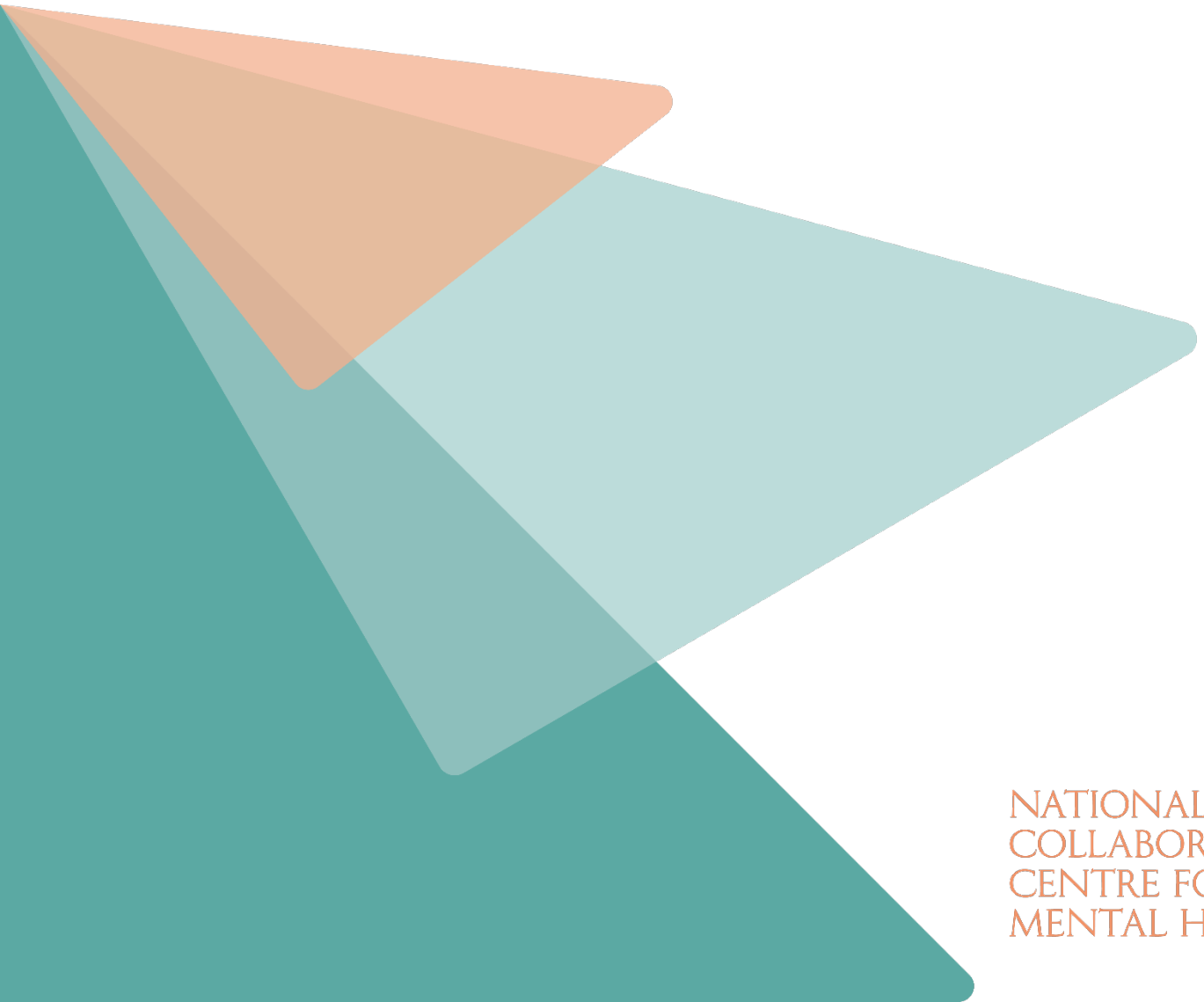
Mental Health Problems and Social Mobility

A systematic review



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Contents

1. Background 4
2. Methods 5
2.1. Research questions 5
2.2. Search strategy 5
2.3. Selection criteria 6
2.4. Study selection 7
2.5. Quality appraisal 7
2.6. Data extraction 7
2.7. Data synthesis 7
3. Results 8
3.1. Studies identified 8
3.2. RQ1: What is the impact of anxiety or depressive disorders on social mobility? 8
3.3. RQ2: Does social class moderate the impact of treatments for mental health problems? 19
3.4. Intersectionality 34
4. Conclusions and recommendations for future research 37
4.1. Limitations 37
4.2. Conclusions and recommendations 37
4.3. Research recommendations 37

Appendix A: Research protocols and search strategies 38
Appendix B: PRISMA diagram 51
Appendix C: Characteristics of included studies 52
Appendix D: Expert Reference Group 59

Abbreviations 60
References 62

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1. Background

In 2019 the NCCMH was commissioned by the Social Mobility Commission to ascertain the relationship between mental health problems and social mobility, specifically: (1) the impact of depression and anxiety disorder on social mobility; (2) the impact of social class on access to mental health treatment and on treatment outcome; (3) the impact of mental health treatment on social mobility; and (4) whether personal protected characteristics have any bearing on the relationship between mental health problems and social mobility.

As part of the research that we undertook for this project, we conducted this systematic review of the literature, which is the first of its kind on this topic.

The research we conducted for the Social Mobility Commission, which also included qualitative research (a thematic analysis of focus group material) and an analysis of data collected by IAPT mental health services, underpinned the Bridge the Gap report (forthcoming, in October 2021).

2. Methods

2.1. Research questions

This systematic review set out to address two research questions (RQs):

- RQ1: What is the impact of anxiety or depressive disorders on social mobility?
- RQ2: Does social class moderate the impact of treatments for mental health problems?

Because an insufficient number of systematic reviews to address RQ2 were identified through an initial scoping search, the following subquestions were set:

- RQ2.1 What is the effect of social class on the likelihood of receiving treatment for mental health problems?
- RQ2.2 What is the effect of social class on treatment outcome for mental health problems?
- RQ2.3 What is the effectiveness of treatment for mental health problems on influencing change in social class?

We also aimed to examine whether intersectionality (age, gender, ethnicity, relationship status, sexuality) would have an impact on the above questions.

2.2. Search strategy

Literature searches for all research questions followed gold-standard and systematic methods as recommended by the Cochrane Collaboration. Studies were identified using database and non-database search methods.[1 2] Seven bibliographic databases were searched: MEDLINE, Embase, PsycINFO, Health Management Information Consortium (HMIC), Social Policy and Practice (SPP) were searched via the Ovid interface; Applied Social Sciences Index Abstracts (ASSIA) and Education Resources Information Center (ERIC) were searched via Pro Quest. For more information, see the research protocols in Appendix A.

A study needed to meet all of the following three criteria to fulfil inclusion:

1. a randomised controlled trial (RCT), or cohort study, or reports a systematic review; and
2. population has a mental health problem; and
3. social mobility is an outcome of the study (or focus of the systematic review).

The search strategy was reviewed using the Peer Review of Electronic Search Strategies (PRESS) Checklist.[3] The primary search strategy is reported using a search narrative to explain the contextual and conceptual detail behind the selection of search terms.[4] The Canadian Agency for Drugs and Technologies in Health (CADTH) RCT/controlled clinical trial (CCT)[5] and the Scottish Intercollegiate Guidelines Network (SIGN)[i] study design literature search filters were used. The SIGN filter was adapted to focus on studies reporting cohort or longitudinal designs. The search was not limited by language or date.

[i] SIGN Strategy (Ovid). Available from: http://www.sign.ac.uk/assets/search-filters-observational-studies.docx.

The following non-database (supplementary) search methods were undertaken:

- Systematic reviews meeting inclusion were checked and their included studies were cross-checked for any studies not identified by our bibliographic searches.
- Web-searching was undertaken by one researcher using the Google advanced interface. The search strategies are reported in web-only material using the guidance of Briscoe.[6]
- The list of all studies meeting inclusion was shared with the expert reference group advising on the wider project (see Appendix D for a list of expert reference group members). The purpose was to identify any studies known to our experts that may not have been identified.[7]

Studies were de-duplicated in EndNote X8. The full database and non-database search strategies are reported in Appendix A.

2.3. Selection criteria

We included RCTs or cohort studies of populations with a mental health problem. Social mobility is formally defined as the link between a person's occupation or income and the occupation or income of their parents. However, data pertaining to this link were rarely reported on in this research literature. As a result, we considered any measure of social class[ii] and proxies for social class and social mobility, in line with previous research,[8] which were:

- educational attainment (any measure, including number of years in education, having a degree or not and examination results)
- income
- occupational status (any measure, including being employed or unemployed, occupational position or level and occupational class[iii])
- socioeconomic status (SES).

Studies meeting other inclusion criteria were required to include the formal definition of social mobility or to report at least one of these above indicators

To be included, the following study selection criterion were followed:

- RQ1 Study reports social class (or proxies for social class) as an outcome in people with mental health problems.
- RQ 2.1. Study reports access to treatment as an outcome and reports this by social class (or proxies for social class) or examines social class (or proxies for social class) as a predictor.
- RQ 2.2 Study reports mental health outcomes of an intervention for mental health problems and reports outcomes by social class (or proxies for social class) or examines social class (or proxies for social class) as a predictor.
- RQ 2.3 Study reports social class (or proxies for social class) as an outcome of mental health intervention or treatment.

We excluded studies with substance and alcohol misuse disorders or neurodevelopmental disorders as the study population. We also excluded dissertations, conference abstracts and protocols. We did not exclude papers on language.

[ii] For example, Hollingshead AB. Two Factor Index of Social Position. New Haven: privately printed, 1957 and Hollingshead AB. Commentary on the 'indiscriminate state of social class measurement'. Social Forces. 1971:49;563–567.
[iii] For example, the International Standard Classification of Occupations codes.

2.4. Study selection

Studies were independently double screened by two researchers using the Rayyan screening tool.[9] A third researcher then screened studies for which the decision was not unanimous.

2.5. Quality appraisal

Quality appraisal was undertaken by one reviewer and checked in detail by another. The Cochrane Risk of Bias tool was used for studies reporting RCTs[10] and a version of the Newcastle–Ottawa Scale (NOS) tool modified by Gondek et al.[11] was used for studies reporting a cohort design.

2.6. Data extraction

A data extraction tool was developed by the research team and piloted. Data extraction was undertaken by one reviewer and checked in detail by another. The following criteria were extracted:

- study citation
- study design
- country and region of study
- setting
- mental health problems and population characteristics
- study purpose
- intervention/exposure
- comparison/control
- social mobility outcome measured and method measurement
- limitations.

2.7. Data synthesis

We synthesised the results narratively.[12] We organised studies into categories according to research question, study type, mental health condition and social class outcome, and produced summary tables of findings. We did not carry out a meta-analysis due to the heterogeneity of populations, interventions, outcomes and adjustments made to reported analyses.

3. Results

3.1. Studies identified

In total, 5,185 studies were identified by the bibliographic and non-bibliographic searches after de-duplication. After reviewing abstracts of all articles, 5,081 studies were excluded. From 104 studies assessed at full text, 51 studies met inclusion criteria and were included in the review. There were 24 prospective cohort studies, 14 retrospective studies, 10 RCTs, two open-label trial extensions, one quasi-experimental study and one before-and-after trial. No systematic reviews of sufficient quality were found to adequately address each question. The three systematic reviews found were searched for additional studies for inclusion. Fifteen studies were identified through this method.

The process of review is summarised in a PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) flow diagram in Appendix B.

The characteristics of included studies can be found in Appendix C.

3.2. RQ1: What is the impact of anxiety or depressive disorders on social mobility?

In total, 23 studies examined how anxiety and depressive disorders may have an impact on social mobility outcomes. Studies were carried out in a variety of countries (10 in the US, five in the UK, four in Finland and one each in the Netherlands, Norway, Sweden and Australia). The quality of the evidence was mixed, with four studies rated as 'good', 13 as 'fair' and six as 'poor'.

We have described the studies and the findings according to whether the impact of mental health problems on social mobility is 'intergenerational' (changes in social mobility between generations) or 'intragenerational' (changes in someone's social mobility throughout the course of his or her lifetime). Seven studies looked at the intergenerational impact of parents' mental health problems on changes in social class in their offspring, and 21 studies looked at the intragenerational impact of an individual's mental health problems on their own change in social class.

Only one study, BIRTCHNELL1971,[13] examined social mobility as an intergenerational shift of social class (no useable data). Thirteen studies reported occupational status outcomes, seven studies reported income outcomes and 11 studies reported educational attainment outcomes. Where possible, outcomes controlling for parental social class are described for intragenerational outcomes. **Table 1** provides a summary of the findings of included studies.

3.2.1. Educational attainment

Intergenerational impact

Five studies examined the impact of parents' mental health problems on the educational attainment of their children. A good quality study (RITSHER2001[14]) found that parental depression did not significantly predict the educational attainment of young adult (mean age 25) offspring (probability [p] = 0.97). Three fair-quality studies (JOHNSTON2013,[15] PSYCHOGIOU2019[16] and SLOMINSKI2011[17]) found that parents' mental health problems did not significantly predict the educational attainment of their adult children ($p>0.05$). But there was some evidence that parents' mental health problems did affect their children's academic competence (PSYCHOGIOU2019 and SLOMINSKI2011) and mental health during childhood (JOHNSTON2013 and SLOMINSKI2011), which may mediate the impact of parental mental health on adult academic achievements (JOHNSTON2013, PSYCHOGIOU2019 and SLOMINSKI2011). Another fair-quality study (ENSMINGER2003[18]) found

that prolonged periods of parental distress may have an impact on the educational attainment of their male (but not female) children during adolescence.

Intragenerational impact

Nine studies (ABEBE2019,[19] CASE2005,[20] CORYELL1993,[21] ISOHANNI2001,[22] JOHNSON1999,[23] JOHNSTON2013, RITSHER2001, SELLERS2019[24] and SLOMINSKI2011) examined the impact of mental health problems on change in educational attainment within one generation.

Good quality evidence from ISOHANNI2001, JOHNSON1999 and RITSHER2001 reported mixed findings. JOHNSON1999 found that having an anxiety or depressive disorder reduced the risk of dropping out of school (anxiety: odds ratio [OR]: 0.21, 95% confidence interval [CI]: 0.05–0.97, p = 0.039, depression: OR: 0.23, 95% CI: 0.06, 0.82, p = 0.028), but had no impact on continuation of studies beyond secondary school (anxiety: OR: 1.59, 95% CI: 0.58, 4.42, p = 0.371, depression: OR: 1.16, 95% CI: 0.43, 3.12, p = 0.769). RITSHER2001 found no association between depression and educational attainment (p = 0.98) and ISOHANNI2001 found that having a non-psychotic disorder tripled the odds of having a basic (versus secondary or tertiary) education, whether the age of onset was before 22 (OR: 3.2, 95% CI: 2.1–4.7, p<0.0001) or after 23 (OR: 3.1, 95% CI: 1.9–5.3, p<0.0001).

Three fair-quality studies (JOHNSTON2013, SELLERS2019 and SLOMINSKI2011) reported an association between mental health problems and educational attainment, including reduced likelihood of having five good exam passes (boys: National Child Development Study [NCDS] dataset: OR: 0.49 [0.31, 0.78], p = 003; Avon Longitudinal Study of Parents and Children [ALSPAC] dataset: OR: 0.30 [0.22, 0.41], p <0.001; girls: NCDS dataset: OR: 0.50 (0.32, 0.76), p = 0.010; ALSPAC dataset: OR: 0.34 [0.23, 0.50)], p <0.001) (SELLERS2019), reduced likelihood of attaining a degree (JOHNSTON2013) when controlling for parental social class and mental health (beta coefficient [b] = 0.023, standard error [SE]: 0.005, p<0.01), and reduced academic attainment at age 30 (SLOMINSKI2011) (b = 0.18, p<0.05). However, one fair-quality study (CORYELL1993) found no difference between adults with depression and adults without in the number of people who improved their educational status over 5 years (OR: 0.83 95% CI: 0.51, 1.35, p = 0.46).

A poor quality study (ABEBE2019) found that mental health problems exacerbate the impact of physical disability on educational attainment (b = -0.136, SE: 0.019, p<0.0001) and another poor quality study (CASE2005) found that mental health/emotional problems at both age 7 and 16 reduced ‘O’ level passes in adolescents (age 16: b:-0.637, SE: 0.123, p>0.05, age 7: b: = -0.601, SE: 0.128, p>0.05) after controlling for physical impairments, family SES variables and prenatal smoking.

