Cross-sectional study protocol for the Arabic Healthy Weight Project promoting active living and healthy eating among Arabic-speaking communities in South Western Sydney

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ABSTRACT

Introduction The South Western Sydney Local Health District (SWSLHD) is home to nearly 75 000 Arabic-speaking people. Of these, nearly three quarters are overweight or obese and suffer from a range of chronic diseases. To address this, the Health Promotion Service of SWSLHD will conduct a community-based overweight and obesity prevention intervention (Arabic Healthy Weight Project, 2018–2021) with Arabic community members aged between 18 and 50 years. The intervention’s main activities will include a comprehensive social marketing campaign and an ‘Eat-Move-Live Healthy’ programme.

Methods and analysis The project will be evaluated using a pre–postintervention study design to measure changes in practices in relation to physical activity, consumption of vegetables and intake of sugar-sweetened beverages. The evaluation will apply mixed data collection methods. The quantitative data will be collected using a face-to-face survey of 1540 participants from two independent samples (pre: 770 and post: 770). Descriptive and inferential statistical tests will be used to analyse the quantitative data. The qualitative component will use focus group discussions and interviews to evaluate the formative, process and follow-up phases of data collection. A combination of deductive and inductive methods of data analysis will be conducted using NVivo software.

Ethics and dissemination The protocol has been approved by the Human Research Ethics Committee of SWSLHD (HREC/16/LPOOL/303). Findings will be published in peer-reviewed journals.

INTRODUCTION

The state of New South Wales (NSW) in Australia is home to many culturally and linguistically diverse (CALD) communities.1 Over one quarter of NSW residents (27.6%) were born overseas and 31% speak a language other than English at home.1 Arabic is the third most commonly spoken language in NSW.1 South Western Sydney Local Health District (SWSLHD) mirrors this diversity,2 with Arabic-speaking communities, predominately from a Middle-Eastern background, making up the main ethnic group, and with the majority (38 643 or 52% of the total Arabic-speaking communities in SWSLHD) residing in the Bankstown area.2

Arabic-speaking people, like their Australian-born counterparts, suffer from a range of chronic diseases, due in part to unhealthy lifestyles.3 4 Regular physical activity can contribute to better health outcomes and reduce obesity levels and the risk of chronic disease.5 6 A diet high in vegetables can also contribute to improved health.7 Only 36.9% of Lebanese-born people (the main Arabic-speaking group in Australia), however, meet the recommended levels of physical activity, while just 2% meet the recommended five serves of vegetables per day.8

It would seem that physical inactivity is common across most migrant CALD groups for reasons associated with their cultural and religious beliefs, as well as the socioeconomic challenges and environmental barriers they experience. Barriers to physical activity include: a lack of time, reliance on an exercise companion, family responsibilities and cost.11 Although they figure prominently in...
a traditional diet, vegetables are now widely perceived as expensive, time consuming to prepare and far less a priority than meat.

Recent evidence suggests that sugar-sweetened beverages (SSBs) are highly consumed within Australia’s Arabic-speaking communities. Moreover, there is strong evidence of a direct relationship between SSB intake and overweight and obesity, which are, in turn, strongly linked to chronic conditions such as cardiovascular disease and diabetes. 

The literature suggests that interventions are more likely to be effective if they are culturally relevant and tailored, use existing social structures, and involve respected role models. Moreover, interventions also need to be multistrategy and collaborative to address multiple levels of influence, including individual, cultural/societal and environmental factors.

Obesity prevention interventions in the general population also have the potential to be culturally modified for CALD communities. Social marketing approaches, for example, have been effective in increasing physical activity in adults, reducing SSBs and fast-food consumption at home, and changing attitudes and behaviours, particularly when part of a multistrategy approach.

Community-based physical activity classes are considered ‘promising’ when offering free fitness instruction and aerobics in public places (parks, community centres, sports facilities). Walkable urban design in local areas also shows potential, but needs to be rigorously evaluated. Other interventions, such as ‘point of purchase’ strategies, including shelf labels, posters and in-store handouts, have modestly impacted consumption of healthy food.

Evidence also suggests that peer nutrition education can improve knowledge and dietary intake in Latino populations, which benefits may be transferable to other CALD communities.

