

A systematic review of the relationship between parenting styles and children's physical activity

EUGENE LEE DAVIDS AND NICOLETTE VANESSA ROMAN

Child and Family Studies Programme, Department of Social Work, University of the Western Cape, Private Bag X17, Bellville, Cape Town 7535, South Africa. E-mail: davidse.psych@gmail.com

Abstract

Physical activity is an important component of childhood that promotes health and well-being. Parents could play a pivotal role in children's involvement in physical activity by means of their parenting style. The role of parenting styles in children's physical activity is unclear. The aim of this systematic review was to establish the role of parenting styles in children's physical activity. A search was conducted during the month of February 2013 using databases and journals such as Science Direct, Ebscohost (PsyArticles, Medline, Academic Search Complete, SportDiscus and Rehabilitation and Sport Medicine Source), BioMed Central, PubMed, Directory of Open Access Journal (DOAJ) and SAGE Journals for the periods from 2002 to 2012. Two reviewers independently evaluated the methodological quality of the studies reviewed. Eleven articles met the criteria for the inclusion in the review. These studies included six cross-sectional studies, three cohort studies and two that used both cross-sectional and cohort studies. Five of the studies were conducted in USA, two in Iran and one each respectively in Australia, Pacific Island, North East England and Northern Taiwan. The age groups of the participants ranged from birth to adolescence. Four of the studies looked at the parent-child dyad when collecting the required data. This review found that parenting styles were related to the promotion of physical activity. Specifically, the results suggest that the majority of studies found a positive relationship between authoritative parenting styles and physical activity. This study provides a good perspective for better understanding the role of parental relations in the context of postmodern sedentary society.

Keywords: Parenting, parenting styles, physical activity, well-being, systematic review.

How to cite this article:

Davids, E.L. & Roman, N.V. (2014). A systematic review of the relationship between parenting styles and children's physical activity. *African Journal for Physical, Health Education, Recreation and Dance*, October (Supplement 2:1), 228-246.

Introduction

Physical inactivity and low levels of physical activity are related to sedentary lifestyles and poor nutrition intake and are considered the fourth leading cause of global mortality (World Health Organisation, 2009). Physical inactivity has also been found to be the leading cause of non-communicable disease and therefore could potentially become a public health concern (Strydom, 2013). Children, especially have been found to be more physically inactive as they progress into adolescence (Mountjoy et al., 2011). Sedentary lifestyles develop among youth as a result of physical inactivity which may continue into adulthood (Sekot,

2012). A decrease in being physically active during childhood and adolescence could result in obesity and other health-related concerns (Monyeki et al., 2012). This phenomenon is experienced internationally, in both developing and developed countries, as a result of urbanisation, industrialisation and globalisation (Jacka et al., 2011). In South Africa, 74.6% of individuals are physically inactive (Strydom, 2013), which means that only a quarter of individuals are physically active. These findings are concerning since the assumption is that physical activity is an important component of health and well-being but young people's involvement in physical activity may not necessarily be aligned with what it ought to be to promote health and well-being (Standage et al., 2012).

Physical activity is an important component of childhood that sets the stage for adult behaviours (Standage et al., 2012). Often physical activity is associated with numerous benefits of physical and mental health and well-being that increase as the amount and intensity of activity increases (Ahn & Fedewa, 2011). Furthermore, involvement in physical activity is also considered important during childhood for brain development and, when carried out in the form of sport participation, it is beneficial for pro-social development (Jacka et al., 2011). Clearly then, children should become physically active and increase their physical activities especially if their levels of physical activity are not as desired. Parents could therefore be the key to encouraging their children to actively participate in physical activities.

As children are socialised and shaped by both their parents' and society's values and beliefs (Spera, 2005), parenting plays a pivotal role in the socialisation and development of children (White et al., 2009). The parent-child relationship is also linked to the child's development and well-being (Akinsola, 2011). Central to the parent-child relationship is that of parenting style which can or, to the contrary, cannot assist in the development of competent and adjusted children (Akinsola, 2011). Parenting style is often defined as a 'typology of attitudes and behaviours that characterise how a parent will interact with a child across domains of parenting' (Ventura & Birch, 2008: 3). These styles create the context in which parents raise their children and the manner in which they parent (Darling & Steinberg, 1993).

Three commonly accepted parenting styles: that is, authoritarian, authoritative and permissive, have been associated with different outcomes for children. These three styles are differentiated by parental control and acceptance, as well as by warmth and interactions (Fuemmeler et al., 2012). An authoritarian parent is low on acceptance and high on control, while an authoritative parent is high on both control and acceptance, and a permissive parent is high on acceptance and low on control (Swartz et al., 2008). The authoritarian parent sets strict rules and standards to which children must adhere, with little warmth shown towards the

children (Swartz et al., 2008). On the other hand authoritative parents display warmth and respect towards their children; they have rules in place and explain to their children the reasons behind the rules and limitations that they set by them (Spera, 2005; Keshavarz & Baharudin, 2009). Additionally, the permissive parent displays nurturance and warmth toward his/her children; however, there are little to no rules and limits imposed (Swartz, 2008). Parenting styles can play a pivotal role in the development and belief towards children's and adolescents' involvement in physical activity (Kimiecik & Horn, 2012), as supporters of their children's engagement in physical activity and health-related behaviours (Berge et al., 2010). Since parenting plays an important role in determining the lifestyle that children lead (Lau, Lee & Ransdell, 2007; Mountjoy et al., 2011), it is important for health professionals to have a comprehensive understanding of the relationship between parenting styles and physical activity in children.

