Figure S1—Effect direction plot for the association between education and sleep outcomes.

Study	Study Design	↓ Sleep duration	↑ Sleep latency	↑ Awakenings/WASO	↓ Sleep efficiency	Sleep difficulty/insomnia	Sleep disordered breathing	Hypersomnia	Abnormal movements/behaviors	Composite sleep disturbance
Roberts 1999	PCS					▲		◄►		
Rocha 2002	CSS					▲				
Rangarajan 2007	CSS								▲	
Stamatakis 2007	PCS	▲								
Li 2008	RCS						▲			
Calem 2012	CSS					▲4				
Lima 2012	CSS	▼						▲		
Benbir 2015	CSS					▲				
El-Sheikh 2015	CSS									▲
Peña 2016	PCS	▲								
Schäfer 2016	CSS	▼								
Smagula 2016	PCS	▲						▲		
Ahmed 2017	CSS					▲				
Assari 2017	PCS					▲				
Grandner 2017	CSS								▲	
Koolhaas 2017	CSS	▼								
Netsi 2017	CSS	◄►		▲						▲
Walsemann 2017	PCS	▲								
Wang 2017	CSS	▲						▲		
Lima 2018	CSS	▼						▲		
Manyanga 2018	CSS	◄►			▲					
Perlus 2018	PCS	▼								
Plancoulaine 2018	PCS	▲						▲		
Al-Hazzaa 2019	CSS	▲								
Barros 2019	CSS									▲
Pontes 2019	CSS								▼	
Troxel 2020	CSS	▼		▼	▼					▼
van de Straat 2020	PCS									▼
Hapte-Gabr 1991	CSS	▼	▲			▲				
Kim 1994	CSS	▼								
Blazer 1995	CSS					▲				
Ohayon 1996	CSS					▲				
Breslau 1997	CSS							▲		
Rona 1998	CSS									▲
Hall 1999	CSS					▲				
Sadeh 2000	CSS			▲	▲					
Hublin 2001	CSS	◄►								
Sutton 2001	CSS					▲				
Li 2002	CSS					▲				
Moore 2002	CSS	▲								▲
Ohayon 2002	CSS					▲				
Doi 2003b	CSS									▲
Kravitz 2003	CSS					▼				
Hara 2004	CSS							▲		
Su 2004	CSS					▲				
Averina 2005	CSS					▲				
Chen 2005	CSS					▼				
Gellis 2005	CSS					▲				
Hale 2005	CSS	▲						▲		
Ohayon 2005	CSS	▲2	▲					◄►2		
Phillips 2005	CSS					▲3				

Tjepkema 2005	CSS					▲				
Ursin 2005	CSS	▲								
Lauderdale 2006	CSS	▲	▲		▲					
Adam 2007	CSS	▼$_2$								
Friedman 2007	CSS		▲		▲$_2$					
Ozden 2007	CSS								▲	
Blay 2008	CSS									▲
Ekici 2008	CSS			▲			▲$_2$	▲		
Inan 2008	CSS								▲	
Kuehni 2008	CSS						▲			
Xiang 2008	CSS					▲$_2$				
Yao 2008	CSS									▼
Arber 2009	CSS					▲				
Baker 2009	CSS							▲		
Hall 2009	CSS	▲	▲	▼	▲					▲
Jiang 2009	CSS	▼								
Joo 2009	CSS							▲		
Kim 2009	PCS					▼				
Krueger 2009	CSS	▲$_2$						▲$_2$		
Sivertsen 2009	CSS					▲				
Yang 2009	CSS									▼
Fritsch Montero 2010	CSS									▲
Grandner 2010	CSS									▲
Gu 2010	CSS	▲$_3$						▲$_2$		◄►
Knutson 2010	CSS	▼								
Lallukka 2010	CSS					▼				
Li S 2010	CSS						▲			
Mittelmark 2010	CSS	▲								
Paparrigopoulos 2010	CSS					▲				
Park 2010	CSS	▲$_2$						▲$_2$		
Patel 2010	CSS									▲
Amra 2011	CSS						▲			
Bonuck 2011	PCS						▲			
Eder 2011	CSS	▲				▼$_3$		▲		◄►$_2$
Hense 2011	CSS	▲								
Pallesen 2011	CSS							▲		
Ryu 2011	CSS	▲						▲		
Wong 2011	CSS									▲
Zhang 2011	CSS					▲				
Adams 2012	CSS						▲			
Blümel 2012	CSS					▲				▲
Bøe 2012	CSS	▲				◄►				
Guo 2012	CSS	▼								
Kachikis 2012	CSS	▼								◄►
Lallukka 2012	CSS	▲$_3$				▲		▲$_3$		
Mazzotti 2012	CSS									▲
Rosenbaum 2012	CSS									▲
Soltani 2012	CSS									▲
Stranges 2012	CSS					▲$_2$				
Talala 2012	CSS					▲				
Tu 2012	CSS	▲$_3$						▲$_3$		
Zhang 2012	PCS					▲				

Chen 2013	CSS					◄►$_{3}$				
Grandner 2013	CSS		▲			▼$_{4}$	▲$_{2}$	▼		
Hartz 2013	CSS					▲				
Innes 2013	CSS								▲	
Kim 2013	CSS					▲$_{5}$				
Luo 2013	CSS									▼
Mindell 2013	CSS									▲
Basner 2014	CSS	▼						▲		
Carrillo-Larco 2014	CSS	▼						▲		
Gubelmann 2014	CSS	▼$_{2}$						▲$_{2}$		
Kang 2014	CSS						▲			
Leng 2014	CSS	▲			▲					
Liviya NG 2014	CSS							▲		
McDonald 2014	CSS	▲								
Pan 2014	CSS						▼			
Speirs 2014	CSS	▲								
Whinnery 2014	CSS	▲$_{2}$						▲		
Baiden 2015	CSS					▲				
Bonke 2015	CSS	▲						▲		
Cunningham 2015	CSS	▲				▲		▲$_{2}$		
Gamaldo 2015	CSS	▲$_{2}$								
Katainen 2015	CSS					▲				
Kim 2015	CSS	◄►$_{2}$						▲$_{2}$		
Kurina 2015	CSS	▼		▲	▲					
Nisar 2015	CSS					▲				
Patel 2015	CSS	▲						▲		
Stringhini 2015	CSS	◄►$_{2}$	▲$_{2}$		▲	▲		▲		▲
Suarez 2015	CSS	▲	▲				▲	▲		▲
van de Straat 2015	CSS									▲
Yoon 2015	CSS	▲						▲		
de Ruiter 2016	CSS	▲								
Hawkins 2016	CSS	▼								
Johnson 2016	CSS	▲						▲		▲
Malone 2016	CSS	▲						▲		
Paine 2016b	CSS			▲		▲$_{2}$				
Seyedmehdi 2016	CSS						▲			
Wong 2016	CSS								▲	
Abraham 2017	CSS									▼
Barazzetta 2017	PCS	◄►$_{4}$				▲$_{4}$			◄►	
Cheng 2017	PCS	▲$_{3}$						▲		
Costanian 2017	CSS	▲								
Didriksen 2017	CSS								▲	
Ham 2017	CSS					▲				▲
Ma JF 2017	CSS								▲	
Ma Y 2017	CSS						▲			
Palmer 2017	CSS					▲$_{5}$				
Perales 2017	CSS	▲								
Tang 2017	CSS									▼
Yunus 2017	CSS									▲
Zhang 2017	CSS									▲
Cha 2018	CSS	▼								
Chang 2018	CSS	▲						▲		

de Lima 2018	CSS									▼
Dong 2018	CSS									▲
Gómez-Olivé 2018	CSS	▼					▼			▲
Goyal 2018	CSS						▲			
Jaisoorya 2018	CSS					▲$_2$				
Lin 2018	PCS	▼								
Ma J 2018	CSS									▲
Ma Y 2018	CSS					◄►				
Miner 2018	CSS					▼				
Park 2018	CSS					▼				
Peltzer 2018	CSS	◄►						▲		
Pepin 2018	CSS	▼								
Thichumpa 2018	CSS									▼
Vermeiren 2018	CSS	◄►								
Wu 2018	CSS									▲
Zheng 2018a	CSS					▲$_3$				
Zheng 2018b	CSS	▲						▲		
Althakafi 2019	CSS	▼								
Carneiro 2019	CSS									▲
Chami 2019	CSS					▲$_2$				
Gordon 2019	CSS	▲								
Hartescu 2019	CSS					▲				
Kobel 2019	CSS	▼								
Lee EY 2019	CSS	◄►								
Lei 2019	CSS									▲
Manyanga 2019	CSS	▼								
Miner 2019	CSS							▲		
Peltzer 2019	CSS					▲				
Redondo-Bravo 2019	CSS	▲								
Ren 2019	CSS	▲						▲		
Sheehan 2019	CSS	▲						▲		
Sun 2019	CSS									▲
Teo 2019	CSS	▼								
Vézina-Im 2019	CSS	▲				▲				
Wang 2019	CSS									▲
Wendt 2019	CSS									▲
Yao 2019	CSS								▲	
Chami 2020	CSS	▲						▲		
Harding 2020	CSS						▲			
Li 2020	CSS									▲
Visvalingam 2020	CSS	▲								▲
Hopton 1992	CSS					▲				
Schechtman 1997	CSS					▲				
Ito 2000	CSS			▲						
Terzano 2004	CSS					▲				
Kim 2005	CSS							▲$_3$		
BaHammam 2006	CSS	▲								
Jean-Louis 2008	CSS					▼				
Tomfohr 2010	CSS	▼	▲	▲	▲			▲		◄►
McHale 2011	CSS	▼								
Pigeon 2011	CSS									▲
Brug 2012	CSS	◄►								

El-Sheikh 2013	CSS	▲			▲				▲
Jarrin 2013	CSS	▼	▲					▼	▲
Jarrin 2014	CSS	◄►$_2$				▲		▲	▼
Karaman 2014	CSS								▲
Buxton 2015	CSS	▲							▲
Tareque 2016	CSS					▲			
Brambilla 2017	CSS								▲
Foroughi 2017	CSS						▲		
Kim 2017	CSS					▲			
McDowall 2017	CSS	▲	▲						▲
de Jonge 2018	PCS					▼			
Khan 2018	CSS					▼			
Akay 2019	CSS	▲							▲
Bazargan 2019	CSS					▼			
Matenchuk 2019	CSS	▲							
Petrovic 2019	CSS						▲		
Poulain 2019	CSS								▲
Metse 2020	CSS	▲	▲						
Seaton 2020	CSS	▲							
Sundbom 2020	CSS					▲$_4$			
Wu 2020	CSS								▲
Binomial proportions % (95% CI)		65.9 (55.4, 75.3) p 0.005	100.0 (81.5, 100.0) p <0.001	77.8 (45.6, 95.1) p 0.180	90.9 (64.7, 99.0) p 0.012	81.2 (70.4, 89.3) p <0.001	88.9 (68.9, 97.6) p 0.001	95.7 (86.8, 99.1) p <0.001	90.0 (61.9, 98.9) p 0.021	81.8 (70.1, 90.3) p <0.001

LEGEND

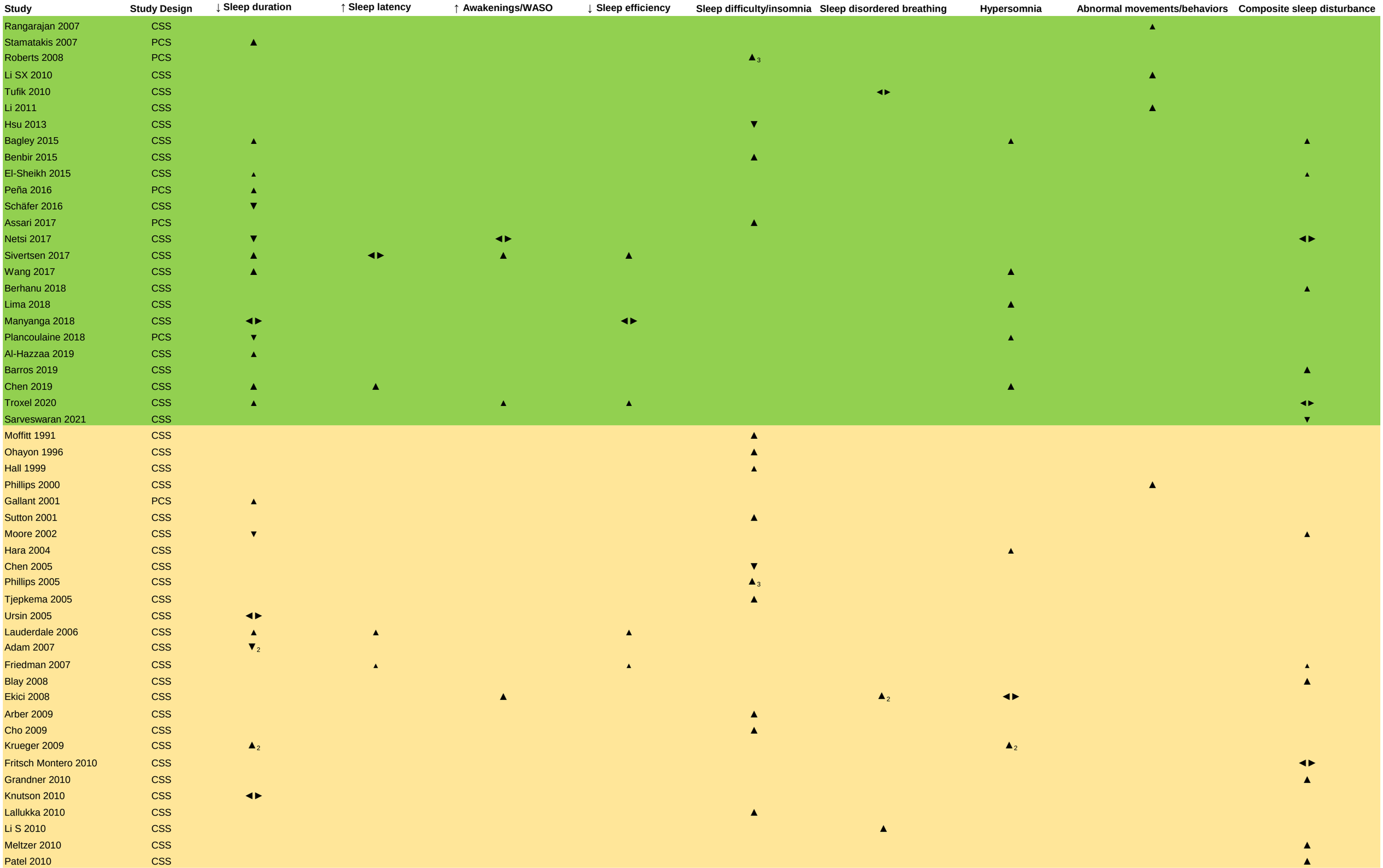
Study design: CSS = Cross-Sectional Study; PCS = Prospective Cohort Study; RCS = Retrospective Cohort Study

Effect direction: upward arrow ▲= expected direction (low SES → poor sleep), downward arrow ▼= opposite direction (high SES → poor sleep), sideways arrow ◄►= no direction/mixed effects/conflicting findings

Sample size: Large arrow ▲ >1,500; medium arrow ▲ 250-1,500; small arrow ▲ <250

Study quality (denoted by row colour): green = good; amber = fair; red = poor

Figure S2—Effect direction plot for the association between income and sleep outcomes.



Ryu 2011	CSS	▲						▲		
Wong 2011	CSS									▲
Adams 2012	CSS						▲			
Guo 2012	CSS	▼								
Kachikis 2012	CSS									▼
Lallukka 2012	CSS	▲$_{3}$				▲		▲$_{3}$		
Talala 2012	CSS					▲				
Tu 2012	CSS	▲$_{3}$						▲$_{3}$		
Zhang 2012	PCS					▲				
Chen 2013	CSS					◄►$_{3}$				
Grandner 2013	CSS		▲			▲$_{4}$	◄►$_{2}$	▲		
Hartz 2013	CSS					▲				
Hoefelmann 2013	CSS	▼								◄►
Innes 2013	CSS								▲	
Kidwai 2013	CSS					▼				
Basner 2014	CSS	▼						▲		
Gubelmann 2014	CSS	◄►$_{2}$						▲$_{2}$		
Liviya NG 2014	CSS							▲		
Pan 2014	CSS						▲			
Speirs 2014	CSS	▲								
Takahashi 2014	CSS	▲			▲					▲
Whinnery 2014	CSS	◄►$_{2}$						▲		
Baiden 2015	CSS					▲				
Gamaldo 2015	CSS	◄►$_{2}$								
Patel 2015	CSS	▼						▲		
Suarez 2015	CSS	▲	▲				▲	▲		▲
Hawkins 2016	CSS	▼								
Johnson 2016	CSS	◄►						▲		▲
Paine 2016b	CSS			▲		▲$_{2}$				
Wong 2016	CSS								▲	
Barazzetta 2017	PCS	▼$_{4}$				▲$_{4}$			▲	
Costanian 2017	CSS	▲								
Ham 2017	CSS					▼				▼
Maume 2017	PCS	▲								
Palmer 2017	CSS					▲$_{5}$				
Patte 2017	PCS	▲						▼		
Perales 2017	CSS	▼								
Seo 2017	CSS	▼								
Yunus 2017	CSS									▲
Cha 2018	CSS	▼								
Chang 2018	CSS	▲						▲		
de Lima 2018	CSS									▼
Dong 2018	CSS									▲
Jaisoorya 2018	CSS					▼$_{2}$				
Ma J 2018	CSS									▼
Ma Y 2018	CSS					▲				
Wu 2018	CSS									▲
Zheng 2018a	CSS					▲$_{3}$				
Zheng 2018b	CSS	▲						▼		
Lee EY 2019	CSS	▼								
Ren 2019	CSS							▲		
Sheehan 2019	CSS	▲						▼		
Teo 2019	CSS	▼								

Vézina-Im 2019	CSS	◄►				◄►			
Wang 2019	CSS								▲
Yao 2019	CSS							▲	
Chami 2020	CSS	◄►					▼		
Visvalingam 2020	CSS	▼							▲
Chervin 2003	CSS						▲2		
McLaughlin Crabtree 2005	CSS	▲					▲		▲
Jean-Louis 2008	CSS					▲			
McHale 2011	CSS	▼							
Pigeon 2011	CSS								▲
Heilemann 2012	CSS					▲			
El-Sheikh 2013	CSS	▲			▲				▲
Jarrin 2013	CSS	▲	▲				▲		▲
Jarrin 2014	CSS	▲2				▲	▲		▲
Karaman 2014	CSS								▼
Seib 2014	CSS								▲
de Jong 2016	CSS	▲							▲
McDowall 2017	CSS	▲	▲						▲
Akay 2019	CSS	▲							▲
Poulain 2019	CSS								▼
Seaton 2020	CSS	▼							
Tomaso 2020	CSS						▲		▲
Binomial proportions % (95% CI)		62.0 (48.2, 74.5) p 0.120	100.0 (70.8, 100.0) p 0.016)	100.0 (55.5, 100.0) p 0.125	100.0 (67.0, 100.0) p 0.031	83.9 (68.2, 93.6) p <0.001	100.0 (67.0, 100.0) p 0.031	85.7 (69.5, 95.0) p <0.001	100.0 (73.8, 100.0) p 0.008	80.6 (65.6, 90.9) p <0.001

LEGEND

Study design: CSS = Cross-Sectional Study; PCS = Prospective Cohort Study; RCS = Retrospective Cohort Study

Effect direction: upward arrow ▲= expected direction (low SES → poor sleep), downward arrow ▼= opposite direction (high SES → poor sleep), sideways arrow ◄►= no direction/mixed effects/conflicting findings

Sample size: Large arrow ▲ >1,500; medium arrow ▲ 250-1,500; small arrow ▲ <250

Study quality (denoted by row colour): green = good; amber = fair; red = poor

Figure S3—Effect direction plot for the association between employment status and sleep outcomes.

Study	Study Design	↓ Sleep duration	↑ Sleep latency	↑ Awakenings/WASO	↓ Sleep efficiency	Sleep difficulty/insomnia	Sleep disordered breathing	Hypersomnia	Abnormal movements/behaviors	Composite sleep disturbance
Virtanen 2008	PCS	▲								
Tufik 2010	CSS						◄►			
Calem 2012	CSS					▲4				
Lima 2012	CSS	▼						▲		
Benbir 2015	CSS					▲				
Ahmed 2017	CSS					▼				
Grandner 2017	CSS								▲	
Walsemann 2017	PCS	▲								
Lima 2018	CSS							▲		
Plancoulaine 2018	PCS	▼						▲		
Barros 2019	CSS									▲
van de Straat 2020	PCS									◄►
Sarveswaran 2021	CSS									▼
Habte-Gabr 1991	CSS	▼	▲			▲				
Ohayon 1996	CSS					▲				
Rásky 1996	CSS									▲
Breslau 1997	CSS							▼		
Fabsitz 1997	CSS					▲4				
Hublin 2001	CSS	▼								
Ohida 2001	CSS	▼2								
Sutton 2001	CSS					▲				
Li 2002	CSS					▲				
Ohayon 2002	CSS					▲2				
Hara 2004	CSS							▲		
Paine 2004	CSS			▲		▲3				
Chen 2005	CSS					▲				
Hale 2005	CSS	◄►						▲		
Tjepkema 2005	CSS					▲				
Tworoger 2005	CSS			▼3	▼					▲
Kronholm 2006	CSS	▲								
Lauderdale 2006	CSS	▼	▲		▲					
Inan 2008	CSS								▲	
Arber 2009	CSS					▲				
Baker 2009	CSS							▲		
Kim 2009	PCS					▲				
Krueger 2009	CSS	▲2						▲2		
Vincent 2009	CSS	▲						▲		
Fritsch Montero 2010	CSS									▲
Grandner 2010	CSS									▲
Knutson 2010	CSS	▼								
Park 2010	CSS	◄►2						▲2		
Patel 2010	CSS									▲
Ryu 2011	CSS	▼						▲		
Wong 2011	CSS									▲
Kachikis 2012	CSS	▼								▲
Lallukka 2012	CSS	▲3				▲		▲3		
Soltani 2012	CSS									▲
Talala 2012	CSS					▲				
Zhang 2012	PCS					▲				
Chen 2013	CSS					◄►3				
Innes 2013	CSS								▲	

Kidwai 2013	CSS					▲					
Mindell 2013	CSS										▲
Basner 2014	CSS	▼							▲		
Carrillo-Larco 2014	CSS	▼							▲		
Leng 2014	CSS	▼			▲						
Speirs 2014	CSS	▾									
Uhlig 2014	CSS					▼					
Bonke 2015	CSS	▼							▲		
Katainen 2015	CSS					▲					
Nisar 2015	CSS					▼					
Patel 2015	CSS	▼							▲		
Stringhini 2015	CSS	▼	▲			▲			▼		▲
Suarez 2015	CSS	▲	▲				▲		▲		▲
van de Straat 2015	CSS										▲
Hawkins 2016	CSS	▲									
Malone 2016	CSS	▲							▲		
Paine 2016a	CSS	▲							▲		
Costanian 2017	CSS	▼									
Ham 2017	CSS					▲					▾
Palmer 2017	CSS					▲5					
Perales 2017	CSS	▼									
Yu 2017	CSS	▾									
Cha 2018	CSS	▲									
Chang 2018	CSS	▾							▲		
Gómez-Olivé 2018	CSS	▼					◄►				▲
Goyal 2018	CSS						▾				
Jaisoorya 2018	CSS					▲2					
Ma J 2018	CSS										▾
Pepin 2018	CSS	▼									
Schlieber 2018	CSS	▼									
Wu 2018	CSS										▲
Zheng 2018a	CSS					▼3					
Zheng 2018b	CSS	▲							▲		
Chami 2019	CSS						▲				
Hartescu 2019	CSS					▲					
Lee ES 2019	CSS	▲									
Maeda 2019	CSS					▲					
Sheehan 2019	CSS	▼							▲		
Yao 2019	CSS									▲	
Chami 2020	CSS	▼							▲		
Ito 2000	CSS		▲								
Terzano 2004	CSS					▲					
BaHammam 2006	CSS	▼									
Goodin 2010	CSS										▾
Pigeon 2011	CSS										▲
Heilemann 2012	CSS					▲					
Nishikitani 2012	CSS	▼	▲			▲					
Seib 2014	CSS										▲
Khan 2018	CSS					▲					
Akay 2019	CSS	▼									▼
Binomial proportions % (95% CI)		31.7 (19.1, 46.8) p 0.029	100.0 (67.0, 100.0) p 0.031	50.0 (6.1, 93.9) p >0.999	66.7 (17.7, 96.1) p >0.999	87.5 (73.0, 95.6) p <0.001	66.7 (17.7, 96.1) p >0.999	91.7 (75.9, 98.2) p <0.001	100.0 (55.5, 100.0) p 0.125		77.3 (57.1, 90.8) p 0.017

LEGEND

Study design: CSS = Cross-Sectional Study; PCS = Prospective Cohort Study; RCS = Retrospective Cohort Study

Effect direction: upward arrow ▲= expected direction (low SES → poor sleep), downward arrow ▼= opposite direction (high SES → poor sleep), sideways arrow ◄►= no direction/mixed effects/conflicting findings

Sample size: Large arrow ▲ >1,500; medium arrow ▲ 250-1,500; small arrow ▲ <250

Study quality (denoted by row colour): green = good; amber = fair; red = poor

Figure S4—Effect direction plot for the association between occupation and sleep outcomes.

