Distinct trajectories of physical activity and related factors during the life course in the general population: a systematic review

Additional file 3: Table S3. Characteristics of the included studies, physical activity trajectories and related factors reported, and main findings in each study.

<table>
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<th>Ref.</th>
<th>Aim of the study</th>
<th>Name of the study; geographical location; study design; year of the baseline measurement; follow-up time; number of measurements</th>
<th>Study sample; age at baseline</th>
<th>Finite mixture model used for identifying trajectories; software used; criteria used for model comparison, determining the final number of trajectory classes and goodness of fit of the model</th>
<th>Method for collecting PA data; PA variables used</th>
<th>Number and names of the identified PA trajectory classes, and the proportion of participants in each trajectory class</th>
<th>Determinants / predictors / confounders / mediators / outcomes / covariates of trajectory class membership</th>
<th>Main findings in relation to trajectory class membership</th>
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<tr>
<td>Audrain-McGovern et al. (2012)</td>
<td>1) Examine how variation in adolescent PA is associated with smoking and alternative tobacco use.</td>
<td>NR; USA; longitudinal study; NR; 4 years; 8</td>
<td>1429 adolescents (50% females, 73% White); 14 years</td>
<td>GGMM; Mplus; the proportion of cohort members in each class &gt; 5%, BIC, ABIC, entropy*, BLRT</td>
<td>SR; MVPA was defined as sum score of hours / week in activities ≥ 3 METs</td>
<td>Five MVPA trajectories: 1) stable higher PA, 21%; 2) decreased PA, 12%; 3) stable regular PA, 15%; 4) curvilinear PA, 5%; 5) stable low PA, 47%</td>
<td>Outcomes: smoking, and alternative tobacco use</td>
<td>Adolescents following the stable regular, stable low or decreasing PA trajectory had at least twice as great likelihood of smoking compared to those following the stable high PA trajectory. The prevalence of alternative tobacco use was the greatest among adolescents following decreased and stable regular trajectories at the age of 18 years. Adolescents whose PA significantly declined did not fall below the recommended level of PA but the decreasing PA trajectory had the greatest proportion of regular smokers and alternative tobacco users.</td>
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<tr>
<td>Farooq et al. (2017)</td>
<td>1) Identify when changes in PA take place during childhood to adolescence.</td>
<td>Gateshead Millenium Cohort Study; North-East England; longitudinal study; 2006–2007; 8 years; 4</td>
<td>545 children and adolescents (52% females); 7 years</td>
<td>GBTM; Stata Traj plugin; BIC, posterior probabilities, determining the final number of trajectories was stopped when substantial improvement in model fit was no more found</td>
<td>OBM; Total volume of PA and MVPA were measured using ActiGraph GT1M accelerometers (MVPA= 574 or more counts / 15 seconds)</td>
<td>One trajectory of total volume of PA, females: 1) decreasing, 100%</td>
<td>Three trajectories of total volume of PA, males: 1) high decreasing, 10% 2) moderate decreasing, 36% 3) low decreasing, 54%</td>
<td>Total PA volume declined already by age seven. It was suggested that greater emphasis should be put to PA promotion already in childhood.</td>
</tr>
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</table>
Findlay, Garner & Kohen (2009)

1) Identify distinct trajectories of organized PA participation among children and youth.
2) Explore the association of PA trajectories with potential risk factors.

National Longitudinal Survey of Children and Youth; Canada; longitudinal study; 1994; 8 years; 5

Multiple trajectory modeling, semiparametric GBTM; SAS Proc Traj; BIC, posterior probabilities (majority of groups >0.7), all slope parameters had to be statistically significant

PR & SR; Organized PA participation was measured with two questions concerning the frequency of engagement to organized PA

Three trajectories of organized PA participation, females:
1) high decreasing participation, 37%
2) moderate stable participation, 24%
3) low decreasing participation, 39%

Three trajectories of organized PA participation, males:
1) high decreasing participation, 32%
2) low decreasing participation, 42%
3) high stable participation, 26%

Predictors: household income, parents’ educational level, urban versus rural dwelling, and dual versus single parent at home

The decreasing trajectories of organized PA tended to peak in middle childhood (around 9 to 12 years of age) and then declined into adolescence. For boys and girls, higher parental education and income were associated with a greater likelihood of weekly participation in organized PA. Additionally, living in an urban area was significantly associated with a greater likelihood of weekly participation for girls.

