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## School-Based Youth Physical Activity Promotion: Thoughts and Beliefs of Pre-Service Physical Education Teachers

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## **School-Based Youth Physical Activity Promotion: Thoughts and Beliefs of Pre-Service Physical Education Teachers**

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*Abstract: Physical education teachers are central to the facilitation of school-based physical activity promotion. However, teachers have self-reported a lack of knowledge, skills, understanding, and competence to successfully implement these strategies. The aim of this investigation was to explore the beliefs and perceptions of pre-service physical education teachers, concerning their potential roles in future school-based programs designed to promote student physical activity. Fifty-seven pre-service physical education teachers (21 males and 36 females) had complete data and were included in the analysis. Participants responded positively, and did not reveal concerns about their capacity to facilitate school-based physical activity promotion during practicum, and prospectively as practising teachers. This may indicate that either this particular tertiary institution provides curriculum which adequately prepared participants; or participants had misconceptions about their ability and preparedness to fulfill this role. This investigation provides important empirical evidence for preparing pre-service physical education teachers in their potential future roles.*

### **Background**

Preventative health, consisting of measures taken for disease prevention, has become the focus of contemporary health care; identifying physical activity as key in determining an individual's current and future health and functioning (Australian Institute of Health and Welfare, 2010; World Health Organization, 2004). Past measures have included mass media campaigns aimed at adults, such as "How do you measure up?", and "Swap it don't stop it" (Department of Health, 2015). However, the focus of these health promotion measures has now turned to youth (e.g., "Get set 4 life"). This is in light of a number of investigations which have found adolescent physical activity to increase the likelihood of maintaining positive lifestyle behaviours throughout adulthood (Herman, Hopman, & Craig, 2010; Ross, Larson, Graham, & Neumark-Sztainer, 2014).

The majority of the ill-effects of physical inactivity, such as the onset of chronic disease, may not manifest until adulthood. There are however, numerous other reasons for youth to be engaged in regular physical activity. A systematic review by Janssen and LeBlanc (2010)

revealed youth physical activity to be associated with a variety of health benefits including; improvements in adiposity, metabolic syndrome, high-density lipoproteins, triglycerides, hypertension, anxiety symptoms, depression symptoms, self-concept, academic performance, bone strength, and physical fitness; while further empirical studies have found youth physical activity to be associated with numerous aspects of wellness (Rachele, Cuddihy, Washington, & McPhail, 2014). Additionally, dose-response relationships from observational studies have indicated that the greater the amount of physical activity engaged in by youth, the greater the health benefit. Similar relationships are found for the intensity of physical activity undertaken. While substantive health benefits can be achieved for physical activity performed at moderate intensities, even greater benefits are obtained for vigorous intensities (Janssen & LeBlanc, 2010). Despite the recognized benefits of increased physical activity engagement, large portions of youth still fail to meet the minimum amounts of physical activity required to obtain health benefits. According to the most recent report from the world's most comprehensive cross-national study, the Health Behavior in School-aged Children (HBSC) study (Currie et al., 2012), 77% of 11 year olds reported less than one hour of moderate-to-vigorous physical activity per day, along with 81% of 13 year olds, and 85% of 15 year olds. Recent Australian data from the 2009-10 National Secondary Students' Diet and Activity survey revealed that 85% of secondary school students from years 8-11 across 237 schools across Australia (n=12,188) reported not engaging in sufficient levels of physical activity to provide health benefits (Cancer Council Australia, 2011), according to the then Department of Health and Ageing's physical activity recommendations for 12-18 year olds (2004).

Schools have become critical settings for health promotion strategies aimed at increasing youth physical activity due to distinct and unique methodological circumstances (Rachele, Cuddihy, Washington, & McPhail, 2013): the World Health Organization specifically identified schools as a target setting for the promotion of physical activity amongst youth (World Health Organization, 2004). Schools are an ideal setting for population-based physical activity measurement and interventions (Dobbins, DeCorby, Robeson, Husson, & Tirilis, 2009; Rachele, McPhail, Washington, & Cuddihy, 2012). They provide one of the few opportunities to address the full range of individuals in a population, and a last chance to access, at no extra cost, a captive audience. Schools also have an inherent responsibility to promote physical activity via curriculum (though its implementation will usually depend on the corresponding documentation or policy) (Corbin, 2002); and to develop citizens who are "physically educated" (Charles & Thomas, 2008). Furthermore, schools are the actual environment where youth live and develop, while experiences within school profoundly influence the establishment of lifestyle behaviours (Alibali & Nathan, 2010). Therefore, while youth physical activity promotion strategies at school level (e.g., during lunch breaks, after-school programs, or those facilitated through curriculum) may have immediate impacts on youth, behaviours adopted during this time are likely to have additional lifelong effects. School-based interventions also build on social-ecological theory, which proposes multiple dimensions of influence, and hypothesize that self-regulation is difficult to establish without broader social and institutional support (Dzewaltowski, 1997).