Intervention: theoretical framework

The over-riding theoretical frameworks for the project strategies are derived from the Anderson model of health utilisation, the Social Cognitive Theory (SCT), and the Transtheoretical Model (TTM) or Stage of Change theory. Dietary and physical activity behaviour change is associated with a range of factors, including predisposing factors (individual beliefs and attitudes towards the behaviour) and enabling factors (knowledge, skills, observation of others, supportive norms, social support and supportive environment). Furthermore, people move through a series of stages in behaviour change as postulated by TTM. In addition, evidence from the SCT, which also focuses on the environment, suggests that there is a constant interaction between the individual, their social and physical environment and their behaviour. Our intervention strategies are designed accordingly.

Intervention description

The intervention will engage role models, use existing social structures, including schools and religious organisations, and be guided by a combination of theories. Planned activities include: delivering campaign messages through social marketing (population level); engaging communities through a grants programme that aims to promote nutritional awareness and encourage physical activity (cultural/societal level); enhancing point of sale/purchase promotions through supermarkets and green grocers (environmental level) and engaging adults in an ‘Eat-Move-Live Healthy’ programme (healthy lifestyle programme) through organisations/schools/religious institutions to provide facilities, promote the programme and recruit participants (individual level). Table 1 outlines the strategies, how they will be implemented, how long they will run for and expected outcomes.

METHODS AND ANALYSIS

This section details the methodology underlying the quantitative and qualitative components. This preintervention and postintervention design consists of two quantitative evaluation phases (baseline and follow-up) and three qualitative evaluation phases (formative, process and follow-up).

Quantitative component

Research and evaluation context

We accept that changes in obesity rates are unlikely to be achieved during the project period (2018–2021); we anticipate, however, that the impact of multistrategy and multilevel project activities may well be reflected in changes in the rates of overweight by the follow-up phase of the project.

We propose that by increasing levels of physical activity (frequency and duration) to the recommended level; by consuming the required number of servings of vegetable and by decreasing the volume and frequency of SSB intake the number of overweight participants will
| Description of component | Expected outcomes |
|--------------------------|-------------------|
| **Population level:**    |                   |
| ► Develop campaign messages (36 weeks across 3 years) through social marketing based on community consultations and baseline survey findings. This will include radio segments (two radio stations), bus advertisement posters, social media and engaging general practitioners. | Changes in knowledge and attitude in relation to frequency and duration of physical activity and vegetable and SSB intake. Changes in social norms regarding physical activity and vegetable intake. |
| **Cultural/societal level:** |                   |
| ► Engage community members through a grants programme (given to community organisations) to promote nutrition and physical activities (six grants per year). | Changes in knowledge and attitude in relation to frequency and duration of physical activity and vegetable and SSB intake. Changes in confidence, skills and practice. |
| ► Community grants are available to support community activities or projects that contribute to the aims of the project. Community grants will be open to community organisations who work with the target group. Ten grants ranging from $1000 to $4500 will be available per phase. |                   |
| ► Applications will be assessed according to the contribution to the aims of the project, reach, achievability and sustainability. |                   |
| ► Promote campaign messages through community events (five per year), community physical activity challenges (three per year) and traditional healthy recipe challenges (one per year). |                   |
| **Environmental level:** |                   |
| ► Enhance point of purchase promotions (12 weeks per year) through supermarkets and green grocers. | Changes in knowledge, attitude, skill, social norms and practices in relation to vegetable and SSB intake. |
| ► Engage organisations via media and social media to develop and implement food guidelines and promote implementation of food policies. The Steering Committee includes: |                   |
| – Minimum of two community members from the target population. |                   |
| – The Arab Council Australia |                   |
| – Uniting |                   |
| – Metro Assist |                   |
| – The Australian National Sports Club |                   |
| – The City of Canterbury Bankstown City Council |                   |
| – The Lebanese Muslim Association |                   |
| ► Bankstown local council to link community members to physical activity infrastructure in the Bankstown area. |                   |
| **Individual level:** |                   |
| Continued |                   |
also decrease. In the longer term, this should lead to an overall reduction in participants’ body mass index (BMI).