Study	Study Design	↓ Sleep duration	↑ Sleep latency	↑ Awakenings/WASO	↓ Sleep efficiency	Sleep difficulty/insomnia	Sleep disordered breathing	Hypersomnia	Abnormal movements/behaviors	Composite sleep disturbance
Wang 2017	CSS	◄►						▲		
van de Straat 2020	PCS									▼
Rona 1998	CSS					▲				
Talvi 1998	CSS									▲
Åkerstedt 2002	CSS					▲$_{2}$				
Averina 2005	CSS					▲				
Sekine 2006	CSS									▲
Kim 2009	PCS					▲$_{2}$				
Lallukka 2010	CSS					◄►				
Bonuck 2011	PCS						▲			
Green 2012	PCS					▲				
Tu 2012	CSS	▲$_{3}$						▲$_{3}$		
Yoshioka 2013	CSS					▲				
Kang 2014	CSS						◄►			
Leng 2014	CSS	▲			▲					
Liviya NG 2014	CSS							▼		
Takahashi 2014	CSS	▾			▴					▴
Nisar 2015	CSS					▼				
Stringhini 2015	CSS	◄►$_{2}$	◄►$_{2}$		▲	▲		▲		▲
Yoon 2015	CSS	▲						▲		
Wong 2016	CSS								▲	
Clark 2017	CSS	▲						◄►		
Ma JF 2017	CSS								▼	
Palmer 2017	CSS					▲$_{5}$				
Yang 2018	CSS	▼								
Åkerstedt 2019	PCS					▲				
Gordon 2019	CSS	▲								
Ren 2019	CSS							▲		
Teo 2019	CSS	▲								
Holstein 2020	CSS					▲				
Visvalingam 2020	CSS	▼								▲
Weyerer 1991	CSS					▲				
Geroldi 1996	CSS					▲				
Larsson 2003	CSS						◄►$_{2}$	▲		
de Jonge 2018	PCS					▴				
Petrovic 2019	CSS						▲			
Poulain 2019	CSS									▲
Wu 2020	CSS									▲
Binomial proportions % (95% CI)		66.7 (34.8, 89.6) p 0.508	—	—	100.0 (46.4, 100.0) p 0.250	92.9 (71.2, 99.2) p 0.002	100.0 (33.3, 100.0) p 0.500	85.7 (49.9, 98.4) p 0.125	50.0 (6.1, 93.9) p >0.999	87.5 (54.6, 98.6) p 0.070

LEGEND

Study design: CSS = Cross-Sectional Study; PCS = Prospective Cohort Study; RCS = Retrospective Cohort Study

Effect direction: upward arrow ▲= expected direction (low SES → poor sleep), downward arrow ▼= opposite direction (high SES → poor sleep), sideways arrow ◄►= no direction/mixed effects/conflicting findings

Sample size: Large arrow ▲ >1,500; medium arrow ▲ 250-1,500; small arrow ▲ <250

Study quality (denoted by row colour): green = good; amber = fair; red = poor

Figure S5—Effect direction plot for the association between assets and sleep outcomes.

Study	Study Design	↓ Sleep duration	↑ Sleep latency	↑ Awakenings/WASO	↓ Sleep efficiency	Sleep difficulty/insomnia	Sleep disordered breathing	Hypersomnia	Abnormal movements/behaviors	Composite sleep disturbance
Perlus 2018	PCS	▲								
Wendt 2020	CSS	▲			▲					
Li 2002	CSS					▲				
Arber 2009	CSS					▲				
Kim 2009	PCS					▲$_2$				
Fritsch Montero 2010	CSS									▲
Lallukka 2010	CSS					▲				
Mittelmark 2010	CSS	▼								
Bonuck 2011	PCS						▲			
Kachikis 2012	CSS	▼								▼
Mazzotti 2012	CSS									▲
Soltani 2012	CSS									▲
Stranges 2012	CSS					▼$_2$				
Carrillo-Larco 2014	CSS							▲		
Whinnery 2014	CSS	▼$_2$						▼		
Patel 2015	CSS	◄►						▲		
van de Straat 2015	CSS									▲
Barazzetta 2017	PCS	▲$_4$				▲$_4$			◄►	
Cheng 2017	PCS	◄►$_3$						▼		
Palmer 2017	CSS					▲$_5$				
Perales 2017	CSS	▲								
Gómez-Olivé 2018	CSS	▼					▲			▲
Ma J 2018	CSS									▼
Peltzer 2018	CSS	▼						▲		
Teo 2019	CSS	▲								
Wendt 2019	CSS									▼
Hopton 1992	CSS					▲				
Bapat 2017	CSS	▼								
Binomial proportions % (95% CI)		45.5 (20.0, 73.0) p >0.999	—	—	100.0 (14.7, 100.0) p >0.999	87.5 (54.6, 98.6) p 0.070	100.0 (33.3, 100.0) p 0.500	60.0 (20.9, 90.6) p >0.999)	—	62.5 (29.5, 88.1) p 0.727

LEGEND

Study design: CSS = Cross-Sectional Study; PCS = Prospective Cohort Study; RCS = Retrospective Cohort Study

Effect direction: upward arrow ▲= expected direction (low SES → poor sleep), downward arrow ▼= opposite direction (high SES → poor sleep), sideways arrow ◄►= no direction/mixed effects/conflicting findings

Sample size: Large arrow ▲ >1,500; medium arrow ▲ 250-1,500; small arrow ▲ <250

Study quality (denoted by row colour): green = good; amber = fair; red = poor

Figure S6—Effect direction plot for the association between composite socioeconomic status and sleep outcomes.

Study	Study Design	↓ Sleep duration	↑ Sleep latency	↑ Awakenings/WASO	↓ Sleep efficiency	Sleep difficulty/insomnia	Sleep disordered breathing	Hypersomnia	Abnormal movements/behaviors	Composite sleep disturbance
Reddy 2009	CSS						▼			
Arman 2011	CSS	▼								
Heshmat 2016	CSS					▲				
Mota-Veloso 2017	CSS								▲	
Matthews 2018	CSS	▾		▴						
Doane 2019	CSS	▲	▲		▲					
Pallesen 2001	CSS		▲	▼		▼				
Gander 2005	CSS							▼		
Baigi 2008	CSS									▲
Mezick 2008	CSS	▾₂	▲₂	▴	▾₂		◄►	▾		▲₂
Gu 2010	CSS	▲₃						◄►₂		▲
Paparrigopoulos 2010	CSS					▲				
Marco 2012	CSS	▴								
Nicholson 2012	CSS					▲				
Wall 2012	CSS						▼₂			
Grandner 2013	CSS		▲			▲₄	◄►₂	▲		
Anders 2014	CSS									▲
Pallesen 2014	CSS		▲	▲		▲₆				
Whinnery 2014	CSS	▼₂						▼		
Schwartz 2015	CSS						◄►₂	▲		
Hawkins 2016	CSS	▼								
Hardy 2017	CSS	▲								
Meneton 2018	PCS									▲
Olorunmoteni 2018	CSS	▾								
Zheng 2018a	CSS					▲₃				
Zheng 2018b	CSS	▼						▲		
Laganière 2019	PCS								▲	
Muller 2019	CSS	▲								
Singh 2019	CSS	▾								
Talvitie 2019	CSS	▲				▼		▲		
Williamson 2019	PCS									▲
Zhu 2019	CSS	▲₃						▲		
Acebo 2005	CSS			▲₂	▲					
Biggs 2013	CSS	▲								
Fulgencio 2017	CSS								▼	
Poulain 2019	CSS									▲
Binomial proportions % (95% CI)		50.0 (27.2, 72.8) p >0.999	100.0 (62.1, 100.0) p 0.062	80.0 (37.1, 97.7) p 0.375	66.7 (17.7, 96.1) p >0.999	75.0 (40.8, 94.4) p 0.289	0.0 (0.0, 66.7) p 0.500	62.5 (29.5, 88.1) p 0.727	66.7 (17.7, 96.1) p >0.999	100.0 (70.8, 100.0) p 0.016

LEGEND

Study design: CSS = Cross-Sectional Study; PCS = Prospective Cohort Study; RCS = Retrospective Cohort Study

Effect direction: upward arrow ▲= expected direction (low SES → poor sleep), downward arrow ▼= opposite direction (high SES → poor sleep), sideways arrow ◄►= no direction/mixed effects/conflicting findings

Sample size: Large arrow ▲ >1,500; medium arrow ▲ 250-1,500; small arrow ▲ <250

Study quality (denoted by row colour): green = good; amber = fair; red = poor

Figure S7—Effect direction plot for the association between subjective socioeconomic status and sleep outcomes.

Study	Study Design	↓ Sleep duration	↑ Sleep latency	↑ Awakenings/WASO	↓ Sleep efficiency	Sleep difficulty/insomnia	Sleep disordered breathing	Hypersomnia	Abnormal movements/behaviors	Composite sleep disturbance
Roberts 1999	PCS					▼		▲		
El-Sheikh 2015	CSS									▲
Troxel 2020	CSS	▲		▲	▲					▲
van de Straat 2020	PCS									▲
Hall 1999	CSS					▲				
Roberts 2004	CSS					▲				
Hall 2009	CSS	▼	▲	▲	▼					▲
Gu 2010	CSS	▲3						◄►2		▲
Lallukka 2010	CSS					▲				
Nomura 2010	CSS					▲				
Bøe 2012	CSS	▲				▲				
Mazzotti 2012	CSS									▲
Grandner 2013	CSS		▲			▲4	▲2	▲		
Kidwai 2013	CSS					▲				
Gjevre 2014	CSS							▲		
Whinnery 2014	CSS	▲2						▲		
Ding 2015	CSS	▲	▲			▲				
Peltzer 2015	CSS					▲				
Peltzer 2016	CSS	▲						◄►		
Palmer 2017	CSS					▲5				
Perales 2017	CSS	▲								
Vermeiren 2018	CSS	▲								
Peltzer 2019	CSS					▲				
Li 2020	CSS									▲
Adler 2000	CSS		▲							
Goodin 2010	CSS									▲
McHale 2011	CSS	▲								
El-Sheikh 2013	CSS	▲			▲					▲
Jarrin 2013	CSS	▲	▲					▲		▲
Jarrin 2014	CSS	◄►2				▲		▲		◄►
Kim 2017	CSS					▲				
Counts 2018	CSS									▲
Bazargan 2019	CSS					▲				
Nagata 2019	CSS					▲2				
Nasim 2019	CSS	▲								
Zvolensky 2021	CSS					▲				
Binomial proportions % (95% CI)		92.3 (69.3, 99.2) p 0.003	100.0 (62.1, 100.0) p 0.062	100.0 (33.3, 100.0) p 0.500	66.7 (17.7, 96.1) p >0.999	94.1 (75.6, 99.4) p <0.001	100.0 (14.7, 100.0) p >0.999	100.0 (67.0, 100.0) p 0.031	—	100.0 (80.0, 100.0) p 0.001

LEGEND

Study design: CSS = Cross-Sectional Study; PCS = Prospective Cohort Study; RCS = Retrospective Cohort Study

Effect direction: upward arrow ▲= expected direction (low SES → poor sleep), downward arrow ▼= opposite direction (high SES → poor sleep), sideways arrow ◄►= no direction/mixed effects/conflicting findings

Sample size: Large arrow ▲ >1,500; medium arrow ▲ 250-1,500; small arrow ▲ <250

Study quality (denoted by row colour): green = good; amber = fair; red = poor

Table S1—Characteristics of included studies and narrative presentation of main outcomes and significant interactions/mediations for the association between SES and sleep outcomes.

Study	Design/Population	SES measures	Sleep measures	Main effects	Interactions/Mediations
Hapte-Gabr 1991	Cross-sectional 3097 adults ≥65y from the general population of two Iowa counties	Education (less than high school, high school, more than high school) Employment status (working, not working)	Self-reported sleep latency (>30 min vs <30 min) and sleep duration	Working women and with higher education got fewer hours of sleep than did not working and less educated women	
Moffitt 1991	Cross-sectional 1765 adults from the general population of three local government areas in South Australia	Annual household income	Sleep subscale of the Nottingham health profile	Low income was associated with more sleep problems	
Weyerer 1991	Cross-sectional 1536 subjects >15y from the general population of three rural communities in Upper Bavaria, Germany	Occupational class (upper/middle vs lower)	Insomnia symptoms assessed with the Clinical Interview Schedule	There was no significant relationship between occupational class and mild or moderate/severe insomnia	
Hopton 1992	Cross-sectional 830 general practice attenders >16 y in Lothian region, Scotland	Social class (based on occupational classification) Home and car ownership Education (having further education vs not) Employment status (employed vs unemployed)	Sleep subscale of the Nottingham health profile (zero vs positive)	Less education and no home ownership predicted greater sleep distress	
Kim 1994	Cross-sectional 5198 adults 20-59y from the general population of Korea	Education (no regular schooling and primary school, middle school, high school, junior college and over)	Sleeping time (adequate vs inadequate)	Inadequate sleeping was not related with educational attainment	
Blazer 1995	Cross-sectional 3976 adults ≥65y from the general population of five counties in North Carolina	Education	Insomnia symptoms (high vs low nighttime sleep complaints)	Education was not associated with sleep complaints	
Geroldi 1996	Cross-sectional 449 adults ≥75y from the general population of Brescia and Padua, Italy	Principal lifetime occupation (white-collar workers, tradesmen and craftsmen, blue-collar workers, housewives)	Insomnia symptoms frequency (five-point scale)	White-collar workers had significantly less insomnia symptoms than blue-collar workers	

Ohayon 1996	Cross-sectional 5622 subjects ≥15y from the general French population	Educational level (high vs low) Monthly family income (high vs low) Employment status (without work vs working)	Sleep satisfaction (composite, dichotomous)	Low educational level and family income are associated with sleep unsatisfaction	Sleeping habits and health status attenuated the effect of income on sleep satisfaction
Rásky 1996	Cross-sectional 8747 adults 20-59y from the general population in 79 rural communities of Styria, Austria	Employment status (employed vs unemployed)	Sleeping disorders (single question, yes vs no)	The unemployed individuals more often reported sleeping disorders than the employed individuals	
Breslau 1997	Cross-sectional 973 adults 26-36y insured in a health maintenance organization in southeast Michigan	Education (<high school, high school, some college, college) Employment status (employed full-time vs employed part-time or unemployed)	Daytime sleepiness (five items from the Sleep-Wake Activity Inventory)	Those employed full-time had more sleepiness than those employed part-time or not employed	
Fabsitz 1997	Cross-sectional 8438 men 33-51y, part of an established cohort of US veteran twin pairs	Employment status (full- or part-time vs. none) Education	Insomnia symptoms frequency (Jenkins Sleep Questionnaire, six levels)	Employment was related to reduced risk of insomnia symptoms	
Rona 1997	Cross-sectional 14674 children 5-11y from primary schools in England and Scotland	Paternal social class (non-manual, skilled manual, semi- and unskilled) Maternal educational level (college or university, secondary education, primary or no education)	Parent-reported nocturnal enuresis (< 1 week vs ≥1 week)	Parental SES was not associated with nocturnal enuresis in children	Girls whose fathers' social class was non-manual or skilled manual had lower prevalence of nocturnal enuresis than boys from non-manual class fathers
Schechtman 1997	Cross-sectional 485 adults >67y enrolled in three linked clinical studies in Seattle, Atlanta, and Farmington	Education (years)	Insomnia symptoms frequency (summary score)	Limited education predicted higher insomnia symptoms	
Rona 1998	Cross-sectional 14372 children 5-11y from primary schools in England and Scotland	Paternal social class (non-manual, skilled manual, semi- and unskilled) Maternal educational level (college or university, secondary education, primary or no education)	Parent-reported sleep disturbance (singe question, at least once a week vs less than once a week)	Children whose mothers had lower education were more likely to have disturbed sleep	
Talvi 1998	Cross-sectional 885 adults 21-55y working in two oil refineries in Finland	Education (primary, intermediate, secondary school, vocational school, vocational institute, university) Occupational status (administration, maintenance, production)	Sleep disorders (single question assessing EDS, sleep latency, and insomnia)	Production workers had higher odds of poor sleep than administration workers	

Hall 1999	Cross-sectional 462 women 41-52 y from the general population of 7 US communities	Education (<12 y, 12-16 y, >16 y) Annual income (< vs >$35000)	Frequency of insomnia symptoms (at least once per week vs not at all in previous 2 weeks) Subjective sleep quality (restless vs sound)	Lower income predicted poorer sleep quality	Self-reported chronic stress mediated the relation
Roberts 1999	Cohort 2380 adults ≥50y part of a general population cohort in Alameda county, California followed for a year	Education (<12 vs ≥12 years) Financial strain (5 items about financial problems; no problems vs any problem)	Incident insomnia and hypersomnia (single question, yes vs no)	Education and financial strain were not associated with incident insomnia or hypersomnia	
Adler 2000	Cross-sectional 156 US white women 30-46 y recruited by advertisements	Subjective SES (ladder ranking 1-10)	Sleep quality and sleep-onset latency subscales of PSQI	Higher subjective SES was related to shorter sleep latency controlling for objective SES	
Ito 2000	Cross-sectional 518 adults 65y enrolled in a population-based health examination in N City, Japan	Educational attainment (less than high school vs high school or more) Employment status (working vs not working)	Self-reported sleep latency (<30 min vs >30 min), awakenings at night (0-2 vs >2), and feeling rested in the morning (yes vs no)	In men, difficulty falling asleep and frequent awakenings at night were significantly associated with retirement from work and low educational attainment respectively	
Phillips 2000	Cross-sectional 1803 adults ≥18y from the general population of Kentucky	Education Income (< vs >$25000/y)	Frequency of restless legs symptoms (never, rarely, or sometimes vs often or very often)	Lower income level was associated with more frequent restless legs symptoms	
Sadeh 2000	Cross-sectional 140 children in the 2nd, 4th, and 6th grade in Tel Aviv, Israel	Parental education (average in years)	5-day actigraphy (sleep onset, time in bed, sleep efficiency, number of awakenings)	The parents' higher education level was associated with improved sleep quality (higher sleep percentage and less night wakings)	
Gallant 2001	Cohort 1266 adults ≥60 y from the general US population followed for three years	Education (six levels) Annual household income (ten levels)	Sleep duration (less than 6h or more than 9h, 6h or 9h, 7h or 8h)	Greater income predicted better sleep habits in white women	
Hublin 2001	Cross-sectional 12423 twin adults 33-60y from the general population in Finland	Education level (primary, secondary, or tertiary) Working status (working vs not working)	Insufficient sleep (more than an hour difference between sleep need and actual sleep)	Working was associated with insufficient sleep than not working. Less education was associated with insufficient sleep only in men.	

Ohida 2001	Cross-sectional 31260 adults ≥20y from the general population in Japan	Employment status (employed vs unemployed)	Insufficient sleep (insufficient/very insufficient vs very sufficient/sufficient) Short sleep duration (fewer than 5h/5-6h vs 6-7h/7-8h/8-9h/9h or more)	Unemployed had lower odds for insufficient and short sleep than employed	
Pallesen 2001	Cross-sectional 2001 adults from the general population in Norway	Composite measure of education and income (below vs above mean)	Insomnia symptoms based on DSM-IV criteria (questionnaire)	Low SES did not predict DSM-IV insomnia diagnosis but predicted greater sleep latency, more early morning awakenings and less dissatisfaction with current sleep	
Sutton 2001	Cross-sectional 10702 adults ≥15y from the general population in Canada	Education (some secondary or less, secondary graduation, some post-secondary, post-secondary degree or diploma) Income adequacy (lowest, next to lowest, middle, next to highest or highest) Working status (not in the labor force, usually work days, regular shift work)	Insomnia (single question, yes vs no)	Low socioeconomic status, reflected by having some secondary education or less, lowest income adequacy, and not being in the labor force, was associated with the presence of insomnia	
Åkerstedt 2002	Cross-sectional 5231 adults 19-65y employed in 40 companies in central Sweden	Occupational class (higher white collar, lower white collar, blue collar)	Insomnia symptoms frequency index	Occupational class was not related to insomnia symptoms	
Li 2002	Cross-sectional 9851 adults 18-65y from the general population in Hong Kong	Education level (tertiary or above, secondary, primary/below) Employment status (employed, student, housewife, unemployed, retired)	Insomnia symptoms (sometimes or always vs no or seldom) at least three times per week within the last month	Housewives and unemployed had higher odds of insomnia symptoms than employed.	Low education was associated with insomnia in men but not in women
Moore 2002	Cross-sectional 1139 adults from the general population of 3 Michigan counties	Years of education Annual income	Self-reported sleep quantity (hours daily) and quality (scale 1-5)	Better sleep quality was significantly associated with higher education and income but not sleep quantity	
Ohayon 2002	Cross-sectional 3719 adults ≥15y from the general population in South Korea	Education (never gone to school, less than 11 years school, 12 years school, non-university diploma, university) Employment status (daytime worker, shift/night work, unemployed, not working, student)	Insomnia symptoms at least three days per week	Having no or little education and being a shift worker was associated with complaints of non-restorative sleep	

Rocha 2002	Cross-sectional 1066 adults from the general population in Bambui, Brazil	Years of education (0, 1–3, 4–7, 8+) Current employment situation (working, not working, retired)	Insomnia symptoms during the last 30 days, at least three times a week or more, with any level of distress	Insomnia was independently associated with less education
Chervin 2003	Cross-sectional 145 children of 2nd and 5th grade from 6 elementary schools in Ypsilanti, Michigan	Financial need (participation in the school lunch assistance program)	22-item SDB subscale of the Pediatric Sleep Questionnaire (high risk score ≥0.33)	SES showed no association with SDB risk after controlling for BMI
Doi 2003a	Cross-sectional 4722 workers of a telecommunications company in Tokyo, Japan	Education (< or >high school)	Excessive daytime sleepiness (ESS score >10)	EDS was not associated with educational status
Doi 2003b	Cross-sectional 4868 workers of a telecommunications company in Tokyo, Japan	Education (< or >high school)	Sleep quality (PSQI global score >5)	Lower education was associated with poorer sleep quality
Kravitz 2003	Cross-sectional 11222 women 40-55y from the general population of seven US cities	Educational level (<12th grade, 12th grade or high school diploma or equivalent, some college, college graduate, graduate studies) Current employment (≥35h/week, <35h/week, not employed) Financial strain (paying for basic needs; very hard, somewhat hard, not very hard)	Sleeping difficulty (single question, yes vs no)	Higher levels of educational attainment were associated with sleep difficulty
Larsson 2003	Cross-sectional 4648 adults 20-69y from the general population in Norrbotten, Sweden	Occupation (workers in service or industry vs professionals, higher civil servants, and self-employed)	Sleep apnea symptoms	Higher occupational class was associated with snoring
Hara 2004	Cross-sectional 1066 adults from the general population in Bambui, Brazil	Years of education (0, 1–3, 4–7, 8+); Monthly personal income (none, <1, 1.0–1.9, ≥2.0 Brazilian minimum wages); Monthly family income (<2.0, ≥2.0 Brazilian minimum wages); Current employment situation (student, working, unemployed, retired)	Excessive daytime sleepiness three or more times per week with consequent impairment of daily activities	Lower family income was associated with EDS
Paine 2004	Cross-sectional	Employment status (unemployed vs employed)	Insomnia symptoms (difficulty falling asleep, frequency of nocturnal	Being unemployed increased the risk of reporting having difficulty falling