The role of physical education teachers has long been identified as key to the promotion of physical activity within schools. It has been suggested that physical education teacher education programs in tertiary institutions, in addition to teaching physical education content and pedagogical skills, should be expanded to prepare future physical education teachers to develop natural linkages to physical activity and public health (Charles & Thomas, 2008; McKenzie & Kahan, 2004). A recent Cochrane review found that studies using physical education teachers as

the providers of interventions reported a significant effect, more often than those using general teachers to implement school-based physical activity interventions (Dobbins et al., 2009). In a recent study of 9 and 15 year-old Norwegian school children, physical activity specific teacher support was a significant predictor of physical activity during non-curricular school time (Ommundsen, Klasson-Heggebø, & Anderssen, 2006). Physical education teachers, although not present in the leisure-time physical activity context, have also been shown to serve an equally important role to parents in supporting adolescents' leisure-time physical activity (McDavid, Cox, & Amorose, 2012). Importantly, studies have found that teachers generally have positive views towards school-based physical activity promotion (Cale, 2002). Although of concern, participants from these same studies identified a lack of knowledge and preparedness to deal with adolescent health issues, and had limited understanding of how to approach school-based physical activity promotion (Cale, 2002; St Leger, 1998). In a recent case study conducted by Torill, Oddrun, and Hege (2013) of eight Norwegian schools, a self-reported lack of skills and competence from teachers was partially attributed to a failure to implement national physical activity policy. Further, in a study of physical education teachers in England, Green (2000) noted that physical education teachers philosophical views of physical education in general were sometimes overlapping, contradictory, ill thought-through and confused.

Given the potential for physical education teachers to play a role in school-based health promotion strategies, it is essential that pre-service teachers are provided with adequate training that prepares and empowers them with the required skills to be successful lifelong health promoters. The purpose of this study was to explore pre-service secondary school physical education teachers' beliefs concerning the promotion of school-based physical activity among student populations.

## **Methods**

This study involved cross-sectional online questionnaire data from pre-service physical education teachers. Questions were developed to address the purpose of the study.

## **Participants**

This investigation included 59 (21 male and 38 female) pre-service physical education teachers from a metropolitan university in Brisbane, Australia. Participants were enrolled in either a single or dual bachelor of education degree, majoring in health and physical education. This course prepares students to deliver the Australian Curriculum, teaching under the National Professional Standards for Teachers; and is recognized by the Australian Institute for Teaching and School Leadership and Queensland College of Teachers. Thirty-six participants were enrolled in single degrees, while 23 were enrolled in dual degrees (education and exercise science). Enrolled alternative teaching areas (in addition to physical education) varied with; 15 in biology, 13 in English, 13 in mathematics, 11 in health education, three in history, two in geography, two in business communication and technologies, and one for each of physics, legal studies, home economics, information technology, and the studies of society and environment (with some participants teaching in more than one alternative area).

## **Instruments**

### ***Survey Questions***

Current literature surrounding physical education teachers provided themes for which questions were based. These included: the roles of physical education teachers (McDavid et al., 2012), supplementary school-based programs outside of the allocated curriculum (Beets, Beighle, Erwin, & Huberty, 2009), features of effective school-based programs (Dobbins et al., 2009), and attitudes toward potential involvement in supplementary school-based programs (McDavid et al., 2012). All customized survey questions were subjected to cognitive pre-testing methods, such as those used by Collins (2003).

Three survey questions were developed to establish the perspective of participants. These questions comprised: “*Do you believe that student physical activity promotion is a part of your role as a pre-service teacher?*”; “*Do you believe that student physical activity promotion is a part of the role of physical education teachers?*”; and, “*Do you believe that student physical activity promotion is a part of the role of teachers who do not teach physical education?*”. Participants responded categorically (i.e., yes/no/unsure).

