
Indigenous Australians and physical activity: using a social–ecological model to review the literature

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Abstract

This paper aims to present what is currently known about Indigenous Australians and their engagement in physical activity and to then challenge some of the ‘taken-for-granted’ ways of thinking about promoting or researching physical activity with Indigenous Australians. Major health, education and sport databases, as well as government websites were searched using the key terms of physical activity, sport, leisure, recreation, Indigenous and Aboriginal/Aborigine. A social–ecological model of health was adapted and used as an organizing framework to synthesize the literature. It is concluded that socioecological models can be valuable tools for understanding and promoting issues related to physical activity engagement for a range of populations but they may require complementary critical insights, including those from Indigenous perspectives. Productive theoretical spaces where Western and Indigenous knowledges come together can assist health educators to consider the complexity and diversity of Indigenous people’s lived experiences when planning and implementing programs.

Introduction

The health status of Indigenous people is considerably lower than that of the non-Indigenous populace in many of the world’s developed countries [1]. In

Australia, the term Indigenous incorporates Aboriginal and Torres Strait Islander peoples. The accepted definition of an Australian Aboriginal person is social more than racial. An Aboriginal person is defined as a person who is a descendant of an Indigenous inhabitant of Australia, identifies as an Aboriginal person and is recognized as Aboriginal by members of the community in which she or he lives [2]. This gap is narrowing in the United States, Canada and New Zealand, but in Australia, the gap in health indicators such as life expectancy continues to widen [1, 3]. Indigenous Australians experience a greater burden of disease, particularly for chronic illnesses such as diabetes, respiratory conditions, circulatory diseases and musculoskeletal conditions [4]. Physical activity is recognized as an important contributor to health for all people [5, 6] and is believed to have benefits in improving mental and skeletal health and providing protection from high blood pressure, overweight and obesity, type 2 diabetes and a range of health risk behaviors such as smoking and alcohol intake [7, 8]. Despite the potential for physical activity to contribute to the health of Indigenous Australians, in 2003, physical inactivity was cited as the third leading cause of the burden of disease in this population (Vos *et al.* 2007 cited in [4]).

Much of the literature examining physical activity among the Indigenous peoples of North America, New Zealand and Australia has attempted to identify determinants, patterns and levels of physical activity engagement of Indigenous people from an epidemiological perspective [9–11]. Some of these studies have attempted to contextualize data collection

instruments for Indigenous populations (e.g. see Levesque *et al.* [12] for their study of Kanien'kehá:ka children in Canada) but to date there is little qualitative research to complement the epidemiological studies. The few studies that have sought to gain the perspectives of Indigenous peoples suggest that a broader view of their lived experiences is needed given that the place of physical activity in their lives is embedded in their social and cultural practices [11, 13–15]. Further, while many countries have sought to interpolate policies addressing community health or school curricula with Indigenous perspectives, Indigenous peoples still sense a marginalization of their ways of knowing and being [16, 17].

Hart [18] has suggested that being aware that we are all positioned as subjects within research is one way in which we can de-privilege Western epistemologies and make them more visible rather than invisible and 'normal'. However, being sensitive to issues of Indigenous knowledge can result in a dilemma for the non-Indigenous health educator. How does one take knowledge gained through white Western ways of knowing and apply it in Indigenous contexts appropriately? Is this possible or justified? In Australia, and particularly in Queensland where the authors reside, there is an absence of any documented cohesive approach to the research or promotion of physical activity from an Indigenous standpoint. While the authors recognize there are guiding principles for health promotion advocated by Indigenous health organizations and individuals [19, 20], there is also a tension with appropriating this knowledge into white Western ways. This paper therefore borrows from Nakata's [21] concept of 'the cultural interface' in recognizing that there are productive theoretical spaces where Western knowledge and traditional and contemporary Indigenous knowledges can come together in useful and informative ways. In doing so, literature is presented using a conceptual framework accepted in Western science, but where possible, adapted using an 'Aboriginal lens' [19].