Systematic reviews have been conducted which examine parenting and children's physical activity (Newman, Harrison, Dashiff & Davies, 2008; Beets, Cardinal & Alderman, 2010). However, these reviews mainly covered parental social support and children's physical activity (Beets et al., 2010) as well as parenting styles and adolescent risk behaviour (Newman et al., 2008; Beets et al., 2010). The current systematic review, however, aimed to establish the association between parenting styles (in terms of Baumrind's (1991) typology of parenting) and physical activity that currently exist within the body of research. A review by Trost and Loprinzi (2011) considered the social environment in which children often find themselves; which are the parental home, family cohesion, parental practices and behaviours, as well as parenting styles. However, Trost and Loprinzi (2011) included only two studies that looked at the association between parenting styles and physical activity. Both of these studies looked at the authoritative parenting style and did not consider the other parenting styles of Baumrind (which would also include the authoritarian and permissive parenting styles). This review, however, considers the three main parenting styles which Baumrind defines, and considers the underlying association between the parenting styles and physical activity of children, adolescents and/or youth.

The current review has also included more studies that were not included within the review by Trost and Loprinzi (2011) as it goes beyond the authoritative parenting style, which was the main focus of their review. Trost and Loprinzi (2011) indicated that there is a gap in the literature in studies that examine the association between physical activity and parenting styles. However, the contribution by Trost and Loprinzi (2011) assists in providing more valuable information on the association between parent-child interactions and physical activity than on parenting styles and physical activity. This systematic review, therefore, further adds to the current debates in the research concerning the valuable contribution of parents to the promotion of physical activity among

children. This review aims to (i) determine which parenting style promotes physical activity, (ii) to examine the influences of parenting styles on physical activity, (iii) identify the instruments or methods to assess physical activity and parenting styles and (iv) to evaluate the methodological quality of studies looking at parenting styles and physical activity among children, adolescents and/or youth.

Methods

Before embarking on the systematic review, terms and explanations to be included within the review were considered (Table 1). A systematic process of collection, examination and reporting was subsequently followed.

Terms and definitions

Table 1: Terms and definitions

Term:	Definition / explanation:
Parenting styles	'Typology of attitudes and behaviours that characterise how a parent will interact with a child across domains of parenting' (Ventura & Birch, 2008). Baumrind identifies three parenting styles namely that of (i) authoritative, (ii) authoritarian and (iii) permissive (parenting, parenting styles).
Physical activity	Any bodily movement made by the skeletal muscles with the overall outcome of energy expenditure by an individual (Thorsen et al., 2005).

Search strategy

In addressing the role that parenting styles play in physical activity of children, adolescents and/or youth, a search was conducted in February 2013, using databases and journals such as Science Direct, Ebscohost (PsycArticles, Medline, Academic Search Complete, SportDiscus and Rehabilitation and Sport Medicine Source), BioMed Central, PubMed, Directory of Open Access Journal (DOAJ) and SAGE Journals for the periods from 2002 to 2012. The studies included in the review consisted of prevalence studies that determined the incidence of physical activity and parenting styles, as well as those which looked at the association between the two variables. The terms used in the search included *physical activity*, *parenting style*, *authoritative parenting*, *authoritarian parenting*, *permissive parenting* and *uninvolved parenting*. From the results obtained, the titles and abstracts were reviewed and examined, using the inclusion criteria outlined in the next section. The retrieval of possible full text articles was done by one of the reviewers and the same process was then followed by another reviewer to determine whether the article adequately met the criteria for inclusion in the review.

Inclusion criteria

The following criteria were considered before a study was included within the review: (i) the paper had to be published in, or translated into, the English language, (ii) the paper had to be published between 2002 and 2012 (to consider literature that was published within the past ten years to give an overview of what is considered current within the findings), (iii) the study had involved either children, adolescents or youth as part of the sample and (iv) the study had to look at the relationship/association between parenting styles and physical activity.

Methods of the review

The primary researcher conducted an initial search and reviewed the abstracts and articles. The initial search yielded 6 619 articles for the keywords *parenting styles and physical activity*. The searches thereafter yielded 1 424 articles for *parenting styles, authoritative parenting, authoritarian parenting, permissive parenting, uninvolved parenting and physical activity*. Following these searches, the titles were reviewed for eligibility and a sample of 123 studies was reached. Six additional studies were considered for possible inclusion, which were obtained from other sources and from reference lists of other articles. The next stage involved removing any duplicates that existed and the remaining sample consisted of thirteen retrieved articles that met the inclusion criteria. These articles were independently read to establish inclusion within the systematic review and the methodological quality of the articles was evaluated to establish their inclusion in the systematic review.

Methodological quality appraisal

The methodological quality for the studies was assessed using an instrument (Table 2) adapted from previous systematic reviews by Louw, Morris and Grimmer-Somers (2007), Wong, Cheung and Hart (2008) as well as Roman and Frantz (2013). The final sample consisted of thirteen articles which were included in the systematic review (Table 3). Figure 1 outlines the process involved in the systematic review.