	2670 adults 20-59 y from the general population in New Zealand		awakenings, difficulty getting back to sleep, waking too early, wake feeling refreshed)	asleep and waking 3 or more times during the night.	
Roberts 2004	Cross-sectional 5118 9th grade adolescents from 13 high schools in 4 Texas counties	Self-reported family's standard of living (very well off, living comfortably, just getting along, nearly poor or poor)	Insomnia symptoms based on DSM-IV criteria (questionnaire)	Poor standard of living predicted insomnia diagnosis	
Su 2004	Cross-sectional 2045 adults ≥65y from the general population of Shi-Pai community in Taipei, Taiwan	Education (illiterate vs. non-illiterate)	Insomnia symptoms based on DSM-IV criteria	Lack of education was associated with insomnia symptoms	
Terzano 2004	Cross-sectional 3284 adults enrolled by general practitioners in Italy	Education (senior high school or university vs elementary or junior high school) Employment (yes vs no)	Insomnia symptoms three times or more per week	Unemployment and low education were risk factors for insomnia	
Acebo 2005	Cross-sectional 169 children 1-5 y recruited by advertisements in Rhode Island	Hollingshead score (5 classes)	Sleep diary (bed time, rise time, time in bed) 1-week actigraphy (sleep start time, sleep end time, sleep period time, sleep time, wake time, wake bouts, sleep efficiency, longest continuous sleep)	Children with a lower family SES rose later in the morning, spent longer times in bed, and had more nocturnal wake time, more wake bouts, shorter longest continuous sleep bouts and lower sleep efficiency. Children in families with lower SES had more nightly variability in bedtimes, sleep start times, and sleep period times.	
Averina 2005	Cross-sectional 3705 adults from the general population in Arkhangelsk, Russia	Education (secondary, secondary professional, high) Occupation (high, average, low income, retirement pension)	Insomnia symptoms (single question, yes vs no)	Insomnia symptoms were more prevalent in occupations with low salary and pensioners vs high salary and in participants with lower vs middle education.	
Chen 2005	Cross-sectional 39588 subjects ≥15 y from the general population in Taiwan	Annual income (very low, low, middle, high) Education (elementary or lower, some high school, high school graduate, some college or higher) Employment status (employed, unemployed, homemaker, student, retired/disability/other)	Insomnia self-assessment inventory score	Higher education predicted higher insomnia score. Unemployed, retired/disability pensioners and homemakers had higher insomnia scores than the employed.	In women lower education was associated with higher insomnia score

Fass 2005	Cross-sectional 15699 adults, part of nine existing US cohorts	Education (college or less)	Nocturnal gastroesophageal reflux (single question, two or more times per month)	College education was associated with less frequent heartburn during sleep	
Gander 2005	Cross-sectional 5441 adults 30-60 y from the general population in New Zealand	Eligibility for community services card (yes vs no)	EDS (Epworth Sleepiness Scale score >10)	Eligibility for a community services card was not associated with EDS	
Gellis 2005	Cross-sectional 575 adults from the general population in Shelby County, Tennessee	Individual SES: years of education Household SES: highest level of formal achievement attained by a member of the household	DSM-IV insomnia criteria assessed by 2-week sleep diary and impairment questionnaires (ESS score >7.4 or Fatigue Severity Scale score >5.5 or Beck Depression Inventory score >10 or State-Trait Anxiety Inventory score >37 or Insomnia Impact Scale score >125)	Higher individual and household SES subjects were less likely to suffer from insomnia	
Hale 2005	Cross-sectional 7095 adults 25-64y from the general US population	Educational status (<high school, high school graduate, college graduate, graduate school) Employment status (no job, retired, work hours <36, work hours 36–50, work hours 50 plus)	Sleep duration (<6.5h, 6.5-8.5h, >8.5h)	Lower education was associated with both short and long sleep. Unemployment and retirement were associated with long sleep	
Hsu 2005	Cross-sectional 197 women 40-60y recruited from local activity centers of five communities in a small town in central Taiwan	Employment status (employed, unemployed)	Sleep quality (PSQI global score >5)	Employment status was not related to sleep quality	
Kim 2005	Cross-sectional 2913 adults 35-65y part of a cohort of employees in 5 state agencies in Wisconsin	Education (some college or less, college graduate or higher)	Excessive daytime sleepiness (13-item questionnaire subjected to factor analysis)	Lower education was related to worse perceived sleepiness and sleep propensity in passive situations	
McLaughlin Crabtree 2005	Cross-sectional 3371 children 2-7 y from public schools in Jefferson County, Kentucky	Median annual income by zip-code residence (> or <$41994)	Parent-reported sleep duration, bed time, rise time, and behaviors	Low SES children were more likely to have shorter sleep duration, problematic bedtime behaviour, and EDS.	Older children in the lower SES group reported to have more sleep behaviour problems than the younger

			(bedtime behaviors and daytime sequelae)		children. Older African American females in the lower SES group were reported to obtain the least sleep, while older Caucasian males in the upper SES group were reported to obtain the most sleep.
Ohayon 2005	Cross-sectional 1026 adults ≥60y from the general population in Paris, France	Years of education (0, 1-7, 8-10, 11-12, >12)	Sleep duration (<4.5h, 4.5-6h, 6-8h, 8-9.5h, >9.5h) Sleep latency (<30min, 30-80min, >80min)	Lower education was associated with short sleep, long sleep, and greater sleep latency	
Phillips 2005	Cross-sectional 13563 adults 47-69 y from the general population of 4 US communities	Education (less than high school, high school completion, more than high school) Annual income (<$16000, $16000-50000, >$50000)	Maastricht Questionnaire insomnia symptoms (difficulty falling asleep, sleep continuity disturbance, nonrestorative sleep)	Lower education and income were associated with more complaints of difficulty falling asleep and waking up repeatedly. Those with lower education were less likely to wake up feeling unrefreshed.	
Tjepkema 2005	Cross-sectional 36984 adults ≥15y from the general population of Canada	Education (less than secondary graduation, secondary graduation, some postsecondary, postsecondary graduation) Household income (lowest, lower-middle, upper-middle, highest) Employment status (employed vs unemployed)	Insomnia symptoms frequency (none of the time, a little of the time, or some of the time vs most of the time or all of the time)	Those with less education, lower income, and unemployed were more likely to report insomnia	Adjusting for lifestyle factors (BMI, physical activity, drinking or drug use), shift work, life and work stress, chronic conditions, activity limitations, mood and anxiety disorders fully attenuated the effect of income
Tworoger 2005	Cross-sectional 73 women 20-40y participating in an intervention study in Seattle	Employment status (employed vs. unemployed)	10-day actigraphy (sleep efficiency, WASO) Sleep quality (PSQI global score >5)	Unemployed women had higher sleep efficiency and less WASO than employed. Unemployed women reported worse sleep quality than employed	
Ursin 2005	Cross-sectional 8860 adults 40-45y from the general population in	Education (none to 10th grade vs high school to graduate university) Family income (< vs >NOK 400000)	Sleep duration	Men with high education levels slept longer than did men with low education levels. Women with high	

	Hordaland county, Norway			family income slept less than did women with low incomes.	
BaHammam 2006	Cross-sectional 1012 children 6-13y from elementary schools in Riyadh, Saudi Arabia	Maternal education (less than high school vs high school or higher) Maternal working status (yes vs no)	Sleep duration	Children whose mothers had high school education or higher had longer sleep duration compared to children whose mothers had lower educational level	
Kronholm 2006	Cross-sectional 7262 adults from the general population in Finland	Education (basic, secondary, higher) Employment status (full-time, part-time, student, retired, unemployed, at home)	Sleep duration deviation (from the mean sleep duration of the sample)	Unemployed and retired exhibited the highest deviation in sleep duration	
Lauderdale 2006	Cross-sectional 669 adults 38-50 y, part of an established general population cohort in Chicago	Education (less than high school, high school graduate, some college, college graduate, more than college) Income (7 levels) Employment status (full-time, part-time, not employed)	3-day actigraphy (total time in bed, sleep latency, total sleep duration, and sleep efficiency)	Higher income was significantly associated with shorter sleep latency and greater sleep efficiency. Higher education was significantly associated with greater sleep efficiency.	The effects of education, income, and employment status on sleep efficiency was significantly larger in Blacks comparing to Whites
Sekine 2006	Cross-sectional 3556 adults (government civil servants) in Japan	Employment grade (highest, intermediate, lowest)	Sleep quality (PSQI global score >5.5)	Lowest-grade employees had poorer sleep quality compared to highest-grade	The effect was attenuated and no longer significant when work (work hours, shift work, job control, demand, support) and family (domestic role, family-to-work and work-to-family conflict) characteristics and longstanding illnesses were adjusted for
Adam 2007	Cross-sectional 2454 children and adolescents 5.5-19y members of a general population US cohort	Family income Parental education (average parents' years of education)	Child- or parent-reported sleep duration	Family income and parental education did not predict child's sleep duration	
Friedman 2007	Cross-sectional 94 women ≥55 y recruited from a prior longitudinal study in Wisconsin	Household income Years of education	NightCap sleep recordings at home for 4 nights (sleep latency, sleep efficiency) Sleep quality (PSQI global score)	Greater income and more years of education significantly predicted reduced sleep latency and greater sleep efficiency. Greater income significantly predicted better sleep quality.	Health indicators (self-rated health, recent and chronic illnesses) and psychological characteristics (depression, neuroticism) attenuated the associations between

					education and sleep efficiency and between income and sleep quality
Ozden 2007	Cross-sectional 1339 children 6-12y from primary schools in Ankara, Turkey	Parental education (primary school or less vs junior high school or more)	Parent-reported nocturnal enuresis	Lower parental education was associated with presence of nocturnal enuresis in children	
Rangarajan 2007	Cross-sectional 1266 adults from the general population in Bangalore, India	Education (below high school vs high school and above) Monthly per-capita income (2 cut-offs: US$2/day and US$1/day)	NIH/IRLSSG criteria for diagnosis of RLS (questionnaire)	RLS was associated with per-capita income less than US$1/day and education less than high school level	
Stamatakis 2007	Cohort 6928 adults 16-94 y from the general population of Alameda county, California followed for 34 y	Household income (grouped in quintiles) Education (<12 y, 12 y, >12 y)	Self-reported sleep duration (<7 h vs 7-8)	The relative odds of short sleep were greater among those in the lower two income quintiles and in those with less than high school education	The increased odds of short sleep associated with low income was substantially reduced after adjusting for living conditions (marital status, home ownership, household density)
Baigi 2008	Cross-sectional 12166 adults 18-84y from the general population of Sweden	Social security recipiency	Sleep disturbances (single question, yes vs no)	Social security recipients experienced more sleep disturbances	Adjusting for lifestyle habits, psychological and physiological symptoms partially attenuated the relationship
Blay 2008	Cross-sectional 6961 adults ≥60y from the general population in Rio Grande do Sul, Brazil	Income (< vs ≥US$200/month) Years of education (0–3 vs ≥4)	Sleep disturbance (single question, yes vs no)	Low income and education were independent risk factors for self-reported sleep disturbance	
Ekici 2008	Cross-sectional 9187 parents and grandparents of primary school children in Kirikkale, Turkey	Education (4 levels) Income (>$200 monthly; <$200 monthly)	Snoring intensity (5-point scale) Observed apnea frequency, daytime sleepiness, frequent awakenings (5-point frequency scale)	Lower education was associated with higher frequency of observed apnea, daytime sleepiness, and awakenings. Higher income was associated with higher frequency of awakenings.	
Inan 2008	Cross-sectional 1626 children 7-11y from primary schools in Edirne, Turkey	Maternal education (low vs high) Maternal employment status (working vs not working)	Child- or parent-reported nocturnal enuresis at least two nights a week	Low educational level of mother increased the odds of nocturnal enuresis in the child	
Jean-Louis 2008	Cross-sectional	Years of education Income	Insomnia symptoms (Comprehensive	Lower income was associated with insomnia symptoms	

	1394 women >50 y from the general population in New York		Assessment and Referral Evaluation sleep subscale)		
Kuehni 2008	Cross-sectional 6811 White and South Asian children 1-4 y from the general population of Leicestershire, UK	Paternal and maternal education (completed full-time education at ≤16 y vs older)	Parent-reported habitual snoring (almost always vs never/only with colds/sometimes apart from colds)	Habitual snoring was associated with low parental education	Environmental factors (maternal smoking during pregnancy, current parental smoking, electrical cooking, central heating, exposure to road traffic, household pets, number of siblings, nursery care, and breastfeeding >6 months) mediated the effect of parental education.
Li 2008	Retrospective cohort 12938 adults >35 y hospitalized for OSA from 1997 to 2001 in Sweden	Education (<10 y, 10-12 y, >12 y)	OSA (ICD-10 code G47.3)	Increased risk for OSA was observed in men with middle educational level, while those of high educational level had a decreased risk. No association was observed in women.	
Mezick 2008	Cross-sectional 187 adults 45-75 y part of a larger cohort in Pittsburgh metropolitan area	Composite SES score (education and annual income)	2-night home PSG (sleep duration, sleep latency, sleep efficiency, WASO, sleep architecture, AHI) 10-day actigraphy (sleep duration, sleep latency, sleep efficiency) Sleep quality (PSQI) EDS (ESS)	Lower SES was associated with longer actigraphy-measured latency, more WASO, and poorer sleep quality on PSQI	Environmental factors (outside noise, room temperature and health worries) and negative affect were statistical mediators of the relationship between SES and PSQI scores
Roberts 2008	Cohort 4175 adolescents 11-17y from the general population of Houston followed for a year	Family income (less than $35,000, $35,000 to 64,999, $65,000 and above)	DSM-IV insomnia criteria	Family income was not associated with incident insomnia	
Virtanen 2008	Cohort 10100 adults 20-54y from the general population in Finland followed for 5y	Employment status trajectory (stable, upward, unstable, downward, chronic unemployment)	Sleep duration	Upward trajectory had increased sleep duration. Downward trajectory and chronic unemployment had decreased sleep duration	
Xiang 2008	Cross-sectional	Education level (college or above, senior high school, junior high school, primary school, illiterate)	Insomnia symptoms lasting 2 weeks or longer in the past 12 months	Being illiterate was associated with lower odds of difficulties maintaining	

	5926 subjects ≥15y from the general population in Beijing, China	Employment status (employed vs unemployed)		sleep and early morning awakenings in the urban sample	
Yao 2008	Cross-sectional 187 adults ≥65y from the general population of a suburban district in Taipei, Taiwan	Education (no formal education, elementary, junior high, senior high, college and above)	Sleep quality (PSQI global score >5)	Those with college education and above had significantly poorer sleep quality than those with no formal education	
Arber 2009	Cross-sectional 8578 subjects 16-74 y from the general British population	Educational qualifications (degree or higher, professional and A levels, lower, no) Employment status (full-time, part-time, unemployed, economically inactive) Housing tenure (owns accommodation, rents from public housing, rents from other sources) Household income (5 levels)	Insomnia symptoms (4 nights or more vs less often) assessed from a single question in Clinical Interview Schedule-Revised	Individuals with disadvantaged SES report more sleep problems than those living in more advantaged circumstances	Smoking, worries and self-reported health variables (depression, self-rated health, number of chronic illnesses) attenuated the relationship between sleep problems and all measures of SES except for education
Baker 2009	Cross-sectional 959 women 18-64y from the general US population	Employment status (working full-time, working more than one job, working part-time, student, homemaker, unemployed, retired, or disabled) Education (high school or less, graduated from high school, some vocational or college courses, graduated from college) Household income (<$35,000, $35,000–$75,000, >$75,000)	Sleep quality (single question, dichotomous) Daytime sleepiness (single question, dichotomous)	Being disabled and having lower education was associated with more daytime sleepiness	
Cho 2009	Cross-sectional 5000 adults 20-59y from the general population of Korea	Occupation (agriculture/fishery/forestry, self-employed, blue collar, white collar, housewife, student, unemployed/other) Monthly income (Korean won <1,500,000, 1,500,000-3,000,000, 3,000,001-4,500,000, >4,500,000)	Insomnia symptoms (difficulty initiating or maintaining sleep, yes vs no)	Lower income was associated with higher odds of insomnia symptoms	
Hall 2009	Cross-sectional 368 midlife women from the general population of 4 US cities	Educational attainment (college or advanced degree vs without) Financial strain (somewhat to very difficult paying for basics vs not difficult at all)	Subjective sleep quality (PSQI) 3-night home PSG assessing sleep duration and continuity (latency, WASO, efficiency)	Financial strain was a significant correlate of poorer subjective sleep quality and PSG-assessed sleep continuity	

Jiang 2009	Cross-sectional 1311 children 3-4y from kindergartens in Shanghai, China	Parent's education level (< vs ≥high school) Household income (≥ vs <3000 yuan/month)	Parent-reported sleep duration	Children whose mothers had higher education levels slept less	
Joo 2009	Cross-sectional 4405 adults 40-69y from the general population of Ansan, Korea	Education (<10 years, 10–14 years, ≥15 years) Income (<1000, 1001–2000, 2001–4000, >4000 Won/month)	EDS (ESS score >10)	A higher level of education was inversely associated with the risk of EDS.	
Kim 2009	Cohort 1204 adults ≥65y from the general population in Kwangju, South Korea followed for 2y	Education (no vs yes) Housing (owned vs rented) Past occupation (manual vs non-manual) Current employment (yes vs no)	Prevalence, incidence, and persistence of insomnia symptoms (difficulty in initiation or maintenance of sleep 3 nights or more per week)	Incident insomnia was independently associated with previous manual occupation	
Krueger 2009	Cross-sectional 110441 adults from the general US population	Hours worked per week (>40, 35-40, <35, not working) Education (less than a high school degree, a high school degree, some college but less than a 4-year degree, a 4-year degree or more) Family income Income portfolio (ranged from 0 to 6 and measured the number of income sources per family member)	Self-reported sleep duration (<6, 6, 7, 8, >8 h)	Those who are not working have increased odds of both short and long sleep. High levels of education or income or additional sources of income per family member are associated with lower odds of short or long sleep.	After adjustment for health behaviors (physical activity, smoking status, alcohol consumption) and self-reported health status (cardiovascular disease, acute or chronic respiratory condition, diabetes, pain, depression, anxiety, BMI, functional limitations) the relationships were partially attenuated
Reddy 2009	Cross-sectional 360 adults 30-65 y from the general population in South Delhi, India	Kuppuswami socioeconomic status score	OSA (AHI ≥5 in PSG)	Prevalence of OSA was not significantly different across the socio-economic strata	
Sivertsen 2009	Cross-sectional 47700 adults 20-89y from the general population of Nord-Trøndelag County, Norway	Educational level (primary, secondary, or college/university)	Insomnia symptoms (difficulties initiating or maintaining sleep, never/occasionally vs often/almost every night)	Insomnia was more frequent among less educated participants than those with college or university degrees	
Vincent 2009	Cross-sectional 5877 adults 15-54y from the general US population	Employment status (student, working, homemaker, other)	Sleep duration (<7h, 7-8h, >8h)	Long sleep was associated with being unemployed	

Yang 2009	Cross-sectional 1058 children 6-12y from primary schools in Liaocheng city, China	Highest parental education (primary school, high school and tertiary education)	Parent-reported sleep behaviour (sleep delays, enuresis at night, fear of sleeping alone or darkness)	Higher parental education was associated with more sleep behaviour problems	
Fritsch Montero 2010	Cross-sectional 3867 adults 18-64y from the general population of Gran Santiago, Chile	Schooling (upper, middle, basic, none) Employment status (10 levels) Per capita income (in quartiles) Income decrease (yes vs no) Type of home (6 levels)	Revised Clinical Interview Schedule sleep score >1	Unemployed, housewives and occasional workers had higher odds of sleep problems than employed. Poorer house condition was associated with more sleep problems.	
Goodin 2010	Cross-sectional 149 college students 18-45 y from a single mid-Atlantic university	MacArthur Scale of Subjective Social Status	Sleep quality (PSQI global score)	There was no association between perceived social status and sleep quality	Perceived social status was negatively associated with sleep quality for Asian and African Americans but not for Caucasian Americans
Grandner 2010	Cross-sectional 159856 adults from the general US population	Education (less than high school, high school graduate, some college, college graduate) Income level (8 levels) Employment status (employed, self-employed, retired, student, homemaker, unemployed <1 year, unemployed >1 year, unable to work)	Frequency of sleep complaints (trouble falling asleep or staying asleep or sleeping too much) >5 days in the last 2 weeks	Socioeconomically disadvantaged have higher likelihood of sleep complaints	Racial/ethnic differences show relationships with lower income and educational attainment in Hispanic/Latino men and women respectively, employment status in African American men, and educational attainment in Asian/Other women
Gu 2010	Cross-sectional 15638 adults >65 y from the general population of 22 provinces in China	Education (1+ years of schooling vs 0) Self-reported family economic condition (good vs poor, as compared to other families) Access to healthcare when in need (yes vs no)	Sleep quality (single question, good/very good vs other) Sleep duration (<6, 6, 7, 8, 9, >9 h)	Good family economic status and adequate access to healthcare increased the odds of reporting good sleep quality and decreased the odds of reporting ≤ 6 h of daily sleep.	
Knutson 2010	Cross-sectional 61027 adults from the general US population	Education (< 12th grade, high school graduate, some college, college degree or higher) Income (divided into quartiles) Employment status (full-time worker, part-time worker, student, retired/homemaker, unemployed)	Sleep duration <6h	Those with some college education were significantly more likely to be short sleepers than those with college degree. Part-time workers, students, retired/homemakers and unemployed were significantly less likely to be short sleepers than full-time workers.	