Findlay, Garner & Kohen (2010)

1) Identify distinct trajectories of unorganized PA for children aged 4–17 years.
2) Study the association of PA trajectories with

National Longitudinal Survey of Children and Youth; Canada; longitudinal study; 1994; 8 years; 5

Semiparametric GBTM; SAS Proc Traj; BIC, all slope parameters had to be statistically significant, posterior probabilities (>0.7)

PR & SR; Participation in unorganized PA was measured with one question concerning the frequency of participating in unorganized sports or PA outside of school

Two trajectories of unorganized PA, females:
1) regular participation, 57%
2) infrequent and decreasing participation, 43%

Predictors: household income, parents’ educational level, single versus dual parent at home, and urban versus rural dwelling

Boys followed relatively stable trajectories of unorganized PA from childhood to adolescence while a group of decreasers was identified in girls. Out of the examined predictors, parents’ higher educational level and having two parents at home predicted regular participation in unorganized PA, but only for boys.
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<td>Howie et al. (2016)</td>
<td>Western Australian Pregnancy Cohort Study; Australia; longitudinal study; expecting mothers were recruited between years 1989-1991; 15 years; 6</td>
<td>Repeated-measures LCA; LatentGOLD; BIC, AIC, BLRT, posterior probabilities (&gt;0.7), entropy, classification errors, the percent of iterations converging on the same solution, meaningfulness of the solutions, odds of correct classification greater than five</td>
<td>PR: SP was measured with a question whether a child participated in organized sport outside of school hours (yes / no) Three trajectories of organized SP, males: 1) consistent sport participators, 48% 2) sport dropouts, 34% 3) sport nonparticipators, 18% Three trajectories of organized SP, females: 1) consistent sport participators, 55% 2) sport dropouts, 37% 3) sport joiners, 8% Outcomes: self-reported PA, body composition, self-rated health, self-rated well-being, mental health, mother’s and father’s race, and mother’s educational level at the age of 20 years Covariates: PA levels at the age of 20 years (total MET-minutes per week) SP started to decrease at the end of 14 years in the consistent SP trajectories. A nonparticipation trajectory was identified only for girls, suggesting that girls probably should start SP before reaching the age of 8 years. Differences were found in health outcomes between trajectory classes, e.g. boys and girls with consistent SP had more preferable health outcomes, and boys with consistent SP had higher levels of PA at the age of 20 years. However, it is unknown whether SP caused improved health in young adulthood or whether SP was indicative of an overall positive health pattern.</td>
</tr>
<tr>
<td>Janz et al. (2014)</td>
<td>Iowa Bone Developmental Study; USA; longitudinal study; 1998–2002; 15 years; 6</td>
<td>LCA: SAS Proc Traj; BIC, individual-specific probabilities OBM; MVPA measured using ActiGraph accelerometers (MVPA = 2296 or more counts/ min)</td>
<td>Three MVPA trajectories, females: 1) severely declining high activity, 6% 2) declining moderate activity, 45% 3) declining persistent inactivity, 50% Three MVPA trajectories, males: 1) increasing high activity followed by a decline, 23% 2) increasing moderate activity followed by a decline, 37% 3) declining persistent inactivity, 40% Outcome: bone strength (dual X-ray energy absorptiometry and peripheral computer quantitative tomography) measured at the age of 17 years Covariates: weight and height The proportion of highly active children was very low, especially among girls. By the age 17 almost all girls, including girls from the once highly active group, were inactive. A persistently high PA level during childhood was significantly associated with greater bone strength among adolescent boys and girls even after reductions in PA level during adolescence.</td>
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</table>
| Kwon, Lee & Carnethon (2015) | National Growth and Health Study; USA; longitudinal study; 1987; 9 years; 7 | LCGA, GBTM, dual-trajectory analyses; Stata Traj; BIC, trajectory shapes for similarity, odds of correct classification >5.0, the proportion of cohort members SR; The sum of Habitual Activity Questionnaire scores for different activity categories (expressed as MET-times per week) was used as an indicator for the level of PA | Four PA trajectories, females: 1) substantially decreasing from high PA, 9% 2) maintaining moderate PA, 32% Predictor: race Outcome: television viewing Eighty-eight per cent of the girls maintaining high PA level followed the decreasing television viewing trajectory, whereas 86% of the girls following the decreasing moderate PA trajectory also followed the increasing television viewing trajectory. A significantly lower proportion of Black girls followed the
3) Study the relationship between PA and television viewing trajectories.

