Bilaga 2

De inkluderade litteraturöversikternas karakteristika och resultat efter vilka skolfaktor översikten studerar

2a. faktorer relaterad till skolans organisation, pedagogiska arbete och psykosociala miljö, 2b. organisatoriska faktorer, 2c. faktorer relaterad till det pedagogiska arbetet, och 2d. den psykosociala skolmiljön. I varje grupp beskrivs översikterna efter publiceringsår (nyaste först)

2a. SCHOOL ENVIRONMENT: INCLUDE SCHOOL ORGANISATION, PEDAGOGICAL SCHOOL ENVIRONMENT AND PSYCHOSOCIAL SCHOOL ENVIRONMENT					
Author Year (Reference)	REVIEW CHARACTERISTICS	ELIGIBLE STUDIES (number of studies in parentheses)			AUTHOR'S REPORTING (summary) and COMMENTS
		CHARACTERISTICS	METHODS	RESULTS	
Kidger 2012 (43)	Focus: impact of the school environment on adolescent emotional health Search period: until 2011 Inclusion criteria *Age:* 11 y–18 y *Setting:* schools *Exposure:* aspects of the school environment related to structural, pedagogic, or relational features of school life (not exclusively bullying or classroom-based interventions) *Outcome:* positive and negative emotional health and self-harm (not solely self-esteem or non-affective mental disorder) *Design* *Intervention*: CT *Observational*: cohorts Identified references: 39, of these the authors included 30 in the narrative summary of results*	Studies/participants (15/32119) *Intervention*: (4/4454) *Observation*: (11/27713) Age *Intervention*: 11 y–14 y *Observation*: 10 y–19 y Risk status: general population Country *Intervention*: Australia (2); USA (2) *Observation*: USA (5); Australia (3); Norway (2); Sweden (1) Publication year *Intervention*: 2000–2012 *Observation:* 2002–2010 Exposure *Type* *Interventions*: whole school multicomponent (3) comprising child health/pedagogical support (3); psychosocial/physical climate improvement (3); curriculum content on mental health management (2); partnership community (2)/parent (1); psychoeducation pupils, parents,	Design *Interventions*: RCT (4); non-randomised CT (2) *Observations*: longitudinal (all) Analyses *Studies* *Interventions*: ANOVA (2); multilevel model (1); NR (1) *Observations*: regression models: unspecified (3), hierarchical linear (1), multivariable logistic (1); structural equation models (1); growth models (1); NR (3) *Confounders considered* *Interventions*: NR, but intervention and control group: alike demographics (2); SES and ethnicity differ (1) *Observations*: outcome at baseline (10 - NA: 1); gender (10); SES (7); ethnicity (6); age (4/NA:2); family structure (4); risk behaviour (2); self-esteem (1) *Review:* narrative summary *Effect model*: NA *Homogeneity:* NR *Publication bias*: not assessed Quality Intervention *Selection bias* *Random sequence generation*	Statistically significant results presented at different *follow-up times* as OR (95% CI); regression coefficient (b, β, OLS), or growth model intercept and slope, all followed by p-values DEPRESSION Whole school multicomponent (interventions) *1 y* (1) Study 1: ns *2 y* (2) Study 1 and 2: ns *3 y* (1) Study 1: ns *5 y* (1) Study 3: ns Connectedness (observations) *1 y* (3) Study 4* and 5*: ns Study 6 (OLS coefficient) Girls -1.94, p < 0.05 Boys -2.07, p < 0.01 *2 y* (1) Study 7*: ns *6 y* (1) Study 8: If connected, odds (95% CI) for trajectory: *-no depression*: 1 (comparison) *-stable low depression*: 0.67 (0.51; 0.88) *-early high depression*: 0.32 (0.2; 0.46) *-late escalating depression*: ns Teacher support (observations) *1 y* (3) Study 9: ns Study 10: β -0.32 p < 0.05 Study 11*: Girls: b -0.97 (SE 0.25) Boys: ns *Difference by gender*: p < 0.00 *2 y* (1): Intercept -0.39 Slope -0.77; p < 0.05	Author's results and conclusions Three intervention studies focusing on multiple school-related factors found no effects on depression or anxiety, and it is concluded that there is no strong evidence that a whole school approach can improve emotional health. At an individual level, three "reasonably good-quality" cohort studies found that school connectedness predicted later depression (boys and girls) and anxiety (girls), and furthermore that children who were well connected socially and in school had better health than those with high social but low school connectedness. Another three cohort studies found no association between connectedness and depression, but these studies had methodological flaws (low samples size, no account for cluster design). Among five cohort studies addressing support at school, three found that teacher support predicted lower depression (1 study: possibly only in girls), one found that a combination of teacher and classmate support predicted lower distress, and one found no association between perceived fairness of teachers and later depression. One of these studies also found an effect of peer support on later depression, while another found no such effect of "trouble getting along with peers". An intervention study with 48 children found a non-significant positive effect of teacher support on internalising problems among children.

	Intervention: 9 (5 studies, 4 eligible, 1 non-eligible outcomes) *Observation:* 21 (11 eligible, 10 non-eligible outcome (5) or only single study results (5)) *Reason for exclusion: only 1 school included and/or lack of control for outcome at baseline (7); small samples and high attrition rates (2) Quality (AMSTAR score): 7.5 of 10 possible	staff (1). Supportive teacher relations (1) *Observation*: connectedness (6); relations teacher (5), and peer/classmate (3); autonomy promotion (2); school-related stress (2) *Provider:* NA/NR *Setting*: school *Comparator* *Intervention*: NR *Longitudinal*: lower or higher degree of exposure *Informant*: teacher (1); NR (3) *Intervention level:* *Intervention*: universal *Observation*: NA Outcome *Interventions*: depression (2); both depression and anxiety (1); internalising problems (1) *Observations*: depression (7); both depression and anxiety (2); internalising problems (distress; anxiety/depression) (2) *Informant*: NR	Risk: low (computerised) (1); high (1); unclear (3) *Allocation concealment* Risk: low (1); high (1); unclear (1) *Response bias* *Incomplete baseline data* 15% (1); 6 of 26 schools = 23% (1); 58%–69% (1) *Incomplete follow-up* Ca. 10% (1); 20% (1); NR (2) *Analysis account for* *Cluster design* (2); *outcome at baseline* or *confounders* (NR) *Measurement bias*: NR Observation *Selection bias*: NA *Recruitment* Random cluster sampling (1); total sample (2); unclear (8) *Response bias* *Incomplete baseline data*: NR *Incomplete follow-up*: <15% (5); 15–30% (3); >30% (2); NR (1) *Analysis accounts for* *cluster design* (6); *outcome at baseline* (10/NA:1); *confounders* (11) *Measurement bias*: NR Intervention and observation *Performance, detection, reporting bias*: NA/NR	Peer relations (observations) *1 y* (1) Study 9 (*troublesome peer relations)*: ns *2 y* (1) Study 12* (*peer support)*: Intercept -0.65 Slope -0.75; p < 0.05 Promote autonomy (observations) *1 y* (1) Study 10: β -0.17 p < 0.05 *2 y* (1) Study 12* Intercept -0.28 Slope -0.35; p < 0.05 School related stress *1 y* (1) Study 11*: ns ANXIETY Connectedness (observations) *1 y* (2) Study 5*: ns Study 6 (OLS coefficient): Girls: -1.81, p < 0.05 Boys: ns Whole school multicomponent (interventions) *2 y* (1) Study 2: ns INTERNALISING PROBLEMS (depression/anxiety/distress) Connectedness (observations) *2.5 y* (1) Study 13 If connected, odds (95% CI) for depression/anxiety -school *high*/social *high*: 1 (comparison) -school *low*/social *high*: 1.34 (1,04; 1.76) -school *high/social low*: ns -*school low/social low*: ns Teacher/classmate support (observations) *1 y* (1) Study 14 b -0.12; p < 0.001 Teacher support (interventions) *5 mo.* (1) study 15: ns School related stress *1 y* (1) Study 14: b 0.11; p < 0.01 *Methodological flaws: no account for cluster sampling and/or low sample size	School stress predicted distress in one study, while another (that did not account for cluster design) found no such effect. Two "reasonable quality studies" found an effect of promoting autonomy in school. It is concluded that there is some rather weak evidence that connectedness to school and perceived teacher support has an effect on emotional health. Author's limitations Most studies applied self-reported rather than objectively measured school factors, which might have resulted in reporting bias. Other methodological shortcomings included small sample sizes (i.e. power problems); high attrition rates (i.e. risk of biased findings); and no adjustment for clustering (i.e. risk of overestimated effects). The definition of school connectedness and teacher support varied across studies. More details are needed about the meaning of particular aspects of these broad concepts. Our comments The narrative summary provided results for association between school factors and internalising problems as defined in the current review of reviews. However, some results were based upon one study only and therefore were not included here. These studies focused on class well-being, happiness at school, feeling close to people at school, feeling part of school, feeling safe at school, pedagogic style encouraging self-improvement rather than competition (mastery vs. performance goal structure), and clarity and consistency of rules. *Overlap*: 3 of 11 eligible studies also in at least one other included review.