Our literature review revealed that only 37% of people with Lebanese background meet recommended levels of physical activity. This project intends, therefore, to effect an incremental increase in physical activity levels by approximately 2.5% per annum and a total of 7% increase in the proportion of people undertaking recommended levels of walking and/or vigorous physical activity (per week) over the life of the intervention. This target is in line with the NSW state’s aim to reduce overall rates of overweight and obesity by 5% by 2020. The clinical significance of such an achievement is supported by the fact that a weight loss of as little as 5%–10% can help to lower blood glucose levels and reduce the risk of developing type 2 diabetes.

In terms of diabetes prevention, there is evidence that increased physical activity, from low levels to up to 1 hour of walking a day, reduce risk. Likewise, a meta-analysis study posited a link between SSB intake, weight gain and health problems such as diabetes. Vegetable intake, on the other hand, is inversely associated with cardiovascular disease (CVD) and heart disease, with 5–6 servings per day is widely believed to reduce CVD and other chronic disease risk. Hence, the evaluation target of a 7% change in primary and other outcome measures will allow demonstration of clinical benefit.

The analysis of physical activity trends in the state of NSW, Australia shows that 7% increase in the proportion of people achieving sufficient level of physical activity over a 3-year period is possible. Guided by this evidence, the authors believe that if the project activities are implemented as planned, a total of 7% absolute increase in the proportion of people that will undertake recommended levels of walking and/or vigorous physical activity (per week) over the life of the intervention could be achievable. In addition, the target population is also expected to change their practices with respect to SSB consumption and intake of vegetables to recommended levels in order to achieve a change in health outcomes. While an absolute change of 7% (from baseline) in reduction of SSBs and increase in vegetable intake is a small change, nevertheless, a small shift in the distribution will lead to a large impact at the population level.

Consultation with project partners and community members confirmed that promoting the practice of taking a regular walk was a simple and effective means of addressing the issue of physical inactivity among Arabic speakers. Since, however, the concept of ‘moderate physical activity’ does not easily translate into Arabic idiom, authors of this study pretested the validated questions on ‘walking and vigorous physical activity’ to ensure more accurate measurement of the primary outcome of this study.

| Description of component | Expected outcomes |
|--------------------------|------------------|
| Engage adults in an Eat-Move-Live Healthy programme (10 per year) will be delivered by bilingual Community Educators through organisations/schools/religious institutions to provide facilities, promote the programme and recruit participants. The purpose of Eat-Move-Live Healthy is to improve nutrition and physical activity skills. Each programme consists of:
  - Four sessions covering key topics of nutrition and physical activity such as sit less move more, choose water as a drink, eat healthy foods as well as practical information and support to implement lifestyle changes and include a group walk at the end of the session.
  - Two booster sessions per programme by inviting all participants who attended the initial four sessions to provide an opportunity to re-engage and get further information. These sessions will focus on achieving a healthy weight and the broader programme objectives based on participants interest and demand at the time. |
| Changes in knowledge, attitude, confidence, skill and practices in relation to frequency and duration of physical activity and vegetable and SSB intake. | SSB, sugar-sweetened beverages. |
Objectives

Primary objective
1. To determine whether the project has increased the proportion of people walking and/or engaging in vigorous physical activity (per week) by 7% from baseline levels.

Secondary objectives
1. To determine whether the project has increased the mean frequency and duration of walking and/or vigorous physical activity (per week) among the participants by 7% from baseline levels.
2. To determine whether the project has decreased the mean volume of SSBs consumed (per day) among the participants by 7% from baseline levels.
3. To determine whether the project has increased the mean serves of vegetables consumed (per day) by 7% from baseline levels.
4. To determine the accuracy of self-reported BMI data.

Research questions
1. To what extent has there been an improvement in weight-related behaviours among adults with Arabic background aged 18–50 years living in Bankstown and surrounding areas of SWSLHD between 2018 and 2021 with respect to:
   - Increased walking and vigorous physical activity practices.
   - Reduced mean volume intake of SSBs.
   - Increased mean serves of vegetables.
   - Changes in overweight and obesity rates.
2. To what extent did the project impact the knowledge and ‘stages of change in behaviours’ (intention, confidence, practice and motivation) leading to improved weight-related behaviours among adults aged 18–50 years, from an Arabic background and living in Bankstown and surrounding areas of SWSLHD between 2018 and 2021?