Summary

The evidence suggests that parents’ mental health problems do not directly have an impact on their adult children’s educational attainment, but may have an impact on their childhood outcomes, which in turn can affect adult educational attainment. Intragenerationally, while evidence is mixed, on balance mental health problems appear to have a negative impact on educational attainment, although it is difficult to tease out possible moderators of effect, and there may be some differences between anxiety and depressive disorders.

3.2.2. Income

Intergenerational impact

Three studies of good, fair and poor quality (RITSHER2001, JOHNSTON2013 and EATON2001[25] respectively) examined the association between parents’ mental health problems and their children’s income in adulthood. When controlling for parental SES, parental depression did not predict income according to both good quality (p = 0.87) and poor quality studies (b = -0.01, p>0.05). However, fair-

quality evidence found that while parents' depression did predict reductions in their children's income at age 30 (b = -0.036, SE = 0.008, p<0.01), this relationship remained but its strength reduced when adjusted for the children's mental health problems in childhood and adulthood (b = -0.021, SE = 0.008, p<0.05), suggesting that both parental and child mental health problems may interact to impact on income.

Intragenerational impact

Seven studies (CORYELL1993, EATON2001, ELOVAINIO2012,[26] GROFFEN2009,[27] JOHNSTON2013, RITSHER2001 and SAREEN2011[28]) examined the impact of mental health problems on income within one generation. One good quality study (RITSHER2001) found no evidence that income in younger adults was predicted by depression (p = 0.33) when controlling for parental SES. Five fair-quality studies found mixed results: two (ELOVAINIO2012 and GROFFEN2009) found that mental health problems were associated with income. GROFFEN2009 found that older adults with social anxiety disorder had increased odds of a decrease in income, controlling for baseline income, occupational status changes, gender, educational attainment and age (OR: 1.69 [1.15–2.50]). ELOVAINIO2012 found that lower initial levels and a faster decrease over time in depressive symptoms were associated with higher income in adulthood, controlling for parental SES. However, one fair-quality study found no significant relationship between baseline mental health problems in young adults and income 3 years later (SAREEN2011). One fair-quality study (CORYELL1993) found that, while depressed, people had reduced odds of an increase in income over 5 years (OR: 0.67, 95% CI: 0.46, 0.97, p = 0.03), though they did not have increased odds of a decrease in income (OR: 1.26, 95% CI: 0.69, 2.27 p = 0.45). Another (JOHNSTON2013) found that while mental health in childhood was not predictive of adult income after controlling for parental mental health (b = -0.010, SE = 0.008, p>0.05), mental health in adulthood was (b = 0.083, SE = 0.008, p<0.01). A poor quality study (EATON2001) found that depression in adulthood had a small negative effect on income percentile at 10-year follow-up (b = -0.10, p<0.01).

Summary

The evidence suggests that parents' mental health problems may have a limited direct impact on their children's income. Within one lifetime, the evidence is more mixed, but age may moderate the effect, with the effect on income being apparent when mental health problems are present in later adulthood (as opposed to early adulthood).

3.2.3. Occupational status

Intergenerational impact

Three studies of good (RITSHER2001) and fair (SLOMINSKI2011 and TOLMAN2009[29]) quality found that parents' mental health was not directly associated with their children's occupation (p>0.05). However, one study (SLOMINSKI2011) found that parents' mental health may be indirectly associated with their children's occupation through the impact on adolescent mental health (b = 0.22, p<0.01), which in turn predicts later occupational status (b = 0.19, p<0.05).

Intragenerational impact

Thirteen studies examined the impact of mental health problems on occupational status within one generation. One good quality study (BUTTERWORTH2012[30]) found that mental health problems in adulthood increased the likelihood of becoming unemployed (p<0.05), but another in younger adults, RITSHER2001, found they did not (p<0.30). Five fair-quality studies found that occupational status was significantly predicted by symptoms of mental health problems (AMOS2018,[31] ARO1995,[32] CORYELL1993, ELOVAINO2012 and SLOMINSKI2011). More specifically:

- mental health at age 18 predicted occupational status at 30 (b = 0.19, p<0.05) (SLOMINSKI2011)
- severity and trajectory of depressive symptoms were associated with occupational status (ELOVAINIO2012)
- the odds of being employed in the past 12 months were significantly reduced in adults with depression (OR: 0.57 95% CI: 0.39, 0.84, p = 0.004) (CORYELL1993)
- the odds of improving occupation from lifetime best pre-depression diagnosis were significantly reduced in adults with depression (OR: 0.45, 95% CI: 0.29, 0.69, p<0.0001) (CORYELL1993)
- men and women with major affective disorder had a 2.5–3.9 times and 2.8–4.2 times higher risk, respectively, of becoming unemployed than the general population (ARO1995)
- people with treatment-resistant depression had a higher risk of either switching to COBRA status (reduced employment hours under the Consolidated Omnibus Budget Reconciliation Act of 1985, US) or terminating employment than employees with no depression (hazard ratio [HR]: 1.37, [1.11, 1.69], p = 0.004) (AMOS2018).

Another fair-quality study (TOLMAN2009) also found that in adults, symptoms of social anxiety disorder in the preceding month significantly predicted number of months worked (b = 0.114, SE = 0.054, p<0.05); however, symptoms of depression did not predict the number or months worked (b = 0.012, SE = 0.031, p>0.05). Finally, a fair-quality study (HALONEN2019[33]) found that symptoms of mental health problems may increase the odds of entering employment before age 18 (compared with age >24: age 19–23 OR:1.01, 95% CI: 0.84, 1.23, p = 0.919; age <18 OR: 0.76, 95% CI: 0.61, 0.95, p = 0.015). Three poor quality studies found that mental health problems in adults did not predict change in occupational status. Adjusting for parental occupational status:

- depressive symptoms did not predict trajectories of employment (LANDSTEDT2016[34])
- baseline depressive symptoms did not predict job percentile after a 10-year follow-up (b = -0.05, p>0.05) (EATON2001)
- at 2 years post-baseline, odds of employment did not decrease in adults with depression (OR: 1.04, p>0.05) (PRAUSE2001[35]).

Another poor quality study found that poor mental health increased the chance of unemployment in people with a physical disability (b = 0.067, SE = 0.007, p<0.0001) (ABEBE2019).

Summary

The evidence suggests that parents' mental health does not have a direct impact on their children's occupational status. However, there is limited evidence to suggest that it may have an effect on child mental health, and that child/adolescent mental health subsequently may impact on occupational status.

The evidence for the impact of a mental health problem on occupational status within a person's lifetime is more conflicting. The highest quality evidence is mixed, medium quality evidence suggests mental health does predict occupational status, and poor-quality evidence suggests that mental health problems do not. Overall, the association with occupational status is somewhat uncertain, though considering all the evidence, mental health problems may be associated with an increased likelihood of unemployment.

3.2.4. Social mobility

Intergenerational impact

We found only one poor-quality study (BIRTCHNELL1971) reporting social mobility as an intergenerational shift of social class. The study found that people with depression (who were originally in social class IV or V) showed significantly less upward social mobility from the social class of their parents than people without depression.

Table 1: Findings for RQ1: the impact of anxiety and depressive disorders and social mobility

Outcome	Intragenerational/ intergenerational	Mental health problem	Age	Study (quality)	Findings
Educational attainment	Intergenerational	Depressive disorders	Young adult	RITSHER2011 (Good quality)[a]	Parents' depression was not a significant predictor of their children's educational attainment after controlling for parental SES (f ratio [F] = 0, p = 0.97)
		Any common mental health problem[b]	Adolescence	ENSMINGER2003 (Fair quality)	Mothers' distress during either their children's childhood or adolescence did not significantly increase the odds of secondary school drop out in either sons (OR: 1.22, 95% CI: 0.72, 2.06, p = 0.458) or daughters (OR: 0.94, 95% CI: 0.55, 1.63, p = 0.823) when controlling for maternal educational attainment. Mothers' distress during their children's childhood *and* adolescence significantly increased the odds of secondary school drop out in sons (OR: 2.29, 95% CI: 1.20, 4.37, p = 0.012) but not in daughters (OR: 1.12, 95% CI: 0.50, 2.49, p = 0.782) when controlling for maternal educational attainment. There was a significant interaction between maternal distress and poverty: maternal distress at only one time point, when combined with poverty, did significantly increase the odds of school drop out in sons only (OR: 3.07, 95% CI: 1.02, 9.22, p = 0.046).
		Any common mental health problem	Adult	JOHNSTON2013 (Fair quality)	Worse mental health in mothers predicted reduced chances of their children gaining a degree by age 30 (b: -0.014, SE: 0.005, p<0.01). However, when controlling for child mental health at age 10, mental health of mothers did not predict reduced chances of the children gaining a degree by age 30 (b = -0.007, SE: 0.005, p>0.05). Children's mental health mediated the effect of their mothers' mental health and their own educational attainment.
		Depressive disorders	Adolescence	PSYCHOGIOU2019 (Fair quality)	More severe depression in mothers was significantly associated with lower academic attainment in their children at age 16, through indirect associations via negative mother-child relationships (b:-0.01. SE:0.002, p<0.001) and prior educational attainment (b:-0.004, SE: 0.001, p<0.01). More severe depression in fathers was significantly associated with lower academic attainment in their children at age 16, through indirect associations via negative father-child relationships (b: 0.008, SE: 0.003, p<0.01).

	Any common mental health problem	Adolescence/adult	SLOMINSKI2011 (Fair quality)	There was no direct association between mothers' mental health and their children's educational attainment in adulthood (b: 0.00, p>0.05). However, mothers' mental health was significantly associated with their children's academic competence in adolescence (b: 0.20, p<0.05) and mental health at age 18 (b: 0.22, p<0.01). These child variables significantly predict educational attainment (academic competence b: 0.54, p<0.001, mental health b: 0.18, p<0.05).
Intragenerational	Any common mental health problem	Adult	ISOHANNI2001 (Good quality)	People with non-psychotic disorders had increased odds of attaining basic (versus secondary or tertiary) education, whether with onset before age 22 (OR:3.2, 95% CI: 2.1, 4.7, p<0.0001) or at age 23 or older (OR: 3.1, 95% CI: 1.9–5.3, p<0.0001). Fewer people with age of onset before 22 attained tertiary education (4%), while more with age of onset at 23 or older attained tertiary education (18%).
	Any common mental health problem	Adolescence	JOHNSON1999 (Good quality)	Controlling for comorbid mental health problems, parental SES, parental psychopathology, child's age, child's gender and child's intelligence quotient, a diagnosis of an anxiety disorder was associated with a reduced risk of dropping out of secondary school (OR: 0.21, 95% CI: 0.05, 0.97, p = 0.039). A diagnosis of an anxiety disorder was not significantly associated with a failure to continue education beyond secondary school (OR: 1.59, 95% CI: 0.58, 4.42, p = 0.371). Controlling for comorbid mental health problems, parental SES, parental psychopathology, child's age, child's gender and child's intelligence quotient, a diagnosis of depression was associated with a reduced risk of dropping out of secondary school (OR: 0.23, 95% CI: 0.06, 0.82, p = 0.028). A diagnosis of depression was not significantly associated with a failure to continue education beyond secondary school (OR: 1.16, 95% CI: 0.43, 3.12, p = 0.769).
	Depressive disorders	Young adult	RITSHER2011 (Good quality)[a]	Depression was not a significant predictor of educational attainment (F = 0.0, p = 0.98) after controlling for parental SES.
	Depressive disorders	Adult	CORYELL1993 (Fair quality)	Adults with depression did not have significantly different odds of improving their educational attainment compared with controls (OR: 0.83, 95% 0.51, 1.35, p = 0.46).
	Any common mental health problem	Adult	JOHNSTON2013 (Fair quality)	Poor childhood mental health significantly predicted reduced likelihood of getting a degree after controlling for maternal mental health, maternal education and parental social class (b: -0.023, SE: 0.005, p<0.01)

		Any common mental health problem	Adolescence	SELLERS2019 (Fair quality)	In two different cohorts (ALSPAC and NCDS), children with mental health problems were less likely to go on to achieve a least five good exam passes than children without mental health problems (boys: NCDS: OR: 0.49, 95% CI: 0.31, 0.78, p = 0.003, ALSPAC: OR: 0.30, 95% CI: 0.22, 0.41, p<0.001; girls: NCDS: OR: 0.50, 95% CI: 0.32, 0.76, p = 0.010, ALSPAC: OR: 0.34, 95% CI: 0.23, 0.50, p<0.001) (no parental SES adjustment).
		Any common mental health problem	Adult	SLOMINSKI2011 (Fair quality)	Offspring mental health at age 18 was significantly associated with educational attainment at age 30 (b: 0.018, p<0.05)
		Any common mental health problem	Adult	ABEBE2019 (Poor quality)	In people with disability, controlling for gender and parental levels of education, poor mental health increased the chances of low levels of educational attainment (b: 0.136, SE: 0.019, p<0.0001).
		Any common mental health problem	Adolescence	CASE2005 (Poor quality)	Mental health or emotional problems at age 16 were associated with a reduced number of 'O' level passes when controlling for family income at age 16, prenatal smoking, height, physical impairments at age 7 and age 16, mental problems at age 7 (b:-0.637, SE: 0.123, p>0.05). Mental health or emotional problems at age 7 were also associated with a reduced number of 'O' level passes when controlling for family income at age 16, prenatal smoking, height, physical impairments at age 7 and age 16 and mental impairments at age 16 (b: = -0.601, SE: 0.128, p>0.05).
Income	Intergenerational	Depressive disorders	Young adult	RITSHER2011 (Good quality)[a]	Parents' depression was not a significant predictor of their children's income (F = 0.03, p = 0.87) after controlling for parental SES.
		Any common mental health problem	Adult	JOHNSTON2013 (Fair quality)	Worse mental health in mothers predicted reduced household income for their children at age 30 (b:-0.036, SE: 0.008, p<0.01). When controlling for child mental health at age 10, the association of mothers' mental health with reduced income for their children at age 30 became weaker but remained significant (b:-0.021, SE: 0.008, p<0.05). Child and maternal mental health interacted to predict offspring income.
		Depressive disorders	Adult	EATON2001 (Poor quality)	Parental depression did not predict personal income (b: -0.01, p>0.05) when controlling for fathers' job level or job percentile
	Intragenerational	Depressive disorders	Young adult	RITSHER2011 (Good quality)[a]	Depression was not a significant predictor of income after controlling for parental SES (F = 0.95, p = 0.33)
		Depressive disorders	Adult	CORYELL1993 (Fair quality)	People with depression had significantly reduced odds of increasing their annual income over 5 years compared with controls (OR: 0.67, 95% CI: 0.46, 0.97, p = 0.03). People with depression did not have significantly different odds of decreasing their annual income over 5 years compared with controls (OR: 1.26, 95% CI: 0.69, 2.27, p = 0.45).

		Depressive disorders	Adult	ELOVAINIO2012 (Fair quality)	Income in adulthood was predicted by depressive symptoms. Lower initial levels and faster decrease over time in depressive symptoms were associated with higher income in adulthood (controlling for parental/childhood SES).
		Anxiety disorders	Older adult	GROFFEN2009 (Fair quality)	Older adults with a social anxiety disorder had increased odds of a decrease in income after adjusting for gender, age, educational attainment, baseline income and change in occupational status (OR: 1.69, 95% CI: 1.15, 2.50, p<0.008). Social anxiety disorder was related to a decrease in income regardless of educational attainment or income levels at baseline: these variables did not moderate the association (p = 0.68).
		Any common mental health problem	Adult	JOHNSTON2013 (Fair quality)	Childhood mental health does not predict adulthood income after controlling for maternal mental health, maternal education and parental social class (b:-0.010 SE: 0.008, p>0.05). Adulthood mental health predicts adulthood income after controlling for maternal mental health, maternal education and parental social class (b:-0.083, SE: 0.008, p<0.01).
		Any common mental health problem	Young adult	SAREEN2011 (Fair quality)	There were no significant relationships between baseline mental health problems and change in income status during the 3-year follow-up period (statistics not reported).
		Depressive disorders	Adult	EATON2001 (Poor quality)	Depression had a small negative effect on income percentile at 10-year follow-up (b:−0.10, p<0.01)
Occupation	Intergenerational	Depressive disorders	Young adult	RITSHER2011 (Good quality)[a]	Parents' depression was not a significant predictor of their children's occupation (F = 1.13, p = 0.29), after controlling for parental SES.
		Any common mental health problem	Adolescence/adult	SLOMINSKI2011 (Fair quality)	There was no direct association between mothers' mental health and their children's occupational status in adulthood (b: 0.08, p>0.05). However, mothers' mental health was significantly associated with their children's mental health in adolescence (b: 0.22, p<0.01). This child variable significantly predicts occupational status (b: 0.19, 0<0.05).
		Depressive disorders	Adult	TOLMAN2009 (Fair quality)	Parents' depression did not predict their children's occupation (b: 0.00, p>0.05) when controlling for fathers' job level or job percentile.
	Intragenerational	Any common mental health problem	Adult	BUTTERWORTH2012 (Good quality)	Men with poor mental health were significantly more likely to become unemployed (b: 0.21, SE: 0.04, p<0.001), and be unemployed for longer (b: 0.14, SE: 0.04 p<0.05) compared with men with better mental health. Women with poor mental health are significantly more likely to become unemployed (b: 0.14, SE: 0.03, p<0.001), but were not more likely to be unemployed for longer (b: 0.04, SE: 0.03, p>0.05)
		Depressive disorders	Young adult	RITSHER2011 (Good quality)[a]	Depression was not a significant predictor of occupation after controlling for parental SES (F = 1.07, p = 0.30).

