

Appendix 1 Literature search strategy for all the databases

MEDLINE:

((stability OR tracking) OR "longitudinal study") AND (("physical activity" OR exercise OR fitness) OR "motor activity")
OR ((sport participation OR sports involvement) OR "athletic performance") AND ("tracking" OR tracking) OR
"longitudinal data")

Embase:

((stability OR tracking) OR "longitudinal study") AND (("physical activity" OR exercise OR fitness) OR "motor activity")
OR ((sport participation OR sports involvement) OR "athletic performance") AND ("tracking" OR tracking) OR
"longitudinal data")

Web of Science:

TS=(" stability " OR "tracking" OR "longitudinal study") AND TS=("physical activity" OR "exercise" OR "fitness" OR
"motor activity") OR TS=("sport participation" OR "sports involvement" OR "athletic performance") AND TS=("tracking"
OR "tracking" OR "longitudinal data")

Appendix 2 Excluded studies and reasons for exclusion

1. Aarnio, M., Winter, T., Peltonen, J., Kujala, U. M., & Kaprio, J. (2002). Stability of leisure time physical activity during adolescence—a longitudinal study among 16-, 17- and 18-year-old Finnish youth. *Scandinavian journal of medicine & science in sports*, 12(3), 179-185.
Reason for exclusion: Inappropriate study population
2. Aira, T., Vasankari, T., Heinonen, O. J., Korpelainen, R., Kotkajuuri, J., Parkkari, J., ... & Kokko, S. P. (2021). Physical activity from adolescence to young adulthood: patterns of change, and their associations with activity domains and sedentary time. *International Journal of Behavioral Nutrition and Physical Activity*, 18(1), 85.
Reason for exclusion: Inappropriate analysis
3. Andersen, L. B., & Haraldsdóttir, J. (1994). Changes in physical activity, maximal isometric strength and maximal oxygen uptake from late teenage to adulthood: an eight-year follow-up study of adolescents in Denmark. *Scandinavian journal of medicine & science in sports*, 4(1), 19-25.
Reason for exclusion: Duplicate study
4. Andersen, L. B., Hasselstrøm, H., Grønfeldt, V., Hansen, S. E., & Karsten, F. (2004). The relationship between physical fitness and clustered risk, and stability of clustered risk from adolescence to young adulthood: eight years follow-up in the Danish Youth and Sport Study. *International Journal of Behavioral Nutrition and Physical Activity*, 1, 1-4.
Reason for exclusion: Duplicate study
5. Anderssen, N., Wold, B., & Torsheim, T. (2005). Stability of physical activity in adolescence. *Research Quarterly for Exercise and Sport*, 76(2), 119-129.
Reason for exclusion: Duplicate study
6. Azevedo, Mario Renato, et al. "Stability of physical activity during adolescence: the 1993 Pelotas Birth Cohort, Brazil." *Revista de Saúde Pública* 48 (2014): 925-930.
Reason for exclusion: Inappropriate study population
7. Barnekow-Bergkvist, M., Hedberg, G., Janlert, U., & Jansson, E. (1996). Physical activity pattern in men and women at the ages of 16 and 34 and development of physical activity from adolescence to adulthood. *Scandinavian journal of medicine & science in sports*, 6(6), 359-370.
Reason for exclusion: Duplicate study
8. Cleland, V. J., Ball, K., Magnussen, C., Dwyer, T., & Venn, A. (2009). Socioeconomic position and the stability of physical activity and cardiorespiratory fitness from childhood to adulthood. *American journal of epidemiology*, 170(9), 1069-1077.
Reason for exclusion: Duplicate study
9. Cleland, V. J., Dwyer, T., & Venn, A. J. (2008). Physical activity and healthy weight maintenance from childhood to adulthood. *Obesity*, 16(6), 1427-1433.
Reason for exclusion: Inappropriate analysis
10. deMontes, L., Arruza, J., Arribas, S., Irazusta, S., & Telletxea, S. (2011). The role of organized sports participation during adolescence in adult physical activity patterns. *Sport Science Review*, 20(5-6), 37.
Reason for exclusion: Inappropriate analysis
11. Dodge, T., & Lambert, S. F. (2009). Positive self-beliefs as a mediator of the relationship between adolescents' sports participation and health in young adulthood. *Journal of Youth and Adolescence*, 38, 813-825.
Reason for exclusion: Duplicate study
12. Ekblom-Bak, E., Ekblom, Ö., Andersson, G., Wallin, P., & Ekblom, B. (2018). Physical education and leisure-time physical activity in youth are both important for adulthood activity, physical performance, and health. *Journal of Physical Activity and Health*, 15(9), 661-670.
Reason for exclusion: Inappropriate study population
13. Fortier, M. D., Katzmarzyk, P. T., Malina, R. M., & Bouchard, C. L. A. U. D. E. (2001). Seven-year stability of physical activity and musculoskeletal fitness in the Canadian population. *Medicine and Science in Sports and Exercise*, 33(11), 1905-1911.
Reason for exclusion: Duplicate study
14. Francis, S. L., Morrissey, J. L., Letuchy, E. M., Levy, S. M., & Janz, K. F. (2013). Ten-year objective physical activity stability: Iowa Bone Development Study. *Medicine and science in sports and exercise*, 45(8), 1508.
Reason for exclusion: Inappropriate study population
15. Fuller, D., Sabiston, C., Karp, I., Barnett, T., & O'Loughlin, J. (2011). School sports opportunities influence physical activity in secondary school and beyond. *Journal of School Health*, 81(8), 449-454.
Reason for exclusion: Inappropriate analysis
16. Gordon-Larsen, P., Nelson, M. C., & Popkin, B. M. (2004). Longitudinal physical activity and sedentary behavior trends: adolescence to adulthood. *American journal of preventive medicine*, 27(4), 277-283.
Reason for exclusion: Duplicate study
17. Hardie Murphy, M., Rowe, D. A., & Woods, C. B. (2017). Impact of physical activity domains on subsequent physical activity in youth: a 5-year longitudinal study. *Journal of Sports Sciences*, 35(3), 262-268.
Reason for exclusion: Inappropriate study population
18. Hasselstrøm, H., Hansen, S. E., Froberg, K., & Andersen, L. B. (2002). Physical fitness and physical activity during adolescence as predictors of cardiovascular disease risk in young adulthood. Danish Youth and Sports Study. An eight-year follow-up study. *International journal of sports medicine*, 23(S1), 27-31.
Reason for exclusion: Duplicate study
19. Huotari, P., Nupponen, H., Mikkelsen, L., Laakso, L., & Kujala, U. (2011). Adolescent physical fitness and activity as predictors of adulthood activity. *Journal of sports sciences*, 29(11), 1135-1141.

Reason for exclusion: Duplicate study

20. Janz, K. F., Dawson, J. D., & Mahoney, L. T. (2000). Stability physical fitness and physical activity from childhood to adolescence: the Muscatine study. *Medicine and science in sports and exercise*, 32(7), 1250-1257.

Reason for exclusion: Inappropriate study population

21. Jose, K. A., Blizzard, L., Dwyer, T., McKercher, C., & Venn, A. J. (2011). Childhood and adolescent predictors of leisure time physical activity during the transition from adolescence to adulthood: a population based cohort study. *International Journal of Behavioral Nutrition and Physical Activity*, 8, 1-9.

Reason for exclusion: Duplicate study

22. Kallio, P., Pahkala, K., Heinonen, O. J., Tammelin, T., Hirvensalo, M., Telama, R., ... & Raitakari, O. T. (2018). Physical inactivity from youth to adulthood and risk of impaired glucose metabolism. *Medicine and science in sports and exercise*, 50(6).

Reason for exclusion: Duplicate study

23. Kirjonen, J., Telama, R., Luukkonen, R., Kääriä, S., Kaila-Kangas, L., & Leino-Arjas, P. (2006). Stability and prediction of physical activity in 5-, 10-, and 28-year follow-up studies among industrial employees. *Scandinavian Journal of Medicine & Science in Sports*, 16(3), 201-208.

Reason for exclusion: Inappropriate study population

24. Kjønniksen, L., Torsheim, T., & Wold, B. (2008). Stability of leisure-time physical activity during adolescence and young adulthood: a 10-year longitudinal study. *International Journal of Behavioral Nutrition and Physical Activity*, 5, 1-11.

