

# A Systematic Literature Review of Sport and Physical Activity Participation in Culturally and Linguistically Diverse (CALD) Migrant Populations

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**Abstract** Culturally and linguistically diverse (CALD) migrants face significant health risks as they adapt to new cultures. These risks are exacerbated by their limited participation in preventative behaviours such as sports and physical activity. The review aimed to identify studies that examined the correlates of sport and physical activity participation in migrants. The systematic review identified 72 papers, including 6 interventions, 18 qualitative and 48 quantitative studies. The 44 identified correlates highlight the complexities involved in working with migrants. The correlates were grouped in four themes using the social

ecological model; acculturation, demographic, psychosocial and environmental/organisational. The social ecological model identified general correlates such as social support and safety. However, there were unique correlates relating to individuals who are facing cultural changes such as acculturation and language. Overall, there is a lack of contextualisation of CALD migrants' sport and physical activity experiences because many studies fail to consider acculturation comprehensively.

**Keywords** Ethnic · Exercise · Migration · Refugee · Minority · Newly arrived

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## Abbreviation

CALD Culturally and linguistically diverse

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## Background

Australia is increasingly becoming a culturally and linguistically diverse (CALD) nation. Numbers of migrants have almost doubled in the last decade and have shown marked increases of arrivals from countries such as Iraq (79.9 % increase in 2009) and Burma (17.1 % increase in 2009) [1]. A significant proportion of migrants from Iraq and Burma arrive in Australia via the Humanitarian Program on refugee or special humanitarian basis [2]. The term 'CALD migrants' is used in this paper to refer to migrants such as these who have resettled into another country where they differ culturally and/or linguistically to the native population. The large numbers of CALD migration is not unique to Australia, in the period between 1990 and 2005, 58 % of the world's migrants were accepted by Europe (12 million) and the United States (9 million) [3]. Resettlement into a Western culture can be a

challenging experience especially when compared to settling in similar regions to the home country [4]. CALD migrants face increased health risks, including poor physical and mental health during this process, due to the nature of their experience [5]. Major concerns for CALD migrants revolve around the unique experiences of migration, resettlement and adaptation. CALD migrants will encounter a process of cultural and psychological change due to discrepancies and differences between their own culture and the culture of the host country; a concept termed acculturation [6]. The definition of acculturation widely cited by researchers is that of anthropologists Redfield and colleagues (1936) who state that acculturation "...comprehends those phenomena which result when groups of individuals having different cultures come into continuous first-hand contact, with subsequent changes in the original culture patterns of either or both groups" [7, p. 149]. The term is now used primarily in discussions relating to individuals settling and living in regions other than the ones they were born in. This includes refugees, immigrants and international students [8]. Furthermore, many CALD migrants will have endured the 'refugee experience' which encapsulates not just the personal, social and cultural consequences of forced migration, but everyday settlement and resettlement struggles [9]. Thus, CALD migrant communities are one of the most vulnerable populations.

Some researchers have suggested that various CALD groups may be predisposed to developing lifestyle diseases such as diabetes owing to genetic and/or biological predispositions among certain racial groups [10, 11]. Despite the numerous health benefits of regular physical activity and sport participation which is perceived in the West as a preventative measure of such lifestyle diseases, CALD communities are less likely to engage in such behaviours [12]. There is strong evidence that sport and physical activity participation is related to improved health outcomes. Physical and psychological benefits of regular sport and physical activity participation are associated with reduction in risks of getting coronary heart disease, obesity, type 2 diabetes, even some cancers [13] and improved mental health and general well-being [14]. Furthermore, active or passive participation in sports may serve important social functions such as social cohesion, expanding social networks and fostering deep cultural meanings and social bonds [15].

Whilst regular participation in physical activity is important for many health outcomes, there is very little known about how acculturation affects participation in sports and physical activities and thus impacts on the health and wellbeing of CALD migrants. The sheer nature of diversity amongst cultures and individual experiences makes research within this topic difficult. The context of each individual case varies considerably. Even in similar contexts, there are still variations in processes of

acculturation as specific differences in religion, geographic location, reasons for migration and family situation make almost every migration case unique. Consequently, the literature on physical activity or sport behaviour in CALD migrant communities is equivocal. Given the specific health risks that CALD migrants are confronted with and the varied circumstances of migration it is important that the role of acculturation in sports and physical activity participation is understood well.

Previous studies and reviews have addressed the correlates of sport and physical activity participation amongst adults in general. These correlates typically include individual, social and environmental factors with specific examples including individual health, marital status, time, past exercise behaviour, social support and neighbourhood characteristics [16]. Other reviews have also addressed correlates of sport and physical activity participation amongst culturally and linguistically diverse migrant groups [17, 18]. In particular, Caperchione et al. [17] review established that the acculturation process was an important component of migrant health, which has been addressed in relation to diet change and the adoption of behaviours that are detrimental to health, such as smoking. However, the impact that acculturation may have on sport and physical activity participation in migrant populations is not yet well-understood.

Thus, the aim of this literature review is to present an exhaustive summary of recent research relating to sport and physical activity participation in CALD migrant populations. The social ecological model provided a framework for the review through which identification and classification of themes could be made. Previous studies have adopted a similar framework for reviewing physical activity correlates, identifying individual/personal, social and environmental levels of classification [e.g., 16, 19, 20]. Building on Caperchione et al. [17] review paper, this review pays particular attention to the process of acculturation and the migration experience as correlates of sport and/or physical activity. The factors identified by the study are unique to CALD migrant groups and are conceptually very relevant to understanding participation in any kind of sport and/or physical activity.