Four open-ended survey questions were developed to explore the underlying themes of youth physical activity promotion in secondary schools. This was the study’s main focus and was, by definition, exploratory. The questions were: “*Who do you believe is responsible for the promotion of student physical activity?*”; “*What do you believe would be effective to promote student physical activity?*”; “*How would you feel about being involved in a program designed to promote physical activity amongst students at your school during your practicum experience?*”; and, “*How would you feel about being involved in a program designed to promote physical activity amongst students at your school, when you are a teacher?*”

## **Procedure**

Data collection was undertaken over a 4 week period of the teaching semester. Participants received an email from the chief investigator via the Queensland University of Technology’s Blackboard service. The email invited the recipient to participate in the study, and contained a link to an online survey hosted by Queensland University of Technology’s Key Survey. After consultation with the unit course coordinator, an online survey was deemed the most suitable and efficient method of collecting data. As all students had university access to the online survey, it was not anticipated that any bias would emerge as a result of using this method. This study was approved by the Human Research Ethics Committee of the Queensland University of Technology, with appropriate permissions obtained from the head of department and course coordinator prior to undertaking data collection.

## **Data Analysis**

Overall, a total of 57 (97%) participants (21 males and 36 females) had complete data and were included in the analysis. Participant demographics can be found in Table 1. Descriptive statistics were analyzed in IBM Statistical Package for the Social Sciences (SPSS) version 21. Open-ended survey questions were analyzed via thematic analysis. Briefly, thematic analysis is a method for identifying, analyzing and reporting patterns (themes) within data (Virginia & Victoria, 2006). Although thematic analysis is typically used for self-report interview data, it can

also be used to analyze text as long as the questions asked are open-ended (Hayes, 2000). Following previously used methods (Warner & Griffiths, 2006) the researchers read the comments twice to become familiar with the data, then searched for the main themes to emerge from each of the questions. Each of the questions were analyzed separately, with responses collated under emerging theme headings. Provisional headings and definitions were then provided under each emerging theme. The responses were then re-read to see if they contained any further relevant information to the provisional themes. Themes were then given their final analytical form and definition. Comments from participants have been selected to represent the breadth and depth of themes and are reported verbatim.

n = 57 participants	n (%)
<b><i>Gender</i></b>	
Male	21 (36.8)
Female	36 (63.2)
<b><i>Undergraduate training (years)</i></b>	
1	16 (28.1)
2	20 (35.1)
3	13 (22.8)
4	6 (10.5)
5	2 (3.5)
<b><i>Qualification enrolled</i></b>	
Single degree	34 (59.7)
Dual degree	23 (40.4)

**Table 1. Participant demographics in the analytic sample**

## Results

The mean age (standard deviation) of participants was 21.94 (4.53) years, with a range of 17.48 – 35.31 years. The median (inter-quartile range (IQR)) number of practicum experience days was 20 (0-20), with a range of 0 – 60 days.

### Beliefs about the Roles of Teachers

Fifty-one (90%) participants believed it part of their role as a pre-service teacher to promote student physical activity, with 9 (10%) opposed. Fifty-five (97%) participants believed student physical activity promotion to be a part of the role of physical education teachers, with one (2%) opposed, and one (2%) unsure. Forty-seven (83%) participants believed student physical activity promotion to be a part of the role of teachers who do not teach physical education, with eight (14%) opposed, and two (4%) unsure.

### **Thematic Analysis**

The following section describes the key themes produced. Each theme produced a number of categories, which are presented below with reference to participant examples. The themes, identified from open-ended research questions of the beliefs of pre-service physical education teachers, the categories within each theme, and participant comments are presented in Table 2.

In response to the first question, participants believed that parents, teachers, and ‘everyone’ were responsible for the promotion of students’ physical activity. For the second question, participants believed that demonstrating the rewards or benefits of involvement, the need for programs to be fun, the inclusion of role models, and the provision of additional opportunities to be active including sports and school-based competitions would be effective to promote student physical activity. Due to the homogeneity in participant responses, the responses to the third and fourth questions were merged to create one topic being “attitude towards involvement in supplementary school-based programs to promote student physical activity”. Participants responded both positively and enthusiastically, had intentions or expectations to be involved in student physical activity promotion, and had concerns about the amount of time that involvement would encompass.