Reason for exclusion: Duplicate study

25. Kristensen, P. L., Møller, N. C., Korsholm, L., Wedderkopp, N., Andersen, L. B., & Froberg, K. (2008). Stability of objectively measured physical activity from childhood to adolescence: the European youth heart study. *Scandinavian journal of medicine & science in sports*, 18(2), 171-178.

Reason for exclusion: Inappropriate study population

26. Kwon, S., Janz, K. F., Letuchy, E. M., Burns, T. L., & Levy, S. M. (2015). Developmental trajectories of physical activity, sports, and television viewing during childhood to young adulthood: Iowa bone development study. *JAMA pediatrics*, 169(7), 666-672.

Reason for exclusion: Inappropriate analysis

27. Lefevre, J., Philippaerts, R. M., Delvaux, K., Thomis, M., Vanreusel, B., Eynde, B. V., ... & Beunen, G. (2000). Daily physical activity and physical fitness from adolescence to adulthood: a longitudinal study. *American Journal of Human Biology: The Official Journal of the Human Biology Association*, 12(4), 487-497.

Reason for exclusion: Duplicate study

28. Li, K., Haynie, D., Lipsky, L., Iannotti, R. J., Pratt, C., & Simons-Morton, B. (2016). Changes in moderate-to-vigorous physical activity among older adolescents. *Pediatrics*, 138(4).

Reason for exclusion: Inappropriate analysis

29. Mathisen, F. K. S., Torsheim, T., Falco, C., & Wold, B. (2023). Leisure-time physical activity trajectories from adolescence to adulthood in relation to several activity domains: a 27-year longitudinal study. *International Journal of Behavioral Nutrition and Physical Activity*, 20(1), 27.

Reason for exclusion: Inappropriate analysis

30. Mulder, M., Ranchor, A. V., Sanderman, R., Bouma, J., & van den Heuvel, W. J. (1998). The stability of lifestyle behaviour. *International journal of epidemiology*, 27(2), 199-207.

Reason for exclusion: Inappropriate study population

31. Murphy, M. H., Rowe, D. A., & Woods, C. B. (2016). Sports participation in youth as a predictor of physical activity: A 5-year longitudinal study. *Journal of physical activity and health*, 13(7), 704-711.

Reason for exclusion: Inappropriate study population

32. Najman, J. M., Kisely, S., Scott, J. G., Ushula, T. W., Williams, G. M., Clavarino, A. M., ... & Wang, W. Y. (2024). Gender differences in cardiovascular disease risk: Adolescence to young adulthood. *Nutrition, Metabolism and Cardiovascular Diseases*, 34(1), 98-106.

Reason for exclusion: Inappropriate study population

33. Nelson, M. C., Gordon-Larsen, P., Adair, L. S., & Popkin, B. M. (2005). Adolescent physical activity and sedentary behavior: patterning and long-term maintenance. *American journal of preventive medicine*, 28(3), 259-266.

Reason for exclusion: Duplicate study

34. Ortega, F. B., Konstabel, K., Pasquali, E., Ruiz, J. R., Hurtig-Wennlöf, A., Mäestu, J., ... & Sjöström, M. (2013). Objectively measured physical activity and sedentary time during childhood, adolescence and young adulthood: a cohort study. *PloS one*, 8(4), e60871.

Reason for exclusion: Inappropriate analysis

35. Owens, C. S., Crone, D., De Ste Croix, M. B. A., Gidlow, C. J., & James, D. V. (2014). Physical activity and screen time in adolescents transitioning out of compulsory education: a prospective longitudinal study. *Journal of Public Health*, 36(4), 599-607.

Reason for exclusion: Inappropriate study population

36. Palomäki, S., Hirvensalo, M., Smith, K., Raitakari, O., Männistö, S., Hutri Kähönen, N., & Tammelin, T. (2018). Does organized sport participation during youth predict healthy habits in adulthood? A 28 year longitudinal study. *Scandinavian journal of medicine & science in sports*, 28(8), 1908-1915.

Reason for exclusion: Inappropriate analysis

37. Raitakan, O. T., Porkka, K. V. K., Taimela, S., Telama, R., Räsänen, L., & Vllkari, J. S. (1994). Effects of persistent physical activity and inactivity on coronary risk factors in children and young adults the cardiovascular risk in young Finns study. *American journal of epidemiology*, 140(3), 195-205.

Reason for exclusion: Duplicate study

38. Raustorp, A., & Ekroth, Y. (2013). Stability of pedometer-determined physical activity: a 10-year follow-up study from adolescence to adulthood in Sweden. *Journal of Physical Activity and Health*, 10(8), 1186-1192.

Reason for exclusion: Duplicate study

39. Raustorp, A., & Fröberg, A. (2018). Stability of pedometer-determined physical activity: a 16-year follow-up study. *Journal of Physical Activity and Health*, 15(1), 7-12.

Reason for exclusion: Duplicate study

40. Ried-Larsen, M., Grøntved, A., Kristensen, P. L., Froberg, K., & Andersen, L. B. (2015). Moderate-and-vigorous physical activity from adolescence to adulthood and subclinical atherosclerosis in adulthood: prospective observations from the European Youth Heart Study. *British journal of sports medicine*, 49(2), 107-112.

Reason for exclusion: Inappropriate analysis

41. Rovio, S. P., Yang, X., Kankaanpää, A., Aalto, V., Hirvensalo, M., Telama, R., ... & Tammelin, T. H. (2018). Longitudinal physical activity trajectories from childhood to adulthood and their determinants: The Young Finns Study. *Scandinavian journal of medicine & science in sports*, 28(3), 1073-1083.

Reason for exclusion: Inappropriate analysis

42. Scheerder, J., Thomis, M., Vanreusel, B., Lefevre, J., Renson, R., Vanden Eynde, B., & Beunen, G. P. (2006). Sports participation among females from adolescence to adulthood: A longitudinal study. *International review for the sociology of sport*, 41(3-4), 413-430.

Reason for exclusion: Duplicate study

43. Scicluna, N., Hamer, M., & Blodgett, J. M. (2023). Associations between adolescent sport and exercise participation and device-assessed physical activity in adulthood: evidence from the 1970 British cohort study. *Journal of Physical Activity and Health*, 20(9), 812-822.

Reason for exclusion: Inappropriate analysis

44. Simons, D., Rosenberg, M., Salmon, J., Knuijman, M., Granich, J., Deforche, B., & Timperio, A. (2015). Psychosocial moderators of associations between life events and changes in physical activity after leaving high school. *Preventive medicine*, 72, 30-33.

Reason for exclusion: Inappropriate analysis

45. Suppli, C. H., Due, P., Henriksen, P. W., Rayce, S. L. B., Holstein, B. E., & Rasmussen, M. (2013). Low vigorous physical activity at ages 15, 19 and 27: childhood socio-economic position modifies the stability pattern. *The European Journal of Public Health*, 23(1), 19-24.

Reason for exclusion: Inappropriate outcome

46. Tammelin, T., Näyhä, S., Laitinen, J., Rintamäki, H., & Järvelin, M. R. (2003). Physical activity and social status in adolescence as predictors of physical inactivity in adulthood. *Preventive medicine*, 37(4), 375-381.

Reason for exclusion: Inappropriate outcome

47. Telama, R. I. S. T. O., & Yang, X. (2000). Decline of physical activity from youth to young adulthood in Finland. *Medicine & Science in Sports & Exercise*, 32(9), 1617-1622.

Reason for exclusion: Duplicate study

48. Telama, R., Laakso, L., & Yang, X. (1994). Physical activity and participation in sports of young people in Finland. *Scandinavian journal of medicine & science in sports*, 4(1), 65-74.

Reason for exclusion: Duplicate study

49. Telama, R., Yang, X., Hirvensalo, M., & Raitakari, O. (2006). Participation in organized youth sport as a predictor of adult physical activity: a 21-year longitudinal study. *Pediatric Exercise Science*, 18(1), 76-88.

Reason for exclusion: Duplicate study

50. Telama, R., Yang, X., Laakso, L., & Viikari, J. (1997). Physical activity in childhood and adolescence as predictor of physical activity in young adulthood. *American journal of preventive medicine*, 13(4), 317-323.

