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Mental health effects of unemployment and re-employment: a systematic review and meta-analysis of longitudinal studies

Tom Sterud ,[1] Lars-Kristian Lunde ,[1] Rigmor Berg ,[2,3] Karin I Proper ,[4] Fiona Aanesen [1]

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[1]National Institute of Occupational Health, Oslo, Norway
[2]Norwegian Institute of Public Health, Oslo, Norway
[3]UiT The Arctic University of Norway, Tromsø, Norway
[4]National Institute for Public Health and the Environment, Bilthoven, The Netherlands

Correspondence to
Dr Tom Sterud;
tom.sterud@stami.no

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ABSTRACT

This systematic review examined the impact of unemployment and re-employment on mental health problems (depression, anxiety and psychological distress) among working-age adults. We searched MEDLINE, Embase, APA PsycINFO and Web of Science (January 2012–March 2024) and included studies from a prior meta-analysis (1990–2012). Risk of bias was assessed using the Newcastle-Ottawa Scale. We conducted random-effects meta-analyses and narrative synthesis and evaluated the certainty of evidence using Grading of Recommendations Assessment, Development and Evaluation (GRADE). Of 9328 search records, 38 prospective longitudinal studies met the inclusion criteria (27 from 2012–2024 and 11 from 1990–2012). A pooled standardised mean difference (SMD, Cohen's d) of 0.19 (95% CI 0.08 to 0.30, I^2=88.7%) indicated increased symptom levels among the unemployed compared with those regularly employed. Similarly, pooled effect estimates indicated reduced symptoms after re-employment, with a stronger effect observed in between-group difference-in-difference analyses (SMD=−0.27, 95% CI −0.35 to −0.20, I^2=40.1%) than within-group analyses (SMD=−0.19, 95% CI −0.29 to −0.10, I^2=84.3%). The certainty of evidence for all outcomes based on our GRADE evaluation was low. Our systematic review and meta-analysis suggest that unemployment increases the risk of mental health problems, while re-employment may reduce this risk. However, due to the lack of high-certainty evidence, further longitudinal studies with multiple follow-ups are needed to strengthen causal inferences and better clarify mental health trajectories before and after re-employment.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Unemployment is associated with poorer mental health, but the extent to which re-employment mitigates these risks remains unclear. It has been over a decade since a systematic review last synthesised the evidence on this topic, highlighting the need for an updated evaluation.

WHAT THIS STUDY ADDS

⇒ Our systematic review and analysis of recent longitudinal research found a consistent small to moderate increase in the risk of mental health problems associated with unemployment, compared with being employed. We also observed a comparable reduction in risk following re-employment among previously unemployed individuals.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ Although causality remains difficult to establish with certainty, these findings highlight the importance of policies that support job retention and facilitate re-employment as strategies to improve mental health. Future research should address current gaps by using studies with repeated follow-ups, detailed employment histories and reliable measures of mental health. It should also explore how broader social and economic factors—such as welfare systems, labour market policies, job quality and sociodemographic characteristics—influence these relationships.

BACKGROUND

Mental health disorders, particularly depression and anxiety, are among the leading causes of health-related burden in developed countries.[1] This poses challenges for labour markets, as mental health issues intersect with demographic and economic shifts. With ageing populations and declining birth rates, most countries are increasingly focused on maximising workforce participation to sustain economic productivity and support social welfare systems.

Employment plays a central role in most contemporary societies, serving not only as a source of income but also as a key contributor to mental health through psychosocial benefits such as time structure, social contact, purpose and status.[2] Systematic reviews and meta-analyses have consistently shown that employment is associated with better mental health outcomes,[3] while precarious work[4 5] and unemployment[6–8] are linked to increased psychological distress. The negative effects of unemployment stem from financial strain, social isolation and loss of self-efficacy.[9] However, employment is not an automatic remedy—while it can promote well-being through financial security and social integration, it may also expose individuals to stressors such as high demands, poor working conditions and

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occupational hazards.[10] These dual effects raise questions about the extent to which re-employment can mitigate the mental health risks of unemployment.

The most recent review on the health effects of employment transitions was conducted by van der Noordt *et al* in 2014,[11] covering studies published between 1990 and 2012. Their meta-analysis of 11 studies found that re-employment was associated with reduced symptoms of depression (n=6) and psychological distress (n=6). However, the authors noted limitations, including methodological heterogeneity, discrepancies between the best evidence synthesis and the meta-analyses, and potential bias due to the 'healthy worker effect'. This issue is particularly relevant when studying the effects of unemployment and re-employment. Individuals in good health are more likely to gain employment and remain employed over time, whereas those in poorer health are more likely to leave the workforce.[11] These selection effects can lead to overestimation of the health benefits of employment in observational studies, and the possibility of reverse causality cannot be excluded.

Several systematic reviews have examined the relationship between employment and mental health, particularly the impact of unemployment.[7 8] This review adds value by offering a specific and updated focus on the mental health effects of re-employment following unemployment, alongside a re-evaluation of the effects of continued unemployment. Since van der Noordt *et al*'s review,[11] new studies with improved designs and statistical methods to better adjust for possible selection effects[12–15] have been published, warranting an updated evaluation of the literature. By incorporating these recent studies, we aim to reassess the mental health effects of both (un)employment status and employment transitions. Specifically, we address two research questions (RQ):

- RQ1: Is unemployment, compared with regular employment, associated with an increased risk of common mental health problems (depression, anxiety and psychological distress) in the general working-age population?
- RQ2: Is the transition into re-employment, following a period of unemployment, associated with changes in the risk of these mental health outcomes?

Beyond employment status, contextual factors—such as welfare policies, gender norms and working conditions—vary across countries[8 16] and may influence the association between unemployment and mental health. When available, we extract such information from the included studies to provide a more comprehensive understanding of the mental health effects of employment transitions.[17]

METHODS

Study criteria

Following a preregistered protocol (PROSPERO, April 2023), later peer-reviewed and published,[17] we included prospective longitudinal studies on the impact of unemployment and regular employment on mental health in individuals aged 15+ within the general labour force. Outcomes included depression, anxiety or psychological distress, assessed via clinical diagnoses or validated questionnaires. We included studies in English, French, German, Dutch, Spanish, Finnish, Italian or Scandinavian languages. We excluded studies focusing on (1) selected subgroups not representative of a labour force (eg, limited to individuals with diseases/disabilities and/or specific sociodemographic characteristics), (2) individuals outside the labour force, (3) sick leave or disability pension recipients or (4) unpaid, sheltered or precarious employment.