Table 2: Methodological Quality Appraisal Tool

1	Sampling method: Was it representative of the population intended in the study?	
	A. Non-probability sampling (including: purposive, quota, convenience and snowball sampling)	0
	B. Probability sampling (including: simple random, systematic, stratified g, cluster, two-stage and multi-stage sampling)	1
2	Was a response rate mentioned within the study? (Respond no if response rate is below 60)	0
	A. No	1
	B. Yes	
3	Was the measurement tool used valid and reliable?	
	A. No	0
	B. Yes	1
4	Was it a primary or secondary data source?	
	A. Primary data source	1
	B. Secondary data source (survey, not designed for the purpose)	0
5	Was Physical Activity looked at within the study?	
	A. No	0
	B. Yes	1
6	Was the relationship/association between Parenting Styles and Physical Activity explored?	
	A. No	0
	B. Yes	1

Scoring: Total score divided by total number of items multiplied by 100

Methodological Appraisal Score

Bad	Satisfactory	Good
0 – 33 %	34 – 66 %	67 – 100 %

Table 3: Methodological Appraisal

Author(s)	Q1	Q2	Q3	Q4	Q5	Q6	%	Total
Saunders, Hume, Timperio and Salmon (2012)	1	1	1	1	1	1	100	67 – 100 %
Hennessy et al. (2010)	1	1	1	1	1	1	100	67 – 100 %
Arredondo et al. (2006)	1	1	1	1	1	1	100	67 – 100 %
Berge, Wall, Loth and Neumark-Sztainer (2010)	0	1	0	0	1	1	50	34 – 66 %
Benar and Behrozi (2012)	1	1	1	1	1	1	100	67 – 100 %

Author(s)	Q1	Q2	Q3	Q4	Q5	Q6	%	Total
Johnson et al. (2012)	0	1	1	1	1	1	83.33	67 – 100 %
Wen and Hui (2012)	1	1	1	1	1	1	100	67 – 100 %
Oliver, Schluter, Schofield and Paterson (2011)	0	1	0	0	1	1	50	34 – 66 %
Berge, Wall, Bauer and Neumark-Sztainer (2010)	0	1	0	0	1	1	50	34 – 66 %
King et al. (2010)	1	1	1	1	1	1	100	67 – 100 %
Benar, et al. (2012)	1	1	1	1	1	1	100	67 – 100 %
Chen, Unnithan, Kennedy and Yeh (2008)	0	1	1	1	1	1	83.33	67 – 100 %
Schmitz et al. (2002)	1	1	1	1	1	1	100	67 – 100 %

Data extraction

After the completion of the Methodological Quality Appraisal, the studies that met the criteria for the categories of good to satisfactory were reviewed, and a data extraction table was formed, using the guidelines of Roman and Frantz's (2013) data extraction tool, which included information regarding the study. The information in the data extraction table included author, geographical location of study, study design, participant information, the aim or purpose of the study, instruments used to assess physical activity and parenting styles, as well as the relationship/association between parenting styles and physical activity (Table 4).