Reason for exclusion: Duplicate study

51. Telama, R., Yang, X., Viikari, J., Välimäki, I., Wanne, O., & Raitakari, O. (2005). Physical activity from childhood to adulthood: a 21-year stability study. *American journal of preventive medicine*, 28(3), 267-273.

Reason for exclusion: Duplicate study

52. Tsoli, S., Fancourt, D., Sullivan, A., Hamer, M., Ploubidis, G. B., & Kawachi, I. (2024). Life-course social participation and physical activity in midlife: Longitudinal associations in the 1970 British Cohort Study (BCS70). *European Journal of Epidemiology*, 1-9.

Reason for exclusion: Inappropriate outcome

53. Twisk, J. W. R., Kemper, H. C. G., Van Mechelen, W., & Post, G. B. (1997). Stability of risk factors for coronary heart disease over a 14-year period: a comparison between lifestyle and biologic risk factors with data from the Amsterdam Growth and Health Study. *American journal of epidemiology*, 145(10), 888-898.

Reason for exclusion: Duplicate study

54. Van Der Zee, M. D., Van Der Mee, D., Bartels, M., & De Geus, E. J. (2019). Stability of voluntary exercise behaviour over the lifespan. *international journal of behavioral nutrition and physical activity*, 16, 1-11.

Reason for exclusion: Inappropriate analysis

55. Vanhelst, J., Béghin, L., Drumez, E., Labreuche, J., Polito, A., De Ruyter, T., ... & Gottrand, F. (2023). Changes in physical activity patterns from adolescence to young adulthood: the BELINDA study. *European Journal of Pediatrics*, 182(6), 2891-2902.

Reason for exclusion: Inappropriate analysis

56. Vanreusel, B., Renson, R., Beunen, G., Claessens, A. L., Lefevre, J., Lysens, R., & Eynde, B. V. (1997). A longitudinal study of youth sport participation and adherence to sport in adulthood. *International Review for the sociology of sport*,

32(4), 373-387.

Reason for exclusion: Duplicate study

57. Vie, T. L., Hufthammer, K. O., Rangul, V., Andersen, J. R., Meland, E., & Breidablik, H. J. (2023). Patterns of physical activity over 34 years in a large sample of adults: The HUNT study, Norway. *Scandinavian Journal of Public Health*, 14034948231174947.

Reason for exclusion: Inappropriate study population

58. Walters, S., Barr-Anderson, D. J., Wall, M., & Neumark-Sztainer, D. (2009). Does participation in organized sports predict future physical activity for adolescents from diverse economic backgrounds?. *Journal of Adolescent Health*, 44(3), 268-274.

Reason for exclusion: Inappropriate analysis

59. Wells, L., Nermo, M., & Östberg, V. (2017). Physical inactivity from adolescence to young adulthood: the relevance of various dimensions of inequality in a Swedish longitudinal sample. *Health Education & Behavior*, 44(3), 376-384.

Reason for exclusion: Inappropriate outcome

60. Yang, X., Kukko, T., Lounassalo, I., Kulmala, J., Hakonen, H., Rovio, S. P., ... & Salin, K. (2022). Organized youth sports trajectories and adult health outcomes: the young Finns study. *American Journal of Preventive Medicine*, 63(6), 962-970.

Reason for exclusion: Inappropriate analysis

61. Yang, X., Kulmala, J., Hakonen, H., Hirvensalo, M., Rovio, S. P., Pahkala, K., ... & Tammelin, T. H. (2021). Stability and changes in daily step counts among Finnish adults. *Medicine and Science in Sports and Exercise*, 53(8), 1615.

Reason for exclusion: Inappropriate study population

62. Young, D. R., Cohen, D., Koebnick, C., Mohan, Y., Saksvig, B. I., Sidell, M., & Wu, T. (2018). Longitudinal associations of physical activity among females from adolescence to young adulthood. *Journal of Adolescent Health*, 63(4), 466-473.