Responsible for promoting youth health behaviors	Effective school-based programs	Involvement in supplementary school-based programs
<p><i>Parents</i></p> <ul style="list-style-type: none"> <li>• “Parents, teachers, governments”</li> <li>• “Parents, Teachers, the School and the Students themselves”</li> <li>• “Parents firstly are obligated, teachers have no obligation but they should show an interest in it.”</li> </ul>	<p><i>Show the rewards / benefits of involvement</i></p> <ul style="list-style-type: none"> <li>• “Educating students on the long term benefits of activity”</li> <li>• “Educating students on the long term effects of not participating in activity”</li> <li>• “Showing the rewards of being physically fit”.</li> </ul>	<p><i>Positive and enthusiastic towards involvement</i></p> <ul style="list-style-type: none"> <li>• “I would participate if I could”.</li> <li>• “I would feel privileged!”;</li> <li>• “I would love to be involved”;</li> <li>• “Awesome!”</li> <li>• “It is something I would get behind 100%”</li> </ul>
<p><i>Teachers</i></p> <ul style="list-style-type: none"> <li>• “Teachers, parents, friends and peers”</li> <li>• “Teachers, parents, role models and professional athletes”</li> <li>• “Every teacher”</li> <li>• “All teachers, parents and senior staff members”</li> <li>• “All teachers should participate in promoting exercise.”</li> <li>• “All teaching staff at the school.”</li> </ul>	<p><i>Programs need to be fun</i></p> <ul style="list-style-type: none"> <li>• “Make it fun”</li> <li>• “FUN AND ENJOYMENT!!!!!!”</li> <li>• “Make it fun, interactive (obviously), and rewarding”</li> <li>• “Emphasizing games and fun.”</li> <li>• “focus more on the topics of how it can be fun”</li> <li>• “Make it more fun and engaging :)”</li> </ul>	<p><i>Intent or expectation to be involved</i></p> <ul style="list-style-type: none"> <li>• “As a Health and Physical Education teacher I would expect to be involved in a program to promote physical activity.”</li> <li>• “If someone doesn't come up with an official program I would try to do it myself.”</li> <li>• “I would expect to be if teaching as a PE teacher”</li> </ul>
<p><i>Everyone who is a member of the community</i></p> <ul style="list-style-type: none"> <li>• “everyone”</li> <li>• “Everyone in society! Parents, leaders, peers, teachers...”</li> <li>• “Everybody from, teachers, to health graduates to parents”</li> </ul>	<p><i>Role models</i></p> <ul style="list-style-type: none"> <li>• “...Elite athletes visiting schools and doing demonstrations...”</li> <li>• “I believe TV role models would effectively promote physical activities within student lives”</li> <li>• “enthusiastic role models”</li> </ul>	<p><i>Concerns about time</i></p> <ul style="list-style-type: none"> <li>• “I would be happy to do so provided time permits”</li> <li>• “....field experience is extremely time consuming with planning, extracurricular actives etc. It may be difficult to fit in...”</li> <li>• “It is difficult to build a rapport with students while on prac due to the time restrictions”</li> </ul>
	<p><i>Provide additional opportunities, sports, and competitions</i></p> <ul style="list-style-type: none"> <li>• “More organized opportunities for students to not only participate in physical activity in school but also the opportunity to continue that outside of school.”</li> <li>• “Have certain competitions which allow all students to play”</li> <li>• “More physical activity event days or competitions”</li> </ul>	

**Table 2. Themes identified from open-ended research questions of beliefs of pre-service physical education teachers, including categories within each theme.**

