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## Title

### ***Association of socio-demographic factors with physical activity in adolescents and young adults: data from EBANS study***

## Abstract

Purpose: To describe the physical activity (PA) level and its association with socio-demographic factors in the Brazilian youth. Methods: We analyzed 476 individual participants of the Brazilian Study of Nutrition and Health (EBANS), using the age cutoff proposed by the World Health Organization to define the adolescence period. The International Physical Activity Questionnaire, was used to obtain PA data. Region, sex, age, socioeconomic level (SEL), education level, and type of occupation were used as socio-demographic factors. The multiple logistic regression stepwise was used for the associated factors. Results: 48% of adolescents and 53% of young adults did not meet the PA recommendations. For adolescents, sex (female OR 0.43; 95%CI 0.23-0.78), SEL (low OR 5.65; 95%CI 1.91-16.67) and type of occupation (student OR 2.07; 95%CI 1.04-4.12) were associated with PA recommendations meeting, and for adults only region (Northeast OR 0.24; 95%CI 0.06-0.97 and Midwest OR 0.16; 95%CI 0.03-0.89) and sex (female OR 0.47; 95%CI 0.25-0.87). Conclusions: The socio-demographic factors identified in this work may be considered in interventions aimed to increase the PA level in the Brazilian youth. The prevalence of individuals who did not meet the PA recommendations found in this study suggests an eminent need to foster sustainable public policies to increase the PA level in the population aged 15-24.9 years. Trial registration: ClinicalTrials.Gov NCT02226627. Retrospectively registered on August 27, 2014. © The Author(s), under exclusive licence to Springer-Verlag Italia S.r.l., part of Springer Nature 2024.

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## References

Sallis J.F., Bull F., Guthold R., Heath G.W., Inoue S., Kelly P., Et al., Progress in physical activity over the olympic quadrennium, *Lancet*, 388, pp. 1325-1336, (2016); Tarp J., Brond J.C., Andersen L.B., Moller N.C., Froberg K., Grontved A., Physical activity, sedentary behavior, and long-term cardiovascular risk in young people: a review and discussion of methodology in prospective studies, *J Sport Health Sci*, 5, 2, pp. 145-150, (2016); Lim S.S., Vos T., Flaxman A.D., Danaei G., Shibuya K., Adair-Rohani H., Et al., A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990-2010: a systematic analysis for the global burden of disease study 2010, *Lancet*, 380, 9859, pp. 2224-2260, (2012); Noncommunicable diseases country profile 2018 Geneva: World Health Organization., (2018); Hayes G., Dowd K.P., MacDonncha C., Donnelly A.E., Tracking of physical activity and sedentary behavior from adolescence to young adulthood: a systematic literature review, *J Adolesc Health*, 65, 4, pp. 446-454, (2019); Patton G.C., Sawyer S.M., Santelli J.S., Ross D.A., Afifi R., Allen N.B., Et al., Our future: a Lancet commission on adolescent health and wellbeing, *Lancet*, 387, pp. 2423-2478, (2016); Patnode C.D., Evans C.V., Senger C.A., Redmond N., Lin J.S., Behavioral counseling to promote a healthful diet and physical activity for cardiovascular disease prevention in adults without known cardiovascular disease risk factors: updated evidence report and systematic review for the us preventive services task force, *JAMA*, 318, 2, pp. 175-193, (2017); Cuenca-Garcia M., Ortega F.B., Ruiz J.R., Gonzalez-Gross M., Labayen I., Jago R., Et al., Combined influence of healthy diet and active lifestyle on cardiovascular disease risk factors in adolescents, *Scand J Med Sci Sports*, 24, 3, pp. 553-562, (2014); Global action plan for the prevention and control of noncommunicable diseases 2013-2020 Geneva: World Health Organization., (2013); Barufaldi L.A., Abreu G.A., Coutinho E.S.F., Bloch K.V., Meta-analysis of the prevalence of physical inactivity

