

Table G6.A1. Summary Table of Studies Investigating Whether Regular Physical Activity Prevents or Delays the Onset of Substantial Functional Limitations and/or Role Limitations in Middle-Aged and Older Adults Who Do Not Have Severe Functional or Role Limitations

Author/Year	Outcome Category	Name of Measure	Referent Group OR	2nd Level of PA	3rd Level of PA	4th Level of PA	5th Level of PA
Ward et al., 1995 (1)	Global	Health Assessment Questionnaire (HAQ)	1.0	0.61; 95% CI (0.40-0.93)	–	–	–
Strawbridge et al., 1996 (2)	Global disability	ADL, IADL, Rosow-Breslau	1.0	0.59; 95% CI (0.34-1.02) ^a	–	–	–
Rantanen et al., 1997 (3)	Strength change	–	Expressed as % strength change in multiple muscle groups, inconsistent results ^b	Expressed as % strength change in multiple muscle groups, inconsistent results ^b	Expressed as % strength change in multiple muscle groups, inconsistent results ^b	Expressed as % strength change in multiple muscle groups, inconsistent results ^b	Expressed as % strength change in multiple muscle groups, inconsistent results ^b
Schroll et al., 1997 (4)	Mobility	Mobility dependency Men	1.0	0.24 (Inverse of 4.14) ^{a,b}	95% CI not provided	–	–
Schroll et al., 1997 (4)	Mobility	Mobility dependency Women	1.0	0.23 (Inverse of 4.32) ^{a,b}	95% CI not provided	–	–
Sarna et al., 1997 (5)	Global	Occupational role limitations	Average working life expectancy was higher in habitually active adults than in the reference group	Average working life expectancy (LE) was higher in habitually active adults than in the reference group	Average working life expectancy was higher in habitually active adults than in the reference group	Average working life expectancy was higher in habitually active adults than in the reference group	Average working life expectancy was higher in habitually active adults than in the reference group
Unger et al., 1997 (6)	Change in ADL/IADL	–	1.0	Decreased slope of decline in people doing several forms of PA	Decreased slope of decline in people doing several forms of PA	Decreased slope of decline in people doing several forms of PA	Decreased slope of decline in people doing several forms of PA
Huang et al., 1998 (7)	Functional limitation, Men	–	1.0	0.7; 95% CI (0.5-0.9) ^b	0.5; 95% CI (0.3-0.8) ^b	–	–
Huang et al., 1998 (7)	Functional limitation, Women	–	1.0	0.7; 95% CI (0.5-1.10)	0.7; 95% CI (0.4-1.20)	–	–
Ferrucci et al., 1999 (8)	Disabled LE	ADL	More years of disabled LE in sedentary	More years of disabled LE in sedentary	More years of disabled LE in sedentary	More years of disabled LE in sedentary	More years of disabled LE in sedentary
Kujala et al., 1999 (9)	Hip disability	–	1.0	0.46; 95% CI (0.22-0.93)	–	–	–

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Author/Year	Outcome Category	Name of Measure	Referent Group OR	2nd Level of PA	3rd Level of PA	4th Level of PA	5th Level of PA
Kujala et al., 1999 (9)	Knee disability	–	1.0	0.69; 95% CI (0.39-1.21)	–	–	–
Leveille et al., 1999 (10)	ADL before death	–	1.0	0.67; 95% CI (0.47-0.98) ^a [Inverse of 1.25 (0.87-1.82)]	0.53 95% CI (0.36-0.80) ^a [Inverse of 1.86 (1.24-2.79)]	–	–
Wu et al., 1999 (11)	ADL	ADL	1.0	0.52 (0.39-0.68)	–	–	–
Brill et al., 2000 (12)	Strength, Men	–	1.0	0.56 (0.34-0.93) ^c	–	–	–
Brill et al., 2000 (12)	Strength, Women	–	1.0	0.54 (0.21-1.39) ^c	–	–	–
Hirvensalo et al., 2000 (13)	ADL	Dependence, Men	1.0	1.10 (0.27-4.55) [Inverse of 0.91 (0.22-3.70)] ^a	In adults with no or mild limitation at baseline	–	–
Hirvensalo et al., 2000 (13)	ADL	Dependence, Women	1.0	0.85 (0.45-1.59) [Inverse of 1.17 (0.63-2.22)] ^a	In adults with no or mild limitation at baseline	–	–
Miller et al., 2000 (14)	Mobility	Ability to walk, climb stairs, stand, and stoop	1.0	0.68 (0.58-0.80)	–	–	–
Miller et al., 2000 (14)	IADL/ADL	Selected IADL and ADL items	1.0	0.74 (0.62-0.89)	–	–	–
Ostbye et al., 2002 (15)	Mobility	Difficulty walking	1.0	0.53 (0.44-0.64)	0.35 (0.30-0.41)	0.21 (0.17-0.25)	–
Ostbye et al., 2002 (15)	ADL	ADL	1.0	0.53 (0.43-0.66)	0.44 (0.36-0.52)	0.28 (0.22-0.36)	–
Ostbye et al., 2002 (15)	Mobility	Difficulty climbing stairs	1.0	0.72 (0.61-0.85)	0.50 (0.43-0.58)	0.26 (0.22-0.31)	–
Ostbye et al., 2002 (15)	Global	Role limitation = inability to do paid work	1.0	0.51 (0.40-0.64)	0.46 (0.37-0.55)	0.25 (0.19-0.33)	–