Researchers have recognized the complex inter-related nature of identifying the factors or conditions that shape engagement in physical activity [22–25]. Drawing on health behavior models, many

researchers across different disciplines have proposed the use of multi-level approaches that consider organizational, environmental and individual factors that may impact on health behaviors, such as physical activity engagement (see, for example, [22, 25–27]). These ecological and social–ecological models are conceptual frameworks that recognize the way in which individual behavior is affected by and also affects the environment [26]. Generally, these models approach physical activity engagement through consideration of intrapersonal, social–environmental and physical environment factors. Intrapersonal factors may include demographics, biology, behavior and beliefs. Social–environmental factors may incorporate social support, social climate, culture, policies governing incentives for physical activity and policies governing resources and infrastructure related to physical activity. Physical environment factors are divided into the natural environment such as the weather and geography and the constructed environment including architecture, transport, recreation infrastructure and the urban/suburban environment [22, 27–29]. One such model, that of Lynch's social–ecological model of health [30], emerged from social epidemiology and places an emphasis on the broader social factors that impact health before considering the individual within that context. Lynch's model is shown below in Fig 1.

While it is acknowledged that there are always limitations of these types of conceptual frameworks in capturing the complexity of associations, Lynch's model has been used by several authors to organize ideas about the various factors impacting both Indigenous and children's health behaviors and the relationships between these factors [30–32]. For instance, Carson *et al.* [31] used Lynch's [30] model to emphasize the need for a multi-level and multi-time point approach to the social determinants of the health of Indigenous Australians.

In reviewing the literature on physical activity among Indigenous Australians, this paper will also use Lynch's [30] social–ecological model as an organizing framework to synthesize the research relating to physical activity of Indigenous populations using the Indigenous Australian experience. The

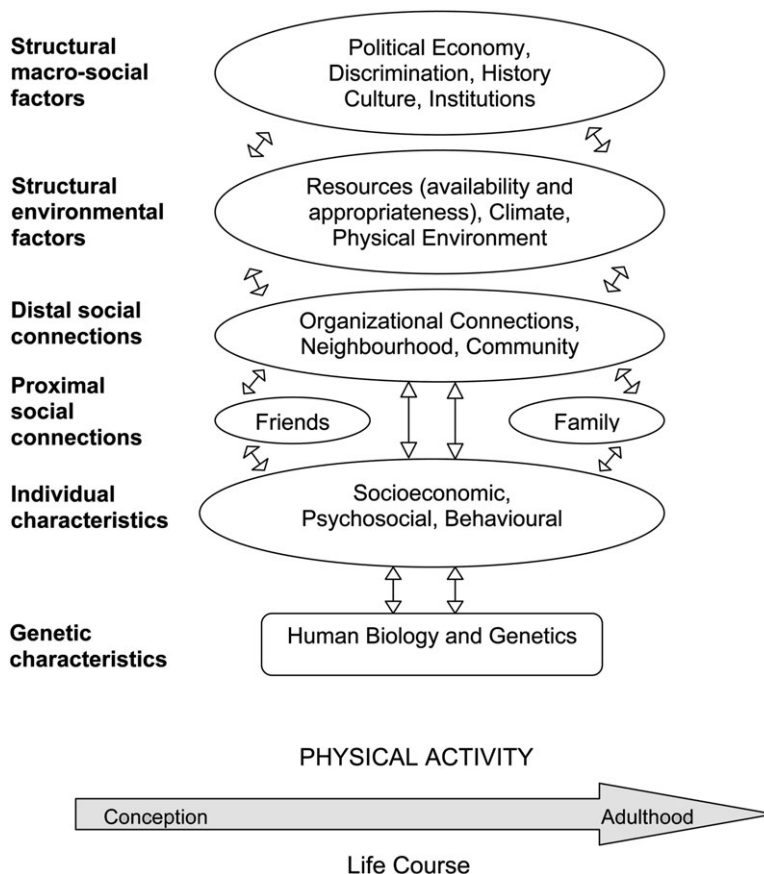


Fig. 1. Adapted social–ecological model of determinants of physical activity (from Lynch [29]).