Iowa Bone Development Study; USA; longitudinal study; 1998–2002; 15 years; 7

537 participants (50% females, 95% White); 5 years

GBTM; Stata Traj; BIC, similarity of trajectory shapes, the proportion of participants in each class (needs to be close to the proportion estimated from the model), odds of correct classification (>0.7), interpretation of 99% confidence intervals

OBM for MVPA; MVPA was measured using ActiGraph accelerometers (MVPA = 2296 or more counts / min).

Four MVPA trajectories: 1) consistently inactive, 15% 2) consistently active, 18% 3) decreasing moderate MVPA, 53% 4) substantially decreasing high MVPA, 14%

Outcomes: SP and television viewing

Covariate: sex

Participants who were active as children but became less active with age were more likely to become obese in young adulthood when compared to consistently active participants.

Kwon et al. (2015a)

1) Identify distinct MVPA trajectories from 5 to 19 years.
2) Examine the associations of MVPA trajectories with SP and television viewing trajectories.

Kwon et al. (2015b)

1) Study whether following certain MVPA trajectories during childhood and adolescence predicts different risk levels of becoming obese in young adulthood.

Iowa Bone Development Study; USA; longitudinal study; 1998–2002; 16 years; 7

493 participants (51% females); 5 years

GBTM; Stata Traj; BIC, posterior probabilities (>0.7), the proportion of cohort members in each class, similarity of trajectory shapes, odds of correct classification (>5.0), the proportion of a sample assigned to a certain group close to the proportion estimated from the model, interpretation of 99% confidence intervals

OBM; MVPA was measured using ActiGraph accelerometers (MVPA = 2296 or more counts / min).

Four MVPA trajectories (identified earlier in Kwon et al. 2015a): 1) consistently inactive, 15% 2) consistently moderately active, 18% 3) decreasing from a moderate level of MVPA, 53% 4) substantially decreasing high level of MVPA, 14%

Outcome: obesity in young adulthood (percentage of body fat measured with whole body dual-energy X-ray absorptiometry)

Covariates: sex, maternal education level, age, level of peak height velocity, and energy intake

Kwon et al. (2016)

1) Identify different latent classes of relationships among parental factors (family income, parental education, parental SES) and PA behaviors (MVPA, sedentary behavior, screen time, a composite of PA and sedentary behaviors).

Iowa Bone Development Study; USA; longitudinal study; 1998–2002; 15 years; 7

408 families; n=537 for MVPA trajectories (48% of children)

GBTM; Stata Traj; BIC, posterior probabilities, similarity of trajectory shapes, proportion of cohort members in each class

OBM for MVPA; MVPA was measured using ActiGraph accelerometers (MVPA = 2296 or more counts / min).