Evaluation design
This before and after evaluation aims to measure the outcomes of the AHWP (by 2021). The primary outcome measure is to detect 7% change in the proportion of people meeting recommended levels of walking and/or vigorous physical activity. An online baseline survey (n=770) and a follow-up online survey (n=770) will be conducted during the project period. The participants will be recruited using convenient sampling methods, and conducted during the project period. The participants (n=770) and a follow-up online survey (n=770) will be recruited using convenient sampling methods, and conducted during the project period. The participants (n=770) and a follow-up online survey (n=770) will be recruited using convenient sampling methods, and conducted during the project period. The participants (n=770) and a follow-up online survey (n=770) will be recruited using convenient sampling methods, and conducted during the project period. 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Definitions of outcome measures
In this study, the term ‘physical activity’ refers to walking and vigorous physical activity. The secondary outcomes include changes in the proportion of people meeting recommended levels of vegetable and SSB consumption.

Physical activity knowledge
Participants’ knowledge of the physical activity guidelines, particularly recommended frequency and duration, will be measured with two pretested (though not validated) questions: ‘how many times do you think you should do physical activity in a week?’ and ‘how many minutes in total do you think you should do physical activity in a week?’

Physical activity: walking and vigorous practices
Participants will be asked two validated and pretested walking practices questions—in the past week, how many times and for how many minutes did you do any vigorous activity which made you breathe harder or puff and pant (eg, gardening, jogging, cycling, aerobics, tennis, gym work, dancing, swimming etc). A participant involved in ≥150 min of walking accumulated across most days of the week will be considered as having met the recommended level.

Participants will be also asked two validated and pretested vigorous activity questions—in the last week, how many times and how many minutes did you do any vigorous activity which made you breathe harder or puff and pant (eg, gardening, jogging, cycling, aerobics, tennis, gym work, dancing, swimming etc). A participant involved in vigorous physical activity for ≥75 min per week (accumulated on most days of the week) will be considered as having met the recommended physical activity levels.

Height and weight measurement
To the best of our knowledge, the accuracy of self-reported BMI has not been reported for CALD groups in Australia, such as Arabic speakers. Therefore, both self-reported and measured height and weight data will be collected to assess the validity between these measurements and the extent of self-report bias in this project. The self-reported body height and weight will be collected as part of the interview and height and weight measurements will be taken by a trained researcher immediately following the interview. Height will be measured without shoes, with the respondent looking straight ahead, heels together and feet at an angle of 45°, with a wall mounted stadiometer to the nearest 0.1 cm. Weight will be measured to the nearest 0.1 kg on calibrated digital scales. BMI will be computed as weight divided by squared height in kg/m². Overweight is defined as BMI ≥25.0–29.9 kg/m² and obesity defined as BMI ≥30.0 kg/m², according to WHO criteria.

Recommended serves of vegetables
One serving of vegetables is defined as half a cup of cooked vegetables or one cup of raw or salad vegetables. A participant who consumes five serves of vegetables per day will be seen to have met recommended dietary requirements.