2b. SCHOOL ORGANISATION

Author Year (Reference)	REVIEW CHARACTERISTICS	ELIGIBLE STUDIES (number of studies in parentheses)			AUTHOR'S REPORTING (summary) and COMMENTS
		CHARACTERISTICS	METHODS and QUALITY	RESULTS	
Langford 2014, 2015, 2017 (44–46)	**Focus**: effectiveness of the Health Promoting Schools (HPS) framework for improving health, well-being, and academic achievement **Search period**: until 2013 **Inclusion criteria** *Age:* 4 y–18 y *Setting:* school *Exposure:* whole-school child health promotion that targets the school curriculum; school ethos and/or environment; and family and/or community engagement. *Outcome:* mental health and emotional wellbeing, as well as specified physical and sexual health outcomes; lifestyle; violence; bullying; body image; safety; and academic outcomes *Design:* Cluster RCT (C-RCT) **Identified references**: 67 (3 eligible; 64 non-eligible outcomes) **Quality** (AMSTAR score): 9 of 11 possible	**Studies/participants** (3/11077) **Age**: 9 y–14 y (13 y–14 y in 2 studies) **Risk status**: none (general population) **Country**: Australia (2), Netherlands (1) **Publication year**: 2004–2010 **Exposure** *Type:* whole school interventions targeting a) mental health and well-being (2) and b) anti-bullying (1) Intervention a) comprises implementation of curriculum, policies, and action plans focusing on mental health management (psychological/ emotional and social skills training), improved classroom climate, and partnership with parents and communities Intervention b) comprises implementation of curriculum, policies, and action plans focusing on anti-bullying, bullying education and monitoring systems, mental health management (social skills training), break time supervision, and parental awareness and involvement *Provider:* whole school approach *Setting*: school *Comparator*: "Community Forum component only" (1), NR (2) *Informant*: NA *Intervention level:* universal **Outcome** (primary health outcomes): depressive symptoms (3) *Informant*: self-reported	**Design**: C-RCT **Analyses** *Studies*: NR *Confounders considered*: NR *Review*: meta analyses (mental health and well-being intervention) and narrative (anti-bullying intervention) *Effect model*: random *Homogeneity:* I^2 statistics *Publication bias*: not assessed (too few studies) **Quality** (Cochrane tool) *Selection bias* *Random sequence generation* Risk: unclear (3) *Allocation concealment* Risk: low (2); unclear (1) *Performance bias* *Blinding participants/ personal* Risk: high (3) *Detection bias* *Blinding outcome assessment* Risk: high (3) *Response bias* *Incomplete baseline data* Risk: high (2), unclear (1) *Incomplete follow-up* Risk: low (1); high (1); unclear (1) *Reporting bias* *Selective reporting* Risk: high (1); unclear (2) *Others*: NR **Overall quality of evidence**: evaluated using GRADE	Statistically significant results presented at different *follow-up times* as SMD (95% CI) followed by heterogeneity (I^2), when relevant DEPRESSION **Whole school mental health and well-being intervention** *0 mo.* (2): ns; I^2 0% *1 & 2 y* (1): no effect (no statistics) **Whole school anti-bullying intervention** *0 mo.* (1): ns *1 y* (1): no effect (no statistics) **Moderator/Mediator**: NR **Overall quality of evidence**: Moderate; RCT evidence downgraded due to high risk of bias (blinding of participants)	**Author's results and conclusions** Overall, there was no evidence that HPS-interventions were effective at reducing rates of depression in students. The quality of this evidence was moderate. The authors conclude that presently there is insufficient data to determine the mental health effect of this approach. **Author's limitations** The current evidence from HPS interventions is primarily focusing on obesity related outcomes, while the effect on mental health is largely absent. Furthermore, the interventions targeting mental health mostly include children above 12 years of age, but risk factors for mental ill health often arise earlier in childhood. Thus, interventions targeting mental health in earlier childhood are also needed. **Our comments** Specific summary provided for the outcome depressive symptoms. *Overlap*: 2 of 3 eligible references also in at least one other included review.

2c. PEDAGOGICAL SCHOOL ENVIRONMENT					
Author Year (Reference)	REVIEW CHARACTERISTICS	ELIGIBLE STUDIES (number of studies in parentheses)			AUTHOR'S REPORTING (summary) and COMMENTS
		CHARACTERISTICS	METHODS	RESULTS	
Waldron 2018 (51)	Focus: long-term effect of universal school-based anxiety prevention interventions Search period: 1980–2017 Inclusion criteria *Age:* 5 y–18 y at start *Setting:* school (during normal school hours) *Exposure:* universal intervention with anxiety as a primary or dual target, a clear theoretical rationale, and involving children *Control*: wait list, attention, or no intervention group *Outcome:* child-reported anxiety symptoms (pre, post, and ≥12 months follow-up) *Design:* RCT Identified references: 11 (8 studies; all eligible) Quality (AMSTAR score): 6.5 of 10 possible	Studies/participants (8/7522) Age: 9 y–18 y Risk status: NR Country: Australia (6); Germany and United Kingdom, (1 each) Publication year: 2003-2016 Exposure *Type*: mental health management intervention based on cognitive behavioural principles and comprising training of psychological/emotional and/or social skills and practices. Parent involvement in 5 studies. Focus on anxiety prevention (5), anxiety and depression prevention (2), unclear (1) *Provider:* graduate student (1) teachers (3), health professionals (3), teacher and health professional (1) *Setting*: school *Comparator*: no intervention (3), wait list (4), attention + no intervention (1) *Informant*: NR *Intervention level:* universal Outcome: symptoms of anxiety *Informant*: child	Design: RCT Analyses *Studies*: NR *Confounders considered*: NR *Review:* narrative summary. *Effect model*: NA. *Homogeneity:* NA *Publication bias*: NR Quality (Cochrane tool) *Selection bias* *Random sequence generation* Risk: low (3); unclear (5) *Concealment of allocation* Risk: low (3); unclear (5) *Performance bias* *Blinding participants/personal* Risk: high (8) *Detection bias* *Blinding outcome assessment* Risk: low (3); high (1); unclear (4) *Attrition bias* Risk: low (2); high (6) *Selective reporting* Risk: low (4); unclear (4) *Other bias* Risk: high (8) *Range* 11–17 in Index ranging from 7–21 *Low risk of bias for all indices* No study	Results presented narratively at different *follow-up times* ANXIETY Positive long-term effects in 5/8 studies, no effect at any time in 3/8 studies *Post-intervention* (7): no effect (4); reduced symptom levels (3) *12 mo.* (6): no effect (1); reduced symptom levels (5), of which sustained effect from post intervention (3), delayed effect (1), first assessment (1); Hedges g 0.2–0.69 *18–54 mo.* (3): no effect (2); reduced symptom level i.e. sustained effect from post-intervention and 12 mo. (1) Moderator: *Age* Study 1, 2a, and 2b: *Post intervention*: effect 9 y–10 y > 14 y–16 y *12 mo.*: effect 9 y–10 y > 14 y–16 y *24–36 mo.*: effect 9 y–10 y not 14 y–16 y Study 3: *Post intervention*: effect 9 y–10 y not 11 y–12 y *12 mo.*: effect 9–10y < 11–12y Moderator: *Gender* Study 2a: effect boys < girls Study 2b: effects boys not girls at 36 months follow-up	Author's results and conclusions Three of eight studies revealed a reduction of anxiety symptoms at post intervention that was greater in the prevention group than in the control group. This effect was sustained at the 12-month follow-up. Another two studies reported a positive intervention effect that first appeared at the 12-month follow-up, while three studies showed no intervention effects at all. One study found the greatest effect in girls, while another found that long-term effect was sustained in boys only. Three studies compared younger and older children. Two found stronger 12-month effects in younger children; 1 found post-intervention effects in the youngest only but strongest 12-months in the oldest group. The findings suggest that scaling up universal school-based anxiety-prevention interventions might have considerable social benefits, and some studies suggest that effects are more sustainable in younger than in older children. Author's limitations The discussion included the small number of studies and the high risk of bias found in the majority of studies. It is also mentioned that the fact that a meta-analysis could not be performed limits the conclusions that can be drawn from this study. Our comments Secondary effects mentioned among others on mood-related outcomes such as depression. However, the level of details does not allow us to include this outcome in our publication. *Overlap*: 7 of 8 references also in at least one other included review.

Author Year (Reference)	REVIEW CHARACTERISTICS	ELIGIBLE STUDIES (number of studies in parentheses)			AUTHOR'S REPORTING (summary) and COMMENTS
		CHARACTERISTICS	METHODS	RESULTS	
Chung 2017 (32)	Focus: effectiveness of school-based sleep education interventions Search period: until 05-2015 Inclusion criteria *Age*:10 y–19 y *Setting:* schools *Exposure:* interventions that target sleep knowledge and/or cognitive and behavioural sleep-related strategies. *Outcome:* sleep duration and other sleep-wake variables, sleep knowledge, daytime sleepiness, other mental health parameters, and social and academic performance. *Design:* RCT Identified references: 7 (all eligible) Quality (AMSTAR score): 8.5 of 11 possible	Studies/participants (7/4359) Age: mean 12.2 y–16.87 y; grade 6–9 Risk status: NR Country: Australia (4); Brazil, New Zealand, Hong Kong (1 each) Publication year: 2009–2015 Exposure *Type:* sleep education: unspecified content (3), include sleep management (2) include sleep knowledge, management and self-monitoring (1), combined with wellness education (unspecified content) (1); parent involvement (4) *Provider:* teachers (1); teacher/registered psychologist (3), health education teacher (2); physician and research staff (1) *Setting*: school *Comparator*: class as usual *Informant*: NR *Intervention level:* universal Outcome: sleep duration *Informant*: NR	Design: RCT (3); C-RCT (4) Analyses *Studies*: NR *Confounders considered*: NR *Review:* meta analyses *Effect model*: random *Homogeneity:* Q and I^2 statistics *Publication bias*: funnel plot not performed due to small n Quality (Cochrane tool) *Selection bias* *Random sequence generation* Risk: low (4); unclear (4) *Allocation concealment* Risk: low (1); unclear (6) *Performance bias* *Blinding participants/personal* Risk: high (7) *Detection bias* *Blinding outcome assessment* Risk: unclear (7) *Response bias* *Incomplete outcome data* Risk: low (6); high (1) *Reporting bias* *Selective reporting* Risk: low (7) *Others* *Selective recruitment of cluster members* Risk: low (3); high (3); unclear (1) *Sample power* Risk: low (3); unclear (4)	Statistically significant results presented at different *follow-up times* as SMD (95% CI) followed by heterogeneity (Q, I^2) SLEEP DURATION Weekdays (total sleep time) *0 mo*. (6): 0.23 (0.17; 0.29); Q ns; I^2 0% *6 week-1 y* (n = NR): ns Weekend (total sleep time) *0 mo*. (3): 0.46 (0.04; 0.88); Q ns; I^2 45% Moderator/Mediator: NR	Author's results and conclusions The review showed that school-based sleep education might have short-term benefits on sleep duration on weekdays and on weekends, but without sustained effect at follow-up 6 weeks to one year later. The short-term effect on weekdays was consistent across studies, while results were moderately inconsistent for weekends. Author's limitations The methodological quality of the studies was judged as moderate with high or uncertain risk of bias in several domains. Limitations included the small number of studies, among others prohibiting analysis of the impact of intervention content, duration, and parent involvement; the inclusion of children with normal sleep duration possibly reducing the power to detect differences, and methodological limitations. These limitations make a definite conclusion difficult. Our comments *Overlap*: none