## Methods

### Literature Search

A systematic search of the international literature was performed to identify studies that discussed the correlates of sport and physical activity participation in culturally and linguistically diverse populations. Peer-reviewed papers and book chapters published since 1990 (inclusive) and

written in English were accessed via EBSCO, PubMed, Cochrane and Informit databases. The search began in March, 2012, with the latest additions and final revisions occurring in May 2012. The databases were searched using combinations of the keywords, physical activity, sport, exercise, minority, CALD, newly arrived, migrant and refugee with participate, involve, uptake, engage, join, take part, enter, play, maintain, reason, determine, demographic, correlates, barrier, obstacle, discourage, limit, prevent, restrict, difficult, and drop-out. Specifically, physical activity, exercise and sport searches were combined with all combinations of the migrant descriptors and participation descriptors. The truncation symbol was added to the most basic word stem for each keyword to ensure all associated terms were included in the search. Due to the diversity of measures used throughout the literature, a systematic review was conducted and not a meta-analysis. The total number of papers found through all search combinations was 7,708. Selection of papers identified by the database search was conducted in three phases with the exclusion and inclusion criteria identified in Table 1.

### Selecting Retrieved Literature

#### *Phase I*

All retrieved papers were reviewed independently by three of the authors (TO'D, LB, RE) based on the title of the paper and the inclusion and exclusion criteria outlined in Table 1.

The focus of this review was on CALD migrant populations who are culturally and linguistically diverse to the native or host country. Indigenous populations such as Australian Aboriginals, Canadian Aboriginals or Native Americans were excluded from this review as they are not

recent migrants or are experiencing resettlement. In addition, African American populations were excluded from this review as they have no linguistic diversity to Anglo-Americans and have been settled in the USA for approximately 10 generations. As such, there are many dissimilarities between this group and recent migrant or refugee groups. In instances where the migration status of the population was not specified, for example some Hispanic populations in the USA may have migrated several generations ago, studies were nevertheless included in the review. The decision to include these studies was based on the fact that this area is relatively new and thus the inclusion of these papers may provide us with an opportunity to learn more. Also based on the same rationale, both qualitative and quantitative studies were included in the review regardless of the study design. It was decided that qualitative studies again would provide us with an opportunity to obtain more information on the topic. Review papers were not included as part of this review, however it was important to identify them and include them as part of the reference list search.

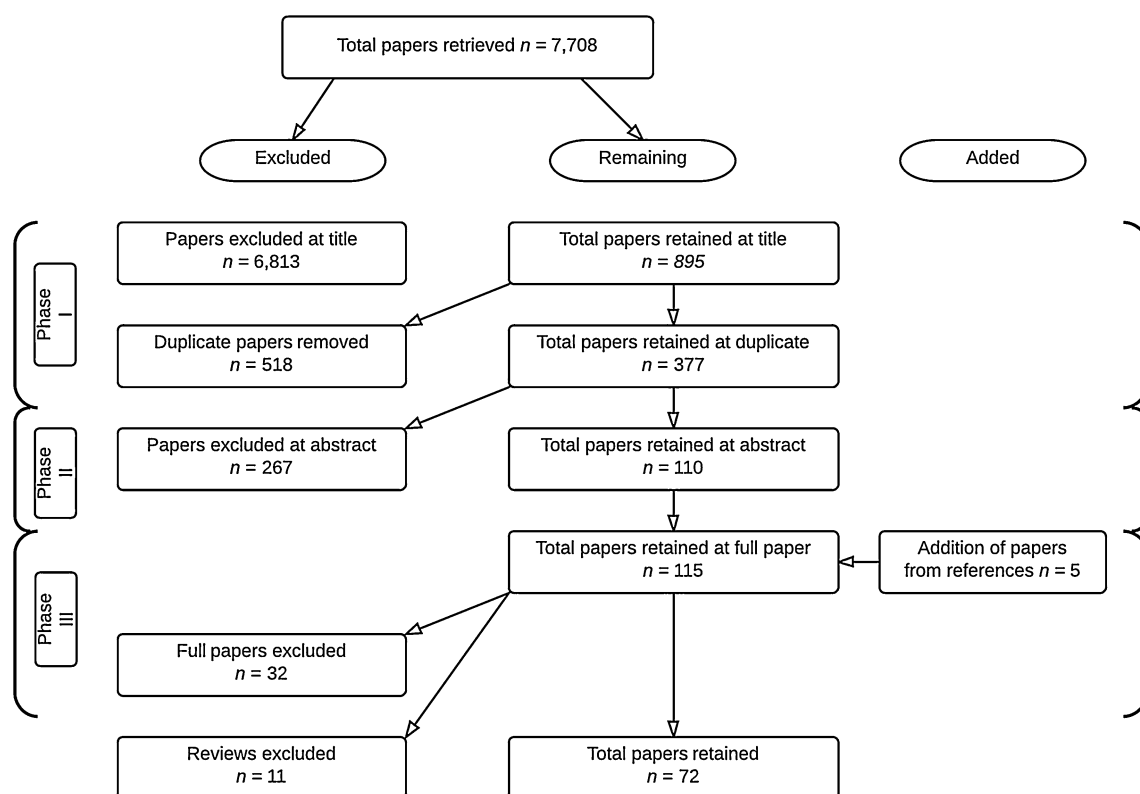
Based on title selection in phase one, 895 titles were selected and after removing duplicates, 377 papers were considered for further review (Fig. 1).

#### *Phase II*

During the second phase, abstracts of the remaining studies were examined independently by two of the authors (TO'D, LB) and included for review based on the criteria in Table 1. Where there was no agreement regarding the inclusion of a particular paper (<10 % of papers), consensus was reached through discussion and re-reading of the abstract.

