



Review

A systematic review on research into the effectiveness of group-based sport and exercise programs designed for Indigenous adults



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ABSTRACT

Objectives: To evaluate research into the effectiveness of group-based sport and exercise programs targeting Indigenous adults on anthropometric, physiological and quality of life outcomes.

Design: A systematic review with quality assessment of study design.

Methods: A computer-based literature search of EBSCO, SPORTDiscus, CINAHL, Informit, Scopus, Web of Science, Medline, PubMed, Global Health, ProQuest and Discover databases was conducted. Methodological quality of individual articles was assessed using McMasters University Guidelines and Appraisal Forms for Critical Review for Quantitative Research. Results of the effectiveness of programs are then summarised.

Results: Six articles were identified with critical appraisal scores ranging from 6 to 12 (from a possible 15 points), with a mean score of 9.6. Five articles were of moderate to good quality. Significant improvements were observed in anthropometric, physiological and quality of life outcomes across all studies. Elements of successful group-based exercise and sport programs corresponded to global recommendations on physical activity for health for 18 to 64 year olds, and were implemented over a period of time ranging from 12 to 24 weeks to exhibit results, plus community consultation in developing programs and nutrition education.

Conclusions: Group-based programs that include nutrition, exercise and/or sport components are effective in producing short to intermediate term health outcomes among Indigenous adults. Further high quality research, specifically on group-based modified sport programs for Indigenous adults that are culturally appropriate and aim to improve quality of life are needed.

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1. Introduction

Physical activity provides significant health benefits across the lifespan.^{1,2} Competitive activity such as sport has been shown to contribute to general health,^{3,4} mobility and wellbeing as people age.⁵ In particular, team sports played in a community-based environment have added benefits including social support, comradeship and skill development through the interactions and skills required in teamwork and when modified to cater for the specific needs and safety of people can be successful in promoting and sustaining physical activity.^{6,7} Furthermore, modified sports may offer a more diverse range of physical activity opportunities for people, including Indigenous people.

Sport, through the facilitation of social networks and cultural capital,⁸ is of particular importance for Indigenous people, where it is suggested that sport creates a vehicle to connect across generations.⁹ This activity can engage Indigenous adults as role models, encouraging the abilities of men to lead, motivate and challenge those younger than themselves⁹ and for women to take control and seize opportunities.¹⁰ The sharing of knowledge and wisdom to younger generations is important to the Indigenous culture^{9,10} where historically the younger generation were prepared for a life as hunters and gatherers by playing games.¹¹ Furthermore, sport teaches life skills including self-reliance, discipline and cooperation¹¹ that contribute to developing a socially cohesive environment which is the foundation of Indigenous communities. Sport, through these connections can provide a healthy path to adulthood, bridge the health divide and have an impact on the health^{9,10} and longevity¹² of all Indigenous adults. Bridging the health divide between Indigenous and non-Indigenous groups is also of importance to governments as evidenced in a

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committed effort to risk factor prevention and chronic disease management by the Australian government.¹² The national estimated life expectancy at birth for Indigenous males being 69.1 years and females 73.7 years, 10.6 years and 9.5 years lower than for non-Indigenous males and females respectively¹³ can be largely attributed to chronic diseases.¹² Providing opportunities for Indigenous people to participate in sport is a way to increase physical activity, where in Australia, physical inactivity rates are substantially higher at an average of 70%¹⁴ for Indigenous Australian adults compared to less than 50% for their non-Indigenous counterparts. Furthermore, studies have shown physical activity to be beneficial in improving general health^{1,2} and obesity, diabetes and heart disease outcomes,⁹ as well as longevity.¹² As such maintaining the health of adults as they age through physical activity is a priority.

From the review of literature no assessment on the effectiveness of a modified sport program on improving the quality of life (QoL) of Indigenous adults was found. However, studies have reported positive results on the use of an exercise rehabilitation program in Indigenous populations to improve chronic disease outcomes including blood pressure (BP), body mass index (BMI) and waist circumference (WC).^{15,16} Participation in a cardiac rehabilitation program improved cardiovascular risk factors and health management¹⁶ and, similarly participation in a cardiopulmonary rehabilitation program led to positive changes in health behaviours, functional exercise capacity and health related QoL.¹⁵ Both rehabilitation programs consisted of one education and one¹⁶ to two¹⁵ supervised exercise sessions per week for a duration of 1 h or within a flexible 4 h timeframe,¹⁶ as well as home-based physical activity¹⁶ for a period of eight weeks.^{15,16} The deficit in research is also evident for the general adult population with studies reporting mixed results, on the use of modified sport programs to improve indicators of health and QoL of non-Indigenous population sub-groups.^{4,7,17} Most research to date has focused on exercise programs of varying types that address chronic disease prevention or management.