## Discussion

Overall, 90% (n=51) of participants believed it a part of their role as a pre-service teacher to promote student physical activity, with 97% (n=55) also believing the same for practicing physical education teachers. Participants provided three categories for whom they believe is responsible for student physical activity promotion. The diversity of parties identified by participants may have key implications regarding their support for future school-based interventions. Social-ecological models propose multiple dimensions of influence and hypothesize that self-regulation is difficult to establish without broader social and institutional support (Dzewaltowski, 1997). Participants in this study would therefore likely support interventions which involve influences from multiple parties. Second, parents and teachers (as identified by participants) have been common providers of past school-based physical activity promotion interventions (Dobbins et al., 2009). These findings also tap into a broader issue around the strategies for youth physical activity promotion, and the bodies that should be charged with facilitating such programs. National physical activity guidelines state that adolescents should engage in at least 60 minutes of moderate to vigorous physical activity per day, on most days per week (Australian Government Department of Health, 2014). Sufficient engagement in physical activity among youth yields numerous benefits (Blair & Morris, 2009; Faulkner, Buliung, Flora, & Fusco, 2009; Hamer, Stamatakis, & Steptoe, 2009; Haskell, Blair, & Hill, 2009; Kim & Lee, 2009; Sattelmair et al., 2011; Scarmeas et al., 2009; Wen et al., 2011; Woodcock, Franco, Orsini, & Roberts, 2011), both now and in the long-term. Much conjecture lies around what role schools, and by extension teachers, should play in physical activity promotion: particularly around whether schools have a responsibility only to deliver a set curriculum, or play an active role in the broader physical and mental development of youth. Given the available evidence of the success of school-based interventions, surely not engaging youth in schools about the benefits of physical activity (and the risks of inactivity) (Australian Government Department of Health, 2014) would be a missed opportunity.

In this study, four themes emerged from what participants believed would be effective for promoting student physical activity. It is significant that participant responses, namely 'showing the rewards / benefits of physical activity', 'making it fun' and 'providing additional opportunities', are also among the most commonly used strategies to promote school-based physical activity among youth (Dobbins et al., 2009). Of particular note is that physical education teachers would likely be the facilitators of each of the strategies identified by participants. It is therefore important that participants in this study believed student physical activity promotion to be a role of both pre-service (90%), and practicing (97%) physical education teachers, while they also responded positively and enthusiastically with respect to their willingness to be involved in such programs. Applying strategies that are identified by program facilitators (e.g. showing the rewards / benefits, making it fun, role models, providing additional opportunities, more sports, and competitions) may have implications for program success. Evidence shows that including program facilitators in their design (allowing facilitators to adapt programs to the ecological niche in which they are working) increases the quality of program delivery, and measureable health outcomes (Berkel, Mauricio, Schoenfelder, & Sandler, 2011).

In relation to teacher willingness to be involved in student physical activity promotion interventions, the findings from this study are consistent with previous literature. Participants in this study gave positive and enthusiastic responses when asked how they would feel about being involved in a program designed to promote physical activity among students at their school, both during their practicum experience and when they are practicing teachers. These results are congruent with existing Australian (St Leger, 1998) and international (Cale, 2002)

literature on practicing teachers' understandings of health promotion in schools, who were found to be very supportive of the concept. Concerning their future as practicing teachers, participants indicated that they either intended, or expected to be involved in such programs. This suggests that participants were aware of their likely involvement as facilitators in future programs. Finally, participants were also concerned about the time that involvement in school-based physical activity promotion programs would occupy. This is understandable as pre-service teachers often have additional issues which may take precedence over the prolonged ill-effects of youth physical inactivity. These include issues where pre-service teachers may lack experience, such as lesson delivery. This is in addition to managing the numerous demands placed on pre-service teachers, such as managing relationships with their teaching mentors and university supervisors (Ballinger & Bishop, 2011), and being evaluated (and self-evaluated) on teaching performance (Tinning, Macdonald, Wright, & Hickey, 2012). It should be noted however, that these responses were preceded by questions asking about participants' beliefs about school-based physical activity promotion. It is possible that the presence of these questions may have influenced responses to the following open-ended questions. To this end, the results also highlight the limitations of undertaking qualitative research via online questionnaires.

Several studies have found that teachers have a self-reported a lack of knowledge and preparedness to deal with adolescent health issues, limited understanding of how to approach school-based physical activity promotion (Cale, 2002; St Leger, 1998), and in some cases, a lack of skills and competence to successfully implement physical activity policy (Torill et al., 2013). Critically in this study, participants did not identify any limitations which may impact upon their ability to successfully promote youth physical activity in school settings. This finding may mean one of two possibilities. First, it is possible that this deficiency (lack of knowledge and preparedness to deal with adolescent health issues) has been recognized by the tertiary institution which participants are attending, and the need has been met to adequately prepare its students for this potential role. Second, pre-service teachers may have misconceptions about their ability and preparedness to fulfill the role of school-based physical activity promotion program facilitator.