Depressive disorders	Adult	AMOS2018 (Fair quality)	People with treatment-resistant depression were 2.3 times more likely than employees without depressive disorders (HR: 2.29 95% CI: 1.44, 3.65, p<0.001) to switch to COBRA status (changed occupational status with reduced hours) during follow-up. There was significant difference between cohorts for employment termination (results not shown). People with treatment-resistant depression were 1.4 times more likely than employees without depressive disorders (HR: 1.37, 95% CI: 1.11, 1.69, p = 0.004) to either switch to COBRA status or terminate employment.
Depressive disorders	Adult	ARO1995 (Fair quality)	Men and women with major affective disorder had a 2.5–3.9 times and 2.8–4.2 times higher risk, respectively, of becoming unemployed than the general population.
Depressive disorders	Adult	CORYELL1993 (Fair quality)	People with depression had significantly reduced odds of being employed in the previous year compared with controls (OR: 0.57, 95% CI: 0.39, 0.84, p = 0.004). People with depression had significantly reduced odds of improving their occupation over their lifetime best in the previous 5 years compared with controls (prevalence ratio [PR]: 0.45, 95% CI: 0.29, 0.69, p<0.0001). People with depression had significantly increased odds of decreasing their occupational status from their lifetime best in the previous 5 years compared with controls (OR: 1.89, 95% CI: 1.31, 2.73, p = 0.001).
Depressive disorders	Adult	ELOVAINIO2012 (Fair quality)	Occupational status in adulthood was predicted by depressive symptoms. Lower initial levels and faster decrease over time in depressive symptoms were associated with higher occupational status in adulthood (controlling for parental/childhood SES).
Any common mental health problem	Adolescence/Adult	HALONEN2019 (Fair quality)	Symptoms of mental health problems were not associated with increased odds of becoming employed at a different age, controlling for parental education and household income, compared with age >24: being age 19–23: OR: 1.01 95% CI: 0.84, 1.23, p = 0.919), being age <18: OR: 0.76 95% CI: 0.61, 0.95, p = 0.015) Symptoms of mental health problems were also not associated with a specific occupational class obtained during first employment. Low occupational class compared with intermediate: OR: 0.95 95% CI: 0.74, 1.22, p = 0.688); non-specified compared with intermediate: OR: 0.93 95% CI: 0.73, 1.20, p = 0.567).
Any common mental health problem	Adult	SLOMINSKI2011 (Fair quality)	Offspring mental health at age 18 significantly predicted occupational status at age 30 (b: 0.19, p<0.05).
Any common mental health problem	Adult	TOLMAN2009 (Fair quality)	Symptoms of social anxiety disorder in the preceding month significantly predicted the number of months worked (b:-0.114 SE: 0.054, p<0.05). Symptoms of depressive disorder in the preceding month did not significantly predict the number of months worked (b:-0.012 SE: 0.031, p>0.05).

		Any common mental health problem	Adult	ABEBE2019 (Poor quality)	In people with a physical disability, controlling for gender and parental education, poor mental health increased the chances of unemployment (b: 0.067, SE: 0.007, p<0.0001).
		Depressive disorders	Adult	EATON2001 (Poor quality)	Depression at baseline did not predict job percentile at 10-year follow-up (b = 0.05, p>0.05, data not shown)
		Depressive disorders	Adult	LANDSTEDT2016 (Poor quality)	Depressive symptoms did not predict employment trajectories after controlling for occupational status. Men: 'medium'[c] education into stable employment: OR: 0.44 95% CI: 0.18, 1.10, p = 0.075; 'short' education into stable employment OR: 0.85 95% CI: 0.38, 1.90, p = 0.692; continuously unstable situation: OR: 2.20 95% CI: 0.90, 5.46, p = 0.086. Women: 'short' education into stable employment OR: 1.69 95% CI: 0.66, 4.38, p = 0.277; continuously unstable situation: OR: 1.92 95% CI: 0.64, 5.80, p = 0.246.
		Depressive disorders	Adult	PRAUSE2001 (Poor quality)	More severe depression was not associated with decreased odds of employment 2 years later in those who were unemployed at baseline (OR: 1.04, p>0.05), and in those who were underemployed at baseline (OR: 1.04, p>0.05). The gap between employment rates of men and women did however decrease with increasing symptoms of depression.
Social mobility	Intragenerational	Any common mental health problem	Adult	BIRTCHNELL1971 (Poor quality)	People with depression showed significantly less upward social mobility (change in social class from parents) than people without depression in classes IV and V.

[a] High-risk sample.

[b] Anxiety or depressive disorders.

[c] 'Medium' and 'short' not defined by the study.

3.2.5. Summary: RQ1

The evidence suggests that mental health problems can have a negative impact on social mobility. While parents' mental health problems may not have a direct impact on their children's social class in adulthood, they may initiate a trajectory for their children that involves poor academic achievement and mental health in childhood, which, in turn, affects educational attainment, income and occupational status in adulthood.

Intragenerationally, the evidence suggests that, overall, experiencing a mental health problem reduces social mobility. It is possible that age may moderate the impact, such that experiencing mental health problems at specific timepoints in a person's lifetime (for example adolescence or early adulthood) may have a more detrimental effect on social mobility. There is some suggestion of differential effects between anxiety and depressive disorders, but the nature and magnitude of this is uncertain and could be the focus of future research.

3.3. RQ2: Does social class moderate the impact of treatments for mental health problems?

In total, 28 studies examined the association between social class and mental health treatments. Studies were carried out in a number of different countries: 12 in the US, six in the UK, two each in Sweden and Finland, and one each in Australia, Denmark, Germany, Norway and multiple countries. The quality of the evidence was mixed, with eight studies rated as 'good' quality or 'low risk of bias', six studies rated as 'fair' quality or 'unclear risk of bias' and 14 studies rated as 'poor' quality or 'high risk of bias'. Because no systematic reviews of sufficient quality to address the question were found, we looked for individual studies addressing the subquestions that were set.

3.3.1. RQ2.1: What is the effect of social class on the likelihood of receiving treatment for mental health problems?

Five studies examined the relationship between social class, and outcomes relating to social class, and access to treatment (CUMMINGS2014,[36] DORNER2017,[37] PAANANEN2013,[38] PACKNESS2017[39] and SHAH2001[40]). These examined different points of access on the care pathway for depressive disorders (number of studies [K] = 2) and common mental health problems (anxiety and depressive disorders) (K = 3).

Two studies looked at the intergenerational impact of parental social class on access to treatment. These examined access to treatment in adolescence and assumed that the social class of adolescents is the same as that of their parents.

Three studies examined the intragenerational impact of social class on access to treatment.

Table 2 provides a summary of the quantitative findings of the identified studies.

Educational attainment

A good quality study (DORNER2017) found that in adults with a common mental health problem, having low educational attainment predicted more use of specialised health care, more prescription of combined psychiatric medication, and medication with anxiolytics, compared with people with higher educational attainment ($p<0.001$). There was a significant interaction between educational attainment and the medication regime, such that having lower educational attainment predicted a weaker association between the regime prescribed and chances of future inpatient care. In people of higher educational attainment, the chosen regime was more important in determining outcomes ($p = 0.007$).

The interaction between educational attainment and medication regime also significantly predicted the likelihood of attempted suicide (p = 0.026).

A poor quality study (PACKNESS2017) suggested that having low educational attainment reduces contact with GPs (OR: 0.71, 95% CI: 0.67–0.75, p<0.05) and psychologists (OR: 0.37, 95% CI: 0.35–0.40, p<0.05).

Intergenerationally, a poor quality study (PAANANEN2013) suggested that there was increased use of inpatient care before age 13 (OR: 3.96, 95% CI: 2.65–5.93, p<0.001) and increased use of specialist services (males: OR: 2.03, 95% CI: 1.78–2.32, p < 0.001; females: OR: 1.93, 95% CI: 1.71–2.18, p < 0.001) in those with low parental education.

Income

A study of poor quality (PACKNESS2017) found that low family income predicted a reduced likelihood of contact with psychologists (OR: 0.49, 95% CI: 0.46–0.53, p<0.05) and GPs (OR: 0.81, 95% CI: 0.77–0.86, p<0.05) compared with those with higher income, and reduced rates of visits in those who did have contact (visits to outpatient psychiatrists: IRR: 0.83, 95% CI: 0.81–0.84, p<0.05; visits to psychologists: incidence rate ratio [IRR]: 0.94, 95% CI: 0.91–0.96, p<0.05; visits to GP mental health services: IRR: 0.94, 95% CI: 0.92–0.97, p<0.05).

Socioeconomic status

One good quality study (CUMMINGS2014) found that adolescents with depression living in more affluent areas had significantly greater likelihood of accessing counselling services (OR: 1.35, 95% CI: 1.10–1.66, p = 0.004). One poor-quality study (SHAH2001) found that the association between SES and consultation rates for mental health problems was weak in older people with any common mental health problem. Although rates were highest among older people from social class V, there was no association overall. Another study of poor quality (PAANANEN2013) found that low parental SES predicted more use of specialised psychiatric care among children (males: OR: 1.58, 95% CI: 1.44–1.73, p < 0.001; females: OR: 1.55, 95% CI: 1.43–1.69, p < 0.001) than those with high parental SES. Low parental SES also strongly predicted use of psychiatric inpatient care before the age of 13 (OR: 2.75, 95% CI: 2.03–3.73, p <0.0001).

Summary: RQ2.1

Overall, evidence for the association between social class and access to mental health treatment is limited. Evidence of varying quality suggests that lower social class is associated with reduced access to primary and secondary mental health care and an increased likelihood of accessing crisis services, including inpatient admission.

Table 2: Findings for RQ2.1: the effect of social class on the likelihood of receiving treatment for mental health problems

Social mobility predictor	Intragenerational/ intergenerational	Mental health problem[a]	Outcome (access to treatment)	Age	Study (quality)	Findings
Educational attainment	Intergenerational	Any common mental health problem	Access to specialist psychiatric services	Adolescence	PAANANEN2013 (Poor quality)	The use of specialised psychiatric care was significantly more common among children of parents with a short education (males: OR: 2.03, 95% CI: 1.78,2.32, p<0.001; females: OR: 1.93, 95% CI: 1.71, 2.18, p<0.001) than those with a long education. A short education (OR: 3.96, 95% CI: 2.65, 5.93, p<0.001) strongly determined the use of psychiatric inpatient care before 13 years, especially among females (no data reported).
County-level SES		Depressive disorders	Counselling in a clinical setting	Adolescence	CUMMINGS2014 (Good quality)	There were significantly higher odds of use of counselling in a clinical setting in places of higher county-level affluence (OR: 1.35, 95% CI: 1.10, 1.66, p = 0.004) when controlling for county-level racial/ethnic composition. There were significantly lower odds of use of counselling in a clinical setting in places of county-level disadvantage after adjusting for county racial/ethnic composition (OR: 0.66, 95% CI: 0.47, 0.92, p = 0.015)
SES		Any common mental health problem	Access to specialist psychiatric services	Adolescence	PAANANEN2013 (Poor quality)	The use of specialised psychiatric care was significantly more common among children of parents with low SES (males: OR: 1.58, 95% CI: 1.44, 1.73, p <0.001; females: OR: 1.55, 95% CI 1.43,1.69, p <0.001) than those with parents with high SES. Parental low SES (OR: 2.75, 95% CI: 2.03,3.73, p <0.001) strongly determined the use of psychiatric inpatient care before 13 years, especially among females (no data reported).
Educational attainment	Intragenerational	Depressive disorders	Mental health treatment	Adulthood	PACKNESS2017 (Poor quality)	Contact with a psychologist was less likely for those with fewer years of education (OR: 0.37; 95% CI 0.35, 0.40, p<0.05) compared with higher educational groups. There was less use of GP mental health services in lower educational groups (OR: 0.71; 95% CI: 0.67, 0.75, p<0.05) compared with higher educational groups. In people who did have contact, those who had lower education had lower rates of visits to outpatient psychiatrists (IRR: 0.75, 95% CI: 0.74, 0.76, p<0.05), psychologists (IRR: 0.80, 95% CI 0.79, 0.82, p<0.05) and visits to GP mental health services (IRR: 0.93, 95% CI: 0.91, 0.96, p<0.05) compared with those with higher education.

	Any common mental health problem	Future inpatient care	Adulthood	DORNER2017 (Good quality)	Individuals with low educational attainment had a higher proportion of specialised health care than individuals with higher education. Combined psychiatric medication and medication with anxiolytics was more common among individuals with low educational attainment. There was a significant interaction between educational attainment and applied medication regimes: this predicted subsequent inpatient care for mental health problems (p = 0.007) and subsequent suicide attempts (p = 0.026). Higher educational attainment resulted in a stronger association between medication regime and future inpatient care.
Income	Depressive disorders	Mental health treatment	Adulthood	PACKNESS2017 (Poor quality)	People with the lowest incomes established contact with outpatient psychiatrists more often (OR: 1.25; 95% CI: 1.17, 1.34, p<0.05) compared with people in the highest income group. Contact with a psychologist was less frequent for lower income groups (OR: 0.49; 95% CI: 0.46, 0.53, p<0.05) compared with higher income groups. Lower income groups used GP mental health service less frequently (OR: 0.81; 95% CI: 0.77, 0.86, p<0.05) compared with higher income groups. There was no significant association between income and emergency service contact. In people who did have contact, those who had a lower income had lower rates of visits to outpatient psychiatrists (IRR: 0.83, 95% CI: 0.81, 0.84, p<0.05), psychologists (IRR: 0.94, 95% CI: 0.91, 0.96, p<0.05) and GP mental health services (IRR: 0.94, 95% CI: 0.92, 0.97, p<0.05) compared with those with higher income, when adjusted for socio-demographics, comorbidity and access to a vehicle.
SES	Any common mental health problem	Consultations	Older age	SHAH2001 (Poor quality)	For all mental health problems, rates of consultation were highest among people from social class V, but overall there was no consistent association between social class and consultation rates. This was also the case for the consultation rates for each diagnostic group.

[a] Anxiety or depressive disorder.

3.3.2. RQ2.2: What is the effect of social class on treatment outcome for mental health problems?

Eighteen studies examined the relationship between social class (and indicators of social mobility) and mental health treatment outcomes. These include 10 RCTs, seven cohort studies and one quasi-randomised trial. Of these, outcomes for treatment for the following mental health problems were examined:

- anxiety disorders (three RCTs and one cohort study)
- depressive disorders (five RCTs and one cohort study)
- common mental health problem (anxiety and depressive disorders) (two RCTs, one quasi-randomised study and two cohort studies)
- psychosis (two cohort studies)
- bipolar disorder (one cohort study).

One study examined the impact of family social class on adolescent mental health treatment outcomes, while another examined the impact of family occupational status on adolescent treatment outcomes. These assumed that social class in adolescents is the same as that of their parents. All remaining studies examined social class intragenerationally, such that a person's own social class and intervention outcomes were examined. **Table 3** provides a summary of the quantitative findings of the identified studies.