Four MVPA trajectories (identified earlier in Kwon et al. 2015a): 1) consistently inactive, 15%

Predictors: family support for PA, and variables of parental characteristics that correlate with child’s PA behavior

More favorable PA and SP behaviors were observed among those in higher SES families and with higher PA engagement of parents. However, youth in the parental factor class described as having low family SES and regular PA in high school by the father tended to
### Articles in the middle group (mainly adults)

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<tr>
<th>Study</th>
<th>Title</th>
<th>Design</th>
<th>Sample</th>
<th>Methods</th>
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<tr>
<td>Rodriguez &amp; Audrain-McGovern (2004)</td>
<td>1) Study the likelihood of smoking at 11th grade among adolescents following distinct trajectories of team sport participation.</td>
<td>NR; USA; longitudinal study; 2000; 2 years; 4</td>
<td>1098 high school students (52% females); 14 years</td>
<td>GGM; Mplus; BIC, entropy</td>
<td>Four team participation trajectories: 1) erratic, 7% 2) decrease, 13% 3) high, 41% 4) low, 39%</td>
<td>Family support</td>
<td>Socio-economic and demographic factors strongly predicted the probability of following certain LTPA trajectories. Older participants, females, those having lower household income, and with lower educational level were significantly more likely to follow active than inactive trajectories. Additionally, those having lower educational level and lower household income were significantly more likely to follow decreasing than active trajectory.</td>
<td>Adolescents following the decreasing and erratic team participation trajectories were more likely to smoke in grade 11 than individuals with high participation. Females were at high risk for following the low trajectory while non-whites were at high risk for following the decreasing and erratic trajectories.</td>
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<td>Barnett et al. (2008)</td>
<td>1) Identify LTPA trajectories. 2) Explore socioeconomic and demographic predictors of distinct LTPA trajectories.</td>
<td>Canada Fitness Survey 1981 / Campbell’s Survey of Well-being 1988 / Physical Activity Longitudinal Study 2002–2004; Canada; follow-up cohort study; 1981; 22 years; 3</td>
<td>884 adults (56% females); 18–60 years</td>
<td>LCGA, semi-parametric GBTM; SAS Proc Traj; BIC, assignment to the class with highest prior probability</td>
<td>Four LTPA trajectories: 1) inactive, 56% 2) increasers, 25% 3) active, 12% 4) decreasers, 7%</td>
<td>Socio-economic factors</td>
<td>Socio-economic and demographic factors strongly predicted the probability of following certain LTPA trajectories. Older participants, females, those having lower household income, and with lower educational level were significantly more likely to follow active than inactive trajectories. Additionally, those having lower educational level and lower household income were significantly more likely to follow decreasing than active trajectory.</td>
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<td>Dishman et al. (2010)</td>
<td>1) Identify trajectories of meeting a</td>
<td>NR; Hawaii; longitudinal</td>
<td>497 adults (64%)</td>
<td>Rubin likelihood ratio</td>
<td>Four trajectories of meeting the recommendations for</td>
<td>Constructs of Transtheoretical model can be used for predicting possible changes in PA behavior. Those</td>
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<tr>
<td>Study</td>
<td>Identification of PA trajectories</td>
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<td>Kaseva et al. (2016)</td>
<td>1) Identify distinct PA trajectories from childhood to adulthood. 2) Study the associations of PA with changes in depressive symptoms in adulthood.</td>
<td>Young Finns Study; Finland; longitudinal study; 1980; 31 years; 8</td>
<td>Young Adult Study; Finland; longitudinal study; 1980; 31 years; 8</td>
<td>LTPA was measured with several questions (e.g., frequency and intensity of PA), categorized using a probability model.</td>
<td>Three trajectories of LTPA: 1) highly physically active, 4%; 2) moderately physically active, 86%; 3) lightly physically active, 10%.</td>
<td>Depressive symptoms in adulthood for each trajectory. Higher PA level was associated with lower levels of depressive symptoms. Lower PA was associated with higher depression symptoms.</td>
<td>A decline in PA was seen in each activity trajectory. Higher PA level was associated with lower levels of depressive symptoms in adulthood when compared to lower PA level, however, the association disappeared when covariates were taken into account. Thus, PA from childhood to adulthood was not associated with the progression of depressive symptoms in adulthood.</td>
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<td>Kim et al. (2016)</td>
<td>1) Identify distinct PA trajectories among women. 2) Study the correlates of PA trajectory class membership.</td>
<td>Women’s Injury Study; Southwest Central region of USA; prospective cohort study; 2007–2008; 5 years (18</td>
<td>OBMI; PA was measured using Assesscuit 120XL-xBX pedometers across 18 consecutive months. The participants reported the step-count data via web-based surveillance in 7- or 8-day intervals.</td>
<td>Three trajectories of PA: females; 1) active (10000–12499 steps / day), 12%; 2) somewhat-active (7500–9999 steps / day), 41%; 3) low-active (5000–7499 steps / day), 47%.</td>
<td>Covariates: age, race, marital status, family income, employment status, cardiovascular-related problems, bone-related problems, and percent of body fat.</td>
<td>Relatively high proportion of women followed the low-active trajectory. Steps / day increased during spring and decreased during autumn and winter except in the active trajectory group where steps / day did not significantly decrease during autumn. Middle-aged (41–60 years) and older (&gt;60 years) women, and obese or overweight women more likely followed the low-activity trajectory.</td>
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months for PA; weekly reporting of PA (median = 104 weeks in the studied sample)