**Table 1** Exclusion and inclusion criteria

Exclusion criteria	Inclusion criteria
Participants are under 18 years old	Published 1990—February 2013
No other specification as to the type of ethnicity was used other than 'white', 'black' and/or 'others'	Scholarly literature (peer reviewed or government reports)
Participants were solely African American and/or Native American	Focus on immigrant or migrant populations
Study designs based on commentaries of the literature (opinion articles)	Focus on physical activity, exercise and/or sport
Abstracts, dissertations or conference proceedings	Participants are identified as culturally diverse groups who are experiencing, or have experienced, migration
Published in a language other than English	
Ethnicity of participants was used as a control variable only	
Participants are Indigenous to the country such as Australian Aboriginals, Canadian Aboriginals and Native Americans	
Participants identified as having a medical condition such as diabetes, cancer, hypertension, cardiovascular disease, mental illness, physical disabilities and/or rehabilitation	



**Fig. 1** Outline of paper exclusion and selection at literature search

This process resulted in a total of 267 articles being excluded from the review.

### Phase III

The remaining publications ( $N = 110$ ) were read independently by two of the authors (TO'D and LB). The reference lists and leading author websites and publication lists were scanned and 5 additional papers were included in this stage of the review. Of a total of 115 papers read in full, 32 were excluded based on the exclusion criteria outlined in Table 1.

The final 83 studies were categorised according to the type of study (review, intervention, quantitative and qualitative) and the review articles were separated and used to contextualise the findings of the original research reviewed. After excluding the review articles, the final number of papers included for review was 72. Given the scarcity of intervention research conducted with CALD groups and the breadth of the migrant populations studied, no formal assessment of methodological quality was conducted in order to select papers.

## Results

Of the 72 papers included in the systematic review, 48 were quantitative, 18 were qualitative studies and 6 were

interventions. The intervention studies consisted of 4 randomized controlled trials and 2 which were descriptive and program evaluations. Of the qualitative studies ( $n = 18$ ), 10 were focus groups, 6 were interviews and 2 were case studies. Of the quantitative studies ( $n = 48$ ) 30 were surveys or questionnaires, 14 were descriptive, 2 included self-reported information and 2 included use of accelerometers. The majority of the studies were from the United States of America accounting for 60 % of the papers, 10 % were from Australia, close to 5 % from Canada, 3 % from the United Kingdom and 2 % from France. There was one study each from Singapore, Norway, Netherlands, Denmark and New Zealand.

A total of 44 different correlates were identified in the reviewed papers. These correlates were grouped into four higher order themes in accordance with the social ecological model; acculturation, demographic, psychosocial and environmental/organisational. The overview of themes and correlates is presented in Table 2.

Most studies were a-theoretical in nature (72 %). Of the 20 studies that explicitly identified a theoretical foundation, 7 used the social ecological model [21], 5 the transtheoretical model/stage of change [22], and 8 other papers highlighted learning theory, social support, segmented assimilation theory, feminist perspective, social capital, grounded theory and the concept of supply and individual disposition.

**Table 2** Summary of important correlates of sport and physical activity

Correlates of sport and physical activity	Studies supportive	Studies not supportive	Explanation
<i>Acculturation/immigration</i>			
Acculturation	[35, 36, 38 <sup>b</sup> , 40, 45, 53, 58 <sup>b</sup> , 62, 87, 95 <sup>b</sup> , 101]	[37, 102]	Physical activity and sport was seen as a means of acculturation [95] <sup>b</sup> . Acculturation was generally associated with higher physical activity [101]
Time in country	[39, 40]		A longer time in the country was associated with higher physical activity
Generation	[41, 101]		Varied effects on different ethnic groups [41], but in general physical activity increased with generation
Home country	[43, 45, 46]		Different routines in new country [46] and the activity usually performed in the home country predicted physical activity in current country
Citizenship	[42]		Citizenship in the new country was associated with increased physical activity
Reason for immigration	[44]		Refugee populations suffered from post-traumatic stress which was associated with less physical activity [44]
<i>Demographic</i>			
Age	[24, 35, 36, 45, 50, 54, 56, 57, 74, 80, 85, 86, 94, 102–105]	[87]	In a midlife sample (40–55 years), older women were more active compared to younger women [54]. However, younger age is typically associated with more physical activity [57, 74, 105]
Gender	[24, 48–50, 57, 74, 80, 86, 87, 94, 97, 101, 102, 105–107]	[36, 39, 51, 52]	Gender is not a uniform effect [107] but in general males do more leisure time physical activity (LTPA) than females [48–50]
Employment	[49, 54, 57, 61, 62, 91, 94, 96, 101, 105]		Type of job and hours worked predicted LTPA, occupational physical activity (OPA) and household physical activity (HPA) differently [61]. For example, blue collar workers engage in more OPA and non-workers engage in more HPA
Education	[36, 37, 45, 49, 54, 57, 80, 85, 88, 91, 94, 105]	[87]	Greater education was associated with more physical activity [49, 88, 108]
Income	[37, 57, 85, 87, 94, 101, 105]	[93]	In general higher income is associated with higher physical activity [87, 94, 101] but inverse relationships do exist for some groups [37]
Language	[44, 46, 58 <sup>b</sup> , 59, 60, 70, 73, 104]		Language difficulties in general were associated with lower physical activity
Rural-metropolitan	[56]		Rural women were less active than urban women [56]
<i>Psychosocial</i>			
Religious considerations	[45, 60, 68, 69, 71 <sup>b</sup> , 75 <sup>b</sup> , 83, 95 <sup>b</sup> , 109 <sup>b</sup> ]	[81 <sup>b</sup> ]	Belief in God and faith not influential in physical activity pursuits for some [81 <sup>b</sup> ], but significant influence for others in positive [83, 95 <sup>b</sup> ] and prohibitive ways [68, 69 <sup>b</sup> ]. Sexualisation of women and acting in a non-feminine manner were barriers [75 <sup>b</sup> ]. Uniform requirements based on religious customs were inappropriate for women [71 <sup>b</sup> ]. Privacy was a key concern for women in Islamic groups [60, 69 <sup>b</sup> ]. Attendance at religious services was associated with more physical activity in the Latino population [45]
Cultural norms	[44, 59, 69 <sup>b</sup> , 73, 75 <sup>b</sup> , 81 <sup>b</sup> , 109 <sup>b</sup> ]	[87]	Exercise and sport is not valued [73, 81 <sup>b</sup> ] but being physically active can be considered normal, especially for women [44]. Female participation can be viewed as a neglect of family duties [69 <sup>b</sup> ] or culturally inappropriate [75 <sup>b</sup> ]. Sport and being active can be viewed as not feminine in some cultures (e.g. Latino) [70]
Perceptions of ability to participate/self-efficacy	[23 <sup>a</sup> , 37, 38 <sup>b</sup> , 64, 66 <sup>a</sup> , 69 <sup>b</sup> , 84, 110]	[87, 111 <sup>a</sup> ]	Not always a positive correlate for every group [64] but widely reported to be a positive correlate of physical activity
Family commitments	[44, 59, 60, 70, 73]		Taking care of children and family members can inhibit physical activity for women [60]

