

Article

Household Chores or Play Outdoors? The Intersecting Influence of Gender and School Type on Physical Activity Among Indian Adolescents

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Abstract

Most Indian adolescents, particularly girls and private school students, do not engage in sufficient physical activity (PA). Current understanding of these sociodemographic differences is limited by a focus on exercise, which may not fully capture PA in developing countries. We examined how gender and school type are associated with multiple PA domains and whether associations with gender differ by school type. We randomly selected an equal number of girls and boys (ages 13-16 years) from public and private schools in Southern India (n = 395). Cross-sectional 24-hour time-use surveys measured PA, which was categorized into three domains: chores, errands, and work; play; and transportation. Negative binomial and logistic regression modeled relative differences in domain-specific PA minutes and the probability of engaging in ≥ 60 minutes of moderate-to-vigorous PA (MVPA), respectively, in the prior 24 hours. Girls and boys were equally likely to meet MVPA recommendations. However, girls spent twice as much active time completing chores, errands, and work (rate ratio = 1.98, 95% confidence interval = [1.32, 2.98]), while boys spent twice as much active time playing (rate ratio = 2.11, 95% confidence interval = [1.23, 3.62]). Public and private school girls spent more active time in chores, errands, and work than boys; however, gender differences were greater among public school students (p value for interaction < .05). Although comparable MVPA levels for girls and boys are beneficial for physical health, girls may gain fewer cognitive, social, and emotional benefits associated with play. Additional research may clarify why the gendered burden of household responsibilities was greater among public school students. School-based programs to engage girls in active play may help reduce inequities.

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Jan 2007

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GSHS. (2007). Global School-Based Student Health Survey: India (CBSE) 2007 fact sheet.

http://www.who.int/ncds/surveillance/gshs/2007_India_CBSE_fact_sheet.pdf**Prevalence of insufficient physical activity among school going adolescents**

Jan 2010

World Health Organization. (2015). Prevalence of insufficient physical activity among school going adolescents, 2010. <http://apps.who.int/gho/data/node.main.A893ADO?lang=en>

... Resulting decreases in PA have contributed to the rapidly growing burden of noncommunicable disease in developing countries (Hallal et al., 2012; Sallis et al., 2016). In India, levels of PA are particularly low among adolescents: in 2007, only 30.2% of school-going children aged 13 to 15 years met World Health Organization (WHO) recommendations for ≥ 60 minutes of moderate-to-vigorous PA (MVPA) per day (GSHS, 2007; WHO, 2015), although data suggest that levels of activity may be higher among adolescents living in rural areas (Bhawra et al., 2018). ...

... As of 2019, India's Central Board of Secondary Education (CBSE) requires all schools to implement a daily 60-minute physical education period for students in Grades 1 to 12 (ages 5-18). However, the CBSE does not regulate all schools in the country and implementation and enforcement vary widely (Bhawra et al., 2018). Monitoring and evaluation plans as well as accountability mechanisms and funding to develop physical infrastructure in lower-resourced schools will likely be needed to achieve population-level impacts. ...

Results from India's 2018 Report Card on Physical Activity for Children and YouthArticle [Full-text available](#)Nov 2018 · *J Phys Activ Health*

● Jasmin Bhawra · ● Priyanka Chopra · ● Harish Ranjani · ● Tarun Reddy Katapally

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... Several studies have identified important sociodemographic differences in Indian adolescents' PA. Girls (Gulati et al., 2014; Swaminathan et al., 2011; Thakor et al., 2004), adolescents from higher-income backgrounds, and students who attend private schools (George et al., 2014; Mahaur & Badiger, 2018; Puri et al., 2008) tend to engage in less PA. However, current understanding of these sociodemographic differences is limited by a focus on exercise-planned and structured PA done to promote physical fitness (Caspersen et al., 1985)-and transportation-related PA. ...

... Our results are consistent with previous findings that private-school students engage in less PA than public school students (George et al., 2014; Mahaur & Badiger, 2018). Private school students spent very little time in household work, but this did not appear to translate into additional time for active recreation. ...

