

APPENDIX 2 (of 2)

TITLE

Does sedentary behaviour cause spinal pain in children and adolescents? A systematic review with meta-analysis

AUTHORS

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Appendix 2 Table 1 Assessment of risk of bias via modified QUIPS for each included report by review objective

	1 Study participation	2 Study attrition	3 Exposure measure	4 Outcome measure	5 Study confounding	6 Analysis & reporting	Overall risk of bias
1) Association Analysis: Cross-sectional studies							
Akbar 2019	High	-	High	Moderate	Low	Moderate	Not Low
Akturk 2019	Moderate	-	High	Low	High	Moderate	Not Low
Alberola López 2010	Moderate	-	High	High	High	High	Not Low
Alghadir 2017	Moderate	-	High	Moderate	Moderate	High	Not Low
Auvinen 2007 ⁱ	Moderate	-	High	Low	Moderate	Low	Not Low
Auvinen 2008 ^j	Moderate	-	Moderate	Low	Low	Low	Not Low
Azabagic 2016	Low	-	High	High	High	High	Not Low
Balague 1988	High	-	High	High	High	High	Not Low
Balague 1994	High	-	Moderate	Moderate	Low	Moderate	Not Low
Belanger 2011	Moderate	-	High	Moderate	Low	Moderate	Not Low
Ben Ayed 2019	Low	-	High	Low	Moderate	Low	Not Low
Bento 2019	Low	-	High	Low	Moderate	Moderate	Not Low
Briggs 2009 ^h	Low	-	Low	Low	Moderate	Low	Not Low
Brindova 2015	Low	-	Moderate	Moderate	Moderate	Low	Not Low
Buabbas 2020	Moderate	-	High	High	High	Low	Not Low
Burke 2002	High	-	High	High	Moderate	Moderate	Not Low
Cankurtaran 2022	Low	-	High	Low	High	Moderate	Not Low
Cardon 2004	Moderate	-	High	Low	Moderate	Low	Not Low
Chiang 2006	Moderate	-	High	Moderate	High	Moderate	Not Low
Chiwaridzo 2015	High	-	High	Low	High	Moderate	Not Low
da Costa 2022 ^{iv}	Low	-	Moderate	Low	Low	Low	Low
de Vitta 2011	Low	-	High	Low	Moderate	Moderate	Not Low
de Vitta 2014	Low	-	High	Low	High	Moderate	Not Low
de Vitta 2021	Low	-	High	Low	Moderate	Low	Not Low
Deng 2014	Moderate	-	High	Low	High	Moderate	Not Low
Dianat 2017 ⁱⁱⁱ	Moderate	-	High	Low	Moderate	Low	Not Low
Dianat 2018 ⁱⁱⁱ	High	-	High	Low	Moderate	Low	Not Low
Diepenmaat 2006	Low	-	High	Low	Moderate	Moderate	Not Low
Dolphens 2016	Low	-	High	Low	High	Low	Not Low
Dutra 2017	Low	-	Moderate	Moderate	High	Moderate	Not Low
Erne 2011	Low	-	High	Low	Moderate	Low	Not Low
Faridizad 2019	Moderate	-	High	Moderate	Low	Moderate	Not Low
Fernandes 2015	Low	-	High	Low	High	Low	Not Low
Fonseca 2016	High	-	High	Low	Moderate	Low	Not Low
Fraille Garcia 2009	Moderate	-	High	Moderate	High	Moderate	Not Low
Franca 2020	Low	-	High	Low	High	Moderate	Not Low
Geldhof 2007	High	-	Low	Low	High	Low	Not Low
Gheysvandi 2019 ^{iv}	Low	-	High	Low	High	Moderate	Not Low
Gonzalez-Galvez 2022	Low	-	High	Low	Moderate	Low	Not Low