Table 2 continued

Correlates of sport and physical activity	Studies supportive	Studies not supportive	Explanation
Social support	[23 <sup>a</sup> , 38 <sup>b</sup> , 44, 58 <sup>b</sup> , 59, 64, 66 <sup>a</sup> , 68, 70, 72, 73, 77, 82, 84, 104, 109 <sup>b</sup> , 112]		Husband support can be important for women [44, 70], likewise having role models and motivational people is a positive correlate of physical activity [73]. Seeing other people exercising in the community is a positive correlate of physical activity
Attitudes	[24, 71 <sup>b</sup> , 84, 85, 91]		Perceptions of the amount of physical activity that peers do can influence physical activity [85, 91] and perceptions of the importance of exercise is a positive predictor of physical activity [24, 84]
Readiness to change	[23 <sup>a</sup> , 43, 85, 90]		Differences amongst ethnic groups in regards to the level of correspondence between readiness to change stage and reported physical activity [90]
Knowledge	[44, 59, 68, 72, 73, 76, 103]		Knowing about exercise, sport and participation and its relationship to health was an important predictor of physical activity
Motivation	[23 <sup>a</sup> , 37, 44, 51, 55, 58 <sup>b</sup> , 65, 68, 73, 74, 75 <sup>b</sup> , 76, 77, 110, 113]		Commitment to an active lifestyle [110] and general motivation were positive correlates of physical activity. Greater number of motives cited by individuals was associated with increased physical activity [37, 65]
Enjoyment/interest	[55, 66 <sup>a</sup> , 71 <sup>b</sup> , 72, 113]	[72]	Greater enjoyment and interest in physical activity were positive predictors of physical activity
General health	[24, 38 <sup>b</sup> , 44, 50, 51, 54, 55, 59, 68, 72, 73, 85, 87, 96, 105, 106]	[36, 88, 103]	Being healthy or unhealthy/overweight is a significant predictor of physical activity [e.g., 68]. Mental health, including depression and cognitive function have a negative association with physical activity [87]
Previous physical activity	[44, 58 <sup>b</sup> , 59, 81 <sup>b</sup> , 86, 107, 110]		Having played sport or exercised previously was associated with higher physical activity. Individuals who were previously active before immigrating were more likely to be active in the current country [86]
Age issues	[60, 68, 73, 76, 82]		Falls prevention was a motivator, however, it was sometimes viewed as inappropriate for older people to exercise [82]. Younger and older people have different preferences in terms of preferences for the types of activity selected and methods of implementation [60]
Self-esteem	[67 <sup>a</sup> , 73, 87]		Self-esteem was a positive correlate of physical activity
Self-conscious	[55, 58 <sup>b</sup> , 68, 69 <sup>b</sup> ]	[72]	Feeling self-conscious and not knowing how to use the facility [69 <sup>b</sup> ] or knowing the rules of the game [58 <sup>b</sup> ] was associated with lower physical activity
Feelings of Isolation	[70, 71 <sup>b</sup> ]		Feeling alone in the community was associated with lower physical activity
Number of barriers	[23 <sup>a</sup> , 37, 38 <sup>b</sup> , 55, 66 <sup>a</sup> , 85]		A greater number of perceived barriers was associated with lower physical activity
Fatigue	[44, 55, 59, 72]		Perceptions of fatigue and a lack of energy were associated with lower physical activity
<i>Environmental/organisational</i>			
Access to information	[44 <sup>a</sup> , 70, 76, 91]		Lack of English proficiency [70], ability to find information and ease of access to this information were significant correlates of physical activity
Lack of time	[44, 55, 68, 69 <sup>b</sup> , 70, 73, 76, 82, 103]		No time because of childcare, family [70], work and other commitments
Type of activities	[68, 69 <sup>b</sup> , 74, 80, 82, 94, 106, 110, 114 <sup>b</sup> ]		Senior specific programs for CALD groups [68] and having an appealing range of activities offered were necessary to engage the community [69 <sup>b</sup> ]. More commitment to HPA and OPA, rather than LTPA, for some ethnic groups [94]
Safety	[36, 43, 44, 46, 51, 59, 60, 68, 69 <sup>b</sup> , 70, 77, 82, 91, 113]		Crime and road safety were significant negative correlates to physical activity