Author Year (Reference)	REVIEW CHARACTERISTICS	ELIGIBLE STUDIES (number of studies in parentheses)			AUTHOR'S REPORTING (summary) and COMMENTS
		CHARACTERISTICS	METHODS	RESULTS	
Werner 2017 (52)	Focus: effect of school-based depression and/or anxiety prevention interventions on symptoms of depression and anxiety Search period: until 02-2015 Inclusion criteria *Age:* Mean 5 y–19 y *Setting:* school (endorsed by the school AND delivered at school hours OR before/after school hours on the school premises. Recruitment within and facilitated by the school. *Exposure:* manualised psychological or psycho-educational intervention aiming to prevent depression or anxiety OR to promote wellbeing (in > 75% of primary studies). *Outcome:* depression or anxiety symptoms assessed by valid/reliable instruments. *Design:* RCT Identified references: 90 (81 studies; all eligible) Quality (AMSTAR score): 8.5 of 11 possible	Studies/participants (81/31794) Age: 4 y–22 y (2 studies >19 y) Risk status *Selective:* negative attributional style (1), low SES living area (2), elevated anxiety sensitivity (1), conduct or behavioural problems (1), personality risk factors (1), exposure to community or political violence (2), parental divorce (1) *Indicated*: elevated levels of anxiety and depression Country *Universal*: Australia (14); USA (10); Canada (5); Germany (3); Italy (2); Belgium, Chile, England, Israel, Mauritius, Netherlands, Norway, New Zealand, Spain, United Kingdom, (1 each) *Selective/indicated*: USA (17), Australia (6), Canada (3), China (2), Holland (2), England, Iceland, Indonesia, Nepal, New Zealand, Spain, United Kingdom (1 each) Publication year: 1985–2014 Exposure *Type*: mental health management intervention comprising training of psychological/emotional and/or social skills and practices (80) or purely psycho-education (1) *Provider:* external (51: 35 mental health professionals/researchers, 6 graduate students, 10 both), school staff (28: 18 teachers, 5 school health staff, 5 both) *Setting*: school *Comparator*: no intervention (40), wait list (21), attention control (8), multiple control groups (12) *Informant*: NR	Design: RCT (51%), Cluster RCT (49%) Analyses *Studies*: NR *Confounders considered*: NR *Review:* meta analyses. *Effect model*: random *Homogeneity:* I^2 statistics *Publication bias*: funnel plots and vid indicated bias, Duval and Tweedie's Trim and Fill procedure was used Quality (Cochrane tool) *Selection bias* Risk: low (22); high (5); unclear (54) *Concealment of allocation* Risk: low (21); high (2); unclear (58) *Attrition bias* Risk: low (32); high (24); unclear (25) *Selective reporting* Risk: low (5); high (6); unclear (70) *Contamination* Risk: low (29); high (52) *Low risk of bias for all five indices* 1 study	Statistically significant results presented at different *follow-up times* as Hedges g (95% CI) followed by heterogeneity (I^2), when provided DEPRESSION All studies *Overall* (74 comparisons): 0.23 (0.19; 0.28); I^2 57% *0–6 mo.* (41 comparisons): 0.20 (0.14; 0.26) *6–12 mo*. (34 comparisons): 0.12 (0.07; 0.17) *>12 mo.* (14 comparisons): 0.11 (0.04; 0.18) Universal prevention *Overall* (39 comparisons): 0.19 (0.14; 0.24); I^2 19% *0–6 mo.* (17 comparisons): 0.18 (0.10; 0.26) *6–12 mo.* (18 comparisons): 0.09 (0.04; 0.15) *>12 mo.* (5 comparisons): ns Targeted prevention *Overall* (35 comparisons): 0.32 (0.23; 0.41); I^2 32% *0–6 mo.* (24 comparisons): 0.23 (0.14; 0.31) *6–12 mo.* (16 comparisons) 0.13 (0.04; 0.23) *>12 mo.* (9 comparisons): 0.16 (0.07; 0.27) ***Difference universal vs. targeted*** (overall): p = 0.01 Moderator: *Age* (all studies) < 10 y (5 comparisons): 0.50 (0.19; 0.80); I^2 69% 10–14 y (32 comparisons): 0.23 (0.16; 0.30); I^2 46% >14 y (37 comparisons): 0.22 (0.15; 0.28); I^2 62% ***Difference by age group***: p = ns Publication bias (overall): bias suspected Adjusted effect: 0.15 (23 studies removed) ANXIETY All studies Overall (49 comparisons): 0.20 (0.14; 0.25); I^2 55% *0–6 mo.* (11 comparisons): 0.23 (0.09; 0.37) *6–12 mo.* (20 comparisons): 0.23 (0.13; 0.33) *>12 mo.* (5 comparisons): 0.13 (0.04; 0.22). Universal prevention *Overall* (32 comparisons): 0.19 (0.13; 0.26); I^2 19% *0-–6 mo.* (5 comparisons): ns *6–12 mo.* (14 comparisons): 0.26 (0.13; 0.40) *>12 mo.* (3 comparisons): ns Targeted prevention	Author's results and conclusions The data suggest that school-based prevention programs have a beneficial effect on depressive and anxiety symptoms when compared to a control condition. The effects were small at post intervention and short-term follow-up, and very small at medium and long-term follow-up. Age at program delivery did not influence the effect on either depression or anxiety. At post intervention (but not later on), effect sizes were greater for targeted than universal prevention of depression. No such differences were found for anxiety. This suggests that for depression programs delivered in the school environment, targeted intervention may be more efficacious. Thus, the results suggest that the refinement of school-based prevention programs have the potential to reduce the mental health burden and advance public health outcomes. Author's limitations Overall, the quality of the included studies was poor, and heterogeneity was moderate. However, the majority of the studies lacked sufficient details on the specific potential biases, which may have resulted in a conservative quality rating. Randomisation was primarily performed at grade, class, or individual level. This may have induced contamination of the control group. Thus, the current effect size estimates may be conservative. Some subgroup results should be interpreted with caution due to a low number of studies and thereby low power to detect differences. Our comments Note that the effect remained when potential publication bias was taken into consideration.

		Intervention level: universal (44), indicated (25), selective (9), indicated/selective (2), universal/indicated (1) Outcome: symptoms of depression (40), anxiety (24), both (17) *Informant*: 18% parent reports		*Overall* (17 comparisons): 0.22 (0.09; 0.34); I^2 22% *0–6 mo.* (6 comparisons): 0.36 (0.11; 0.61) *6–12 mo.* (6 comparisons): 0.14 (0.00; 0.27) *>12 mo.* (2 comparisons): ns ***Difference universal vs. targeted*** (overall): p = ns Moderator: ***Age*** (all studies) ≤10 y (15 comparisons): 0.23 (0.09; 0.38); I^2 73% 10–14 y (22 comparisons): 0.21 (0.15; 0.28); I^2 32% >14 y (12 comparisons): 0.12 (0.02; 0.21); I^2 41% ***Difference by age group:*** p = ns Publication bias (all studies): no evidence of bias	*Overlap*: 55 of 90 references also in at least one other included review.

Author Year (Reference)	REVIEW CHARACTERISTICS	ELIGIBLE STUDIES (number of studies in parentheses)			AUTHOR'S REPORTING (summary) and COMMENTS
		CHARACTERISTICS	METHODS	RESULTS	
Stockings 2015 (49)	Focus: efficacy of universal, selective and indicated preventive interventions for depression and anxiety among children and adolescents Search period: 1980–2014 Database: 2010–2014 Biographies: 1980–2013 Inclusion criteria *Age:* 5 y–18 y *Setting:* no restriction *Exposure:* psychological, educational, or physical prevention of depression and anxiety prior to a clinically realised diagnosis of anxiety or depression *Outcome:* depression, anxiety measured by valid scales *Design:* RCT Identified references: 117 (=146 studies) Universal: 42 (=54 studies, all eligible)	Studies/participants (54/30159) Age: mean 8.7 y–15.6 y Risk status: no mental diagnoses as determined by structured diagnostic interviews or validated scales Country: USA (22); Australia (15); Canada (4); Germany (3); United Kingdom, Norway, Netherlands, Italy, Israel, Chile, Mexico, New Zealand, Mauritius (1 each); NR (1) Publication year: 1990–2014 Exposure *Type:* mental health management interventions comprising training of psychological skills and strategies (45), purely psychoeducation*(2), both (7) *solely information provision, e.g. lectures or pamphlets *Provider:* teachers or other school employees (13), external health professionals or experts (41) *Setting*: school *Comparator*: no intervention (49) Other (placebo, attention control or other intervention) (5)	Design: RCT Analyses *Studies*: NR *Confounders considered*: NR *Review:* meta analyses *Effect model*: random *Homogeneity:* Q and I^2 statistics *Publication bias*: not assessed *Others*: number needed to treat/prevent assessed based upon incidence estimates for children aged 12.5 years from the Global Burden of Disease Study (2013) Quality (Cochrane tool) *Selection bias* *Random sequence generation* Risk: low (10); unclear (44) *Allocation concealment* Risk: low risk (4); high (40); unclear (10) *Performance bias* *Blinding participants/personal* Risk: low (1); high (30); unclear (23) *Detection bias* *Blinding outcome assessment* Risk: low (11); high (7); unclear (36) *Response bias* *Incomplete outcome data*	Statistically significant results presented at different *follow-up times* as Cohen's d (95% CI) for symptoms and RR (95% CI) for disorders, followed by heterogeneity (Q, I^2; note: no information below = I^2 < 75%) DEPRESSION Symptoms *0 mo.* (41): -0.11 (-0.16; -0.05) *1–3 mo*. (9): -0.12 (-0.21; -0.04) *6–9 mo*. (27): -0.19 (-0.27; -0.11) *12 mo*. (17): -0.09 (-0.17; -0.01) *18 mo.* (7): ns Disorder *0 mo.* (9): 0.41 (0.24; 0.69); Q p < 0.05; I^2 = 73% *1–3 mo*. (2): 0.35 (0.24; 0.53) *6–9 mo*. (10): 0.45 (0.35; 0.58) *12 mo*. (7): ns *18 mo*. (5): ns; I^2 > 75% ANXIETY Symptoms *0 mo.* (22) -0.16 (-0.27; -0.06); I^2 > 75% *1–3 mo.* (4) -0.52 (-1.03; -0.03); I^2 > 75% *6–9 mo.* (9) -0.12 (-0.24; -0.01); I^2 > 75% *12 mo.* (5) ns; I^2 > 75% *18 mo.* (3) ns Disorder *0 mo.* (3): 0.25 (0.10–0.65); Q ns; I^2 = 0%	Author's results and conclusions Universal interventions reduced the risk of later anxiety disorder immediately post-intervention and of anxiety symptoms up until 6–9 months. Likewise, a risk reduction of depressive *disorders* was seen up until 6-9 months post-intervention and of depressive *symptoms* up until 12 months after the intervention. Taken together, a significant reduction of internalising disorders and symptoms (combined anxiety and depression) were identified from immediate post-intervention to 6-9 and 12 months after the intervention, respectively, and the number needed to prevent one internalising disorder case per 100 children was estimated to be 71 children. Country income level did not impact intervention efficacy for internalising disorders and symptoms at post intervention. The authors conclude that universal prevention interventions were shown to reduce the risk of disorder onset and disorder symptoms for up to 12 months. Furthermore, it was concluded that there was support for the efficacy of large-scale implementation in schools and within the existing school staff resources. Author's limitations

	Selective: 37 (=45 studies, not eligible: non-school settings included) Indicated: 38 (= 47 studies, not eligible: non-school settings included) Quality (AMSTAR score): 6.5 of 11 possible	*Informant*: NR *Intervention level:* universal Outcome: disorder/symptoms of depression (30), anxiety (12) and merged to internalising problems (52) *Informant*: NR	Risk: low (25); high (11); unclear (18) *Reporting bias* *Selective reporting* Risk: low risk (1); high (2); unclear (51) *Others* Risk: low (0); high (11); unclear (43)	*1–3 mo.* (1): ns *6–9 mo*. (2): ns *12 mo*. (2): ns; Q p=0.05; I^2 = 87% *18 mo*. (2): ns INTERNALISING Symptoms *0 mo.* (51): -0.15 (-0.21; -0.08) *1–3 mo.* (12): -0.27 (-0.47; -0.09) *6–9 mo.* (31): -0.19 (-0.26; -0.11) *12 mo.* (19): -0.13 (-0.25; -0.01) *18 mo.* (7): ns Moderator: *Country income* (HIC vs. LMIC) *0 mo.* (51): no moderating effect Disorders *0 mo.* (9): 0.39 (0.26; 0.59) 1–3 mo. (3): 0.33 (−0.18; 0.61) 6–9 mo. (10): 0.47 (0.37; 0.60) 12 mo. (7): ns 18 mo. (5): ns Moderator *Country income* *0 mo.* (8): no moderating effect Numbers needed to prevent 1 case of internalising disorder per 100 children: 70.92 (95% CI 41.7−135.12), equivalent to just over two regular school classes.	Symptom screening scales with known internal reliability and validity assessed depression and anxiety. However, the diagnostic utility of these scales is questionable, and the cut-offs used may have resulted in numerous false positive cases. Another limitation is the high heterogeneity for some results. These results should be interpreted with caution. Finally, the general lack of anxiety studies only allowed merged analyses of different types of anxiety disorders, which may be argued to be inappropriate. Our comments Specific summary provided for universal prevention studies that exclusively include school studies. *Overlap*: 36 of 42 eligible references also in at least one other included review.