Search strategy, study selection, data extraction and quality assessment

A research librarian (Ingrid Løken Jørgensen) searched MEDLINE (Ovid), Embase, APA PsycINFO and Web of Science Core Collection (January 2012–March 2023), updating in March 2024. The search used MeSH terms and keywords related to employment, unemployment and mental health (full strategy in online supplemental file 1). In June 2023, we searched OpenAlex, a large open catalogue including grey literature, using Evidence for Policy and Practice Information (EPPI)-Reviewer to identify related studies and track citations.[18] We also included relevant studies from a prior review (1990–2012).[11]

We used EPPI-Reviewer[17] for deduplication and screening. Title and abstract screening followed a machine learning-assisted priority screening approach. Two reviewers screened 1900 records until the last 200 consecutive records contained no relevant studies, after which screening switched to single-reviewer mode. An additional 400 records were screened in succession with no inclusions before screening was concluded. OpenAlex and updated database search results were screened by two reviewers.

Two authors extracted data on study and participant characteristics, exposures, outcomes, confounders and results using a pre-piloted Excel sheet.[17] Three authors in pairs independently assessed methodological quality using the Newcastle-Ottawa Scale (NOS) for cohort studies,[19 20] resolving disagreements through discussion. Studies scored across three NOS categories: selection (four stars), comparability (two stars) and outcome (three stars). Studies using self-reported data could score up to 7, while a score of 9 required registry verification. A minimum score of 5 was set for moderate risk, requiring at least two stars in selection (cohort representativeness) and at least three stars across comparability (ensuring comparability of exposed and unexposed groups) and outcome (adequate follow-up and attrition). Scores of ≤4 indicated poor quality, 5–7 fair and ≥8 good quality (online supplemental file 2).

Data synthesis and grading of evidence

We conducted meta-analyses with forest plots showing individual and pooled estimates (95% CIs) when populations, settings, designs and measures were comparable. Analyses used R V.4.4.2 (meta package),[21] with random-effects models chosen a priori due to anticipated heterogeneity. We analysed binary and continuous outcomes separately, converting ORs and HRs to relative risks (RRs) using baseline risk in the unexposed group. Mean differences were standardised (Cohen's d) with 95% CIs by dividing the mean difference by the pooled SD, derived from the pooled SE of the mean difference.[22] Heterogeneity was assessed using the Q statistic ($p<0.05$ indicating significance) and quantified with the I^2 statistic. When possible, subgroup analyses were conducted by outcome, sex and region (welfare regimes), and sensitivity analyses excluded studies with low methodological quality. If subgroup analyses were unfeasible, we qualitatively assessed the study characteristics' influence on estimates. A narrative review supplemented the meta-analyses, summarising all the included studies considering effect direction and precision.

Although not prespecified in our initial protocol, we evaluated the certainty of evidence using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach, categorising evidence as 'high', 'moderate', 'low' or 'very low',[23] starting at a 'low' certainty level for observational studies. Downgrading criteria include risk of bias, inconsistency, indirectness,

imprecision and potential publication bias. Upgrading criteria include strength of association, dose-response or opposing plausible confounding/bias. Due to the small number of studies, we qualitatively assessed publication bias instead of using funnel plots. Specifically, we looked for patterns in effect sizes in relation to sample sizes and study quality ratings to identify any clear trends suggestive of publication bias.

RESULTS

Search results

The initial search identified 8105 unique records, with 1223 added in the update. Two reviewers screened 92 full-text papers, resolving disagreements through discussion or a third reviewer. We excluded studies for including individuals outside the labour force (n=38) or not assessing paid employment or employment transitions (n=14). From van der Noordt *et al*'s review,[11] 28 studies were evaluated, of which 11 met our inclusion criteria.[24–34] The remaining 16 were excluded for similar reasons (ie, inclusion of individuals outside the labour force and exposure measure not meeting our criteria). In total, 38 studies (27 from our search and 11 from the previous review) were included (Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) flowchart in online supplemental file 1).

Description of the included studies

A short descriptive summary is available in tables 1 and 2 (see online supplemental file 3 for more details). 18 studies compared employment to unemployment, while 23 examined transitions from unemployment to employment. Most assessed psychological distress (n=30); six focused on depression symptoms alone, and two examined multiple mental health outcomes. Most studies sampled from the general working population of employed and/or unemployed, except for one industry-specific study[26] and three samples recruited from employment offices.[27 29 35] One study included only men.[36] Regarding design, 24 used panel data, 13 used cohort designs, and one was based on data from a quasi-experimental study.[29] Geographically, 21 studies were European, with the UK (n=8) being the most represented, followed by the Netherlands (n=3), Norway (n=3), Finland (n=3), Germany (n=2), Switzerland (n=1) and Greece (n=1). Outside Europe, there were 10 studies from Australia, four from the USA and three from Asia (South Korea (n=2) and Taiwan (n=1)). There were multiple studies using the same data source; for example, six used the British Household Panel Survey (BHPS),[14 21 30 36–38] four studies used the UK Household Longitudinal Study data,[15 21 38 39] while four studies relied on the Household, Income and Labour Dynamics in Australia survey.[40–43]

Methodological quality assessment

The detailed results of the methodological quality assessments are reported in online supplemental table 1. All included studies received at least one star in each of the three assessed domains: selection, comparability and outcome. The lowest-rated studies[26 27 44] received four stars, while the highest-rated study[45] received eight. Three studies received seven stars,[12 46 47] while most were in the midrange, with 13 receiving six stars[13 21 24 25 32 33 35 40 42 48–51] and 18 receiving five stars.[14 15 28–31 34 36–39 41 43 52–56] Midrange ratings were primarily due to reliance on self-reported data for both exposure and outcome. The difference between five- and six-star studies was related to higher attrition rates or inadequate reporting on how attrition was addressed. Only three studies[12 45 46] used register data to measure employment status, and just one study assessed mental health outcomes through records.[45] Although most studies controlled for previous mental health and key confounders such as age, gender and education, only five[24 45 47 49 51] explicitly stated that the outcome was absent at baseline.