**Table 2** continued

Correlates of sport and physical activity	Studies supportive	Studies not supportive	Explanation
Geographical isolation	[44, 59, 77]		Facilities and programs being too far from home (irrespective of transport) was a negative correlate
Unfamiliarity with environment	[43, 82]		Feelings of discomfort and unfamiliarity in the local environment were negative correlates of physical activity
Walkability	[36, 51]		The aesthetic appeal of walking was associated with physical activity
Facilities	[36, 43, 46, 60 <sup>a</sup> , 68, 70, 71 <sup>b</sup> , 72, 77, 91, 93]	[81 <sup>b</sup> ]	In general facilities were unavailable and inappropriate, however, for some migrants facilities were seen as better [81 <sup>b</sup> ]. Inappropriate opening hours [68] and poorly maintained facilities [46] were prohibitive
Weather	[38 <sup>b</sup> , 44, 51, 59, 68, 73, 77, 82, 114 <sup>b</sup> ]		Weather is a correlate of physical activity in general. Weather that is different to what was typically experienced in the home country is associated with lower physical activity [60, 83]
Transport	[46, 60, 68, 70, 73, 77, 104]		Greater access to transport was associated with more physical activity.
Others' behaviour	[46, 60, 70, 71 <sup>b</sup> , 73, 95 <sup>b</sup> ]		Women felt subject to stereotyping [71 <sup>b</sup> ] and discrimination in the health and fitness setting.
Cost	[44, 59, 60, 68, 70, 73, 77, 82]		Cost is a correlate of physical activity
Organisational structure	[69 <sup>b</sup> , 71 <sup>b</sup> , 76 <sup>a</sup> , 109 <sup>b</sup> ]		Facilities and organisational structures developed in consultation with the community [69 <sup>b</sup> , 109 <sup>b</sup> ]. Bilingual support is a correlate of physical activity [69 <sup>b</sup> ]

<sup>a</sup> Denotes studies that were interventions or randomly controlled trials

<sup>b</sup> Denotes studies that focused exclusively on sports or had a specific focus on sport alongside physical activity

## Samples

For the most part cultural backgrounds of participants were categorised similarly across the studies (e.g. Latino, Korean or Bosnian), however differences in cultural group allocation still existed which makes comparisons between cultural groups across studies difficult. For example, some studies categorised participants into large cultural groups such as 'Asian' or 'Black' whereas others categorised specific groups such as South East Asian and Caribbean black or African black. Moreover, some studies clustered Asian/Pacific Islander as one cultural group whilst others separated Pacific Islander and Asian.

Of the papers that specified cultural groups ( $n = 69$ ), 36 % were Latino, Hispanic or Mexican only (excluding non-Hispanic white, non-Hispanic black, African American or Native American groups). Other cultural groups included were Chinese (11 %), Asian (10 %), Vietnamese (7 %), Muslim (6 %), South Asian (6 %), Korean, Filipino, Pacific Islander, Asian/Pacific Islander, East/South East Asian, Italian, Macedonian (4 %), Bosnian, Turkish, West Asian, African, Croatian, Greek, Maltese, Asian Indian (3 %), Arabic, Sudanese, Iranian, Cuban, Slavic, South Asian, Indian, Pakistani, Bangladeshi, Caribbean, Moroccan, Tunisian, Colombian, Malay, Japanese, Polish, Serbian, Middle Eastern and Somali (1 %). The 3 studies

that did not specify a cultural group used classifications such as multiethnic [23] and 'predominantly Hispanic' [24] to describe their populations.

Of the studies that specified the number of participants ( $N = 66$ ), this ranged from 5 to 171,513. The average number of participants in the quantitative studies was 13,283. The average age of participants in the quantitative studies that specified age ( $N = 20$ ) was 47.1 years. In the qualitative studies the average number of participants was 67. Seven qualitative studies specified the age of their participants, with the average age of participants being 53.6 years. The average number of participants in the intervention studies was 111. Only 3 intervention studies specified the age of participants with the average age being 45 years.

## Measures

Physical activity measures most commonly used in the quantitative studies included the International Physical Activity Questionnaire (28 %), the Behavioral Risk Factor Surveillance System [25] (14 %) and the other studies used accelerometers, Self Report of Physical Activity questionnaire [26], Physical Activity History, Kaiser Physical Activity Survey [27], Community Health Activity Model Program for Seniors (CHAMPS) Physical Activity

Questionnaire [28], San Diego Health and Exercise Questionnaire [29], EPIC Physical Activity Questionnaire and the Purposes for Engaging in Physical Activity Scale [30].

A range of measures were used to identify barriers and motivators for physical activity and sport including the St. Louis Scale—Measuring Physical Activity in Communities [31], Neighbourhood Environment Walkability Scale [32], Environmental Supports for Physical Activity Scale [33] and the Exercise Self-Efficacy Scale [34]. Barriers and motivators were also identified through open-ended questioning in small-group and individual interviews. Interviewer administered questionnaires were common throughout studies that surveyed non-English proficient populations. Likewise, direct translations of English language questionnaires were also used in these groups. Four studies reported back-translation and language specific validation of English language questionnaires for the target language population. In the qualitative studies, interviews were conducted in the native language of the participants and translated for analysis.

### Correlates

The results indicate that some positive correlates of sport and physical activity for CALD migrants are generic, such as self-efficacy, social support, education and motivation. Other correlates are unique to CALD migrant groups and include acculturation, citizenship and command of the English language. From these correlates, clear factors emerged in terms of the demographic, psychosocial and environmental/organisational correlates identified. Table 3 in *ESM* outlines the detailed characteristics of each study included in the review. Themes of correlates that emerged from the review will be discussed below.

### Acculturation

Acculturation was measured differently across the included studies. Some studies measured acculturation on the basis of English language proficiency or preference only [35, 36], whilst others utilised culturally specific or comprehensive measures of acculturation assessing cultural orientation, identity and attitudes as well as language [37, 38].