Consumption of SSB
Data will be collected on three types of SSBs (excluding diet drinks) consumed in cups per day (one cup=250 mL).
| Evaluation component                | Outcome measures                                                                                           | Method and source of data collection                                                                 |
|------------------------------------|------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| Baseline and follow-up data collection | 1. Self-stated and measured body mass index (weight and height).                                            | Data collection: baseline and follow-up survey questionnaires.                                        |
|                                    | 2. Perceived benefits and barriers to recommended practices in relation to physical activity levels and diet changes. | Sample: two independent samples.                                                                      |
|                                    | 3. Knowledge, self-efficacy and intention to change behaviours in relation to recommended practices in relation to physical activity levels and diet changes. | Sample size: 770 participants of the Arabic-speaking communities.                                       |
|                                    | 4. Actual behaviours in relation to recommended practices for physical activity levels and diet changes.    |                                                                                                       |
|                                    | 5. Awareness and use of physical activity opportunities (organised and unorganised) in the Bankstown area.  |                                                                                                       |
|                                    | The follow-up survey will collect data on participants views on:                                           |                                                                                                       |
|                                    | ► Campaign recall: whether or not campaign messages were seen or heard.                                   |                                                                                                       |
|                                    | ► Impact of the campaign: did it prompt discussion, was it convincing and impact on behaviour.            |                                                                                                       |
|                                    | ► Sources of campaign messages.                                                                         |                                                                                                       |
| Formative evaluation               | Knowledge and attitudes of the community towards healthy lifestyles generally and more specifically in relation to recommended practices in physical activity and dietary changes. | Qualitative: seven focus groups with Arabic-speaking community members.                                 |
| (a) Consultations with community members | Perceived benefits and barriers to recommended practices in relation to physical activity levels and diet changes. |                                                                                                       |
|                                    | Qualitative: seven key informant interviews representing the community-based organisations.               |                                                                                                       |
| (b) Consultations with organisations | 1. Community needs and priorities.                                                                      |                                                                                                       |
|                                    | 2. Mapping of solutions and process of implementation.                                                    |                                                                                                       |
|                                    | 3. Level of participation and support by the community organisations.                                     |                                                                                                       |
| (c) Baseline survey                | Pretesting the baseline questionnaire.                                                                     | Quantitative: 30–40 participants of the Middle Eastern Arabic community.                                |
| (d) Testing materials              | Pretesting of campaign materials.                                                                        | Qualitative: six focus groups                                                                         |
| Process evaluation                 | Data will be collected on:                                                                                | Seven focus groups with participants in Eat-Move-Live Healthy’ programme.                              |
| Evaluation of outcomes of ‘Eat-Move-Live Healthy’ programme | ► Programme coordinators’ experiences in implementation of these programmes (challenges and benefits; strengths and weaknesses of programme), observed changes in participants’ knowledge, skills, confidence or health behaviours. | Ten in-depth interviews with programme coordinators of ‘Eat-Move-Live Healthy’ programme.               |
|                                    | ► Programme reach and participants’ views on satisfaction including any noticed changes in participants’ knowledge, skills, confidence or health behaviours. |                                                                                                       |
|                                    | ► Factors linked with successful implementation.                                                           |                                                                                                       |
| Follow-up (qualitative)            | The qualitative tools aim to elicit information on the perceived impact of the project intervention in bringing about the desired outcomes including the effectiveness and capacity of social and cultural institutions within the Arabic community. | Seven focus groups with participants in Eat-Move-Live Healthy’ programme. Tenc in-depth interviews with programme coordinators of ‘Eat-Move-Live Healthy’ programme. |
Participants will be shown the models of drink sizes to elicit the correct information and be asked—how many cups of soft drink, cordial or sports drinks, such as lemonade or Gatorade, do you usually drink in a day? how many cups of fruit juice or fruit juice drink do you usually drink in a day? and how many cups of sweetened black tea (with sugar) do you usually drink in a day? Apart from the last, these questions were validated and pretested.

Stages of change in relation to recommended physical activity and vegetable intake
Participants will be stratified into two stages of change using a two-step algorithm. In step 1, respondents will be asked to self-rate their vegetable intake and physical activity levels. In step 2, their intentions and confidence regarding increasing these amounts over the next 6 months. Participants with moderate and high vegetable intake and physical activity levels will be categorised into action (adopting healthy behaviour within the next 6 months) or maintenance stage (maintaining healthy behaviour for at least 6 months).

Participants who report a low intake of vegetables or participate in little or no physical activity or do not know their vegetable intake or level of physical activity will be categorised into: (a) precontemplation stage (have no intention of changing their behaviour within the next 6 months); (b) contemplation stage (participants who thought of making change in practices within the next 6 months) and (c) preparation stage (respondents planning to change practices within the next 6 months).

Conduct of research
Questionnaire development
The questionnaire was designed to measure participants’ knowledge and practices around walking and vigorous physical activity, consumption of vegetables, SSB, and BMI. The questionnaire was developed in close consultation with the Arabic community and experts in health promotion, research and evaluation, physical activity and nutrition. Questions on knowledge were validated but pretested on a small sample of Arabic community members. Questions on frequency and duration of walking and vigorous activities and vegetable consumption were adopted from the Active Australia Survey and New South Wales Population Health Survey. These questionnaires have been validated among the Australian population but not necessarily among people of Arabic-speaking background. Questions on Stage of Change in relation to recommended dietary changes were adopted from Chee Yen et al., pretested and adapted for research into physical activity. The questions on SSBs were adopted from the New South Wales Population Health Survey.