Lallukka 2010	Cross-sectional 7957 adults 40-60 y recruited from the staff of the City of Helsinki, Finland	Past SES (parental education, childhood economic difficulties) Present SES (own education, occupational class, household income, housing tenure, current economic difficulties)	4 insomnia items from the Jenkins Sleep Questionnaire (complaints of insomnia at least once a week during the previous month were used as a cut-off point)	Childhood and current economic difficulties showed associations with complaints of insomnia among both women and men. Not owing a house was associated with complaints of insomnia only among men.	The association between insomnia and childhood economic difficulties or housing tenure was stronger among men
Li S 2010	Cross-sectional 20152 children 5-12 y from 55 elementary schools in 8 Chinese cities	Parental educational levels (middle school or under, high school, college or above) Household income (< 800, 800-2500, ≥ 2500 RMB/person/month)	Parent-reported habitual snoring (almost always/frequently vs occasionally/never in a single question from the Children's Sleep Habits Questionnaire)	Lower family income and lower father's educational level were independent predictors of habitual snoring	
Li SX 2010	Cross-sectional 8558 parents of primary school children in Hong Kong	Employment status (employed vs unemployed) Education level (≤primary school, secondary school, ≥tertiary school) Housing type (private, public, semi-public/other) Monthly family income (HK$ ≤10,000, 10,001-20,000, ≥20,001)	Nightmare frequency (none/seldom, 1-2 times/month, 1-2 times/week, >2 times/week)	Low monthly family income was significantly associated with nightmare frequency	
Meltzer 2010	Cross-sectional 154957 children and adolescents visiting 32 pediatric practices affiliated with a tertiary hospital in Philadelphia	Median household income according to residence zip code (in quartiles)	Sleep disorders (ICD-9 codes in medical records)	Higher income quartile was associated with less frequent diagnosis of sleep disorders in preschool- and school-aged children and adolescents	
Mittelmark 2010	Cross-sectional 4916 women 15-49y from the general population of Ghana	Education (secondary or higher, primary, no education) Literacy (can vs cannot read) Assets (ownership of consumer items and dwelling characteristics, in quintiles)	Hours of rest per day (<7 vs ≥7)	Lower education but higher wealth index predicted rest deprivation	
Nomura 2010	Cross-sectional 1007 and 785 adults from the general population of South Korea and Taiwan respectively	Educational level (<12, 12–15, >15 years) Self-rated household income (low, intermediate, high)	Insomnia symptoms (difficulty initiating sleep, difficulty maintaining sleep, early morning waking) on a regular, nightly basis for more than two weeks	Low household income was significantly associated with insomnia symptoms in South Korea, but not in Taiwan	

Paparrigopoulos 2010	Cross-sectional 1005 adults from the general population in Greece	Educational level (high, middle, low) Social class (ESOMAR 1997 index categorised as upper/upper middle, lower middle, lower)	Athens Insomnia Scale score ≥6	Participants of lower social class and education were more likely to suffered from insomnia	
Park 2010	Cross-sectional 6510 adults 18-64y from the general population in Korea	Education (less than middle school, middle school degree, high school degree, college degree or higher) Employment status (full-time, part-time, unemployed)	Sleep duration (5 h or less, 6, 7, 8, and 9 h or more)	A high level of education was associated with lower odds of sleeping for 5 h or less or for 8 h or more. Compared with subjects who had full-time jobs, unemployed subjects had higher odds of sleeping for either 5 h or less or 8 h or more.	
Patel 2010	Cross-sectional 9714 adults from the general population of 5 counties in Pennsylvania	Income status (above vs below the poverty threshold) Education (less than high school graduate, high school graduate, some college, college graduate, post-college level) Employment status (employed, unemployed, disabled, retired, other)	Sleep quality (single question, range 1-5, cut-off 2)	Poverty, low education and unemployment/disability was associated with poorer sleep quality	The effect of income on sleep quality was larger in Whites than African-Americans, Latinos, and other races. Health indicators and lifestyle habits (self-reported health status, BMI, smoking, heavy alcohol use, diagnosis of mental illness, stress levels) attenuated the effect of unemployment and poverty.
Tomfohr 2010	Cross-sectional 128 adults 18-52 y recruited through advertisements in San Diego, California	Childhood SES: highest level of education attained by each parent (low if neither parent achieved education beyond high school, and high if either parent achieved some education beyond high school)	Sleep quality (PSQI) EDS (ESS) PSG (sleep duration, latency, efficiency, architecture, WASO)	Individuals with lower childhood SES spent more time in Stage 2 sleep and less time in SWS than participants from higher childhood SES backgrounds independently of current SES	Women from low childhood SES backgrounds had longer sleep latency than women from the high childhood SES group
Tufik 2010	Cross-sectional 1042 adults 20-80 y from the general population in Sao Paulo, Brazil	Annual household income (high, mid, low according to the Brazilian Economic Classification Criteria) Employment status (working vs not working)	OSA ICSD-2 criteria (AHI from PSG, items 2 and 5 from Berlin Questionnaire, ESS >10 and/or item 8 from PSQI, Chalder Fatigue Scale >4)	SES was not associated with OSA	Low income was a protective factor for males, but an associated factor for females
Amra 2011	Cross-sectional	Education (junior high school or less, senior high school, university)	OSA high risk (Berlin Questionnaire)	No association between education and OSA risk	

	3529 adults 18-70y from the general population of Isfahan, Iran			
Arakane 2011	Cross-sectional 340 women 40-59y visiting inpatients at wards of an obstetrics hospital in Guayaquil, Ecuador	Years of education (<12 vs ≥12)	Insomnia (Insomnia Severity Index score)	There was no association between education and insomnia
Arman 2011	Cross-sectional 2669 children from the general population in Istanbul, Turkey	SES index (occupation and educational level of parents, house ownership, number of rooms in the house, presence of various electrical devices in the house, land value of the house determined according to its location in the city, car ownership)	Parent-reported bedtime, morning waking time and total sleep duration (combining nighttime sleep and naps)	Total sleep duration decreased significantly for both boys and girls with higher SES
Bonuck 2011	Cohort 14049 children assessed at 1.5, 4.75 and 6.75 y from the general population in Avon, England	Housing inadequacy (yes vs no) Paternal social class (manual vs. professional) Maternal education (low vs high)	Parent-reported mouth-breathing, apnea, snoring (composite score)	Lower SES was associated with increased risk for SDB symptoms
Eder 2011	Cross-sectional 1000 subjects >15 y from the general population in Sweden	Educational attainment (primary, secondary, tertiary level)	Telephone interview (short sleep <6 h, long sleep >8 h, sleep quality, EDS, insomnia symptoms)	Non-college educated respondents were more likely to sleep < 6 or > 8 h per night and experience EDS than people with college educations
Hense 2011	Cross-sectional 8542 children 2-9y from primary schools and preschools in 8 European countries	Parental education (ISCED levels 0, 1, and 2 indicating low education; 3 and 4 indicating medium education, and ≥5 indicating high education)	Parent-reported sleep duration	Parental education level showed no association with sleep duration
Li 2011	Cross-sectional 6359 children 5-15y from primary schools in Hong Kong	Parental employment status (employed vs unemployed) Parental education level (≤primary school, secondary school, ≥college degree) Housing type and area (private, public, other; ≤400, 401-600, >600 m^2) Monthly family income (HK$ ≤10,000, 10,001-15,000, ≥15,001)	Parent-reported nightmare frequency (never, <1x/month, 1-2x/month, ≥1x/week)	Lower family income was significantly associated with more frequent nightmares

McHale 2011	Cross-sectional 469 Mexican American 7th grade adolescents and their older sibling recruited from schools in and around a southwestern US metropolitan area	Family economic hardship (composite score of 17-item questionnaire measuring inability to make ends meet, not having enough money for necessities, economic adjustments or cutbacks, financial strain) Parental education Family income	Self-reported sleep duration	Higher parental education and family income was associated with shorter sleep duration	
Moore 2011	Cross-sectional 247 adolescents 13-16 y recruited from an established cohort in Cleveland	Parent education (5 levels) Parent income (8 levels)	1-week actigraphy (sleep duration and coefficient of variation)	Family SES was not associated with sleep duration or variability	
Pallesen 2011	Cross-sectional 1279 11th-13th grade adolescents from high schools in Hordaland county, Norway	Parental education (primary school, vocational/high school, college/university)	Behaviorally induced insufficient sleep syndrome (excessive daytime sleepiness, short habitual sleep duration and sleeping considerably longer than usual during weekend/vacations)	Higher level of maternal education was negatively related to BIISS	
Pigeon 2011	Cross-sectional 92 adults >40 y recruited in a family medicine practice in Rochester	Employment status (employed vs unemployed) Annual household income (<$20,000 vs >$20,000) Education level (no high school diploma, high school diploma, college degree)	Sleep quality (PSQI global score >6)	Lower education was associated with poorer sleep quality	After adjusting for depression and chronic health conditions the effects were attenuated
Ryu 2011	Cross-sectional 4411 adults from the general population of 5 districts in Gwangju, Korea	Educational background (uneducated, elementary school, middle school, high school, university or higher) Average monthly family income (4 levels) Job status (unemployed, daytime work, work other than daytime)	Self-reported sleep duration (<7, 7-8, >8)	Short sleep was associated with working other than daytime and long sleep with lower education and unemployment	Health behaviors (physical activity, smoking, alcohol consumption) and conditions (BMI, pain/discomfort, depression/anxiety, cardiovascular disease, subjective health) attenuated the effects of education
Wong 2011	Cross-sectional	Monthly household income (5 levels) Education level (6 levels) Employment status (6 levels)	Sleep quality (PSQI global score >5)	Except for students, respondents in all non-full-time employment status categories had higher odds of poor	

	5001 adults from the general population in Hong Kong			sleep quality than their full-time counterparts
Zhang 2011	Cohort 1611 children 6-13y from primary schools in Hong Kong followed for 5y	Parental educational level (<12 years vs ≥12 years) Family income (≤HK$15,000/month vs >HK$15,000/month)	Insomnia symptoms ≥3 times/week over the past 12 months	Lower paternal education level was associated with incident insomnia
Adams 2012	Cross-sectional 3007 adults ≥15y from the general population of South Australia	Education (high school or less, still studying, trade/diploma, university degree or higher) Household income ($<30000, 30–60000, 60–100000, >100000)	High risk OSA (STOP-BANG questionnaire)	High risk for OSA was associated with less education and lower income
Blümel 2012	Cross-sectional 6079 women 40-59y recruited from 20 healthcare centres in 11 Latin American countries	Education (≤ vs >12 years)	Insomnia (AIS score >5) Sleep quality (PSQI global score >5)	Higher educational level was an independent risk factor related to less insomnia and better sleep quality
Bøe 2012	Cross-sectional 5781 children 11-13 y from all public and private schools in Bergen, Norway	Family economy (very good, good, average, poor) Parental education (elementary school, high school, college/university)	Parent-reported difficulties initiating and/or maintaining sleep (DIMS) (not true, somewhat true, certainly true) Parent-reported sleep duration (time in bed) (≤2 SD, −2 to ≤1 SD, −1 to +1 SD)	Children with poor family economy had significantly higher odds of reporting DIMS and short TIB. Lower maternal education was significantly associated with short TIB.
Brug 2012	Cross-sectional 7234 children 10-12y from primary schools in 7 European countries	Parental education (both parent/caregivers with fewer than 14 years of education vs at least one parent/caregiver with 14 or more years of education)	Parent-reported sleep duration	No significant differences in sleeping behavior were reported between high and lower educated parents
Calem 2012	Cross-sectional 20503 adults 16-64y from the general population of England, UK	Education level (“A-level” or higher, “O-level” or “GCSE”, left school before the age of 16 and/or with no educational qualifications) Employment status (currently in employment, currently unemployed, economically inactive)	Insomnia DSM-IV criteria	Insomnia was associated with lower levels of education, unemployment and economic inactivity
Green 2012	Cohort	Household occupational class (manual vs non-manual)	Repeated measures latent class analysis of 2 insomnia	Respondents from manual occupational classes were more likely

	2867 adults from 2 age cohorts (born in 1932 and 1952) from the general population of the greater Glasgow area, Scotland followed for 20 y		symptoms (sleep latency and maintenance) assessed in 5 time points that identified 4 classes: healthy, episodic, developing, and chronic mixed	than their non-manual counterparts to be in the Developing or Chronic Mixed latent classes relative to the Healthy class	
Guo 2012	Cross-sectional 4445 children and adolescents 5-18 y from 12 public schools in Shenyang, China	Monthly family income (<2000 RMB, 2000-5000 RMB, >5000 RMB) Parental education (both less than high school, at least one above high school, both more than high school)	Self-reported sleep duration (>7.5 h vs <7.5 h)	Family income and parental education was not associated with children reporting sufficient sleep	
Heilemann 2012	Cross-sectional 312 women of Mexican descent 21-40y recruited from advertisements in an urban Northern California community	Monthly income Employment status (employed vs unemployed)	Sleep disturbance (General Sleep Disturbance Scale score)	Low income women reported more sleep disturbance than high income	
Kachikis 2012	Cross-sectional 2670 women 18-55 y attending University of Texas Medical Branch Regional Maternal & Child Health Program clinics	Education (less than a high school diploma, high school diploma, more than a high school diploma) Employment status (employed vs unemployed) Annual household income (<$5000, $5000-$15000, >$15000) Residence in a public housing project (yes vs no)	Self-reported sleep duration Sleep quality (single question, 5 levels) Sleep adequacy (single question, 5 levels)	Shorter sleep duration was associated with higher education. Better sleep quality was associated with being employed, living in public housing and having lower income.	
Lallukka 2012	Cross-sectional 5578 adults 30-79 y from the general population in Finland	Education (<7, 7-9, 10-12, >12 years) Household income level (in quartiles) Employment status (working, unemployed, retired due to old age, retired due to disability, retired due to other reason, other)	Self-reported sleep duration (<5, 5, 6, 7, 8, 9, >9 h) Insomnia-related symptoms (Symptom Checklist-90, single question, 3 levels: no, occasional, frequent)	Those with low household income levels, the unemployed, and disability retirees were the most likely to report short or long sleep duration and poor sleep.	The association between household income level and frequent insomnia symptoms was reduced after adjusting for self-perceived health
Lima 2012	Cross-sectional 2637 adults from the general population in Campinas, Brazil	Education (0-3, 4-7, 8-11, >11 y) Per capita monthly household income (1 minimum salary or less, 1-3 times the minimal salary, 3 or more times the minimum salary) Work status (working, not working, housewife)	Sleep duration (<7, 7-8, >8 h)	Long sleep was more prevalent among those with a lower level of education, those who did not work and housewives	

		Number of household appliances (≤10, >10).			
Marco 2012	Cross-sectional 155 seventh-grade students from two urban middle schools in New England	SES factor from principal components analysis (income, education level, number of adults working in the home, and proportion of single-family homes in the neighborhood)	1-week actigraphy that assessed sleep patterns (sleep onset, sleep offset, sleep period, and minutes asleep), sleep consistency (standard deviation for each sleep outcome across nights) and sleep regularity (differences between school and weekend nights)	Adolescents living in lower socioeconomic conditions experienced significantly poorer sleep outcomes in terms of the timing, duration, consistency, and regularity across the week	
Mazzotti 2012	Cross-sectional 16680 adults ≥65y residents in catchment areas within eight low- and middle-income countries	Education (none, not completed primary, completed primary, completed secondary, completed tertiary) Assets (in quartiles) Food insecurity (no vs at least occasional) Income	Sleep disturbance (single question, yes vs no)	Higher educational status was significantly associated with a decreased risk of reporting sleep complaints	
Nicholson 2012	Cross-sectional 5107 infants 0-1 y and 4983 children 4-5 y from the general population of Australia that were reassessed 2 years later	Composite variable (family annual income, years of parental education, parental occupational status) divided in quintiles	Two or more parent-reported sleep problems (difficulty getting to sleep, not happy sleeping alone, waking during the night, and restless sleep), four or more nights per week	Lower SES was associated with increased odds for parent-reported sleep problems	
Nishikitani 2012	Cross-sectional 1344 women recruited from the alumnae of a national university in Tokyo, Japan	Employment status (housewives, working with or without family demands)	Short sleep (<6h) Sleep latency (>30 min) Insomnia symptoms	Shortage of sleep was significantly more frequent in both sets of working women than in housewives. Sleep dissatisfaction was significantly more frequent among working women without family demands compared to housewives.	
Rosenbaum 2012	Cross-sectional 11302 young adults 26-32y from an established school cohort in USA	Highest education (high school diplomas, community college certificates and associate's degrees, bachelor's degrees)	Self-reported sleep problems (snoring/stopping breathing during sleep, problems falling asleep or staying asleep)	Young adults whose highest degree was a BA were less likely to have sleep problems compared with young adults whose highest degree was a community college credential	
Soltani 2012	Cross-sectional	Family income per week (>$1,000, $700-$1000, $400-$700, <$400)	PSQI global score (0-5, 5-10, >10)	Women with poor sleep quality were more likely to have not completed	Adjusting for mental (anxiety and depression)

	3655 women from an already established cohort in Queensland, Australia	Highest level of education (tertiary, complete high school, incomplete high school) Housing tenure (own, rent) Employment status (employed, home duties, unemployed/economically inactive)		high school, to be either unemployed or to be undertaking home duties and to be renting their current home	and physical (self-perceived physical health, number of chronic illnesses, BMI) health factors attenuated those relationships except for education
Stranges 2012	Cross-sectional 43935 adults ≥50y from the general population in 8 Health and Demographic Surveillance System sites in Africa and Asia	Education (no formal education; less than 6y; 6y or more) Wealth index (according to dwelling characteristics and household possessions, in quintiles)	Insomnia symptoms (none/mild/moderate vs severe/ extreme)	There was no significant association between SES and insomnia symptoms	
Talala 2012	Cross-sectional 70115 adults 26-64 y from the general population of Finland during a period of 23 years	Employment status (employed, unemployed, student, retired, housewife) Education (3 levels) Household income (quintiles)	Self-reported insomnia (single question, yes vs no)	Low education in men and retirement or unemployment in both sexes were associated with insomnia. Low income was protective factor for insomnia in both sexes.	Adjustment for depression partially attenuated the effects of education and employment status but increased the effects of income
Tu 2012	Cross-sectional 68832 women 44-74y from the general population in 7 urban communities of Shanghai, China	Educational attainment level (elementary school or under, middle school, high school, college or above) Occupational status (professional, clerical, manual laborer, housewife) Annual family income (<10,000 yuan, 10,000–19,999 yuan, 20,000–29,999 yuan, ≥30,000 yuan)	Sleep duration (≤4, 5, 6, 7, 8, 9, ≥10h)	Lower education, income, and occupational status was associated with both short and long sleep duration	
Wall 2012	Cross-sectional 1073116 adults >50 y registered in the UK Health Improvement Network database	Social class (quintiles of Townsend score derived from the 2001 UK Census and linked by post code to area of residence)	Physician diagnosis of OSA Self-reported snoring	The odds of OSA diagnosis and snoring decreased with increasing levels of socioeconomic disadvantage	
Zhang 2012	Cohort 2316 parents of primary school children in Hong Kong followed for 5y	Educational level (<12 vs ≥12 years) Employment status (employed vs unemployed/housewife) Family income (less than or equal to HK$15,000/month vs more than HK$15,000/month)	Insomnia symptoms for at least three times per week over the past year	Unemployment was associated with incident insomnia. Lower education was associated with persistent insomnia	

Ansarin 2013	Cross-sectional 5545 subjects >16 y from the general US population	Education (7 levels)	OSA symptoms: habitual snoring (often/almost every night), combined with daytime sleepiness (often/almost always) and/or witnessed apnea (often/almost every night)	Individuals in the lowest education category had less complaints of OSA symptoms	
Biggs 2013	Cross-sectional 1845 children 5-10 y from 32 primary schools in Adelaide, Australia	Area SES index based on postal code (low, mid, high)	Parent-reported sleep duration	Children from low SES areas reported later bedtimes and reduced sleep opportunity than children from higher SES areas	
Chen 2013	Cross-sectional 2113 adolescents 15-17y from the general population of Taiwan	Household annual income levels (less than NT$400,000, $400,000-$999,999, above $1,000,000) Education level of the head of household (primary education or less, senior high school or occupational high school, college degree or higher) Employment status of the head of the household (employed vs unemployed)	Insomnia symptoms (Insomnia Self-assessment Inventory, often/always vs never/seldom)	Insomnia was not associated with any of the SES measures	
El-Sheikh 2013	Cross-sectional 276 third- and fourth-grade children recruited from 7 public schools in the southeastern US	Income-to-needs ratio (computed by dividing family income by the federal poverty threshold for that family size) Perceived economic well-being (composed of three Conger scales: can't make ends meet, material needs, and financial cutbacks) Maternal education (7 levels)	7-day actigraphy (sleep minutes, sleep efficiency, sleep onset variability) Child-reported sleep/wake problems (Sleep/Wake Problems Scale of the Children's Sleep Habits Survey)	Lower income-to-needs ratio predicted higher levels of reported sleep/wake problems. Lower parental perceived economic well-being was associated with shorter sleep minutes and greater variability in sleep onset. Lower mother's education was associated with lower sleep efficiency.	African American children's sleep was more negatively affected by income-to-needs ratio and mother's education than was the sleep of European American children
Grandner 2013	Cross-sectional 4081 adults from the general US population	Household income (above vs below $20,000) Education level (<9th grade, 9th to 11th grade, high school graduate, some college, college graduate) Access to private health insurance (yes vs no) Household food security (combination of 18 items and categorised as full, marginal, low, very low)	Sleep latency >30min (yes vs no) Insomnia symptoms (never, rarely, sometimes, often, almost always) Daytime sleepiness (never, rarely, sometimes, often, almost always)	Lower income was associated with difficulty falling asleep, lower education with sleep latency >30 min, non-restorative sleep, snorting/gasping and snoring, no private insurance with sleep latency >30 min and non-restorative sleep and lower household food security with all symptoms	Adjusting for self-assessed physical and mental health attenuated the effects of income

			Sleep apnea symptoms (never, rarely, sometimes, frequently)		
Hartz 2013	Cross-sectional 148938 women 50-79y enrolled at 40 clinical centres throughout the US	Education (11 levels) Income (8 levels)	Insomnia symptoms (WHI Insomnia Rating Scale score)	Lower education was associated with more severe insomnia symptoms	
Hoefelmann 2013	Cross-sectional 11557 adolescents 15-19y from high schools in Santa Catarina, Brazil	Monthly family income (in tertiles)	Short sleep (<8h) Poor sleep quality (sometimes/hardly ever/never vs always/nearly always	Higher family income was associated with both short sleep and poor sleep quality	
Hsu 2013	Retrospective cohort 970769 enrollees in a health insurance database in Taiwan followed for 1y	Insurable monthly wage (>NTD 40,000, NTD 20,000-40,000, <NTD 20,000)	Healthcare-seeking insomnia (ICD-9-CM codes 780.52, 307.41 and 307.42)	Higher SES was associated with greater risk for insomnia in men but lower risk in women. Middle SES group predicted greater insomnia risk for both genders than lower SES.	
Innes 2013	Cross-sectional 1217 adults visiting 4 primary care clinics in Morgantown area, West Virginia	Education (<12 years, high school graduate, some college, college graduate) Employment status (employed, unemployed/out of work, homemaker, retired, student, disabled) Annual household income (<$25,000, $25,000-50,000, $50-75,000, >$75,000).	RLS diagnosis based on IRLSSG diagnostic criteria (7-item questionnaire)	Those with RLS were more likely to have lower income and be unemployed or disabled and less likely to be college educated than those without RLS	
Jarrin 2013	Cross-sectional 177 adults 30-65 y recruited from advertisements in Montreal, Canada	Objective SES: household income, years of education, employment status (employed vs. unemployed) Subjective SES: MacArthur Scale of Subjective Social Status (scale 1-10)	Sleep quality (PSQI Global score) Sleep latency (PSQI sleep latency subscale) Weekday sleep duration Weekend oversleep (difference between weekend and weekday total sleep duration) Daytime sleepiness (ESS)	Higher SES was associated with better sleep quality, shorter sleep latency, longer sleep duration, shorter weekend oversleep, and less daytime sleepiness. Subjective SES better predicted sleep duration, weekend oversleep and daytime sleepiness than objective SES. Objective SES better predicted sleep quality and latency than subjective SES.	After controlling for self-rated mental health and perceived stress the effects of subjective SES on sleep quality and income on sleep latency were attenuated
Kidwai 2013	Cross-sectional 1488 adults from the general population in five communities of Karachi, Pakistan	Income (5 levels) Employment status (employed, unemployed, homemaker) Financial problems (yes vs no)	Insomnia (single question, yes vs no)	Those who experienced financial problems were significantly more likely to report insomnia	

Kim 2013	Cross-sectional 1985 adults ≥65y from the general population of South Korea	Education (no vs some)	Insomnia (DSM-IV criteria)	There were significant relationships between a lack of education and difficulty in initiating or maintaining sleep and early morning awakening	
Luo 2013	Cross-sectional 1086 adults ≥60y from the general population of the Jingansi community in Shanghai, China	Years of education	Sleep quality (PSQI global score >5)	Increased duration of education was associated with a higher risk of poor sleep quality	
Mindell 2013	Cross-sectional 10085 mothers of children 0-6y recruited from online advertisements in 14 countries	Education (elementary school, high school, college, post-graduate) Employment status (employed vs non-employed)	Sleep quality (PSQI global score >5)	Not being employed and lower education level predicted higher likelihood of having poor sleep	
Yoshioka 2013	Cross-sectional 5946 male employees 34-59 y from two local governments in Japan	Employment level (higher-level non-manual workers, lower-level non-manual workers, manual workers)	Insomnia (Athens Insomnia Scale score >5)	Lower employment level was significantly associated with the risk of insomnia	Job strain and effort-reward ratio attenuated those relationships, while over commitment strengthened them
Anders 2014	Cross-sectional 3281 adults 16-72 y from the general population of eight urban areas in Germany	Winkler Index (composite score based on participant's school and occupational education, net household income, and current occupational status and categorised as low, medium and high)	Sleep quality (PSQI global score >5)	The probability of good sleep quality in participants increased with a higher SES	Presence of physical diseases and psychological predictors (anxiety, depression) partially attenuated the association
Basner 2014	Cross-sectional 124517 adults ≥15y from the general US population	Education (less than high school, high school graduate, college graduate, master's degree or higher) Family income (6 levels) Employment status (10 levels)	Sleep duration Short sleep (≤6h) Long sleep (≥11h)	Higher educational attainment was associated with less sleep, but lower odds of being a short or long sleeper. Family income and sleep duration were negatively correlated and the odds of being a long sleeper decreased with increasing family income. Respondents who were unemployed, retired, or not in the labor force obtained significantly more sleep, were less likely to be short sleepers, and more likely to be long sleepers.	
Carrillo-Larco 2014	Cross-sectional	Education (none/primary school, high school, higher)	Self-reported sleep duration (<6, 6-8, >8 h)	Participants with lower education were more likely to have long sleep	

	12424 adolescents and adults ≥12 y from the general population of Peru	Asset index (in tertiles) Job status (yes vs no)		duration and less likely to have short sleep duration. Those with higher asset index were less likely to report long sleep. Employed had a higher probability of being short sleepers and lower probability of being long sleepers than unemployed.
Gjevre 2014	Cross-sectional 7597 adults from the general population in Saskatchewan province, Canada	Household income adequacy (4 levels) Money left over at the end of the month (some, just enough, not enough) Education (less than high school, completed high school, completed university, completed other postsecondary education)	EDS (ESS score >10)	Not enough money left over at the end of the month increased the risk of EDS
Gubelmann 2014	Cross-sectional 3853 adults recruited between 2005 and 2011 from the general population in Geneva canton, Switzerland	Education (university level yes/no) Income (<5000 SFr, 5000-9500 SFr, >9500 SFr)	Self-reported time in bed (two threshold limits: <7, 7-9, >9 h and <8, 8-10, >10 h)	Low educational level was associated with long TIB. Participants with high income had lower prevalence of short and long TIB.
Jarrin 2014	Cross-sectional 239 children and adolescents 8-17 y recruited from schools and neighborhoods in Montreal, Canada	Objective SES: household income (17 categories) and highest parental education (9 categories) Subjective SES: Subjective Social Status Scale-Youth Version (two 10-rung ladders: school and society, youth reported)	Sleep quality (youth-rated, 10-point scale) Daytime sleepiness (youth-rated, Pediatric Daytime Sleepiness Scale) Sleep disturbances (parent-rated, Children's Sleep Habits Questionnaire) Sleep duration (youth- and parent-reported)	In children, higher subjective SES predicted less daytime sleepiness and longer self-reported sleep duration and higher household income predicted longer parent-reported sleep duration. In adolescents, higher subjective SES was associated with better sleep quality and shorter parent-reported sleep duration and higher household income was associated with fewer sleep disturbances.
Kang 2014	Cross-sectional 7955 adults from the general population of 9 communities in the west area of Gyeongnam province, Korea	Education (no education, elementary school, middle school, high school, above high school) Occupation (farmers, white-collar workers, blue-collar workers, others)	High risk OSA (Berlin Questionnaire)	Education and occupation were not associated with OSA risk