Although measures of acculturation varied, the review suggests that greater acculturation was associated with increased participation in sports and physical activity and in some studies, physical activity and sport were seen as a means of acculturation. Specifically, a longer time in the country (10 years+) [39, 40], later generations (being born and having parents born in the new country) [41] and citizenship in the new country [42] also suggested an association with higher participation rates. Studies that

evaluated reasons for immigration found that refugee populations suffered post-traumatic stress and were not considering or actively participating in physical activity [43, 44]. Generally, the type of physical activities performed in the home country predicted physical activities in the new country [43, 45, 46]. One study found that refugees were more active in their home country, reporting less use of cars and more walking [43]. Due to lack of places to exercise, including facilities and outdoor settings, these participants reported being less physically active in the new country [43].

A number of studies used acculturation scales developed specifically for some cultural groups [37] (e.g., Suinn-Lew Asian Self Identity Acculturation Scale [47]). The use of such scales may be an appropriate method for studying large groups in common areas; however the multitude of variables regarding culture, relocation and resettlement countries makes it difficult to create specific scales for all groups in all locations. Acculturation scales accounting for such variables would need to be validated for different cultural groups. A widespread reliance on general acculturation scales may lead to a lack of understanding in regards to the interaction of cultural and migration differences and a tendency to cluster comparable populations who are inherently different. For example, in instances where individuals identify with the same ethnic group such as Latino, but are of different countries of origin such as Puerto Rico and the Dominican Republic [45], a Latino acculturation scale may not detect some of the integral differences between the two groups.

In general, measuring acculturation or cultural impacts and shifts was not broadly addressed. Very few studies evaluated confounding factors such as time in current country [39, 40], experiences in the home country [43, 45, 46] such as levels of physical activity in the home country [43] and reasons for immigration [44]. Culture and the migration experience is rarely addressed or measured explicitly. Table 2 shows a lack of research attention to cultural and acculturation factors compared to many of the other correlates investigated, suggesting they are of equal or lesser importance. This lack of attention to acculturation experiences and their impact on health behaviours of CALD migrants may be due to the concept of acculturation being poorly defined and loosely used. We believe that acculturation acts as a filter and provides context for all the other correlates, thus in future it needs to be at the core of investigations and research initiatives.

### Demographic

The demographic correlates of sport and physical activity participation were mostly consistent across the literature



with the general trends suggesting that males participate in more leisure time physical activity than females [48–50]. There were a small number of studies, which did not find gender differences [36, 39, 51, 52]. For example, in a study of older people ( $M = 72$  years) from seven different cultural groups there was no difference found between the reported amount of physical activity by men and women indicating that gender was not a significant correlate of physical activity in this population [51]. Being unmarried [53, 54] or living alone [55] was associated with higher levels of physical activity for women. Furthermore, one study found that rural women were less physically active than urban women [56].

Greater education, higher income, and younger age were associated with higher levels of physical activity and sport participation, as was the type of occupation [e.g., 57]. Language was commonly identified as a barrier to participation in sport [58] and physical activity [59, 60] and language difficulties interacted significantly with other correlates identified [46, 58]. Blue collar workers expended more energy than white collar or non-workers [61], however non-workers engaged in more house-hold physical activity than blue and white collar workers [61]. One study found that Latinos had more physically active occupations compared with non-Latino black groups and amongst employed individuals [62]. In this study, Latinos had the greatest number of individuals reporting no leisure time physical activity [62].

A large proportion of studies were women-only which is problematic as there is a need to understand the gender dynamics of sports and physical activity participation in general amongst CALD migrants. It is unknown why women were the major focus of previous research programs. It could be that Western researchers often focused on CALD migrant women from Muslim backgrounds because they are perceived as being oppressed or restricted compared to women from the West. Women of some cultures and religions also require additional privacy and modesty provisions, making it more difficult for them to exercise at traditional facilities. However, both males and females in CALD migrant groups are typically not physically active enough to maintain health benefits [24, 50]. Men are still at risk in terms of health, and warrant equal attention in the research, particularly as longevity for men is typically lower than it is for women [63]. Similarly, focusing on CALD migrant women in isolation of their families may begin to disrupt the cultural gender balance between women and their families, which may include changes in gender roles or power imbalances. Gender, and all other demographic correlates of sport and physical activity, must be investigated in light of cultural variables and the acculturation process. Across the literature, this interaction of demographic correlates and culture/acculturation was

largely assessed superficially. Gender, employment and living location will certainly be influenced by the culture of the population and the level of adoption of the cultural dynamics of the new community.

### Psychosocial

General psychosocial correlates of sport and physical activity such as self-efficacy, social support and attitudes were relatively consistent throughout the literature [e.g., 24, 64, 65]. The majority of studies suggest that an individual's perception of their ability to partake in physical activity [23, 66], higher self esteem [67] and lower self-consciousness [68, 69] are strongly associated with increased participation. However, anomalies do exist. One study found that women from Latina communities were more confident in their abilities to undertake physical activity but were less likely to meet physical activity recommendations [64]. The author suggests that perhaps external factors such as community and social support may be more critical for adopting physical activity behaviours than self-confidence in the person for this specific group [64]. Feelings of isolation [70, 71], fatigue [e.g., 59, 72] and an increased number of barriers [e.g., 23, 66] were largely associated with lower physical activity participation.

Having friends, family members and peers in the community who engaged in physical activity were also associated with increased participation, acting as support providers and/or role models [73]. For women, their husbands' support was an important enabler of physical activity [44, 70], however taking care of children and family members was an inhibitor [60]. This was exacerbated for some groups, such as women from South American countries, who felt cultural pressures to 'sacrifice their personal lives' and be submissive to their families [46].

Motivation to engage in physical activity was unsurprisingly associated with physical activity [58, 74]. Specific motivators for engaging in sports and physical activity differed according to cultural group, but some common motivators included maintaining physical health [44, 68, 75], managing chronic disease [76, 77] and socialising [55, 58, 77]. Generally, the greater the number of motives an individual cited, the greater was their participation in sports and physical activity [37, 65]. Motivation is intricately associated with acculturation and various cultural dynamics. For example, the weighting that is placed on values such as body image [78] and concepts of health and illness vary extensively across cultures [79].

