



How do employment conditions and psychosocial workplace exposures impact the mental health of young workers? A systematic review

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Abstract

Purpose To assess the quality of the research about how employment conditions and psychosocial workplace exposures impact the mental health of young workers, and to summarize the available evidence.

Methods We undertook a systematic search of three databases using a tiered search strategy. Studies were included if they: (a) assessed employment conditions such as working hours, precarious employment, contract type, insecurity, and flexible work, or psychosocial workplace exposures such as violence, harassment and bullying, social support, job demand and control, effort-reward imbalance, and organizational justice; (b) included a validated mental health measure; and (c) presented results specific to young people aged ≤ 30 years or were stratified by age group to provide an estimate for young people aged ≤ 30 years. The quality of included studies was assessed using the Risk of Bias in Non-randomized Studies of Exposures (ROBINS-E) tool.

Results Nine studies were included in the review. Four were related to employment conditions, capturing contract type and working hours. Five studies captured concepts relevant to psychosocial workplace exposures including workplace sexual harassment, psychosocial job quality, work stressors, and job control. The quality of the included studies was generally low, with six of the nine at serious risk of bias. Three studies at moderate risk of bias were included in the qualitative synthesis, and results of these showed contemporaneous exposure to sexual harassment and poor psychosocial job quality was associated with poorer mental health outcomes among young workers. Longitudinal evidence showed that exposure to low job control was associated with incident depression diagnosis among young workers.

Conclusions The findings of this review illustrate that even better studies are at moderate risk of bias. Addressing issues related to confounding, selection of participants, measurement of exposures and outcomes, and missing data will improve the quality of future research in this area and lead to a clearer understanding of how employment conditions and psychosocial workplace exposures impact the mental health of young people. Generating high-quality evidence is particularly critical given the disproportionate impact of COVID-19 on young people's employment. In preparing for a post-pandemic world where poor-quality employment conditions and exposure to psychosocial workplace exposures may become more prevalent, rigorous research must exist to inform policy to protect the mental health of young workers.

Keywords Young people · Mental health · Work · Employment conditions · Psychosocial workplace exposure · Risk of bias · Review

Background

Employment is a key social determinant of health [1, 2] and has wide-reaching consequences on employees' physical [3] and mental health [4, 5]. Because the conditions in which people work are socially structured, individuals who have the least power and fewest political, economic, social, and cultural resources are likely to experience greater exposure to poorer working environments and unemployment

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[6]. Young people are one such group, and many may face a conflation of disadvantages related to employment that lead to social exclusion as they transition from education to work [7]. This has been exacerbated in the current climate of COVID-19 economic repercussions, as industries in which young people are concentrated, such as tourism and hospitality, have been disproportionately affected by job losses, hours reductions, and uncertain business futures [8–11]. Recovery in these sectors is anticipated to be slow, leading to continued unemployment and underemployment among young people, as well as greater competition for the jobs that do exist, potentially eroding employment conditions and increasing exposure to psychosocial workplace exposures.

The process of transitioning from education to the labour force for young people has become increasingly longer and more difficult globally [12], and this will likely be intensified by COVID-19. In addition to rising unemployment rates among young people, the quality of employment for young people is a significant concern: young people are more likely to work in poor-quality, insecure, and unstable jobs with low wages, and permanent positions are rare [13, 14]. This is troubling, as workers in jobs characterized by these conditions are more vulnerable to psychosocial workplace exposures such as bullying [15], and individuals in lower status jobs may be more likely to experience greater job demand and reduced control [16].

The age at which people transition from education to work is also commonly associated with the first onset of mental illness. Approximately half of lifetime mental disorders start by the mid-teens, and 75% start by the mid-twenties [17]. In countries such as Australia, people aged 16–25 years have the highest prevalence of mental illness compared to all other age groups [18]. It is therefore critically important to consider the sensitivity of this time period for young people's mental health in the context of the work experiences they are encountering, as poorer employment conditions and exposure to psychosocial workplace exposures, such as that marked by poor psychosocial working environments [19], increased job strain [20], effort-reward imbalance [21], lack of organizational justice [22], low social support [23], and job insecurity [24] are associated with poorer mental health in the general population.

