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Adolescent's perceptions of parental influences on physical activity

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Abstract

Background: Youth physical activity engagement is a key component of contemporary health promotion strategies. Parents have potential to influence the physical activity behaviours of their children. The purpose of this study was to explore associations between adolescent self-reported physical activity, parent physical activity and perceptions of parental influence as measured by the Children's Physical Activity Correlates (CPAC) questionnaire.

Methods: This investigation included a total of 146 adolescents and their parents. Self-reported measures of physical activity were obtained using the International Physical Activity Questionnaire for Adolescents and International Physical Activity Questionnaire for adolescents and their parents respectively. Adolescent perceptions of parental role modelling, support, and encouragement were measured with the parental influences scales of the CPAC.

Results: Ordinary least squares regression indicated that perceptions of parental role modelling ($\beta=197.41$, 95% CI 34.33–360.49, $p=0.031$) was positively associated with adolescent self-reported moderate-to-vigorous physical activity with the overall model accounting for a small amount of the variance ($R^2=0.076$).

Conclusion: These results are in agreement with previous research indicating that parents play a small, albeit vital

role in the physical activity engagement of their children. Public health campaigns with the aim of promoting youth physical activity should endeavour to incorporate parents into their interventions.

Keywords: adolescence; parent; physical activity; self-report.

Background

Physical activity is a critical health behaviour, responsible for reducing several cardiovascular risk factors including obesity and hypertension, as well as lowering the incidence of type 2 diabetes, some forms of cancer and stroke (1–3). With prevention a key component of contemporary healthcare systems, promoting positive health behaviours in adolescence has become essential, given that it has consistently shown to be positively associated with adult physical activity (4–6). Parents in particular have potential to influence youth physical activity behaviours through role modelling and direct involvement, with evidence indicating that these influences may last well beyond adolescence (7). Single parent status, parent overweight/obesity, parent physical activity, parent participation in physical activity with youth, parental encouragement and persuasion, parents transporting their children to physical activity events, and parents paying for related fees have all been associated with youth physical activity (8). A recent systematic review of physical activity interventions for children and adolescents found strong evidence that involving families may have a significant effect on increasing youth physical activity (9).

Welk, Wood and Morss (10) conceptualised a mediational model used to explain parental influence on child physical activity. This model is based on the Youth Physical Activity Promotion model, a social-ecological model developed specifically to characterise and explain factors influencing child physical activity (11). The model proposes that parents can influence children both directly and indirectly through various reinforcing factors. Direct effects may be through facilitating a child's efforts to be active, while indirect effects may be mediated through other affective or

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attitudinal processes (10). Psychosocial correlates of physical activity were selected or developed to assess each of the components in the proposed measurement model. The resultant battery of psychosocial measures is referred hereafter as the Children's Physical Activity Correlates (CPAC). The CPAC includes 44 items that assess various psychosocial correlates of physical activity in children; and combines items from a number of other validated scales into one instrument that can be used to evaluate correlates of physical activity in children. The instrument uses a "structured alternative format" to decrease the tendencies for socially acceptable responses. Predictive and discriminate validity of the CPAC have been tested, along with the extent to which parental influence is related to parent physical activity. The parental influence scales accounted for 20%, 26%, and 28% of the variance in physical activity, attraction to physical activity, and perceptions of competence, respectively. Correlations between parent and child levels of activity were low, but children of active parents had higher scores on the parental influence measures and psychosocial correlates than inactive parents (10).

Parents have now been included in social ecological models that aim to promote physical activity in youth samples (12). One novel component of the CPAC was the presence of parental influence scales including; perceptions of parental role modelling, perceptions of parental support, and perceptions of parental encouragement. The purpose of this study was to explore associations between adolescent self-reported physical activity and parental physical activity and perceptions of parental influence as measured by the Children's Physical Activity Correlates Questionnaire. It was anticipated that perceptions of parental influence would be associated with adolescent physical activity in this study.

Methods

Design and participants

This cross-sectional investigation included 146 adolescents (55 males and 91 females) aged between 12 and 15 years and their parents (44 males and 102 females) aged between 32 and 66 years. Participants were recruited from four secondary schools in metropolitan Brisbane, Australia.