RQ1: effect of unemployment versus regular employment on mental health

Of the 18 studies examining the association between regular employment versus unemployment and mental health (table 1), 13 were eligible for meta-analysis. Studies were excluded from the meta-analysis due to duplicated data[36] or the use of effect measures that were not compatible.[25 41 50 53]

Meta-analyses

Unemployment increased the risk of mental health problems: RR 1.95 (95% CI 1.62 to 2.34, I^2=94.5%, n=7 studies, n=1 228 320 individuals) (figure 1). The RR ranged from 1.59 in the UK general population to 2.67 among young workers in Australia, except for one study from Taiwan, which reported an RR close to parity. Similarly, a pooled standardised mean difference (SMD, Cohen's d) of 0.19 (95% CI 0.08 to 0.30, I^2=88.7%, n=5 studies, n=43 778 individuals) indicated higher symptom levels among unemployed individuals. Effect estimates ranged from d=0.1–0.3 and were smallest in studies from the USA and Australia and highest in studies from the UK and Greece. In subgroup analyses, we did not detect significant differences for distress or depression symptoms, and based on qualitative assessment, we did not detect any systematic patterns regarding study sample size, methodological quality or geographical region.

Narrative summary

Among the 13 studies included in the meta-analysis, 12 risk estimates indicated an increased risk of mental health problems, while two studies reported effect estimates with CIs that included zero, one of which reported an RR close to parity. Of the five studies excluded from the meta-analysis, three studies from Australia[25 41 53] and one from Greece[55] reported significantly poorer mental health among unemployed individuals, while one US study[50] found no significant association between unemployment and depression symptoms. In line with pooled estimates, 17 out of 19 studies reported statistically significant associations supporting a negative impact of unemployment on mental health. Two studies with sex-stratified results showed mixed findings: a stronger negative effect among men in Australia[41] and among women in Greece.[55] Additionally, two studies examined the Great Recession (2008–2013) with mixed results: a smaller impact of unemployment during the recession compared with the prerecession in the UK[38] and a greater health deterioration in the Greek working population.[55]

RQ2: effect of re-employment versus unemployment on mental health

Of the 24 studies examining the association between re-employment (re-employed vs continuously unemployed) and mental health (table 2), 17 were eligible for meta-analysis. Studies were excluded from the meta-analysis due to duplicated data,[34] insufficient data[26 29 44] or the use of effect measures that were not compatible with the other studies.[21 25 31]

Meta-analyses

Re-employment reduced the risk of mental health problems: RR of 0.66 (95% CI 0.61 to 0.72, I^2=0.0%, n=5 studies, n=4177 individuals; figure 2). Estimates ranged from RR 0.27 in the

Table 1 Description of included studies reporting effect of employment versus unemployment on mental health, sorted by country (n=18)

Study (country)	Design (waves, follow-up)	Population	Outcome (instrument)	N	Analysis	Key results*	NOS†
Arya 2021 (AU)[52]	Panel (2, 6 years)	Gen. pop. ≥45 years	Dis. (K10)	51 341	Logistic regression	OR: 2.00 (1.1–3.43)	5
Biddle 2023 (AU)[53]	Panel (10, 1 year)	Gen. pop. all ages	Dis. (K6)	17 394	Random-effects probit	ME: 0.074 (p<0.01)	5
Butterworth 2011 (AU)[25]	Panel (7, 1 year)	Gen. pop. all ages	Dis. (MHI-5)	7155	Random-intercept regression	Mean 75.1 (74.9–75.4) versus 68.5 (67.5–69.5)	6
Crowe 2016 (AU)[54]	Panel (3, 4 years)	Gen. pop. 20–24 years	Dep. (Goldberg)	1978	Logistic regression	OR: 2.13 (1.5–3.0)	5
Crowe 2016 (AU)[43]	Panel (3, 6 years)	Gen. pop. 20–34 years	Dis. (MHI-5)	9383	Logistic regression	OR: 3.12 (2.34–4.18)	5
Milner 2014 (AU)[40]	Panel (7, 1 year)	Gen. pop. 15–64 years	Dis. (MCS)	11 204	FE regression	B: 0.52 (0.12–1.02)	6
Richardson 2012 (AU)[41]	Panel (9, 1 years)	Gen. pop. 15–64 years	Dis. (MHI-5)	8487 (F) / 13 752 (M)	FE regression	B: 0.852 (p=0.21) (F); B: 2.647 (p<0.001) (M)	5
Shields 2020 (AU)	Panel (3, 1 years)	Gen. pop. 21 years	Dis. (K6)	12 118	Logistic regression	OR: 2.54 (1.98–3.27)	7
Gander 2021 (CH)[56]	Panel (2, 2y)	Gen. pop. 26–56 years	Dis. (GHQ-12)	181	Linear mixed model (FE)	ΔDis.: 0.09 (p=0.249)	5
Hakulinen 2023 (FI)[45]	Cohort (30 years)	Gen. pop. born 1966–1986	Dep. (ICD F30-39)	1 115 287	Cox regression	HR: 2.08 (2.04–2.12)	8
Drydakis 2015 (GR)[55]	Panel (6, 1 year)	Gen. pop. 18–65 years	Dep. (CES-D)	7295 M/7558 F	FE regression	B: 0.0318 (M); 0.0464 (F) (p<0.01)	5
Chu 2016 (TW)[49]	Panel (2, 12 years)	Gen. pop. 50–64 years	Dep. (CES-D)	1043	Logistic regression	OR: 1.03 (0.6–1.8)	6
Flint 2013 (UK)[14]	Panel (18, 1 year)	Gen. pop. 16–65 years	Dis. (GHQ-12)	2988	FE regression	B: 2.11 (1.89–2.32)	5
Mulligan 2020 (UK)[38]	Panel (15, 1 year)	Gen. pop. 16–64 years	Dis. (GHQ-12)	15 798	FE regression	B: 1.19 (SE 0.074)	5
Steele 2013 (UK)[36]	Panel (19, 1 year)	Gen. pop. male, 16–64 years	Dis. (GHQ-12)	8784	Dynamic panel	B: 0.89 (0.66–1.12)	5
Thomson 2022 (UK)[4]	Panel (9, 1 year)	Gen. pop. 25–64 years	Dis. (GHQ-12)	26 971	Marginal structural modelling	OR: 2.6 (2.33–2.9)	5
Kalousová 2022 (USA)[50]	Panel (3, 2 years)	Gen. pop. 20–34 years	Dep. (PHQ-9)	331	Logistic regression	ME: 0.00 (SE 0.03)	6
Young 2012 (USA)[13]	Panel (2, 2 years)	Gen. pop. all ages	Dep. (CES-D)	3567	FE regression	Δ Score: 0.05 (SE 0.08, p>0.05)	6