While the associations between poorer employment conditions and psychosocial workplace exposures and mental health have been frequently asserted in the literature [19, 20, 23–25], a paucity of research has focused on people aged 30 years and under as they transition into the labour force. The existing scoping review [26] highlighted the importance of exploring how precarious employment affects the health of young workers, but is not systematic and therefore does not collate and evaluate the quality of all relevant evidence. The previous systematic review [27] in this area was broad in scope, leading to heterogenous outcome measures which

may obfuscate the true relationship between exposures and outcomes. This review placed little emphasis on quality assessment results, and provided scant discussion of how flaws in included studies may impact their results, and therefore their policy and practice relevance. This raises significant concerns about the risk of bias in available evidence and its implications for interpreting and applying study results. Considering the substantial impact of the COVID-19 pandemic on young people's employment, accurately understanding how employment conditions and psychosocial workplace exposures impact the mental health of young people is more important than ever before. Therefore, the aim of this systematic review is to focus specifically on young people as they are entering and establishing themselves in the workforce, and to assess how employment conditions and psychosocial workplace exposures impact mental health. We use a rigorous Risk of Bias tool to assess the quality of the literature and provide considerations for improving the quality of future research.

Methods

Search strategy and selection criteria

For this systematic review, we searched Scopus, PsycINFO, and Pubmed from their inception to 22 January 2021. We used a three-tiered search strategy to identify studies including terms relating to mental health, employment, and young people. We then applied an additional fourth tier relevant to employment conditions and psychosocial workplace exposures. See Appendix 1 for the search terms used for each tier and for information on how they were combined. No restrictions were placed on language or publication type. This systematic review is registered with PROSPERO (CRD42020151406). We note that since registration with PROSPERO, the review has been modified in response to reviewers' comments.

Studies were included if they assessed the effect of employment conditions or psychosocial workplace exposures on mental health for people aged ≤ 30 years. We were purposefully broad with our conceptualization of employment conditions and psychosocial workplace exposures. This is because some concepts, such as precarious employment [28], are discussed and assessed in myriad ways in the literature and may not be conceived of uniformly. In particular, exposures of interest included employment conditions such as working hours, notions of precarious employment, contract type, insecurity, and flexible work. With regards to psychosocial workplace exposures, we were interested in violence, harassment, and bullying, social support, job demand and control, effort-reward imbalance, and organizational justice. Measures of job quality which included

components of employment conditions and/or psychosocial workplace exposures were eligible for inclusion. We were deliberately inclusive with the measurement of exposures, as we anticipated that most exposures would be measured through self-report and without using validated tools. Studies which included individuals of working age (15–30 years inclusive) were eligible for inclusion. We accepted studies wherein individuals experiencing the exposures of interest were compared to unexposed individuals, unemployed individuals, or individuals who were not in the labour force. We excluded physical, ergonomic, or chemical workplace exposures, as we were not interested in indirect mental health effects which would be mediated by physical health effects. Our focus was on identifying ways to improve the psychosocial working conditions and arrangements of young people.

We focused on the common mental disorders anxiety and depression as outcomes and, therefore, included any studies that either (1) used a validated mental measure of symptomatology, such as depression and depressive symptoms, anxiety or anxiety symptoms, general mental health status (e.g. SF-36), or psychological distress (e.g. K6), or (2) included a mental health diagnosis or register data such as hospital admission records for a mental health condition.

We included international evidence from all countries in our review, and only considered research that was published in peer-reviewed journals. Studies with a prospective cohort, case–control, retrospective, cross-sectional, or intervention trial design were considered for inclusion, as we wanted to present all the literature identified relating to this age group, enabling comprehensiveness while acknowledging limitations. We excluded studies which were case reports, qualitative in nature, study protocols, or descriptive works only. Studies which could not be obtained in English were excluded, as were existing reviews. Where the same dataset was used in multiple studies, we included the most recent study covering the longest period.