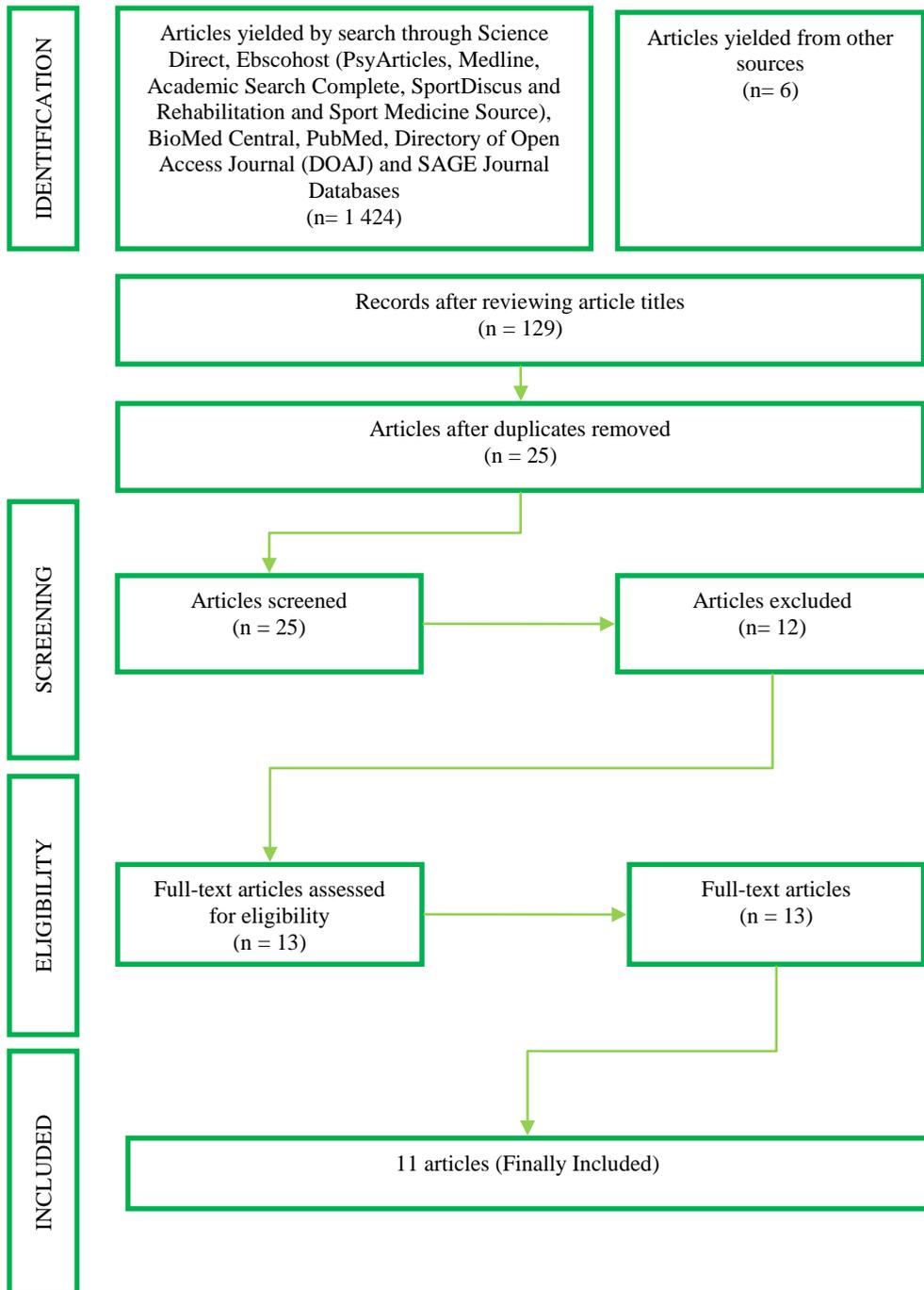


Figure 1: Flow chart of study screening

Results

Table 3 provides an outline of the results that were obtained for the various studies, which utilised the methodological appraisal instrument to assist with the final inclusion criteria. Of the initial 25 studies, 13 formed part of the methodological appraisal section of the review. The criteria that were used in the methodological quality assessment instrument included sampling methods, measurement tool, the data sources used, whether physical activity was looked at in the study, and whether the relationship between parenting styles and physical activity was discussed. Of the 13 articles that formed part of the methodological appraisal, ten reached the desired outcome within the good category in the 67 – 100% range and three reached the satisfactory category in the 34 – 66% range. The three articles which were in the satisfactory category were included in the review; only if an article fell within the bad category was it excluded from the review. Furthermore, the three studies that were included also examined the associations between physical activity and parenting styles. This was another reason why they were included in the review. Two of the articles (Arredondo et al., 2006; Wen & Hui, 2012) fell within the good category in the 67 – 100% range; however, they were excluded from the review because, notwithstanding that they examined the associations between physical activity and parenting styles, they did not utilise the typology of parenting styles as defined by Baumrind, but instead examined the associations between physical activity and parenting practices. Therefore the remaining eleven studies that were methodologically appraised were included in the final review.

Of the initial 25 articles, 11 articles met the reviewers' inclusion criteria (Table 4).

Overview of reviewed studies

Of the final sample of 11 articles included in the systematic review, six were cross-sectional, three were cohort studies and two included both cross-sectional and cohort components. The geographical location of the studies included five conducted within the United States of America, two in Iran, and one in Australia, the Pacific Islands, North East England and Northern Taiwan, respectively. The age groups of the participants of the various studies included in the review extended to adolescence. Four of the studies looked at the parent-child dyad when collecting the required data.

Parenting Styles

The 11 articles in the review all considered parenting styles using Baumrind's typology.

Table 4: Data extraction

Author (s)	Country/ Geographical location	Study Design	Participants	Instrument(s) used	Relationship / association between Parenting Styles (PS) and Physical Activity
Saunders, Hume, Timperio and Salmon (2012)	Melbourne, Victoria, Australia	Cross-sectional and longitudinal Cohort Study	2001: 919 children (495=girls) between ages 10 -12 and their parents 2004: 222 adolescent girls and their parents 2006: 166 adolescent girls and their parents	Height & Weight: digital scale and stadiometer Parenting styles (PS): 22 item adaptation of Baumrind's typology Organised sport participation: Adolescent Physical Activity Recall Questionnaire Walking/cycling trips: self-report Moderate-to-vigorous physical activity (MVPA): Accelerometers	Cross-sectional: Authoritarian PS and frequency in organised sport participation; less walking and cycling due to authoritative and indulgent PS. Single parents: Authoritative PS and increased MVPA; decreased authoritarian related in increased walking/ cycling. Longitudinal: 2006: Authoritative and neglectful PS and physical activities
Hennesy et al. (2010)	USA (California, Mississippi, South Carolina & Kentucky)	Cross-sectional Survey	99 parent-child dyads (children were between the ages of 6 – 11) from rural communities	Parenting styles (PS): Parenting Dimensions Inventory Activity Related Parenting Practices: Assessment of logistical support and explicit modelling. Physical Activity: Accelerometer Height and weight: Stadiometer and digital scale	Permissive, not uninvolved, PS related to increased MVPA. Increased parental reinforcement and monitoring to be associated with increased levels of physical activity.
Berge, Wall, Loth and Neumark-Sztainer (2010)	Minnesota, United States of America	Cohort study	2516 adolescents from 31 Minnesota schools	Parenting styles (PS): 4 PS were created using adolescents' reports of parenting characteristics Body Mass Index: Height/Weight Dietary Intake: 149 item Youth and Adolescent Food Frequency Questionnaire Physical Activity: Adapted from Godin Leisure-Time Exercise Questionnaire	Time 1: Paternal neglectful PS predicted less physical activity in sons. Time 2: No significant association between physical activity and parenting styles.