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Graup 2014	Moderate	-	High	Low	High	Low	Not Low
Grimmer 2000	Low	-	High	Moderate	High	Moderate	Not Low
Gunzburg 1999	Low	-	Moderate	Moderate	High	High	Not Low
Hakala 2006 ^v	Low	-	High	Moderate	Low	Low	Not Low
Hakala 2010 ^v	Low	-	High	Moderate	Moderate	Low	Not Low
Hakala 2012	High	-	High	Moderate	Moderate	Low	Not Low
Harreby 1999	Moderate	-	High	Low	High	Low	Not Low
Hulsegge 2011 ^{vi}	Low	-	High	Moderate	Moderate	Low	Not Low
Joergensen 2021	Low	-	High	Low	Low	Low	Low
Jung 2010	High	-	Moderate	Moderate	High	High	Not Low
Keane 2017	Low	-	High	Moderate	Low	Low	Not Low
Kedra 2019	Low	-	High	Moderate	High	Moderate	Not Low
Khalil 2019	Low	-	High	Low	High	Low	Not Low
Kristjansdottir 2002	Moderate	-	High	Moderate	Moderate	Moderate	Not Low
Leininger 2017	Low	-	Low	Moderate	High	Low	Not Low
Lemes 2022 ^{viiv}	Low	-	Moderate	Low	Low	Low	Low
Lewandowski 2014	Moderate	-	High	High	High	Moderate	Not Low
Mafanya 2011	Moderate	-	High	High	High	Moderate	Not Low
Martínez-Crespo 2009	Low	-	High	Moderate	High	Moderate	Not Low
Masiero 2021	Moderate	-	Moderate	Moderate	High	Moderate	Not Low
Meziat-Filho 2015 ^{vii}	High	-	High	Low	Moderate	Low	Not Low
Meziat-Filho 2017 ^{vii}	High	-	High	Low	High	Low	Not Low
Minghelli 2019	Low	-	High	Moderate	Moderate	Moderate	Not Low
Minghelli 2014 ^{viii}	Low	-	High	Moderate	High	Low	Not Low
Minghelli 2016 ^{viii}	Low	-	High	Moderate	High	Low	Not Low
Mohseni-Bandpei 2007	Low	-	High	Low	High	Moderate	Not Low
Montgomery 2022	Low	-	High	Low	Moderate	Low	Not Low
Munoz-Serrano 2021	Moderate	-	Moderate	Low	High	Low	Not Low
Myrtveit 2014	Low	-	High	Moderate	Low	Low	Not Low
Namwongsa 2018	Low	-	High	Moderate	Moderate	Moderate	Not Low
Nawrocka 2014	Moderate	-	Moderate	Low	High	Moderate	Not Low
Nazik 2022	High	-	High	Moderate	High	Moderate	Not Low
Noll 2012 ^x	Moderate	-	High	Moderate	High	Moderate	Not Low
Noll 2016a ^x	Low	-	High	Moderate	Moderate	Low	Not Low
Noll 2016b ^x	Moderate	-	High	Moderate	High	Moderate	Not Low
Noll 2016c ^x	Low	-	High	Moderate	High	Moderate	Not Low
Noll 2017 ^x	Low	-	High	Moderate	High	Low	Not Low
O'Sullivan 2011 ⁱⁱ	Low	-	High	Low	Moderate	Low	Not Low
Onofrio 2012	Low	-	High	Low	Moderate	Low	Not Low
Palm 2007	Low	-	High	Low	High	Moderate	Not Low
Paranjape 2018	Moderate	-	High	High	High	Moderate	Not Low
Picavet 2016 ^{vi}	Moderate	-	High	Moderate	Moderate	Low	Not Low
Prista 2004	Moderate	-	High	High	High	Moderate	Not Low
Rezapur-Shahkolai 2021 ^{iv}	Moderate	-	High	Low	Low	Low	Not Low
Roman-Juan 2022	Moderate	-	High	Moderate	Moderate	High	Not Low
Rossi 2016	Low	-	High	Low	Moderate	Moderate	Not Low
Santos 2021	Moderate	-	High	Low	Low	Moderate	Not Low
Saueressig 2015	Moderate	-	Moderate	Low	Low	Low	Not Low
Schwertner 2019	Moderate	-	Moderate	Moderate	Moderate	Low	Not Low
Shan 2013 ^{xi}	Low	-	High	Low	Moderate	Low	Not Low
Shan 2014 ^{xi}	Low	-	Moderate	Low	Low	Low	Low
Shehab 2005	Moderate	-	High	Moderate	High	High	Not Low
Silva 2016	Low	-	High	Low	Moderate	Low	Not Low
Silva 2017 ^{xii}	Moderate	-	High	Low	Moderate	Moderate	Not Low
Silva 2019 ^{xii}	Moderate	-	High	Low	Moderate	Moderate	Not Low
Sjolie 2004	Moderate	-	Moderate	Low	Moderate	Low	Not Low