Instruments

International Physical Activity Questionnaire for Adolescents: The International Physical Activity Questionnaire for Adolescents (IPAQ-A), adapted from the International Physical Activity Questionnaire Long

Version, was developed for use in adolescents (13, 14). This adapted version also measures physical activity over the previous 7 days, and covers four domains of physical activity being school-related physical activity, including activity during physical education classes and breaks; transportation; housework; and leisure time. In each of the four domains, the numbers of days per week and time periods per day spent walking, in moderate activity and in vigorous activity are recorded. Variations from the adult version include, questions about physical activity at work being replaced by physical activity at school, and including only one question about physical activity in the garden or at home (vs. 3 in the standard IPAQ) (13). Moderate-to-vigorous physical activity (MVPA) minutes per week was calculated and used as the outcome measure in this investigation.

International Physical Activity Questionnaire: The International Physical Activity Questionnaire (IPAQ) was designed by a multinational working group, for use as a universal instrument in epidemiological studies (15). It is a self-report instrument which records the duration of habitual physical activity in the previous week (15). The short-version (9 items) is a dimension-based instrument, structured to capture four forms of physical activity, being vigorous, moderate, walking, and sitting (15). MVPA minutes per week was calculated and used as the outcome measures in this investigation.

Parental subscales of the Children's Physical Activity Correlates Questionnaire: The Children's Physical Activity Correlates (CPAC), was originally developed by Welk, Wood and Morss (10) and is centred on a mediational model used to explain parental influence on children's physical activity. The CPAC contains three scales which were developed to measure parental influence namely; perceptions of parental role modelling, perceptions of parental support, and perceptions of parental encouragement. A total of 18 items were developed to score each parental influence scale (6 items per scale) (10). The items are worded using a structured alternative format and scored on a four-point scale (1–4) with higher scores reflecting more positive responses. Each scale is calculated using mean scores from each the six items. Examples of items include "Some kids have parents who get a lot of exercise"; "Some kids have parents who let them play on community or school sport teams"; and "Some kids have parents that don't encourage them to play outside".

Procedure

Surveys were distributed to students via teaching staff at their respective schools. Students and their parents were invited to complete the survey at home. Surveys were then returned by the students to teaching staff, and subsequently collected by the principal researcher. This study was approved by the Human Research Ethics Committee of the Queensland University of Technology.

Data analysis

All analyses were performed using Stata SE version 13 (StataCorp, College Station, USA) (16). Conventional descriptive statistics (means, standard deviations) were used to describe participants' age and physical activity levels. To examine whether parent self-reported

MVPA or perceptions of parental influence as measured by the CPAC were associated with self-reported adolescent MVPA, ordinary least squares (OLS) regression was undertaken, adjusting for age and gender, and allowing for clustering at the school level (using the *vce cluster* option). Prior to conducting the regression, multi-collinearity was assessed using variance inflation factors and tolerance statistics. Variance inflation factors below 10 (17–19) and tolerance statistics above 0.2 (19, 20) were deemed acceptable for analysis. Cronbach's Alpha was also undertaken to determine the internal consistency of the parental influences scales of the CPAC instrument.

Results

The mean (standard deviation) age was 13.7 (0.7) and 46.3 (5.3) years for adolescents and their parents respectively. The mean (standard deviation) moderate-to-vigorous physical activity of adolescents was 783 (777) minutes per week. Observed variance inflation factors and tolerance statistics were below 10 and above 0.2 respectively, indicating that multi-collinearity was not present among parent self-reported MVPA, perceptions of parental encouragement, perceptions of parental support, or perceptions of parental role modelling. Acceptable internal consistency reliability was found for each of perceptions of parental role modelling ($\alpha=0.83$), perceptions of parental support ($\alpha=0.76$), and perceptions of parental encouragement ($\alpha=0.74$). The results from the OLS regression are displayed in Table 1. Perceptions of parental support ($\beta=197.41$, $t(6)=3.85$, $p=0.031$) was the only scale that was significantly associated with adolescent self-reported MVPA. Overall, the model explained approximately 7.6% of the variance in adolescent self-reported MVPA.