Author Year (Reference)	REVIEW CHARACTERISTICS	ELIGIBLE STUDIES (number of studies in parentheses)			AUTHOR'S REPORTING (summary) and COMMENTS
		CHARACTERISTICS	METHODS	RESULTS	
Corrieri 2014 (33)	Focus: effect of school-based interventions to prevent the occurrence of depression and anxiety disorders Search period: 2000–2011 Inclusion criteria *Age:* not specified (but school based) *Setting:* school *Exposure:* school-based interventions targeting	Studies/participants (28/16153) Meta analyses: Outcome depression (9/4636) Outcome anxiety (7/2207) Age: 7 y–19 y Risk status: NR. Country: Australia (13); USA (5); Germany (3); United Kingdom, Spain, Israel, Canada, Chile, New Zealand (1 each)	Design: RCT (10), C-RCT (18) Analyses *Studies*: NR *Confounders considered*: NR *Review:* narrative summary (28); meta analyses (16), note, must measure outcome by the CDI or RCMAS *Effect model*: random *Homogeneity:* NR *Publication bias*: NR	Statistically significant results presented at different *follow-up times*, first narratively (share of studies being effective) and then as Cohen's d for the subgroup included in the meta analyses DEPRESSION All: 16/24 effective (67%) Universal: 13/19 effective (68%) Indicated: 3/6 effective (50%) Meta analyses All *Post intervention* (8): -0.12 (range -0.57; 0.30)	Author's results and conclusions The majority of the studies showed that school-based interventions could effectively prevent both depression and anxiety. Meta analyses of the studies that used the standardised instruments CDI and RCMAS showed that the effect was small. Author's limitations Variations in sample sizes, intervention methods, randomisation and allocation procedures, intervention providers, and measurement instruments as well as low

	depression and anxiety prevention *Outcome:* depression, anxiety *Design:* RCT *Others*: sample n ≥ 100; included in meta-analysis if using the standardised measures CDI or RCMAS Identified references: 28 (all eligible) Quality (AMSTAR score): 4.5 of 11 possible	Publication year: 2000–2010 Exposure *Type:* mental health management interventions to lessen anxiety and depression that comprise training of psychological/emotional and/or social skills and strategies (27) including psycho-education (3); or purely physical activity (1) *Provider* Depression: trained school staff (13), mental health professionals (9), both (2) Anxiety: trained school staff (6), mental health professionals (7), both (2) *Setting*: school *Comparator*: NR *Informant*: NR *Intervention level*: universal (23 in total: 19 depression, 13 anxiety), indicated (6 in total: 6 depression, 3 anxiety) Outcome: symptoms of depression (24) and anxiety (15) *Informant*: NR	Quality *Selection, performance, detection, response, reporting or other biases*: not assessed but only includes RCTs, n≥ 100; standardised outcome measures in meta analyses .	*6 mo.* (3): 0.06 *10–30 mo.* (6): -0.05 Universal prevention *Post intervention*: -0.14 Indicate prevention *Post intervention*: -0.08 ANXIETY All: 11/15 effective (73%) Universal: 10/13 effective (77%) Indicated: 1/3 effective (33%) *Meta analyses* Post intervention (6): -0.29 *6 mo.* (3): -0.1 *18–30 mo.* (3): -0.05 Universal prevention *Post intervention*: 0.15 Indicated prevention *Post intervention*: -0.42 Moderator/Mediator: NR	compliance over time may affect the validity and representativeness of the results. Our comments Information is lacking about confidence intervals or statistical significance of results in meta analyses. Heterogeneity is not assessed or controlled for. *Overlap*: 21 of 28 eligible references also in at least one other included review.

Author Year (Reference)	REVIEW CHARACTERISTICS	ELIGIBLE STUDIES (number of studies in parentheses)			AUTHOR'S REPORTING (summary) and COMMENTS
		CHARACTERISTICS	METHODS	RESULTS	
SBU 2010 (48)	Focus: effect of interventions to prevent externalising and internalising problems in children and adolescents Search period: 1990–2009 Inclusion criteria *Age:* 2 y–19 y *Setting:* no restriction *Exposure:* standardised interventions to prevent mental ill health that target children and/or parents *Outcome:* mental ill health (externalising and internalising problems)	Studies/participants (11/12183) Age: 10 y–16 y Risk status: general population. Country: Australia (6), USA (2), Germany (2), Norway (1) Publication year: 2001–2009 Exposure *Type:* mental health management interventions to prevent internalising problems. The interventions comprise training of psychological/emotional and/or social skills and strategies, including psychoeducation for teachers	Design: RCT (2), C-RCT (8), CT (1) Analyses *Studies*: NR *Confounders considered*: NR *Review:* narrative summary and meta analyses *Effect model:* fixed *Homogeneity:* I^2 statistics *Publication bias*: NR, but unclear whether this is assessed Quality *Selection*, *Performance*, and *Reporting bias*	Statistically significant results presented at different *follow-up times* as SMD (95% CI) followed by heterogeneity (Q, I^2) DEPRESSION *6 mo.* (8 comparisons): ns; Q p < 0.05; I^2 54% *12 mo.* (9 comparisons): ns; Q ns; I^2 34% *Overall quality of evidence*: very low; deduction for study quality, consistency, precision At higher symptom level at baseline *6–12 mo.* (3): -0.32 (-0.52; -0.12); Q ns; I^2 63% *Overall quality of evidence*: low; deduction for study quality, precision Moderator: *gender* No gender related effect (4) Greater intervention effect in girls than boys (1)	Author's results and conclusions The studies showed no or limited lasting effects on depressive symptoms. Three studies among children with elevated risk for depression found a small to moderate intervention effect, but the studies were heterogeneous and the results therefore tentative. Overall, the scientific evidence is insufficient to judge whether universal school interventions can reduce depressive symptoms in children. Thus, there is no support for introducing such programs for the purpose of preventing depression. Two studies of the intervention FRIENDS found a small beneficial effect on anxiety, which was sustained for at least one year. Apart from that, it is not possible to judge whether universal school interventions can reduce anxiety among schoolchildren. The few studies that examined gender-related effects showed similar effects among girls and boys or

	Design: systematic reviews and primary studies; CT; follow-up for at least 6 months. *Others*: studies with low quality not included in the summary Identified references: 148, of which 56 on internalising problems (36 of acceptable quality): Universal: 16 (=11 studies; all eligible) Selective: 5 (not eligible; non-school settings included) Indicated: 16 (not eligible; non-school settings included) Quality (AMSTAR score): 8 of 11 possible	and/or others working with children (2), other community involvement (1), enhancement of school climate (1), and multicomponent approaches (2) *Provider:* NR *Setting*: school *Comparator*: no intervention curriculum as usual (7), waitlist (1), Penn Enhancement Program (concentration training) (1), wellness classes (1), community forum component only (1) *Informant*: NR *Intervention level:* universal Outcome: symptoms of depression (11), anxiety (4) *Informant*: self- and parent-rated (1), Unclear (10) ("mostly self-reported")	Not directly assessed *Detection bias* *Blinding outcome assessment* Risk: low (2); unclear (9) *Response bias* *Incomplete baseline data*: NR *Incomplete follow-up* All ≤ 30% at 6 months or ≤ 50% at longer follow-up if trustworthy missing analyses presented *Others* Randomised or controlled design with adequate control for confounders (11) Overall quality of evidence: evaluated using GRADE	ANXIETY *8–12 mo.* (4): -0.12 (-0.18; -0.05); Q p < 0.05; I^2 90% *Overall quality of evidence*: very low; deduction for study quality, consistency, precision Moderator *Age* Intervention effect in grade 6, not in grade 9 (1) *Gender* Greater intervention effect in girls than boys (1)	greater effects among girls. In addition, a study found greater effects on anxiety symptoms among younger compared to older children. The authors summarise that the universal intervention FRIENDS can reduce symptoms of anxiety among 10–13-year olds. Other than that, there is insufficient evidence to establish whether universal school interventions can accomplish a lasting reduction of depression or anxiety symptoms among children. Author's limitations Limitations include that most analyses showed high levels of heterogeneity (I^2 > 50%), that the outcome primarily depended on self-reported data, and that most populations were urban. The studies were completed in populations that did not differ significantly from Swedish children, but no study was Swedish and it is unclear to what extend the interventions can be translated into the Swedish context with sustained effect. Our comments Specific summary provided for effect of universal prevention studies on internalising problems, and all studies were performed in the school. Some information contradictory in the text and meta analyses, e.g. regarding effect of the Penn Prevention Program on depression. *Overlap*: 15 of 16 eligible references also in at least one other included review.