Reason for exclusion: Inappropriate analysis

Table S1 Characteristics of the included studies

Study (year)	Country	Study design	Data source	n	Females	Mean age or range at early years	Mean age or range at adulthood	Follow-up (years)	PA measurement tool at early years	PA measurement tool at adulthood
Andersen and Haraldsdóttir (1993) (1)	Denmark	Prospective	A randomized sample of school children (1983)	203	115	15-19	23-27	8	Self-report questionnaire (measured PA as sport activities + daily life activities in hours and reported it as hours per week)	Self-report questionnaire (measured PA as sport activities + daily life activities in hours and reported it as hours per week)
Azevedo <i>et al.</i> (2007) (2)	Brazil	Cross-sectional	A representative sample of urban households (2003)	2577	1440	-	37.8	-	Regular PA and sports participation	Self-report questionnaire (IPAQ): a cut-off value of 150 min per week was used to classify individuals as active or not
Barnekow-Bergkvist <i>et al.</i> (1998) (3)	Sweden	Prospective	A randomly selected group of Swedish students (1974)	278	121	16.1	33.7	18	Self-report questionnaire regarding participation in leisure-time sports activity, number of sports activities and membership of sports clubs (with that information, they calculated MET-hours per week)	Leisure-time PA and sports participation
Bélanger <i>et al.</i> (2015) (4)	Canada	Prospective	Natural History of Nicotine Dependence in Teens (NDIT) study (1999-2005) and (2011-12)	673	363	12.7	24	5	The number of PA sessions per week was obtained using a 7-day recall adapted from the Weekly Activity Checklist.	International PA Questionnaire short form
Beunen <i>et al.</i> (2004) (5)	Belgium	Prospective	Leuven Longitudinal Study on Lifestyle, Fitness and Health (1969-1996)	166	0	13-18	40	26	Questionnaire about sports participation	Self-report questionnaire about PA and sports (Baecke questionnaire), and triaxial accelerometer
Boreham <i>et al.</i> (2004) (6)	Northern Ireland	Prospective	Northern Ireland Young Hearts Project (1989-1990) and (1999)	476	231	15	22	7	Self-report questionnaire (PA)	PA, sports activity (Baecke questionnaire modified)
Campbell <i>et al.</i> (2001) (7)	Canada	Prospective	Quebec Family Study	153	73	13.5	25.3	12	3-day activity record (PA)	3-day activity record (PA)
Cleland <i>et al.</i> (2012) (8)	Australia	Prospective	Australian Schools Health and Fitness Survey	2201	NR	9-15	26-30	20	Self-report questionnaire (PA and sports participation)	IPAQ-L and pedometer (PA and sports participation)
Engström <i>et al.</i> (2008) (9)	Sweden	Prospective	1968 to 2007	1518	NR	15	53	38	Self-report questionnaire of physical education and their leisure-time sporting activities	Exercise
Frändin <i>et al.</i> (1995) (10)	Sweden	Retrospective		526	293	10-20	76	-	Interviews asking PA questions and sports participation	PA and sports participation
Fraser <i>et al.</i> (2023) (11)	Finland	Prospective	Special Turku Coronary Risk Factor Intervention (STRIP) Project (1990)	328	189	17	26	9	Leisure-time PA was estimated by multiplying the frequency, mean duration, and mean intensity (expressed as a multiple of the resting metabolic rate, metabolic equivalent) of weekly leisure-time PA	Leisure-time PA was estimated by multiplying the frequency, mean duration, and mean intensity (expressed as a multiple of the resting metabolic rate, metabolic equivalent) of weekly leisure-time PA
Friedman <i>et al.</i> (2008) (12)	USA	Prospective	Terman Life-Cycle Study (1922)	712	NR	10	65	55	Parents and teachers rated the participant on a number of traits, and parents reported on their children's current activities	Questionnaire about level of participation in various activities
Garcia-Hermoso <i>et al.</i> (2022) (13)	USA	Prospective	National Longitudinal Study of Adolescent Health (Add Health) (1994-1995 and 2016-2018)	7128	4045	15.35	37.25	22	In-home interview, engagement in moderate-to-vigorous PA and sports participation	PA and sports participation
Glenmark <i>et al.</i> (1994) (14)	Sweden	Prospective	A randomly selected group of Swedish students (1974)	425	205	16	27	11	The subjects were asked about the frequency and duration of physical exercise during their leisure time, their membership in sports clubs, and their attitude towards PA	Participation in physical activities during leisure time and membership in sports clubs.
Herman <i>et al.</i> (2009) (15)	Canada	Prospective	Canada Fitness Survey (1981 and re-evaluated in 2002-04)	374	183	7-18	29-41	22	Self-administered questionnaire assessed leisure time PA using an adaptation of the Minnesota Leisure Time PA Questionnaire	Self-administered questionnaire assessed leisure time PA using an adaptation of the Minnesota Leisure Time PA Questionnaire
Hirvensalo <i>et al.</i> (2000) (16)	Finland	Ambispective	Evergreen project (1988 and follow-up in 1996)	652	443	10 - 19	65 - 84	8	Past PA was evaluated using specific questions regarding participation in competitive sports or recreational activities during the ages of 10 to 19 years	The level of PA and its intensity were evaluated using a six-point scale
Husoy <i>et al.</i> (2024) (17)	Norway	Prospective	PANCs follow-up study	242	136	9 - 15	24	14	Actigraph accelerometers	Actigraph accelerometers
Itoh <i>et al.</i> (2017) (18)	Japan	Cross-sectional	Japanese workers	880	576	12	40	-	Intensity-specific leisure-time PA	Leisure-time PA
Kimm <i>et al.</i> (2000) (19)	USA	Prospective	NHLBI Growth and Health Study (1985)	2379	2379	9 - 10	19 - 20	10	A Caltrac activity monitor was used to objectively quantify activity levels in years 3-5. A 3-d diary (AD) and a habitual patterns questionnaire (HAQ)	PA diary
Kjønniksen <i>et al.</i> (2009) (20)	Norway	Prospective	Norwegian Longitudinal Health Behaviour Study (1990)	630	274	13	23	10	Global leisure-time PA and Sports participation (adopted from the Health Behaviour in School-aged Children) nad organized youth sports	Global leisure-time PA and Sports participation
Kraut <i>et al.</i> (2003) (21)	Israel	Retrospective	Cardiovascular Occupational Risk Factors in Israel Study (CORDIS) cohort (1985-87)	3818	0	NR	43.5	29.5	Organized childhood sporting activities	Self-report questionnaire about leisure PA
Laakso <i>et al.</i> (2022) (22)	Finland	Prospective	Four-phase stratified random sample and the schools represented Finland's different geographical provinces (1976)	2330	1236	14.4	59.6	45	Self-report leisure-time PA questionnaire covered the frequency, intensity, and type of leisure-time PA, as well as participation in organized leisure-time PA (such as sports clubs in leisure time and extracurricular school sports) and competitive sports	Frequency and intensity of leisure-time PA, the average duration of a leisure-time PA session and participation in organized and competitive sports
Mäkelä <i>et al.</i> (2017) (23)	Finland	Prospective	FinnTwin16 project (1991-1995)	3860	2204	17	34	18	Self-report questionnaire about leisure-time PA frequency and the diversity of sport activities	Leisure-time PA levels in adulthood were assessed as leisure-time Metabolic Equivalent of Task
Mäkinen <i>et al.</i> (2010) (24)	Finland	Cross-sectional	National FINRISK 2002 study	4408	2490	-	NR	-	PA and sports participation (via self-reports)	Physical activity via a self-administered recall questionnaire
Matton <i>et al.</i> (2006) (25)	Belgium	Prospective	Leuven Longitudinal Study on Lifestyle, Fitness and Health	138	138	16.6	40.5	24	PA was assessed by means of a sports participation inventory (how often they played outdoor and indoor games and sports, and went swimming and dancing)	Single question about sports participation at age 23 y, and PA at 33 and 42
Parsons <i>et al.</i> (2006) (26)	England, Scotland and Wales	Prospective	Longitudinal Physical Activity and Diet Patterns (1958 British Birth Cohort)	9769	5074	11	42	31	Personal questionnaire (reported by mother and individual)	Participants responded to a single question, about sports participation at age 23 years, and PA with examples given at 33 and 42 years
Perkins <i>et al.</i> (2004) (27)	USA	Prospective	Michigan Study of Adolescent Life Transitions (1983)	1127	682	12	25	13	Questionnaire about sports participation and fitness	Questionnaire about sports participation and fitness
Rauner <i>et al.</i> (2015) (28)	Germany	Prospective	"Motorik-Modul (MoMo) Longitudinal Study" (2003-2006, and 2009-2012)	947	500	11 to 17	NR	6	MoMo-PA questionnaire (sports clubs, leisure-time, school, daily activities and overall PA)	MoMo-PA questionnaire (sports clubs, leisure-time, school, daily activities and overall PA)
Raustorp <i>et al.</i> (2021) (29)	Sweden	Prospective	Convenience sample of Swedish adolescents (2000 to 2020)	64	32	12.9	32.9	20	PA was measured as mean steps per day with pedometers	PA was measured as mean steps per day with pedometers
Richards <i>et al.</i> (2007) (30)	New Zealand	Prospective	Dunedin Multidisciplinary Health and Development Study cohort (1972-1973)	829	404	7	21	14	Interview with questions about Club Sport Participation	Interview with questions about Club Sport Participation
Scott <i>et al.</i> (1989) (31)	USA	Prospective	74 rural Pennsylvania high schools (1947)	1298	NR	15	52	37	Self-report sport participation	Questionnaire about leisure time activities, including sports participation
Smith <i>et al.</i> (2015) (32)	England, Scotland and Wales	Prospective	1970 British Birth Cohort	6458	3343	10	42	32	Parents were interviewed about participation in sports and PA of the participants	Participants were interviewed about participation in sports and PA
Taylor <i>et al.</i> (1999) (33)	USA	Retrospective	Cooper Clinic clients	105	0	6-12 and 13-18	45	-	There were estimated types of PA, habitual patterns of activity, and psychosocial factors related to PA during childhood (preteens, 6-12 years) and adolescence (teens, 13-18 years)	Subjects were asked to recall their weekly exercise during the past 3 months (workouts per week, sports...)
Telama <i>et al.</i> (1996) (34)	Finland	Prospective	Cardiovascular Risks in Young Finns	1320	739	9-12-15-18	18-21-24-27	9	Sports participation	PA index
Telama <i>et al.</i> (2014) (35)	Finland	Prospective	Cardiovascular Risks in Young Finns	2166	1200	3-6-9-12-15-18	31-33-36-39-42-45	27	Leisure time PA	Leisure time PA
Trudeau <i>et al.</i> (2004) (36)	Canada	Prospective	Trois-Rivières (1970-1977 and 1996-1998)	166	87	10 and 12	36	26	PA assessed in children (diary) and parents (questionnaire)	PA assessed through a subject recall
Twisk <i>et al.</i> (2000) (37)	Netherlands	Prospective	Amsterdam Growth and Health study	181	98	13	27	15	Daily PA was measured with an interviewer administered activity questionnaire, in relation to school, work, sports, and on other leisure time activities	Daily PA was measured with an interviewer administered activity questionnaire, in relation to school, work, sports, and on other leisure time activities
Wichstrøm <i>et al.</i> (2013) (38)	Norway	Prospective	Young in Norway Study (1992)	3251	NR	15	28.5	13	Leisure-time PA (frequency)	Leisure-time PA (frequency and duration)

IPAQ, International Physical Activity Questionnaire; MET, metabolic equivalent; NR, not reported; PA, physical activity.