The seldom explored association between sport and the health of Indigenous people, plus the portrayal of sport being a leisure time activity⁹ may be reasons for the research deficit on modified sport programs for Indigenous adults. Therefore, research that explores these associations and supports Indigenous people, their values and culture may enhance the QoL of Indigenous adults. Given the limited evidence and life expectancy of Indigenous people, this study will evaluate research into the effectiveness of group-based sport and exercise programs targeting Indigenous adults on anthropometric, physiological and QoL outcomes in order to assist in guiding further research into such programs.

2. Methods

A systematic literature search was conducted with the aim to identify and evaluate research into the effectiveness of group-based sport and exercise programs targeting Indigenous adults on anthropometric, physiological and QoL outcomes. Due to similarities in health and socio-economic disadvantage¹⁸ in Indigenous peoples around the world, a range of terms was selected to provide a representation of articles reporting on Indigenous peoples (where Indigenous was defined according to the United Nations by the criterion of self-identification as underlined in a number of human rights documents),¹⁹ and a definition further endorsed by the World Health Organisation.¹⁸ The target population was adults aged 18 years or older and described as Australian Aboriginal, Torres Strait Islander, Murri, Koori, First Australian, Maori, Hawaiian Indigenous, Canadian Indigenous, Inuit, Aleutian, and First People and satisfy the definition of Indigenous. These Indigenous peoples were selected due to having similarities more likely of relevance to Australian Indigenous peoples, and represent geographical

locations of the Pacific and circumpolar regions and characterise a proportion of the diversity within the 370 million Indigenous people spread across 70 countries worldwide.¹⁸ Included programs were interventions described as, or include a group-based sport program or exercise program, where exercise and sport are defined as subcategories of physical activity that are planned, structured, repetitive, and purposeful wherein the improvement or maintenance of one or more components of physical fitness is the main objective²⁰ or one of the objectives.²¹ Program evaluation outcomes also needed to include health and QoL measures. Additional inclusion criteria included articles in English, full text, peer reviewed, and scholarly journals.

The systematic search was undertaken from August 2014–June 2015 using eleven electronic databases (EBSCO, SPORTDiscus, CINAHL, Informit, Scopus, Web of Science, Medline, PubMed, Global Health, ProQuest and Discover) selected for their focus on exercise, sport, health and Indigenous studies. After numerous searches, entering a diverse range of criteria, yielded a paucity of results, three separate searches were undertaken using the terms sport, exercise, and physical activity, where the key criterion of Indigenous remained constant throughout the three searches. To ensure a thorough search these criteria were entered both separately and in Boolean combination into each database, as well as a review of relevant article reference lists and key author searches. Article identification and screening was performed by the first author with eligibility and inclusion decided by the first three authors. Six articles were identified as meeting all the inclusion criteria and were reviewed for critical appraisal. The article selection process is represented in Fig. 1.

Critical appraisal of selected articles for quality was conducted using the McMasters University Guidelines and Appraisal Forms for Critical Review for Quantitative Research.²² This critical appraisal tool was selected as each article utilised quantitative methods and for its previous application in sport and exercise science systematic literature reviews.^{23,24} The form uses a questionnaire format and provides grading options that include 'yes', 'no', 'not applicable' and 'not addressed' depending on the question. A numerical scoring system, devised in previous reviews^{25,26} was used to facilitate comparison across articles. The criteria and scoring system are illustrated in Table 1. Scores between 7 and 10 were defined as moderate quality (50–66%) and scores ≥ 10 out of 15 (>66%) were defined as good quality based on previous reviews.^{27,28} A moderate to good score for five articles was considered by the authors to be sufficient to guide future research; however, the authors also consider that it would be prudent to address the limitations of the six included articles. The scoring criteria included relevance of the literature that informed the overall study, practicality of the design, analysis and results based on outcome measures and sample, measurement, and performance biases. All included articles were critically appraised and scored by the first author then independently by the second and third authors. Scores were then collated and compared. Agreement on scores and quality was reached by discussion between reviewers by seeking a common understanding of the criterion definitions and decision-making applied to the scoring system. This process ensured that critical appraisal methods were applied consistently.

3. Results

The results of the critical appraisal for the six included articles in this review are presented in Table 1. The critical appraisal scores ranged from 6 to 12, with a mean score of 9.6, of a possible 15 points indicating a moderate to good quality for five articles^{29–33} (Table 1). There was a lack of studies providing a high level of evidence therefore the quality of evidence needs to be considered when interpreting the findings. The authors also considered

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