Author Year (Reference)	REVIEW CHARACTERISTICS	ELIGIBLE STUDIES (number of studies in parentheses)			AUTHOR'S REPORTING (summary) and COMMENTS
		CHARACTERISTICS	METHODS	RESULTS	
Kavanagh 2009a 2009b (41,42)	Focus: effectiveness of school-based interventions grounded in cognitive behavioural techniques in preventing or alleviating depression, anxiety, and suicidality in young people and the impact on health inequalities Search period: 1996-onwards	Studies/participants (17/5385) Age: 9 y–19 y Risk status: symptoms of depression (5) and anxiety (2), risk of substance abuse (1) Country: USA (9); Australia (3); United Kingdom, Germany,	Design: RCT (12); Cl-RCT (5) Analyses *Studies*: NR; *Confounders considered*: NR *Review:* narrative summary and meta analyses when possible *Effect model*: random *Homogeneity:* Q and I^2 statistics *Publication bias*: not assessed	Statistically significant results presented at different *follow-up times* as SMD (95% CI) followed by heterogeneity (Q, I^2) DEPRESSION All studies *0–4 weeks* (14): -0.23 (-0.43; -0.03); Q p < 0.05; I^2 77% *0-4 weeks* (13): -0.16 (-0.26; -0.05); Q ns; I^2 23% 1 small outlier removed *3 mo.* (4): -0.21 (-0.35; -0.07) *6 mo.* (9): ns; Q p < 0,05; I^2 57%	Author's results and conclusions Interventions based upon CBT given to children in secondary schools can reduce depression and anxiety. The effects on depressive symptoms were in general sustained up to three months, but were shown to be shorter when provided universally (up to 4 weeks) and longer when provided to children with existing depressive symptoms (up to 6 months). For anxiety, an overall effect was seen immediately post-intervention and at 6 month's follow-ups, while universal and indicated prevention did not seem to

	Inclusion criteria *Age:* 11 y–19 y *Setting:* secondary schools *Exposure:* interventions grounded in cognitive behavioural techniques and aiming to improve mental health or prevent poor mental health *Outcome:* Depression, anxiety, suicidality *Design:* RCT *Others*: control group equivalent to the intervention group on sociodemographic and outcome variables (17) Identified references: 17 (all eligible) Quality (AMSTAR score): 7.5 of 11 possible	China, Italy, New Zealand (1 each) Publication year: 1998–2008 Exposure *Type:* mental health management interventions delivered at group level and comprising training of psychological/emotional and social skills and practices; 2 studies involved parental involvement. *Provider:* teachers/ other school employees (4); external health professional/expert (8); both (4) both and peers (1); external and peers (1) *Setting*: school *Comparator*: no intervention *Informant*: NR *Intervention level:* universal (13 in total: 9 depression, 4 anxiety), indicated (8 in total: 8 depression, 3 anxiety) Outcome: symptoms of depression (17), anxiety (7) *Informant*: NR	Quality *Selection bias* *Random sequence generation* Computer generated (2); "block randomisation" (2); random number tables (1); random draw from container (1); unclear (11) *Allocation concealment* Risk: low (2); unclear (15) *Performance bias* *Blinding participants/personal* Risk: low (2); unclear (15) *Detection bias* *Blinding outcome assessment*: NR *Response bias* NR *Reporting bias* *Selective reporting* Risk: low (17)* *Others* All studies reported to be considered "sound" on the following grounds: 1. findings reported for each outcome in the study aims (17) 2. pre-intervention data provided for all individuals in each group (17) 3. post-intervention data provided for each group (15); or low attrition rate and reported no difference between dropouts and attendees (1); or high levels of unequal attrition between controls and intervention groups = outcome data considered unreliable (1)	*12 mo.* (5): ns; no heterogeneity Universal prevention *0–4 weeks* (9): -0.15 (-0.25; -0.05); no heterogeneity *> 4 weeks:* ns; no heterogeneity Indicated prevention *0–4 weeks* (6): ns; Q p < 0.05; I^2 90% *0–4 weeks* (4): -0.27 (-0.48; -0.06); Q ns; I^2 0% 2 lower quality/outliers removed *3 mo.* (3): -0.27 (-0.49; -0.06) *6 mo.* (4): -0.25 (-0.42; -0.08); no heterogeneity Moderator: *SES* 0–4 weeks Low SES (2; n = 40 and 17): ns Medium SES (2; N = 737 and 1266): -0.28 (-0.44; -0.11) High SES (2; n = 68 and 215): -0.31 (-0.54; -0.07) All: no heterogeneity *Difference by SES*: p = ns ANXIETY *0–4 weeks* (7): ns; Q NR; I^2 89%. *0–4 weeks* (6): -0.23 (-0.45; -0.02); Q ns; I^2 0% 1 small outlier removed *3 mo.* (2): ns, no heterogeneity *6 mo.* (9): -0.18 (-0.35; -0.01); no heterogeneity Universal prevention *0–4 weeks* (3): ns; no heterogeneity *6 mo.* (2): ns; no heterogeneity Indicated prevention *0–4 weeks* (3): ns; Q p < 0.05; I^2 95% *0–4 weeks* (2): ns; Q ns; I^2 39% 1 small outlier removed	be effective. School-based CBT-type interventions might be less effective in groups with lower socioeconomic status. However, this conclusion is uncertain due to a lack of data and relevant analyses (i.e. trend not statistically significant (p = 0.072) and may therefore be the result of chance). Author's limitations In cases where levels of heterogeneity were high and significant, particularly if the group of studies was small, caution should be applied in concluding that the effect was significant. However, when removing studies, this generated significant findings with minor heterogeneity, and this result was sustained at later time points, thus suggesting that the effect with high heterogeneity was reliable. Only studies in English were included, which is a limitation. The intervention impact on mental health inequalities was not able to be comprehensively analysed, which reflects the limits of the available evidence. Our comments A limitation in the analyses of SES as a moderator is the large variation in "n", particularly the low "n" in the studies of the low SES group. It is furthermore noted that external providers only occurred in low SES areas, which may have confounded the analyses of SES. In cases of discordant information, information has been extracted from appendix 4 as a first priority and from appendix 3 as a second priority. *Overlap*: 14 of 17 eligible references also in at least one other included review.

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Shucksmith 2007 (49)	Focus: effectiveness of school-based targeted and indicated interventions aiming to promote	Studies/participants (10/948) Age: 5 y–15 y	Design: RCT (7); C-RCT (3) Analyses *Studies*: NR *Confounders considered*: NR	Statistically significant results presented narratively at different *follow-up times* (no numeric results available) DEPRESSION	Author's results and conclusions The studies primarily used a CBT based approach, in some cases allied with social components. Most anxiety studies targeted rural or suburban populations, while no study seemed to include a

	mental wellbeing in primary education Search period: 1990–2007 Inclusion criteria *Age:* 4 y–11 y *Setting:* schools in developed countries *Exposure:* non-pharmacological targeted or indicated interventions aiming to improve mental wellbeing through interventions ≥ 1 month long, delivered in the classroom by a teacher or another specialist. Whole school and universal interventions not included *Outcome:* Psychological, social and emotional wellbeing (including the opposite of depression and anxiety) *Design:* RCT, C-RCT Identified references: 48 (11 eligible=10 studies; 22 non-eligible outcomes) Quality (AMSTAR score): 7 of 11 possible	Risk status: elevated anxiety (3) or depression scores (3), divorced parents (1), school refusal (1), violence exposure and elevated Post Traumatic Stress Disorder (PTSD) scores (1), special educational needs (1) Country: USA (7); Australia (3) Publication year: 1990–2005 Exposure *Type:* mental health management primarily comprising training of psychological/ emotional and social skills and strategies with some also specifically including educational training (1), "support" (1), and capacity building of parents (3) or parents and teachers (1). NO whole school approaches *Provider:* psychologist (5), therapist (1), school mental health clinician (1), school counsellor (1), school paraprofessional (1), teacher (1), vice principal (1), research team (1) *Setting*: school (classroom not whole school) *Comparator*: no intervention (5), no intervention or drama program (1) normal care (1), waitlist (2), waitlist/no intervention (1) *Informant*: NR *Intervention level:* indicated/targeted Outcome: symptoms of depression (5), anxiety (5) *Informant*: child (9), parents (5), teacher (5), clinician (1)	*Review:* narrative summary *Effect model*: NA *Homogeneity:* NA *Publication bias*: not assessed Quality *Selection bias*, *performance bias*, *reporting bias*: NR *Detection bias* *Blinding outcome assessment* Risk: low (5); unclear/NA (5) *Response bias* *Incomplete baseline or follow-up data* < 25 (5); up till 40–48% (2); NR (3) *Others* *5 studies rated as 1++* (best) (1 depression, 4 anxiety) a) randomised trial b) intervention and control group alike at baseline c) validated outcome measure d) both attention and no intervention control groups e) dropout rate <30% *5 studies rated as 1+* (4 depression, 1 anxiety) a-c) as above d) only "no intervention control group" e) dropout rate <50%	*0 mo*. (7): reduced symptom levels (4) no effect on symptom levels (1) unclear (2) *2 mo*. (1): sustained no effect (symptoms) *3 mo*. (2): sustained improvement (symptoms) *6 mo*. (1): sustained improvement (symptoms) *9 mo*. (1): sustained improvement (symptoms) *12 mo*. (1): sustained unclear effect *3 y* (1): sustained improvement (symptoms) ANXIETY *0 mo*. (6): reduced symptom levels (3) no effect on symptom levels (1) unclear (2) *3 mo*. (1): sustained improvement (symptoms) *6 mo*. (1): sustained improvement (inclusive disorder) *12 mo*. (1): sustained unclear effect *2 y* (1): sustained improvement (inclusive disorder) Moderator/Mediator: NR	large ethnic minority population. Furthermore, the interventions were mostly offered by external (often university based) therapists. Thus, the studies may best be seen as exploratory trials prior to the design of school-based interventions using school staff. The studies showed that school-based interventions of this type might relieve and prevent depressive symptoms when applied among children with elevated levels of such symptoms and among children at risk for depression after being exposed to violence. Likewise, the studies showed positive effects on anxiety among children with elevated anxiety levels and when directed to children at risk for anxiety, i.e. those with divorced parents and anxious school refusers. Even brief (8-10 weeks) interventions appeared successful in improving depression symptoms and in reducing anxiety or in preventing the development of anxiety disorders when offered to children showing the precursor symptoms associated with depressive or anxiety disorders. Finally, the interventions targeting reduced anxiety disorders have been transferred successfully between countries, indicating a high degree of generalisability of applicability. Author's limitations There are noticeable shifts in quality and focus of evidence across the period studied. The period prior to 1990 (our starting point) and the early 1990s saw a proliferation of small-scale studies (mostly US-based). Early interventions used weak controls, were small and underpowered, and focused on some aspects of the problem to the neglect of the broader picture of mental health problems. Our comments Specific summary provided for studies targeting internalising problems (depression and anxiety). *Overlap*: 6 of 11 eligible references also in at least one other included review.