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Author/Year	Outcome Category	Name of Measure	Referent Group OR	2nd Level of PA	3rd Level of PA	4th Level of PA	5th Level of PA
Ostbye et al., 2002 (15)	Other	Hospitalization	1.0	0.83 (0.70-0.97)	0.70 (0.61-0.81)	0.60 (0.51-0.71)	–
Stessman et al., 2002 (16)	ADL	ADL	1.0	0.23 (0.09-0.56) [Inverse of 4.30 (1.80-10.6)] ^a	Subgroup analysis found significant effects in both men and women	–	–
Stessman et al., 2002 (16)	IADL	IADL	1.0	0.43 (0.20-0.91) [Inverse of 2.30 (1.10-5.10)] ^a	Subgroup analysis found significant effect in men but non-significant trend in women	–	–
Wang et al., 2002 (17)	Global	Health Assessment Questionnaire (HAQ)	Non-runners had more worsening of HAQ scores over 13 years than did runners	Non-runners had more worsening of HAQ scores over 13 years than did runners	Non-runners had more worsening of HAQ scores over 13 years than did runners	Non-runners had more worsening of HAQ scores over 13 years than did runners	Non-runners had more worsening of HAQ scores over 13 years than did runners
Brach et al., 2003 (18)	ADL, global, and mobility	Any ADL difficulty, Physical Performance Test (PPT), and gait speed	The higher the level of PA over time (assessed in both 1985 and 1995), the better the functional performance and role performance as judged by gait speed, PPT, and ADL difficulties (i.e., tests for trends across PA levels were significant) ^b	The higher the level of PA over time (assessed in both 1985 and 1995), the better the functional performance and role performance as judged by gait speed, PPT, and ADL difficulties (i.e., tests for trends across PA levels were significant) ^b	The higher the level of PA over time (assessed in both 1985 and 1995), the better the functional performance and role performance as judged by gait speed, PPT, and ADL difficulties (i.e., tests for trends across PA levels were significant) ^b	The higher the level of PA over time (assessed in both 1985 and 1995), the better the functional performance and role performance as judged by gait speed, PPT, and ADL difficulties (i.e., tests for trends across PA levels were significant) ^b	The higher the level of PA over time (assessed in both 1985 and 1995), the better the functional performance and role performance as judged by gait speed, PPT, and ADL difficulties (i.e., tests for trends across PA levels were significant) ^b
He et al., 2004 (19) (“Light PA”)	Mobility	Difficulty walking/ climbing stairs	1.0	0.89 (0.65-1.16)	0.78 (0.56-1.03)	0.69 (0.49-0.92)	0.75 (0.53-1.01)
He et al., 2004 (19) (“Vigorous PA/ household chores”)	Mobility	Difficulty walking/ climbing stairs	1.0	0.83 (0.69-0.97)	0.73 (0.59-0.89)	0.58 (0.48-0.70)	0.57 (0.43-0.76)