Patterns of physical activity among government and private school children in coastal KarnatakaArticle [Full-text available](#)

Aug 2018

Gunjan Mahaur · ● Sanjeev Badiger

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... Girls may be restricted in their movement outside of home due to safety concerns and notions of propriety, and expected to engage in home-centered activities that will prepare them for adult roles as homemakers (Singh & Misra, 2015; Verma & Sharma, 2003). In contrast, boys are often permitted more freedom of movement and encouraged to engage in work-related activities outside of home in preparation for roles as economic providers (Basu et al., 2017). ...

Learning to Be Gendered: Gender Socialization in Early Adolescence Among Urban Poor in Delhi, India, and Shanghai, ChinaArticle [Full-text available](#)Sep 2017 · *J ADOLESCENT HEALTH*

● Sharmistha Basu · ● Xiayun Zuo · ● Chaohua Lou · ● Rebecka Lundgren

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A study of cardiovascular risk factors and its knowledge among school children of Delhi

Article [Full-text available](#)

May 2014 · [Indian Heart J](#)

● Kamlesh Kumari Sharma · Grace Mary George · Sharma KK · Sanjeev Kumar Gupta SK

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... School type also indicates exposure to varying social and material supports for PA. For example, although private schools commonly provide greater access to sports equipment and play areas, a strict focus on academics may prevent extensive use of these resources (Bhargava et al., 2016). In contrast, although public school students may have fewer material supports for PA, they may be allowed more unstructured play time during school hours (Bhargava et al., 2016). ...

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... Private school students spent very little time in household work, but this did not appear to translate into additional time for active recreation. In a recent qualitative study, private school students in New Delhi discussed their academic workload as one of the most significant barriers to PA (Satija et al., 2018), and Bhargava et al. (2016) found that private schools in the northern Indian state of Uttarakhand were well-equipped with sports materials and structured play areas, but allotted little time for PA. As of 2019, India's Central Board of Secondary Education (CBSE) requires all schools to implement a daily 60-minute physical education period for students in Grades 1 to 12 (ages 5-18). ...

Physical activity correlates of overweight and obesity in school-going children of Dehradun, Uttarakhand

Article [Full-text available](#)

Jul 2016 · [JFMPC](#)

● Madhavi Anurag Bhargava · S.D. Kandpal · ● Pradeep Aggarwal

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... This study examined patterns and correlates of PA among Southern Indian adolescents in overall MVPA and three PA domains: chores, errands, and work; active play; and active transportation. Consistent with prior regional estimates (Shridhar et al., 2016; Swaminathan et al., 2011), the majority of adolescents (68.3%) engaged in ≥60 minutes of MVPA during the previous 24 hours. However, there were important differences by gender and school type. ...

Prevalence and correlates of achieving recommended physical activity levels among children living in rural South Asia—A multi-centre study

Article [Full-text available](#)

Dec 2016 · [BMC PUBLIC HEALTH](#)

● Krithiga Shridhar · Christopher Millett · ● Anthony A Laverty · ● Preet K Dhillon

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... Mechanization has reduced the need for physical labor, inactive transportation options are widely accessible, and leisure time has become increasingly sedentary (Hallal et al., 2012; Katzmarzyk & Mason, 2009). Resulting decreases in PA have contributed to the rapidly growing burden of noncommunicable disease in developing countries (Hallal et al., 2012; Sallis et al., 2016). In India, levels of PA are particularly low among adolescents: in 2007, only 30.2% of school-going children aged 13 to 15 years met World Health Organization (WHO) recommendations for ≥60 minutes of moderate-to-vigorous PA (MVPA) per day (GSHS, 2007; WHO, 2015), although data suggest that levels of activity may be higher among adolescents living in rural areas (Bhawra et al., 2018). ...