Training
Health Promotion Officers, Multicultural Health Workers (MHWs) and Bilingual Community Educators (BCEs) were trained over 3 days by research and evaluation staff on all aspects of data collection procedures using hard-copy or online survey tools. Three MHWs fluent in both Arabic and English were trained as master interviewers who refined the skills of the BCEs. The training period was 1 week and occurred in three stages:
1. Training of three MHWs as master interviewers.
2. Role play sessions by master interviewers to refine their interview skills.
3. Training of BCEs by master interviewers. This team will administer the baseline and follow-up questionnaires via face to face interviews.

Pilot testing
Prior to the baseline interviews, the survey questionnaire was field tested by trained interviewers on a small sample of Arabic speakers to determine the appropriateness of the content, its length and cultural sensitivity. Following pretesting, the questionnaire was shortened from 30 to 20 min. Prior to final administration, the online survey will be piloted with a small number of individuals to ensure appropriateness.

Recruitment and selection of participants
Survey sample size
The total sample for this evaluation consists of 1540 adults from two independent samples (preintervention, n=770; postintervention, n=770) living in the Bankstown area of NSW. A sample of this size, based on a power of 80% and alpha of 0.05, will detect 7% change (from 37% to 44%) in the estimated level of physical activity among participants.

Participants: inclusion criteria and sources of recruitment
Respondents who meet the inclusion criteria: of Arabic-speaking background; live in Bankstown or surrounding area (places with a high proportion of Middle-Eastern residents) and aged between 18 and 50 years will be eligible to participate.

Participants for the preintervention (baseline) and postintervention surveys will be recruited, applying non-probability sampling methods. The sampling frame includes recruitment of participants from a number of settings. These settings include places such as shopping centres, school and cultural events where adults can be approached to participate. This method of recruitment was chosen because other methods have yielded low response rates, logistic difficulties and high costs. To increase robustness and overcome limitations in generalising the findings, three measures will be taken: (i) recruitment of an adequate sample for both baseline and postintervention surveys; (ii) recruitment from multiple but similar sources to address sample variations between the baseline and follow-up participants and (iii) ensure our sample reflects the sociodemographic distribution of the Arabic-speaking communities in the Bankstown area.

Quantitative data management and analysis
Analysis will be performed using the SPSS V.24.0 (SPSS, 2015) for descriptive statistics and statistical significance.
Pearson’s $\chi^2$ test or the Fisher’s exact test to assess associations between sociodemographic characteristics, knowledge levels, intention to change, social cognitive factors and intake of vegetables (adequate/inadequate), levels of physical activity (adequate/inadequate) and SSB consumption (0 SSB/day, occasional SSB, ≥1/day).

Unpaired t-test to compare the mean differences between preintervention and postintervention data for:
(a) knowledge of recommended physical activity levels and vegetable intake, (b) amount of physical activity (walking and vigorous activity), (c) serves of vegetable intake per day and (d) volume of SSBs per day. The paired t-test will be used to assess the differences between self-reported and measured BMIs. One way analysis of variance (ANOVA) and factorial (two-way) ANOVA will be used to test for significant differences (using Tukey’s HSD test) in the mean of outcome variables by sociodemographic characteristics. Non-parametric tests will be used as appropriate. To examine the relationship between predictor variables and dependent variables, binary or linear regression tests will be conducted. Univariate regression will be initially used to examine the relationship between predictor and dependent variables. Significant variables from the univariate regression models will then be entered into a multivariable regression model, and the backward selection will be used to derive the final model. Associations will be presented as adjusted ORs with 95% CIs. We will adjust for baseline lifestyle variables, such as BMI, physical activity and SSB-consumption levels and key sociodemographic variables such as age, gender and education levels, in the regression models.