use of a social–ecological model to help frame the literature is a somewhat different, though generative, application of this tool. Two minor modifications have been made to the model for the purposes of this paper. First, two-way arrows have been added in order to signify the ways in which the perspectives and strengths of Indigenous young people themselves can inform more structural and macro-social levels of physical activity determinants. This is in keeping with the intent of ecological models to highlight the way in which individual behavior is influenced by and influences the environment [26]. Second, Lynch [30] does not identify structural environmental factors in his model but they have been added in this paper as they are often represented in

other social–ecological models and are recognized as important when considering physical activity participation and health education with Indigenous people [20, 27, 28]. Following the overview of the physical activity literature, gaps in current knowledge as well as several questions and critiques of the ways in which Indigenous Australians are often positioned will be discussed. This paper therefore aims to present what is currently known about Indigenous Australians and their engagement in physical activity, what impacts on this engagement and where further research is needed. Additionally, it aims to challenge some of the ‘taken-for-granted’ ways of thinking about promoting or researching physical activity with Indigenous Australians.

Methods

The literature reviewed in this paper was sourced in three ways. First, major electronic databases, including PubMed, CINAHL, ERIC, PsycINFO and SPORTS-DISCUS, were searched for relevant articles post-1990. Major search terms included: physical activity, sport, leisure, recreation, Indigenous and Aboriginal/Aborigine. Second, references located in the retrieved articles were identified where relevant. Third, additional sources, which were not found within the primary search of electronic databases, were identified through a more general search of government websites, academic and non-academic library databases and discussions with colleagues within this research area. As per the method of Allender *et al.* [33], a number of eligibility criteria were devised for inclusion of papers in this review:

- (i) the paper provided either qualitative or quantitative information relating to physical activity (in its broadest sense) and Indigenous people.
- (ii) the paper was focused on Australian Indigenous people: all ages and both urban and rural locations.

Given the limited data that were generated through this process, our aim was to be as inclusive as possible, thus all articles that met the eligibility criteria above were included for the review, irrespective of the number of participants or rigor of the research process involved.

Understanding the physical activity of Indigenous Australians

Structural macro-social factors

Structural macro-social factors include those influences that occur at a political, historical, cultural and institutional level and Australia's history of colonization is at the forefront of these factors with implications for Indigenous health [20, 34]. Indigenous people have been locating their ill health in the context of macro-social factors such as colonialism, discrimination and dispossession for many years [31].

Indigenous engagement in sport and physical activity also has a long association with colonizing practices and racial discrimination [35, 36]. Historically, Indigenous people were encouraged to engage in sport and physical activity as a pathway toward being 'civilized' [35]. However, exclusions from legitimate participation were also common practice until well into the 20th century and marginalization through socio-economic limitations may continue today [37]. In contemporary Australia, Indigenous people are often esteemed as having an innate sporting superiority while simultaneously being portrayed as being unreliable or ill-disciplined [38]. The impact of this historical context on Indigenous participation in physical activity has not yet been explored.

Culture is appropriately considered an important structural macro-social factor, understood as a 'dynamic social phenomenon that changes depending on location and time' [39] (p. 9). Cashman [40] noted that in traditional Aboriginal communities, engagement in sport was not viewed as separate from other parts of everyday life such as hunting and tracking. He also asserted, however, that there was great diversity within Indigenous cultures and therefore it is 'difficult to generalize about the nature of sport and play in Aboriginal culture' (p.13). While traditional Indigenous games were played in many communities, few are currently played today and there is limited information about them [41].

In contemporary Australia, some authors have suggested that approaching physical activity research from a Western perspective that promotes the individual's responsibility to 'take exercise' may not be culturally relevant to some Indigenous people [42–44]. For example, Atkinson [42] has suggested that recreational activities may not be perceived as 'physical activity' as the following excerpt illustrates:

Nobody told us this (camping and hunting with family) was recreation. It was just something we did as a family. These activities were essential components in our socialization [45] (p. 1).

In an urban context, recognition of cultural assets and legitimate identity have been problematized by dominant societal attitudes, but urban dwelling

Indigenous people maintain their strong cultural identities [46, 47]. However, the experiences of urban Indigenous people in physical activity appear to be diverse and difficult to attribute to ‘cultural meanings’ *per se*. For instance, a study of urban Indigenous young people found that some young people attributed their sporting ability and interest to their Aboriginality while others did not perceive their involvement in sport to be related to cultural meanings at all [14]. The limited research about cultural meanings attached to physical activity suggests that there are diverse ways in which physical activity is understood and that a more sophisticated approach to understanding the ways in which Indigenous people navigate their cultural knowledges and practices within a post-colonial context is needed.