Discussion

The main findings of this study were that perceptions of parental support were associated with adolescent self-reported physical activity. However, it was noteworthy

that these variables explained only a small proportion of variance in adolescent physical activity levels. This is perhaps not surprising when considered in the context of all possible, and not necessarily quantifiable, influences on adolescent physical activity behaviours (e.g. peers, structured exercise activities, community, teachers, geographical location). Nonetheless, these findings indicate that parent physical activity behaviours do have a role in influencing the physical activity behaviours of their adolescent children.

The results of this study are in agreement with prior studies using similar instruments and analysis techniques. Welk et al. (10) found that the observed tendencies for a familial aggregation of physical activity may be mediated through a variety of influences. While a direct link was unable to be ruled out, it was found to be more likely that parents shaped their children's interests and attitudes through other direct (e.g. provision of transport, access) and indirect (e.g. encouragement, support) forms of socialisation (10). In this previous study (among $n=994$ elementary school children), it was found that parental influence, as a reinforcing factor, accounted for 20% of the variance in children's physical activity. The results of this study reinforce the existing theme within the literature that parents play some role in their child's level of engagement in physical activities (21–23). A review of the literature by Beets et al. (24) demonstrated the positive effects of parents social support. Wilson, Lawman et al. (25) found a significant effect of parental support on the MVPA of minority adolescents; while Bauer et al. (26) found adolescent-reported maternal and paternal encouragement to be active, and parental care for fitness were positively associated with MVPA in young-adult males. The results of our study contribute to supporting evidence for youth public health campaigns founded in social ecological theory (12) which incorporate parental involvement, with the aim of promoting youth physical activity.

The findings of this investigation should be considered in the context of several limitations. First, this investigation only included participants from a high income

Table 1: Ordinary least squares regression results for self-reported adolescent moderate-to-vigorous physical activity (MVPA) and parent self-reported MVPA, perceptions of parental encouragement, support, and role modelling, adjusted for age and gender.

	β	Robust standard errors	p-Value	95% Confidence interval	
Parent MVPA	0.15	0.11	0.279	-0.21	0.51
Perceptions of parental role modelling	134.95	63.51	0.124	-67.18	337.07
Perceptions of parental support	197.41	51.24	0.031 ^a	34.33	360.49
Perceptions of parental encouragement	-159.46	101.08	0.213	-481.12	162.21
	R ² =0.076				

^a $p<0.05$.

nation where participation in school education is compulsory for adolescents in this age group. Therefore these findings may not be applicable to youth from dissimilar societies. Second, this study only included participants aged 12–15 years, and consequently, the findings cannot be extrapolated beyond this age group. Further investigations in the 9–12 year and 15–17 year age groups would enhance the understanding of the parental influence on youth physical activity as youth physical activity levels tend to continue declining throughout these years (27). In particular, examining this relationship longitudinally (and measuring parental influences over time) would enable stronger assertions of causality; particularly if physical activity declines were accompanied by simultaneous reductions in parental influences as perceived by the adolescent.

There are several related priorities for future research. First, self-report measures of lifestyle physical activity such as those used in this study are practical for use in large samples due to cost and relative ease of administration, and this is common for the majority of studies measuring parent and child physical activity (23). However, wherever possible objective measures of physical activity such as accelerometers should be used to increase measurement accuracy, and to prevent common methodological difficulties such as the dependence on recall of detailed historical activity information (14). Second, this study only measured parental influence via youth perceptions using the parental influence scales of the CPAC instrument, and self-report measures of physical activity were employed for both parents and adolescents. It is interesting to note that in this study, perceptions of parental encouragement for adolescent physical activity was negatively (although not significantly) associated with their MVPA. It is possible that direct forms of parental involvement (e.g. providing access to equipment, transport to physical activity) were sufficient, and that forms of encouragement from parents were not required to increase physical activity. In this case, it may have been useful to gather information on parents' perceptions of their influence (including forms of encouragement) on the physical activity engagement of their children.

The findings from this study suggest that parents play a small, albeit potentially vital role in youth engagement in physical activity. Future research should seek to explore the relationship between parental physical activity behaviours and adolescent physical activity behaviours in other age groups (such as with 9–12 and 15–17 years of age) during continuing decline in physical activity. Rigorous evaluations of physical activity interventions for adolescents that incorporate parental behaviours are

also worthwhile. Public health campaigns with the aim of promoting youth physical activity may also benefit from the inclusion of parents in intervention strategies.

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