Author Year (Reference)	REVIEW CHARACTERISTICS	ELIGIBLE STUDIES (number of studies in parentheses)			AUTHOR'S REPORTING (summary) and COMMENTS
		CHARACTERISTICS	METHODS	RESULTS	
Cuijpers 2006 (34)	**Focus:** effect of intervention in children who screened positive for depression in school **Search period:** 1966–2005 **Inclusion criteria** *Age:* school ages <18 y *Setting:* school *Exposure:* school-based psychological interventions to children with depression or depressive symptoms *Outcome:* depression *Design:* RCT **Identified references**: 8 (all eligible) **Quality** (AMSTAR score): 5.5 of 11 possible	**Studies/participants** (8/413, selected from a population of 5803) **Age:** 7 y–19 y **Risk status**: depressive symptoms (8) and sub-threshold depression, but NOT a clinical diagnosis (1) **Country**: USA (6); Belgium, Australia (1 each) **Publication year:** 1990–2004 **Exposure** *Type:* mental health management interventions that comprise training of psychosocial skills and practices (CBT) and in two studies also include relaxation training. *Provider:* NR *Setting*: school *Comparator*: waiting-list (4), no intervention or business as usual (4) *Informant*: NR *Intervention level:* indicated prevention **Outcome:** depressive symptoms *Informant*: self-report (7), diagnostic interview (1)	**Design**: RCT **Analyses** *Studies*: NR *Review:* meta analyses *Effect model*: Fixed (due to low heterogeneity) *Homogeneity:* Q and I^2 statistics *Publication bias*: not assessed **Quality** *Selection bias* *Random sequence generation* Risk not assessed *Allocation concealment* Risk: unclear (4); NA (4) *Performance bias* *Blinding participants/personal* Risk not assessed *Detection bias* *Blinding outcome assessment* Risk: low (3); unclear (5) *Response bias* *Incomplete baseline data* Risk not assessed *Incomplete follow-up* 0%–21% lost to follow-up *Reporting bias*: not assessed. *Others*: NR	Statistically significant results presented at different *follow-up times* presented as Cohen's d (95% CI) followed by heterogeneity (Q, I^2) DEPRESSION (less) *0 mo.* (8): 0.58 (0,37; 0,78); Q ns; $I^2$11% *0 mo.* (7): 0.72 (0.45; 0.99); Q ns; I^2 0% -largest study excluded *9 mo.* (1): 0.4 *12 mo.* (1): 0.12 **Numbers needed to prevent** (4): 31 (95% CI 27; 32) (=numbers needed to screen to have one positive outcome, i.e. improved/recovered, ~ symptom scores < specified cut-off) *Moderator/Mediator:* NR	**Author's results and conclusions** The study indicates that screening and early interventions in schools may decrease the burden from depression in children and adolescents. Before implementing this, further research is needed into the long-term effects and the potential negative side effects of such an approach. **Author's limitations** Few included studies, non-optimal study quality, limited data on long-term effects, and uncertainty regarding the level of depression. **Our comments** *Overlap*: 6 of 8 eligible references also in at least one other included review.

Author Year (Reference)	REVIEW CHARACTERISTICS	ELIGIBLE STUDIES (number of studies in parentheses)			AUTHOR'S REPORTING (summary) and COMMENTS
		CHARACTERISTICS	METHODS	RESULTS	
Brown 2013 (31)	**Focus:** efficacy of physical activity interventions on depression in children and adolescents **Search period**: until 2011	**Studies/participants** (5/423) **Age**: mean 10 y–16.6 y **Risk status**: Hispanic origin living in USA (1); low SES (1); general population (3)	**Design**: RCT (1); C-RCT (3); quasi-experimental (1) **Analyses** *Studies*: NR *Confounders considered*: NR *Review:* meta analyses; negative effect sizes: intervention effect = decreased depression scores	Statistically significant results presented as Hedges g (95% CI) followed by heterogeneity (Q, I^2, τ^2) DEPRESSION *9–40 weeks* (5): -0.143 (-0.454; -0.064); Q $p < 0.05$; τ^2 2.18; I^2 0%	**Author's results and conclusions** No specific comment **Author's limitations** No specific comment **Our comments**

	Inclusion criteria *Age:* 5 y–19 y *Setting:* no restrictions *Exposure:* interventions to promote or increase physical activity *Outcome:* depression *Design:* CT Identified references: 9 (5 eligible; 4 non-eligible, not school setting) Quality (AMSTAR score): 6.5 of 11 possible	Country: USA (3); Chile; United Kingdom (1 each) Publication year: 1992–2010 Exposure *Type:* physical activity interventions at school level (3) or class level (2) and including sports/physical education (PE) lesson (1); aerobic exercise (2); health education focusing physical activity (1); yoga/mindfulness (1). *Provider:* physical education teacher (1); research staff (1); trained counsellor (2); unknown (1) *Setting*: school *Comparator*: NR *Informant*: NR *Intervention level:* NR, NA Outcome: symptoms of depression *Informant*: NR	*Effect model*: random *Homogeneity:* Q, I^2 and τ^2 statistics *Publication bias*: not assessed Quality (Delphi list) Overall High quality (1); low quality (4) *Selection bias* *Random sequence generation* Risk: unclear (5) *Allocation concealment* Risk: high (5) Groups similar at baseline on most important prognostic indicators (4); Eligibility criteria specified (1) *Performance bias* *Blinding participants/personal* Risk: low (2); high (3) *Detection bias* *Blinding outcome assessment* Risk: high (5) *Response bias* *Incomplete baseline data* Risk: unclear (5) *Incomplete follow-up* Risk: unclear (5) *Reporting bias* *Selective reporting* Present point estimates and measures of variability for the primary outcome measures (5) *Others* ITT (1)	Moderator/Mediator: NR	Specific summary (meta-analysis) provided for school studies. The school arena is presented as a potential effect-modifier for physical activity interventions. Reporting is somewhat inconsistent. Study characteristics extracted from table 3. *Overlap*: 1 of 5 eligible references also in at least one other included review.

Author Year (Reference)	**REVIEW CHARACTERISTICS**	**ELIGIBLE STUDIES** (number of studies in parentheses)			**AUTHOR'S REPORTING** (summary) and **COMMENTS**
		CHARACTERISTICS	**METHODS**	**RESULTS**	
Gustafsson 2010 (40)	Focus: association between schooling and mental health, in particular causal associations between academic achievement and mental health Search period: 1999–2009	Studies/participants (8/21746) Age: 5 y–16 y Risk status: economically disadvantaged (2); poor readers (2) Country: USA (6); Finland, Norway (1 each)	Design: longitudinal cohort (6); longitudinal case control (2) Analyses *Studies:* logistic regression (2); regression (2); multilevel logistic regression, cross-lagged path,	Statistically significant results presented narratively at different *follow-up times* (no numerical results available) DEPRESSIVE SYMPTOMS *Max 4.5 y* (study 1): *reading problems* at age 15 y were a risk factor for major depression after at most 4.5 y	Author's results and conclusions One study concluded that in the early school years, school achievement (a high vocabulary) protects against the development of depression; one that poor grades are related to the development of depression, but only in girls; and one that reading difficulties are a risk factor for anxiety disorders during mid- to late adolescence. Furthermore,

	Inclusion criteria *Age:* 2 y–19 y *Setting:* schooling and learning environments *Exposure:* Academic achievement *Outcome:* mental health specified as internalising and externalising problems, other psychiatric symptoms, and positive aspects of mental health. *Design:* longitudinal observation studies Identified references: 51 (8 eligible; 43 non-eligible outcomes) Quality (AMSTAR score): 4.5 of 10 possible	Publication year: 2000–2008 Exposure *Type:* academic achievement specified as reading problems (5); vocabulary, academic achievement, grades (1 each) *Provider:* NA *Setting*: school *Comparator*: typical readers (2) NR (6) *Informant*: child (3); teacher (1); NR (4) *Intervention level:* NA Outcome: Symptoms of depression (4), anxiety (1) and internalising problems (3)	bivariate latent difference growth (LDS) (1 each), NR (1) *Confounders considered:* *Cohorts*: child and family factors (1); prior reading problems; SES and demographic factors (1); NR (4) *Case-control*: ethnicity and gender matched (2) *Review:* narrative summary. *Effect model*: NA *Homogeneity:* NA *Publication bias*: not assessed Quality All studies reported to be of high methodological quality and high relevance. Quality criteria not specified.	*Max 6 y* (study 2) *higher vocabulary* was protective against increasing levels of depression between ages 8 y and 14 y Moderator Sex *1 y* (study 3): *poor academic achievement* (grades) associated with the level of depressive symptom in ages 12 y–15 y Girls: yes Boys: ns Peer relations *"T2"* (study 4): *poor academic achievement* (grades) predicts depressive symptoms in middle school If few friends in the classroom: yes If many friends in the classroom: ns ANXIETY *Max 4.5 y* (study 5): *reading problems* at age 15 y were a risk factor for later anxiety disorders after at most 4.5 y INTERNALISING PROBLEMS *"Months"–1 y* (study 6): *reading problems* in 5–6-year-old pre-schoolers predict an increase in internalising problems during the preschool year and in grade 1 *2 y* (studies 7 and 8): *reading problems* in grades 1 or grade 3 predict internalising problems in grades 3 and 5, respectively	reading failures in the early school years (3 studies) and in adolescence (1 study) were related to the development of internalising problems, while classmate friendship was shown to protect against the negative effect of poor achievement on internalising symptoms. One conclusion is that the review supports that school failure affects mental health in the form of increased internalising problems. Another conclusion is that the review gives support for a causal effect of early as well as adolescent reading problems on internalising problems. However, in adolescence this only seems to hold true for females, and more research is needed to firmly establish this finding. The final main conclusions state that early school failures, in particularly reading problems, cause internalising problems, and furthermore that problematic academic achievement in adolescence causes internalising problems in females. Author's limitations Limitations include that only studies involving normal, non-clinical samples were addressed, and therefore the research is limited to milder forms of mental health problems, which might narrow the effects. Other limitations are that despite the generally very high quality of the studies, longitudinal designs do not guarantee causal inferences. Another problem is the substantial heterogeneity within each of the categories of variables in the review, i.e. the way academic achievement and mental health were measured vary greatly over the studies. Our comments Specific summary provided for studies on internalising problems. *Overlap*: 1 of 8 eligible references also in at least one other included review