Kivi-niemi et al. (2016)
1) Study the association between lifelong PA and cardiovascular autonomic function in midlife.

Northern Finland Birth Cohort 1966; Finland; longitudinal study; 1980; 34 years; 3 3062 participants (58% females); 14 years LCA; NR; BIC, interpretability of the classification, conceptual meaningfulness of the model, sizes of the subgroups SR; LTPA was measured with two questions concerning the frequency of participation in sports outside school hours (at the age of 14) and the frequency of participating to brisk PA / exercise during leisure-time (at the ages of 31 and 46) after which the two answers were combined for the LCA.

Three LTPA trajectories, females: 1) active, 23% 2) semiactive, 51% 3) inactive, 26%
Three LTPA trajectories, males: 1) active, 28% 2) semiactive, 43% 3) inactive, 29%
Outcomes: cardiovascular autonomic function (vagally mediated heart rate variability and cross-spectral baroreflex sensitivity) at the age of 46 years
Covariates: smoking, alcohol consumption, sleep, sitting time, BMI, waist-to-hip ratio, blood pressure, lipid status, glucose status
Higher lifelong PA was independently associated with better cardiovascular autonomic function in midlife in women, while in men this association was mediated by other cardiometabolic and lifestyle factors.

Laddu et al. (2017a)
1) Identify distinct PA trajectories from young adulthood to middle age.
2) Study the association of PA trajectories with the prevalence of coronary artery calcification.

Coronary Artery Risk Development in Young Adults; USA; longitudinal study; 1985–1986; 25 years; 8 3175 (57% females); 18–30 years GBTM; SAS Proc Traj; BIC, posterior probabilities, qualitative examination SR; LTPA was measured with several questions (e.g., frequency of participation in vigorous or moderate intensity recreational sports, exercise, home maintenance, and occupational activities during the previous year). A total activity sum-score was expressed in exercise units where a threshold of 300 exercise units was determined as meeting PA guidelines.

Three PA trajectories: 1) three times PA guidelines, 8% 2) meeting PA guidelines, 35% 3) below PA guidelines, 57%
Outcome: presence of coronary artery calcification
Covariates: age, race, sex, hypertension, diabetes, smoking status, BMI, education, and hyperlipidemia
White participants following the 'three times PA guideline' trajectory had higher odds of developing subclinical coronary artery disease by middle age compared to the participants following the 'below PA guidelines' trajectory.

Oura et al. (2016)
1) Study the association of LTPA trajectories from adolescence to middle age with vertebral dimensions in adulthood.

Northern Finland Birth Cohort 1966; Finland; longitudinal study; 1980; 34 years; 3 1188 participants (56% females); 14 years LCA; NR; BIC, interpretability of the classification, conceptual meaningfulness, sizes of the subgroups SR; LTPA was measured with two questions concerning the frequency of participation in sports outside school hours at the age of 14, and the frequency of participating to brisk PA / exercise during leisure-time at the ages of 31 and 46 years.