Author (s)	Country/ Geographical location	Study Design	Participants	Instrument(s) used	Relationship / association between Parenting Styles (PS) and Physical Activity
Benar and Behrozi (2012)	Rasht City, Iran	Cross-sectional: survey design	360 female high school learners, between ages 14 – 17.	Parenting Styles: Parenting Styles Questionnaire Physical Activity: Physical Activity Questionnaire for Adolescents	No significant association between parenting styles and physical activity.
Johnson, Welk, Saint-Maurice and Ihmels (2012)	USA	Cross-sectional: survey design	182 children from two urban elementary schools, aged 7 - 10	Parenting Styles: Parenting Styles and Dimensions Questionnaire Nutrition and Physical Activity: Family Nutrition and Physical Activity Assessment	Family nutrition and physical activity positively associated with authoritative PS and negatively associated with authoritarian and permissive PS.
Oliver, Schluter, Schofield and Paterson (2011)	Pacific Island	Two studies: (i) Cohort (ii) Cross-sectional	135 children and 91 mothers	Physical Activity: Accelerometer Parenting Styles: Abbreviated version of Parenting Styles and Dimensions Questionnaire	Increased authoritative PS associated with increased MVPA
Berge, Wall, Bauer and Neumark-Sztainer (2010)	Minnesota, USA	Cohort study	4764 adolescents from 31 different middle and high schools, between ages 11 - 18	Parenting styles and practices Physical Activity: Adapted from Godin Leisure-Time Exercise Questionnaire	Authoritative and permissive PS co-occurred with modelling and encouraging health behaviour (A parenting practice promoting physical activity among adolescents).
King et al. (2010)	North East England, United Kingdom	Birth Cohort Study	480 participants	Physical Activity: Accelerometer Parenting style	No significant relationships
Benar, Hemmatinezhad, Behrozi, Andam and Yousefi (2012)	Rasht City, Iran	Cross-sectional Survey design	360 female learners aged 14 – 17 years	Parenting Styles: Parenting Style Questionnaire (PSI-II) Physical Activity: Physical Activity Questionnaire for Adolescents	A negative relationship between physical activity and mothers' permissive PS.
Chen, Unnithan, Kennedy and Yeh (2008)	Taiwan	Cross-sectional	Children aged 7 and 8 and their mothers from two elementary schools (one urban and one rural)	Parenting Styles: Child-Rearing Practice Report, 91 item questionnaire Physical Activity: (i) Seven day physical activity recall (ii) Progressive Aerobic Cardiovascular Endurance Run (PACER)	Boys: Increased moderate-to-vigorous activity and low authoritarian PS.

Author (s)	Country/ Geographical location	Study Design	Participants	Instrument(s) used	Relationship / association between Parenting Styles (PS) and Physical Activity
Schmitz, Lytle, Phillips, Murray, Birnbau m and Kubik (2002)	Twin Cities, Minnesota	Cross-sectional: survey design	3 878 seventh graders from 16 different schools	Physical Activity: 2 items rating physical activity levels Parenting Styles: Jackson et al (1994; 1998)	Girls: Maternal authoritative PS related to increased physical activity.

Physical Activity

All 11 articles considered physical activity, because it was one of the methodological quality appraisal items to be considered for inclusion in the systematic review. In the context of the review, physical activity was considered as being any bodily movement made by the skeletal muscles with the overall outcome of energy expenditure by an individual, as proposed by Thorsen et al. (2005).

The types of physical activities in which the participants engaged was very difficult to establish, as the only study that made use of actual physical activities was that conducted by Chen et al. (2008) which included muscular endurance (sit ups), flexibility (sit-and-reach test) and aerobic capacity of the participants. In addition to this study, only four studies involved the use of accelerometers to measure participants' physical activity engagement on the various days of data collection (King et al., 2010; Oliver et al., 2011; Saunders et al., 2012; Hennessy et al., 2010). However, the other studies used paper-based questionnaires and recall methods to establish physical activity participation.

Parenting Styles and Physical Activity

The studies reviewed looked at the relationship between parenting styles and physical activity. Four of the studies found a relationship between authoritative parenting style and physical activity (Saunders et al., 2012 [negatively associated with walking and cycling]; Johnson et al., 2012 [positively associated with family nutrition and physical activity scores]; Oliver et al., 2011 [positively associated with moderate to vigorous physical activity]; Schmitz et al., 2002 [maternal authoritative parenting style was positively associated with higher levels of physical activity]; three found a relationship between permissive parenting styles (Hennessy et al., 2010 [positively related to moderate to vigorous physical activity]; Johnson et al., 2012 [negatively associated with family nutrition and physical activity scores]; Benar et al., 2012 [negative association in mothers and physical activity]); three for authoritarian (Saunders et al., 2012 [positive association with organised sport]; Johnson et al., 2012 [negative association with family nutrition and physical activity scores]; Chen et

al., 2008 [less authoritarian parenting was associated with increased METs with physical activity]), one for uninvolved/neglectful parenting styles (Berge, Wall, Loth & Neumark-Sztainer, 2010 [paternal neglectful parenting predicted less physical activity in sons]) and one study found that a mixture of authoritative and permissive parenting was related to increased physical activity (Berge, Wall et al, 2010 [a model of authoritative and permissive parenting was associated with an encouraging health behaviour which included the promotion of physical activity among adolescents]).