Study: first author, publication year and country (AU, CH, FI, GR, TW, UK and USA). Sorted alphabetically by country and author.
Design (waves, follow-up): study design, number of measurement waves and follow-up duration.
Population: general population (Gen.pop).
N is the number of participants included in analyses.
Analysis: statistical method used (FE, random-effects, marginal structural modelling, linear mixed model, dynamic panel, random-intercept and logistic regression).
*Key results: main findings, reported as mean differences (Δ), regression coefficients (B), OR, RR or ME.
†NOS score (0–9), assessing study quality.
AU, Australia; CES-D, Centre for Epidemiologic Studies Depression Scale; CH, Switzerland; Dep., depression symptoms; Dis., distress symptoms; F, female; FE, fixed-effects; FI, Finland; GHQ-12, General Health Questionnaire; GR, Greece; ICD, International Classification of Diseases; K6/K10, Kessler Psychological Distress Scales; M, male; MCS, mental component summary; ME, marginal effects; MHI-5, Mental Health Inventory; NOS, Newcastle-Ottawa Scale; PHQ, Patient Health Questionnaire; RR, risk ratio; TW, Taiwan.

Table 2 Description of included studies reporting effects of re-employment versus unemployment on mental health, sorted by country (n=24)

Study	Design (waves, follow-up)	Population	Outcome (instrument)	N	Analysis	Key results	NOS
Butterworth 2011 (AU)[25]	Panel (7, 1 year)	Gen. pop. all ages	Dis. (MHI-5)	7155	Random-intercept regression	Δ −1.68 (SE 0.08)	6
Ye 2023 (AU)[42]	Panel (5, 1 year)	Gen. pop. 15–64 years	Dis. (MHI-5)	6652	FE regression	Δ −1.4 (95% CI 0.5 to 2.2)	6
Morrell 1994 (AU)[24]	Cohort (3 years)	Gen. pop. 15–25 years	Dis. (GHQ-12)	445	Mantel-Haenszel	RR 1.76 (p≤0.01)	6
Gander 2021 (CH)[56]	Panel (2, 2 years)	Gen. pop. 26–56 years	Dis. (GHQ-12)	222	LMM	Δ 0.23 (p<0.001)	5
Unger 2018 (DE)[12]	Panel (2, 3 years)	Gen. pop. 31–60 years	Dis. (SF-12)	664	OLS (DiD)	Δ 1.71 (p>0.1)	7
Zechmann 2019 (DE)[35]	Panel (6, 3–5 months)	Unemployed all ages	Dis. (GHQ-12)	775	Multilevel	Δ −0.33 (SE 0.04)	6
Lahelma 1992 (FI)[26]	Cohort (15 months)	Unemployed 25-49 years	Dis. (GHQ-12)	1375	Logistic regression	OR 0.26 (NR)	5
Vuori 1999 (FI)[29]	Cohort (2, 1 year)	Job seekers 18–54 years	Dis. (GHQ-20)	401	ANOVA	Mean difference at T2: 3.83, p<0.001).	5
Kim 2013 (KR)[51]	Panel (2, 1 year)	Gen. pop. ≥18 years	Dep. (CES-D)	308	Poisson regression	RR 0.26 (0.11–0.63)	6
Roh 2014 (KR)[44]	Cohort (18 months)	Unemployed all ages	Dis. (GHQ-12)	196	Analysis of covariance	Mean (T2): 2.16 versus 2.28 (p<0.1)	4
Carlier 2018 (NL)[48]	Panel (2, 2 years)	Unemployed all ages	Dis. (K10 and SF-12)	434	Generalised estimating equations	K10: B −3.67 (p<0.10); SF-12: B 2.89 (p>0.10)	5
Schuring 2011 (NL)[28]	Cohort (6 months)	Gen. pop. 18–64 years	Dis. (SF-36)	965	OLS regression	B 11.0 (SE 2.7)	5
Van de Ven 2022 (NL)[46]	Panel (7, 1 year)	Gen. pop. 45–64 years	Dis. (SF-12)	1882	Generalised LMM	Δ 0.65 (−0.36 to 1.66)	7
Claussen 1993 (NO)[33]	Cohort (2 years)	Unemployed 16-–63 years	Dep./Dis. (GHQ-12 and HSCL)	310	Logistic regression	Dep.: RR 0.45 (p<0.05); Dis.: RR 0.80 (n.s.)	6
Claussen 1999 (NO)[34]	Cohort (5 years)	Unemployed 16–63 years	Dep./Dis. (GHQ-12 and HSCL)	310	Logistic regression	Dep.: OR 0.26 (0.10–0.64); Dis.: OR 0.76 (0.20–1.34)	5
Halvorsen 1998 (NO)[31]	Cohort (18 months)	Gen. pop. 20–59 years	Dis. (HSCL-10)	501	OLS regression	β −0.11 (p<0.05)	5
Chung 2021 (UK)[15]	Panel (6, 1 year)	Gen. pop. 16–64 years	Dis. (GHQ-12)	14 992	Dynamic panel	Δ −1.86 (p<0.01)	5
Flint 2013 (UK)[14]	Panel (17, 1 year)	Gen. pop. 16–65 years	Dis. (GHQ-12)	994	FE regression	Δ −0.58 (−0.29 to −0.88)	5
Thomas 2007 (UK)[30]	Panel (10, 1 year)	Gen. pop. ≥16 years	Dis. (GHQ-12)	1346	Random-effect regression	OR 0.52 (0.41–0.68 (M) and 0.68 (0.51–0.92) (F)	6
Thomson 2022 (UK)[4]	Panel (9, 1 year)	Gen. pop. 25–64 years	Dis. (GHQ-12)	1618	Marginal structural modelling	OR: 0.65 (0.58–0.72)	6
Steele 2013 (UK)[36]	Panel (19, 1 year)	Gen. pop. M, 16–64 years	Dis. (GHQ-12)	8784	Dynamic panel	B −2.05 (−2.36 to −1.75)	5
Wang 2021 (UK)[21]	Panel (27, 1 year)	Gen. pop. 16–64 years	Dis. (GHQ-12)	13 155 (F) / 10 686 (M)	FE regression.	EMM: 24.35 (24.25–24.45) versus 22.88 (22.58–23.15) (F) 25.65 (25.58–25.71) versus 23.65 (23.41–23.90) (M)	6
Prause 2001 (USA)[32]	Cohort (12 months)	Gen. pop. 14–21 yeas	Dep. (CES-D seven-item)	325	OLS regression	β −1.59 (p<0.05)	6
Wanberg 1995 (USA)[27]	Cohort (9 months)	Job seekers 18–60 years	Dis. (GHQ-12)	129	ANOVA	Δ −4.81 (SE 2.50)	4
Young 2012 (USA)[13]	Panel (2, 2 years)	Gen. pop. all ages	Dep. (CES-D)	202	FE regression	Δ 0.15 (p<0.05)	6