Common mental health problems

Social class

RCT evidence

Three RCTs examined how social class impacted on treatment for common mental health problems. One RCT in adults with depression (FALCONNIER2009[41]), which was of low risk of bias, found that people from lower social classes (classes IV and V) who were treated with either psychotherapy or pharmacotherapy had lower rates of improvement measured on the Hamilton Rating Scale for Depression (HRSD) (b = 0.96, SE = 0.37, p = 0.011) than people from classes III and II. However, outcomes measured on the Beck Depression Inventory (BDI) were not predicted by indicators of social class (b = 1.13, SE = 0.61, p = 0.065). There was no significant difference between people from class I and people from classes II and III. Another study of unclear risk of bias (KODAL2018[42]) found that in adolescents with an anxiety disorder treated with individual cognitive behavioural therapy (CBT), family social class was negatively associated with no longer meeting diagnostic criteria for any anxiety-related disorder at 2-year follow-up (OR: 0.07, CI: 0.01, 0.55, p = 0.03). Also, lower family social class was negatively associated with loss of principal inclusion anxiety diagnosis at 2-year follow-up (OR: 0.26, CI: 0.09, 0.75, p = 0.04). Another RCT of unclear risk of bias (GILMAN2013[43]) found that assigning a care manager to ensure guideline-based provision of treatment for older adults with depression was equally effective across groups irrespective of area-level deprivation (averaged across all follow-ups, the difference in intervention effect between high and low poverty areas was not significant [0.9, 95% CI: -2.1, 3.9, p>0.05]).

Non-RCT evidence

One study of good quality (DELGADILLO2017[44]) found that people from areas of higher deprivation had worse outcomes following treatment in Improving Access to Psychological Therapies (IAPT) services (p<0.001). However, a study of poor quality (POOTS2014[45]) found that IAPT outcomes did not differ in different levels of deprivation. There was no significant effect of Index of Multiple Deprivation (IMD) category on average change in the Patient Health Questionnaire – 9 items (PHQ-9) (F[2, 1,417] = 0.90, P = 0.406).

Occupational status

RCT evidence

Four RCTs reported how occupational status was associated with treatment effectiveness. One low risk of bias RCT (NGUYEN2013[46]) examined the impact of parental occupation on adolescent mental health outcomes following an intervention to improve social mobility. Parental unemployment did not significantly moderate measures of psychological distress (females: b = -0.08 CI: -0.36, 0.19, p = 0.55, males: b = 0 CI: -0.26, 0.26, p = 0.99).

An RCT of unclear risk of bias (FOURNIER2009[47]) found that in adults with depression, occupational status predicted whether cognitive therapy was more effective than medication. In employed participants, there was no difference in treatment outcomes (test statistic [t] (155) = -0.67, p = 0.51, Cohen's d = -0.12, CI: -0.47, 0.23), but unemployed participants showed more symptom reduction when treated with cognitive therapy relative to medication (t(163) = 3.24, p = 0.002, Cohen's d = 1.19, CI: 0.41, 0.97).

Two RCTs of high risk of bias found that occupational status in adults had an impact on which treatments (longer- or shorter-term psychotherapy) were effective for mood and anxiety disorders (JOUTSENNIEMI2012[48]) and on the effectiveness of interpersonal psychotherapy (CORT2012[49]) in reducing symptoms of depression (employed [versus unemployed]: b = -3.58 SE = 1.32 CI: -6.7, -0.98, p = 0.02).

Non-RCT evidence

One quasi-randomised study of high risk of bias (MEHDIPANAH2014[50]) of a neighbourhood improvement project found that while men in manual classes had poorer mental health at follow-up regardless of whether they lived in renewed (intervention) neighbourhoods or control neighbourhoods (prevalence ratio year [PRyear] = 1.61, 95% CI: 0.72, 3.60, p>0.05 renewed neighbourhoods and PRyear = 1.74 95% CI: 1.05, 2.88, p>0.05 comparison neighbourhoods), in non-manual classes, mental health remained constant regardless of neighbourhood lived in.

A good quality cohort study (DELGADILLO2017) found that unemployed people had worse outcomes following treatment in IAPT services (b: 0.54–0.68, SE: 0.07, p<0.001). A fair quality cohort study (ELALAOUI2015[51]) also found that in adults with anxiety disorders, being employed predicted better outcome of CBT delivered online at end of treatment (b = -2.29 SE = 0.95, p<0.05).

Educational attainment

RCT evidence

Four RCTs examined the relationship between educational attainment and effectiveness of interventions in reducing symptoms of common mental health problems.

A low risk of bias RCT (NGUYEN2013) of a social mobility-focused intervention found that low parental education did not significantly moderate measures of psychological distress (females: b = 0.03 CI: -0.21, 0.26, p = 0.83, males: b = -0.15 CI: -0.40, 0.10, p = 0.24). Another low risk of bias RCT (FALCONNIER2009) found that in adults with a depressive disorder given either psychotherapy or pharmacotherapy, education (having more or less education than having a secondary school qualification) was not a significant predictor of outcome when controlling for other covariates (HRSD: b = 0.56, SE = 0.40, p = 0.155, BDI: b = 0.13, SE = 0.63, p = 0.833).

Two other RCTs at high risk of bias found that educational attainment did not moderate treatment outcome following online CBT for adults with depression (BUTTON2012[52]) at 4-month follow-up (less than 'A' level education: b = -2.9, CI: -9.3, 3.5, p = 0.372), but that educational attainment may predict for how long interpersonal psychotherapy treatment needs to be given to have a positive outcome (JOUTSENNIEMI2012).

Non-RCT evidence

One study of good quality (HOYER2016[53]) found that the educational attainment of adults with anxiety disorders did not predict improvements in symptoms at end of CBT treatment. A fair quality study (PIRKIS2011[54]) found that, in adults given an intervention to improve access to treatment, people with higher educational attainment made more treatment gains. Those who had completed secondary school experienced improvements of 1.36–1.58 points higher than those who had not (p = 0.001–0.004).

Income

RCT evidence

Three RCTs reported how income was associated with treatment effectiveness. One RCT at low risk of bias (FALCONNIER2009) found that, measured on the BDI, family income explained 1% of the variance in depressive symptoms at end of CBT treatment (b = -0.22, SE = 0.09, p = 0.016). However, variance in symptoms measured on the HRSD (b = -0.03, SE = 0.06, p = 0.559) was not explained by family income. Another RCT at low risk of bias (KELLY2015[55]) showed that having a perceived 'lack of money' predicted lower odds of remission at 6 months post-treatment for an anxiety disorder (OR: 0.72, 95% CI: 0.56, 0.93, p = 0.019).

However, an RCT with unclear risk of bias (GILMAN2013) found that more 'financially strained' older adults with depression consistently improved on symptom measures following guideline-based treatment (citalopram or psychotherapy) more than those who were less 'financially strained'. Averaged across all follow-ups, the difference in intervention effect between financially strained and not was -4.5 (95% CI: -8.6, -0.3, p<0.05).

Summary: Common mental health problems

Low social class may be associated with poorer treatment outcomes in people with common mental health problems, hindering improvement following intervention. Occupational status may also play some role in influencing the effectiveness of mental health interventions and some interventions may need to be adapted to be of benefit to people of lower educational attainment. Though limited, it is of note that interventions that aim to improve social mobility[iv] show improvements in mental health independent of changes in occupational or educational status. Tailored care (having access to psychosocial interventions as well as, or instead of, medication) may limit the impact of deprivation on reducing intervention effectiveness, for example, for people with lower educational attainment or income, or people who are unemployed.

Serious mental illness (psychosis and bipolar disorder)

Social class

Non-RCT evidence

Two poor quality cohort studies examined the differential impact of social class on intervention effectiveness in adults with psychosis. One study (MYERS1965[56]) found a significant relationship between social class and follow-up treatment status, such that more people of lower social class remained hospitalised 10 years later (39% class I-II, 49% class III, 52% class IV, 57% class V). Another (GIFT1986[57]) found that both individual (r = -0.12) and parental social class (r = -0.25) were significantly associated with symptom severity at follow-up after treatment, with lower social class being associated with more severe symptoms.

[iv] Interventions that aim to improve circumstances which may prevent people from being upwardly mobile, such as neighbourhood deprivation, rather than mental health interventions.

Socioeconomic status

Non-RCT evidence

A fair quality cohort study (TOHEN1990[58]) of people with bipolar disorder found that SES did not predict relapse following treatment 48 months post-treatment (HR = 0.7, SE = 0.47).

Occupation

Non-RCT evidence

The same study (TOHEN1990) found that people were not more or less likely to relapse according to their occupational status 48 months post-treatment (HR: 1.1, SE: 0.34).

Summary

Evidence regarding the relationship between various proxies for social class and treatment for serious mental illness (SMI) is extremely limited. there is some suggestion of no relationship between proxies for social class and treatment outcomes in people with bipolar disorder, though social class may play a role in psychosis, based on poor quality research.

Table 3: Findings for RQ2.2: the effect of social class on treatment outcome for mental health problems

Social mobility predictor	Study design	Severity	Mental health problem	Outcome	Age	Study (quality)	Treatment	Findings
Educational attainment	RCT	Common mental health problem[a]	Depressive disorders	Symptom severity	Adulthood	FALCONNIER2009 (Low risk of bias)	Psychotherapy or pharmaco-therapy	Educational attainment (having more or less education than a secondary school qualification) was not a significant predictor of outcome when controlling for other covariates when symptom severity was measured on the HRSD (b: 0.56, SE: 0.40, p = 0.155), BDI (b: 0.13, SE: 0.63, p = 0.833) or Global Assessment Scale (GAS) (b: -0.13, SE: 0.61, p = 0.063).
			Any common mental health problem	Symptom severity	Adolescence	NGUYEN2013* (Low risk of bias)	The 'Moving to Opportunity' social mobility intervention	Low parental education was not a significant treatment modifier (negative values indicate improved treatment effect) in females (b: 0.03, 95% CI: -0.21, 0.26, p = 0.83) or males (b: -0.15 95% CI: -0.40, 0.10 p = 0.24).
			Depressive disorders	Symptom severity	Adulthood	BUTTON2012 (High risk of bias)	Online CBT	There was no evidence of an interaction between educational attainment and treatment. Less than 'A' level (compared with 'A' level or above) b: -2.9 95% CI:-9.3, 3.5, p = 0.372.
			Any common mental health problem	Symptom severity	Adulthood	JOUTSENNIEMI 2012 (High risk of bias)	Long-term psychotherapy and short-term treatment	A university education or a basic education predicted a sufficient outcome for short-term treatment, whereas an intermediate education predicted the need for long-term psychotherapy.
	Non-RCT	Common mental health problem	Social anxiety disorder	Symptom severity	Adulthood	HOYER2016 (Good quality)	CBT	Controlling for baseline Liebowitz Social Anxiety Scale score, age, gender and educational attainment did not predict improvements in symptoms at end of treatment.
			Any common mental health problem	Symptom severity	Adulthood	PIRKIS2011 (Fair quality)	Access to Allied Health Professionals[b]	Having any level of education predicted more treatment gains than not completing secondary school: completed education to year 10: b:1.50 95% CI: 0.49, 2.51, p = 0.004; completed education to year 11: b:1.36 95% CI: 0.57, 2.15, p = 0.001; completed education to year 12: b:1.42, 95% CI: 0.49, 2.35, p = 0.003; completed tertiary education: b:1.58, 95% CI: 0.61, 2.55, p = 0.002.
Occupational status	RCT	Common mental health problem	Depressive disorders	Symptom severity	Adulthood	CORT2012 (High risk of bias)	Standardised interpersonal psychotherapy	Occupational status was significantly associated with improvement on the HRSD: employed (versus unemployed) b: -3.58 SE:1.32 95% CI: -6.7, -0.98, p = 0.02.
			Depressive disorders	Symptom severity	Adulthood	FOURNIER2009 (Unclear risk of bias)	CBT	For participants who were employed, there was no difference between the two treatments (t[155] = -0.67, Cohen's d = -0.12, 95% CI: -0.47, 0.23, p = 0.51); however, for unemployed participants, cognitive therapy was associated with superior outcomes relative to medication (t[163] = 3.24, Cohen's d = 1.19, 95% CI: 0.41, 1.97, p = 0.002).

			Any common mental health problem	Symptom severity	Adolescence	NGUYEN2013* (Low risk of bias)	The Moving to opportunity social mobility intervention	Parental unemployment was not a significant treatment modifier in adolescents: females: b: -0.08 95% CI: -0.36, 0.19, p = 0.55, males: b: 0 95% CI: -0.26, 0.26, p = 0.99.
			Any common mental health problem	Symptom severity	Adulthood	JOUTSENNIEMI 2012 (High risk of bias)	Long-term psychotherapy and short-term treatment	Employed people benefited more from long-term psychotherapy, whereas short-term treatment was sufficient for the rest, with the exception of homemakers, who received no help from either therapy for general symptoms or anxiety symptoms.
		Common mental health problem	Any common mental health problem	Symptom severity	Adulthood	DELGADILLO2017 (Good quality)	IAPT	People who were unemployed had more severe symptom measures following IAPT treatment. Unemployed versus employed: PHQ-9 b: 0.68, SE: 0.07, p<0.001; GAD 7 b: 0.54, SE: 0.07, p<0.001.
	Non-RCT					MEHDIPANAH2014* (Quasi-randomised, High risk of bias)	'The neighbour-hood law' – neighbour-hood improvement project	Men in manual jobs had poorer mental health regardless of whether they were in the intervention arm, where their neighbourhood was improved (PRyear: 1.61, 95% CI: 0.72, 3.60), or the control arm (PRyear: 1.74, 95% CI 1.05, 2.88) at 10-year follow-up. Whereas poor mental health did not differ significantly at follow-up for men in non-manual jobs.
			Social anxiety disorder	Symptom severity	Adulthood	ELALAOUI2015 (Fair quality)	Online CBT	Controlling for age, global functioning, adherence and treatment credibility rating, being employed (versus unemployed) predicted significantly lower social anxiety symptoms at follow-up (b:-2.29 SE: 0.95, p<0.05).
		SMI[c]	Bipolar disorder	Relapse	Adulthood	TOHEN1990 (Fair quality)	Naturalistic treatment (clinician decided)	Poor occupational status at baseline did not significantly predict relapse 48 months post-treatment (HR: 1.1, SE: 0.34, p>0.05).
Income	RCT	Common mental health problem	Depressive disorders	Symptom severity	Adulthood	FALCONNIER2009 (Low risk of bias)	Psycho-therapy or pharmaco-therapy	Controlling for social functioning, cognitive dysfunction, expectation of improvement, endogenous depression, duration of current episode and age, family income predicts depression measured using the BDI, but not the HRSD (self-rated). The percent of variance explained by family income was only 1%. HRSD: 0.0% variance explained b:-0.03, SE: 0.06, p = 0.559. BDI: 0.9% variance explained b:-0.22 SE: 0.09 ,p = 0.016.*
			Anxiety disorders			KELLY2015 (Low risk of bias)	Collaborative care or usual care	After controlling for intervention assignment, baseline severity, satisfaction, diagnosis, previous use of CBT, having a lack of money predicted lower odds of remission at 6 months (OR: 0.72, 95% CI: 0.56, 0.93, p = 0.019).
			Depressive disorders			GILMAN2013 (Unclear risk of bias)	Care managers assigned to ensure guideline-based	The intervention was more effective among participants under conditions of financial strain, both between baseline and 4 months (intervention mean reduction 5.9, 95% CI: -11, -0.8 for participants under financial strain; 2.9, 95% CI: -4.8, -0.9 for participants without financial strain). Averaged across all follow-ups, the difference in intervention effect

							provision of depression treatment (citalopram or psycho-therapy)	between participants under financial strain and participants without financial strain was -4.5 (95% CI -0.86, -0.3).
Social class	RCT	Common mental health problem	Anxiety disorders	Loss of anxiety diagnosis	Adolescence	KODAL2018 (Unclear risk of bias)	Individual CBT	Low family social class was negatively associated with no longer meeting diagnostic criteria for any anxiety-related disorder at 2-year follow-up (OR: 0.07, 95% CI: 0.01, 0.55, p = 0.03), and loss of principal inclusion anxiety diagnosis at 2-year follow-up (OR: 0.26, 95% CI: 0.09, 0.75, p = 0.04). No other parent-related predictors were associated with long-term changes in youth anxiety.
			Depressive disorders	Symptom severity	Older adults	GILMAN2013 (Unclear risk of bias)	Care managers assigned to ensure guideline-based provision of depression treatment (citalopram or psycho-therapy)	The intervention was equally effective across groups irrespective of level of census-tract poverty, both between baseline and 4 months (intervention mean reduction -3.5 high poverty, -3.2, SE:1.1, SE:1.7 low poverty). Averaged across all follow-ups, the difference in intervention effect between high and low poverty was 0.9 (95% CI: -2.1, 3.9, p>0.05).
					Adulthood	FALCONNIER2009 (Low risk of bias)	Psycho-therapy or pharmaco-therapy	People from classes IV and V (working class and poor) showed less improvement following psychotherapy or pharmacotherapy than those from classes II and III ('middle class') on the HRSD (b:0.96, SE:0.37, p = 0.011), explaining 2.8% of variance is symptom severity. However, depression measured on the BDI was not predicted by indicators of social position (b:1.13, SE:0.61, p = 0.065). People from class I did not differ in improvement from people from 'middle classes'.
	Non-RCT	Common mental health problem	Any common mental health problem	Symptom severity	Adulthood	DELGADILLO2017 (Good quality)	IAPT	People from areas of higher deprivation had higher symptom severity measures following treatment in IAPT services. IMD (reference category first IMD quintile) b (SE). Second quintile PHQ-9 b:-0.77 SE: 0.11, p<0.001 GAD 7: b: -0.63 SE: 0.10, p<0.001. Third quintile PHQ-9 b:-1.11, SE: 0.11, p<0.001 GAD 7: b: -0.85 SE: 0.09, p<0.001. Fourth quintile PHQ-9: b:-1.36 SE: 0.11, p<0.001 GAD 7: b: -1.03, SE: 0.10, p<0.001. Fifth quintile PHQ-9 b: -1.75 SE: 0.12, p<0.001 GAD 7: v: -1.33 SE: 0.10, p<0.001.
			Depressive disorders			POOTS2014 (Poor quality)	IAPT	IAPT services from areas of different levels of deprivation did not show different changes on the PHQ-9 according to IMD category (F(2, 1,417) = 0.90, p = 0.406).