Furthermore, the two studies that looked at the relationship between parenting styles and physical activity found that some of the findings had no significant relationship between parenting styles and physical activity (Benar & Behrozi, 2012 [no associations found between physical activity and parenting styles]; King et al., 2010 [no associations found between physical activity and parenting styles]).

Measures of assessment used

A number of methods were used to assess parenting styles in the studies reviewed: (i) two of the studies created parenting styles based on self-reports of adolescents' parenting characteristics (Berge et al., 2010; Berge, Wall et al., 2010), (ii) two studies used the Parenting Styles and Dimensions Questionnaire; other methods used by the various studies included (Oliver et al., 2011; Johnson et al., 2012), (iii) an instrument adapted from Baumrind's typology of parenting (Saunders et al., 2012), (iv) parenting dimension inventory – short form (Hennessy et al., 2010), (v) Parenting Styles Questionnaire (PSI-II) (Benar & Behrozi, 2012; Benar et al., 2012), (vi) Child-Rearing Practice Report (Chen et al., 2008), (vii) Authoritative versus non-authoritative parenting instrument (Schmitz et al., 2008) and (viii) one study did not report on the parenting styles' assessment (King et al., 2010).

Regarding the methods of physical activity assessment in the studies reviewed: (i) four studies used accelerometers to assess physical activity (Hennessy et al., 2010; King et al., 2010; Oliver et al., 2011; Saunders et al., 2012), (ii) two used an adapted version of the Godin Leisure-Time Exercise Questionnaire (Berge et al., 2010; Berge, Wall et al., 2010), (iii) additional two studies used the Physical Activity Questionnaire for Adolescents (Benar & Behrozi, 2012; Benar et al., 2012); the other studies used (iv) the Adolescent Physical Activity Recall Questionnaire (Saunders et al., 2012), (v) self-reported measure of walking/cycling (Saunders et al., 2012), (vi) the Family Nutrition and Physical Activity Assessment (Johnson et al., 2012), (vii) 7-Day Physical Activity Recall (Chen et al., 2008), (viii) two items self-rating of physical activity levels (Schmitz et al., 2002) and (ix) Progressive Aerobic Cardiovascular Endurance Run (PACER) (Chen et al., 2008).

Discussion

This systematic review was carried out to examine the relationship between parenting styles and physical activity. The review focused on studies conducted internationally. Most of the studies reviewed were conducted in the United States of America. The review showed that authoritative, authoritarian and permissive parenting styles were positively related to the promotion of physical activity.

The relationship between parenting styles and physical activity indicates that authoritarian parenting styles are related to frequent participation in organised sport (Saunders et al., 2012), and an increase in moderate-to-vigorous activity (MVPA). Moderate-to-vigorous activity Metabolic Equivalent's (MET's) was found among boys where there was less authoritarian parenting styles (Chen et al., 2008).

Authoritative and permissive parenting styles were negatively related to walking and cycling (Saunders et al., 2012). However, in a bi-variable analysis the relationship between authoritative parenting was associated with more moderate-to-vigorous physical activity (Oliver et al., 2011). The results also suggest that maternal authoritative parenting styles were related to higher physical activity among girls (Schmitz et al., 2002). In addition, authoritative and permissive parenting styles were found to co-occur with 'modeling and encouraging health behaviour' that included the promotion of physical activity (Berge et al., 2010).

Neglectful paternal parenting styles were found to be associated with less physical activity among their sons (Berge et al., 2010); however, a longitudinal study found that there were associations between authoritative parenting styles and walking/cycling, as well as MVPA and neglectful parenting, and the duration as well as frequency of organised sport (Saunders et al., 2012).

Parenting styles play a role in the promotion/involvement of physical activity among children as the various parenting styles have differing implications for physical activity involvement. The results suggest that most studies found a positive relationship between authoritative parenting styles and physical activity. Authoritative parenting style is often associated with pro-social/socially acceptable outcomes for children. Three of the studies suggest a positive relationship between authoritative parenting and physical activity; Lee, Daniels and Kissinger (2006) have also suggested that parenting that involves nurturing, assistance and monitoring, which are characteristics that are consistent with authoritative parenting, are associated with children's positive health outcomes.

Often authoritarian and permissive parenting are associated with less positive outcomes of children (Lee, Daniels & Kissinger, 2006) but this was not the case in the results. For example, two studies found a positive relationship between

authoritarian parenting and physical activity (Berge et al., 2010; Saunders et al., 2012). In addition, the results for the permissive parenting style were ambivalent, with both positive and negative associations found between permissive parenting and physical activity (Hennessey et al., 2012; Johnson et al., 2012).

Therefore, more research, which examines the associations of parenting styles within the context of physical activity and its implications on children, is needed. With the myriad of assessment tools available to evaluate physical activity, the review intended to establish the measures that were most commonly used to assess physical activity in studies that examined the association between parenting styles and physical activity. The assessment of physical activity suggests that two general types of measures were used: namely, (i) recall measures and (ii) accelerometers. Recall measures have some shortfalls as they are dependent on how the participants respond to the various items, and there is the possibility that participants may not provide reliable responses when partaking in the measurement of physical activity. In contrast, accelerometers indicate the actual energy expenditure of the participants and are a more reliable reflection of the participant's physical activity levels and energy expenditure. However, of the studies reviewed, the Godin Leisure-Time Exercise Questionnaire (Berge et al., 2010; Berge, Wall et al., 2010) and Physical Activity Questionnaire for Adolescents (Benar & Behrozi, 2012; Benar et al., 2012) were the most commonly used recall measures. Similar to variations in assessing physical activity, parenting styles, too, have been assessed in a number of ways by different researchers. Therefore, the current review also attempted to establish the most commonly used measures to assess parenting styles in studies that examined the association between physical activity and parenting styles. The results suggest that the most commonly used measures in the articles reviewed were the Parenting Styles and Dimensions Questionnaire (Oliver et al., 2011; Johnson et al., 2012) as well as parenting styles based on participants' self-reported characteristics.