Study (country): first author, publication year and country.
Design (waves, follow-up): study design, number of measurement waves and follow-up duration.
Population: General population (Gen.pop.), job seekers or unemployed individuals.
N is the number of participants included in the analyses.
Analysis: statistical method used (FE regression, DiD, OLS regression, etc).
Key results: main findings, reported as mean differences (Δ), regression coefficients (B), OR, RR or EMM and reported uncertainty estimates (CIs, p values, SE or NR).
NOS score (0–9), assessing study quality.
ANOVA, analysis of variance; AU, Australia; CES-D, Center for Epidemiologic Studies Depression Scale; CH, Switzerland; DE, Germany; Dep., depression symptoms; DiD, difference-in-differences; Dis., distress symptoms; EMM, estimated marginal means; F, female; FE, fixed-effects; FI, Finland; GHQ-12, General Health Questionnaire; HSCL, Hopkins Symptoms Checklist; K6/K10, Kessler Psychological Distress Scales; KR, South Korea; LMM, linear mixed model; M, male; MHI-5, Mental Health Inventory; NL, Netherlands; NO, Norway; NOS, Newcastle-Ottawa Scale; NR, not reported; OLS, ordinary least squares; RR, risk ratio; SF-12 or -36, Short Form Survey.

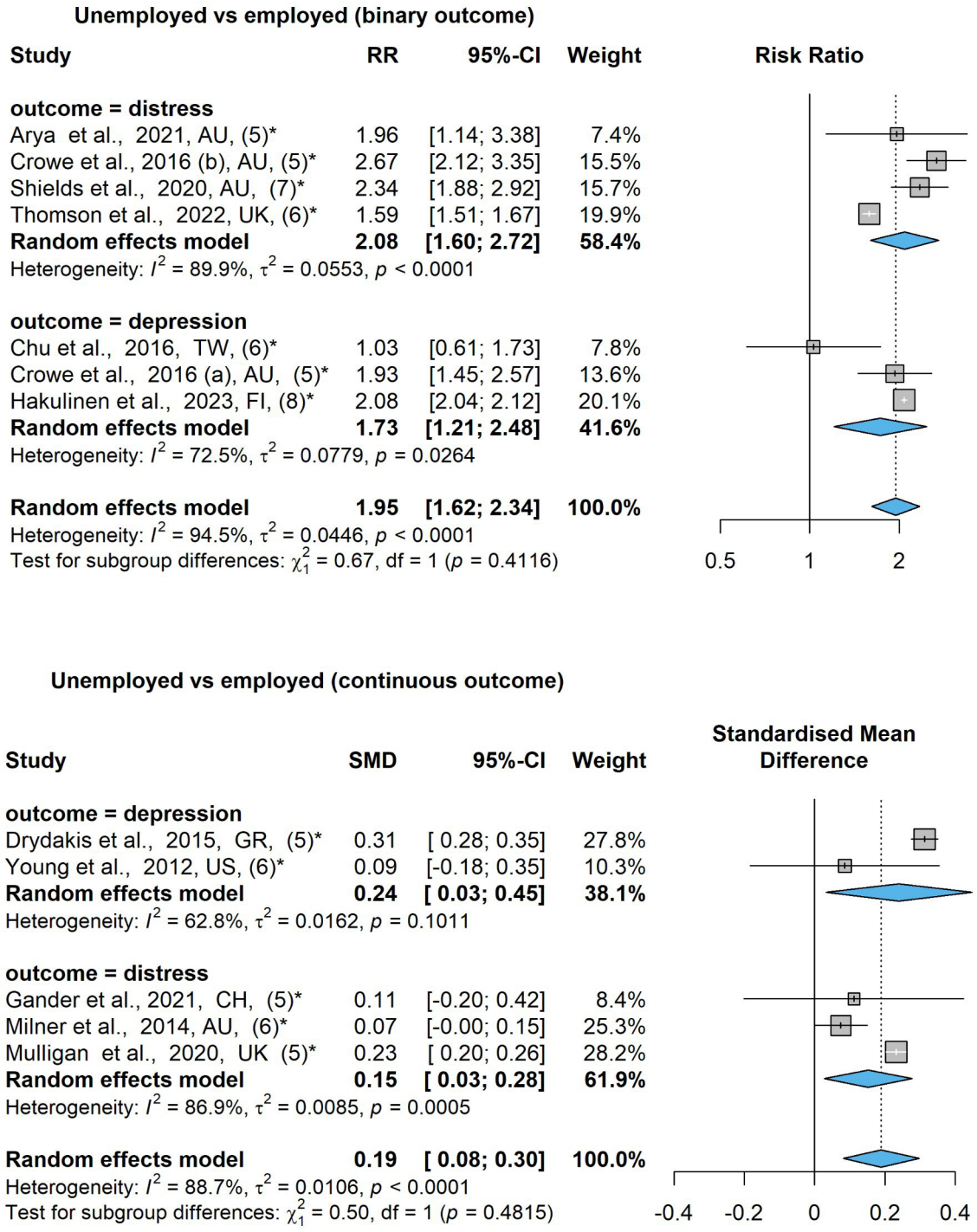

Figure 1 Forest plots showing the effect of unemployment versus regular employment on mental health (coded so that RR >1 indicates a higher risk of mental health problems, and SMD >0 reflects more symptoms). Study (country): first author, publication year and country. *Quality assessment score (Newcastle-Ottawa Scale). AU, Australia; CH, Switzerland; FI, Finland; GR, Greece; RR, relative risk; SMD, standardised mean difference; TW, Taiwan.

Korean general population to RR 0.85 in Norway, both from small studies. Pooled analyses of between-group and within-group change scores yielded SMDs of −0.27 (95% CI −0.35 to −0.20, I²=40.1%, n=8 studies, n=21 117 individuals) and −0.19 (95% CI −0.29 to −0.1, I²=85.1%, n=7 studies, n=3676 individuals), respectively, indicating reduced mental health symptoms among re-employed individuals. Subgroup analyses showed no significant differences between distress and depression outcomes, and no systematic patterns were found based on sample size, study quality or geographical region.