While this investigation provides valuable empirical evidence to assist with preparing pre-service physical education teachers with their potential future roles, there are several related research priorities. First, the participants from this investigation were from a single institution, and all completed practicum experience in schools which must abide the rules of the same educational organization (Education Queensland). Comparing between institutions and education systems, either across various regions within the same country, or between countries may be a priority for future research. Second, this investigation did not record the participants' previous practicum experience schools, and the physical activity policies, campaigns, and initiatives that existed within those schools. Investigating pre-service teachers' experiences, concurrent with evaluations of physical activity promotion programs may also be a priority for future research. Lastly, this investigation assessed pre-service teachers at one time-point within their undergraduate tertiary degrees. Longitudinal cohort studies which assess participant beliefs from the beginning of undergraduate involvement, through to the early stages of their teaching careers is likely to improve our understanding of the beliefs of physical education teachers toward youth physical activity promotion in school settings.

School-based physical activity promotion is an important element of pre-service physical education teacher education, and the ongoing professional development of practicing physical education teachers. The role of physical education teachers in school-based physical activity promotion is likely to continue into the future; given the rates of physical inactivity in the Australian population (Australia Bureau of Statistics, 2013), and the previous success of

school-based programs (Dobbins et al., 2009). This study found participants responded positively to their potential roles as the facilitators of future school-based physical activity programs. Participants in this study also did not reveal any concerns about their capacity to facilitate school-based physical activity promotion programs during practicum, and prospectively as practising teachers; as opposed to previous studies in this field. This may indicate that either this particular tertiary institution has provided curriculum which adequately prepared participants; or participants had misconceptions about their ability and preparedness to fulfil this role. These particular findings provides valuable empirical evidence to assist with preparing pre-service physical education teachers for their potential future roles as the central facilitators of school-based physical activity promotion programs. Participants in this study also offered constructive suggestions for potential school-based physical activity programs, including communicating the benefits of any involvement in physical activity programs, the need to make programs fun, the use of role models, and the running of school-based competitions. Future studies should endeavour to build on the findings from the current study, and examine the effect of different school programs, tertiary institutions, and education systems, as well as applying longitudinal study designs to establish any changes in teacher perception throughout career progression.

## References

- Alibali, M., & Nathan, M. (2010). Conducting Research in Schools: A Practical Guide. *Journal of Cognition and Development, 11*(4), 397-407. <http://dx.doi.org/10.1080/15248372.2010.516417>
- Australia Bureau of Statistics. (2013). *Australian Health Survey: Physical Activity, 2011-12* Canberra.
- Australian Government Department of Health. (2014). *More than half of all Australian adults are not active enough: make your move - sit less, be active for life!* Canberra.
- Australian Government Department of Health. (2014). *Australia's Physical Activity & Sedentary Behaviour Guidelines for Young People (13 -17 years)*. Canberra.
- Australian Institute of Health and Welfare. (2010). *Australia's health 2010*. Canberra: AIHW.
- Ballinger, D. A., & Bishop, J. G. (2011). Mentoring Student Teachers: Collaboration with Physical Education Teacher Education. *Strategies: A Journal for Physical and Sport Educators, 24*(4), 30-34. <http://dx.doi.org/10.1080/08924562.2011.10590941>
- Beets, M. W., Beighle, A., Erwin, H. E., & Huberty, J. L. (2009). After-School Program Impact on Physical Activity and Fitness: A Meta-Analysis. *American Journal of Preventive Medicine, 36*(6), 527-537. <http://dx.doi.org/10.1016/j.amepre.2009.01.033>
- Berkel, C., Mauricio, A. M., Schoenfelder, E., & Sandler, I. N. (2011). Putting the pieces together: An integrated model of program implementation. *Prevention Science, 12*(1), 23-33. <http://dx.doi.org/10.1007/s11121-010-0186-1>
- Blair, S. N., & Morris, J. N. (2009). Healthy hearts—and the universal benefits of being physically active: physical activity and health. *Annals of Epidemiology, 19*(4), 253-256. <http://dx.doi.org/10.1016/j.annepidem.2009.01.019>
- Cale, L. (2002). Physical Activity Promotion in Schools -- PE Teachers' Views. *European Journal of Physical Education, 5*(2), 158-168. <http://dx.doi.org/10.1080/1740898000050204>
- Cancer Council Australia. (2011). Prevalence of Meeting Physical Activity Recommendations in Australian Secondary Students: Cancer Council Australia.