Table S2 Results of the Joanna Briggs Critical Appraisal Checklist for cohort studies and for analytical cross-sectional studies

Study (year)	1	2	3	4	5	6	7	8	9	10	11	Total
JBI Critical Appraisal Checklist for Cohort Studies												
Andersen <i>et al.</i> (1993)	NA	Y	N	N	N	NA	N	Y	Y	N	Y	4/9
Barnekow-Bergkvis <i>et al.</i> (1998)	NA	Y	Y	N	N	NA	Y	Y	Y	N	Y	6/9
Bélanger <i>et al.</i> (2015)	NA	Y	Y	Y	Y	NA	Y	Y	N	N	Y	7/9
Beunen <i>et al.</i> (2004)	NA	Y	Y	N	N	NA	Y	Y	N	N	Y	5/9
Boreham <i>et al.</i> (2004)	NA	Y	Y	N	N	NA	Y	Y	Y	N	Y	6/9
Campbell <i>et al.</i> (2001)	NA	Y	N	N	N	NA	N	Y	N	N	Y	3/9
Cleland <i>et al.</i> (2012)	NA	Y	Y	N	N	NA	Y	Y	Y	Y	Y	7/9
Engström <i>et al.</i> (2008)	NA	Y	N	N	N	NA	N	Y	Y	Y	Y	5/9
Frändin <i>et al.</i> (1995)*	NA	Y	N	N	N	NA	N	NA	NA	NA	Y	2/6
Fraser <i>et al.</i> (2023)	NA	Y	Y	N	N	NA	Y	Y	N	N	Y	5/9
Friedman <i>et al.</i> (2008)	NA	Y	N	N	N	NA	N	Y	N	N	Y	3/9
Garcia-Hermoso <i>et al.</i> (2022)	NA	Y	N	N	N	NA	N	Y	N	N	Y	3/9
Glenmark <i>et al.</i> (1994)	NA	Y	N	N	N	NA	N	Y	Y	N	Y	4/9
Herman <i>et al.</i> (2009)	NA	Y	Y	N	N	NA	Y	Y	N	N	Y	5/9
Hirvensalo <i>et al.</i> (2000)	NA	Y	N	Y	Y	NA	N	Y	Y	N	Y	6/9
Husoy <i>et al.</i> (2024)	NA	Y	Y	N	N	NA	Y	Y	N	N	Y	5/9
Kimm <i>et al.</i> (2000)	NA	Y	Y	N	N	NA	Y	Y	N	N	Y	5/9
Kjonnikssen <i>et al.</i> (2009)	NA	Y	Y	N	N	NA	Y	Y	Y	N	Y	6/9
Kraut <i>et al.</i> (2003)*	NA	Y	N	N	N	NA	N	NA	NA	NA	Y	2/6
Laakso <i>et al.</i> (2022)	NA	Y	N	N	N	NA	N	Y	Y	N	Y	4/9
Mäkelä <i>et al.</i> (2017)	NA	Y	N	Y	Y	NA	N	Y	N	N	Y	5/9
Matton <i>et al.</i> (2006)	NA	Y	N	N	N	NA	N	Y	N	N	Y	3/9
Parsons <i>et al.</i> (2006)	NA	Y	N	N	N	NA	N	Y	N	N	Y	3/9
Perkins <i>et al.</i> (2004)	NA	Y	N	N	N	NA	N	Y	N	N	Y	3/9
Rauner <i>et al.</i> (2015)	NA	Y	Y	N	N	NA	Y	Y	N	Y	Y	6/9
Raustorp <i>et al.</i> (2021)	NA	Y	Y	N	N	NA	Y	Y	Y	N	Y	6/9
Richards <i>et al.</i> (2007)	NA	Y	N	N	N	NA	N	Y	N	N	Y	3/9
Smith <i>et al.</i> (2015)	NA	Y	N	N	N	NA	N	Y	N	N	Y	3/9
Taylor <i>et al.</i> (1999)*	NA	Y	N	Y	Y	NA	N	NA	NA	NA	Y	4/6
Telama <i>et al.</i> (1996)	NA	Y	N	N	N	NA	N	Y	N	N	Y	3/9
Telama <i>et al.</i> (2014)	NA	Y	N	N	N	NA	N	Y	N	N	Y	3/9
Trudeau <i>et al.</i> (2004)	NA	Y	N	N	N	NA	N	Y	N	N	Y	3/9
Twisk <i>et al.</i> (2000)	NA	Y	N	N	N	NA	N	Y	Y	N	Y	4/9
Wichstrøm <i>et al.</i> (2013)	NA	Y	N	N	N	NA	N	Y	Y	N	Y	4/9
JBI Critical Appraisal Checklist for Analytical Cross-sectional Studies												
Azevedo <i>et al.</i> (2007)	Y	Y	Y	Y	N	N	Y	Y				6/8
Itoh <i>et al.</i> (2017)	Y	Y	N	N	Y	Y	N	Y				6/8
Mäkinen <i>et al.</i> (2010)	Y	Y	N	N	N	N	N	Y				3/8

Items of the Joanna Briggs Institute checklist for cohort studies: 1. Were the two groups similar and recruited from the same population? 2. Were the exposures measured similarly to assign people to both exposed and unexposed groups? 3. Was the exposure measured in a valid and reliable way? 4. Were confounding factors identified? 5. Were strategies to deal with confounding factors stated? 6. Were the groups/participants free of the outcome at the start of the study (or at the moment of exposure)? 7. Were the outcomes measured in a valid and reliable way? 8. Was the follow up time reported and sufficient to be long enough for outcomes to occur? 9. Was follow up complete, and if not, were the reasons to loss to follow up described and explored? 10. Were strategies to address incomplete follow up utilized? 11. Was appropriate statistical analysis used? Items of the Joanna Briggs Institute checklist for analytical cross-sectional studies: 1. Were the criteria for inclusion in the sample clearly defined? 2. Were the study subjects and the setting described in detail? 3. Was the exposure measured in a valid and reliable way? 4. Were objective, standard criteria used for measurement of the condition? 5. Were confounding factors identified? 6. Were strategies to deal with confounding factors stated? 7. Were the outcomes measured in a valid and reliable way? 8. Was appropriate statistical analysis used? *, the study design employed for these reports is retrospective, meaning that requiring follow-up are not applicable and, consequently, are not included in the total score calculation. N, no; NA, not applicable; Y, yes.

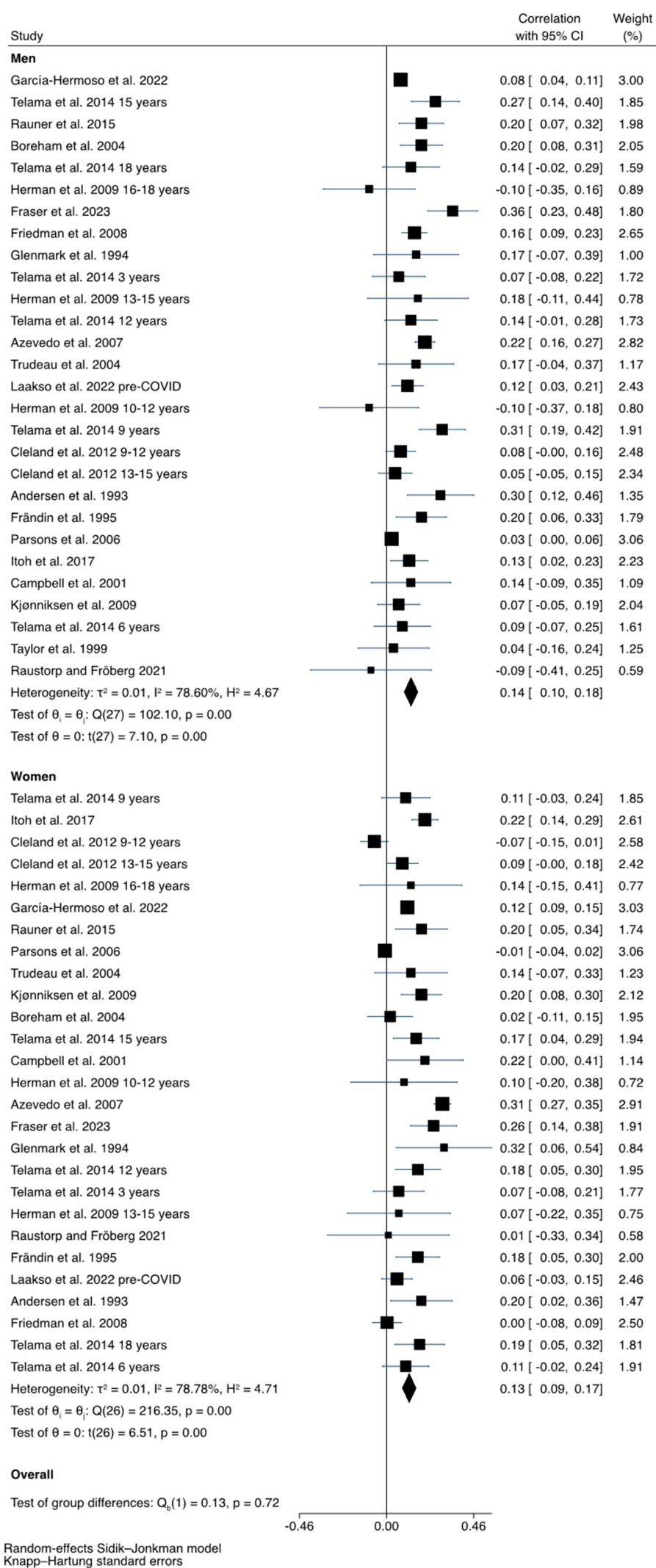


Figure S1 Tracking of physical activity from early years to adulthood according to sex.