The manner in which cultural norms affected physical activity varied across cultural groups [72, 80] and, when

addressed, the level of acculturation [35, 58]. For example, some studies demonstrated that sports or physical activity was not valued favourably in some cultures [81] or that sport was perceived as non-feminine [75]. Generally, falls prevention was a motivator for older participants in some cultural groups, however in other groups, it was viewed that exercise was generally culturally inappropriate for older people [82]. Women in some cultural groups reported that physical activity was closely linked to gender roles and being physically active throughout the day was culturally favourable [73]. Furthermore, religious considerations were not influential factors for some groups [81]. A belief in God and religious faith was a positive influence for some groups (e.g. Russian-speaking Slavic) [83] and an inhibitive one for others (e.g. Muslim) [69]. These diverse findings indicate the importance of understanding the religious affiliations of the culture of the group in question when considering physical activity.

Enjoyment, attitudes and knowledge of sport and physical activity were also important predictors [59, 71]. For example, attitudes to the importance of physical activity [24, 84] and the amount of activity peers were engaged in [85] influenced physical activity positively. Moreover, knowledge about sport and physical activity participation and its relationship to health was a predictor of physical activity [72, 73], as was enjoyment and interest [66]. One study found that for some Mexican-American groups, a lack of enjoyment was not a barrier for physical activity [72]. It is important to consider the cultural values and the values adopted since arriving in the new country, particularly when considering very personal and value-driven correlates such as attitudes, enjoyment and motivation. To date there is little understanding of the process of acculturation and its influence of health behaviours of CALD migrants.

Overall, previous physical activity experience [e.g., 44, 86] and general health [e.g., 50, 87] were positive correlates of physical activity. Lack of good health [72] or having depression had a negative association with physical activity. On the other hand, one study found that self-rated health status and body mass index (BMI) were not significant predictors of leisure time physical activity [88]. Moreover, having played sport or being involved in physical activity previously was associated with higher current physical activity levels [88]. CALD migrants who were more active before migrating were more likely to be active in the new country [86].

The Transtheoretical Model of Health Behaviour Change was discussed in several papers, indicating that readiness to change was influenced by culture [89]. Differences amongst ethnic groups were reported with regards to the level of correspondence between readiness to change stages and reported physical activity. One study found that

black women were less likely to be in the active (preparation, action, maintenance) stages of change model than were Hispanics and Native American women [90]. This model was typically used as a proxy for, or in support of physical activity participation [90]. No study assessed the process of changing stage for CALD migrant groups or measured readiness to change over time. It is important for future studies to investigate stage progression towards maintenance and how readiness to change modifies over time for CALD migrants and the factors which influence change.

### Environmental/Organisational

There were some common environmental and organisational correlates of sports and physical activity amongst CALD migrant groups. These included access to information [44, 70, 76, 91], lack of time [69, 70], safety [43, 51], geographic isolation [44, 59, 77], walkability (neighbourhood characteristics facilitating walking including sidewalks, facilities, aesthetics etc.) [92], facilities [91, 93], weather [38, 82], type of activity [68, 69], transport [60, 77], behaviour of others [46, 71] and cost [44, 68]. Unfamiliarity with local environment was also negatively related to physical activity participation [43, 82]. Moreover, cultural variables made common environmental correlates more complex. For example, access to information was intricately linked to language barriers [70], and went beyond simply the availability of information as issues arose from not even knowing where to look for information [44].

Some studies reported that CALD specific programs and activities were necessary to engage CALD migrants to participate [68, 69], whilst others found that CALD groups were more committed to household and occupational physical activity rather than leisure time physical activity [94]. Walking was often the most preferred method of physical activity [e.g., 74, 82] (especially amongst older adults [51]) and thus safety in the neighbourhood was seen as an important contributor to walking behaviours [e.g., 43, 51, 60]. Preferences for physical activity are very much influenced by the culture of the group and their level of acculturation.

Facilities were mostly perceived as unavailable [e.g., 46, 77], inappropriate due to inadequate operating hours [68] and poorly maintained [46]. For some CALD migrants, quality of facilities was perceived as better in the new country compared to the home country [81]. The behaviour of others was a negative correlate of sports and physical activity for CALD migrants [e.g., 60, 95]. For example, Muslim women in Australia felt subject to stereotyping and discrimination [71]. Taylor's study found myths and

stereotypes to be common themes amongst their female participants, with women aware of the myth in Western cultures that Muslim women are oppressed and do not think for themselves [71]. Future research should explore this further in other CALD migrant groups and investigate what the factors are which contribute to individuals feeling that they are subject to stereotyping and discrimination.

## Discussion

The aim of this systematic review was to identify existing knowledge relating to the impact of the acculturation process on sport and physical activity participation by CALD migrants via an exhaustive search of the literature. Based on the results of the review, this paper also provides some considerations for further research and intervention program development. The quantitative literature indicates that a vast number of general and unique correlates exist for CALD migrant groups [e.g., 55, 88, 91, 96, 97]. In addition, some of the qualitative literature suggests that complex interactions between these correlates may occur for this group [e.g., 43, 44, 71, 95]. However, these interactions are rarely explored comprehensively and there is a general lack of cultural understanding in the literature. From the studies that did investigate culture and the process of acculturation, it is clear that acculturation variables influence almost all other correlates making the sport and physical activity pursuits of a CALD community unique to the specific culture of the community and their new location. Variations in methods, classification and measures made it difficult to compare studies with one another. However, the systematic review does identify vital issues and gaps in the CALD migrant participation in sports and physical activity literature.