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Skemiene 2012	Moderate	-	High	Moderate	Moderate	Low	Not Low
Skoffer 2008	Low	-	Moderate	Low	Low	Low	Low
Smith 2009	Low	-	Moderate	Low	High	Moderate	Not Low
Song 2008	High	-	Moderate	Low	High	Moderate	Not Low
Straker 2011 ⁱⁱ	Low	-	Moderate	Low	Moderate	Low	Not Low
Straker 2018	Moderate	-	Moderate	Moderate	Moderate	Low	Not Low
Toh 2019	Low	-	High	Low	Moderate	Low	Not Low
Torsheim 2010	Low	-	High	Moderate	Low	Low	Not Low
Toyran 2002	High	-	Moderate	High	High	High	Not Low
Troussier 1994	Moderate	-	Moderate	Moderate	Moderate	Low	Not Low
Turk 2011	High	-	Moderate	High	High	Moderate	Not Low
Vanti 2010	High	-	High	Moderate	High	Moderate	Not Low
Watson 2003	Moderate	-	Moderate	Low	Moderate	Low	Not Low
Wedderkopp 2003	Low	-	High	Moderate	Low	Low	Not Low
Wirth 2013 ^{xiii}	Moderate	-	Moderate	Moderate	Low	Moderate	Not Low
Wirth 2015 ^{xiii}	Moderate	-	High	Low	Moderate	Low	Not Low
Yabe 2018	Moderate	-	Moderate	Low	Low	Low	Not Low
Yang 2017	Moderate	-	High	Low	Moderate	Moderate	Not Low
Yao 2012	Moderate	-	Moderate	Low	Low	Moderate	Not Low
Zapata 2006	Low	-	High	Low	Moderate	Low	Not Low
Low RoB	n=54, 47.0%	-	n=3, 2.6%	n=60, 52.2%	n=21, 18.3%	n=59, 51.3%	n=5, 4.3%

2) Risk Assessment: Longitudinal studies

Aartun 2015 ^{xiv}	Low	Moderate	Low	Low	Moderate	Low	Not Low
Aartun 2016 ^{xv}	Low	High	Low	Low	Low	Low	Low
Brink 2009 ^{xv}	Moderate	High	High	Low	High	Moderate	Not Low
Brink 2015 ^{xv}	Low	Moderate	Moderate	Low	Moderate	Low	Not Low
Brink 2020 ^{xv}	Moderate	High	High	Low	Moderate	High	Not Low
de Vitta 2021 ^{xvi}	Moderate	Moderate	High	Low	Low	Low	Not Low
de Vitta 2023 ^{xvi}	Low	Moderate	High	Low	Low	Low	Low
Jones 2003	Moderate	High	Moderate	Low	Moderate	Low	Not Low
Noll 2021 ^{xvii}	Low	High	High	Moderate	Low	Low	Not Low
Rosa 2022 ^{xvii}	Low	High	High	Moderate	Low	Low	Not Low
Siivola 2004	Moderate	High	High	Low	High	Low	Not Low
Smith 2017	Moderate	High	Moderate	Low	High	Moderate	Not Low
Szita 2018	High	High	High	Moderate	Low	Moderate	Not Low
Szpalski 2002	Moderate	High	Moderate	Low	High	Low	Not Low
Low RoB	n=6, 42.9%	n=0, 0.0%	n=2, 14.3%	n=11, 78.6%	n=6, 42.9%	n=10, 71.4%	n=2, 14.3%

Legend: superscript roman numerals indicate reports analysing the same study sample; 'Low', ≥4 domains graded 'Low' including domain 5; 'Not low', studies that do not meet 'Low' criteria