Narrative summary

Among the 19 studies in the meta-analysis, all indicated a reduced risk of mental health problems with re-employment, although six had CIs that included zero. Of the five studies not included in the meta-analysis, re-employed individuals had significantly fewer mental health symptoms in general population studies from South Korea,[44] Norway,[34] the UK[21] and the Netherlands,[28] as well as in a Finnish sample of unemployed individuals.[29] Consistent with pooled estimates, 18 out of 24 studies reported

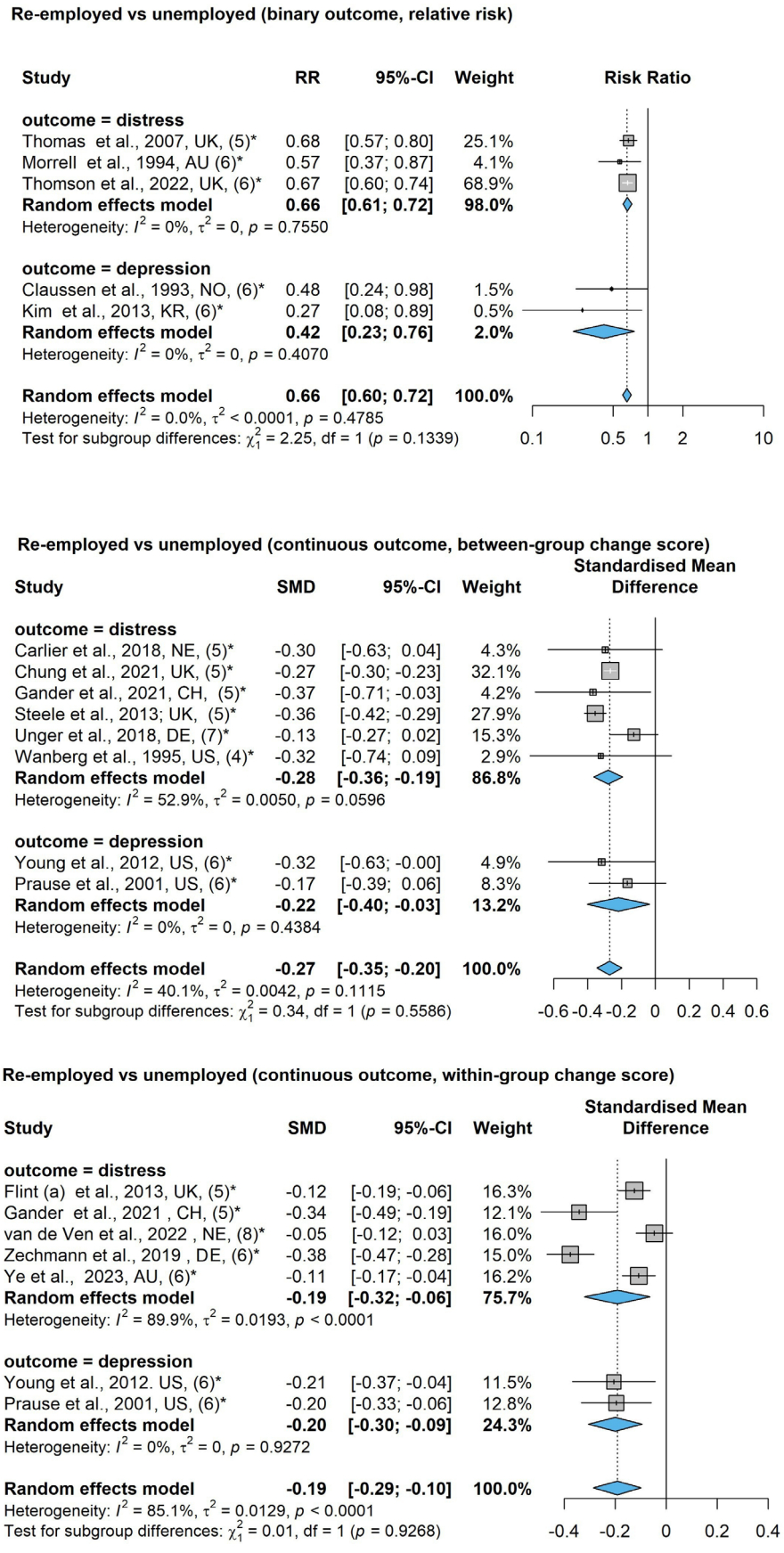

Figure 2 Forest plots showing the effect of re-employment versus unemployment on mental health (coded so that RR >1 indicates a higher risk of mental health problems, and SMD >0 reflects more symptoms). Study (country): first author, publication year and country. *Quality assessment score (Newcastle-Ottawa Scale). AU, Australia; CH, Switzerland; DE, Deutschland; FI, Finland; GR, Greece; KR, South Korea; NE, Netherlands; NO, Norway; RR, risk ratio; SMD, standardised mean difference; TW, Taiwan.

Table 3 Assessment of the certainty of evidence using a GRADE approach

Comparison	Analysis type	GRADE downgrades	N (studies/ participants)	RR (95% CI)	SMD (95% CI)	Certainty
Unemployment versus employment	Adjustment for baseline risk	None	7/1 228 320	**1.95 (1.62 to 2.34)**	0.36 (0.27 to 0.47)	Low
	Between-group mean DiD	None	5/43 778	1.41 (1.16 to 1.71)	**0.19 (0.08 to 0.30)**	Low
Re-employment versus unemployment	Adjustment for baseline risk	None	5/4177	**0.66 (0.61 to 0.72)**	−0.22 (−0.27 to −0.18)	Low
	Within-group mean DiD	None	7/3676	0.71 (0.61 to 0.81)	**−0.19 (−0.29 to −0.10)**	Low
	Between-group mean DiD	None	8/21 117	0.61 (0.53 to 0.70)	**−0.27 (−0.35 to −0.20)**	Low

Estimates in bold represent the original estimate from the meta-analyses. Estimates in regular text are approximations recalculated from SMD to RR and vice versa using the formula: $d=(\sqrt{h}*r)/\sqrt{(1-r^2)}$ and $r=d/\sqrt{(d^2+h)}$.
Quality downgrading criteria: 0 indicates no serious concern, meaning the quality is not downgraded from the baseline. −1 indicates a serious concern, leading to a downgrade of the evidence by one level (eg, from high to moderate). −2 indicates a very serious concern, leading to a downgrade of the evidence by two levels (eg, from high to low).
DiD, difference-in-difference; GRADE, Grading of Recommendations Assessment, Development and Evaluation; RR, risk ratio; SMD, standardised mean difference.

significant associations supporting the positive impact of re-employment on mental health. Three sex-stratified studies showed mixed results: two UK studies reported a larger symptom reduction in men compared with women[15] and a similar effect for both sexes,[21] while a German study[12] reported improvements only in women.