Structural environmental factors

These factors usually include the physical environment and can be barriers or facilitators for physical activity engagement. Indigenous Australian adults have identified that environmental factors such as feeling unsafe and too great a dependence on cars were barriers to physical activity engagement [48]. Indigenous young people from remote areas of northern Australia identified that a lack of appropriate equipment and lack of organized activities, as well as climate-related factors such as being too hot and sweaty, limited their ability to be physically active [49].

Many public health initiatives have been targeted at the physical environment level and include provision of community sports facilities such as swimming pools [50]. Where these initiatives have been community coordinated to meet the unique needs and promote the strengths of each Indigenous community, results have been promising [51]. However, consideration needs to be given to maintenance of facilities and appropriate processes such as dress codes at swimming pools in traditional Indigenous communities where swimming costumes could be deemed inappropriate or offensive.

Social connections

Social connections influence Indigenous people’s engagement in physical activity at an organizational

and community level (distal connections) as well as the influence of family and friends (proximal connections). Organizational connections within Indigenous communities have often been a site of intervention for sport and physical activity initiatives [52, 53]. These have included broad community sports programs (such as the Australian Sport Commission’s Indigenous Sport Program) that encourage participation as well as elite athlete identification and training [54, 55]. Most of these programs have been externally controlled by, for example, the Australian Government or national football associations and while a preliminary report from remote communities has been positive [56], it is not known how (or if) these programs impact on the lives of urban Indigenous people or remote and rural communities more broadly.

Sport and leisure, including physical activity, have been seen by many Indigenous people as an important part of social life in Aboriginal communities where families and communities can meet and develop social and community links [42, 48, 54, 57]. Physical activity may mean more than engagement in ‘exercise’ for an individual’s physical health benefits and provide opportunities for social connections. Research with urban Indigenous adults found that physical activity is ‘embedded in a complex web of meanings that tie people to their family and larger Aboriginal community’ (p. 734), with the decision to be physically active significantly impacted upon by connections with family and community [48, 58]. For instance, some Indigenous adults reported that they viewed individual health and fitness activities as a ‘disconnecting and shameful experience’ because it focused on them as an individual rather than on social relationships [49]. In contrast, Nelson [14] found that solitary physical activity for some urban Indigenous young people provided an opportunity for relaxation and a reprieve from social issues. Other research has cited a lack of family oriented sustainable activities as a barrier to their engagement in physical activity [59]. Indigenous young people from northern Australia also identified that family and peer influences were important in encouraging participation in physical activity although there was no reported link between family encouragement and self-reported level of activity

[49]. In some Indigenous communities, sport has become a site of social engagement in which participation occurs through both the sport itself and the ancillary tasks such as organizing competition and providing food [60]. Therefore, within the social–ecological model, social connections require particular attention when shaping interventions, as they are key in determining and extending physical activity participation.

Individual characteristics

Psychosocial factors are one dimension of individual characteristics outlined in Lynch's [30] model that impact physical activity engagement. For the purposes of this paper, a broad interpretation of psychosocial factors will be taken, one that encompasses the stress caused by the long-term impact of colonization.

While British colonization was mentioned previously as a structural macro-social factor, its impact is experienced at this individual level through the significant disruption it caused to traditional Aboriginal routines, roles and engagement in physical activities [20, 61]. Many Indigenous people have grown up in households where there were high levels of emotional stress due to factors such as disrupted families, violence and frequent bereavement, which place them at risk of social and emotional difficulties [62, 63]. Kickett-Tucker [64] described engagement in sport as a vehicle for positive self-expression for some urban Indigenous young people. Similarly, urban Indigenous young people have described engagement in physical activity as a useful tool for managing stress [14]. Thus, physical activity may be a means to countering the effects of some of these psychosocial factors.

Socio-economic factors may also impact on an individual's participation in physical activity. Many Indigenous people continue to experience social disadvantage [65] marked by lower levels of educational attainment, higher levels of unemployment and lower income levels than those of non-Indigenous Australians [34]. In addition, Indigenous young people may look for work, have children and learn to manage on their own at an earlier age than non-Indigenous Australians and these factors may impact

on the time they have available and their access to resources, both physical and social, which would support their engagement in physical activity [63]. While lower socio-economic status may influence access to opportunities for physical activity, it must be recognized that this is an individual-level characteristic and there will be some Indigenous young people who come from higher socio-economic backgrounds and who therefore do not face these limitations.