2d. PSYCHOSOCIAL SCHOOL ENVIRONMENT

Author Year (Reference)	REVIEW CHARACTERISTICS	ELIGIBLE STUDIES (number of studies in parentheses)			AUTHOR'S REPORTING (summary) and COMMENTS
		CHARACTERISTICS	METHODS	RESULTS	
Rueger 2016 (47)	Focus: association between perceived social support and depression in children and adolescents, and the general benefits and stress-buffering effects of social support Search period: until 12-2014 Inclusion criteria *Age:* <20 y or mean age <19 y, not college students *Setting:* no restrictions *Exposure:* perceived social support *Outcome:* depression *Design:* observational Identified references: 341 (58 eligible on teacher support, 283 non-eligible settings) Quality (AMSTAR score): 7.5 of 11 possible	Studies/participants (58/129358) Age:6 y–19 y Risk status: general population (30); medical/psychiatric problems (9); low income (7); environmental trauma (6); family medical problems (2); pregnant, abuse, sexual minority, victimisation/ hassles (1 each) Country: USA (42); China (5); Norway (3); Canada (3); Poland, United Kingdom, Rumania, Belgium, South Korea, Thailand, Australia (1 each) Publication year: 1989–2014 Exposure *Type:* teacher support specified as emotional (20), instrumental (0), informational (0), appraisal (0), global (21), global/unspecified (3), unspecified (14) *Disposition*: Available (51); enacted (1); unknown (6) *Provider:* teacher *Setting*: school *Comparator*: no exposure *Informant*: child *Intervention level:* NA Outcome: depression diagnosis (1), symptoms (57) *Informant*: NR	Design: longitudinal (2), cross-sectional (50), both (6) Analyses *Studies*: NR *Confounders considered*: NR *Review:* meta analyses. *Effect model*: random *Homogeneity:* Q and I^2 statistics *Publication bias*: funnel plot, Begg and Mazumdar's rank correlation test, Duval & Tweedie's Trim & fill procedure Quality *Measurement bias* *Social support* Standardised (49); non-standardised (9) *Depression* Standardised (55); non-standardised (3) Note, measurement quality considered in the analyses *Other* Not reported for individual studies or for the teacher support group, i.e. selection, performance, detection, response, reporting, recruitment and analysis-related bias: NA/NR	Statistically significant results presented as ES (= *r*) (85% CI) followed by heterogeneity (Q, I^2); Positive ES = more support associated with less depression DEPRESSION Valid measures (both for the exposure and outcome) Cross-sectional (51): 0.25 (0.23; 0.27); Q p < 0.05; I^2 82% Longitudinal (7): 0.16 (0.13; 0.19); Q ns; I^2 26% Non-validated measures Cross-sectional (2): 0.28 (0.26; 0.30); Q ns; I^2 0% *Differences* *Cross-sectional > longitudinal*: p < 0.05 *Valid < non-validated measure*: p < 0.05 *Short vs. long follow-up time* (longitudinal): p = ns Moderator Cross-sectional studies and valid measures *Age*[1] Child (3): 0.24 (0.19; 0.30) Younger adolescent (13): 0.25 (0.21; 0.28) Older Adolescent (10): 0.24 (0.20; 0.27) [1]*Child* = <12 y, or grade 0 to 6 *Younger adolescent* = 12 y–14 y, or middle school/grade 6 to 8 *Older adolescent* =14 y–19 y, or high school/ grade 9 to 12 *Gender* Similar patterns for girls and boys (stem and leaf plots) *Income* Low income (7): 0.31 (0.24; 0.36); Q ns; I^2 32% Publication bias Not specified for studies of teacher support	Author's results and conclusions Cross-sectional and longitudinal studies indicated a significant association between support from teachers and depression with small to moderate effect sizes and significant heterogeneity. The tests indicated significant associations for children and young and older adolescents, but limited evidence for age or gender differences. Longitudinal results suggest causal processes from social support to depression. However, this does not eliminate the potential for the inverse relationship. The results have important implications for educators on improving social support with a focus on efforts to reduce youth depression. Author's limitations The use of self-report measures of social support, and in the majority of cases also for depression, may have induced shared-method bias, which may have inflated the magnitude of correlations. Depression may also have led to a more negative view of the support. In addition, relatively few studies reported exclusively on children, few studies were longitudinal, and few studies distinguished between specific types of support. Our comments Summary provided for teacher support in school-aged children. *Overlap*: 4 of 58 studies also in Gariépy 2016 and 1 also in Kidger 2012.

Author Year (Reference)	REVIEW CHARACTERISTICS	ELIGIBLE STUDIES (number of studies in parentheses)			AUTHOR'S REPORTING (summary) and COMMENTS
		CHARACTERISTICS	METHODS	RESULTS	
Gariépy 2016 (35)	**Focus:** associations between social support and depression according to broad life periods **Search period**: until 02-2015 **Inclusion criteria** *Age:* children/adolescents, adults and older adults *Setting:* general population *Exposure:* social support *Outcome:* depression *Design:* observational **Identified references**: 100 (7 eligible on teacher support, 93 non-eligible age or context) **Quality** (AMSTAR score): 6.5 of 10 possible	**Studies/participants** (7/115366) **Age:** 9 y–18 y (1 study 9–13 y; all others ≥14 y) **Risk status**: None **Country**: Finland (3); USA (2); Belgium, Norway (1 each) **Publication years:** 2001–2014 **Exposure:** social support *Provider:* teachers (7), school (1) *Setting*: schools *Comparator*: no exposure *Informant*: NR *Intervention level:* NA **Outcome**: depression *Informant*: NR	**Design**: longitudinal (3), cross-sectional (4), case control (0) **Analyses** *Studies*: linear regression (4); logistic regression (1); multilevel regression (1); SEM (1) *Confounders considered (7)*: at least 3 key confounders considered (5) *Review:* narrative summary *Effect model*: NA *Homogeneity:* NA *Publication bias*: not assessed **Quality** (Modified Newcastle–Ottawa Scale) *Overall* Risk: moderate (6); low (1) *Selection bias* *Participants represent study base* Yes (6); somewhat (1) *People with different social support drawn from the same population* Yes (7) *Analysis account for* *Cluster Design*: NR *Outcome at baseline:* yes (1); no (4); NA (2) *Confounder:* yes (7); no (0) *Measurement bias*: *Valid measure of support* Yes (2); no (4); NA (1) *Valid measure of depression* Yes (3); no (3); unclear (1) *Unclear for at least one* (7) *Response bias* Response rate <60% (7) *Performance* and *reporting bias*: NA/NR *Others*: NR	Statistically significant results presented as OR (dichotomous outcomes) and standardised *β* (continuous outcomes) for depression depending on availability of social support, followed by (95% CI) and p-value, respectively DEPRESSION **Support from teachers** Overall (7): association confirmed in 6/7 studies (86%) *Specification* Study 1: OR 0.44 (0.38; 0.51) Study 2: OR 0.12 (0.12; 0.13) Study 3* *β* -0.15 (-0.27; -0.03) Study 4*: *β* ns (but association for boys, see below) Study 5: *β* -0.25, p < 0.001 Study 6: *β* -0.12, p < 0.05 (Finland) *β* -0.17, p < 0.01 (Norway) Study 7*: *β* -0.13, p < 0.05 **Moderator: sex** Study 4*: Girls *β* ns Boys *β* 0.12, p < 0.05 Study 7*: Girls *β* -0.18, p < 0.05 Boys -0.03, p < 0.05 * Longitudinal design **Support from school** Overall (1): association confirmed in 1/1 studies (100%) *Specification* Study 4: *β* ns **Moderator: sex** Study 4: Girls *β* ns Boys *β* ns	**Author's results and conclusions** Teachers is one of the sources of support that is most consistently reported to be protective against depression in children and adolescents (86% of studies reported a significant association for teacher support). **Author's limitations:** General limitations included the possibility of publication bias, language restrictions to English, French, and Finnish, and restriction to western countries (i.e. limited generalisability). A large share of studies is cross-sectional, precluding inference of the direction of associations. Social support measures vary greatly, which limit replicability. Measures are commonly non-validated, preventing accurate measures of the concepts. Time frames are mostly lacking in social support scales (i.e. responses vary depending on individual choices) and vary greatly in depression scales (may influence the strength and reliability of an association). **Our comments:** Specific summary provided for teacher support in school-aged children. The information given in each section (including for teacher support) is limited and the summary of results as well as the discussion of these is very scant. The data extraction table, DS2 for instance, provides information on support from classmates (4 studies) and "adults at school" (1 study), but this is not mentioned or summarized elsewhere. *Overlap*: 4 of 7 eligible studies also in Rueger 2016

Author Year (Reference)	REVIEW CHARACTERISTICS	ELIGIBLE STUDIES (number of studies in parentheses)			AUTHOR'S REPORTING (summary) and COMMENTS
		CHARACTERISTICS	METHODS	RESULTS	
Gini 2009, 2009 (36,37)	Focus: risk for psychosomatic problems in children involved in bullying Search period: until 2008 Inclusion criteria *Age:* non-adults *Setting:* schools *Exposure:* school bullying *Outcome:* psychosomatic problems *Design:* controlled design Identified references: 11 (all eligible) Quality (AMSTAR score): 6.5 of 11 possible	Studies/participants (11/152186) Victimised (11/152186) Bullies (6/24301) Both (5/23445) Age: 7 y–16 y Risk status: NR. Country: multiple countries (1) Australia (2); Netherlands (2); USA, Italy, United Kingdom, Norway, Greenland, India (1 each) Publication year: 1996–2008 Exposure *Type:* peer relations school bully victims (11); bullies (6); both (5) *Provider:* NA *Setting*: school *Comparator*: children not involved in bullying *Informant*: child *Intervention level:* NA Outcome: psychosomatic problems *Informant*: child	Design: longitudinal (2), cross-sectional (9) Analyses *Studies*: NR *Confounders considered*: not specified (3): specified (8): gender (6), age (5), SES (2), school (2), social relations, race, overweight/obesity, country (1 each), *Review:* meta analyses *Effect model*: random *Homogeneity:* Q statistics *Publication bias*: Kendall's π, Orwin's "fail-safe N" (Nfs) with the "5k +10" benchmark Quality *High quality* = randomised sampling and response rate >80% (6) *Recruitment* Cluster random sampling (4); simple random sampling (2); convenience (1), cohort (1); NR (3) *Analysis accounts for* *Cluster design*: yes (2); no (9) *Outcome at baseline:* NR *Confounders*: yes (8); NR (3) *Measurement bias* *Psychosomatic* Cronbach's α > 0.7 (2); NR (9) *Victimization* Cronbach's α ≥ 0.8 (2); NR (9) *Bullying* Cronbach's α =.075 (1); NR (5) *Response bias* Response rate: >80% (8); ≥70% (1); <30% (1); NR (1) *Selection, performance*, and *reporting bias*: NA/NR *Others*: NR	Statistically significant results including sensitivity analyses presented as OR (95% CI) followed by heterogeneity (Q), when available, and publication bias (Kendall's π, "fail-safe N" (Nfs) with the "5k +10" benchmark) PSYCHOMATIC PROBLEMS Victimised Overall (11): 2.00 (1.70; 2.35); Q ns *Sensitivity* High quality* studies (6): 1.90 (1.57; 2.31) Largest studies (2): 1.96 (1.82; 2.12) *Publication bias* π = 0.13, P= 0.58; $N_{fs,}$143, benchmark n = 65 (~no bias) Bullies overall (6): 1.65 (1.34; 2.04); Q ns *Sensitivity* High quality* studies (3): 1.64 (1.27; 2.10) Largest studies (2): 1.64 (1.25; 2.16) *Publication bias* π 0.07, P= 0.85; $N_{fs,}$56, benchmark n = 40 (~no bias) Victimised and bully others Overall (5): 2.22 (1.77; 2.77); Q ns *Sensitivity* High quality* studies (3): 2.34 (1.74; 2.87) Largest studies (2): 2.24 (1.68; 2.99) *Random sampling, response rate>80% *Publication bias* π 0.20, P=0.62; N_{fs} 77, benchmark n = 35 (~no bias) Moderator/Mediator: NR	Author's results and conclusions Children who are victimized, bullying others or both victimised and bullies were all found to have a higher risk for psychosomatic problems than uninvolved peers. The largest effect sizes were seen in victims and bully-victims, whereas bullies had lower risk for psychosomatic problems than these two groups. Having limitations in mind, the studies supported that children who are frequently involved in bullying, especially victims and bully-victims, suffer from psychosomatic problems and suggest that this occurs in both genders, different age groups, and different countries around the world. Author's limitations Most studies relied on self-report measures, which may induce bias due to low respondent-self-consciousness, denial of the condition, reluctance to identify oneself as a bully, or due to inflation by the common method variance. Different forms of victimization (physical and relational) were not measured separately and these forms may be differentially related to personal adjustment. Finally, most studies were cross-sectional and all were of observational design. This limits the possibility of causal inference, and although potential confounders were adjusted for, the influence of confounding cannot be completely ruled out. Our comments This publication is upgraded and expanded in Gini (2013) and Gini (2014). *Overlap*: All studies in this review are included in Gini (2013) and/or Gini (2014), but the analyses differ between publications. No studies in any other reviews.