Progress in physical activity over the Olympic quadrennium

Article [Full-text available](#)

Jul 2016 · [Lancet](#)

James F Sallis · ● Fiona Bull · ● Regina Guthold · ● Pedro Hallal

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... Examining activities beyond exercise and transportation may be particularly important for understanding sociodemographic differences in PA, as gender-and socioeconomic-based norms likely inform the type and amount of PA in which adolescents engage. Girls may be restricted in their movement outside of home due to safety concerns

and notions of propriety, and expected to engage in home-centered activities that will prepare them for adult roles as homemakers (Singh & Misra, 2015; Verma & Sharma, 2003). In contrast, boys are often permitted more freedom of movement and encouraged to engage in work-related activities outside of home in preparation for roles as economic providers (Basu et al., 2017). ...

Pattern of leisure-lifestyles among Indian school adolescents: Contextual influences and implications for emerging health concerns

Article [Full-text available](#)

Jun 2015 · *Psychology*

 Arun Pratap Singh ·  Girishwar Misra

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... Several studies have identified important sociodemographic differences in Indian adolescents' PA. Girls (Gulati et al., 2014; Swaminathan et al., 2011; Thakor et al., 2004), adolescents from higher-income backgrounds, and students who attend private schools (George et al., 2014; Mahaur & Badiger, 2018; Puri et al., 2008) tend to engage in less PA. However, current understanding of these sociodemographic differences is limited by a focus on exercise-planned and structured PA done to promote physical fitness (Caspersen et al., 1985)-and transportation-related PA. ...

Physical Activity Patterns Among School Children in India

Article [Full-text available](#)

Jun 2014 · *Indian J Pediatr*

 Achal Gulati ·  Alexander Hochdorn ·  Haralappa Paramesh ·  Ileana Baldi

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... For each activity, participants were asked where the activity took place, the time it began and ended, and who else was present. Time-use surveys have demonstrated good test-retest reliability and validity compared with accelerometer data in several populations in Australia (van der Ploeg et al., 2010) and the United States (Matthews et al., 2013; Welk et al., 2014) but, to our knowledge, have not been tested in India. Time-use surveys are less subject to recall and social desirability bias as they require participants to account for all activities in which they engaged during the preceding 24 hours, unlike traditional PA questionnaires which only ask about selected activities and require estimates of time spent in each activity outside the context of the full 24-hour period (van der Ploeg et al., 2010). ...

Validation of a Previous-Day Recall Measure of Active and Sedentary Behaviors

Article [Full-text available](#)

Aug 2013 · *Med Sci Sports Exerc*

Charles E Matthews ·  Sarah Kozey Keadle ·  Joshua Sampson ·  Jay H Fowke

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... It extends the limited existing literature by providing a detailed picture of PA beyond the conventional domains of exercise and transportation, and highlighting the importance of gender and school type as independent and intersecting influences on PA. Using 24-hour time-use surveys allowed us to capture the range of activities in adolescents' lives and may also reduce social desirability and recall bias by requiring participants to account for all activities in the previous 24 hours, rather than select activities (van der Ploeg et al., 2010). ...

Advances in Population Surveillance for Physical Activity and Sedentary Behavior: Reliability and Validity of Time Use Surveys

Article [Full-text available](#)

Nov 2010 · *Am J Epidemiol*

 Hidde P van der Ploeg ·  Dafna Merom ·  Josephine Y Chau ·  Adrian Bauman

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... Industrialization, urbanization, and technological advancements have transformed patterns of physical activity (PA) worldwide. Mechanization has reduced the need for physical labor, inactive transportation options are widely accessible, and leisure time has become increasingly sedentary (Hallal et al., 2012; Katzmarzyk & Mason, 2009). Resulting decreases in PA have contributed to the rapidly growing burden of noncommunicable disease in developing countries (Hallal et al., 2012; Sallis et al., 2016). ...

