interventions, undertaking activity with family or friends and with bilingual community peers to facilitate engagement, motivation and support.

The level of detail of the content and delivery of the interventions that were identified from the grey literature and grey information was unclear or limited. It was not clear, for example, whether the participants received any written advice in hard copy, by email, or internet site. However, evidence suggests that Muslims living in the United Kingdom favour spoken content and delivery of physical activity and diet interventions, including personal stories, within local informal rather than provider settings.<sup>38</sup> It is reasonable to assume that interventions delivered in this way are less likely to be described in detail in writing.

We found some evidence to suggest that the promotion of the intervention by religious leaders was done in the context of the Islamic faith. Indeed, references advocating physical activity can be inferred from the Qur'an and Prophetic tradition/saying (Hadiths), which share the common theme of maintaining respect for the body. The following Hadith narrated by Aisha, wife of the Prophet Muhammad, not only serves to promote walking and running as physical exercise but also shows that this benefit relates to women and men equally.

"I raced with the Prophet (p.b.u.h.) and beat him in the race.

Later, when I had put on some weight, we raced again and he won."  
[Noumani,<sup>39</sup> quoting Abu Dawud, Hadith number 2572]

One study, which assessed the feasibility of developing (in coproduction with resident imams) and delivering tailored sermons (included theologically framed health messaging), found that the intervention was well received by all members of the mosque community.<sup>3</sup> These findings support those of recent studies that suggest that strategies for leveraging religious concepts to promote health among Muslims have value.<sup>40,41</sup>

Most of the interventions we identified were inspired and run by members of the mosque community or Muslim organizations, the impetus being the personal experience of a member of the congregation or instruction from Mosque leaders. The most common

\*To improve the completeness of reporting, and ultimately the replicability, of interventions, an international group of experts and stakeholders developed the Template for Intervention Description and Replication (TIDieR) checklist and guide. The resultant 12-item TIDieR checklist and guide provides, for each item, an explanation, elaboration, and examples of good reporting.

recruitment method was via announcements after prayers, and faith leaders appear supportive of health promotion interventions. This method of recruitment appears to promote a relatively high reach (recruitment and retention rate), which in turn may militate against intervention-generated inequalities.<sup>42</sup> Indeed, Jepson and colleagues<sup>37</sup> found that role models were seen by South Asians living in Scotland as important for inspiring and motivating people to undertake physical activity interventions that they may otherwise lack confidence in. Findings from an ongoing systematic review conducted by Mustafa and colleagues,<sup>43</sup> which aims to elucidate the role and effectiveness of imams and mosques in health promotion in Western societies, may highlight more insights for intervening in these settings.

It is clear that most health promotion interventions in IRS are not associated with any public funding. Most activities are volunteer-led (often members of the congregation who are health professionals) and funded by congregant donations and/or Muslim organizations. We did not hear, in our conversations with people, that this approach was a result of the fact that they had applied for public funding and had been rejected. The approach of volunteering their own time and resources was not something that any of the people we talked to complained about, or found unusual. As for many other religious faiths, it is central to the Muslim identity to feel care and compassion for one's fellow human beings. As well as the indisputable benefits for those receiving charity, Islam also highlights the spiritual need of those with wealth to give some of it away selflessly. In the Qur'an, Allah emphasises that charity should be given in "prosperity or adversity" (Al-Quran, 3:134). Indeed, one of the five central pillars of Islam is zakat, or alms-giving—the obligatory tax due on an adult Muslim's wealth every year, making charity an undeniable cornerstone of the faith.

A number of national and international organizations and agencies have suggested that faith-based organizations and groups, including IRS, should be the focus of greater efforts to promote health. Recently, the World Health Organization published their Global Action Plan on Physical Activity, in which action 3.3 is to "enhance provision of, and opportunities for, more physical activity programmes and promotion in ... faith-based centres, to support participation in physical activity, by all people of diverse abilities".<sup>44</sup> We suggest that health promotion in IRS should be supported by public funding, health professional, and academic researcher input, where that is welcome, and researchers should work in coproduction with faith leaders in IRS. Such support should be informed and sensitive to the Islamic norms and culture in these settings, which highly value health and the benefits of physical activity and a healthy diet. We suggest that this support should focus on working in partnership with faith leaders in IRS to help them develop, deliver, and evaluate health promotion interventions. Where relevant, this should include training programmes (train the trainer) to upskill those delivering the intervention in IRS.

Previous studies have indicated that faith-based organizations and settings are natural partners for the delivery of health promotion programs due to a number of factors.<sup>45-48</sup> These factors include their role as community centres; access to large segments of the population, especially underserved groups; supportive infrastructure (eg, health ministries, communication channels, regularity of contact); presence

of support networks (eg, prayer groups); and personnel resources (eg, volunteers, lay leaders, and champions). Although the majority of the existing evidence base comes from church-based organizations in America, and particularly the black African-American community, we suggest that the learning from research in these settings could be translated for IRS in the United Kingdom. In particular, we suggest that the learning around barriers to access and intervention implementation that were addressed in these projects by partnering with established community-based religious organizations are highly relevant to health promotion in IRS in the United Kingdom. An excellent example of good practice and potential learning is emerging from *The Racial and Ethnic Approaches to Community Health for Asian Americans* (REACH FAR) project, that is implementing a multilevel and evidence-based health promotion in faith-based organizations serving Asian American communities (Bangladeshi, Filipino, Korean, Asian Indian) across multiple denominations (Christian, Muslim, and Sikh) in New York/New Jersey.<sup>49</sup>

## 6 | CONCLUSION

The current review suggests that IRS are an appropriate setting for health promotion interventions associated with obesity, which may reach a high proportion of the community and reduce inequalities in health. However, it was clear from this scoping review that this is an area severely lacking in evidence. In order to ascertain the potential effectiveness of interventions in this setting, future research should first focus on developing interventions with a sound theory of change and clear specification of key components. This should be done in partnership with IRS and faith leaders to learn from their existing, albeit informal, expertise in this area. Second, high-quality evaluations are needed to evidence the impact of these interventions on health outcomes.

We also suggest that the methods used in this review, including the learning around positionality of researchers, could be adopted by other researchers as a way to best locate opportunities and partners for effective community-level interventions.

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## CONFLICT OF INTEREST

No conflict of interest was declared.

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## SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

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