		SMI	Psychosis	Symptom severity	Adulthood	GIFT1986 (Poor quality)	Psychiatric treatment	Individual social class was significantly associated with symptom severity at follow-up (r = -0.12). Parental social class was significantly associated with symptom severity at follow-up (r = 0.25).
			Psychosis	Treatment status	Adulthood	MYERS1965 (Poor quality)	Psychiatric treatment	Significantly more people from 'lower classes' who were having treatment for psychosis were still hospitalised 10 years later (39% class I-II, 49% class III, 52% class IV, 57% class V). More people from higher classes were living in the community at follow-up (30% classes I and II, 27% class III, 18% class IV, 10% class V).
SES	Non-RCT	SMI	Bipolar disorder	Relapse	Adulthood	TOHEN1990 (Fair quality)	Naturalistic treatment (clinician decided)	Lower SES at baseline did not significantly predict relapse 48 months post-treatment (HR: 0.7 SE: 0.47, p>0.05).

[a] Anxiety or depressive disorders.

[b] Intervention to improve access to low intensity treatment, similar to IAPT.

[c] Psychosis and bipolar disorder.

* NGUYEN2013 and MEHDIPANAH2014 were both interventions to improve social class in people with mental health problems rather than interventions to improve mental health problems.

Summary: RQ2.2

Overall, evidence from interventions for common mental health problems suggests that people of lower social class may not gain as much benefit from mental health interventions as those of higher social class. Tailoring interventions (so that people with lower educational attainment and income or those who are unemployed have access to psychosocial interventions as well as, or instead of, medication) may help to reduce the impact of these variables on intervention effectiveness. Furthermore, interventions aiming to improve social mobility are less sensitive to social class and also report reductions in mental health problem severity. Further research is also needed on the association between social class and intervention effectiveness in people with SMI.

3.3.3. RQ2.3: What is the effectiveness of treatment for mental health problems on influencing change in social class?

Six studies examined the relationship between being treated for a mental health problem and social mobility (DION1988,[59] KOZMA2011,[60] PERRY1999,[61] ROYCHENGAPPA2005,[62] TOHEN1990 and TSIACHRISTAS2016[63]). These included one RCT and five cohort studies. One cohort study examined occupational status outcomes for people with schizophrenia and one for people with bipolar disorder following pharmacological intervention. One RCT and three cohort studies examined occupational status outcomes (RCT: K = 1, cohort study: K = 2) and education outcomes (cohort study: K = 1) for bipolar disorder (RCT: K = 1, cohort study: K = 2) and psychosis unspecified (cohort study: K = 1). All studies examined social mobility outcomes intragenerationally (changes in social class following treatment compared with prior social status). **Table 4** provides a summary of the quantitative findings of the identified studies.

Pharmacological interventions

Employment

Paliperidone extended release

One pre-post cohort study of poor quality (KOZMA2011) found that 52 weeks after adults with schizophrenia received treatment with paliperidone extended release, the percentage of people in full-time competitive employment increased from pre-treatment ($p<0.0001$).

Olanzapine

One pre-post cohort study of poor quality (ROYCHENGAPPA2005) found that people with bipolar disorder treated with olanzapine for a mean of 28 weeks had reduced rates of paid employment (59.81% pre-treatment, 30.97% post-treatment, OR: 0.30, CI: 0.17, 0.53)

Summary: Pharmacological interventions

Overall, evidence on the effectiveness of drug treatments in improving social mobility outcomes in people with SMI is extremely limited, mixed and of poor quality.

Psychosocial and service-level interventions

Employment

RCT evidence: Teaching self-management for people with bipolar disorder

One RCT with a low risk of bias (PERRY1999) found that people with bipolar disorder who were taught self-management techniques improved in terms of how well they performed in their employment (measured on a scale of 0–3) compared with the control group at 18 months (mean difference: 0.70, 95% CI: 0.07–1.33). However, improvements at earlier time points (6 and 12 months) were not significant.

Non-RCT evidence: Early intervention in psychosis

One study of poor quality (TSIACHRISTAS2016) found that people with psychosis treated in early intervention in psychosis services[v] who were unemployed at baseline had an increased probability ratio of becoming employed at 3-year follow-up compared with people who had standard care (2.16, CI: 1.26–3.71, p = 0.005).

Hospitalisation

One pre-post study of fair quality (TOHEN1990) found that people with bipolar disorder admitted to hospital and treated at the discretion of the treating psychiatrist had significant improvements in employment rates at 48 months post-release compared with 6 months post-release (60% 6 months, 72% 48 months, McNemar X^2 test: p = 0.002). A study of poor quality (DION1988) found that hospital admission reduced the odds of people with bipolar disorder being unemployed 6 months post-release, compared with before admission (OR: 0.12, 95% CI: 0.05, 0.32, p<0.0001). However, both these studies did not control for any improvement in symptoms that was not the result of the treatment.

Educational attainment

Non-RCT evidence

A study of poor quality (TSIACHRISTAS2016) found that people treated in early intervention in psychosis services did not show an increased probability of resuming studying compared with people treated in other mental health services (1.82, 95% CI: 0.79, 4.21, p = 0.156).

Summary: Psychological and service-level interventions

Limited high-quality RCT evidence suggests that teaching people with bipolar disorder to identify when to seek treatment for a relapse is beneficial in helping them maintain/gain employment. Fair quality observational evidence suggests that people with bipolar disorder also respond well to hospital admission with treatment according to psychiatrist discretion.

The evidence for psychosis was of poor quality and very limited.

[v] Low patient-to-care-coordinator ratio, assertive community treatment, regular appointments, routine psychological and family therapy for 3 years.

Table 4: Findings for RQ2.3: he effect of treatment versus no treatment for mental health problems on influencing class change

Intervention type	Outcome	Study design	Mental health problem	Study (quality)[a]	Treatment	Findings
Pharmacological	Occupational status	Cohort	Schizophrenia	KOZMA2011 (Poor quality)	Paliperidone extended release	The percentage of people in full-time competitive employment increased from pre-treatment by 81.6% after 52 weeks following treatment (a change from 4.8% of the sample to 8.8% of the sample, p<0.0001). There was a 114% increase in the percentage of people who were in either full- or part-time competitive employment (p<0.0001) and an 88% increase in people who were in any employment (p<0.0001).
			Bipolar disorder	ROYCHENGAPPA 2005 (Poor quality)	Olanzapine	Treatment with olanzapine did not improve rates of paid employment: Pre-treatment paid employment: 64/107 (59.81%) Post-treatment paid employment pay: 35/113 (30.97%) OR of employment after treatment: 0.30, 95% CI: 0.17, 0.53, p<0.0001.
Psychological	Occupational status	Cohort	Bipolar disorder	DION1988 (Poor quality)	Hospitalisation	At admission, 34/44 people were unable to work; at 6 months post-release, 13/44 were unable to work (OR of unemployment at post-release compared with pre-release: 0.12, 95% CI: 0.05, 0.32, p<0.0001). At admission, 2/44 were employed at the expected level; at 6 months 9/44 were employed at the expected level (OR of employment 5.50 95% CI: 1.09, 26.65, p = 0.038).
				TOHEN1990 (Fair quality)	Hospitalisation	After release from hospital, employment rates increased: 6 months post-hospital: 60% able to work or study; 48 months post-hospital: 72% able to work or study (significant improvement: McNemar X2 test, p = 0.002).
			Psychosis	TSIACHRISTAS2016 (Poor quality)	Early intervention in psychosis service	People in the early intervention in psychosis group who were unemployed at baseline had an increased probability ratio, compared with people treated in other mental health services, of becoming employed (PR: 2.16, 95% CI: 1.26, 3.71, p = 0.005) at 3-year follow-up.
		RCT	Bipolar disorder	PERRY1999 (Low risk of bias)	Teaching self-management	People given the intervention had improved employment rates compared with the control group at 18 months (mean difference 0.70, 95% CI: 0.07, 1.33, measure range: 1–3). Improvements were not significantly different at 6 or 12 months.
	Educational attainment	Cohort	Psychosis	TSIACHRISTAS2016 (Poor quality)	Early intervention in psychosis service	People in the early intervention in psychosis group did not show an increased probability of resuming studying compared with people treated in other mental health services (PR: 1.82, 95% CI: 0.79, 4.21, p = 0.156).

[a] All results are in adult populations, and report intragenerational outcomes.

Summary: RQ2.3

Overall, the evidence for associations between mental health treatment and improved social mobility is limited, particularly for pharmacological treatments. Given the large pool of research into pharmacological treatments, more could be done to encourage the use of social mobility outcomes in clinical trials to better understand how such interventions could improve social circumstances.

Psychosocial interventions may provide some benefit in aiding people to return to or gain employment, for example, people with bipolar disorder. Evidence for improvements in other populations was limited.

3.4. Intersectionality

Intersectionality refers to the way that people can be disadvantaged by and discriminated against by overlapping and interconnecting social categorisations, such as race, class and gender. Consideration of how social mobility is differentially impacted by mental health problems for different groups provides an important context in which to target efforts to reduce discrimination.[64] The systematic review found 15 studies that considered intersectionality in their outcomes.

Table 5 provides a summary of the quantitative findings of the identified studies. Two studies (CUMMINGS2014 and PRAUSE2001) examined whether different ethnic groups experienced differential associations between mental health and social mobility. PRAUSE2001 found that Hispanic and African Americans had reduced odds of adequate employment when they had more severe depressive symptoms, but increased odds when they had less severe depressive symptoms, relative to other ethnic groups. CUMMINGS2014 examined variation in access to treatment and found that adolescents from a Black, Hispanic or Asian American/Pacific Islander background were significantly less likely to receive counselling services than their White peers. While limited, these findings suggest that ethnicity may interact to exacerbate the relationship between poor mental health and low social class.

Ten studies (AMOS2018, ARO1995, BUTTERWORTH2012, ENSMINGER2003, HALONEN2019, ISOHANNI2001, MEHDIPANAH2014, PRAUSE2001, SELLERS2019 and SLOMINSKI2011) examined whether different genders experienced differential associations between mental health and social mobility. Five studies (ARO1995, BUTTERWORTH2012, ISOHANNI2001, PRAUSE2001 and SELLERS2019) found that the effect of mental health problems on intragenerational social mobility outcomes differed according to gender. Mental health problems showed a greater impact on occupational status and educational attainment outcomes in males than females. One study (ENSMINGER2003) showed that maternal distress was associated with school drop out in sons but not daughters. One study (MEHDIPANAH2014) suggested that males may experience less benefit of social interventions in ameliorating mental health problems, and also may be worse off if they continue without intervention than women. Three studies (AMOS2018, HALONEN2019 and SLOMINSKI2011) found that the effect of mental health problems was no different in males compared with females. These findings suggest that there may be some differential impact of mental health problems on males and females and that the presence of a mental health problem might increase the possibility of downward mobility in males.

Four studies (AMOS2018, ARO1995, GROFFEN2009 and JOUTSENNIEMI2012) examined whether different age groups experienced differential associations between mental health and social mobility. One study (GROFFEN2009) found that social mobility outcomes were worse in older age groups, but so too were severity of symptoms, suggesting that this may reflect the

chronicity of the disorder. One study (ARO1995) found that the effect of mental health problems on unemployment was greater in younger age groups, but this could reflect the higher proportion of retired people in older populations. One study (JOUTSENNIEMI2012) found that age may interact with type of treatment; younger people seem to gain most from short-term therapy for depression and longer-term therapy for general symptoms of anxiety, while the opposite seems to be the case for older age groups, who seem to gain most from long-term therapy for depression and short-term therapy for anxiety. In contrast, one study (AMOS2018) found that mental health problems did not differentially affect social mobility outcomes in different age groups.

Two studies (ABEBE2019 and JOHNSTON2013) examined how physical disability influenced the relationship between mental health problems and social mobility. One study (ABEBE2019) found that mental health problems exacerbated the impact of physical disability on social mobility outcomes. However, the other (JOHNSTON2013) found that the association between mental health and social mobility was unchanged after controlling for physical health.

One study (PRAUSE2001) found that the odds of underemployment relative to unemployment were lower for married individuals with mild to moderate depression, but were higher for married individuals with more severe depression, suggesting that marriage may benefit people with severe symptoms of depression in finding a job.

Table 5: Intersectionality, mental health and social mobility

Intersectionality variable	RQ	Study ID	Findings
Ethnicity	1	**PRAUSE2001**	The odds of adequate employment increased in Hispanic/African Americans at lower levels of depression but decreased for higher levels of depression compared with non-Hispanic/African Americans.
	2.1	**CUMMINGS2014**	Black (OR: 0.54, 95 % CI: 0.33, 0.91, p = 0.017), Hispanic (OR: 0.43, 95 % CI 0.24, 0.76, p = 0.004), and Asian American/Pacific Islander adolescents (OR: 0.27, 95 % CI 0.10, 0.71, p = 0.009) are significantly less likely to receive clinical counselling services than White adolescents. These findings are unchanged after the addition of county-level affluence, racial/ethnic composition, and provider supply.
Gender	1	**AMOS2018**	There was no significant difference in outcomes by gender.
	1	**ARO1995**	In general, the pattern of downward social drift was similar among men and women. But the relative risk of becoming unemployed was higher among ‘white collar’ groups in men but not women.
	1	**BUTTERWORTH2012**	Poor mental health increased the length of time unemployed in men but not women.
	1	**ENSMINGER2003**	Sons were more affected by mother's distress than daughters. Only in sons did distress increase the likelihood of school dropout.
	1	**HALONEN2019**	The association between anxiety/depression and the occupational status of first job did not differ by gender.
	1	**ISOHANNI2001**	All men (regardless of diagnosis) were more likely to achieve no more than basic levels of education, while women were more likely to have attained tertiary education.
	1	**PRAUSE2001**	The study found a gender interacts with depression severity such that the effect of depression on unemployment varied by gender: the odds of unemployment reduced more with greater levels of depression in males compared with females.
	1	**SELLERS2019**	In boys only, the link between mental health and academic gains became more pronounced over time.