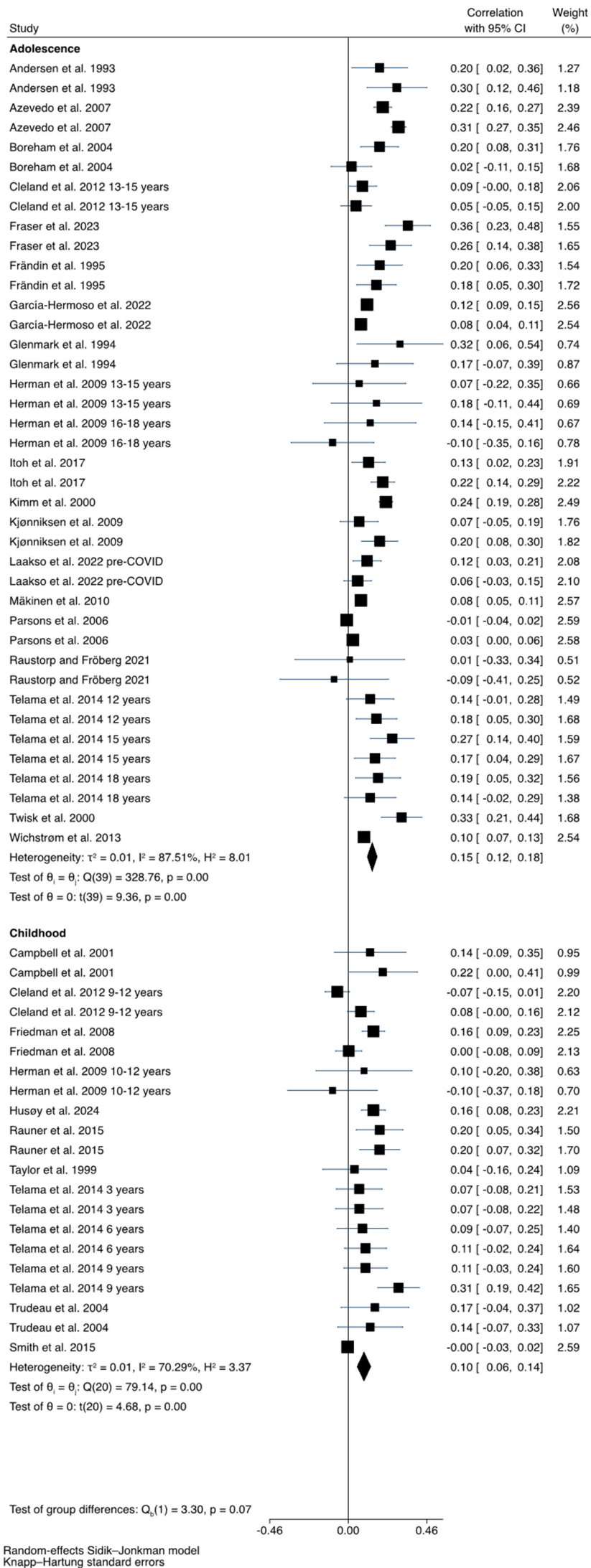


Figure S2 Tracking of physical activity from early years to adulthood according to age at baseline.

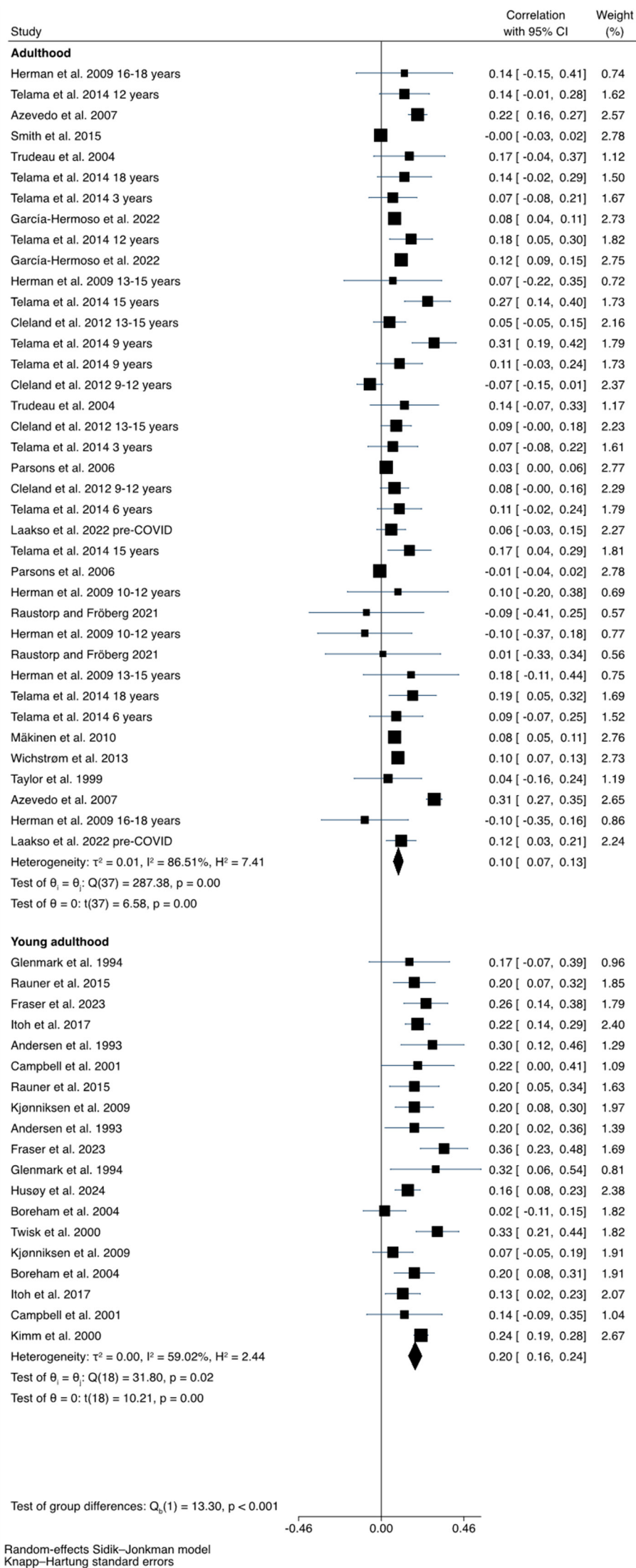


Figure S3 Tracking of physical activity from early years to adulthood according to age at follow-up.

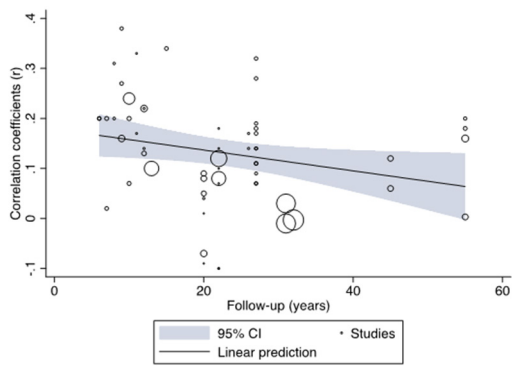


Figure S4 Meta-regression analysis between length of follow-up and the correlation coefficients of physical activity in the early years and at adulthood. The solid line indicates a linear relationship. The size of each data point is proportional to its statistical weight.