Behavioral factors are the third individual characteristic outlined in the social–ecological model [30]. Recreation is often promoted as a way of protecting against boredom and preventing crime for Indigenous young people through access to appropriate activities within a supportive social environment [42, 66]. Cameron and MacDougall [66] suggested that sport and physical activity can be a 'fantasy that allows one to escape from the day to day reality of family conflict, homelessness, or the temptations to use alcohol, drugs or inhale petrol' (p. 22). Some teachers identified that Indigenous children with behavioral problems were more 'compliant' and appeared happier engaging in sport than any other activity [57]. However, these comments raise questions about the implications for those Indigenous young people who do not engage in sport and those who may want to follow academic pathways.

While Marshall *et al.* [67] and Ramanathan [68] found that Indigenous adults generally felt positive about physical activity and were aware of its health benefits and of the national physical activity guidelines, this has not been found by all. Despite the potential for positive behavior change and health outcomes, a Western Australian study found that more than one quarter of Indigenous young people reportedly did not do enough exercise to make them sweat or breathe hard [69]. In the Torres Strait Islands in Australia, Indigenous young people identified that they would like to be more active but many of them felt this was hard to achieve [49]. They identified personal factors such as not enough time, lack of motivation and shyness as potential barriers to physical activity [49]. In an urban context, the competitive side of some sports was found to both encourage and inhibit Indigenous young people's participation in physical activity [14].

While such individual-level factors are important, it was unclear from these studies how structural factors interplay with individual factors to limit or encourage physical activity engagement.

Human biology and genetics

This level of Lynch's [30] social–ecological model comprises those biological and genetic factors that may influence physical activity participation. Measurement of the black body has a long and difficult history in Australia [70]. Early colonial examinations of Indigenous bodies were focused on the deficits associated with disease and eugenic policies that assumed a 'dying out' of the 'full-blood' Aboriginal person [70]. Contemporary narratives have continued to be preoccupied with the black body with Indigenous people often portrayed as having an innate athletic ability without any evidence or critical examination of these constructions [38]. However, there is a danger that these types of discourses produce racial stereotypes of physicality [71] over and above other dimensions of Indigenous Australian's cultural wealth [72].

Discussion

Through a broad interpretation of Lynch's [30] model, key factors influencing physical activity participation for Indigenous Australians have been introduced. However, there are several assumptions within the mainstream literature outlined above that need to be critiqued in order to develop a more robust and culturally safe approach [73] to the examination of physical activity with Indigenous Australians, one that considers the social and historical context of contemporary physical activity engagement and particularly the ways in which colonial attitudes continue to construct Indigenous people and place them in often disempowered positions.

Pathologizing

Indigenous people are often presented as 'the other' where they are compared with the assumed non-Indigenous 'norm'. Ironically, Australia's policies

of anti-discrimination have perhaps inadvertently constructed and positioned Indigenous people as a subset of problems, being 'disadvantaged' and resource 'poor', with Aboriginality deemed a predictor of unhealthy behaviors rather than a source of cultural identity [74]. While the 'poor' state of Indigenous health by some measures is irrefutable, this pathologized position has at times limited researchers and policy makers from seeing the valuable resources and resilience Indigenous young people bring to engagement in physical activity, even if those resources are different from what one might expect of the dominant 'white' majority [75]. This view that the 'disadvantaged' Indigenous person is in 'need' of our (albeit well-meaning) white Western help can further disempower Indigenous people from being active in decisions to affect their physical activity behavior [76]. Indeed, it is not known whether or not Indigenous young people see themselves as at risk of ill health and whether or not this is a determinant in their physical activity participation.

Indigenous people need to be encouraged and supported to use their knowledge, values and culture as strengths and resources in their physical activity engagement. There is a long history of Indigenous people negotiating the interface between Western knowledge systems and those from traditional Indigenous lore [21, 77] but health educators (and/or health promotion professionals) need to recognize the unique ways in which they negotiate all these different knowledges.