	1	**SLOMINSKI2011**	There were no gender differences found in the study variables F(20,70), = 1.24, p = 0.279.
	2.2	**MEHDIPANAH2014**	Poor mental health increased significantly in men in the comparison neighbourhoods with a PRyear = 1.93 (95% CI 1.23 to 3.01), while there was no significant change in women. Within the intervention group, a break in the pre-intervention upward trend in poor mental health is observed for women, while it continued to gradually increase in men; all changes were non-significant.
Age	1	**AMOS2018**	There was no significant difference in outcomes by age.
	1	**ARO1995**	The effect of mental health problems on unemployment was greater in younger age groups (in the older age group more of the general population were retired).
	1	**GROFFEN2009**	People over the age of 75 were significantly more likely to report a decrease in income between 2003 and 2006. They were also more likely to report social anxiety.
	2.2	**JOUTSENNIEMI2012**	Short-term therapy tended to be sufficient for depressive symptoms in the younger age group but being in the older age group (25–46) predicted a need for long-term therapy. However, the opposite was true for anxiety; in older people short-term therapy was sufficient but younger people needed long-term therapy.
Physical disability	1	**ABEBE2019**	Mental health problems exacerbate the impact of having a physical disability on social mobility.
	1	**JOHNSTON2013**	Controlling for the physical health of the cohort member at age 30) did not change the predictive power of maternal and cohort member mental health.
Marriage	1	**PRAUSE2001**	The odds of underemployment relative to unemployment were lower for those who were married who had low levels of depression, but were higher for those who were married who had high levels of depression

3.4.1. Summary: Intersectionality

The evidence reviewed provides some evidence that the impact of mental health problems on social mobility interact with a number of variables. Being from an ethnic minority background may exacerbate the impact of mental health problems on social mobility. Furthermore, mental health problems appear to have a greater impact on the social mobility of males than females, though it is unclear whether this is due to mental health specific factors attributable to gender or other factors. Although only reported in one study, evidence suggests that marriage may have a protective role in reducing the effect of depression on unemployment. The impact of physical disability remains unclear. Finally, treatment considerations may be better informed when taking age into account because people of different ages appear to respond differentially to different interventions.

4. Conclusions and recommendations for future research

4.1. Limitations

There are a number of limitations associated with this systematic review. First, the reporting of participant characteristics and methods was in some cases poor, with notable details often omitted from study descriptions. This may have meant that important moderating variables of intervention effect were overlooked in our synthesis. Second, the body of evidence addressing some of our research questions was limited, so older studies were given more weight than they would have had otherwise. Third, many of the intervention studies that reported social mobility outcomes only considered some aspects of social class, not all. It is also possible that researchers may have included social mobility measures in their studies but not reported them. If they did, we will not have identified them in our search.

However, it is possible to reach some conclusions and make tentative recommendations.

4.2. Conclusions and recommendations

We found that mental health problems in childhood and adolescence can have a negative impact on a person's ability to maintain or improve their social status. Therefore, **interventions that improve the mental health of young people should be provided** because they may have long-term benefits on their mental health and social mobility.

In addition, parental mental health problems may, when associated with mental health problems or educational difficulties in adolescence, have a negative impact on social mobility. As a consequence, **interventions that improve the mental health of parents and which may have long-term benefits for their children's mental health and social mobility, should be provided**.

Lower social class is associated with more limited access to treatment, which may negatively impact on social mobility. Consideration should be given to **interventions that specifically promote increased access to mental health treatments for people from lower social classes** because they may have long-term benefits for their children's mental health and social mobility.

Finally, we found that people from lower social classes may not benefit as much from interventions as individuals from higher social classes, and that people from ethnic minority backgrounds and men and boys may not benefit as much as other groups. **Adaptations to interventions and their mode of delivery should be considered, to improve retention and outcomes for people from lower social classes and from ethnic minority backgrounds, and for men and boys**.

4.3. Research recommendations

The interventions we have suggested should be evaluated in both controlled trials with appropriate outcomes along with further research that evaluates the long-term outcomes of these interventions.

Appendix A: Research protocols and search strategies

Protocol for RQ1

Methods

The review will be carried out according to the methodological guidance set out in the Centre for Reviews and Dissemination's handbook.[65]

Searching

Study identification (literature searching) will use database and non-database methods of study identification.[66]

Bibliographic

The following electronic databases will be searched:

- Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily[vi]
- Embase, from 1974 to 24 September 2019[vi]
- HMIC, from 1979 to May 2019[vi]
- PsycINFO, from 1806 to week two of September 2019[vi]
- SPP, to September 2019[vi]
- ASSIA[vii]
- Social Science Database[vii]
- ERIC.[viii]

The bibliographic search strategy will take the following form:

> ((search terms for social mobility) **and** (search terms for mental health) and (studies reporting RCT or cohort/longitudinal study designs))

The following study deign literature search filters will be used: the CADTH RCT/CCT filter[67] and the SIGN filter.[ix] The SIGN filter was adapted to focus on studies reporting cohort or longitudinal designs.

The search strategy will be reviewed using the PRESS Checklist.[68] The primary search strategy is reported below using a search narrative to explain the contextual and conceptual detail behind the selection of search terms.[69]

The following non-database search methods will be undertaken to identify published and unpublished studies:

- Systematic reviews meeting inclusion will be checked and their included studies cross-checked for any studies that might meet our inclusion criteria but which have not been identified by our bibliographic searches.

[vi] Searched via Ovid.
[vii] Searched via ProQuest.
[viii] Searched via EBSCOHost.
[ix] SIGN Strategy (Ovid). Available from: http://www.sign.ac.uk/assets/search-filters-observational-studies.docx.

- Web-searching will be undertaken by one researcher using the Google advanced interface. The search strategies will be based on the bibliographic search strategy set out in the Annex to RQ1 with syntax and format modified for the Google interface. The guidance of Briscoe will be used to report web-searches.[70]
- The list of all studies meeting inclusion will be shared with the rest of the project team and expert reference group.

Limits

The searches will not be limited by date or language of publication. The searches will be limited by study design to: studies reporting trials (for example, RCT) or cohort studies. Systematic reviews will not be included but any identified will be retained for scrutiny of their included studies (see above).

Screening

All studies will be double screened at title/abstract and full text by three researchers using Rayyan software.[71] The title/abstract screening is initially broader in scope than is necessary to address this research question specifically. The searches and title/abstract screening are being used to address a second research question and separate review.

Inclusion criteria applied at title/abstract

Study reports:

1. An RCT **or** Cohort study **or** Systematic review; and
2. Population has a mental health problem; **and**
3. Social mobility is an outcome of the study.

Criteria 2 and 3 will be interpreted broadly with any recognised mental health problem or possible description of social mobility being sufficient for a study to be included for further screening at full text.

Inclusion criteria applied at full text

Study reports:

1. Cohort study or systematic review; **and**
2. Population has a mental health problem; **and**
3. Social mobility is an outcome of the study; **and**
4. Population has a diagnosed anxiety **or** depressive disorder.

Criteria 1 and 4 are intended to focus study selection at full text to align with the research question of this review specifically. The decision to include cohort studies was taken by the expert reference group.

Quality appraisal

Quality appraisal will be undertaken by one reviewer and checked in detail by another. The NOS tool will be used.[72]

Data extraction

The following data will be extracted by one reviewer and checked in detail by another.

Descriptive data

Study reference

- Selection/eligibility criteria for cohort
- Cohort/sample size
- Age: mean sample age
- Gender: % of sample of who are female
- Ethnicity: % of each ethnicity recorded
- Diagnosis (including diagnostic criteria used)
- Specific problem/disorder + formal diagnosis (yes/no) and criteria used.

Outcome data for synthesis

- Comparator or intervention/exposure
- Occupational change (method of measurement and assessment will be extracted)
- Change in income or socioeconomic status (method of measurement and assessment will be extracted)
- Severity of illness
- Events or summary measures over time
- Adjusted = if yes, how
- Data collection points and follow-up
- Potential confounders/modifiers
- Reference to missing data or loss to follow-up
- Country
- Region
- Setting.

General data

- Limitations as identified by study authors
- Funding
- Link to other work (protocol or other studies).

Data synthesis

Data will be synthesised narratively by mental health problem (for example, anxiety or depressive disorder) and then sub-categorised by identified social mobility outcomes. Similar outcomes will be grouped and differences between study outcomes explained narratively. Study characteristics will be reported in three tables aligned to the subheadings set out above in data extraction.

If sufficiently homogenous and high-quality data are located, random-effects meta-analysis may be considered, although this is unlikely. A minimum number of five studies reporting unadjusted data and the same social mobility outcome measures will be used as initial guide.

Review team

Phoebe Barnett
Chris Cooper
Iyinoluwa Oshinowo
Stephen Pilling

Annex to RQ1

The MEDLINE search strategy

Database: Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily

Host: Ovid

Search parameters: 1946 to 3 October 2019

Date of search: 4 October 2019

Search checked by: Phoebe Barnett and Iyinoluwa Oshinowo.

Conceptual narrative: The purpose of this literature search is to identify studies that examine the impact of mental health problems on social mobility. The units of analysis will be: i) studies reporting RCTs, to examine access to treatment (or interventions) by social class; and ii) cohort studies, to examine the impact of mental health problems on social mobility over time. The decision to focus on these particular study designs was taken by the expert reference group.

In **Table 6**, a contextual narrative is set out to describe the structure and technical detail of the literature search, as well as to explain the decision-making process of the literature search for MEDLINE.

Table 6: Contextual narrative to the search strategy for RQ1

Search strategy	Contextual narrative
1 Social Mobility/ (961) 2 (Social$ adj3 (mobil$ or change)).ti,ab,kw. (7080) 3 ((absolute or relative or "long range" or "short range") adj3 mobil$).ti,ab,kw. (1785) 4 exp Socioeconomic Factors/ and mobil$.ti,ab,kw. (5725) 5 *Economic Status/ and (mobil$ or change).ti,ab,kw. (6) 6 ((socioeconomic or socio-economic or economic$ or income or salary or salaries or earn or earning or wealth or occupation or employment or job) adj3 (mobil$ or change or stratification)).ti,ab,kw. (3309) 7 ((intergenerational or inter-generational Intragenerational or Intra-generational) adj2 (mobil$ or change)).ti,ab,kw. (209) 8 ((low or medium or high) adj3 depriv$).ti,ab,kw. (1697) 9 ((father* or mother* or parent* or grandfather* or grandmother* or early-life) adj3 (occupation* or employment* or job or education or upbringing)).ti,ab,kw. (15425)	Lines 1–14 set out the search terms for social mobility. The search terms are reported by line number (and as run, per Cochrane guidance[73]), with the corresponding number of studies identified per line reported in parentheses. Lines 1, 4, 5 and 13 represent controlled indexing terminology (identified by the use of /). Line 5, 10 and 13 represent focused indexing terms (identified by the *) which means only studies in which the indexing term is the central topic of the paper will be retrieved. Lines 5 and 13 are further focused by free-text search terms, meaning that the search line searches first for the indexing term and then within this, any study using the term mobil* at title, abstract or keyword. The remaining lines represent free-text search terms. Free-text terminology was identified in scoping, a review of the search terms used in potentially relevant systematic reviews and their included studies, and with reference to our expert reference group[74 75 76 77 78 79 80 81 82 83]). All the searching is undertaken on the title (ti), abstract (ab) and author generated keyword (kw) fields. The free-text lines use proximity searching, indicated by adj3. This means that the term social* will be searched within two words of the term mobil*, allowing for other words which may

10 *Social class/ (12835) 11 ((social class or social background or social status or social standing or social selection or social determinism or social classification or socioeconomic classification) adj3 (mobil$ or change)).ti,ab,kw. (144) 12 (((poor or disadvantage$) adj3 (background or mobil$)) or "standard of living").ti,ab,kw. (4474) 13 *Education/ and mobil$.ti,ab,kw. (139) 14 ((education* and (attainment or performance or results or outcome$ or grade$)) adj3 mobil$).ti,ab,kw. (2106) 15 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 (51357)	appear between these two words, and in any order. Truncation is used indicated by the $ sign. Truncation captures alternative spellings or word-endings, such as social$ for socially and mobil$ for mobile or mobility. Line 15 combines all of the search terms using the Boolean connector OR. This means that all of the search terms set out in lines 1–14 will be searched for.
16 exp Mental Disorders/ (1193721) 17 (mental$ adj3 (health$ or ill$ or unwell or disorder$)).ti,ab,kw. (189969) 18 16 or 17 (1288150)	Line 16 represents controlled indexing for mental health problems. The term is employed to capture relevant subheadings (represented by exp). In this case, the subheadings relate to mental health problems such as anxiety or depressive disorders. Line 17 represents high-level terms for mental health terminology. Given the unit of analysis for this reviews, and the resources available, this is a pragmatic decision to control the volume of studies identified.[84] A form of sensitivity analysis has been undertaken to examine the effect of this decision and recall was unaffected based on the marker papers identified from scoping searches.
19 (Randomized Controlled Trial or Controlled Clinical Trial or Pragmatic Clinical Trial or Equivalence Trial or Clinical Trial, Phase III).pt. (582068) 20 Randomized Controlled Trial/ (490662) 21 exp Randomized Controlled Trials as Topic/ (129469) 22 "Randomized Controlled Trial (topic)"/ (0) 23 Controlled Clinical Trial/ (93279) 24 exp Controlled Clinical Trials as Topic/ (134583) 25 "Controlled Clinical Trial (topic)"/ (0) 26 Randomization/ (100589) 27 Random Allocation/ (100589) 28 Double-Blind Method/ (153596) 29 Double Blind Procedure/ (0) 30 Double-Blind Studies/ (153596)	Lines 19–48 are search terms for controlled trials. The search filter used here is the Canadian Agency for Drugs and Technologies in Health (CADTH) April 2018 controlled trials filter.[85] The filter has been amended at line 48 to incorporate the P3 search filter.[86] The P3 filter improves the sensitivity of searches for controlled trials.

31 Single-Blind Method/ (27393) 32 Single Blind Procedure/ (0) 33 Single-Blind Studies/ (27393) 34 Placebos/ (34482) 35 Placebo/ (0) 36 Control Group/ (1631) 37 (random* or sham or placebo*).ti,ab,hw,kf,kw. (1425255) 38 ((singl* or doubl*) adj (blind* or dumm* or mask*)).ti,ab,hw,kf,kw. (228220) 39 ((tripl* or trebl*) adj (blind* or dumm* or mask*)).ti,ab,hw,kf,kw. (906) 40 (control* adj3 (study or studies or trial* or group*)).ti,ab,kf,kw. (929014) 41 (Nonrandom* or non random* or non-random* or quasi-random* or quasirandom*).ti,ab,hw,kf,kw. (41481) 42 allocated.ti,ab,hw. (61788) 43 ((open label or open-label) adj5 (study or studies or trial*)).ti,ab,hw,kf,kw. (32438) 44 ((equivalence or superiority or non-inferiority or noninferiority) adj3 (study or studies or trial*)).ti,ab,hw,kf,kw. (7383) 45 (pragmatic study or pragmatic studies).ti,ab,hw,kf,kw. (362) 46 ((pragmatic or practical) adj3 trial*).ti,ab,hw,kf,kw. (4400) 47 ((quasiexperimental or quasi-experimental) adj3 (study or studies or trial*)).ti,ab,hw,kf,kw. (6934) 48 (phase adj3 (III or "3") adj3 (study or studies or trial*)).ti,hw,kf,kw. (26282) 49 or/19-48 (2052554)	
50 exp cohort studies/ (1904669) 51 (cohort adj (study or studies)).tw. (185011) 52 Cohort analy$.tw. (7266) 53 (Follow up adj (study or studies)).tw. (47569) 54 (observational adj (study or studies)).tw. (96492) 55 Longitudinal.tw. (228754)	Lines 50–56 are search terms for cohort studies (and potential synonyms) which are taken from the SIGN observational search filter.[x]

[x] Healthcare Improvement Scotland: SIGN. Search Filters Edinburgh: Healthcare Improvement Scotland: SIGN; 2019 [cited 19 July 2019]. Available from: https://www.sign.ac.uk/what-we-do/methodology/search-filters/.

56 Retrospective.tw. (488119) 57 50 or 51 or 52 or 53 or 54 or 55 or 56 (2275158)	
58 (systematic adj3 review$).ti,ab,kw. (159098)	Line 58 is a pragmatic search for systematic reviews.
59 49 or 57 or 58 (4039720)	Line 59 combines the search filter for controlled trials (line 49) **or** the search filter for cohort studies (line 57) **or** systematic reviews.
60 15 and 18 and 59 (2268)	Line 60 completes the literature search, combining line 15 (terms for social mobility) **and** (terms for mental health problems) **and** (terms for controlled trials **or** cohort studies **or** systematic reviews) No language or date limits are applied to the search strategy.

Protocol for RQ2

Methods

The review will be carried out according to the methodological guidance set out in the Centre for Reviews and Dissemination's handbook.[87]

Searching

Study identification (literature searching) will use database and non-database methods of study identification.[88]

Bibliographic

The following electronic databases will be searched:

- Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily[xi]
- Embase 1974 to 2019 September 24[xi]
- HMIC 1979 to May 2019[xi]
- PsycINFO 1806 to September Week 2 2019[xi]
- SPP, to September 2019[xi]
- ASSIA[xii]
- Social Science Database[xii]
- ERIC[xiii]

The bibliographic search strategy will take the following form:

> ((search terms for social mobility) **and** (search terms for mental health) and (studies reporting RCT or Cohort/longitudinal study designs))

[xi] Searched via Ovid.
[xii] Searched via ProQuest.
[xiii] Searched via EBSCOHost.