### Table 3: Survey instrument—sequence and details of survey items

| Physical activity                        | Questions                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Knowledge of physical activity          | Two items: How many times per week and how many minutes per week?                                                                                                                                                                                                                                                                       |
| Walking continuously for 10min          | Two items: How many times per week and how many minutes per week?                                                                                                                                                                                                                                                                       |
| Vigorous physical activity              | Two items: How many times per week and how many minutes per week?                                                                                                                                                                                                                                                                       |
| Awareness and use of physical activity opportunities | Six items: Are you aware of and do you use any of the following physical activity opportunities in the Bankstown area? Cycle ways, walking tracks, parks, outdoor gyms, walking groups and others.                                                                                                                                                 |
| Physical activity—Stages of Change      | Six items: precontemplation/contemplation (no intention); planning (intention) action (practising) and maintenance (practising regularly).                                                                                                                                                                                                      |
| Physical activity—perceived barriers/enablers | Four items: the following statements ask your opinion about your physical activity: (multiple response—tick all that apply). I have the time to do physical activity; I don’t have people to do physical activity with; Family responsibilities do not make it difficult to be physically active; It is expensive to do physical activity. |
| Sedentary behaviour                     | One item: Currently, on average, how many minutes per day do you spend sitting? (eg, watching television, using computer, smart phones, for pleasure).                                                                                                                                                                                      |
| Nutrition                               |                                                                                                                                                                                                                                                                                                                                                                                                    |
| Actual vegetable intake                 | One item: How many serves of vegetables do you usually eat each day? (include fresh, frozen and tinned vegetables and legumes eg, lentils, chickpeas etc). One serve = ½ cup cooked or 1 cup of salad vegetables.                                                                                                                                 |
| Knowledge of recommended vegetables intake | One item: How many serves of vegetables do you think you should eat each day? (include fresh, frozen and tinned vegetables and legumes eg, lentils, chickpeas, etc) One serve = ½ cup cooked or 1 cup of salad vegetables.                                                                                                             |
| Vegetable intake—Stages of Change       | Six items: precontemplation/contemplation (no intention); planning (intention) action (practising) and maintenance (practising regularly).                                                                                                                                                                                                      |
| Vegetable intake—perceived barriers/enablers | One item: the next question asks your opinion about eating enough vegetables. Vegetables are expensive to buy; Preparing vegetables takes a lot of time; I feel confident preparing vegetable dishes; It is more important to eat other foods eg, meat—is this an open ended question or do we give options? |
| Sugar-sweetened beverage                | Three items: How many cups of SSB per day; How many cups of fruit juice per day? How many cups of black tea (with sugar) per day?                                                                                                                                                                                                            |
| Body mass index                         | Two items: self-reported height (cm) and weight (kg) Two items: objectively measured height (cm) and weight (kg)                                                                                                                                                                                                                           |
| Demographic variables                   | Gender, age, income, employment status, marital status, education, main language spoken at home, born in Australia, year of migration, use of social media, main type of social media used.                                                                                                                                                |
that individual participants will not be identifiable. Prior to analysis, and findings will be reported in a way that can identify a participant will remain confidential. The confidentiality of participants and information collected from them will be protected and remain unidentifiable in the dissemination of findings. To ensure that the findings of this project are useful and accessible, we will, in conjunction with our stakeholders, disseminate our findings to a range of audiences. Our results will be summarised in lay language (in both Arabic and English) and also share our findings with colleagues at academic conferences. These initiatives will contribute to an evidence base that can be used to guide and inform the implementation of a multistrategy community-based intervention among adults of Arabic-speaking background and may also have relevance for other culturally diverse communities.

Data collection procedures

**Pretesting and conducting interviews and focus group discussions**

The project team will develop multiple open-ended topic guides for conducting focus groups and interviews. The guides will be further refined after expert review, pretested on a sample of project participants and modified where required. Pretesting will assess the appropriacy and scope of interview questions and the duration of group discussions and interviews.

Face-to-face interviews and focus group discussions will be conducted by trained staff. One of the project members will contact the eligible participants by telephone before their scheduled appointment to explain the study, obtain their consent and set an appointment with them. The focus groups and interviews will last for approximately 60 min.

**Patient and public involvement**

All information obtained in connection with this study that can identify a participant will remain confidential. The project steering committee members will have the opportunity to review the report and provide their feedback prior to publication. The data will be de-identified prior to analysis, and findings will be reported in a way that individual participants will not be identifiable.