---

among Brazilian adolescents, *Cad Saude Publica*, 28, 6, pp. 1019-1032, (2012); Ekelund U., Luan J., Sherar L.B., Esliger D.W., Griew P., Cooper A., Moderate to vigorous physical activity and sedentary time and cardiometabolic risk factors in children and adolescents, *JAMA*, 307, 7, pp. 704-712, (2012); Camargo E.M., Silva M.P., Mota J., Campos W.D., Prevalence and factors associated with active transportation to school for adolescents, *Rev Saude Publica*, (2020); Rech C.R., de Camargo E.M., de Araujo P.A.B., Loch M.R., Reis R.S., Perceived barriers to leisure-time physical activity in the brazilian population, *Rev Bras Med Esporte*, 24, 4, pp. 303-309, (2018); Bauman A.E., Reis R.S., Sallis J.F., Wells J.C., Loos R.J.F., Martin B.W., Correlates of physical activity: why are some people physically active and others not?, *Lancet*, 380, 9838, pp. 258-271, (2012); Lehne G., Bolte G., Impact of universal interventions on social inequalities in physical activity among older adults: an equity-focused systematic review, *Int J Behav Nutr Phys Act*, (2017); Mielke G.I., Malta D.C., de Sa G.B.A.R., Reis R.S., Hallal P.C., Diferenças regionais e fatores associados à prática de atividade física no lazer no Brasil: resultados da Pesquisa Nacional de Saúde-2013, *Rev Bras Epidemiol*, (2015); Guthold R., Stevens G.A., Riley L.M., Bull F.C., Worldwide trends in insufficient physical activity from 2001 to 2016: a pooled analysis of 358 population-based surveys with 1.9 million participants, *Lancet*, 6, 10, pp. 1077-1086, (2018); Knuth A.G., Malta D.C., Dumith S.C., Pereira C.A., Morais Neto O.L., Temporao J.G., Et al., Prática de atividade física e sedentarismo em brasileiros: resultados da Pesquisa Nacional por Amostra de Domicílios (PNAD) 2008, *Cien Saude Colet*, (2011); Camargo D.M., Ramirez P.C., Quiroga V., Rios P., Fermino R.C., Sarmiento O.L., Physical activity in public parks of high and low socioeconomic status in Colombia using observational methods, *J Phys Act Health*, 15, 8, pp. 581-591, (2018); Werneck A.O., Oyeyemi A.L., Fernandes R.A., Romanzini M., Ronque E.R.V., Cyrino E.S., Et al., Regional socioeconomic inequalities in physical activity and sedentary behavior among brazilian adolescents, *J Phys Act Health*, (2017); Ministério da Saúde. Secretaria de Vigilância em Saúde.