Two reviewers (MS and AM) reviewed extracted titles and abstracts using Excel. Disagreement was resolved by including the article. Articles identified as potentially relevant were screened in full and assessed for inclusion by one reviewer (MS).

Data extraction and analysis

Data were extracted by one reviewer (MS) in a pre-piloted data extraction tool in Microsoft Excel. Data were extracted on study design, study sample, workplace exposure, outcome measure, method of statistical analysis, and key results.

Risk of bias was assessed using the Risk of Bias in Non-randomized Studies of Exposures (ROBINS-E) tool. The ROBINS-E tool is based on the ROBINS-I instrument [29]. There are three steps to applying the ROBINS-E tool, two of which are done prior to its application. First, reviewers

must clarify their review question and identify considerations specific to their topic, such as potential confounders, which are important when assessing bias. Second, the authors then describe a hypothetical, ideal randomized controlled trial which would answer their review question. Finally, authors evaluate each study as compared to the ideal study across the seven risk of bias (RoB) items: (1) bias due to confounding, (2) bias in selection of participants into the study, (3) bias in classification of exposures, (4) bias due to departures from intended exposures, (5) bias due to missing data, (6) bias in measurement of outcomes, (7) bias in selection of the reported result.

RoB on each item is evaluated as ‘low’, ‘moderate’, ‘serious’, or ‘critical’, and reviewers determine both a study-level and an item-level RoB judgment. An important benefit of the ROBINS-E approach to RoB assessment is that it moves away from study-design-based judgments, such as non-randomized studies automatically receiving higher RoB than RCTs using the GRADE approach [30].

Two reviewers (MS and TK) independently evaluated the RoB of included studies. Differences were resolved by consensus, with input from a third reviewer (MJS). We used the available ROBINS-E template [31] to create a custom template with the signaling questions tailored to our review topic and ideal RCT. Studies were classified at low risk of bias if all RoB items were coded as low risk, moderate risk of bias if one or more items were coded as moderate but none as serious, serious risk of bias if at least one item was coded as serious but none as critical, and critical risk of bias if at least one item was coded as critical [32]. In line with ROBINS-I guidance which advocates caution in including studies at increased risk of bias in analyses, [32] we have included only studies at low or moderate risk of bias in the qualitative synthesis.

Key findings from the included studies were summarized in a descriptive table and discussed using a narrative/descriptive synthesis. While the aim of our study was to pool the available evidence and conduct a meta-analysis, we were unable to do this because of variation in exposure and outcome measures and because an insufficient number of studies were identified as having a low or moderate risk of bias. Our review followed PRISMA guidelines [33], see Appendix 2.

The funders of the study had no role in study design, data collection, data analysis, data interpretation, or writing of the report. The corresponding author had full access to all the data in the study and had final responsibility for the decision to submit it for publication.

Results

Study characteristics

The flow of studies into the review is shown in Fig. 1. After full-text review, 27 studies were excluded. The studies and reasons for exclusion can be seen in Appendix 3. Nine studies were identified for inclusion in the systematic review and are detailed in Table 1. Of the nine studies, four were related to employment conditions, capturing contract type and working hours [34–37]. The five remaining studies captured concepts relevant to psychosocial workplace exposures including workplace sexual harassment [38, 39], psychosocial job quality [40], work stressors [41], and job control [42].

Three of the nine studies used data from the United States [38, 39, 41]. Of the remaining six, one was from France [34], one from Canada [35], one from Turkey [36], one from Egypt [37], one from Australia [40], and one from Denmark. [42] Three studies used a cross-sectional design [34, 36, 38], while the remaining six used prospective cohorts and employed a longitudinal design. [35, 37, 39–42] Descriptive information related to the studies is shown in Table 1.