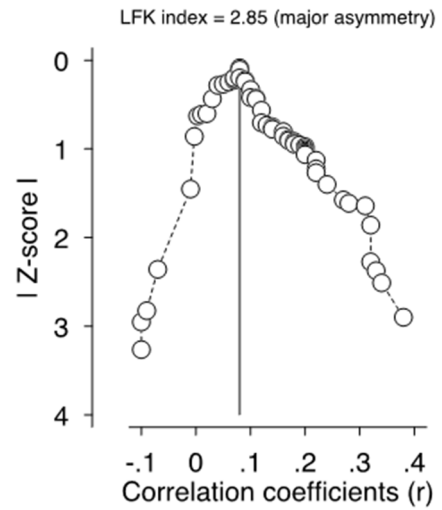


Figure S5 Doi-plot for physical activity stability.

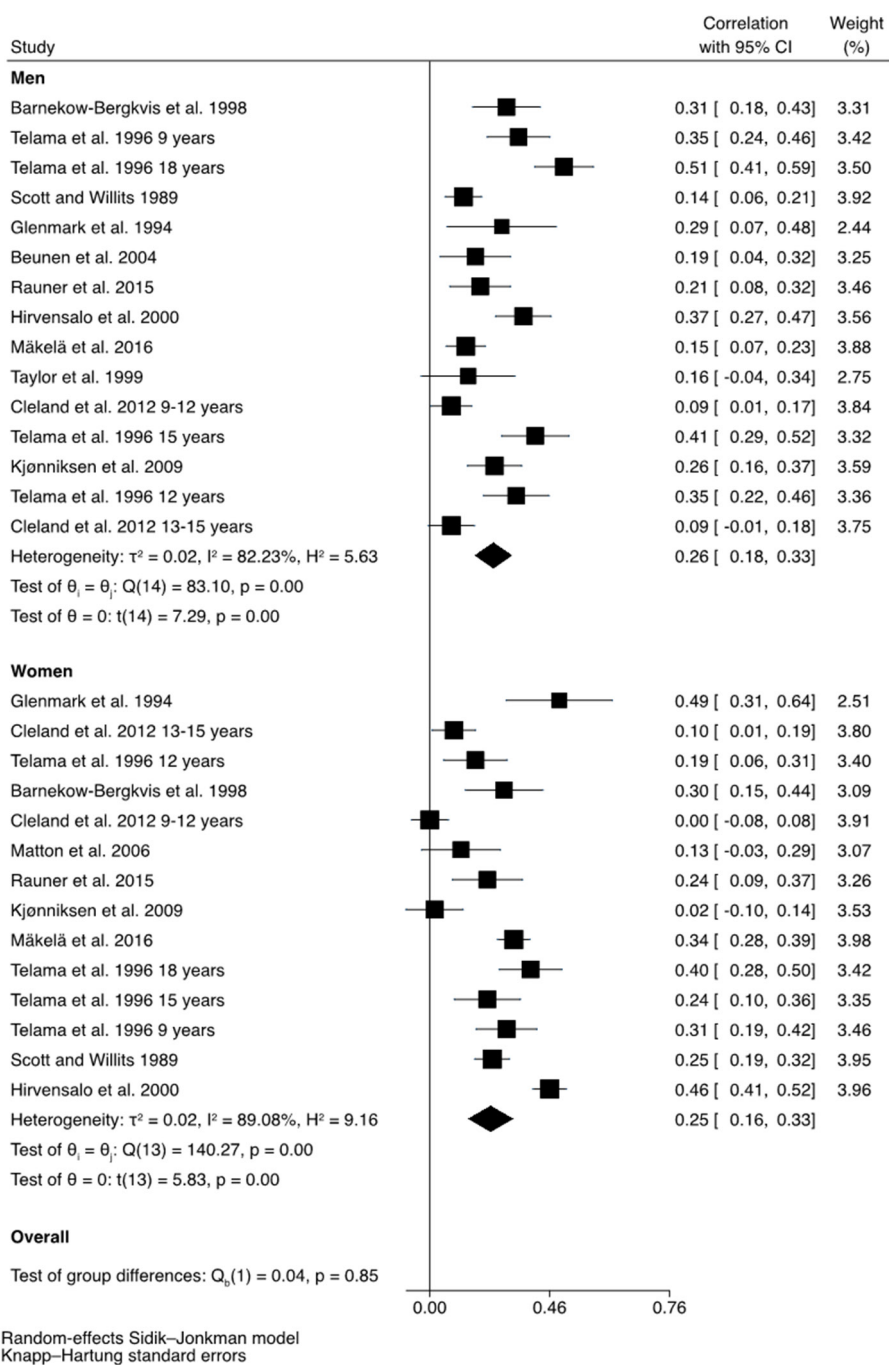


Figure S6 Tracking of sport participation in early years and physical activity stability at adulthood according to sex.

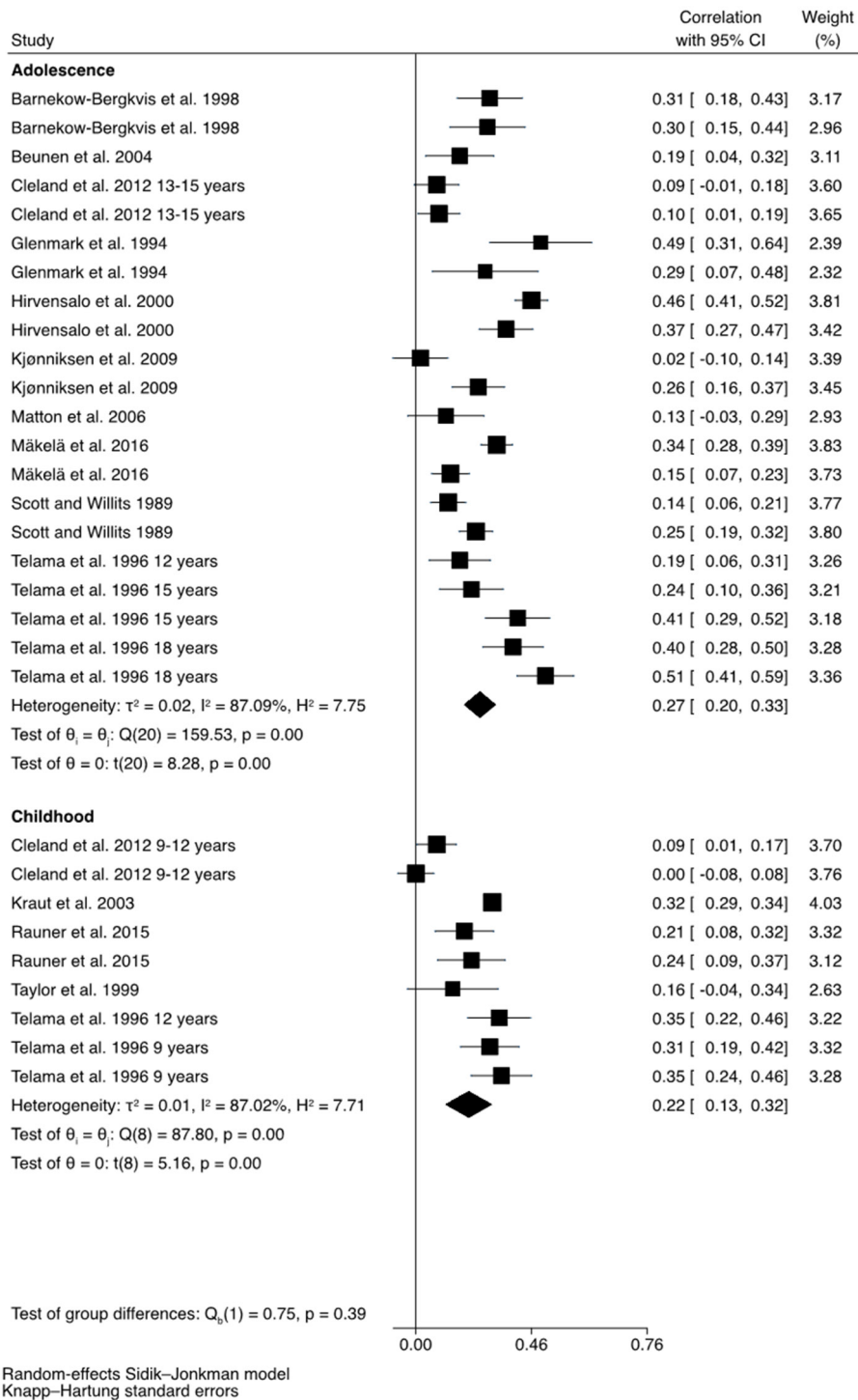


Figure S7 Tracking of sport participation in early years and physical activity stability at adulthood according to age at baseline.