Four studies examined job quality as a modifier of re-employment effects. In Australia, transitioning to a high-quality job improved mental health, whereas a poor-quality job was more detrimental than remaining unemployed.[25] In Norway and the USA, secure[31] and high-quality jobs[27] reduced distress compared with unemployment,[31] while insecure and low-quality jobs showed no benefit. However, a Dutch study of workers aged 45 and older found no significant interaction with job quality.[46]

Certainty of evidence

The certainty of evidence using the GRADE approach is summarised in table 3. Since all studies were observational, the initial certainty was rated as low due to potential residual confounding. No serious concerns regarding risk of bias, indirectness or imprecision warranted further downgrading. Statistical heterogeneity (I^2) was high in three of five meta-analyses, but effect estimates were largely consistent, with only one study deviating and six of 23 having CIs crossing zero. As the overall pattern remained stable, we did not downgrade for inconsistency. Given the small number of studies for specific meta-analyses, we qualitatively assessed for publication bias and examined for any clear pattern between effect size and study characteristics, including study size and our quality ratings. No such patterns were evident from these qualitative checks, suggesting a moderate to low risk of publication bias and supporting that study quality did not systematically influence the reported effect sizes. While GRADE allows for upgrading based on large effects, dose-response relationships or minimal confounding, no strong justification was found. The effects of unemployment and re-employment on mental health were generally consistent but of weak to moderate magnitude. Thus, the certainty of evidence remains low for both the negative impact of unemployment and the beneficial effect of re-employment on mental health.

DISCUSSION

Based on a systematic literature search, we conducted an updated systematic review and meta-analysis, incorporating 11 studies (1990–2012) from a previous review and 27 additional studies (2012–2024). Through narrative synthesis and meta-analysis, this review found a consistent small to moderate increase in the risk of mental health problems due to unemployment compared with those employed (RQ1) and a comparable reduction in risk following re-employment among previously unemployed individuals (RQ2). Our GRADE assessment indicates low certainty of evidence for both the negative impact of unemployment and the beneficial effect of re-employment on mental health.

Comparison with previous reviews

Previous meta-analyses have provided valuable insights into the relationship between employment status and mental health. Paul and Moser, who included studies from 1963 to 2004, found that re-employment reduced mental health symptoms (Cohen's d, SMD=−0.35), while unemployment had a smaller negative effect (SMD=−0.08).[6] In the most recent review covering the period 1990–2012, Van der Noordt *et al*[11] reported lower odds of depression (OR=0.52, approximating SMD≈−0.36) and distress (RR=0.79, approximating SMD≈−0.12) following re-employment.[11] Our study found no major differences between depression and distress outcomes. While our re-employment estimates were slightly weaker (SMD=−0.19 to −0.25; RR=0.64–0.71), unemployment had a stronger negative impact (SMD=0.19, RR=1.95) than in Paul and Moser's study. A recent meta-analysis of unemployment and well-being reported SMD estimates of −0.18 for distress and −0.23 for depression symptoms.[9]

Our review builds on van der Noordt *et al*[11] by incorporating more recent studies and applying a more rigorous methodology. It includes nearly three times as many studies, covering the period 1990–2024. Unlike previous reviews, we applied stricter inclusion criteria to ensure direct comparisons between unemployed and employed individuals, reducing confounding by other forms of economic inactivity. Moreover, we conducted separate meta-analyses for unemployment and re-employment and differentiated between studies, adjusting for baseline health and those using fixed regression models to examine the impact of individual changes in employment status on mental health. The use of fixed-effect (FE) models strengthens causal inference by accounting for time-invariant individual differences.

Implications for research and society

The higher prevalence of poor mental health among unemployed individuals may reflect both causation (unemployment worsening mental health) and selection (poorer mental health increasing unemployment risk). While longitudinal data and FE models help disentangle these mechanisms, selection bias remains a challenge. Most studies compare only two time points, failing

to capture pretransition health trends, even though the effects of unemployment and re-employment on mental health are likely to evolve over time. Health improvements or deteriorations may begin before the transition, highlighting the need for research with multiple repeated measurements. As an example, a Dutch study of workers aged 45 and older illustrated this, showing mental health improvements before re-employment, peaking in the transition year and then gradually declining.[46] These methodological gaps in the primary research are key reasons why definitive conclusions remain uncertain, even from a large body of such studies.

Effect sizes may vary by sociodemographics (eg, gender and age) and country-level factors (eg, welfare policies and unemployment rates). Though sex-stratified meta-analysis was not feasible, the few studies that addressed this question showed mixed results.[12 15 41 55] Thus, there is very limited evidence to suggest that the effects of unemployment or re-employment differ systematically by sex. Similarly, too few studies were available to meaningfully categorise findings by welfare regime. However, effect sizes were in the upper range across diverse countries (eg, the UK, Greece, Finland, Norway and Australia) and varied even within the same country (eg, Australia[24 40 41 52 54] and the Netherlands[46 48]).

Additionally, two studies reported mixed results for the impact of unemployment during the economic recession.[38 55] While welfare state differences cannot be ruled out, future research should use harmonised cross-country datasets or individual participant data meta-analyses to improve comparability. An analysis by welfare regime, had it been possible, would have offered valuable insights, as national welfare systems and labour market policies—such as the generosity and duration of unemployment benefits or access to active labour market programmes—can substantially moderate the psychosocial consequences of unemployment and the benefits of re-employment. Further studies should also explore sex differences in employment transitions across welfare regimes and their intersection with age.

Although evidence remains scarce, job quality appears crucial in moderating the effects of re-employment. The types of jobs available, especially for those returning after mental health-related absences, may determine whether employment benefits well-being. Some studies suggest that re-employment in jobs with good working conditions[25 27] and job security[31] improves mental health, whereas insecure jobs with poor psychosocial working conditions offer little to no benefit[27 31] or may even be more detrimental than remaining unemployed.[25] However, one study found no significant interaction between re-employment and job quality in its impact on mental health in a study of workers aged 45 and older.[46] These findings highlight the need for further research on how job quality, including aspects such as precarious employment, influences mental health following re-employment, particularly for individuals with a history of mental health issues. Although precarious employment was not the focus of this review due to scope limitations, it has been addressed in recent systematic reviews[4 5] and warrants continued investigation.