---

Departamento de Análise em Saúde e Vigilância de Doenças Não Transmissíveis. Vigitel Brasil (2019) vigilância de fatores de risco e proteção para doenças crônicas por inquérito telefônico. Brasília, Ministério da Saúde; Instituto Brasileiro de Geografia e Estatística. Pesquisa Nacional por Amostra de Domicílios. Práticas de Esporte e Atividade Física: 2015. Rio de Janeiro: Instituto Brasileiro de Geografia e Estatística, (2017); Instituto Brasileiro de Geografia e Estatística. PeNSE 2015: Pesquisa Nacional de Saúde do Escolar. Rio de Janeiro: Instituto Brasileiro de Geografia e Estatística, (2016); Bloch K.V., Szklo M., Kuschner M.C.C., Abreu G.A., Barufaldi L.A., Klein C.H., Et al., The study of cardiovascular risk in adolescents-ERICA: rationale, design and sample characteristics of a national survey examining cardiovascular risk factor profile in Brazilian adolescents, BMC Public Health, (2015); Fisberg M., Kovalskys I., Previdelli A.N., Zimberg I.Z., Del'Arco A.P.W.T., Ferrari G.L.M., Brazilian Study of Nutrition and Health (EBANS)-Brazilian data of ELANS: methodological opportunities and challenges, Rev Assoc Med Bras, 65, 5, pp. 669-677, (2019); Pardini R., Matsudo S., Araujo T., Matsudo V., Andrade E., Braggion G., Et al., Validação do questionário internacional de nível de atividade física (IPAQ-versão 6): estudo piloto em adultos jovens brasileiros, Rev Bras Ciênc e Mov, 9, 3, pp. 45-51, (2001); Guedes D.P., Lopes C.C., Guedes J.E.R.P., Reproducibility and validity of the International Physical Activity Questionnaire in adolescents, Rev Bras Med Esporte, 11, 2, pp. 151-158, (2005); Report of a WHO Study Group on Young People and 'Health for All by the Year 2000', Technical Report Series, 731, (1986); Fisberg M., Kovalskys I., Gomez G., Rigotti A., Cortes L.Y., Herrera-Cuenca M., Et al., Latin America Study of Nutrition and Health (ELANS): rationale and study design, BMC Public Health, 16, (2016); Instituto Brasileiro de Geografia e Estatística, (2010); Hallal P.C., Gomez L.F., Parra D.C., Lobelo F., Mosquera J., Florindo A.A., Et al., Lessons learned after 10 years of IPAQ use in Brazil and Colombia, J Phys Act Health, 7, pp. S259-S264, (2010); Craig C.L., Marshall A.L., Sjostrom M., Bauman A.E., Booth M.L., Ainsworth B.E., Et al., International physical activity questionnaire: 12-country

---

reliability and validity, *Med Sci Sports Exerc*, 35, 8, pp. 1381-1395, (2003); Ainsworth B.E., Haskell W.L., Whitt M.C., Irwin M.L., Swartz A.M., Strath S.J., Et al., Compendium of physical activities: an update of activity codes and MET intensities, *Med Sci Sports Exerc*, 32, 9, pp. S498-S504, (2000); Ainsworth B.E., Haskell W.L., Herrmann S.D., Meckes N., Basset D.R., Tudor-Locke C., Et al., Compendium of physical activities: a second update of codes and MET values, *Med Sci Sports Exerc*, 43, 8, pp. 1575-1581, (2011); Associação Brasileira de Empresas de Pesquisa. Brazilian economic classification criteria (Critério Brasil).; Bull F.C., Al-Ansari S.S., Biddle S., Borodulin K., Buman M.P., Cardon G., Et al., World Health Organization 2020 guidelines on physical activity and sedentary behaviour, *Br J Sports Med*, 54, pp. 1451-1462, (2020); Katz M.H., *Multivariable analysis: a practical guide for clinicians and public health researchers*, (2011); Hallal P.C., Knuth A.G., Cruz D.K.A., Mendes M.I., Malta D.C., *Prática de atividade física em adolescentes brasileiros*, *Cien Saude Colet*, (2010); de Rezende L.F.M., Azeredo C.M., Canella D.S., Claro R.M., de Castro I.R.R., Levy R.B., Et al., Sociodemographic and behavioral factors associated with physical activity in Brazilian adolescents, *BMC Public Health*, 14, (2014); de Sousa C.A., Cesar C.L.G., Barros M.B.A., Carandina L., Goldbaum M., Marchioni D.M.L., Et al., Prevalência de atividade física no lazer e fatores associados: estudo de base populacional em São Paulo, Brasil, 2008-2009, *Cad Saude Publica*, 29, 2, pp. 270-282, (2013); Cureau F.V., da Silva T.L.N., Bloch K.V., Fujimori E., Belfort D.R., Carvalho K.M.B., Et al., ERICA: inatividade física no lazer em adolescentes brasileiros, *Rev Saude Publica*, (2016); Ramirez-Velez R., Garcia-Hermoso A., Agostinis-Sobrinho C., Mota J., Santos R., Correa-Bautista J.E., Et al., Cycling to school and body composition, physical fitness, and metabolic syndrome in children and adolescents, *J Pediatr*, 188, pp. 57-63, (2017); Verhoeven H., Simons D., Van Dyck D., Cauwenberg J.V., Clarys P., De Bourdeaudhuij I., Et al., Psychosocial and environmental correlates of walking, cycling, public transport and passive transport to various destinations in Flemish older adolescents, *PLoS ONE*, (2016); Matsudo