Conclusion

The social environment often plays a significant role in the development of certain behaviours and habits among children and adolescents. The home and family environment are usually those to which children, adolescents and/or youth are exposed. The growing rate of physical inactivity among young persons has become a public health concern. This review examined the association between parenting styles and physical activity to provide valuable information to health professionals about the critical role that parenting plays.

Notwithstanding that parenting plays an important role in influencing how young person's engage in and perceive their involvement in physical activity, it is necessary that future interventions are focussed not only on children but also on their parents.

References

- Ahn, S. & Fedewa, A.L. (2011). A meta-analysis of the relationship between children's physical activity and mental health. *Journal of Paediatric Psychology*, 36(4), 385-397.
- Akinsola, E.F. (2011). Relationship between parenting style, family type, personality dispositions and academic achievement of young people in Nigeria. *IFE Psychologia*, 19(2), 246-267.
- Arredondo, E.M., Elder, J.P., Ayala, G.X., Cambell, N., Baquero, B. & Duerksen, S. (2006). Is parenting style related to children's healthy eating and physical activity in Latino families? *Health Education Research: Theory and Practice*. 21(6), 862-871.
- Baumrind, D. (1991). Parenting styles and adolescent development. In J. Brooks-Gunn, R. Lerner & A.C. Petersen (Eds.), *The Encyclopaedia of Adolescence*. New York: Garland.
- Beets, M.W., Cardinal, B.J. & Alderman, B.L. (2010). Parental social support and the physical activity-related behaviours of youth: A review. *Health Education and Behavior*, 37(5), 621-644.
- Benar, N. & Behrozi, A. (2012). The study between parenting styles of mothers' physical activity levels and overweight among female students. *Fiziceskoe Vospitanie Studentov*, 2, 114-119.
- Benar, N., Hemmatinezhad, M.A., Behrozi, A., Andam, R. & Yousefi, M. (2012). The relationship between parenting styles, parenting practices, maternal education level with physical activity levels among adolescent girls. *International Journal of Sport Studies*, 2(9), 436-443.
- Berge, J.M., Wall, M., Bauer, K.W. & Neumark-Sztainer, D. (2010). Parenting characteristics in the home environment and adolescent overweight: A latent class analysis. *Obesity*, 18(4), 818-825.
- Berge, J.M., Wall, N., Loth, K. & Neumark-Sztainer, D. (2010). Parenting styles as a predictor of adolescent weight and weight-related behaviors. *Journal of Adolescent Health*, 46, 331-338.
- Chen, J.L., Unnithan, V., Kenny, C. & Yeh, C.H. (2008). Correlates of physical fitness and activity in Taiwanese children. *International Nursing Review*, 55, 81-88.
- Darling, N. & Steinberg, L. (1993). Parenting style as context: An integrative model. *Psychology Bulletin*, 113, 487-496.
- Department of Sport and Recreation (2005). *Participation Patterns in Sport and Recreation Activities in South Africa: 2005 Survey*. Cape Town: Formeset Printers.
- Fuemmeler, B.F., Yang, C., Costanzo, P., Hoyle, R.H., Siegler, I.C., Williams, R.B. & Østbye, T. (2012). Parenting styles and body mass index trajectories from adolescence to adulthood. *Health Psychology*, 31(4), 441-449.

Hennessy, E., O Hughes, S., Goldberg, J.P., Hyatt, R.R. & Economos, C.D. (2010). Parent-child interactions and objectively measured child physical activity: A cross-sectional study. *International Journal of Behavioural Nutrition and Physical Activity*, 7, 71.

Jacka, F.N., Pasco, J.A., Williams, L.J., Leslie, E.R., Dodd, S., Nicholson, G.C., Kotowicz, M.A. & Berk, M. (2011). Lower levels of physical activity in childhood associated with adult depression. *Journal of Science and Medicine in Sport*, 14, 222-226.

Johnson, R., Welk, G., Saint-Maurice, P.F. & Ihmels, M. (2012). Parenting styles and home obesogenic environments. *International Journal of Environmental Research and Public Health*, 9, 1411-1426.

Kashavarz, S. & Baharudin, R. (2009). Parenting styles in a collectivist culture of Malaysia. *European Journal of Social Sciences*, 10(1), 66-73.

Kimiecik, J.C. & Horn, T.S. (2012). Examining the relationship between family context and children's physical activity beliefs: The role of parenting styles. *Psychology of Sport and Exercise*, 13, 20 – 18.

King, A.C., Parkinson, K.N., Adamson, A.J., Murray, L., Besson, H., Reilly, J.J., Basterfield, L. & Gateshead Millennium Study Core Team (2010). Correlates of objectively measured physical activity and sedentary behaviour in English children. *European Journal of Public Health*, 21(4), 424-431.