**Evaluation design**

A qualitative mixed-methods approach will be used to identify community needs and priorities, and map intervention implementation strategies and solutions. Such an approach will also enable the study’s authors to explore participants’ perceptions of whether, and to what extent, AHWP activities have had an impact on their behaviour, information that can be used to test the quantitative objectives of the study. Qualitative data will be collected using focus group discussions and in-depth interviews at three different stages (table 2) which includes: (i) formative evaluation (2015–2016); (ii) process evaluation of ‘Eat-Move-Live Healthy Programme’ (2018–2019) and (iii) follow-up evaluation of ‘Eat-Move-Live Healthy Programme’ (2020–2021) (see table 2 for outcome measures).

**Participant selection**

The initial sample for each of these phases will include up to seven focus groups (with 6–8 participants) and 10 in-depth interviews (table 2). However, whether to conduct more interviews and focus group discussions will be determined by our findings from initial data analysis that provides clues to data saturation. Participants in our focus group discussions and in-depth interviews will be recruited using purposive sampling methods from multiple sources, such as members of key partner organisations, AHWP programme participants and programme coordinators for conducting interviews and focus group discussions to achieve variation in perceptions related to the impact of AHWP activities.

**Qualitative data management and analysis**

Data from focus group discussions and interviews will be electronically recorded, professionally transcribed. NVivo V.10 (QSR International) will be used to organise and manage the data. A combination of deductive and inductive methods of data analysis will be conducted. The deductive analysis will use the Anderson model of health utilisation and SCT, while the inductive method will follow the Grounded Theory.

The first stage of analysis will develop a coding scheme consisting of themes, subthemes and their definitions. In the second stage, researchers will negotiate relationships within and between the themes, subthemes and demographic information. In cases of disagreement, a solution will be found by clarifying and discussing the findings until mutual agreement is reached. The data gathered from the focus groups and individual interviews will be compared with capture qualitative dimensions of the data. For example, focus group and interview participants’ responses on specific beliefs and practices in relation to physical activity and dietary intake will be triangulated with findings obtained from survey respondents. Finally, findings will be presented to team and steering committee members from various organisations working with Arabic-speaking communities to validate interpretation.

**Ethics and dissemination**

The confidentiality of participants and information collected from them will be protected and remain unidentifiable in the dissemination of findings. To ensure that the findings of this project are useful and accessible, we will, in conjunction with our stakeholders, disseminate our findings to a range of audiences. Our results will be summarised in lay language (in both Arabic and English) to ensure continuous engagement and partnership with people of diverse backgrounds (community members, partner organisations, health services and health professionals). We also aim to publish in peer-reviewed journals and also share our findings with colleagues at academic conferences. These initiatives will contribute to an evidence base that can be used to guide and inform the implementation of a multistrategy community-based intervention among adults of Arabic-speaking background and may also have relevance for other culturally diverse communities.

**Discussion**

To the best of our knowledge, this is the first intervention using a comprehensive, multistrategic, multilevel community-based intervention to address low levels of physical activity, insufficient intake of vegetables and high SSB intake in the Arabic-speaking community in Australia. This study focuses on major risk factors for chronic non-communicable diseases, especially behaviours such as physical inactivity and unhealthy diet. The aim of this study is to determine whether the implementation and effectiveness
of a multistrategy intervention can cause participants to increase levels of physical activity and vegetable intake and reduce mean SSB consumption by 7%. The study’s findings have the potential to enhance the knowledge and self-efficacy of Arabic-speaking community members in respect of healthy living. For example, factors identified as contributing (both positively and negatively) to lifestyle habits among the population could be strategically tailored in enhancing promotion of healthy living in a culturally sensitive manner.

Current study status and timelines

The data collection in this study will be carried out across successive stages (baseline data: 2016–2018, process evaluation: 2019–2020 and post evaluation: 2019–2021).

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Contributors

AHWP investigators, DW, PA, JR, VK: were responsible along with KM and MW for identifying the research question, the design of the protocol and obtaining ethics committee approval. DW, JR, others: were responsible for recruiting study participants for all phases of this study. VK, PA: were responsible for data management and analysis. BJ: provided technical inputs for AHWP and the development of this manuscript. VK: wrote the manuscript; all authors contributed towards the critical review and approval of the final version.

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Competing interests

None declared.

Patient consent for publication

Obtained.

Ethics approval

The study protocol was approved by the Human Research Ethics Committee of SWSLHD (HREC/16/LPOOL/303).

Provenance and peer review

Not commissioned; externally peer reviewed.

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