Three LTPA trajectories, females: 1) active, 24% 2) moderately active, 46% 3) inactive, 30%
Three LTPA trajectories, males: 1) active, 29%
Outcome: vertebral dimensions (lumbar magnetic resonance imaging) at the mean age of 47 years
Covariates: height, weight, BMI, SES (educational level), and smoking
A high level of lifetime LTPA was associated with greater vertebral size among women, but only to a small extent. No such association was observed among men.
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<th>Study Details</th>
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<tr>
<td>Rovio et al. (2017)</td>
<td>1) Identify distinct PA trajectories from childhood to midlife. 2) Identify predictors of the PA trajectory class membership.</td>
<td>Young Finns Study; Finland; longitudinal study; 1980-2012; 31 years; 8 females; 9-18 years.</td>
<td>Five trajectories of LTPA: 1) persistently active, 7% 2) decreasingly active, 14% 3) increasingly active, 14% 4) persistently low active, 51% 5) persistently inactive, 15%</td>
</tr>
<tr>
<td>Aggio et al. (2018)</td>
<td>1) Identify distinct PA trajectories from midlife to old age. 2) Identify predictors of PA trajectory class membership.</td>
<td>British Regional Heart Study; Great Britain; longitudinal study; 1978-1980; 20 years; 4 males.</td>
<td>Three PA trajectories, males: 1) low-decreasing, 25% 2) light stable, 51% 3) moderate-increasing, 24%</td>
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<tr>
<td>Artaud et al. (2016)</td>
<td>1) Identify separate trajectories of PA, smoking, alcohol, and fruit and vegetable consumption. 2) Study the associations between the trajectories and health behaviors.</td>
<td>Whitehall II cohort study; Great Britain; longitudinal study; 1985-1988; 28 years; 19 years for PA; 11 (health behaviors have been)</td>
<td>Four PA trajectories: 1) persistent inactivity, 15% 2) intermediate then inactivity, 36% 3) intermediate then recommended, 23% 4) persistently recommended level, 27%</td>
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<tr>
<td>Study</td>
<td>Data</td>
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| Gabriel et al. (2017)                                                | Study of Women’s Health Across the Nation; USA; longitudinal study; 1996-1997; 20 years; baseline and 15 follow-ups (PA data were collected at baseline and at 6 follow-ups) | LCGA; SAS Proc Traj; BIC, scientific plausibility, highest prior probability | Five trajectories of PA, females: 1) highest, 14% 2) middle, 24% 3) decreasing, 22% 4) increasing, 13% 5) lowest, 26%  
Outcome: physical function (40 foot walk, 4 meter walk, repeated chair stands, and grip strength)  
Covariates: age, ethnicity, site, sociodemographic factors, other health behaviors (e.g., smoking status), BMI, self-rated health status, bodily pain, physical difficulties, menopausal status, hormone use, presence of depressive symptoms, and self-reported comorbidities  
The highest PA trajectory group had the most favorable physical functioning outcomes (all p < 0.001) when compared to other PA groups. Statistically significant differences in the physical functioning were observed when all other trajectory groups were compared to the lowest or increasing PA trajectory group. Characteristics associated with the lowest PA trajectory group were being Hispanic and Black, being single or never married, having fair or poor overall health status, being obese, having income < $35,000 per year, being current cigarette smoker, having severe or very severe bodily pain, having reported physical difficulties and having osteoarthritis. |
| Hsu et al. (2013)                                                    | Taiwan Longitudinal Survey on Aging; Taiwan; longitudinal study; 1996; 11 years; 4 | GBTM and joint trajectory model; SAS Proc Traj; BIC, parsimony principle | Four trajectories of regular exercise, females: 1) none or little, 49 % 2) decreasing exercisers, 17% 3) increasing exercisers, 19% 4) regular exercisers, 14%  
Four trajectories of regular exercise, males: 1) non-exercisers, 44% 2) decreasing exercisers, 11% 3) increasing exercisers, 23% 4) regular exercisers, 21 %  
Predictors: age, number of years of education, marital status, self-related health, depressive symptoms, social support, social participation, and economic satisfaction at baseline  