Karaman 2014	Cross-sectional 1996 adults >19y from the general population in Tokat, Turkey	Education level (primary school or less vs higher) Income level (US$<400, 400−799, 800−1200, >1200)	Sleep quality (PSQI global score)	Higher income was associated with poorer sleep quality	
Leng 2014	Cross-sectional 8480 adults 49-90 y from an already established cohort in Norwich, UK	Social class (non-manual vs manual) Educational level (lower vs higher) Working status (not working, working <35 h/week, working >35 h/week)	Self-reported time in bed and sleep duration Sleep proportion (ratio of night-time sleep duration and time in bed)	Sleep duration and proportion increased in participants of higher educational level. Increasing working hours were associated with shorter sleep duration but higher sleep proportion.	
Liviya NG 2014	Cross-sectional 707 adults recruited from 10 workplaces in Melbourne, Australia	Education (nontertiary vs tertiary) Occupation (manager, professional, associate professional, clerical or service) Income per week (≥$2000, $1600–$1999, $1000–$1599, $0–$999)	Excessive daytime sleepiness (ESS score >10)	There was no association between SES and EDS	
McDonald 2014	Cross-sectional 1702 children 14–27 months members of a British twin birth cohort	Maternal education (up to secondary school vs college and beyond)	Short sleep (<11h)	Lower maternal education significantly increased the odds of shorter sleep	A later bedtime significantly mediated the association between lower education and shorter sleep
Paine 2014	Cross-sectional 4330 adults 20-59 y from the general population in New Zealand	Work status (unemployed, no night work, night work)	ASPD/DSPD symptoms (Munich Chronotype Questionnaire)	Night work was associated with reporting both ASPD and DSPD	
Pallesen 2014	Cross-sectional 4001 adults from the general population in Norway	Composite measure of education and income (below vs above mean)	Insomnia symptoms based on DSM-IV criteria (questionnaire)	Low SES was associated with sleep-onset insomnia, early morning awakening insomnia, daytime impairment and DSM-IV insomnia	
Pan 2014	Cross-sectional 38638 adults from the general US population	Annual income (0-19,999$; 20,000-49,999$; 50,000-74,999$; ≥75,000$) Education level (less than high school vs high school graduate)	Self-reported diagnosis of sleep apnea	No significant associations were found between sleep apnea and education or income	
Seib 2014	Cross-sectional 322 women 60-70 y from the general population in South-East Queensland, Australia	Employment status (employed, domestic duties, unemployed/disability pension, retired) Income (<20000 AUD, 20000-80000 AUD, >80000 AUD)	Sleep disturbance (General Sleep Disturbance Scale)	Women who were unemployed or on a disability support pension reported more sleep disturbance	
Speirs 2014	Cross-sectional	Maternal education (less than college degree vs higher)	Parent-reported sleep duration	Children whose mothers were employed full time were less likely to	

	247 children 2-3y from 32 childcare centers in Urbana, Illinois	Annual household income (5 levels) Maternal employment status (full-time, part-time, minimal or no employment)		sleep longer hours compared to those whose mothers were employed <20h per week	
Takahashi 2014	Cross-sectional 55 employees in Toyama, Japan	Household income (divided by the square root of household size) Occupational class (high or low)	7-day actigraphy (total sleep time, sleep efficiency, mean activity during sleep, sleep-onset latency, wake after sleep onset) Sleep quality (PSQI global score)	There was no association between SES and sleep parameters or quality	After adjusting for work schedule, weekly work hours and psychosocial work characteristics (job demand/control/support, effort-reward imbalance, organizational justice, workplace social capital) low occupational class was associated with longer sleep duration and better quality of perceived sleep
Uhlig 2014	Cross-sectional 47453 adults ≥20y from the general population of the Nord-Trøndelag County, Norway	Employment status (employed vs unemployed)	Insomnia (DSM-V criteria)	Employed showed higher odds for insomnia than unemployed	
Whinnery 2014	Cross-sectional 4850 adults from the general US population	Annual income (8 levels) Education level (<high school, some high school, high school graduate, some college, college graduate) Access to insurance (no, public, private) Home ownership (yes vs no) Household food security (combination of 18 items and categorised as full, marginal, low, very low)	Sleep duration (<5, 5-6, 7-8, >8 h)	Lower income groups reported more very short sleep. Increased very short sleep was seen among all lower education levels. Those with public insurance reported more very short and long sleep versus uninsured. Very low food security was associated with very short and short sleep.	
Bagley 2015	Cross-sectional 271 children recruited from semirural public schools in the southeastern US	Income-to-needs ratio (computed by dividing family income by the federal poverty threshold for the same family size)	1-week actigraphy (sleep duration, night waking duration, variability in sleep schedule) School Sleep Habits Survey (Sleep/Wake Problems Scale, Sleepiness Scale)	Lower income-to-needs ratio was related to shorter sleep duration, greater sleep/wake problems, and increased sleepiness	Environmental conditions and presleep worries partially mediated the relation with sleep/wake problems and fully mediated the relation with sleepiness
Baiden 2015	Cross-sectional	Postsecondary education (no vs yes) Annual personal income (6 levels)	Insomnia symptoms (most/all of the time vs	Higher annual income was associated with less troubled sleep	

	19349 subjects >15 y from the general population of Canada		none/a little of/some of the time)		
Benbir 2015	Cross-sectional 4758 adults from the general population in Turkey	Educational status (none, 5 y, 6-8 y, 9-11 y, <11 y) Monthly household income (<$500, $500-1000, $1000-1500, >$1500) Working status (paid job, owns a business, lease payments, retired, housewife, student, unemployed)	Insomnia symptoms based on DSM-IV criteria (questionnaire)	Insomnia diagnosis was associated with lower income level and being unemployed	
Bonke 2015	Cross-sectional 5022 adults 18-64 y from the general population in Denmark	Education (no post-school education, vocational education, short, medium, and long tertiary education) Employment (no job, work hours <37, 37, 38-44, 45+, retired)	Self-reported sleep duration (<6, 6-8, >8 h)	In women higher education decreased the likelihood of short sleep. Unemployed and retired men were more likely to be long sleepers. Retired and part-time working women were more likely to be long sleepers and retired women were less likely to be short sleepers.	
Buxton 2015	Cross-sectional 1103 children 6-17y from the general US population	Parental education (college graduate vs less)	Parent-reported sleep duration (sufficient vs insufficient, cut-offs according to age) Parent-rated sleep quality (excellent vs less than excellent)	Higher parental education was associated with higher odds of sufficient sleep duration	The odds were attenuated and became non-significant after controlling for presence of rules on limiting child caffeine and enforcing bedtimes and for leaving any technology on in the children's bedroom
Cunningham 2015	Cross-sectional 33865 adults from the general US population	Educational attainment (years of completed schooling)	Sleep duration (<7, 7-8, >8 h) Fatigue (yes vs no) Excessive daytime sleepiness (yes vs no) Insomnia (yes vs no)	Higher educational attainment was associated with less short sleep, less long sleep, less fatigue, less excessive daytime sleepiness and less insomnia	Among African Americans, higher educational attainment was associated with more short sleep. Among Hispanics, higher educational attainment was associated with more short sleep, more long sleep, more fatigue, more excessive daytime sleepiness and more insomnia. Among Asians, higher educational

					attainment was associated with more short sleep.
Ding 2015	Cross-sectional 10901 adults ≥22 y from the general US population	Food security status (full, marginal, low, very low)	Sleep duration (h) Sleep latency (min) Insomnia complaints (single question, yes vs no)	Food insecurity predicted shorter sleep duration, longer sleep latency, and more insomnia complaints	Adjusting for SES (income, household size, race, education level, marital status, work schedule) and health (BMI, poor mental health, general health condition, smoking status, alcohol consumption, and menopause status) variables attenuated the differences in sleep duration and latency
El-Sheikh 2015	Cross-sectional 211 women recruited from invitations sent through their children' schools in rural and semirural towns in the Southeastern US	Income-to-needs ratio (computed by dividing family income by the federal poverty threshold for the same family size) Perceived economic well-being (latent variable composed of 3 Conger scales: can't make ends meet, material needs, financial cutbacks) Education (7 levels)	1-week actigraphy (sleep duration, sleep efficiency) Subjective sleep problems (PSQI global score)	Higher income-to-needs ratio is associated with longer sleep duration. Higher perceived economic well-being and education is associated with less subjective sleep problems.	Stress was a mediator linking perceived economic well-being with subjective sleep problems
Gamaldo 2015	Cross-sectional 1207 adults 35-69y members of a cohort from the general population of 13 neighborhoods in Baltimore, Maryland	Years of education Family income (< vs >125% the poverty threshold)	Sleep duration (<6h, 6-7h, >7h)	Lower levels of education were associated with an increased likelihood of reporting sleep durations <6h compared with greater than 7h	Whites were more likely than blacks to report sleep durations <6h compared with greater than 7h with increasing education levels
Katainen 2015	Cross-sectional 3421 women 41-54 y invited for a free population-based screening mammography in Turku, Finland	Educational level (low, intermediate, high) Employment status (employed, unemployed, retired)	Insomnia symptoms (three questions from the Women's Health Questionnaire)	Higher educational level and employment, protected against insomnia symptoms	
Kim 2015	Cross-sectional 1924 adults ≥65y from the general population in Korea	Education (no vs some)	Sleep duration (5h or less, 6h, 7h, 8h, 9h or more)	Formally educated subjects were less likely to report sleeping for 8h or more	

Kurina 2015	Cross-sectional 739 adults 62-90 y from the general US population	Educational attainment (less than high school degree, high school degree or some college, bachelor's degree or more) Household income (5 levels) Household assets (5 levels)	3-day actigraphy (total sleep time, WASO, time in bed, sleep percentage, sleep fragmentation)	Those with higher education had less WASO and time in bed and, thus, higher sleep percentage
Nisar 2015	Cross-sectional 3062 women 40-70y from the general population in Matiary district of Sindh province, Pakistan	Education (no formal education, 5y, 8y, 10y, 12y and above) Employment (housewife, farmer, labourer, servant, others) Family SES (poor, middle class, upper class, based on husband's occupation)	Insomnia item on Menopause Rating Scale	There was no significant association between insomnia and education, occupation, or family SES
Patel 2015	Cross-sectional 11860 adults 18-74 y from the general population of Hispanic/Latino ethnicity in four major US metropolitan areas	Household income (5 levels) Level of education (<high school, high school graduate, >high school) Employment status (retired, unemployed, employed part-time, employed full-time) Home ownership (yes vs no)	Self-reported sleep duration (<7, 7-9, >9 h)	Low education was associated with both short and long sleep duration. Retired and unemployed were more likely to be long sleepers and less likely to be short sleepers.
Peltzer 2015	Cross-sectional 20222 university students 16-30y from 26 countries	Perceived family wealth status (within the highest 25% in country, within the 50 to 75% range for their country, within the 25 to 50% range from country, within the lowest 25% in their country)	Insomnia symptoms (single question, severe/extreme problem vs less)	Lower wealth status was associated with more severe insomnia symptoms
Schwartz 2015	Cross-sectional 2682 adults >35 y from the general population of 4 Peruvian settings	Wealth index (based on current occupation, household income, assets and household facilities)	SDB symptoms: habitual snoring (self-reported snoring at least 3 nights per week); observed apneas (pauses in breathing or choking during sleep reported by a spouse or bed partner); excessive daytime sleepiness (modified ESS score >6)	Lower SES was associated with less habitual snoring but more excessive daytime sleepiness.
Sivertsen 2015	Cross-sectional 9338 adolescents 16-19 y from the general population in Hordaland county, Norway	Parental education (primary school, secondary school, college/university) Perceived family economy (better, approximately like most others, poorer)	DSPD ICSD-2 criteria (questionnaire)	Low paternal education and poorer family economy were associated with DSPD
Stringhini 2015	Cross-sectional	Educational level (high, middle, low) Occupational position (high, middle, low)	Subjective sleep assessment: sleep quality	Men not employed full time were more likely to have longer sleep

	3391 adults 40-81 y from the general population in Lausanne, Switzerland	Employment status (employed full time/not)	(PSQI global score >5), sleep latency (>30 min), daytime sleepiness (ESS score >10), sleep duration (<5 h), insomnia (from 2 items in PSQI) Objective sleep assessment: total sleep time, sleep latency, slow wave sleep, sleep efficiency, stage shifts (in-home 1-night PSG in a subsample of 1569 participants)	latency. Men with a low educational level or occupational position were more likely to suffer from poor sleep quality, short sleep duration, and insomnia. Men with a low occupational position were also more likely to have long sleep latency. Women with a low educational level were more likely to have long sleep latency and short sleep duration. Women with a low occupational position were more likely to have long sleep latency, excessive daytime sleepiness and short sleep duration. Participants with low SES had lower sleep efficiency and higher stage shifts in PSG.	
Suarez 2015	Cross-sectional 4144 adults 30-79 y from the general population in Boston	Annual household income per resident (<$6000, $6000-$30000, >$30000) Education level (less than high school, high school diploma, some college, college diploma, post-college education) Employment status (working for pay full-time, working for pay part-time, other employment, unemployed)	Self-reported sleep duration (<7, 7-8, >8 h), sleep latency (in minutes), restless sleep (yes vs no), sleep apnea risk (Berlin questionnaire)	Lower education was associated with short sleep and unemployment with long sleep. Lower education and unemployment predicted longer sleep latency. Lower income and unemployed individuals were more likely to report restless sleep. Lower education was associated with greater sleep apnea risk.	The results were attenuated after adjustment for lifestyle, behavioral and health factors (smoking, alcohol consumption, physical activity, BMI, depression or antidepressant use, perceived stress, self-rated health status, use of sedating medications)
van de Straat 2015	Cross-sectional 54722 adults >50 y from the general population of 16 European countries	Highest level of education (no education, primary, lower secondary, upper secondary, post-secondary non-tertiary, tertiary) Current job situation (retired, employed or self-employed, unemployed, permanently sick or disabled, homemaker) Household net worth (incorporating the sum of the real assets, net of any debts, and the net financial assets of the household)	Self-reported sleep problems (single question, yes vs no)	A higher level of education and a higher household net worth were associated with less sleep problems. Employed individuals and homemakers reported less sleep problems while permanently sick or disabled reported more sleep problems than retired individuals.	

Yoon 2015	Cross-sectional 84094 adults 40-69y recruited from health examination centers and training hospitals in Korea	Education (middle school or below, high school graduate, college or above) Occupation (non-manual, manual, unemployed)	Sleep duration (<6h, 6–7h, 8–9h, ≥10h)	Both short and long sleep duration were associated with having the lowest education attainment and having a manual job
Zapata Roblyer 2015	Cross-sectional 91 adolescents 11-19y from public schools in Tulsa, Oklahoma	Family income (less than $29,000, $30,000–$44,999, $45,000–$59,999, $60,000 and more)	PSQI sleep duration, sleep latency, and sleep disturbance components	Family income was not associated with sleep outcomes
Danielsson 2016	Cross-sectional 671 subjects 16-26y from the general population in Uppsala, Sweden	Employment status (attending educational activity or work vs no educational activity or work or on sick leave)	Delayed sleep phase disorder (DSM-5 criteria)	Not attending any educational or work activity was significantly associated to DSPD
de Jong 2016	Cross-sectional 90 children 33-71 months from 17 preschools in western Massachusetts	Household income (8 levels)	Parent-reported sleep problems (Child Sleep Habits Questionnaire) Sleep duration and variability (15-day actigraphy)	Children in lower income homes were likely to have more inconsistent sleep schedules. There was no association between household income and children's sleep problems or total sleep duration.
de Ruiter 2016	Cross-sectional 24857 children 2-14 y from the general population of Spain	Highest education level achieved by the head of the household (illiterate/primary level, secondary level and non-university, university education)	Parent-reported sleep duration (short sleep based on age)	Lower parental education was associated with short children sleep
Hawkins 2016	Cross-sectional 196990 children 6-17y from the general US population	Highest education in the household (<high school, high school, >high school) Household poverty level (0-99% FPL, 100-199% FPL, 200-299% FPL, 300-399% FPL, ≥400% FPL) Employment status (anyone in household, yes vs no) Insurance status (none, Medicaid/CHIP, private)	Parent-reported sleep inadequacy (no vs yes)	Among 10-17-year-olds higher household education, income and private insurance was associated with sleep inadequacy
Heshmat 2016	Cross-sectional 13486 children and adolescents 6-18 y from the general population in Iran	Family SES determined by principle component analysis method including parents' education, occupation, possessing a private car, school type (public vs private), home type (private vs rented) and having a personal computer at home (total score was a weighted average	Insomnia problems (single question from the WHO-Global School Based Student Health Survey questionnaire)	Odds for insomnia were lower in students with high SES compared to low SES

		of the SES variables and was categorised into low, middle and high)			
Johnson 2016	Cross-sectional 5215 African Americans 21-95 y recruited from lists and advertisements in 3 counties in the Jackson metropolitan area, Mississippi	Education (less than high school, high school, greater than high school but less than a college degree, college degree or more) Annual family income (classified as low, lower-middle, upper-middle and affluent, based upon income, family size, number of children <18 years and the US Census designated poverty level)	Sleep duration (≤6, 7-8, ≥9 h) Sleep quality (single question, excellent/very good/good vs fair/poor)	Lower income and lower education categories were associated with higher odds of long sleep and poorer sleep quality	After adjustment for depressive symptoms, the associations were attenuated but remained statistically significant for long sleep
Malone 2016	Cross-sectional 439933 adults 40-69y from the general UK population	Education (attended college, yes/no) Employment status (employed, non-employed, retired)	Sleep duration (<5h, 5-6h, 7-8h, >8h)	Lower education and unemployment were associated with less short and long sleep. Retirement was associated with less short and more long sleep than being employed	
Paine 2016a	Cross-sectional 4330 adults 20-59 y from the general population in New Zealand	Employment status (employed with no night work, employed with night work, unemployed)	Self-reported sleep duration: short sleep (<7 h), long sleep (>8 h), insufficient sleep (extension of sleep duration by >2 hours on free days compared with scheduled days)	The odds of reporting insufficient sleep were higher for those employed in night work and lower for the unemployed. The odds of reporting short sleep were higher for night workers and unemployed. The likelihood of reporting long sleep was higher for unemployed.	
Paine 2016b	Cross-sectional 10369 adults from the general population in New Zealand	Education (tertiary, some secondary, no secondary qualification) Equivalized household income (low, middle, high tertiles)	Difficulty falling asleep, frequent nocturnal awakenings, early morning awakenings (all/most of the time vs a good bit/some/a little/none of the time)	Difficulty falling asleep and frequent nocturnal awakenings were more likely among those with less than a secondary school education. Being in the highest household income tertile was associated with a lower likelihood of reporting early morning awakenings.	
Peltzer 2016	Cross-sectional 19417 university students 16-30y from 26 countries	Perceived family wealth status (within the highest 25% in country, within the 50 to 75% range for their country, within the 25 to 50% range from country, within the lowest 25% in their country)	Sleep duration (≤6h, 7-8h, ≥9h)	Family economic background was not associated with short or long sleep	
Peña 2016	Cohort	Maternal education (<college graduate vs ≥college graduate)	Sleep curtailment score (based on mean daily sleep	Lower maternal educational attainment and household income	Environmental and behavioral characteristics

	1288 children of women recruited during early pregnancy from a multi-specialty group practice in Massachusetts and followed until 7y	Annual household income (<$40000, $40000-$70000, >$70000)	duration at each of the 8 measurement times using sleep duration thresholds from the literature, range 0-13)	were associated with higher chronic sleep curtailment	(maternal smoking status, child TV/video viewing, active play, breastfeeding) partially mediated the relationships
Safak 2016	Cross-sectional 665 adults ≥60y from 21 family health centers in the urban areas of Kayseri province, Turkey	Education (illiterate, literate, 1–8 years, >8 years) Income level (high, medium, low)	Restless leg syndrome (2003 International RLS Study Group criteria)	No association was found between SES and RLS diagnosis	
Schäfer 2016	Cross-sectional 4106 adolescents 18y members of a population-based birth cohort in Pelotas, Brazil	Family income at birth and at 18y (in quintiles) Maternal schooling at birth (0, 1-4, 5-8, 9-11, ≥12y)	Self-reported sleep duration	Lower maternal schooling and lower family income was associated with higher sleep duration	
Seyedmehdi 2016	Cross-sectional 715 staff employees of a hospital in Tehran, Iran	Education (undergraduate vs graduate or postgraduate)	OSA risk (Berlin questionnaire, high vs low risk)	There was no association between education and OSA risk	
Smagula 2016	Cohort 8265 adults ≥60y from the general Chinese population in Singapore followed for 13y	Educational attainment (none, primary school, secondary school, junior college, university/technical school)	Sleep duration (<6h, 6-8h, >8h)	Educational attainment was inversely related to odds of becoming a long sleeper	
Tareque 2016	Cross-sectional 1002 adults from the general population of five prefectures in Japan	Years of schooling	Insomnia symptoms severity (none, mild, moderate, severe, extreme)	No statistically significant association between years of schooling and insomnia symptoms was found	
Wong 2016	Cross-sectional 12784 adults, part of an already established cohort, from the general population in Tangshan, China	Educational level (primary, middle, college) Income level (<600 RMB, 600-1000 RMB, >1000 RMB) Occupation (white vs blue collar)	REM sleep behavior disorder questionnaire	Lower level of education and blue collar occupation were significantly associated with higher risk of having RBD	
Abraham 2017	Cross-sectional 1015 adults ≥60y members of a community registry in Pittsburgh, Pennsylvania	Education (more than 4-year college degree, some college/4-year college degree, HS degree/GED or less)	Sleep quality (single question, very satisfied/satisfied/neutral vs dissatisfied/very dissatisfied)	The likelihood of reporting poor satisfaction with sleep was lower among participants with some college/4-year college degree	

				compared to more than 4-year college degree	
Ahmed 2017	Cross-sectional 2095 adults recruited from blood bank donors, pre-employment clinics, visitors, and employees of a hospital in Riyadh, Saudi Arabia	Education (non-educated, elementary, intermediate, high school, university) Employment status (employed, housewife, student, unemployed)	Insomnia (ICSD-2 criteria)	There was a significant relationship among insomnia and lower education	
Assari 2017	Cohort 37495 adults >50 y from the general US population followed for 6 years	Years of education Total household income	Sustained insomnia symptoms (4-symptom mean score assessed in 3 waves and creating a latent factor)	Higher education and income were associated with lower levels of sustained insomnia symptoms	The association between education and sustained insomnia was non-significant for black men
Bapat 2017	Cross-sectional 268 5th-9th grade adolescents from two public and four private schools in Pune, India	4-item Family Affluence Scale (divided in 3 categories)	Self-reported sleep time	Children with a higher SES slept shorter than children with a lower SES	This relation was significantly mediated by screen time (low SES children reported more screen time and thus less sleep time) and academic work (high SES children reported more academic work and thus less sleep time)
Barazzetta 2017	Cohort 13978 children recruited at birth and followed up to 9 y from the general population in Avon, UK	Mother's education level (cse/none, vocational, O-level, A-level, university degree) Net household income per week (averaged over 4 waves and divided in quartiles) Material deprivation index (8 items, range 0-8, divided in 0, 1, >1)	Parent-reported sleep quality (at least one of six sleep problems) and duration	Higher material deprivation, lower maternal education and family income were associated with higher odds of reporting at least one sleep problem but neither showed significant effects on sleep duration	
Brambilla 2017	Cross-sectional 1977 children 1-14y recruited from 72 family paediatricians in Italy	Maternal education (high school or university degree vs less)	Parent-reported optimal sleep (sleeping in own bed all night without awakenings)	Optimal sleeper condition was positively associated with mother's high education level	
Cheng 2017	Cohort	Education level (none, primary, secondary, vocational/junior college/polytechnic/university)	Sleep duration (≤4, 5, 6, 7 – 8, ≥9h)	Higher education level was associated with lower risks for short sleep	