---

S.M., Matsudo V.R., Araujo T., Andrade D., Andrade E., Oliveira L., Nível de atividade física da população do Estado de São Paulo: análise de acordo com o gênero, idade, nível socioeconômico, distribuição geográfica e de conhecimento, *Rev Bras Ciên e Mov*, 10, 4, pp. 41-50, (2002); Azevedo M.R., Araujo C.L., Silva M.C., Hallal P.C., Tracking of physical activity from adolescence to adulthood: a population-based study, *Rev Saude Publica*, 41, 1, pp. 69-75, (2007); Sallis J.F., Prochaska J.J., Taylor W.C., A review of correlates of physical activity of children and adolescents, *Med Sci Sports Exerc*, 32, pp. 963-975, (2000); Franzini F., Futebol é “coisa para macho”? Pequeno esboço para uma história das mulheres no país do futebol, *Rev Bras Hist*, 25, 50, pp. 315-328, (2005); de Medeiros P.A., Streit I.A., Sandreschi P.F., Fortunato A.R., Mazo G.Z., Male participation in types of physical activities of a program for the elderly: a longitudinal study, *Cien Saude Colet*, 19, 8, pp. 3479-3488, (2014); Lopez S.B., Nunes Moreira M.C., Brazilian comprehensive health care policies for adolescents, young men and the health of men: political debates and masculinity, *Cien Saude Colet*, 18, 3, pp. 743-752, (2013); Matsudo V.K.R., Ferrari G.L.M., Araujo T.L., Oliveira L.C., Mire E., Barreira T.V., Et al., Socioeconomic status indicators, physical activity, and overweight/obesity in Brazilian children, *Rev Paul Pediatr*, 34, 2, pp. 162-170, (2016); Ferrari G.L.M., Kovalskys I., Fisberg M., Gomez G., Rigotti A., Sanabria L.Y.C., Et al., Socio-demographic patterning of objectively measured physical activity and sedentary behaviours in eight Latin American countries: findings from the ELANS study, *Eur J Sport Sci*, 20, 5, pp. 670-681, (2020); de Oliveira M.G.D., Araujo R.H.O., Couto J.O., Santos A.E., Santos J.R., Batista K.R.O., Et al., School environment and practice of accumulated physical activity in young Brazilian students, *Rev Bras Cineantropom Desempenho Hum*, 20, 4, pp. 563-573, (2018); Solmon M.A., Optimizing the role of physical education in promoting physical activity: a social-ecological approach, *Res Q Exerc Sport*, 86, 4, pp. 329-337, (2015); Silva R.J.S., Silva D.A.S., Oliveira A.C., Low physical activity levels and associated factors in Brazilian adolescents from public high schools, *J Phys Act Health*, 11, 7,

---

pp. 1438-1445, (2014); Kremer M.M., Reichert F.F., Hallal P.C., Intensidade e duração dos esforços físicos em aulas de educação física, Rev Saude Publica, 46, 2, pp. 320-326, (2012); Prado C.V., de Farias Junior J.C., Czestschuk B., Hino A.A.F., Reis R.S., Physical activity opportunities in public and private schools from Curitiba, Brazil Rev Bras Cineantropom Desempenho Hum, 20, 3, pp. 290-299, (2018); Scholes S., Bridges S., Fat L.N., Mindell J.S., Comparison of the physical activity and sedentary behaviour assessment questionnaire and the short-form international physical activity questionnaire: an analysis of health survey for England data, PLoS ONE, (2016)

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