The following study deign literature search filters will be used: the CADTH RCT/CCT filter[89] and the SIGN filter.[xiv] The SIGN filter was adapted to focus on studies reporting cohort or longitudinal designs.

The search strategy will be reviewed using the PRESS Checklist.[90] The primary search strategy is reported in Appendix 2 using a search narrative to explain the contextual and conceptual detail behind the selection of search terms.[91]

The following non-database search methods will be undertaken to identify published and unpublished studies:

- Systematic reviews meeting inclusion will be checked and their included studies cross-checked for any studies that might meet our inclusion criteria but which have not been identified by our bibliographic searches.
- Web-searching will be undertaken by one researcher using the Google advanced interface. The search strategies will be based on the bibliographic search strategy set out in the Annex to RQ2 with syntax and format modified for the Google interface. The guidance of Briscoe will be used to report web-searches.[92]
- The list of all studies meeting inclusion will be shared with the rest of the project team and expert reference group.

Limits

The searches will not be limited by date or language of publication. The searches will be limited by study design to: studies reporting trials (for example, RCTs) or cohort studies. Systematic reviews will not be included but any identified will be retained for scrutiny of their included studies (see above).

Screening

All studies will be double screened at title/abstract and full text by three researches using Rayyan software.[93] The title/abstract screening is initially broader in scope than is necessary to address this research question specifically. The searches and title/abstract screening are being used to address a second research question and separate review.

The following inclusion criteria will be applied at title/abstract:

Study reports:

1. An RCT **or** Cohort study **or** Systematic review; and
2. Population has a mental health problem; **and**
3. Social mobility is an outcome of the study.

Criteria 2 and 3 will be interpreted broadly with any recognised mental health problem or possible description of social mobility being sufficient for a study to be included for further screening at full text.

The following inclusion criteria will be applied at full text:

Study reports:

1. RCT **or** Cohort **or** Systematic review; **and**
2. Population has a mental health problem; **and**
3. Social mobility is an outcome of the study; **and**
4. Intervention/treatment for mental health problem is described with reference to results.

[xiv] SIGN Strategy (Ovid). Available from: http://www.sign.ac.uk/assets/search-filters-observational-studies.docx.

Criteria 1 and 4 are intended to focus study selection at full text to align with the research question of this review specifically. The decision to limit studies reporting RCT or cohort studies was taken by the expert reference group.

Quality appraisal

Quality appraisal will be undertaken by one reviewer and checked in detail by another. The Cochrane Risk of Bias tool will be used for studies reporting RCTs[94] and the NOS tool will be used for cohort studies.[95]

Data extraction

The following data will be extracted by one reviewer and checked in detail by another.

For RCTs

- Bibliographic reference
- Study type
- Study quality
- Intervention
- Comparator
- Method of allocation
- Setting
- Number of participants
- Participant characteristics
- Length of follow-up
- Method of analysis
- Outcomes
- Unintended consequences
- Limitations identified by authors
- Funding.

For cohort studies

Descriptive data

Study reference

- Selection/eligibility criteria for cohort
- Cohort/sample size
- Age: mean sample age
- Gender: % of sample of who are female
- Ethnicity: % of each ethnicity recorded
- Diagnosis (including diagnostic criteria used)
- Specific problem/disorder + formal diagnosis (yes/no) and criteria used.

Outcome data for synthesis

- Comparator or intervention/ exposure
- Occupational change (method of measurement and assessment will be extracted)
- Change in income or socioeconomic status (method of measurement and assessment will be extracted)
- Severity of illness
- Events or summary measures over time
- Adjusted = if yes, how
- Data collection points and follow-up
- Potential confounders/modifiers

- Reference to missing data or loss to follow-up
- Country
- Region
- Setting.

General data

- Limitations as identified by study authors
- Funding
- Link to other work (protocol or other studies).

Data synthesis

Data will be synthesised narratively by mental health problem (for example, anxiety or depressive disorder) and then sub-categorised by identified social mobility outcomes. Similar outcomes will be grouped and differences between study outcomes explained narratively. Study characteristics will be reported in three tables aligned to the subheadings set out above in data extraction.

If sufficiently homogenous and high-quality data are located, random-effects meta-analysis may be considered, although this is unlikely. A minimum number of five studies reporting unadjusted data and the same social mobility outcome measures will be used as initial guide.

Review team

Phoebe Barnett
Chris Cooper
Iyinoluwa Oshinowo
Stephen Pilling

Annex to RQ2

The MEDLINE search strategy

Database: Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily

Host: Ovid

Search parameters: 1946 to 3 October 2019

Date of search: 4 October 2019

Search checked by: Phoebe Barnett and Iyinoluwa Oshinowo.

Conceptual narrative: The purpose of this literature search is to identify studies which examine the impact of mental health problems on social mobility. The units of analysis will be: i) studies reporting RCTs, to examine access to treatment (or interventions) by social class, and; ii) cohort studies, to examine the impact of mental health problems on social mobility over time. The decision to focus on these particular study designs was undertaken by the expert reference group.

In **Table 7**, a contextual narrative is set out to describe the structure and technical detail of the literature search, as well as to explain the decision-making process of the literature search for MEDLINE.

Table 7: Contextual narrative for the search strategies of RQ2

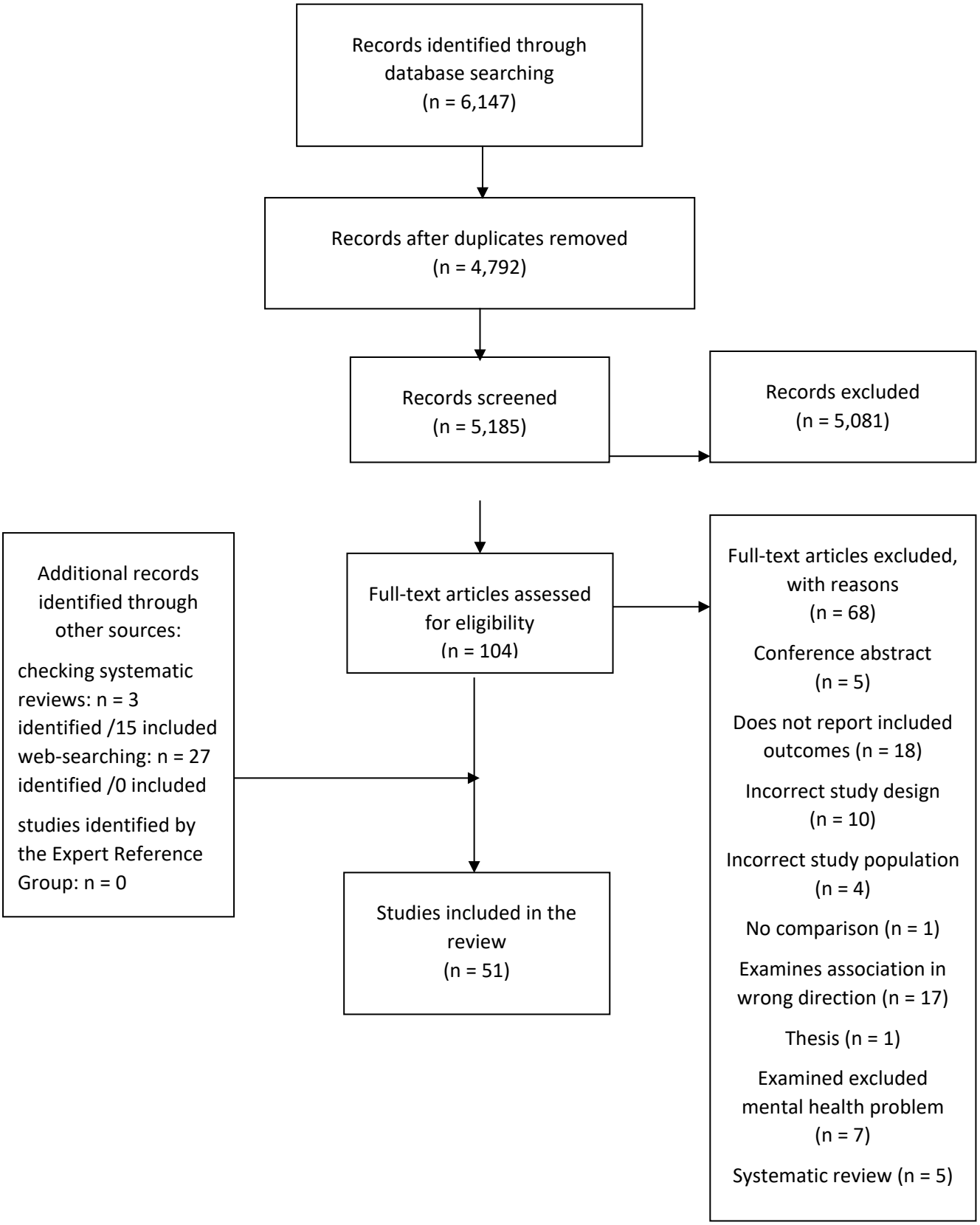
Search strategy	Contextual narrative
1 Social Mobility/ (961) 2 (Social$ adj3 (mobil$ or change)).ti,ab,kw. (7080) 3 ((absolute or relative or "long range" or "short range") adj3 mobil$).ti,ab,kw. (1785) 4 exp Socioeconomic Factors/ and mobil$.ti,ab,kw. (5725) 5 *Economic Status/ and (mobil$ or change).ti,ab,kw. (6) 6 ((socioeconomic or socio-economic or economic$ or income or salary or salaries or earn or earning or wealth or occupation or employment or job) adj3 (mobil$ or change or stratification)).ti,ab,kw. (3309) 7 ((intergenerational or inter-generational Intragenerational or Intra-generational) adj2 (mobil$ or change)).ti,ab,kw. (209) 8 ((low or medium or high) adj3 depriv$).ti,ab,kw. (1697) 9 ((father* or mother* or parent* or grandfather* or grandmother* or early-life) adj3 (occupation* or employment* or job or education or upbringing)).ti,ab,kw. (15425) 10 *Social class/ (12835) 11 ((social class or social background or social status or social standing or social selection or social determinism or social classification or socioeconomic classification) adj3 (mobil$ or change)).ti,ab,kw. (144) 12 (((poor or disadvantage$) adj3 (background or mobil$)) or "standard of living").ti,ab,kw. (4474) 13 *Education/ and mobil$.ti,ab,kw. (139) 14 ((education* and (attainment or performance or results or outcome$ or grade$)) adj3 mobil$).ti,ab,kw. (2106) 15 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 (51357)	Lines 1–14 set out the search terms for social mobility. The search terms are reported by line number (and as run, per Cochrane guidance[73]), with the corresponding number of studies identified per line reported in parentheses. Lines 1, 4, 5 and 13 represent controlled indexing terminology (identified by the use of /). Line 5, 10 and 13 represent focused indexing terms (identified by the *) which means only studies in which the indexing term is the central topic of the paper will be retrieved. Lines 5 and 13 are further focused by free-text search terms, meaning that the search line searches first for the indexing term and then within this, any study using the term mobil* at title, abstract or keyword. The remaining lines represent free-text search terms. Free-text terminology was identified in scoping, a review of the search terms used in potentially relevant systematic reviews and their included studies, and with reference to our expert reference group[96 97 98 99 100 101 102 103 104 105]). All the searching is undertaken on the title (ti), abstract (ab) and author generated keyword (kw) fields. The free-text lines use proximity searching, indicated by adj3. This means that the term social* will be searched within two words of the term mobil*, allowing for other words which may appear between these two words, and in any order. Truncation is used, indicated by the $ sign. Truncation captures alternative spellings or word endings, such as social$ for socially and mobil$ for mobile or mobility. Line 15 combines all of the search terms using the Boolean connector OR. This means that all of the search terms set out in lines 1–14 will be searched for.
16 exp Mental Disorders/ (1193721) 17 (mental$ adj3 (health$ or ill$ or unwell or disorder$)).ti,ab,kw. (189969)	Line 16 represents controlled indexing for mental health problems. The term is employed to capture relevant subheadings (represented by exp). In this case, the subheadings relate to mental health

Search strategy	Contextual narrative
18 16 or 17 (1288150)	problems such as anxiety or depressive disorders. Line 17 represents high-level terms for mental health terminology. Given the unit of analysis for this reviews, and the resources available, this is a pragmatic decision to control the volume of studies identified.[106] A form of sensitivity analysis has been undertaken to examine the effect of this decision and recall was unaffected based on the marker papers identified from scoping searches.
19 (Randomized Controlled Trial or Controlled Clinical Trial or Pragmatic Clinical Trial or Equivalence Trial or Clinical Trial, Phase III).pt. (582068) 20 Randomized Controlled Trial/ (490662) 21 exp Randomized Controlled Trials as Topic/ (129469) 22 "Randomized Controlled Trial (topic)"/ (0) 23 Controlled Clinical Trial/ (93279) 24 exp Controlled Clinical Trials as Topic/ (134583) 25 "Controlled Clinical Trial (topic)"/ (0) 26 Randomization/ (100589) 27 Random Allocation/ (100589) 28 Double-Blind Method/ (153596) 29 Double Blind Procedure/ (0) 30 Double-Blind Studies/ (153596) 31 Single-Blind Method/ (27393) 32 Single Blind Procedure/ (0) 33 Single-Blind Studies/ (27393) 34 Placebos/ (34482) 35 Placebo/ (0) 36 Control Group/ (1631) 37 (random* or sham or placebo*).ti,ab,hw,kf,kw. (1425255) 38 ((singl* or doubl*) adj (blind* or dumm* or mask*)).ti,ab,hw,kf,kw. (228220) 39 ((tripl* or trebl*) adj (blind* or dumm* or mask*)).ti,ab,hw,kf,kw. (906) 40 (control* adj3 (study or studies or trial* or group*)).ti,ab,kf,kw. (929014) 41 (Nonrandom* or non random* or non-random* or quasi-random* or quasirandom*).ti,ab,hw,kf,kw. (41481)	Lines 19–48 are search terms for controlled trials. The search filter used here is the CADTH April 2018 controlled trials filter.[107] The filter has been amended at line 48 to incorporate the P3 search filter.[108] The P3 filter improves the sensitivity of searches for controlled trials.

Search strategy	**Contextual narrative**
42 allocated.ti,ab,hw. (61788) 43 ((open label or open-label) adj5 (study or studies or trial*)).ti,ab,hw,kf,kw. (32438) 44 ((equivalence or superiority or non-inferiority or noninferiority) adj3 (study or studies or trial*)).ti,ab,hw,kf,kw. (7383) 45 (pragmatic study or pragmatic studies).ti,ab,hw,kf,kw. (362) 46 ((pragmatic or practical) adj3 trial*).ti,ab,hw,kf,kw. (4400) 47 ((quasiexperimental or quasi-experimental) adj3 (study or studies or trial*)).ti,ab,hw,kf,kw. (6934) 48 (phase adj3 (III or "3") adj3 (study or studies or trial*)).ti,hw,kf,kw. (26282) 49 or/19-48 (2052554)	
50 exp cohort studies/ (1904669) 51 (cohort adj (study or studies)).tw. (185011) 52 Cohort analy$.tw. (7266) 53 (Follow up adj (study or studies)).tw. (47569) 54 (observational adj (study or studies)).tw. (96492) 55 Longitudinal.tw. (228754) 56 Retrospective.tw. (488119) 57 50 or 51 or 52 or 53 or 54 or 55 or 56 (2275158)	Lines 50–56 are search terms for cohort studies (and potential synonyms) which are taken from the SIGN observational search filter.[xv]
58 (systematic adj3 review$).ti,ab,kw. (159098)	Line 58 is a pragmatic search for systematic reviews.
59 49 or 57 or 58 (4039720)	Line 59 combines the search filter for controlled trials (line 49) **or** the search filter for cohort studies (line 57) **or** systematic reviews.
60 15 and 18 and 59 (2268)	Line 60 completes the literature search, combining line 15 (terms for social mobility) **and** (terms for mental health problems) **and** (terms for controlled trials **or** cohort studies **or** systematic reviews) No language or date limits are applied to the search strategy.