	2653 adults ≥60y from the general population in Singapore followed for 2y	Housing type (1–2 room public, 3 room public, ≥4 room public/ private)			
Clark 2017	Cross-sectional 7835 women 31-36y and 59-64y from two general population cohorts in Australia	Occupation (manager/professional, clerical/sales, trades/production/labourer)	Sleep duration Short sleep (≤6h/day vs >6h/day) Long sleep (≥8h/day vs <8h/day)	In the young cohort, trades/production/labourers slept less than other occupational categories	
Costanian 2017	Cross-sectional 3675 toddlers 1-2y from the general population in Canada	Household income (<$30,000, $30,000 – <$60,000, $60,000 – <$100,000, ≥$100,000) Mother's work status (currently working vs not currently working) Mother's education level (college graduate or less vs more than college graduate)	Parent-reported sleep duration (<11h vs more)	Toddlers who came from a household with higher annual income were less likely to sleep <11h per night	
Didriksen 2017	Cross-sectional 12822 blood donors 18-67 y in Denmark	Employment status (employed/student vs unemployed) Education (≤high school/vocational course vs ≥short-length higher education) Income (<median vs ≥median earnings)	Cambridge-Hopkins RLS-questionnaire	Men with lower education were more likely to suffer from RLS	
Foroughi 2017	Cross-sectional 4021 adults from the general population in Tehran, Iran	Educational level (illiterate, high school or less, university degree or higher)	OSA risk (Stop-Bang questionnaire)	Education did not have any significant effect on OSA risk	
Fulgencio 2017	Cross-sectional 1344 adolescents 13-15 y from 14 public and private schools in Itabira, Brazil	Composite variable (goods owned by the family and educational level of its head, categorized as higher vs lower)	Parent-reported possible sleep bruxism (single question, yes vs no)	Greater prevalence of possible sleep bruxism was observed among adolescents from a higher SES	
Grandner 2017	Cross-sectional 20497 adults from the general US population	Education level (college graduate, some college, high school, less than high school) Employment status (yes vs no)	Nocturnal leg cramps frequency (none, mild, moderate-severe)	Non-college graduates and unemployed had a higher likelihood of nocturnal leg cramps	Adjusting for sleep symptoms, medical history, and physiologic health markers attenuated the effects of employment status
Ham 2017	Cross-sectional 423 women 40-65y recruited from	Monthly family income (≤2.4 million won vs >2.4 million won) Education (middle school or less vs high school or above)	Insomnia (ISI score) Sleep quality (PSQI global score)	Lower education level was positively associated with the ISI score	

	advertisements in Incheon, Korea	Employment status (yes vs no)		
Hardy 2017	Cross-sectional 7555 children 5-16 y from the general population in New South Wales, Australia	Area index (based on post codes and divided in tertiles)	Self-reported sleep duration (adherence to recommendation according to age)	There was no difference in adherence between high and low SES children
Kim 2017	Cross-sectional 509 adults ≥60y from the general population in "Y"-myeon, Ganghwa-gun, Korea	Education level (≥7 years vs 0–6 years) Perceived economic status (fair vs poor)	Insomnia symptoms	Low education level was associated with insomnia symptoms
Koolhaas 2017	Cross-sectional 1120 adults 70-94y from the general population of the Ommoord district in Rotterdam, Netherlands	Education (primary, lower, intermediate, higher)	Sleep duration (1-week accelerometer and sleep diary)	Education was not associated with sleep duration
Ma JF 2017	Cross-sectional 3635 adults >50 y recruited by telephone notifications and posted advertisements in Wuliqiao Community of Shanghai, China	Occupation (mental vs labour) Level of education (illiterate, primary school, junior high school, senior high school, university or higher)	RBD screening questionnaire score ≥5	Higher education was associated with lower risk of having probable RBD
Ma Y 2017	Cross-sectional 1825 adolescents 11-18y from 6 middle schools in Changchun City, China	Highest parental education (primary school or low, junior high school, senior high school, university and above)	Parent-reported snoring (more than half the time while sleeping)	Parental education of a university degree and above was a protecting factor for snoring
Maume 2017	Cohort 974 adolescents 12y members of a birth cohort from 24 hospitals of 10 US cities followed for 3y	Income-to-needs ratio (ratio of total family income to Census-defined poverty threshold)	Self-reported sleep duration	Improvement in family income-to-needs is associated with longer sleep at age 15
McDowall 2017	Cross-sectional 115 children 2-12y attending inpatient or day wards of a children's hospital in Wellington, New Zealand	Parental education (6 levels) Household income (5 levels)	Parent-reported sleep latency, sleep duration, and sleep problems (Children's Sleep Habits Questionnaire score)	Parents from homes with higher annual income were more likely to report shorter sleep latencies and fewer sleep problems. Parents with higher education reported shorter

				weekday sleep latencies.	
Mota-Veloso 2017	Cross-sectional 851 children 6-12 y from seven public and two private schools in Diamantina, Brazil	Composite variable of 3 indicators: equivalized household income (10 levels), mother's and father's schooling (9 levels)	Sleep bruxism (reports of parents/caregivers and oral clinical evaluation)	Lower SES was associated with more sleep bruxism	The effect was mediated by sucking behavior (finger sucking, nails or other objects bite)
Netsi 2017	Cohort 3842 infants recruited at birth in Pelotas, Brazil and evaluated at 3, 12, 24, and 48 months	Maternal education (0-4 years, 5-8 years, ≥9 years) Family income (in quintiles)	Parent-reported sleep duration, awakenings, and sleep disturbances (nightmares/night terrors, restless sleep, difficulty going to sleep, wakes up at night, and wakes up early)	Maternal education and family income were not associated with infant sleep duration or disturbances	
Palmer 2017	Cross-sectional 8067 adults 50-64y recruited from 24 general practices in England	Educational level (university degree or higher professional, vocational training certificate, school only) Occupational class (higher managerial, intermediate, manual and routine) Home ownership (owned/owned with a mortgage vs other) Pension entitlement (state pension only vs private pension) Financial hardship (two items on difficulty managing financially and on many things being unaffordable) Work status (employed, self-employed, unemployed, retired)	Insomnia symptoms (no/mild/moderate problem vs severe problem)	Insomnia was more common among the less educated, those of lower social class, and the unemployed and was associated with lack of home ownership, lack of a private pension, and reported difficulties in managing financially and affording things)	
Patte 2017	a) Cross-sectional b) Cohort 36088 (a) and 7394 (b, followed for 2y) adolescents 9^{th}-12^{th} grade from secondary schools in Ontario and Alberta, Canada	School area average income (median household income of census divisions that corresponded with school postal codes according to data from the 2011 National Household Survey)	a) Short sleep duration (<8h) b) Sleep duration trajectories (short, low-normal, high-normal, long)	a) Sufficient sleep was more likely among students attending schools in areas classified in the highest SES group b) Attending schools in low-income areas predicted short and low-normal sleep duration trajectories over time	
Perales 2017	Cross-sectional 9181 adults 20-70y from the general population of Australia	Education (degree or higher, professional qualification or secondary school, below secondary school)	Sleep duration	Lower education, material deprivation and lack of prosperity were associated with shorter sleep duration, while	

		Employment status (full-time, part-time, self-employed, unemployed, full-time student) House tenure (owned outright, mortgage, rental) Material deprivation (yes vs no) Lack of prosperity (poor/very poor vs other) Financial worsening (one of last year's major life events) Income poverty (annual income below 60% of the sample median)		unemployment with longer sleep duration
Seo 2017	Cross-sectional 1608 adolescents 12-18 y from the general population in Korea	Household income (calculated by dividing household monthly income by the square root of the number of people in the household and divided in quartiles) Recipient of national basic livelihood security (current/past vs never) National Health Insurance (employees of corporation, self-employed, Medicaid)	Self-reported sleep duration	Sleep duration was shorter in the highest income quartile
Sivertsen 2017	Cross-sectional 8873 adolescents 16-19 y from the general population in the county of Hordaland, Norway	Latent class analysis to identify patterns of family income across previous 7 years (never poor, moving out of poverty, moving into poverty, chronically poor)	Self-reported sleep duration, sleep onset latency, WASO and sleep efficiency	Adolescents from families experiencing worsening in their family income reported significantly shorter sleep duration, longer WASO, and lower sleep efficiency than those being never poor
Tang 2017	Cross-sectional 25827 subjects ≥12y from the general population of Hunan Province, China	Years of education	Sleep quality (PSQI global score >5)	Higher educational level was associated with poor sleep quality
Walsemann 2017	Cohort 8473 adults 18-22y members of a general US population cohort followed for 9y	Enrollment status (not enrolled in college, enrolled in college, enrolled in graduate school) Highest degree attained (no degree, GED, high school diploma, associate's degree, bachelor's degree or higher) Employment status (no, part-time, full-time)	Sleep duration	Individuals enrolled in college or graduate school and working part- or full-time reported lower decreases in sleep duration over time than those not enrolled in college and not working

Wang 2017	Cross-sectional 17320 adults 18-79y from the general population in Jilin Province, China	Education (≤9y vs >9y) Household's monthly income per person (<1,000 yuan, 1,000–2,999 yuan, >3,000 yuan)	Sleep duration (<7h, 7-9h, >9h)	Lower education was negatively associated with long sleep
Yu 2017	Cross-sectional 1049 children 0-36 months recruited from mailing lists and online advertisements in Hong Kong	Parental employment status (employed full-time, employed part-time, on maternity leave, homemaker/at-home parent, student, unemployed/in-between jobs or other) Parental education (high school or below, college, postgraduate)	Parent-reported sleep duration (Brief Infant Sleep Questionnaire)	Children whose mothers had a part-time job or were not employed had longer sleep duration
Yunus 2017	Cross-sectional 1648 adults ≥60y from the general population in Kuala Pilah district, Malaysia	Monthly household income (less than RM1000, RM1000-RM2499, RM2500 and above). Education level (no formal education, primary to secondary, college and above)	Sleep quality (PSQI global score)	Those with lower income had poorer sleep
Zhang 2017	Cross-sectional 1563 adults ≥45y from the general population in Dongguan city, China	Education (senior middle school or higher, junior middle school, elementary school or lower)	Sleep quality (PSQI global score >5)	Participants with lower education had a higher risk of poor sleep
Berhanu 2018	Cross-sectional 422 adults from the general population in Jimma Town, Ethiopia	Educational status (no formal education, primary education, secondary and above) Monthly income (>1000 ETB vs ≤1000 ETB)	Sleep quality (PSQI global score >5)	Subjects with monthly income ≤1000 ETB were more likely to experience poor sleep quality than those with monthly income above 1000 ETB
Cha 2018	Cross-sectional 70678 adults 35-60 y from the general population in Korea	Education level (junior high, high school, 2-year college, 4-year university) Income level (range 1-11) Employment status (yes vs no)	Self-reported sleep duration	The higher the education level, the shorter the sleep duration for both genders. For men, higher income level is associated with shorter sleep duration, while it is not demonstrated in women.
Chang 2018	Cross-sectional 12174 subjects 3-79y from the general population in Canada	Highest level of education attained in the household for preschoolers, children and youth or by the respondent for adults and older adults (less than secondary school degree, secondary school degree, postsecondary school degree) Household income adequacy (based on total annual household income and	Self- or parent-reported (for those aged less than 12y) sleep duration (recommended, short, long according to guidelines)	Among preschoolers, low household income was significantly associated with short sleep. Among older adults, less than secondary school education and full-time employment were significantly associated with short sleep. Among adults and older adults, less than secondary school education was significantly associated with long

		number of people living in the household and categorized as low, middle, or high) Employment status (full-time, part-time, unemployed) for adults and older adults		sleep. Unemployed older adults were more likely to sleep longer.	
Counts 2018	Cross-sectional 391 college students at a state university in Montana	Subjective childhood SES (MacArthur scale)	Sleep quality (PSQI global score)	Lower subjective childhood SES was associated with poorer sleep quality	The association was moderated by risky family environment. In less risky family environments, childhood SES was not associated with sleep quality.
de Jonge 2018	Cohort 230 employees 23-63y in 3 hospitals in Netherlands followed for 2y	Education Occupation level	Insomnia symptoms (three items derived from the Maastricht Questionnaire; no, sometimes, yes)	Education and occupation level were not associated with insomnia over time	
de Lima 2018	Cross-sectional 1110 adolescents 14-19y from high schools in São José, Brazil	Maternal education (<8 vs ≥8 years) Family income (up to two minimum wages; two to ten times the minimum wage; more than ten times the minimum wage)	Sleep quality (single question, almost never/seldom/sometimes vs with relative frequency/almost always)	Students whose mothers had high level of education were more likely to have low quality of sleep	
Dong 2018	Cross-sectional 1584 adults ≥45y from the general population of a rural community in Deqing, China	Educational level (<9 years vs ≥9 years) Monthly individual income (<77 US$, 77–330 US$, >330 US$)	Sleep quality (PSQI global score >5)	Subjects with lower income were more likely to have poor sleep quality	
Gómez-Olivé 2018	Cross-sectional 5059 adults ≥40y members of a general population cohort in the Agincourt district of Mpumalanga Province, South Africa	Education (no formal education, 1–7y, 8–11y, 12 or more years) Employment status (not working, employed, homemaker) Household wealth index score (modern assets, power supply, water and sanitation, quality of housing, and livestock assets, in quintiles)	Sleep duration (in quartiles) Insufficient sleep (sometimes/rarely/never sufficient vs often/very often sufficient) Restless sleep (yes vs no) Snoring (yes vs no)	Subjects with higher education were less likely to report insufficient and restless sleep. Unemployed were more likely to have longer sleep duration and restless sleep. Those in the lowest wealth quintile were more likely to have longer sleep.	
Goyal 2018	Cross-sectional 1346 children 5-10y from 3 schools in Bhopal, India	Maternal education (illiterate vs literate) Maternal employment status (yes vs no)	OSA risk (score >0.33 in the Sleep-Related Breathing Disorder scale of the Pediatric Sleep Questionnaire)	Maternal employment was associated with OSA risk	

Jaisoorya 2018	Cross-sectional 7017 adults 18-60y attending 71 primary health centers in the State of Kerala, India	Education (≤10y vs >10y) Income (below vs above poverty line) Employment status (unemployed vs employed)	Insomnia (ISI score 0, <15, ≥15)	Lower education was associated with both subclinical and clinical insomnia. Unemployment was associated only with subclinical insomnia.	
Khan 2018	Cross-sectional 1700 adults ≥20y from the general population of Dehradun district, India	Education (none, high school, intermediate, graduate and above) Employment (not working, service, agriculture, self employed) Socio-economic class (upper, middle, lower)	Insomnia (ISI score >7)	Higher education and unemployment increased the odds for having clinical insomnia	
Lima 2018	Cross-sectional 1969 adults ≥20y from the general population of Campinas, Brazil	Work status (yes vs no) Income (<1; 1–2; 3 or more minimum wages) Schooling (0–4; 5–8; 9–11; 12 or more years of schooling)	Sleep duration (6h or less, 7-8h, 9h or more)	Those with higher schooling were more likely to have short sleep. The chance of long sleep was lower in those who have more years of schooling, have higher income, and worked.	Adjusting for chronic diseases and health problems attenuated the effects of education on short sleep
Lin 2018	Cohort 1747 7th grade adolescents, members of a primary school cohort in Taipei City and Hsinchu County, Taiwan followed for 6y	Paternal and maternal years of education	Self-reported time in bed	Lower paternal education was associated with longer weekday TIB over time	
Ma J 2018	Cross-sectional 1125 adults 18-65y from the general population in 26 communities of Beijing, China	Monthly income (5 levels) Education (primary, secondary, tertiary) Housing tenure (owner vs renters) Employment status (employed vs unemployed)	Sleep disturbance frequency (single question, never vs rarely/sometimes/often)	Higher income and owing a house were associated with sleep disturbances	
Ma Y 2018	Cross-sectional 3045 adults >60 y from the general population in Anhui Province, China	Education (illiterate, elementary school, junior school or above) Income status (fixed vs no fixed income)	Athens Insomnia Scale score (0-3, 4-6, >6)	Having no fixed income was significantly associated with higher likelihood of suffering from severe insomnia	
Manyanga 2018	Cross-sectional 6040 children 9-11 y recruited from schools in 12 countries	Annual household income (4 levels) Highest level of parental education (did not complete high school, completed high school or some college, bachelor's or postgraduate degree)	1-week actigraphy (sleep duration, sleep efficiency)	There were no significant linear trends for sleep duration and sleep efficiency based on income and education levels.	
Matthews 2018	Cross-sectional	Family Hollingshead score (measured through age 7 to 16)	1-week actigraphy (sleep duration, WASO)	Greater WASO was associated with lower baseline childhood SES,	Shorter sleep duration was associated with increasing

	244 men 30-34 y from an established school cohort in Pittsburgh	Adult Hollingshead score	Perceived sleep quality (5-point scale averaged over a week)	decreasing childhood SES and lower adult SES	childhood SES only in Whites
Meneton 2018	Cohort 20625 adults 35-50y working at the French National Gas and Electricity Company and followed for 25y	Social status (composite score of educational attainment, wealth, income, and occupation; high, middle, low)	Sleep complaints (single question, yes vs no)	Lower social status at baseline predicts the incidence of sleep complaints	Work environment has a significant mediating effect in the association between social class and sleep complaints
Miner 2018	Cross-sectional 379 adults ≥78y, members of a cohort recruited from a large health plan in New Haven, Connecticut	Education (< vs ≥high school)	Insomnia (ISI score >7)	Education was not associated with insomnia	
Olorunmoteni 2018	Cross-sectional 346 adolescents 10-19y from secondary schools in Ile-Ife, Nigeria	Social class (composite score of parental educational level and occupational status, in 5 levels)	Self-reported sleep duration (Adolescent Sleep Habit Survey Questionnaire, <8½h vs ≥8½h)	The odds of having sufficient sleep on the weekdays increased almost 3-fold among the lower social class compared to those of the higher social class	
Park 2018	Cross-sectional 709 subjects from the general population in Yangcheon-gu, Seoul, South Korea	Education (high school or less vs college or more)	Insomnia (ISI score ≥10)	Education was not associated with insomnia	
Peltzer 2018	Cross-sectional 4725 adults ≥40y members of a general population cohort in the Agincourt district of Mpumalanga Province, South Africa	Formal education (none, grade 1–7, grade 8–11, grade 12 or more) Household wealth index score (ownership of household items, livestock, and vehicles; in quintiles)	Sleep duration (<7h, 7-8h, >8h)	Greater wealth status was associated with short sleep duration. Having higher education and greater wealth status decreased the odds of long sleep duration	
Pepin 2018	Cross-sectional 23088 mothers 18-54y with children <13y from the general US population	Education (less than a high school diploma/GED; high school diploma/GED; some college education or associate's degree; bachelor's degree or more) Employment status (employed full-time, employed part-time, non-employed)	Sleep duration	Higher education and full-time employment were associated with shorter sleep duration	
Perlus 2018	Cohort 1615 12th grade adolescents, members of a	Family affluence (owning computers, vehicles, and taking vacations; low, moderate, high)	Short sleep duration (<7h)	Students whose parents had completed some college education compared to those with high school or	

	US high school cohort followed for 1y	Highest level of parental education (high school or less, some college, bachelor degree or greater)		less reported greater weekday sleep insufficiency	
Plancoulaine 2018	Cohort 1205 children recruited at birth in the Poitiers and Nancy university hospitals, France and followed for 5-6y	Monthly household income (<€1500, €1500-3000, >€3000) Highest parental educational level (below high-school diploma, high-school diploma, above) Maternal employment status (no, part-time, full-time)	Patterns of parent-reported sleep duration from the age 2 to 5-6 years by group-based trajectory modelling method (5-group model: short-sleep, medium-low-sleep, medium-high-sleep, long-sleep, and changing-sleep duration trajectory)	Belonging to the short-sleep and medium-low-sleep trajectory was more likely for children with full-time working mothers compared to the medium-high-sleep trajectory	
Schlieber 2018	Cross-sectional 2868 children 2-3y enrolled in Head Start across USA	Ratio of income to poverty Maternal educational level Maternal employment	Parent-reported sleep duration	Children whose mothers worked were more likely to have a lower amount of sleep at night	
Thichumpa 2018	Cross-sectional 266 adults ≥60y from the general population of a sub-district in rural Chiang Rai Province, Thailand	Education (no school, primary school, >primary school)	Sleep quality (PSQI global score >5)	Higher educational level was associated with poor sleep quality	
Vermeiren 2018	Cross-sectional 1403 children 4-12 y from 9 primary schools in Parkstad region, Netherlands	Maternal education (primary/vocational/lower secondary, higher secondary/lower professional, higher professional/academic) Parental material deprivation (4-item weighted variable divided into tertiles)	Parent-reported sleep duration	Average sleep duration was significantly higher for pupils with high SES by material deprivation	The high SES group by maternal education showed a less steep decline in average sleeping hours with increasing age compared with the low SES group
Wu 2018	Cross-sectional 6905 adults participating in a poverty alleviation program in rural areas of Ezhou City, China	Education (illiterate, elementary school, junior middle school, senior middle school or higher) Average annual income per person of a household (RMB ≤1000 vs >1000) Employment status (employed vs unemployed)	Sleep quality (PSQI global score >5)	Lower education, lower income, and unemployment were associated with increased risk of poor sleep quality	In males, education was not associated with sleep quality
Yang 2018	Cross-sectional 11954 students of 50 universities in China	Maternal occupation (operations and commercial work; staff and administration; teachers, scientific and technical work)	Short sleep duration (2 cut-offs; <6h, <7h)	Students whose mothers had higher occupational status had higher odds of short sleep	