The Physical Activity Transition

Article [Full-text available](#)

Jun 2009 · [J Phys Activ Health](#)

● Peter Katzmarzyk · ● Caitlin Mason

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... Historically, it has been maintained that gender inequality in India is greater among women from higher social strata, whose autonomy and freedom of movement are more restricted by notions of purity and propriety (Liddle & Joshi, 1989). However, Deshpande (2002 Deshpande (, 2011 argues that this characterization is no longer accurate and offers evidence that women in lower social strata are subject to greater socioeconomic disadvantage and less egalitarian gender norms, including more restricted decision making; whether these experiences extend to adolescents is unknown. Examining if and how the experience of gender-and its influence on PA-differs for public and private school students may help researchers successfully target and tailor PA interventions. ...

... Our study provides the first evidence that gender differences in PA may be more pronounced among public school students. Our findings are consistent with Deshpande's (2002 Deshpande's (, 2011 assertion that gender inequality may be greater among women from lower social strata. Exploring factors that help explain greater gender disparities among women from lower social strata, including factors unique to younger women and girls, are important avenues for future research. ...

Assets versus Autonomy? The Changing Face of the Gender-Caste Overlap in India

Article [Full-text available](#)

Feb 2002 · [Fem Econ](#)

● Ashwini Deshpande

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... We used the Compendium of Energy Expenditures for Youth to assign each activity a MET value (Ridley et al., 2008). Three team members reached consensus on the MET value assigned to each activity. ...

Development of a Compendium of Energy Expenditures for Youth

Article [Full-text available](#)

Oct 2008 · [INT J BEHAV NUTR PHY](#)

● Kate Ridley · Barbara E. Ainsworth · ● Tim Olds

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... Exploring factors that help explain greater gender disparities among women from lower social strata, including factors unique to younger women and girls, are important avenues for future research. To this end, Iyer et al. (2007) offer a useful distinction between "pure bias" and "rationing bias." The latter occurs when gender hierarchies emerge in the context of socioeconomic constraints to inform the distribution of resources and responsibilities. ...

The Dynamics of Gender and Class in Access to Health Care: Evidence from Rural Karnataka, India

Article [Full-text available](#)

Feb 2007 · [INT J HEALTH SERV](#)

● Aditi Iyer · Gita Sen · ● Asha George

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... While the largely comparable amount of active time for girls and boys is positive in terms of physical health, there may be other advantages and disadvantages to time spent in specific domains. Although girls may obtain physical benefits from MVPA, they may gain fewer of the cognitive, social, and emotional benefits associated with play, such as confidence, resiliency, creativity, conflict resolution skills, and learning readiness (Ginsburg, 2007; Yogman et al., 2018). Guidelines, policies, and programs may need to explicitly promote specific types of PA, like play, to ensure that these nonphysical health benefits are accessible to adolescents of all genders. ...

The Power of Play: A Pediatric Role in Enhancing Development in Young Children

Article

Aug 2018 · [Pediatrics](#)

● Michael Yogman · Andrew Garner · Jeffrey Hutchinson · ● Roberta Michnick Golinkoff

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... Private school students spent very little time in household work, but this did not appear to translate into additional time for active recreation. In a recent qualitative study, private school students in New Delhi discussed their academic workload as one of the most significant barriers to PA (Satija et al., 2018), and Bhargava et al. (2016) found that private schools in the northern Indian state of Uttarakhand were well-equipped with sports materials and structured play areas, but allotted little time for PA. As of 2019, India's Central Board of Secondary Education (CBSE) requires all schools to implement a daily 60-minute physical education period for students in Grades 1 to 12 (ages 5-18). ...

... Still, interventions will likely need to attend to physical infrastructure needs in public schools and gender-specific barriers to PA participation to avoid exacerbating existing inequities. Adolescent girls in India have reported various barriers to PA including, norms limiting "acceptable" activities, unsuitable dress codes (e.g., skirts), lack of confidence, and concerns about getting tan or sweaty (Satija et al., 2018). Programs that promote positive body image, offer examples of Indian women in sports, and offer various activity options may help facilitate equal participation (Satija et al., 2018). ...