Lau, P.W.C., Lee, A. & Ransdell, L. (2007). Parenting styles and cultural influences on overweight children's attraction to physical activity. *Obesity*, 15(9), 2293-2302.

Lee, S.M., Daniels, M.H. & Kissinger, D.B. (2006). Parental influences on adolescent adjustment: Parenting styles versus parenting practices. *The Family Journal*, 14(3), 253-259.

Louw, Q.A., Morris, L.D. & Grimmer-Somers, K. (2007). The prevalence of low back pain in Africa: A systematic review. *BMC Musculoskeletal Disorders*, 8, 105.

Monyeki, M.A., De Ridder, J.H., Du Preez, S.M., Toriola, A.L. & Malan, D.D.J. (2012). The effect of a ten month physical activity intervention programme on body composition of 9-13 year old boys. *African Journal for Physical, Health Education, Recreation and Dance*, 18(2), 241-250.

Mountjoy, M., Andersen, L.B., Armstrong, N., Biddle, S., Boreham, C., Bedenbeck, H.B., Ekelund, U., Engebretsen, L., Hardman, K., Hills, A., Kahlmeier, S., Kriemler, S., Lambert, E., Ljungqvist, A., Matsudo, V., McKay, H., Micheli, L., Pate, R., Riddoch, C., Schamasch, P., Sundberg, C.J., Tomkinson, G., van Sluijs, E. & van Mechelen, W. (2011). International Olympic Committee consensus statement on the health and fitness of young people through physical activity and sport. *British Journal of Sports Medicine*, 45, 839-848.

Newman, K., Harrison, L., Dashiff, C. & Davies, S. (2008). Relationships between parenting styles and risk behaviors in adolescent health: An integrative literature review. *Rev Latino-am Enfermagem*, 16(1), 142-150.

- Oliver, M., Schluter, P.J., Schofield, G.M. & Paterson, J. (2011). Factors related to accelerometer-derived physical activity in Pacific children aged 6 years. *Asia-Pacific Journal of Public Health*, 23(1), 44-56.
- Roman, N.V. & Frantz, J.M. (2013). The prevalence of intimate partner violence in the family: A systematic review of the implications for adolescents in Africa. *Family Practice*, 30(3), 256-266.
- Saunders, J., Hume, C., Timperio, A. & Salmon, J. (2012). Cross-sectional and longitudinal associations between parenting style and adolescent girls' physical activity. *International Journal of Behavioral Nutrition and Physical Activity*, 9, 141.
- Schmitz, K.H., Lytle, L.A., Phillips, G.A., Murray, D.M., Birnbaum, A.S. & Kubik, M.Y. (2002). Psychosocial correlates of physical activity and sedentary leisure habits in young adolescents: The teen eating for energy and nutrition at school study. *Preventative Medicine*, 34, 266-278.
- Sekot, A. (2012). *Sport and Society in the Czech Republic*. Athens: ATINER'S Conference Paper Series, No: FIT2012-0189.
- Spera, C. (2005). A review of the relationship among parenting practices, parenting styles, and adolescent school achievement. *Educational Psychology Review*, 17(2), 125-146.
- Standage, M., Gillison, F.B., Ntoumanis, N. & Treasure, D.C. (2012). Predicting students' physical activity and health-related well-being: A prospective cross-domain investigation of motivation across school physical education and exercise settings. *Journal of Sport and Exercise Psychology*, 34, 37-60.
- Strydom, G.L. (2013). Physical activity, health and well-being: A strategic objective of the National Sport and Recreation Plan (NSRP) of South Africa. *African Journal for Physical, Health Education, Recreation and Dance*, 19(4:2), 980-992.
- Swartz, L., de la Rey, C., Duncan, N. & Townsend, L. (2008). *Psychology: An Introduction*. Cape Town: Oxford University Press.
- Thorsen, L., Nystad, W., Stigum, H., Dahl, O., Klepp, O., Bremnes, R.M., Wist, E. & Fosså, S.D. (2005). The association between self-reported physical activity and prevalence of depression and anxiety disorder in long-term survivors of testicular cancer and men in a general population sample. *Support Care Cancer*, 13, 637-646.
- Trost, S.G. & Loprinzi, P.D. (2011). Parental influences on physical activity behaviour in children and adolescents: A brief review. *American Journal of Lifestyle Medicine*, 5(2), 171-181.
- Ventura, A.K. & Birch, L.L. (2008). Does parenting affect children's eating and weight status? *International Journal of Behavioral Nutrition and Physical Activity*, 15(5), 1-12.
- Wen, X. & Hui, S.S. (2012). Parenting style as a moderator of the association between parenting behaviors and the weight status of adolescents. *Journal of Early Adolescence*, 32(2), 252-268.
- White, R.M.B., Roosa, M.W., Weaver, S.R. & Nair, R.L. (2009). Cultural and contextual influences on parenting in Mexican American families. *Journal of Marriage and Family*, 71, 61-79.

World Health Organisation (2009). *Global Health Risks: Mortality and Burden of Disease Attributable to Selected Major Risks*. Geneva: World Health Organisation.

Wong, W.C., Cheung, C.S. & Hart, G.J. (2008). Development of a quality assessment tool for systematic reviews of observational studies (QATSO) of HIV prevalence in men having sex with men and associated risk behaviours. *Emerging Themes in Epidemiology*, 5, 23-27.