Zheng 2018a	Cross-sectional 4399 adults attending medical outpatient clinics of 4 general hospitals in Guangzhou, China	Education (in years) Personal monthly income (<6000 vs ≥6000 yuan) Employment status (employed, unemployed, retired) Health insurance (yes vs no)	Insomnia symptoms in the past month (no/sometimes vs often)	Lower education was associated with all three types of insomnia symptoms. Lacking health insurance increased the odds of difficulty initiating sleep. Unemployed or retired subjects were less likely to have difficulty maintaining sleep.	
Zheng 2018b	Cross-sectional 4399 adults attending medical outpatient clinics of 4 general hospitals in Guangzhou, China	Education (in years) Personal monthly income (<6000 vs ≥6000 yuan) Employment status (employed, unemployed, retired) Health insurance (yes vs no)	Sleep duration (<7, 7-8, >8h)	Lower education was associated with both short and long sleep. Unemployment increased the odds of long sleep.	
Akay 2019	Cross-sectional 76,046 individual-year observations 20-65y from a general population cohort in Germany from 2008 to 2013	Education (in years) Employment status (employed vs not employed) Absolute per capita household income Relative income (average equalized household income of all people who live in the same region, who are in the same age group, who are similarly educated, and who are of the same gender in each year)	Sleep duration Sleep quality (single question, 11-point scale)	There was a substantial negative association between relative income and sleep duration and quality. More years of education were positively and significantly related to both amount of sleep and sleep quality.	The estimates of relative income on quantity of sleep are larger among younger people, and the effect of relative income on sleep quality is larger among older people. The parameter estimates of absolute and relative income are larger among males and married individuals for both quantity and quality of sleep. The effect of relative income on sleep duration and quality is larger in people with relatively fewer working hours, a higher demand for household production and leisure activities, and lower physical health and well-being.
Åkerstedt 2019	Cohort 5377 workers 18-68y from the general working	Occupational category (blue-collar workers, low white-collar workers, high white-collar workers)	Insomnia symptom trajectories (4 items from Karolinska Sleep	There was no significant difference in insomnia symptom trajectories between occupational groups	

	population in Sweden followed for 8y		Questionnaire, 6-point scale)		
Al-Hazzaa 2019	Cross-sectional 1051 children 6-13y from elementary schools in Riyadh, Saudi Arabia	Parental education (<high school, high school, university degree, post-graduate degree) Family income (<10,000SR, 10,000-20,000SR, >20,000SR)	Parent-reported sleep duration (<9h vs ≥9h)	Higher parental education was associated with lower odds of short sleep duration	
Althakafi 2019	Cross-sectional 805 adults 15-60y responding in an online survey in Saudi Arabia	Educational level (primary, intermediate, secondary, university/more)	Self-reported sleep duration (<7h vs ≥7h)	Educational level was not associated with short sleep duration	
Barros 2019	Cross-sectional 1998 adults ≥20y from the general population in Campinas, Brazil	Education (0-3y, 4-8y, 9-11y, ≥12y) Per capita family income (3 categories) Employment (working vs not working)	Sleep quality (single question; excellent/ very good/good vs regular/poor/very poor)	Unemployment was associated with higher prevalence of poor sleep quality	Adjusting for amount of health problems, self-rated health, common mental disorders, and life satisfaction attenuated the effect
Bazargan 2019	Cross-sectional 398 African-American adults ≥65y from an urban region in Los Angeles, USA	Educational attainment (in years) Financial difficulty (score derived from 3 measures: lack of cash to afford clothing, food, and difficulty with paying bills)	Insomnia symptoms (ISI score)	Higher financial difficulty was associated with a higher frequency of insomnia symptoms	
Carneiro 2019	Cross-sectional 651 children 2-15y recruited from a public hospital and a private school in Cape Verde and Mozambique	Parental education (in years; dichotomized)	Parent-reported sleep problems (Children's Sleep Habits Questionnaire total score)	Higher parental education was associated with less sleep problems	
Chami 2019	Cross-sectional 501 adults from the general population of Beirut, Lebanon	Education level (below high school/high school/university) Monthly income (<$1,000/≥$1,000) Employment status (employed/unemployed)	Insomnia (DSM-5 and ICSD-3 criteria) Sleep apnea risk (Berlin Questionnaire)	Education level below high school was a significant predictor of insomnia. Unemployment was significantly associated with increased sleep apnea risk.	
Chen 2019	Cross-sectional 1693 adults ≥60y from the general US population	Present poverty (below 133% of the federal poverty line) Exposure to poverty across previous 45y (no exposure, 1-y exposure, 2-4y of exposure, and ≥5y of exposure)	Self-reported sleep duration (<6h, 6-10h, >10h) Self-reported sleep latency (≤ vs >30min)	Present poverty and exposure to over 2y of poverty was associated with long sleep duration and latency	Adjusting for marital status, years of education, employment status, hours of work, home ownership, self-rated health, residential location and state of

					residence, family-level characteristics, functional limitation, and psychological distress attenuated the effect on long sleep duration
Doane 2019	Cross-sectional 381 twin children 7-8y from a general population twin birth cohort of Arizona, USA	Composite SES (12 months): income-to-needs ratio (annual income divided by the federal poverty threshold for that household size) and parental education (less than high school, high school, some college, college degree, two or more years of graduate school, graduate or professional degree)	1-week actigraphy (sleep duration, sleep efficiency, sleep onset latency, midpoint variability) Parent-reported sleep problems (Child Sleep Habits Questionnaire)	Higher early SES was associated with longer sleep duration, shorter sleep latency and lower midpoint variability	Quality of the home environment mediated the effects of early SES on sleep duration and variability
Gordon 2019	Cross-sectional 2211 adults from the general population in Australia	Education (primary/secondary school, TAFE/technical college, university) Occupation (manager/professional, white collar, blue collar, retired/pension, unemployed/student)	Perceived sleep insufficiency frequency in past month (0-13 vs 14-30 days)	There were no statistically significant associations between frequent perceived insufficient sleep and education or occupation	
Hartescu 2019	Cross-sectional 9238 adults recruited from social media and websites in South Africa, Australia, China, South Korea, and UK	Education (less than primary/primary/lower secondary; upper secondary/post-secondary nontertiary; tertiary) Employment status (yes vs no)	Insomnia (DSM-5 criteria)	Lower education and unemployment were associated with insomnia diagnosis	
Kobel 2019	Cross-sectional 308 first and second grade children in Baden-Württemberg state, Germany	Highest parental education (high school degree or not)	Sleep duration (6-day accelerometry; averaged in h and dichotomized < vs ≥10:08h)	Parental education was not linearly associated with sleep duration. Lower parental education was a significant predictor of short sleep compared to long sleep.	The effect of parental education on sleep duration was significant in boys but not in girls
Laganière 2019	Cohort 529 children recruited at birth in obstetric clinics of Montreal and Hamilton, Canada and followed until 48 months	High SES (high maternal education level and high income) vs middle/low SES (low on at least one of the variables)	Sleep rhythmic movements (single question, Children's Sleep Habits Questionnaire)	Lower SES predicted sleep rhythmic movements in children	
Lee ES 2019	Cross-sectional 1228 adults 23-37y from the general economically	Employment status (categorised as permanent employment; precarious employment; unemployment) trajectories	Self-reported sleep duration (<7h vs ≥7h)	Compared to stability sustained group, gradually deteriorated, gradually alleviated, and instability	

	active population in South Korea	by latent class growth analysis for the previous 6y (stability sustained, gradually deteriorated, swiftly alleviated, gradually alleviated, instability sustained)		sustained groups had greater odds of reporting less hours of daily sleep	
Lee EY 2019	Cross-sectional 10708 subjects ≥12y from the general population in South Korea	Education level (for adults; less than post-secondary graduate vs post-secondary graduate or more) Household income (ratio of total monthly household income to number of household members; in quartiles)	Self-reported sleep duration	Higher income was associated with longer sleep duration only in adolescents. Education was not associated with sleep duration.	
Lei 2019	Cross-sectional 2674 adults recruited during health examinations in 2 hospitals in Taiwan	Education (<10, 10-12, ≥12 years)	Sleep quality (PSQI global score >5)	Lower education level was associated with poor sleep quality	
Maeda 2019	Cross-sectional 43865 adults 20-59y from the general population in Japan	Employment status (regularly employed, non-regularly employed, self-employed, others, unemployed, not in the labor force)	Sleep difficulty (single question, yes vs no)	Compared to regularly employed, unemployed men and women and men not in the labor force had higher odds of sleep problems	Adjusting for marital status, education level, mental illness, smoking status, parental status, household expenditure, and chronic diseases attenuated the effects in men
Manyanga 2019	Cross-sectional 683 children 9-11y recruited from primary schools in Maputo city and Macia district, Mozambique	Parental education (bachelor's/graduate degree vs lower)	Sleep duration (7-day accelerometry; <9 h/night vs 9 to 11 h/night)	Parental education was not associated with short sleep duration	
Matenchuk 2019	Cross-sectional 619 infants at 3 months of age, members of a population-based birth cohort in Edmonton, Canada	Maternal education (university degree vs lower)	Parent-reported sleep duration	Infants of mothers without a university degree had significantly reduced sleep duration compared to mothers with a university degree	The effect of lower maternal education on infant total sleep duration was mediated through prenatal depression and birth mode
Miner 2019	Cross-sectional 357 adults 78-102y from a health plan cohort in New Haven, USA	Education (did not complete high school vs higher)	Hypersomnia (ESS score)	Education was not associated with hypersomnia	

Muller 2019	Cross-sectional 910 preschoolers 3-4y from a birth cohort in New Zealand	Maternal socioeconomic deprivation (composite score from yes/no responses to various deprivation characteristics)	Mother-reported sleep duration (<10h vs 10-13h)	Preschoolers whose mothers experienced high individual deprivation were twice as likely as children of mothers reporting no deprivation characteristics to have short sleep on the weekend but not on weekdays	
Nagata 2019	Cross-sectional 14786 adults 24-32y from a general population cohort of adolescents in USA	Subjective food insecurity (single question; yes vs no)	Insomnia symptoms (2 questions; two times or less vs three times or more per week)	Food insecurity was associated with more frequent insomnia symptoms	
Nasim 2019	Cross-sectional 12121 adolescents 10-19y from intermediate and secondary schools in Saudi Arabia	Self-reported SES (better than others, similar to others, poorer than others)	Self-reported sleep duration (<7h vs ≥7h)	Adolescents who considered themselves to be "poorer than others" in socioeconomic status were more likely to report sleep deprivation	
Peltzer 2019	Cross-sectional 31432 adults ≥15y from the general population of Indonesia	Education (none or elementary vs high school or higher) Subjective economic status (6-step ladder; classified as poor, medium, rich)	Insomnia (10 items from the PROMIS sleep disturbance and impairment questionnaire; score >20)	Lower education and lower economic status increased the odds of having insomnia	
Petrovic 2019	Cross-sectional 2162 adults 40-81y members of a general population cohort in Lausanne, Switzerland	Occupation (managers, lower level executives, low qualified non-manuals and manuals) Education (university, higher secondary, lower secondary or lower)	Home PSG (apnea-hypopnea index and ≥3% oxygen desaturation index)	Lower occupational position was associated with an increased risk of AHI ≥30 and ODI ≥30. Lower education was associated with an increased risk of ODI ≥15.	These associations were mediated by BMI
Pontes 2019	Cross-sectional 1280 adults ≥18y from the general population in Rio Grande, Brazil	Education (0 to 11 years vs 12 years or more)	Sleep bruxism (ICSD criteria)	Higher education was associated with higher prevalence of sleep bruxism	
Poulain 2019	Cross-sectional 493 children 3-10y from a population-based cohort in Leipzig, Germany	Maternal education (7 categories) Maternal occupation (7 categories) Household income (7 categories) Composite score (Winkler index)	Parent-reported sleep problems (Children's Sleep Habits Questionnaire score)	There were no significant associations between SES indicators and child sleep problems	
Redondo-Bravo 2019	Cross-sectional 4025 bank employees 40-54y in Madrid, Spain	Education (no university versus university studies)	Sleep duration (7-day accelerometry)	Having university studies was associated with longer sleep duration	

Ren 2019	Cross-sectional 21435 adults 18-79y from the general population in Jilin Province, China	Educational level (primary school or below, junior middle school, senior middle school, undergraduate or above) Average monthly income (¥ <500, 500-3000, >3000) Occupation (manual worker, mental worker, other)	Self-reported sleep duration (<7h, 7-9h, >9h)	Higher educational level was associated with lower odds of short and long sleep. Higher monthly income was associated with lower odds of long sleep.	
Sheehan 2019	Cross-sectional 398382 adults 18-84y from the general US population	Educational attainment (less than high school, high school degree, some college, college or more) Annual household income (US$0–34999, US$35000–74999, ≥US$75000) Employment status (0h worked, 0–39h worked, 40h worked, >40h worked)	Self-reported sleep duration (≤6h, 7-8h, ≥9h)	Lower educational attainment was associated with increased odds of short and long sleep duration. Lower household income was associated with increased odds of short sleep. Unemployment was associated with increased odds of long sleep and lower odds of short sleep duration.	
Singh 2019	Cross-sectional 73 female adolescents 11-18y recruited from advertisements in urban and rural communities from 3 regions in Guyana	Household deprivation (Multidimensional Poverty Index; education, health, and living-standard dimensions)	Self-reported sleep duration 7-day actigraphy (sleep duration, sleep efficiency, WASO)	Increasing household poverty scores were associated with longer self-reported sleep duration. Household poverty score did not significantly predict any of the actigraphic parameters.	
Sun 2019	Cross-sectional 5497 medical students 16-27y from a university in Shenyang, China	Parental education (primary, secondary, university)	Sleep quality (PSQI global score >5)	Parental education was not associated with sleep quality	
Talvitie 2019	Cross-sectional 1038 adults 30-45y members of a general population cohort in Finland	Childhood SES (parental composite score; employment status, occupation, education, family income, household overcrowding)	Self-reported sleep duration (≤6h, 6.5-8.5h, ≥9h) Insomnia symptoms (Jenkins's scale)	Childhood SES was not associated with sleep duration or insomnia in adulthood	
Teo 2019	Cross-sectional 482 adults 21-69y recruited from advertisements in Singapore	Education (university and above, others) Income level Occupation (manual labor, service industry, office work/professionals, unemployed/retired) Housing (public, private, others)	Sleep duration (5-day activity tracking and self-reported)	Higher occupational class and living in private house was associated with longer wearable-derived but not self-reported sleep duration	
Vézina-Im 2019	Cross-sectional	Education (less than high school; high school diploma; some postsecondary	Insufficient sleep duration (<7h)	Lower education was associated with more frequent insomnia symptoms	Adjusting for behavioral factors (fruit and vegetable

	9749 women 18-44y from the general population in Canada	studies; postsecondary certificate/diploma or university degree) Household income	Insomnia symptoms (none/little of the time vs some/most/all the time)		intake, physical activity, smoking, and alcohol status) partially attenuated the effect
Wang 2019	Cross-sectional 27424 adults 18-79y from the general population of five rural regions in Henan Province, China	Education (elementary school or below, junior high school, high school or above) Average monthly individual income (<500RMB, 500～RMB, 1000～RMB)	Sleep quality (PSQI global score >5)	Subjects who had low education level or low average monthly individual income experienced poor sleep quality	
Wendt 2019	Cross-sectional 60202 adults from the general population in Brazil	Education (none, incomplete primary level, complete primary level, secondary level, higher education) Wealth index (assets index score; in quintiles)	Sleep disturbance frequency in last two weeks (single question; none/up to seven days vs more than seven days/almost every day)	Highly-educated individuals had lower prevalence of sleep disturbance than those with no formal education	
Williamson 2019	Cohort 4517 infants 0-1y from the general population in Australia followed for 10y	Socioeconomic risk index (average of financial hardship score and composite SES score [derived from income, education, and occupational prestige])	Parent-reported sleep problems trajectories (single question; no sleep problems, mild sleep problems over time, increased middle childhood sleep problems, limited infant/preschool sleep problems, persistent sleep problems through middle childhood)	Higher socioeconomic risks increased the odds for all sleep problem trajectories compared to no sleep problems	
Yao 2019	Cross-sectional 19584 adults 45-85y from the general population in Canada	Education (middle school and under, secondary school, bachelor degree and above) Annual personal income (<$20,000, $20,000-$49,000, $50,000-$99,000, ≥$100,000) Employment status (employed vs retired)	Possible REM sleep behavior disorder (single question, yes vs no)	Lower education level was a risk factor of possible RBD	
Zhu 2019	Cross-sectional 82995 adults 43-79y members of a UK population-based cohort	Residence deprivation index (Townsend score in quintiles; home ownership, car ownership, employment status)	Sleep duration (accelerometry; <5h, 5-6h, 6-7h, 7-8h, >8h)	Those sleeping <6h were more likely to live in the most deprived area compared with the 7-8h sleep group	
Chami 2020	Cross-sectional	Education level (below high school/high school/above high school)	Self-reported sleep duration (<6h, 6-8h, >8h)	There was no association between sleep duration and education, employment status, or income	

	501 adults 18-70y from the general population in Beirut, Lebanon	Employment status (employed vs unemployed) Monthly income (<1000$ vs ≥1000$)		
Harding 2020	Cross-sectional 1205 children 6-10y whose parents completed an online survey in New Zealand	Parental education (secondary or below vs tertiary or above)	High risk for SDB (Sleep Related Breathing Disorder Scale of the Pediatric Sleep Questionnaire score ≥0.33)	Parental education was not associated with high risk for SDB
Holstein 2020	Cross-sectional 35320 5th, 7th, and 9th grade children recruited from public and private schools in Denmark	Parental occupation (professionals and managerial positions/technical and administrative staff, skilled workers/unskilled workers, outside labour market)	Difficulty falling asleep (single question; about every day, more than once a week, about every week, about every month, rarely or never)	Lower parental occupational class was associated with higher odds of difficulty falling asleep
Li 2020	Cross-sectional 3274 adults ≥60y from the general population in Tianjin, China	Educational attainment (illiterate, primary school, junior high school, senior high school and above) Subjective family economic status (good, moderate, poor)	Sleep quality (PSQI global score >7)	Low educational attainment and poor subjective family economic status were significantly associated with higher odds of poor sleep quality
Metse 2020	Cross-sectional 1265 adults from the general population in Australia	Education (up to secondary school vs technical/tertiary) Employment status (employed vs unemployed)	Self-reported sleep duration, sleep onset latency, number of awakenings, WASO, and sleep efficiency (suboptimal vs appropriate according to age-related cut-offs)	Lower education was associated with higher odds of suboptimal sleep duration and sleep onset latency. Unemployment was associated with an increased likelihood of suboptimal sleep efficiency.
Seaton 2020	Cross-sectional 227 male employees 18-66y from six workplaces in northern British Columbia, Canada	Education (some high school, completed high school, trades certification/college diploma, university degree) Income (>Can$100,000, Can$50,000-Can$100,000, <Can$50,000)	Self-reported sleep duration	Education and income were not significantly associated with sleep duration
Sundbom 2020	Cross-sectional 23875 adults 18-45y from the general population in Sweden	Education (9-year compulsory school, high school graduation, academic degree)	Insomnia symptoms (at least four times a week vs less)	Both lower and higher educational level than high school graduation was associated with increased frequency of insomnia symptoms
Tomaso 2020	Cross-sectional 184 adolescents 11-14y members of a cohort recruited from	Family income-to-needs ratio (dividing family income by year's federal poverty level for a specific family size)	Sleep wake problems (Sleep-Wake Problems Behavior Scale of the Sleep Habits Survey)	Lower income-to-needs ratio was associated with greater sleep-wake problems and daytime sleepiness

	advertisements in a small city in the Midwest US		Daytime sleepiness (Epworth Sleepiness Scale–Revised for Children)		
Troxel 2020	Cross-sectional 828 adults from the general population of two neighborhoods in Pittsburgh, USA	Education (less than high school, high school diploma, some college, college/bachelor's degree) Annual household income Food insecurity (Adult Food Security Survey Module)	Sleep duration, sleep efficiency, WASO (7-day actigraphy) Sleep quality (single question; 5-point scale)	Higher income was associated with higher sleep efficiency and lower WASO. Higher food insecurity was associated with shorter sleep duration, poorer sleep efficiency, and poorer subjective sleep quality.	Psychological distress mediated the association between food insecurity and subjective sleep quality
van de Straat 2020	Cohort 23766 adults 50-96y from the general population in 14 European countries followed for 12y	Educational attainment (completed tertiary education vs less) Main occupational position (high skill vs low skill, based on International Standard Classification of Occupations) Income satisfaction (4 levels) Employment status (retired vs no)	Sleeping problems (single question, yes vs no)	Income dissatisfaction was associated with sleeping problems	
Visvalingam 2020	Cross-sectional 464 employees ≥21y from 4 companies in Singapore	Education (primary, secondary and higher secondary, pre-college, college and above) Monthly income (<S$4000, ≥S$4000) Job category (managers and admin personnel, engineers, technicians and traffic controllers, customer service workers)	Sleep quality (PSQI global score >5) Sleep duration (PSQI component; <7h)	SES was not significantly associated with sleep quality and duration	
Wendt 2020	Cross-sectional 2462 22-year-old adults from a population-based birth cohort in Pelotas, Brazil	Wealth index (asset index in quintiles)	Sleep duration and efficiency (7-day accelerometry)	Women in the poorest quintile of wealth index presented with lower sleep efficiency	
Wu 2020	Cross-sectional 36586 adults 20-74y from the general population of Songjiang district in Shanghai, China	Education (junior middle school or lower, senior middle school, college degree or above) Occupation (officer, businessman/serviceman, manual worker, others)	Sleep quality (PSQI global score >7)	Education level was unrelated with sleep quality. Higher occupation level was associated with better sleep quality in females.	
Sarveswaran 2021	Cross-sectional 789 adolescents 10-19y from the general	Income (Modified BG Prasad's scale; lower and lower middle, middle, upper and upper middle)	Sleep quality (PSQI global score ≥5)	Higher income was found to be significant determinant for poor quality of sleep	

	population of two villages in rural Puducherry, India			
Zvolensky 2021	Cross-sectional 401 Latinx college students 18-25y from a US university	Subjective social status (McArthur scale)	Insomnia (insomnia subscale of the Inventory of Depression and Anxiety Symptoms)	Lower subjective social status predicted higher insomnia symptoms

SES = socio-economic status, PSQI = Pittsburgh Sleep Quality Index, DSM = Diagnostic and Statistical Manual of Mental Disorders, SDB = sleep-disordered breathing, BMI = body mass index, ESS = Epworth Sleepiness Scale, EDS = excessive daytime sleepiness, WASO = wake after sleep onset, NIH = National Institutes of Health, IRLSSG = International Restless Legs Syndrome Study Group, RLS = restless legs syndrome, OSA = obstructive sleep apnea, ICD = International Statistical Classification of Diseases and Related Health Problems, PSG = polysomnography, AHI = apnea-hypopnea index, NREM = non-rapid eye movement, EEG = electroencephalogram, ESOMAR = European Society for Opinion and Marketing Research, SWS = slow-wave sleep, ISCED = International Standard Classification of Education, ICSD = International Classification of Sleep Disorders, BIISS = behaviorally induced insufficient sleep syndrome, AIS = Athens Insomnia Scale, DIMS = difficulty initiating or maintaining sleep, TIB = time in bed, ASPD = advanced sleep phase disorder, DSPD = delayed sleep phase disorder, WHO = World Health Organization, REM = rapid eye movement, RBD = REM sleep behavior disorder, ISI = Insomnia Severity Index, ODI = oxygen desaturation index.

Table S2—Quality assessment of included studies according to NHLBI's Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies.

Study	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Quality rating
Hapte-Gabr 1991	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Moffitt 1991	Y	Y	Y	Y	N	N	N	N	Y	N	N	NA	NA	Y	Fair
Weyerer 1991	Y	Y	Y	Y	N	N	N	N	Y	N	N	NA	NA	N	Poor
Hopton 1992	Y	Y	N	Y	N	N	N	Y	Y	N	N	NA	NA	N	Poor
Kim 1994	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Blazer 1995	Y	Y	Y	Y	N	N	N	N	Y	N	N	NA	NA	Y	Fair
Geroldi 1996	Y	N	N	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Poor
Ohayon 1996	Y	Y	Y	Y	N	N	N	N	Y	N	N	NA	NA	Y	Fair
Rásky 1996	Y	Y	Y	Y	N	N	N	N	Y	N	N	NA	NA	Y	Fair
Breslau 1997	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Fabsitz 1997	Y	Y	Y	Y	N	N	N	N	Y	N	N	NA	NA	Y	Fair
Rona 1997	Y	Y	Y	Y	N	N	N	Y	Y	N	Y	NA	NA	Y	Good
Schechtman 1997	Y	Y	NA	N	N	N	N	N	Y	N	N	NA	NA	Y	Poor
Rona 1998	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Talvi 1998	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Hall 1999	Y	Y	NR	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Roberts 1999	Y	Y	Y	Y	N	Y	Y	N	Y	N	N	NA	Y	Y	Good
Adler 2000	Y	N	NR	Y	N	N	N	Y	N	N	N	NA	NA	N	Poor
Ito 2000	Y	Y	N	Y	N	N	N	N	Y	N	N	NA	NA	Y	Poor
Phillips 2000	Y	Y	Y	Y	N	N	N	N	Y	N	N	NA	NA	Y	Fair
Sadeh 2000	Y	N	Y	Y	N	N	N	N	Y	N	Y	Y	NA	Y	Fair
Gallant 2001	Y	Y	Y	Y	N	N	Y	N	Y	N	N	NA	N	Y	Fair
Hublin 2001	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Ohida 2001	Y	Y	Y	Y	N	N	N	N	Y	N	N	NA	NA	Y	Fair
Pallesen 2001	Y	Y	Y	Y	N	N	N	N	Y	N	Y	NA	NA	Y	Fair
Sutton 2001	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Åkerstedt 2002	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair

Li 2002	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Moore 2002	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Ohayon 2002	Y	N	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Rocha 2002	Y	Y	Y	Y	Y	N	N	Y	Y	N	N	NA	NA	Y	Good
Chervin 2003	Y	Y	N	Y	N	N	N	NA	Y	N	N	NA	NA	N	Poor
Doi 2003a	Y	Y	Y	Y	N	N	N	N	Y	N	N	NA	NA	Y	Fair
Doi 2003b	Y	Y	Y	Y	N	N	N	N	Y	N	N	NA	NA	Y	Fair
Kravitz 2003	Y	Y	N	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Larsson 2003	Y	N	Y	Y	N	N	N	N	Y	N	N	NA	NA	N	Poor
Hara 2004	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	N	Fair
Paine 2004	Y	Y	Y	Y	N	N	N	Y	N	N	N	NA	NA	Y	Fair
Roberts 2004	Y	Y	Y	Y	N	N	N	Y	N	N	Y	NA	NA	Y	Fair
Su 2004	Y	Y	Y	Y	N	N	N	N	Y	N	Y	NA	NA	N	Fair
Terzano 2004	Y	N	NR	Y	N	N	N	N	Y	N	N	NA	NA	Y	Poor
Acebo 2005	Y	N	NR	Y	N	N	N	Y	Y	N	Y	N	NA	Y	Poor
Averina 2005	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Chen 2005	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Fass 2005	Y	Y	Y	N	N	N	N	N	Y	N	Y	NA	NA	Y	Fair
Gander 2005	Y	Y	Y	Y	N	N	N	Y	N	N	N	NA	NA	Y	Fair
Gellis 2005	Y	Y	N	Y	N	N	N	Y	Y	N	Y	NA	NA	Y	Fair
Hale 2005	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Hsu 2005	Y	N	Y	Y	N	N	N	N	Y	N	N	NA	NA	Y	Poor
Kim 2005	Y	Y	NR	Y	N	N	N	N	Y	N	N	NA	NA	Y	Poor
McLaughlin Crabtree 2005	Y	Y	N	N	N	N	N	N	N	N	N	NA	NA	Y	Poor
Ohayon 2005	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Phillips 2005	Y	Y	NR	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Tjepkema 2005	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Tworoger 2005	Y	Y	Y	Y	N	N	N	N	Y	N	Y	NR	NA	Y	Fair
Ursin 2005	Y	Y	Y	Y	N	N	N	N	Y	N	N	NA	NA	Y	Fair
BaHammam 2006	Y	Y	Y	Y	N	N	N	N	Y	N	N	NA	NA	N	Poor
Kronholm 2006	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair

Lauderdale 2006	Y	Y	Y	Y	N	N	N	Y	Y	N	Y	NR	NA	Y	Fair
Sekine 2006	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Adam 2007	Y	Y	Y	Y	N	N	N	N	Y	N	N	NA	NA	Y	Fair
Friedman 2007	Y	Y	N	Y	N	N	N	Y	Y	N	Y	NR	NA	Y	Fair
Ozden 2007	Y	N	Y	Y	N	N	N	N	Y	N	Y	NA	NA	Y	Fair
Rangarajan 2007	Y	Y	Y	Y	Y	N	N	N	Y	N	Y	NA	NA	Y	Good
Stamatakis 2007	Y	Y	Y	Y	N	N	N	Y	Y	Y	N	NA	Y	Y	Good
Baigi 2008	Y	Y	Y	Y	N	N	N	N	Y	N	N	NA	NA	Y	Fair
Blay 2008	Y	Y	Y	Y	N	N	N	N	Y	N	N	NA	NA	Y	Fair
Ekici 2008	Y	Y	Y	Y	N	N	N	N	Y	N	N	NA	NA	Y	Fair
Inan 2008	Y	Y	Y	Y	Y	N	N	N	Y	N	Y	NA	NA	N	Fair
Jean-Louis 2008	Y	N	NR	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Poor
Kuehni 2008	Y	N	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Li 2008	Y	Y	NA	Y	NA	Y	Y	Y	Y	CD	Y	NA	NA	Y	Good
Mezick 2008	Y	Y	Y	Y	N	N	N	Y	Y	N	Y	NR	NA	Y	Fair
Roberts 2008	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y	NA	N	Y	Good
Virtanen 2008	Y	Y	N	Y	N	N	Y	Y	Y	Y	N	NA	Y	Y	Good
Xiang 2008	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Yao 2008	Y	N	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Arber 2009	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Baker 2009	Y	Y	N	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Cho 2009	Y	N	Y	Y	Y	N	N	Y	Y	N	N	NA	NA	Y	Fair
Hall 2009	Y	Y	NR	N	N	N	N	Y	Y	N	Y	Y	NA	Y	Fair
Jiang 2009	Y	Y	Y	Y	N	N	N	N	Y	N	N	NA	NA	Y	Fair
Joo 2009	Y	Y	N	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Kim 2009	Y	Y	Y	Y	N	Y	Y	N	Y	N	N	NA	N	Y	Fair
Krueger 2009	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Reddy 2009	Y	Y	Y	Y	N	N	N	Y	Y	N	Y	Y	NA	Y	Good
Sivertsen 2009	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Vincent 2009	Y	Y	NR	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Yang 2009	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	CD	Fair

Fritsch Montero 2010	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Goodin 2010	Y	N	NR	Y	N	N	N	Y	N	N	N	NA	NA	Y	Poor
Grandner 2010	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Gu 2010	Y	Y	Y	Y	N	N	N	N	Y	N	N	NA	NA	Y	Fair
Knutson 2010	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Lallukka 2010	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Li S 2010	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Li SX 2010	Y	Y	Y	Y	N	N	N	Y	Y	N	Y	NA	NA	Y	Good
Meltzer 2010	Y	Y	NA	Y	NA	N	N	Y	N	N	Y	Y	NA	Y	Fair
Mittelmark 2010	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Nomura 2010	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Paparrigopoulos 2010	Y	Y	N	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Park 2010	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Patel 2010	Y	Y	N	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Tomfohr 2010	Y	N	NA	Y	N	N	N	N	Y	N	Y	NR	NA	Y	Poor
Tufik 2010	Y	Y	Y	Y	Y	N	N	Y	Y	N	Y	NR	NA	Y	Good
Amra 2011	Y	N	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Arakane 2011	Y	Y	Y	Y	Y	N	N	N	Y	N	N	NA	NA	Y	Fair
Arman 2011	Y	Y	Y	Y	Y	N	N	Y	Y	N	N	NA	NA	Y	Good
Bonuck 2011	Y	Y	Y	Y	N	N	N	N	Y	Y	N	NA	N	Y	Fair
Eder 2011	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Hense 2011	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Li 2011	Y	Y	Y	Y	N	N	N	Y	Y	N	Y	NA	NA	Y	Good
McHale 2011	Y	N	Y	Y	N	N	N	N	Y	N	N	NA	NA	Y	Poor
Moore 2011	Y	Y	Y	Y	N	N	N	Y	Y	N	Y	Y	NA	Y	Good
Pallesen 2011	Y	N	Y	Y	N	N	N	Y	Y	N	Y	NA	NA	Y	Fair
Pigeon 2011	Y	N	Y	Y	N	N	N	Y	Y	N	N	NA	NA	N	Poor
Ryu 2011	Y	Y	NR	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Wong 2011	Y	Y	N	Y	Y	N	N	Y	Y	N	N	NA	NA	Y	Fair
Zhang 2011	Y	Y	Y	Y	N	Y	Y	N	Y	N	N	NA	N	Y	Fair
Adams 2012	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	N	Fair

Blümel 2012	Y	N	Y	Y	Y	N	N	N	Y	N	N	NA	NA	Y	Fair
Bøe 2012	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	N	Fair
Brug 2012	Y	Y	Y	Y	N	N	N	N	Y	N	N	NA	NA	N	Poor
Calem 2012	Y	Y	Y	Y	N	N	N	Y	Y	N	Y	NA	NA	Y	Good
Green 2012	Y	Y	Y	Y	N	N	Y	N	Y	N	N	NA	N	Y	Fair
Guo 2012	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Heilemann 2012	Y	Y	Y	Y	N	N	N	N	Y	N	N	NA	NA	N	Poor
Kachikis 2012	Y	Y	NR	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Lallukka 2012	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Lima 2012	Y	Y	Y	Y	Y	N	N	Y	Y	N	N	NA	NA	Y	Good
Marco 2012	Y	N	Y	Y	N	N	N	Y	Y	N	Y	NR	NA	Y	Fair
Mazzotti 2012	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Nicholson 2012	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Nishikitani 2012	Y	Y	N	Y	N	N	N	N	Y	N	N	NA	NA	Y	Poor
Rosenbaum 2012	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Soltani 2012	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	N	Fair
Stranges 2012	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Talala 2012	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Tu 2012	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Wall 2012	Y	Y	NA	Y	NA	N	N	Y	N	N	Y	NA	NA	Y	Fair
Zhang 2012	Y	Y	Y	Y	N	Y	Y	N	Y	N	N	NA	N	Y	Fair
Ansarin 2013	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Biggs 2013	Y	Y	N	Y	N	N	N	Y	N	N	N	NA	NA	Y	Poor
Chen 2013	Y	Y	NR	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
El-Sheikh 2013	Y	Y	N	Y	N	N	N	Y	Y	N	Y	NR	NA	N	Poor
Grandner 2013	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Hartz 2013	Y	Y	NR	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Hoefelmann 2013	Y	Y	NR	Y	Y	N	N	Y	Y	N	N	NA	NA	Y	Fair
Hsu 2013	Y	Y	NA	Y	NA	CD	N	Y	Y	N	Y	NA	NA	Y	Good
Innes 2013	Y	N	Y	Y	N	N	N	Y	Y	N	Y	NA	NA	Y	Fair
Jarrin 2013	Y	N	NA	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Poor

Kidwai 2013	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Kim 2013	Y	Y	Y	Y	N	N	N	N	Y	N	Y	NA	NA	Y	Fair
Luo 2013	Y	Y	Y	Y	N	N	N	N	Y	N	N	NA	NA	Y	Fair
Mindell 2013	Y	Y	NA	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Yoshioka 2013	Y	Y	N	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Anders 2014	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Basner 2014	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Carrillo-Larco 2014	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Gjevre 2014	Y	Y	N	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Gubelmann 2014	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Jarrin 2014	Y	N	NA	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Poor
Kang 2014	Y	Y	NR	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Karaman 2014	Y	N	NR	Y	Y	N	N	N	Y	N	N	NA	NA	Y	Poor
Leng 2014	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Liviya NG 2014	Y	Y	NR	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
McDonald 2014	Y	Y	Y	Y	N	N	N	N	Y	N	N	NA	NA	Y	Fair
Paine 2014	Y	Y	Y	Y	N	N	N	Y	N	N	Y	NA	NA	Y	Fair
Pallesen 2014	Y	Y	Y	Y	N	N	N	N	Y	N	Y	NA	NA	Y	Fair
Pan 2014	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Seib 2014	Y	Y	N	Y	N	N	N	Y	Y	N	N	NA	NA	N	Poor
Speirs 2014	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Takahashi 2014	Y	Y	Y	Y	N	N	N	Y	Y	N	Y	NR	NA	Y	Fair
Uhlig 2014	Y	Y	N	Y	N	N	N	N	Y	N	Y	NA	NA	Y	Fair
Whinnery 2014	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Bagley 2015	Y	Y	Y	Y	N	N	N	Y	Y	N	Y	Y	NA	Y	Good
Baiden 2015	Y	Y	NR	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Benbir 2015	Y	Y	Y	Y	N	N	N	Y	Y	N	Y	NA	NA	Y	Good
Bonke 2015	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Buxton 2015	Y	Y	N	Y	N	N	N	N	Y	N	N	NA	NA	Y	Poor
Cunningham 2015	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Ding 2015	Y	Y	Y	Y	N	N	N	Y	N	N	N	NA	NA	Y	Fair

El-Sheikh 2015	Y	Y	Y	Y	N	N	N	Y	Y	N	Y	Y	NA	Y	Good
Gamaldo 2015	Y	Y	Y	Y	N	N	N	N	Y	N	N	NA	NA	Y	Fair
Katainen 2015	Y	N	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Kim 2015	Y	Y	Y	Y	N	N	N	N	Y	N	N	NA	NA	Y	Fair
Kurina 2015	Y	Y	Y	Y	N	N	N	Y	Y	N	Y	NR	NA	Y	Fair
Nisar 2015	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Patel 2015	Y	Y	N	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Peltzer 2015	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Schwartz 2015	Y	Y	N	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Sivertsen 2015	Y	Y	N	Y	N	N	N	Y	Y	N	Y	NA	NA	N	Fair
Stringhini 2015	Y	Y	Y	Y	N	N	N	Y	Y	N	Y	NR	NA	Y	Fair
Suarez 2015	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
van de Straat 2015	Y	Y	N	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Yoon 2015	Y	Y	NR	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Zapata Roblyer 2015	Y	N	NR	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Poor
Danielsson 2016	Y	Y	Y	Y	N	N	N	N	Y	N	Y	NA	NA	N	Fair
de Jong 2016	Y	Y	NR	Y	N	N	N	N	Y	N	Y	NR	NA	N	Poor
de Ruiter 2016	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Hawkins 2016	Y	Y	N	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Heshmat 2016	Y	Y	Y	Y	Y	N	N	Y	Y	N	N	NA	NA	Y	Good
Johnson 2016	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Malone 2016	Y	Y	N	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Paine 2016a	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Paine 2016b	Y	Y	Y	Y	N	N	N	Y	N	N	N	NA	NA	Y	Fair
Peltzer 2016	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Peña 2016	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	NA	N	Y	Good
Safak 2016	Y	Y	NR	Y	N	N	N	Y	Y	N	Y	NA	NA	Y	Fair
Schäfer 2016	Y	Y	Y	Y	N	N	N	Y	Y	Y	N	NA	NA	Y	Good
Seyedmehdi 2016	Y	Y	Y	Y	N	N	N	N	Y	N	N	NA	NA	Y	Fair
Smagula 2016	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	NA	NR	Y	Good
Tareque 2016	Y	Y	N	Y	N	N	N	N	Y	N	N	NA	NA	Y	Poor

Wong 2016	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Abraham 2017	Y	Y	N	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Ahmed 2017	Y	Y	Y	Y	N	N	N	Y	Y	N	Y	NA	NA	Y	Good
Assari 2017	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	NA	NR	Y	Good
Bapat 2017	Y	N	NR	N	N	N	N	Y	Y	N	N	NA	NA	Y	Poor
Barazzetta 2017	Y	Y	Y	Y	N	N	N	Y	Y	Y	N	NA	N	Y	Fair
Brambilla 2017	Y	Y	NR	Y	N	N	N	N	Y	N	N	NA	NA	N	Poor
Cheng 2017	Y	Y	Y	Y	N	N	Y	N	Y	N	N	NA	N	Y	Fair
Clark 2017	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	N	Fair
Costanian 2017	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Didriksen 2017	Y	Y	Y	Y	N	N	N	N	Y	N	Y	NA	NA	Y	Fair
Foroughi 2017	Y	N	NR	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Poor
Fulgencio 2017	Y	N	NR	Y	Y	N	N	N	Y	N	N	NA	NA	N	Poor
Grandner 2017	Y	Y	Y	Y	N	N	N	Y	Y	N	Y	NA	NA	Y	Good
Ham 2017	Y	Y	Y	Y	N	N	N	N	Y	N	N	NA	NA	Y	Fair
Hardy 2017	Y	Y	Y	Y	Y	N	N	N	N	N	N	NA	NA	Y	Fair
Kim 2017	Y	Y	NR	Y	N	N	N	N	Y	N	N	NA	NA	Y	Poor
Koolhaas 2017	Y	Y	Y	Y	N	N	N	Y	Y	N	Y	Y	NA	Y	Good
Ma JF 2017	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Ma Y 2017	Y	Y	NR	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Maume 2017	Y	Y	Y	Y	N	N	Y	N	Y	Y	N	NA	NR	Y	Fair
McDowall 2017	Y	Y	Y	Y	N	N	N	N	Y	N	N	NA	NA	N	Poor
Mota-Veloso 2017	Y	N	Y	Y	Y	N	N	Y	Y	N	Y	NA	NA	Y	Good
Netsi 2017	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	NA	Y	Y	Good
Palmer 2017	Y	Y	N	Y	Y	N	N	Y	Y	N	N	NA	NA	Y	Fair
Patte 2017	Y	Y	Y	Y	N	Y	Y	Y	N	N	N	NA	N	Y	Fair
Perales 2017	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Seo 2017	Y	Y	NR	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Sivertsen 2017	Y	Y	N	Y	N	Y	Y	Y	Y	Y	N	NA	NA	Y	Good
Tang 2017	Y	Y	Y	Y	N	N	N	N	Y	N	N	NA	NA	Y	Fair
Walsemann 2017	Y	Y	Y	Y	N	N	Y	Y	Y	Y	N	NA	Y	Y	Good

Wang 2017	Y	Y	Y	Y	Y	N	N	Y	Y	N	N	NA	NA	Y	Good
Yu 2017	Y	Y	NA	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Yunus 2017	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Zhang 2017	Y	Y	NR	Y	Y	N	N	Y	Y	N	N	NA	NA	Y	Fair
Berhanu 2018	Y	Y	Y	Y	Y	N	N	Y	Y	N	N	NA	NA	Y	Good
Cha 2018	Y	Y	NR	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Chang 2018	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Counts 2018	Y	N	NR	Y	N	N	N	Y	N	N	N	NA	NA	Y	Poor
de Jonge 2018	Y	N	Y	Y	N	N	Y	N	Y	N	N	NA	N	Y	Poor
de Lima 2018	Y	Y	NR	Y	Y	N	N	Y	Y	N	N	NA	NA	Y	Fair
Dong 2018	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Gómez-Olivé 2018	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Goyal 2018	Y	Y	Y	Y	Y	N	N	N	Y	N	N	NA	NA	N	Fair
Jaisoorya 2018	Y	Y	Y	Y	Y	N	N	N	Y	N	N	NA	NA	Y	Fair
Khan 2018	Y	N	NR	Y	Y	N	N	Y	Y	N	N	NA	NA	N	Poor
Lima 2018	Y	Y	Y	Y	Y	N	N	Y	Y	N	N	NA	NA	Y	Good
Lin 2018	Y	Y	Y	Y	N	Y	Y	N	Y	N	N	NA	N	Y	Fair
Ma J 2018	Y	Y	NR	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Ma Y 2018	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Manyanga 2018	Y	Y	NR	Y	Y	N	N	Y	Y	N	Y	Y	NA	Y	Good
Matthews 2018	Y	Y	Y	N	N	CD	N	Y	Y	Y	Y	Y	NA	Y	Good
Meneton 2018	Y	Y	N	Y	N	Y	Y	Y	Y	N	N	NA	N	Y	Fair
Miner 2018	Y	Y	Y	Y	N	N	N	N	Y	N	N	NA	NA	Y	Fair
Olorunmoteni 2018	Y	N	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Park 2018	Y	Y	Y	Y	N	N	N	N	Y	N	N	NA	NA	Y	Fair
Peltzer 2018	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Pepin 2018	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Perlus 2018	Y	Y	Y	Y	N	N	Y	Y	Y	N	N	NA	Y	Y	Good
Plancoulaine 2018	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	NA	N	Y	Good
Schlieber 2018	Y	Y	Y	Y	N	N	N	N	Y	N	N	NA	NA	Y	Fair
Thichumpa 2018	Y	Y	NR	Y	Y	N	N	Y	Y	N	N	NA	NA	Y	Fair

Vermeiren 2018	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Wu 2018	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Yang 2018	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	N	Fair
Zheng 2018a	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Zheng 2018b	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Akay 2019	Y	Y	NR	Y	N	N	N	Y	Y	N	N	NA	NA	N	Poor
Åkerstedt 2019	Y	Y	Y	Y	N	N	Y	Y	Y	N	N	NA	N	Y	Fair
Al-Hazzaa 2019	Y	Y	Y	Y	Y	N	N	Y	Y	N	N	NA	NA	Y	Good
Althakafi 2019	Y	Y	NA	Y	Y	N	N	Y	Y	N	N	NA	NA	Y	Fair
Barros 2019	Y	Y	Y	Y	Y	N	N	Y	Y	N	N	NA	NA	Y	Good
Bazargan 2019	Y	Y	NR	Y	N	N	N	N	Y	N	N	NA	NA	Y	Poor
Carneiro 2019	Y	Y	Y	Y	N	N	N	N	Y	N	N	NA	NA	Y	Fair
Chami 2019	Y	Y	NR	Y	N	N	N	N	Y	N	Y	NA	NA	Y	Fair
Chen 2019	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	N	NA	NA	Y	Good
Doane 2019	Y	Y	NR	Y	N	CD	N	Y	Y	Y	Y	Y	NA	Y	Good
Gordon 2019	Y	Y	N	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Hartescu 2019	Y	Y	NA	Y	N	N	N	Y	Y	N	Y	NA	NA	Y	Fair
Kobel 2019	Y	Y	Y	Y	N	N	N	N	Y	N	Y	Y	NA	Y	Fair
Laganière 2019	Y	Y	NR	Y	N	Y	Y	N	Y	N	N	NA	N	Y	Fair
Lee ES 2019	Y	Y	NR	Y	N	N	N	Y	Y	Y	N	NA	NA	Y	Fair
Lee EY 2019	Y	Y	NR	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Lei 2019	Y	Y	NR	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Maeda 2019	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Manyanga 2019	Y	Y	NR	Y	N	N	N	N	Y	N	Y	Y	NA	Y	Fair
Matenchuk 2019	Y	Y	NR	Y	N	N	N	N	Y	N	N	NA	NA	Y	Poor
Miner 2019	Y	Y	Y	Y	N	N	N	N	Y	N	N	NA	NA	Y	Fair
Muller 2019	Y	Y	NA	Y	Y	N	N	Y	Y	N	N	NA	NA	Y	Fair
Nagata 2019	Y	Y	Y	Y	N	N	N	N	N	N	N	NA	NA	Y	Poor
Nasim 2019	Y	Y	N	Y	N	N	N	Y	N	N	N	NA	NA	Y	Poor
Peltzer 2019	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Petrovic 2019	Y	Y	Y	Y	N	N	N	N	Y	N	Y	NR	NA	N	Poor

Pontes 2019	Y	Y	Y	Y	Y	N	N	N	Y	N	Y	NA	NA	Y	Good
Poulain 2019	Y	Y	NA	Y	N	N	N	N	Y	N	N	NA	NA	Y	Poor
Redondo-Bravo 2019	Y	Y	Y	Y	N	N	N	N	Y	N	Y	NR	NA	Y	Fair
Ren 2019	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Sheehan 2019	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Singh 2019	Y	Y	Y	Y	N	N	N	N	Y	N	Y	Y	NA	Y	Fair
Sun 2019	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	N	Fair
Talvitie 2019	Y	Y	Y	Y	N	CD	N	N	Y	N	N	NA	NA	Y	Fair
Teo 2019	Y	N	NA	Y	N	N	N	Y	Y	N	Y	Y	NA	Y	Fair
Vézina-Im 2019	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Wang 2019	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Wendt 2019	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Williamson 2019	Y	Y	Y	Y	N	Y	Y	N	Y	N	N	NA	N	Y	Fair
Yao 2019	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Zhu 2019	Y	Y	N	Y	N	N	N	Y	N	N	Y	Y	NA	Y	Fair
Chami 2020	Y	Y	NR	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Harding 2020	Y	Y	NA	Y	Y	N	N	Y	Y	N	N	NA	NA	N	Fair
Holstein 2020	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Li 2020	Y	Y	Y	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Fair
Metse 2020	Y	Y	N	Y	N	N	N	N	Y	N	N	NA	NA	N	Poor
Seaton 2020	Y	Y	NR	Y	N	N	N	N	Y	N	N	NA	NA	Y	Poor
Sundbom 2020	Y	N	NR	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Poor
Tomaso 2020	Y	N	Y	Y	N	N	N	N	Y	N	N	NA	NA	Y	Poor
Troxel 2020	Y	Y	Y	Y	N	N	N	Y	Y	N	Y	Y	NA	Y	Good
van de Straat 2020	Y	Y	Y	Y	N	N	N	Y	Y	Y	N	NA	Y	Y	Good
Visvalingam 2020	Y	Y	NA	Y	Y	N	N	Y	Y	N	N	NA	NA	Y	Fair
Wendt 2020	Y	Y	Y	Y	N	N	N	Y	Y	N	Y	Y	NA	Y	Good
Wu 2020	Y	N	NR	Y	N	N	N	Y	Y	N	N	NA	NA	Y	Poor
Sarveswaran 2021	Y	Y	Y	Y	Y	N	N	Y	Y	N	N	NA	NA	Y	Good
Zvolensky 2021	Y	Y	NR	Y	N	N	N	N	N	N	N	NA	NA	Y	Poor

Y = Yes, N = No, CD = cannot determine, NA = not applicable, NR = not reported.

Q1. Was the research question or objective in this paper clearly stated?
Q2. Was the study population clearly specified and defined?
Q3. Was the participation rate of eligible persons at least 50%?
Q4. Were all the subjects selected or recruited from the same or similar populations (including the same time period)? Were inclusion and exclusion criteria for being in the study prespecified and applied uniformly to all participants?
Q5. Was a sample size justification, power description, or variance and effect estimates provided?
Q6. For the analyses in this paper, were the exposure(s) of interest measured prior to the outcome(s) being measured?
Q7. Was the timeframe sufficient so that one could reasonably expect to see an association between exposure and outcome if it existed?
Q8. For exposures that can vary in amount or level, did the study examine different levels of the exposure as related to the outcome (e.g., categories of exposure, or exposure measured as continuous variable)?
Q9. Were the exposure measures (independent variables) clearly defined, valid, reliable, and implemented consistently across all study participants?
Q10. Was the exposure(s) assessed more than once over time?
Q11. Were the outcome measures (dependent variables) clearly defined, valid, reliable, and implemented consistently across all study participants?
Q12. Were the outcome assessors blinded to the exposure status of participants?
Q13. Was loss to follow-up after baseline 20% or less?
Q14. Were key potential confounding variables measured and adjusted statistically for their impact on the relationship between exposure(s) and outcome(s)?