Contemporary views of health and physical activity

In Western societies, discourses around the importance of the regulation of the body (e.g. eat well and exercise more) have become accepted as not only the way to health but also as morally 'right' [78]. Much of the current physical activity and health literature is based on this assumption and the desire to be 'healthy' has arguably become a new form of corporeal control [13, 79]. The media also promotes a slender body shape as desirable, healthy and easily attainable by all, while those who are overweight or obese are portrayed as lazy and undesirable [79, 80].

However, this Western way of viewing the body appears to benefit the white middle class and masks the reality that not all people have the same opportunities to achieve and maintain health and be physically active [81].

Cowlshaw [82] has argued that ‘all’ perspectives need to be recognized as sources of insight. This is important when considering approaches to health education/promotion with Indigenous people. For example, an Indigenous model of health highlights the spiritual and emotional aspects of health but these values are often in contrast to non-Indigenous materialistic, dualistic (mind–body) and mechanistic notions of being [83]. As Thompson and Gifford state [58], ‘achieving a “balance” in life requires the maintenance of meaningful connections to family, the land, the past and future, all of which are important for health and well being’ (p. 1458) but may be antithetical to producing the self-managing, slender healthy citizen.

Physical activity as a panacea

Physical activity, and particularly sport, has at times been advocated as a remedy for the disadvantage experienced by Indigenous young people by providing an opportunity for upward socio-economic mobility. Some initiatives have argued that participation in sport provided a ‘level playing field’ with non-Indigenous people or a means by which Aboriginal children could excel while feeling proud of their Aboriginality [53, 64]. However, Hayward [84], while acknowledging the potential that sporting success offered in terms of economic advantages and social mobility, also argued that for Indigenous people there were often issues of discrimination and inequity of access to opportunities to enter and participate in sport. There is also a risk that focusing on sport as a solution to the issues facing Indigenous young people could come at the expense of addressing other needs such as educational and employment options [71]. The use of traditional Indigenous games as a community-based health promotion initiative may be a way forward in balancing these issues [51] although care needs to be taken in how this traditional knowledge is used.

Engagement in sport and leisure has also been advocated as an antidote to what are perceived as the high-risk behaviors of some Indigenous young people. Some evidence exists of an association between crime prevention and the engagement in sport and recreation by Indigenous young people [85]. However, Mason and Wilson [85] argued that it was unrealistic to expect that sport and recreation programs alone could have an ongoing impact on Indigenous young people’s behaviors if not considered within the broader context of Indigenous young people and their needs.

Figure 2 comprises Lynch’s adapted model and summarizes the ways in which the literature has been organized using this conceptual framework, including elaborations of the factors influencing Indigenous Australian’s physical activity participation.

Identified gaps in the literature

Several gaps in current knowledge about physical activity and Indigenous Australians have been identified through this review. We suggest that there is very little understanding of the contemporary meanings of physical activity held by Indigenous Australians. There is also a need for more age- and geographic location-specific research so that participation and values related to physical activity can be more clearly understood. For example, while health policies and practices advocate that young Indigenous Australians would find physical activity particularly valuable, little is known about what physical activity means to different Indigenous children and young people and what factors impact their ongoing participation as they move through school and into adulthood.

In addition, further research is needed to evaluate the impact of Indigenous-focused sports programs in rural, remote and urban locations. This will require careful consideration of appropriate and sophisticated measurement tools that can account for the interrelatedness of the different factors outlined above. Research using a social–ecological model may help to gain a greater understanding of how different factors impact one another and where physical activity interventions might be most sustainable and effective.