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Physical Activity Among Adolescents in India: A Qualitative Study of Barriers and Enablers

[Article](#)Jul 2018 · [HEALTH EDUC BEHAV](#)

 Ambika Satija ·  Neha Khandpur ·  Shivani Satija ·  K M V Narayan

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... While initial evidence suggests that gender and school type independently influence PA, researchers have yet to examine whether they interact. Historically, it has been maintained that gender inequality in India is greater among women from higher social strata, whose autonomy and freedom of movement are more restricted by notions of purity and propriety (Liddle & Joshi, 1989). However, Deshpande (2002) and Deshpande (2011) argue that this characterization is no longer accurate and offers evidence that women in lower social strata are subject to greater socioeconomic disadvantage and less egalitarian gender norms, including more restricted decision making; whether these experiences extend to adolescents is unknown. ...

Daughters of Independence: Gender, Caste, and Class in India.

[Article](#)May 1987 · [J ASIAN STUD](#)

Janet Contursi · Joanna Liddle · Rama Joshi

[View](#)

A Tutorial on Interaction

[Article](#)

May 2014

Tyler J. VanderWeele · Mirjam J Knol

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... We used logistic regression to assess adjusted associations between exposures of interest and participation in ≥ 60 minutes of MVPA in the prior 24 hours. Because odds ratios may overestimate prevalence ratios when the outcome is common (prevalence of participation in ≥ 60 minutes of MVPA = 59.75%), we converted odds ratios to prevalence ratios (Zhang & Yu, 1998). ...

What's the Relative Risk?

[Article](#)Nov 1998 · [JAMA-J AM MED ASSOC](#)

 Zhang Jun ·  Kai F Yu

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... For each activity, participants were asked where the activity took place, the time it began and ended, and who else was present. Time-use surveys have demonstrated good test-retest reliability and validity compared with accelerometer data in several populations in Australia (van der Ploeg et al., 2010) and the United States (Matthews et al., 2013; Welk et al., 2014) but, to our knowledge, have not been tested in India. Time-use surveys are less subject to recall and

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Validity of 24-h Physical Activity Recall: Physical Activity Measurement Survey

[Article](#)

Feb 2014 · [Med Sci Sports Exerc](#)

● Gregory J. Welk · ● Youngwon Kim · ● Bryan Stanfill · ● Alicia Carriquiry

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... Adolescents who attend private schools, which are primarily accessible to wealthier families, face significant academic pressures and are expected to devote substantial time to homework and other academic activities, which may reduce time for play (Lloyd et al., 2008; Verma & Sharma, 2003). Still, school type is not only an indicator of household socioeconomic status; some poorer families send children to private school as an investment in future financial prospects. ...

Gender Differences in Time Use Among Adolescents in Developing Countries: Implications of Rising School Enrollment Rates

[Article](#)

Feb 2008 · [J Res Adolesc](#)

Cynthia B. Lloyd · ● Monica Jane Grant · ● Amanda S Ritchie

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Global physical activity levels: surveillance progress, pitfalls, and prospects

[Article](#)

Jul 2012 · [Lancet](#)

● Pedro Hallal · ● Lars Bo Andersen · ● Fiona Bull · ● Ulf Ekelund

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The Grammar of Caste: Economic Discrimination in Contemporary India

[Book](#)

Jan 2011

● Ashwini Deshpande

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... Increasing knowledge of PA's positive effects on cognitive performance (Chang et al., 2012) may increase teacher and parent receptivity to incorporating PA into student schedules. Opportunities for play in the school environment, where students spend a substantial portion of each day, offer an immediate strategy for increasing adolescents' access to the physical and nonphysical benefits of play across gender and school type. ...