Five distinct trajectory groups of multiple health-related behaviors were identified for men (smoking, inactive, healthy lifestyle, smoking and drinking, and quitting) and three for women (smoking and drinking, inactive and healthy lifestyle). Age, education, self-rated health, depressive symptoms, and economic satisfaction at baseline associated with the health behavior trajectories. Studying multiple longitudinal trajectories instead of only single behavior trajectories can give new insight concerning the clustering of health behaviors across time. |
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<th>Outcome</th>
<th>Predictors</th>
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<tr>
<td>Laddu et al. (2017b)</td>
<td>1) Identify distinct trajectories of PA and body composition in older men. 2) Study the association of PA trajectories with body composition trajectories over time.</td>
<td>Osteoporotic Fractures in Men Study; USA; longitudinal study; 2000-2002; 7 years; 3</td>
<td>3) Increasing, 23% 2) Decreasing, 12% 1) Inactive, 48%</td>
<td>A decline in PA was observed in all PA trajectories, with the greatest decline in the high-declining PA trajectory group. Men in the high-declining group reported higher PA levels throughout the study period when compared to other two PA groups. Among high-declining and low-declining PA trajectory groups total body weight and lean mass significantly declined while fat mass stayed relatively unchanged. Fat mass increased in the moderate-declining PA trajectory group.</td>
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<tr>
<td>Nguyen et al. (2013)</td>
<td>1) Identify recreational PA trajectories among postmenopausal women. 2) Examine whether women following different PA trajectories engage in different types of PA. 3) Study baseline sociodemographic characteristics, lifestyle behaviors, health, and psychosocial status as predictors of PA trajectory membership.</td>
<td>Women’s Health Initiative Observation Study; USA; prospective, multi-center clinical trial and observational study; 1993-1998; 8 years; 7</td>
<td>3) Highly active, 4% 2) Moderate, 17% 1) Minimally active, 50%</td>
<td>Nearly 75% of the participants were following the minimally active trajectory. Sociodemographic characteristics (e.g., ethnicity, income, and education), some health status indicators (e.g., BMI), and past vigorous PA were predictive of PA trajectory class membership.</td>
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<tr>
<td>Pan et al. (2015)</td>
<td>1) Identify PA trajectories among Taiwanese older adults. 2) Identify the related factors of the different trajectories.</td>
<td>Taiwan Longitudinal Study for Aging; Taiwan; follow-up study; 1996; 11 years; 4</td>
<td>Four PA trajectories: 1) Inactive, 48% 2) Decreasing, 12% 3) Increasing, 23% 4) Active, 17%</td>
<td>Heterogeneity of PA was found among Taiwanese older adults. Nearly half of the participants were following the inactive trajectory. Older age and higher educational level were positively associated with being active. Those participants having jobs, depressive symptoms, and several physical functional limitations were less likely to be physically active in the decreasing, increasing, and active patterns.</td>
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<tr>
<td>Xue et al. (2012)</td>
<td>1) Identify PA trajectories among older women. 2) Assess the associations of PA trajectories with all-cause mortality. 3) Identify predictors of change in PA.</td>
<td>Women’s Health and Aging Study II; USA; prospective cohort study; 1994; 12 years; 7</td>
<td>433 adults (100% females); 70–79 years</td>
<td>Joint latent class and survival mixture model; Mplus, and Stata; Lo-Mendell-Rubin adjusted likelihood ratio test, scientific plausibility, meaningfulness of the trajectory patterns, person-specific probabilities (higher value representing a better classification)</td>
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</table>

NR not reported; NA not applicable; PA physical activity; SP sport participation; MVPA moderate to vigorous intensity physical activity; LTPA leisure-time physical activity; MET metabolic equivalent; SR self-report; PR parent-report; OBM objectively measured; GBTM group-based trajectory modeling; GGMM general growth mixture modeling; LCA latent class analysis; LCGA latent class growth analysis; BLRT bootstrap likelihood ratio test; BIC Bayesian information criterion; ABIC adjusted Bayesian information criterion; AIC Akaike’s information criterion; BMI body mass index; SES socioeconomic status

*Entropy = Average classification probability