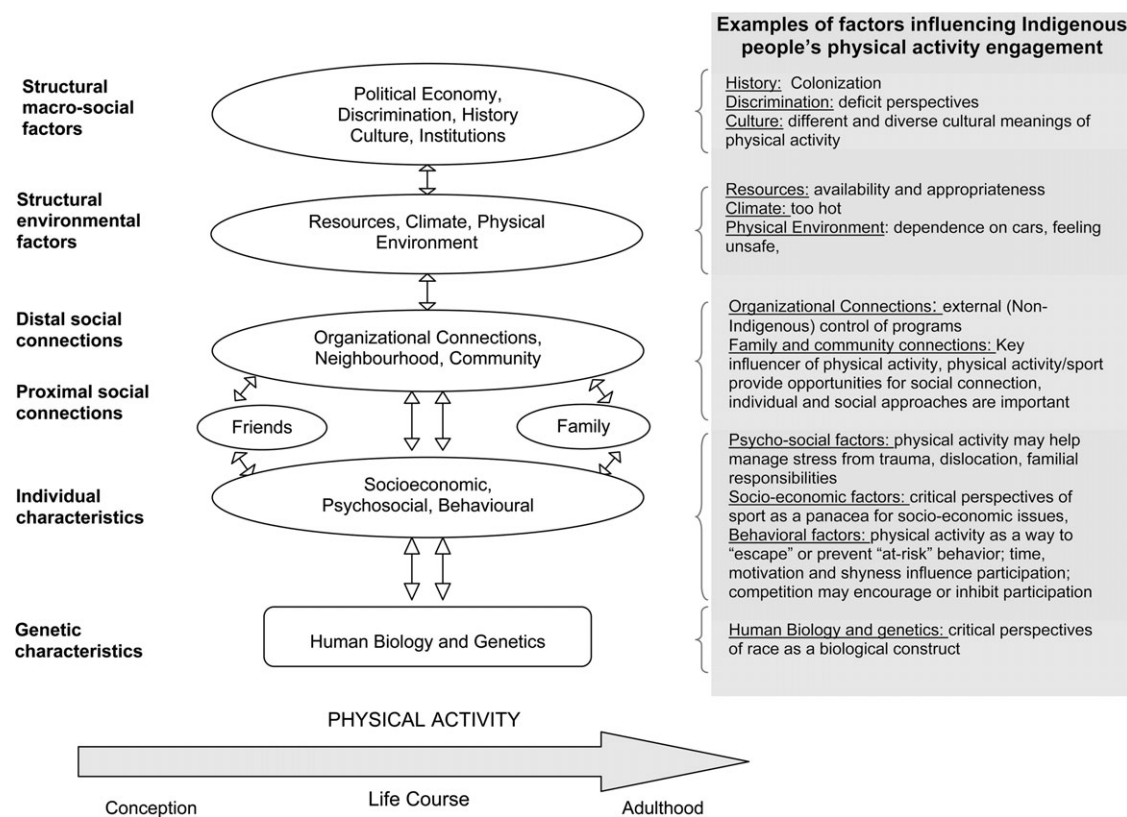


Fig. 2. Elaboration of the adapted social–ecological model of determinants of physical activity for Indigenous people.

Conclusion

The engagement of Indigenous Australians in physical activity and the ways in which it has meaning in their lives cannot be separated from the myriad of other influences such as ‘social relationships, underlying environmental, occupational, nutritional, residential and experiential conditions’ [86] and, more broadly, colonization, culture, history and family. As health educators, we need to be cognizant of the heterogeneous and multifaceted context in which physical activity may or may not take place [87] thereby resisting approaches that assume homogeneity, monoculturalism and fixedness. An examination of the cultural factors impacting the participation of Indigenous people in physical activity needs to go beyond a view of culture as a fixed

entity and acknowledge that there are different approaches and meanings attached to physical activity for all people and that any public health initiative will require a more complex consideration of this diversity in order to be effective [46]. We need to recognize that health education and promotion initiatives in Australia are inevitably produced from a Western cultural perspective that reflects particular values that are potentially incongruent to those of some Indigenous people.

‘The cultural interface’ [21] provides a helpful conceptual tool to assist health educators to consider the complexity and diversity of Indigenous people’s lived experiences when planning and implementing programs aimed at promoting active living. It is described in part as an intersection of ‘different systems of thought ... within and

between different knowledge traditions and different systems of social, economic and political organization' [21] (p. 199). Indigenous communities around the globe are articulating their own models of health and health promotion (see, for example, [16, 88]) and there are promising collaborations in Australia between Indigenous and non-Indigenous agencies [19, 20]. As suggested by Nakata [21], if this interface is to be fruitful, health educators need to approach physical activity engagement from a strength-based perspective when working with Indigenous people. This means valuing 'all' knowledges in a process of creating new ways of understanding and recognizing that diversity and tailoring of approaches are key to sustainable efforts.

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Conflict of interest statement

None declared.

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