Regardless of causal interpretations, the present results highlight the importance of policies that not only support employment but also facilitate access to secure jobs and supportive work environments. By integrating mental health support into employment services, policymakers can better mitigate the negative effects of unemployment and enhance job seekers' long-term well-being. A recent systematic review found that mental health-focused interventions for people experiencing unemployment generally have value at both treatment and prevention levels.[57] Beyond improving mental well-being, such measures may also enhance job readiness and increase the likelihood of re-employment.

Methodological quality of the studies included

Most studies were of moderate quality based on our NOS evaluation. They generally represented the working population, with exposed and control groups drawn from the same source. Since randomisation to unemployment and re-employment is unethical, included studies were observational panel or cohort designs, offering the best available evidence.

Panel studies strengthen internal validity through repeated measurements, but attrition and inadequate handling of missing data can bias results. In survey-based studies, attrition often disproportionately affects individuals with poorer mental health or job instability. For instance, in the UK BHPS panel, psychological distress and unemployment predicted loss to follow-up,[30] potentially underestimating mental health risks for the unemployed. In re-employment analyses, bias may arise if individuals with persistent distress are less likely to return to work and more likely to drop out, inflating positive effects due to a 'healthy worker' bias.

Exposure and outcome measures were primarily self-reported using validated instruments. While employment status is reliably self-reported, administrative records can offer more detailed and precise employment histories. For mental health outcomes, register data provide systematic coverage of diagnosed conditions but are limited by the underdiagnosis of mental disorders in the general population[58] and, therefore, cannot be considered a gold standard. In contrast, self-reported measures can capture a broader spectrum of symptoms, including subclinical and undiagnosed conditions, and are thus a pragmatic and widely used approach in population-based studies. Ideally, future research would include cohort designs with repeated clinical diagnostic interviews to strengthen the evidence base, though these are resource-intensive and challenging to implement at scale. It remains important to acknowledge that common method bias may arise when both employment status and mental health are self-reported at the same time point.[28]

Residual confounding is a key limitation in non-randomised studies if essential factors are unmeasured or inadequately adjusted. Most studies controlled for relevant covariates prespecified in the protocol: age, gender, education, socioeconomic status and mental health.[17] Prior mental health was accounted for by study design or statistical adjustments, but few studies confirmed its absence at baseline. Additionally, most did not explore potential moderators, meaning small overall effects could obscure larger subgroup differences. While selection and information biases may affect estimates, we judge the overall risk of bias as moderate. Heterogeneity was expected but showed no clear link to study quality or country of origin.

Strengths and limitations of this review

Our review has several strengths. We followed systematic review guidelines, adhering to a preregistered protocol with predefined research questions, search strategy and inclusion criteria. Study selection and appraisal were based on prespecified criteria, with independent assessments and consensus meetings. We also follow the PRISMA 2020 guideline for reporting systematic reviews.[17]

To enhance efficiency, we manually screened only 28% of records, using EPPI-Reviewer's priority screening tool, which effectively identifies relevant studies early in the process.[59] The recall plot indicated that relevant study identification plateaued

after 1000 screened records, with few additional relevant studies found thereafter, suggesting a low probability of missing relevant studies. Additionally, we implemented a rigorous stopping rule, requiring that no relevant records be identified in the last 600 screened before concluding manual screening. Given these safeguards, we consider the risk of missing important studies to be minimal.

However, some limitations apply. First, our search was restricted to 2012–2024, relying on Van der Noordt *et al*[11] for studies from 1990 to 2012. Differences in search strategies and inclusion criteria between the two reviews may have affected comparability. However, both reviews followed systematic review guidelines, and we excluded studies from Van der Noordt *et al* that did not meet our inclusion criteria, ensuring consistency in the selection process. While narrow inclusion criteria improved comparability and enabled meta-analyses, they restricted conclusions to individuals currently in the workforce. Furthermore, the geographical distribution of the included studies should be noted: of the 38 studies, 21 were from Europe (eight from the UK), 10 from Australia, four from the USA and three from Asia. While findings likely generalise across diverse regions, the overrepresentation of UK and Australian studies may limit broader applicability. Regional differences warrant further investigation.

Finally, to assess certainty of evidence, we applied the GRADE approach, which is widely used but typically assigns an initial 'low' certainty to observational studies. This has prompted debate about its suitability in fields like occupational and environmental health, where randomised trials are rarely feasible. Alternative frameworks, such as the Navigation Guide, developed for environmental health sciences reliant on observational studies, begin with a 'moderate' rating for high-quality observational studies[60] and may offer a more appropriate framework in such contexts. While a full comparison is beyond our scope, we followed GRADE to ensure a transparent and systematic assessment, while acknowledging the relevance of ongoing discussion around grading methodologies.

CONCLUSIONS

Our systematic review and meta-analysis addressed two distinct but related aspects of employment and mental health. The findings suggest that unemployment, compared with regular employment (RQ1), increases the risk of mental health problems and that the transition from unemployment to re-employment (RQ2) may reduce this risk. Despite these consistent directional findings, the overall certainty of the evidence—as assessed using the GRADE approach—remains low for both the negative effects of unemployment and the positive effects of re-employment. Strengthening the evidence base requires longitudinal studies with multiple follow-ups and detailed, objective data on employment transitions and mental health. Such research is crucial for clarifying causal pathways and mental health trajectories before and after re-employment across different job types and policy contexts.

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Contributors All authors (TS, LKL, RB, KIP and FA) contributed to the development and planning of the review. TS conducted the analyses and GRADE evaluation, drafted the manuscript and is the guarantor for the review. A research librarian developed the search strategy and conducted the database searches. FA, LKL and RB screened titles and abstracts, and FA, LKL and RB screened the papers in full text. FA, LKL and TS conducted the quality appraisal of the included studies. FA and TS extracted data from the included studies. All authors critically revised and commented on the manuscript draft and read and approved the final manuscript. ChatGPT AI was used to a limited degree to optimise the text.

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ORCID iDs
Tom Sterud http://orcid.org/0000-0001-8393-8923
Lars-Kristian Lunde http://orcid.org/0000-0001-6219-9244
Rigmor Berg http://orcid.org/0000-0002-6915-0993
Karin I Proper http://orcid.org/0000-0001-7016-1625
Fiona Aanesen http://orcid.org/0000-0002-3284-8060

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