[xv] Healthcare Improvement Scotland: SIGN. Search Filters Edinburgh: Healthcare Improvement Scotland: SIGN; 2019 [cited 2019 Jul 19]. Available from: https://www.sign.ac.uk/what-we-do/methodology/search-filters/.

Appendix B: PRISMA diagram



Appendix C: Characteristics of included studies

Research question (RQ)	Study reference	Country (region)	Sample size	Intervention setting	Study design	Exposure/ intervention	Comparison	Mean age (range)	Gender (% female)	Ethnicity/ nationality [a]	Follow-up	Study quality[b]
1	ABEBE2019	Norway	12,287	Not applicable (NA)	Prospective cohort	Mental health problems and a physical disability	No mental health problems and a physical disability	28.5 (not recorded [NR])	55.1	NR	13 years	Poor quality (5)
1	AMOS2018	US	39,479	NA	Retrospective cohort	Treatment-resistant depressive disorder	No depressive disorder	NR (18–64)	64.2	NR	6 years	Fair quality (6)
1	ARO1995	Finland	6,521	NA	Retrospective cohort	Major affective disorder	No major affective disorder	NR	55.5	NR	17 years	Fair quality (6)
1	BIRTCHNELL 1971	UK (Aberdeen)	4,159	NA	Prospective cohort	Depressive disorder	No depressive disorder	NR	0.0	NR	Multiple	Poor quality (4)
1	BUTTERWORTH 2012	Australia (Melbourne)	13,969	NA	Prospective cohort	Anxiety and depressive disorders	No anxiety or depressive disorders	35.85 (NR)	54.1	NR	5 years	Good quality (7)
1	CASE2005	UK	17,409	NA	Prospective cohort	Mental health and emotional problems	No mental health and emotional problems	NR	NR	NR	42 years	Poor quality (4)
1	CORYELL1993	US (Boston MA, Chicago IL, Iowa City IA, New York NY, St Louis MO)	480	NA	Prospective cohort	Depressive disorder	No depressive disorder	39.15 (NR)	67.5	NR	6 years	Fair quality (6)
1	EATON2001	US (Baltimore MD)	907	NA	Prospective cohort	Depression disorder	No depressive disorder	43.2 (NR)	55.1	NR	16 years	Poor quality (3)
1	ELOVAINIO2012	Finland	3,596	NA	Prospective cohort	Depressive disorder	No depressive disorder	10.4 (NR)	53.8	NR	27 years	Fair quality (4)
1	ENSMINGER 2003	US (Chicago IL)	1,242	NA	Prospective cohort	Psychological distress	No psychological distress	NR	NR	NR	NR	Fair quality (5)

Research question (RQ)	Study reference	Country (region)	Sample size	Intervention setting	Study design	Exposure/ intervention	Comparison	Mean age (range)	Gender (% female)	Ethnicity/ nationality [a]	Follow-up	Study quality[b]
1	GROFFEN2009	Netherlands (Eindhoven)	4,745	NA	Prospective cohort	Social anxiety disorder	No social anxiety disorder	68.9 (NR)	47.8	NR	3 years	Fair quality (4)
1	HALONEN2019	Finland (Northern Finland)	9,432	NA	Retrospective cohort	Anxiety and depressive disorders	No anxiety or depressive disorders	NR	50.0	NR	30 years	Fair quality (5)
1	ISOHANNI2001	Finland (Northern Finland)	11,017	NA	Prospective cohort	Non-psychotic disorder	No non-psychotic disorder	NR	49.0	NR	NR	Good quality (7)
1	JOHNSON1999	US (New York NY)	736	NA	Prospective Cohort	Anxiety and depressive disorders	No anxiety or depressive disorders	22.5 (NR)	51.0	White: 91%	19 years	Good quality (5)
1	JOHNSTON2013	UK (UK-wide)	8,496	NA	Retrospective cohort	Anxiety and depressive disorders	No anxiety or depressive disorders	NR	53.0	British: 100%	34 years	Fair quality (4)
1	LANDSTEDT 2016	Sweden (North Sweden)	1,083	NA	Retrospective cohort	Depressive disorder	No depressive disorder	42 (NR)	48.5	NR	26 years	Poor quality (4)
1	PRAUSE2001	US	1,160	NA	Retrospective cohort	Depressive disorder	No depressive disorder	33.2 (NR)	NR	NR	2 years	Poor quality (3)
1	PSYCHOGIOU 2019	UK (Avon)	13,988	NA	Prospective cohort	Depressive disorder	No depressive disorder	NR	48.6	NR	16 years	Fair quality (5)
1	RITSHER2011	US (New Haven CT)	756	NA	Retrospective cohort	Depressive disorder	No depressive disorder	25 (18–49)	NR	NR	17 years	Good quality (5)
1	SAREEN2011	US	34,653	NA	Prospective cohort	Mental health problems	No mental health problems	NR	NR	NR	3 years	Fair quality (4)
1	SELLERS2019	UK	35,924	NA	Prospective cohort	Child mental health problems	No child mental health problems	NR	48.5	NR	9 years	Fair quality (4)

Research question (RQ)	Study reference	Country (region)	Sample size	Intervention setting	Study design	Exposure/ intervention	Comparison	Mean age (range)	Gender (% female)	Ethnicity/ nationality [a]	Follow-up	Study quality[b]
1	SLOMINSKI2011	US	196	NA	Retrospective cohort	Mental health problems	No mental health problems	NR	55.0	European American: 63% African American: 34% Puerto Rican: 3%	3–30 years	Fair quality (5)
1	TOLMAN2009	US (Michigan)	753	NA	Prospective cohort	Social anxiety disorder or major depressive disorder	No mental health problem	NR	100.0	Black: 56% White: 45%	1 year	Fair quality (4)
2.1	CUMMINGS2014	US	1,133	Clinic	Prospective cohort	County-level SES	NA	15.8 (NR)	59.2	White: 38.9% Hispanic: 25.6% Black: 24.0% Asian: 9.6% Other: 1.9%	1 year	Good quality (6)
2.1	DORNER2017	Sweden (Stockholm)	66,097	Inpatient	Prospective cohort	Educational attainment	NA	NR (18–59)	69.2	Country of birth: Sweden: 86.3%) Other Northern European: 3.2% Rest of world: 8.4%	4 years	Good quality (7)
2.1	PAANANEN2013	Finland	59,476	Specialised psychiatric care	Prospective cohort	Parental SES Parental educational attainment	NA	NR (0–21)	NR	NR	21 years	Poor quality (6)

Research question (RQ)	Study reference	Country (region)	Sample size	Intervention setting	Study design	Exposure/ intervention	Comparison	Mean age (range)	Gender (% female)	Ethnicity/ nationality [a]	Follow-up	Study quality[b]
2.1	PACKNESS2017	Denmark	50,374	Mental health care services	Prospective cohort	Income Educational attainment	NA	NR (20–64)	56.9	Country of birth: Denmark: 84.40% European and western countries: 8.21% Non-western countries and unknown: 7.38%	12 months	Poor quality (5)
2.1	SHAH2001	UK (England and Wales)	17,197	Clinic-general practice	Prospective cohort	Social class	NA	NR	NR	NR	11 months	Poor quality (3)
2.2	BUTTON2012	UK	297	NA	RCT – secondary analysis	Online CBT	Waitlist control	34.95 (18–75)	68.01	NR	4 months	High risk of bias
2.2	CORT2012	US (New York NY)	70	Community	RCT – secondary analysis	Standardised interpersonal psychotherapy	Usual care psychotherapy	36 (NR)	100	White: 59% Black: 41%	2 years	High risk of bias
2.2	ELALAOUI2015	Sweden (Stockholm)	764	Psychiatric clinic	Prospective cohort	Online CBT	Pre-online CBT	32.51 (NR)	46.0	NR	End of treatment	Fair quality (5)
2.2	DELGADILLO 2017	UK	28,498	Community	Retrospective case note review	IAPT	Pre-treatment	38.27 (16–92)	64.6	White: 85.5%	End of treatment	Good quality (6)
2.2	FALCONNIER 2009	US (Washington, Pennsylvania, Oklahoma)	239	Hospital	RCT	Psychotherapy or pharmacotherapy	Placebo plus clinical management	NR (21–60)	70	White: 89% African American: 9% Hispanic: 2% Other non-	6, 12, 18 months	Low risk of bias

Research question (RQ)	Study reference	Country (region)	Sample size	Intervention setting	Study design	Exposure/ intervention	Comparison	Mean age (range)	Gender (% female)	Ethnicity/ nationality [a]	Follow-up	Study quality[b]
										White: less than 1%		
2.2	FOURNIER2009	US (Philadelphia, PA)	180	Outpatient	RCT	CBT	Placebo	39.94 (NR)	NR	White: 83%	16 weeks	Unclear risk of bias
2.2	GIFT1986	US	217	Inpatient	Prospective cohort	Inpatient admission	Pre-inpatient admission	NR (15–55)	NR	NR	2 years	Poor quality (3)
2.2	GILMAN2013	US (New York, Philadelphia PA, Pittsburgh PA)	514	Primary care	RCT	Guideline-based provision of depression treatment (citalopram or psychotherapy)	Usual care	NR	72	NR	2 years	Unclear risk of bias
2.2	HOYER2016	Germany (Bochum, Dresden, Göttingen, Jena and Mainz)	237	Outpatient	Before-and-after trial	CBT	Pre-CBT	34.94 (18–70)	55.2	NR	15 weeks	Good quality (6)
2.2	JOUTSENNIEMI 2012	Finland (Helsinki)	326	Outpatient	RCT	Long-term therapy	Short-term therapy	NR	75.8	NR	3 years	High risk of bias
2.2	KELLY2015	US (New Haven CT)	1,004	Primary care	RCT-secondary analysis	Collaborative care (Coordinated Anxiety Learning and Management) or usual care	NA	NR (18–75)	70.0	NR	6 months	Low risk of bias
2.2	KODAL2018	Norway	179	Community mental health clinics	RCT	Individual CBT	Group CBT	15.5 (NR)	54.7	NR	End of treatment, 12 months	Unclear risk of bias
2.2	MEHDIPANAH 2014	Spain (Barcelona)	2,792	Community	Quasi-experimental	'The neighbourhood law' (neighbourhood improvement)	Non-intervened neighbourhoods	NR	50	NR	10 years	High risk of bias

Research question (RQ)	Study reference	Country (region)	Sample size	Intervention setting	Study design	Exposure/ intervention	Comparison	Mean age (range)	Gender (% female)	Ethnicity/ nationality [a]	Follow-up	Study quality[b]
2.2	MYERS1965	US (New Haven CT)	1,565	Inpatient	Retrospective cohort	Psychiatric treatment	NA	NR	NR	NR	10 years	Poor quality (5)
2.2	NGUYEN2013	US (Boston MA, Baltimore MD)	2,829	Community	RCT	Moving to opportunity social mobility intervention	No further assistance	9.94 (NR)	50.1	African American: 62.8% Hispanic: 30% White: 1.1% Other: 2.2% Not specified: 3.8%	4 years	Low risk of bias
2.2	PIRKIS2011	Australia	16,700	Community	Retrospective service evaluation	Access to Allied Health Professionals	Pre-treatment	NR	73.1	NR	NR	Fair quality (4)
2.2	POOTS2014	UK (London)	6,062	Community (IAPT)	Retrospective service evaluation	IAPT services	Pre-IAPT use	NR	NR	NR	3 years, 3 months	Poor quality (4)
2.2, 2.3	TOHEN1990	US (Boston MA)	75	Hospital (inpatient)	Prospective cohort	48 months post-hospital	6 months post-hospital	NR (17–NR)	NR	White: 97.3%	4 years	Fair quality (4)
2.3	DION1988	US (Belmont MA)	67	Hospital (inpatient)	Prospective cohort	Hospital admission	Pre-hospital admission	31.4 (17–59)	68.0	White: 97.77% 'Oriental': 3.33%	1 year	Poor quality (5)
2.3	KOZMA2011	Multiple	1,012	Outpatient	Open-label trial extension	Paliperidone extended release	Pre-treatment	37.7 (NR)	40.9	NR	52 weeks	Poor quality (4)

Research question (RQ)	Study reference	Country (region)	Sample size	Intervention setting	Study design	Exposure/ intervention	Comparison	Mean age (range)	Gender (% female)	Ethnicity/ nationality [a]	Follow-up	Study quality[b]
2.3	PERRY1999	UK (North-west England)	69	Community	Single blind RCT	Teaching people with bipolar disorder to identify early symptoms of relapse and seek prompt treatment from health services, plus routine care	Routine care alone	44.51 (NR)	68.1	White: 91.30%	6, 12, 18 months	Low risk of bias
2.3	ROY-CHENGAPPA 2005	US (Pittsburgh PA)	139	Hospital	Open-label trial extension	Olanzapine	Pre-treatment	39.5 (NR)	48.0	NR	1 year	Poor quality (4)
2.3	TSIACHRISTAS 2016	UK (Oxford)	3,674	Community	Retrospective cohort	Early intervention in psychosis service	Other community mental health teams	27.13 (NR)	42.5	White British: 37.21%	3 years	Poor quality (6)

[a] As reported by the study authors.

[b] The Cochrane Risk of Bias tool was used for studies reporting RCT[109] and a version of the NOS tool modified by Gondek et al. was used for studies reporting a cohort design.[110] The number in brackets after the quality assessment refers to the number of stars assigned in the adapted NOS (maximum is eight stars).

Appendix D: Expert Reference Group

Phoebe Barnett	Systematic reviewer/Research Assistant, University College London (UCL)
Stella Branthonne-Foster	Expert by Experience; Member of the Lived Experience Working Group, National Institute for Health Research Mental Health Policy Research Unit
Chris Cooper	Systematic Reviewer, UCL
Dr Jacqui Dyer MBE	Expert by Experience; President of the Mental Health Foundation; Independent Health and Social Care Consultant
Professor Peter Fonagy OBE	Head of the Division of Psychology and Language Sciences at UCL; Chief Executive of the Anna Freud National Centre for Children and Families, London
Dr Alissa Goodman	Professor of Economics and Director of the Centre for Longitudinal Studies, UCL Institute of Education
Helen Greenwood	Research and Design Officer, National Collaborating Centre for Mental Health (NCCMH)
Dr James Kirkbride	Reader in Epidemiology in the Division of Psychiatry, UCL
Iyinoluwa Oshinowo	Research Assistant, NCCMH
Dr Praveetha Patalay	Associate Professor, UCL Institute of Education and UCL Faculty of Population Health Sciences
Professor Steve Pilling	Director, NCCMH; Professor of Clinical Psychology and Clinical Effectiveness
Dr Jean-Baptise Pingault	Associate Professor, Clinical, Education and Health Psychology, Division of Psychology and Language Sciences, UCL
Joanna Popis	Project Manager, NCCMH
Dr Shubulade Smith	Director, NCCMH; Consultant Psychiatrist, South London and Maudsley NHS Foundation Trust
Dr Clare Taylor	Head of Quality and Research Development, NCCMH
Vicky Turner	Research Assistant, NCCMH
Harri Weeks	Expert by Experience; Partnerships and Community Manager – Understanding Patient Data, Wellcome Trust

Abbreviations

ALSPAC	Avon Longitudinal Study of Parents and Children
ASSIA	Applied Social Sciences Index Abstracts
b	beta coefficient
BDI	Beck Depression Inventory
CADTH	Canadian Agency for Drugs and Technologies in Health
CBT	Cognitive behavioural therapy
CCT	Controlled clinical trial
CI	Confidence interval
COBRA	Consolidated Omnibus Budget Reconciliation Act of 1985, US
ERIC	Education Resources Information Center
F	The statistic calculated by analysis of variance (f ratio)
HMIC	Health Management Information Consortium
HR	Hazard ratio
HRSD	Hamilton Rating Scale for Depression
IAPT	Improving Access to Psychological Therapies
IMD	Index of Multiple Deprivation
IRR	Incidence rate ratio
K	Number of studies
n	Number of participants
NA	Not applicable
NCCMH	National Collaborating Centre for Mental Health
NCDS	National Child Development Study
NOS	Newcastle–Ottawa Scale
NR	Not recorded
OR	Odds ratio
p	Probability
PHQ-9	Patient Health Questionnaire – 9 items
PR	Prevalence ratio
PRESS	Peer Review of Electronic Search Strategies
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
PRyear	Prevalence ratio year
RCT	Randomised controlled trials
RQ	Research question
SE	Standard error
SES	Socioeconomic status
SIGN	Scottish Intercollegiate Guidelines Network
SMI	Serious mental illness

SPP	Social Policy and Practice
t	Test statistic
UCL	University College London

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