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Author/Year	Outcome Category	Name of Measure	Referent Group OR	2nd Level of PA	3rd Level of PA	4th Level of PA	5th Level of PA
Haight et al., 2005 (20)	Functional limitations at any of 4 surveys, Men	–	1.0	0.63; 95% CI (0.00-0.92)	–	–	–
Haight et al., 2005 (20)	Functional limitations at any of 4 surveys, Women	–	1.0	0.47; 95% CI (0.14-0.92)	–	–	–
Hillsdon et al., 2005 (21)	Not having highest SF-36	SF-36	1.0	0.91; 95% CI (0.74-1.14)	0.63; 95% CI (0.5-0.77)	–	–
Simonsick et al., 2005 (22)	LE performance	–	1.0	Greater decline in walkers \geq 8 blocks vs. non-walkers	Greater decline in walkers \geq 8 blocks vs. non-walkers	Greater decline in walkers \geq 8 blocks vs. non-walkers	Greater decline in walkers \geq 8 blocks vs. non-walkers
Visser et al., 2005 (23)	Mobility, Men	–	1.0	0.70; 95% CI (0.54-0.85) [Inverse of 1.47 (0.56-0.89)] ^a	0.48; 95% CI (0.30-0.63) [Inverse of 2.08 (1.60-2.70)] ^a	–	–
Visser et al., 2005 (23)	Mobility, Women	–	1.0	0.73; 95% CI (0.57-0.93) [Inverse of 1.44 (1.12-1.84)] ^a	0.51; 95% CI (0.38-0.66) [Inverse of 1.98 (1.51-2.60)] ^a	–	–
Wannamethee et al., 2005 (24)	Mobility	Any of 3 mobility problems	1.0	0.90 (0.68-1.19)	0.88 (0.64-1.21)	0.77 (0.58-1.03)	–
Backmand et al., 2006 (25)	Daily activities	–	1.0	0.89; 95% CI (0.83-0.95) Risk per MET	–	–	–
Berk et al., 2006 (26)	Global	Health Assessment Questionnaire	“Sedentary” and “Exercise Decreasers” had more worsening of HAQ scores over 16 years compared to “Exercisers” and “Exercise Increaseers”	“Sedentary” and “Exercise Decreasers” had more worsening of HAQ scores over 16 years compared to “Exercisers” and “Exercise Increaseers”	“Sedentary” and “Exercise Decreasers” had more worsening of HAQ scores over 16 years compared to “Exercisers” and “Exercise Increaseers”	“Sedentary” and “Exercise Decreasers” had more worsening of HAQ scores over 16 years compared to “Exercisers” and “Exercise Increaseers”	“Sedentary” and “Exercise Decreasers” had more worsening of HAQ scores over 16 years compared to “Exercisers” and “Exercise Increaseers”

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Christensen et al., 2006 (27)	Mobility	Mobility-Tiredness Scale	1.0	0.18; 95% CI (0.05-0.60) [Inverse of 5.65 (1.66-19.28)] ^a	–	–	–
Patel et al., 2006 (28)	Mobility, Men	400-meter walk	1.0	0.37; 95% CI (0.15-0.93)	0.23; 95% CI (0.09-0.63)	–	–
Patel et al., 2006 (28)	Mobility, Women	400-meter walk	1.0	0.69; 95% CI (0.37-1.28)	0.70; 95% CI (0.31-1.59)	–	–
Tessier et al., 2007 (29)	Physical Function	SF-36	Modest but significant association between change in PA and change in physical function domain	Modest but significant association between change in PA and change in physical function domain	Modest but significant association between change in PA and change in physical function domain	Modest but significant association between change in PA and change in physical function domain	Modest but significant association between change in PA and change in physical function domain

ADL, activities of daily living; CI, confidence interval; HAQ, health assessment questionnaire; IADL, instrumental activities of daily living; LE, life expectancy; MET, metabolic equivalent; PA, physical activity; PPT, physical performance test; SF-36, short form health survey with 36 questions

^a Odd ratios (ORs) were recalculated to use the least active group as the reference category.

^b Both physical activity and fitness were measured.

^c The study by Brill et al., 2000 (12) was not included in the review for the overall conclusions because it did not include any measure of physical activity. It was considered in the limitations section because it provided information about muscle strength and function.

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