- Charles, B. C., & Thomas, L. M. (2008). Physical Activity Promotion A Responsibility for Both K-12 Physical Education and Kinesiology. *Journal of Physical Education, Recreation & Dance*, 79(6), 47. <http://dx.doi.org/10.1080/07303084.2008.10598200>
- Collins, D. (2003). Pretesting survey instruments: An overview of cognitive methods. *Quality of Life Research*, 12(3), 229-238. <http://dx.doi.org/10.1023/A:1023254226592>
- Corbin, C. B. (2002). Physical Activity for Everyone: What Every Educator Should Know About Promoting Lifelong Physical Activity. *Journal of Teaching in Physical Education*, 21(2).
- Currie, C., Zanotti, C., Morgan, A., Currie, D., de Looze, M., Roberts, C., . . . Barnekow, V. (2012). *Social Determinants of Health and Well-being Among Young People: Health Behaviour in School-aged Children (HBSC) Study: International Report from the 2009/2010 Survey*: World Health Organization, Regional Office for Europe.
- Department of Health. (2015). A Healthy and Active Australia. Retrieved August 12, 2015, from <http://www.healthyactive.gov.au/>
- Department of Health and Ageing. (2004). *Australia's physical activity recommendations for 12-18 year olds*. Canberra: DOHA.
- Dobbins, M., DeCorby, K., Robeson, P., Husson, H., & Tirilis, D. (2009). Cochrane review: Schoolbased physical activity programs for promoting physical activity and fitness in children and adolescents aged 6-18. *Evidence-Based Child Health: A Cochrane Review Journal*, 4(4), 1452-1561. <http://dx.doi.org/10.1002/ebch.461>
- Dzewaltowski, D. A. (1997). The ecology of physical activity and sport: Merging science and practice. *Journal of Applied Sport Psychology*, 9(2), 254-276. <http://dx.doi.org/10.1080/10413209708406486>
- Faulkner, G. E., Buliung, R. N., Flora, P. K., & Fusco, C. (2009). Active school transport, physical activity levels and body weight of children and youth: a systematic review. *Preventive Medicine*, 48(1), 3-8. <http://dx.doi.org/10.1016/j.ypmed.2008.10.017>
- Green, K. (2000). Exploring the everyday 'philosophies' of physical education teachers from a sociological perspective. *Sport, Education and Society*, 5(2), 109-129. <http://dx.doi.org/10.1080/713696029>
- Hamer, M., Stamatakis, E., & Steptoe, A. (2009). Dose-response relationship between physical activity and mental health: the Scottish Health Survey. *British Journal of Sports Medicine*, 43(14), 1111-1114. <http://dx.doi.org/10.1136/bjism.2008.046243>
- Haskell, W. L., Blair, S. N., & Hill, J. O. (2009). Physical activity: health outcomes and importance for public health policy. *Preventive Medicine*, 49(4), 280-282. <http://dx.doi.org/10.1016/j.ypmed.2009.05.002>
- Hayes, N. (2000). *Doing psychological research: gathering and analysing data*. Philadelphia: Open University Press.
- Herman, K. M., Hopman, W. M., & Craig, C. L. (2010). Are youth BMI and physical activity associated with better or worse than expected health-related quality of life in adulthood? The Physical Activity Longitudinal Study. *Quality of Life Research*, 19(3), 339-349. <http://dx.doi.org/10.1007/s11136-010-9586-8>
- Janssen, I., & LeBlanc, A. G. (2010). Systematic review of the health benefits of physical activity and fitness in school-aged children and youth. *International Journal of Behavioral Nutrition and Physical Activity*, 7(1), 40-40. <http://dx.doi.org/10.1186/1479-5868-7-40>
- Kim, Y., & Lee, S. (2009). Physical activity and abdominal obesity in youth. *Applied Physiology, Nutrition, and Metabolism*, 34(4), 571-581. <http://dx.doi.org/10.1139/H09-066>