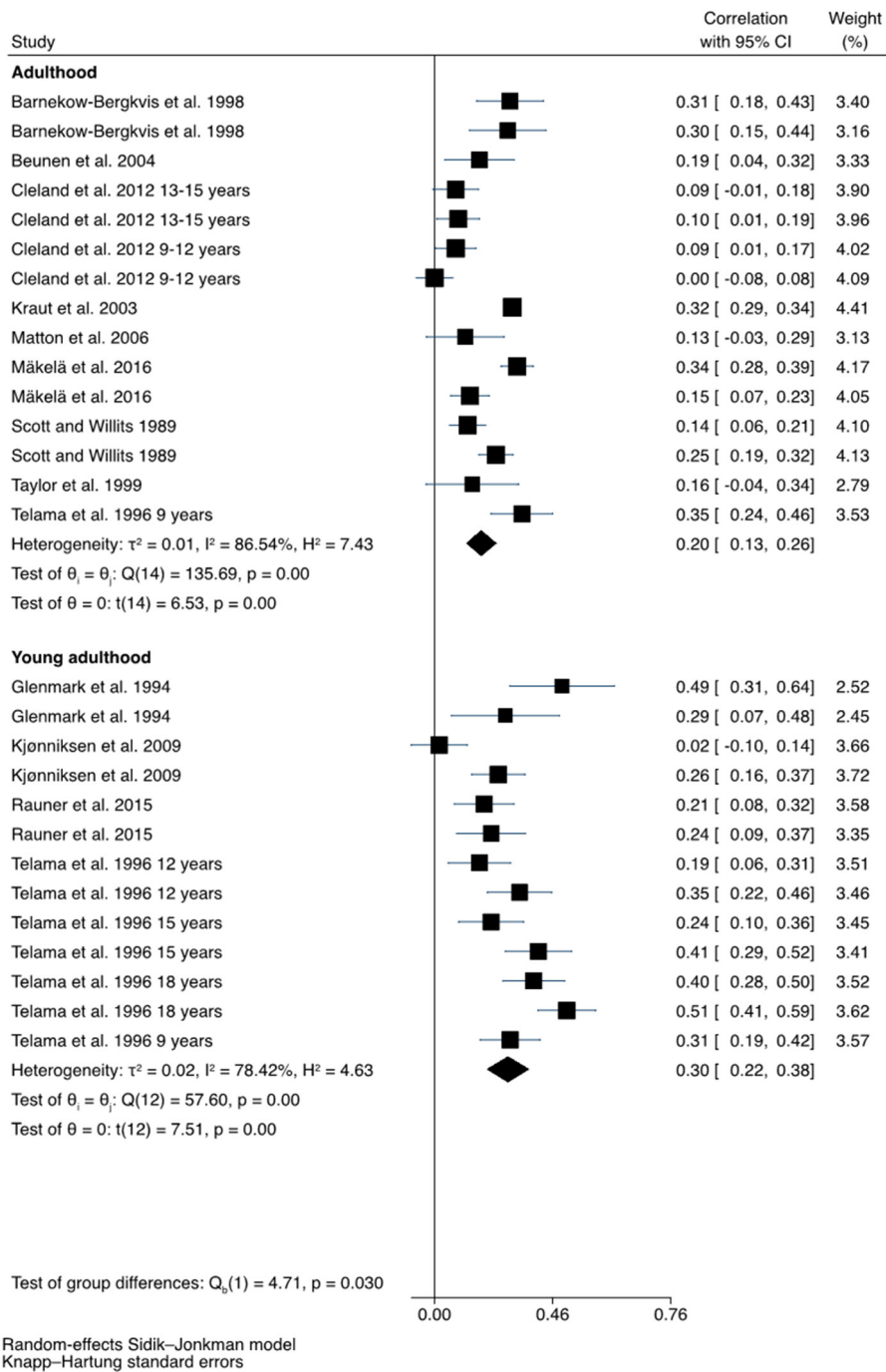


Figure S8 Tracking of sport participation in early years and physical activity stability at adulthood according to age at follow-up.

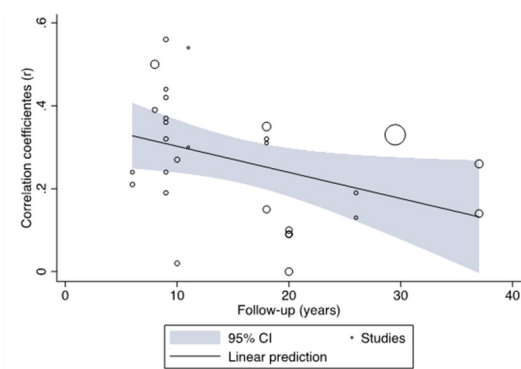


Figure S9 Meta-regression analysis between length of follow-up and the correlation coefficients of sport participation in the early years and physical activity stability at adulthood. The solid line indicates a linear relationship. The size of each data point is proportional to its statistical weight.

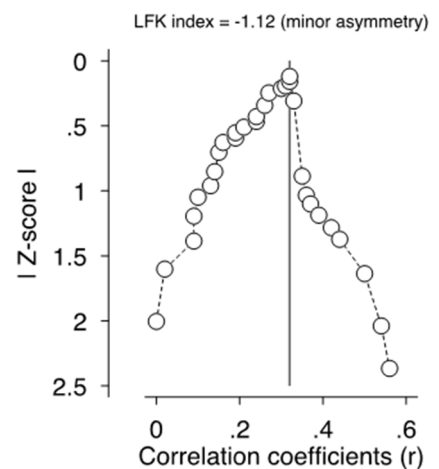


Figure S10 Doi-plot of sport participation in early years and physical activity tracking at follow-up.

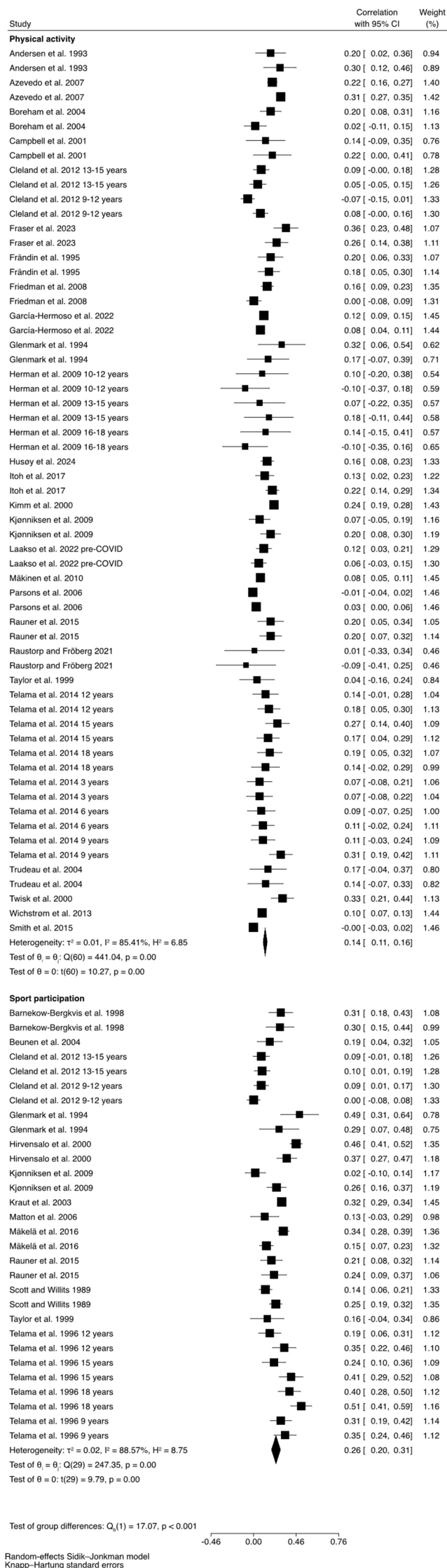


Figure S11 Correlation coefficients of physical activity tracking according to physical activity or sport participation in early years.

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