The effects of acute exercise on cognitive performance: A meta-analysis[Article](#)Mar 2012 · [Brain Res](#)

● Yu-Kai Chang · ● Jeff Labban · ● Jennifer I Gapin · ● Jennifer Etnier

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... Studies that do not measure all domains likely underestimate MVPA and may systematically underestimate the MVPA of girls. One of the only other studies to measure multiple domains of PA among Indian youth also found no significant gender differences in MVPA (Swaminathan et al., 2011). They did, however, report higher MVPA intensity among boys, a possibility in our sample as well: boys may have spent more time in vigorous-intensity PA, such as biking, while girls may have spent more time in moderate-intensity PA, such as indoor cleaning. ...

Longitudinal trends in physical activity patterns in selected urban South Indian school children[Article](#)Aug 2011 · [INDIAN J MED RES](#)

● Sumathi Swaminathan · ● Sumithra Selvam · ● Tinku Thomas · ● Mario Vaz

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... Three team members reached consensus on the MET value assigned to each activity. We could not identify a suitable match in the Compendium for two activities ("home repairs & outdoor chores" and "other outdoor chores"), so MET values from the Adult Compendium of Physical Activities were used (Ainsworth et al., 2011). Per WHO guidelines, we classified activities with MET values ≥ 3.0 as MVPA (WHO, 2011). ...

2011 Compendium of Physical Activities: A Second Update of Codes and MET Values[Article](#)Jun 2011 · [Med Sci Sports Exerc](#)

● Barbara E Ainsworth · ● William L. Haskell · ● Stephen D Herrmann · ● Arthur Leon

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Physical Activity, Exercise, and Physical Fitness: Definitions and Distinctions for Health-Related Research[Article](#)Nov 1984 · [PUBLIC HEALTH REP](#)

Carl J. Caspersen · Kenneth E. Powell · Gregory M. Christenson

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Cultural Continuity Amid Social Change: Adolescents' Use of Free Time in India

[Article](#)

Apr 2003 · [New Dir Child Adolesc Dev](#)

● Suman Verma · ● Deepali Sharma

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Effect of Physical and Mental Activity on Blood Pressure

[Article](#)

May 2004 · [Indian J Pediatr](#)

● Hitendrasinh G Thakor · ● Pradeep Kumar · ● Vikas K Desai

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... While the largely comparable amount of active time for girls and boys is positive in terms of physical health, there may be other advantages and disadvantages to time spent in specific domains. Although girls may obtain physical benefits from MVPA, they may gain fewer of the cognitive, social, and emotional benefits associated with play, such as confidence, resiliency, creativity, conflict resolution skills, and learning readiness (Ginsburg, 2007; Yogman et al., 2018). Guidelines, policies, and programs may need to explicitly promote specific types of PA, like play, to ensure that these nonphysical health benefits are accessible to adolescents of all genders. ...

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... Several studies have identified important sociodemographic differences in Indian adolescents' PA. Girls (Gulati et al., 2014; Swaminathan et al., 2011; Thakor et al., 2004), adolescents from higher-income backgrounds, and students who attend private schools (George et al., 2014; Mahaur & Badiger, 2018; Puri et al., 2008) tend to engage in less PA. However, current understanding of these sociodemographic differences is limited by a focus on exercise-planned and structured PA done to promote physical fitness (Caspersen et al., 1985)-and transportation-related PA. ...

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Katherine J Ford · G David Batty · [...] · Anja K Leist

Background: Limited workplace control, an important dimension of job strain, can reduce occupational opportunities for problem solving and learning. Women may have fewer professional resources to mitigate effects of low control, while conversely, gender-role norms may moderate the influence of occupational psychosocial risk factors. We therefore examined whether the links between control and ... [\[Show full abstract\]](#)

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Solvita Klavina-Makrecka · Inese Gobina · Toms Pulmanis · [...] ·  Anita Villerusa

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Powers of attorney (POA), widely used in end-of-life planning, give authority, often to relatives, to manage elders' affairs if they become incapacitated. Unfortunately, family members are frequently perpetrators of elder family financial exploitation (EFFE). To understand possible EFFE precursors, the Elder Family Financial Exploitation Survey (EFFES) collected hierarchical data (individual ... [\[Show full abstract\]](#)

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