- McDavid, L., Cox, A. E., & Amorose, A. J. (2012). The relative roles of physical education teachers and parents in adolescents' leisure-time physical activity motivation and behavior. *Psychology of Sport and Exercise, 13*(2), 99-107. <http://dx.doi.org/10.1016/j.psychsport.2011.10.003>
- McKenzie, T. L., & Kahan, D. (2004). Impact of the surgeon general's report: Through the eyes of physical education teacher educators. *Journal of Teaching in Physical Education, 23*(4), 300-317.
- Ommundsen, Y., Klasson-Heggebø, L., & Anderssen, S. A. (2006). Psycho-social and environmental correlates of location-specific physical activity among 9-and 15-year-old Norwegian boys and girls: the European Youth Heart Study. *International Journal of Behavioral Nutrition and Physical Activity, 3*(1), 32. <http://dx.doi.org/10.1186/1479-5868-3-32>
- Rachele, J. N., Cuddihy, T. F., Washington, T. L., & McPhail, S. M. (2013). Averting uncertainty: A practical guide to physical activity research in Australian schools. *Australian Journal of Teacher Education, 38*(9), 76-93. <http://dx.doi.org/10.14221/ajte.2013v38n9.4>
- Rachele, J. N., Cuddihy, T. F., Washington, T. L., & McPhail, S. M. (2014). The association between adolescent self-reported physical activity and wellness: The missing piece for youth wellness programs. *Journal of Adolescent Health, 55*(2), 281-286. <http://dx.doi.org/10.1016/j.jadohealth.2014.01.021>
- Rachele, J. N., McPhail, S. M., Washington, T. L., & Cuddihy, T. F. (2012). Practical physical activity measurement in youth: a review of contemporary approaches. *World Journal of Pediatrics, 8*(3), 207-216. <http://dx.doi.org/10.1007/s12519-012-0359-z>
- Ross, S. E. T., Larson, N., Graham, D. J., & Neumark-Sztainer, D. (2014). Longitudinal Changes in Physical Activity and Sedentary Behavior From Adolescence to Adulthood: Comparing US-Born and Foreign-Born Populations. *Journal of Physical Activity and Health, 11*(3), 519-527. <http://dx.doi.org/10.1123/jpah.2011-0359>
- Sattelmair, J., Pertman, J., Ding, E. L., Kohl, H. W., Haskell, W., & Lee, I.-M. (2011). Dose response between physical activity and risk of coronary heart disease a meta-analysis. *Circulation, 124*(7), 789-795. <http://dx.doi.org/10.1161/CIRCULATIONAHA.110.010710>
- Scarmeas, N., Luchsinger, J. A., Schupf, N., Brickman, A. M., Cosentino, S., Tang, M. X., & Stern, Y. (2009). Physical activity, diet, and risk of Alzheimer disease. *JAMA, 302*(6), 627-637. <http://dx.doi.org/10.1001/jama.2009.1144>
- St Leger, L. (1998). Australian teachers' understandings of the health promoting school concept and the implications for the development of school health. *Health Promotion International, 13*(3), 223. <http://dx.doi.org/10.1093/heapro/13.3.223>
- Tinning, R., Macdonald, D., Wright, J., & Hickey, C. (2012). *Becoming a physical education teacher: Contemporary and enduring issues*: Pearson Education.
- Torill, L., Oddrun, S., & Hege, T. (2013). Physical activity in schools: A qualitative case study of eight Norwegian schools' experiences with the implementation of a national policy. *Health Education, 113*(1), 52. <http://dx.doi.org/10.1108/09654281311293637>
- Virginia, B., & Victoria, C. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101. <http://dx.doi.org/10.1191/1478088706qp063oa>
- Warner, R., & Griffiths, M. D. (2006). A Qualitative Thematic Analysis of Exercise Addiction: An Exploratory Study. *International Journal of Mental Health and Addiction, 4*(1), 13-26. <http://dx.doi.org/10.1007/s11469-006-9000-5>

- Wen, C. P., Wai, J. P. M., Tsai, M. K., Yang, Y. C., Cheng, T. Y. D., Lee, M.-C., . . . Wu, X. (2011). Minimum amount of physical activity for reduced mortality and extended life expectancy: a prospective cohort study. *The Lancet*, 378(9798), 1244-1253.  
[http://dx.doi.org/10.1016/S0140-6736\(11\)60749-6](http://dx.doi.org/10.1016/S0140-6736(11)60749-6)
- Woodcock, J., Franco, O. H., Orsini, N., & Roberts, I. (2011). Non-vigorous physical activity and all-cause mortality: systematic review and meta-analysis of cohort studies. *International Journal of Epidemiology*, 40(1), 121-138.  
<http://dx.doi.org/10.1093/ije/dyq104>
- World Health Organization. (2004). *Global strategy on diet, physical activity and health*. Geneva: World Health Organisation (WHO).

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