The results of the review show that some research in this field is missing vital components related to studying CALD migrant groups. Some studies did not specify the cultural or ethnic backgrounds of their participants whilst other studies classified participants in general terms such as Muslim. Islam is practiced in many different countries around the world such as Sudan, Iran, Indonesia and Bosnia and Herzegovina. Thus, individuals who practice Islam may have a very different cultural background and acculturation process even though their religion is the same. That is also not to say that participants should be classified by country of birth or country of residence prior to settlement. Some individuals identify themselves via ethnic or cultural boundaries, for example some people born in Burma may identify themselves as Karen or Chin.

Furthermore, some studies did not specify whether their samples were recent migrants or perhaps individuals who have been in a new country for several generations (e.g.

possibly with some Hispanic populations in the USA). Recently migrated CALD groups are fundamentally different to groups of culturally or linguistically diverse communities who have been in a new country for several generations. However, with some studies it was difficult to identify if their participants were recently immigrated CALD groups.

## Limitations of the Literature

The a-theoretical nature of reviewed literature has provided limited context in which to place the discussion within a theoretical framework, and in turn understand the full meaning of the correlates of sports and physical activity participation for CALD migrant communities. A theoretical framework may provide a more structured account of the findings contained in this complex field.

The average age of participants in most studies was reasonably high (45–54 years), higher than the average ages of migration in some Western countries (24 years for refugees [98] and 34 years for migrants in general [99]). This makes it highly likely that many of the studies included second generation samples, making it difficult to attribute findings to recent migrants.

Many of the studies included in the review were cross-sectional in nature, limiting our ability to make inferences about how these groups change over time. It is also difficult to assess causality with the large cross-sectional design focus and small number of interventions. Numerous cross-sectional studies included in this review were conducted using mainstream census data. These findings highlight the low participation rates and various correlates of sport and physical activity participation for CALD migrant groups. However, they do not provide a comprehensive indication of the way in which culture impacts on these correlates.

## Future Directions

One of the key gaps in the literature is the lack of research on sport participation of CALD migrants. Only 12 % of the papers analysed were exclusively sports focused or cited sport alongside physical activity. Sports and physical activity have many different organisational and social factors and thus it cannot be assumed that the principles applying to physical activity participation for CALD migrants apply to sports. Participation in sport is characterised by wearing a uniform or clothing requirements to some degree, acquiring and using certain equipment, team/group settings, regular training or coaching, regular competitive game days and social dynamics of club membership (including cost of membership). On the other hand, the

social nature of sport and inherent requirement for group participation may make sport an appealing type of activity for some CALD migrants. These factors need to be explored further so that appropriate programs for CALD migrants can be developed and recommended.

Another important issue highlighted by this systematic review is the lack of a clear understanding and approach to researching CALD migrant groups. The circumstances of all CALD migrant groups vary, however the literature often appears to homogenise these groups in an attempt to compare findings and identify similarities. Unfortunately, with this approach it is difficult to examine the full scope of the dynamics involved in sport and physical activity participation for CALD migrant groups. To begin to grasp the issue holistically, it is essential to consider the specific circumstances that make these groups unique. Amongst many others, some of these factors include time spent in the current country, experience of sport and physical activity in the home country, reasons for migrating, experience during migration and resettlement process, the possibility of a traumatic background, notions of health and well being, concept of sport and physical activity, cultural or religious factors impacting on participation, cultural value or meaning of sport and physical activity and attitudes or motivations towards sports and physical activity. When recommending sport and physical activity for health amongst CALD migrants, assessing the specific population is essential to ensure the community program is not only appropriate but necessary for the group at the point in time chosen. When reflecting on the social determinants of health [100], many basic health requirements are likely to precede sport and physical activity in terms of priority. For example, employment/income, access to medical services, housing and education are important health determinants that are likely to be perceived by some CALD migrants as more of an immediate concern compared to sport and physical activity. These issues may also be influenced by reasons for migration, such as in the case of refugees who may have trauma and complex admission/visa procedures to cope with. It is imperative that the group is consulted and empowered in the decision making process and that a clear understanding of culture and acculturation is obtained before developing community based programs and/or research. The complexities with understanding and researching these dynamics are evident. However, a clear focus on the uniqueness of cultural and psychosocial aspects concerned with CALD migrants is largely missing from the literature.

Much of the research conducted in this review was not theoretically driven nor had a theoretical framework. Explorative a-theoretical research is important, however, given the complexity of research involving CALD migrants, a theoretical framework may help researchers be

more systematic and structured in their research. Many of the theories proposed in the small number of studies that did include a theoretical component were developed in Western cultures. It will be interesting to investigate whether these theories are relevant to CALD migrant groups whose family structure, collectivist nature and value systems may be very different from the typical Western individual.

Finally, it is important to note that the results of this review have provided a clear indication that the concept of acculturation is not well understood in this field of research. To develop and validate an instrument to measure acculturation is difficult and complex. The process of acculturation can be affected by a multitude of variables such as age at settlement, length of time in the new country, prior 'cultural change' experiences, links to the original culture and country of birth, personal values and beliefs (and how much they differ to the new country) and willingness to participate in the new society. These factors, among others, will vary considerably across individuals and thus it is difficult to construct a measurement tool, which will capture the breadth of these variables which are unique to each individual and impact on acculturation.

## Conclusions

This review has highlighted the vast number of correlates that researchers and people involved with the development and delivery of community sport and physical activity must consider when planning to work with CALD migrant populations. However, these correlates are not uniform in their effect across all groups, in fact some correlates can have completely conflicting influences on different groups. The interactions between the demographic, psychosocial and environmental/organisational correlates of sport and physical activity can only really be determined in light of a true understanding of the culture and acculturation of the group being studied. The findings of this review suggest future CALD migrant research is preceded by a thorough investigation of the cultural group being researched to ensure the group would like to and is ready to engage in sport and/or physical activity. This understanding will ensure well-intentioned efforts to increase the health and quality of life for CALD migrants are welcome, well-structured and appropriate for the group themselves.

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