Author Year (Reference)	REVIEW CHARACTERISTICS	ELIGIBLE STUDIES (number of studies in parentheses)			AUTHOR'S REPORTING (summary) and COMMENTS
		CHARACTERISTICS	METHODS	RESULTS	
Gini 2013 (38)	Focus: risk for psychosomatic problems in children and adolescents who are bullied by peers Search period: until 2012 Inclusion criteria *Age:* children, adolescents *Setting:* schools *Exposure:* school bully and victimisation *Outcome:* psychosomatic problem *Design:* controlled design Identified references: 30 (all eligible) Quality (AMSTAR score): 6.5 of 11 possible	Studies/participants (30/219560) Age:7 y–21 y (2 studies include ages >19 y) Risk status: NOT clinical studies of psychiatric patients Country: multiple countries (2); Norway (5); USA (4); Australia (3); United Kingdom (2); Netherlands (2); Finland (2); India (2): Mexico, Turkey, Italy, France, Austria, Germany, Greenland, China (1 each) Publication year: 1996–2012 Exposure *Type:* relations (school bullied) *Provider:* NA *Setting*: school *Comparator*: non-bullied *Informant*: child (26); parents (1); peers (1); multi-informant (2) *Intervention level:* NA Outcome: psychosomatic problems *Informant*: child (26); parent (3); multi-informants (child/parent/teacher) (1)	Design: longitudinal (6), cross-sectional (24) Analyses *Studies*: NR *Confounders considered*: None (11); not specified (2); specified (17): gender (12),; age (9); SES (8); race (3); family structure (3); social relations (3); exposure to violence (3); country (2); school (2); living area, residence, family situation, grade, childhood aggression, problem behaviours and overweight/obesity (1 each) *Review:* meta analyses *Effect model*: random *Moderator analyses*: meta-regression *Homogeneity:* Q and I^2 statistics *Publication bias*: Kendall's π, Orwin's "fail-safe N" (Nfs) with the "5k +10" benchmark Quality *High quality* = randomised sampling or whole population, and response rate >80% (12) *Recruitment* Cluster random sampling (5); simple random sampling (5); convenience (10), population (6); stratified random sampling (1); NR (3) *Analysis account for* *Cluster Design*: yes (1); no (27); NR (2) *Outcome at baseline:* NR *Confounders*: yes (17); no (13) *Measurement bias*: NR *Response bias* Response rate ≥80% (19); ≥70% (2); ≥ 60% (2) > 50% (1) <30% (1); NR (5) *Selection, performance, and reporting bias*: NA/NR *Others*: NR	Statistically significant results including sensitivity analyses presented as OR (95% CI) followed by heterogeneity (Q, I^2), when available, moderator effects for sex as regression coefficient β (95% CI); and publication bias as Kendall's π, Orwin's $N_{fs,}$ "5k +10" benchmark PSYCHOMATIC PROBLEMS Longitudinal *9 mo.–11 y* (6): 2.39 (1.76; 3.24); Q ns; I^2 0% *Publication bias* π 0.53, p = 0.13; N_{fs} 102, benchmark n = 40 (~no bias) Cross-sectional Overall (24): 2,17 (1.91; 2.46); Q p < 0.05; I^2 78% *Publication bias* π 0.05, p = 0.75; N_{fs} 325, benchmark n = 130 (~no bias) Moderator *Sex* Number of female (20): β -0.04 (-0.07; -0.02) *Geographic location* Europe (15): 2.19 (1.82; 2.62) Non-Europe (8): 2.16 (1.61; 2.90) ***Difference by location***: p = ns Cross-sectional and longitudinal *Sensitivity* High-quality* studies (12): 2.10 (1.87; 2.46) *Random sampling, response rate >80%	Author's results and conclusions In both longitudinal and cross-sectional studies, bullied children were found to have a higher risk for psychosomatic problems. The bullied pupils were at least twice as likely to have such problems compared to non-bullied age mates, and the likelihood of psychosomatic problems was higher in samples with proportionally more boys. Geographic location, however, was not a significant moderator for this relationship. The present results indicate that school bullying should be seen as a significant international public health problem. The authors suggest that the large overall sample size and the wide geographic distribution supports generalisability. Other strengths include the lack of evidence of publication bias and the fact that longitudinal and cross-sectional studies gave similar results. Author's limitations Most studies relied on self-report measures, which may induce bias due to low respondent self-consciousness, denial of the condition, or inflation due to common method variance. Information on bullying and psychosomatic problems obtained from the same source may also have inflated the results. Many studies controlled for potential confounders, but all the same the influence of confounders cannot be completely ruled out. Our comments This publication seeks to upgrade and expand Gini (2009) and is further upgraded and extended in Gini (2014). *Overlap*: 20 studies also in Gini (2009) and/or Gini (2014). No studies in any other reviews.

Author Year (Reference)	REVIEW CHARACTERISTICS	ELIGIBLE STUDIES (number of studies in parentheses)			AUTHOR'S REPORTING (summary) and COMMENTS
		CHARACTERISTICS	METHODS	RESULTS	
Gini 2014 (39)	Focus: risk for headache in children and adolescents who are bullied by peers Search period: until 2013 Inclusion criteria *Age:* children, adolescents *Setting:* schools *Exposure:* school bully and victimisation *Outcome:* headache *Design:* controlled design Identified references: 20 (all eligible) Quality (AMSTAR score): 7.5 of 11 possible	Studies/participants (20/173775) Age: 7 y–20 y (1 study includes participants >19 y) Risk status: NOT clinical studies of psychiatric patients Country: multiple countries (1); Norway (5); USA (2); Turkey (2); Netherlands (2); India (2); United Kingdom, Italy, Finland, Greenland, Russia, China (1 each) Publication year: 1996–2012 (1 study before 2004) Exposure *Type:* relation (school bullied) *Provider:* NA *Setting*: school *Comparator*: non-bullied *Informant*: child (19); parent (1) *Intervention level:* NA Outcome: headache *Informant*: child (19); parent (1)	Design: longitudinal (3), cross-sectional (17) Analyses *Studies*: NR *Confounders considered*: gender (10); age (8); SES (7); Race (3); Family structure (3); having friends (3); exposure to violence (2); school grade (2); country, residence, school and overweight/obesity (1 each) *Review:* meta analyses *Effect model*: random *Homogeneity:* Q and I^2 statistics *Publication bias*: Kendall's π, Orwin's "fail-safe N" (N_{fs}) with the "5k +10" benchmark Quality *High quality* = randomised sampling or whole population, and response rate >80% (13) *Recruitment* Cluster random sampling (4); simple random sampling (6); convenience (2), population (5); NR (3) *Analysis account for* *Cluster Design*: no (20) *Outcome at baseline:* NR *Confounders*: yes (14); no (6) *Measurement bias*: NR *Response bias* Response rate ≥80% (16); ≥70% (1); NR (3) *Selection, performance, and reporting bias*: NA/NR *Others*: NR	Statistically significant results including sensitivity analyses presented as OR (95% CI) followed by heterogeneity (Q, I^2), when available; moderator effects for sex as regression coefficient β (95% CI); and publication bias as Kendall's π, Orwin's $N_{fs,}$ "5k +10" benchmark HEADACHE Fourteen studies reported data on the prevalence of headache = ~ 32.7% (range: 9.1%–71.7%) in the bullied group and 19.1% (range: 5.3%–46.1%) in the control group. Longitudinal studies *9 mo-11 y* (3): 2.10 (1.19; 3.71); Q ns; I^2 51% Cross-sectional Overall (17): 2.00 (1.70; 2.35); Q p < 0.05; I^2 76%. *Sensitivity analysis:* High quality* studies (13): 1.90 (1.61; 2.25) * random sampling, response rate >80% Moderator *Sex* Number of female (15): β −0.06 (−.07; −.04); p < 0.001 *Geographic location* Europe (11): 2.03 (1.59; 2.60) Non-Europe (5): 2.00 (1.32; 3,02) *Difference by location*: p = ns Cross-sectional and longitudinal Self-report questionnaires (13): 1.87 (1.57; 2.23) *Publication bias* π 0.13, p = 0.44; N_{fs} 253, benchmark n = 110	Author's results and conclusions In both longitudinal and cross-sectional studies, bullied children were found to have a higher risk for headache. The bullied pupils were about twice as likely to have frequent headaches compared to non-bullied age mates, and the strength of the relationship was higher when the samples included proportionally more boys. Geographic location (Europe vs. non-Europe) was not a significant moderator for the relationship. The authors suggest that the large overall sample size and the wide geographic distribution supports generalizability. Other strengths include the good quality of most studies, the lack of evidence of publication bias, and the fact that longitudinal and cross-sectional studies gave similar results. Author's limitations The studies did not explicitly compare male and female samples or different ethnic groups. This is a limitation because youths' cultural background might influence the experience of victimization and the ability to cope with victimisation. Most studies relied on self-report measures, which may induce bias due to low respondent self-consciousness, denial of the condition, or inflation due to common method variance. The measures also had limitations, e.g. they lacked information about cyberbullying and the type of headache. Although potential confounders were adjusted for in many studies, the influence of confounding cannot be completely ruled out. Our comments This publication seeks to upgrade and expand Gini (2009) and Gini (2013). Note, the number of confounders did not influence the results. *Overlap*: 18 studies also in Gini (2009) and/or Gini (2013). No studies in any other reviews.

AMSTAR: A MeaSurement Tool to Assess systematic Reviews; ANCOVA: Analysis of covariance; ANOVA: Analysis of variance; CDI: Children's Depression Inventory; CI: confidence interval; C-RCT: cluster randomised controlled trial; CT: controlled trial; ES: effect size; GRADE: Grading of Recommendations Assessment, Development and Evaluation; HIC: High Income Country; HPS: Health Promoting Schools; LMIC: Low and Middle Income Country; MANOVA: multivariate analysis of variance; mo.: month(s); NA: not applicable; NR: not reported; NR-CT: not randomised controlled trial; ns: not significant result; OLS: ordinary least squares; OR: odds ratio; RCMAS: Revised Children's Manifest Anxiety Scale; RCT: randomised controlled trial; SDM: standardised mean difference: SES: socioeconomic status; y: year(s)