Risk of bias assessment

A summary of the study-level and item-level RoB is shown in Table 2. Regarding bias due to confounding, one study was at low risk, five studies were at moderate risk and three were at serious risk. We judged two studies to be at low risk of bias due to the selection of participants, four at moderate

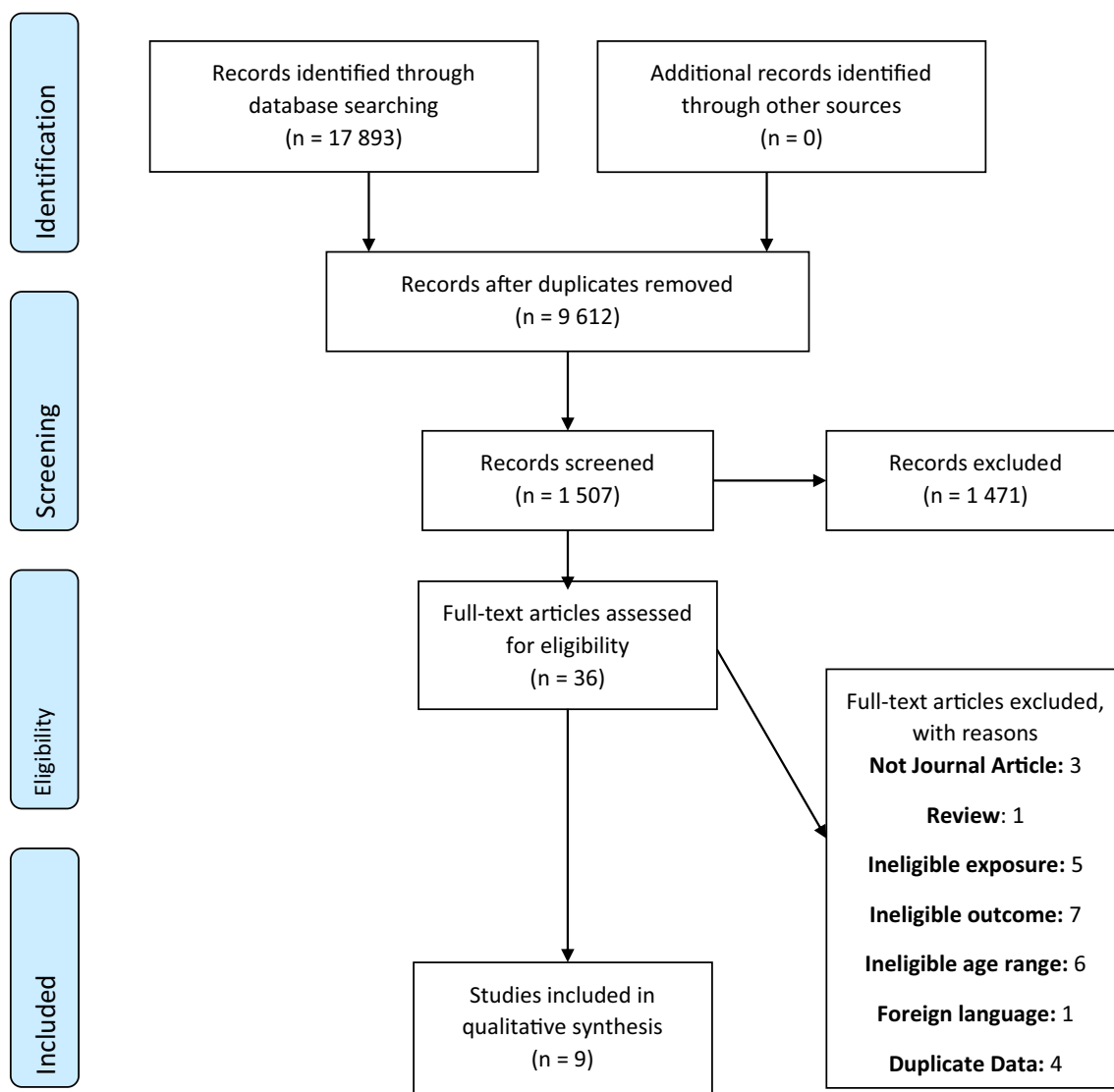


Fig. 1 PRISMA diagram

Table 1 Detailed description of studies included in the review

First author; year; country	Study design	Analytic sample	Exposure	Outcome measure(s) and analysis	Results
Employment conditions Blanquet; 2017; France	Cross-sectional	<i>n</i> = 4282 participants aged 16–25 years recruited from health and social centres	Occupational status: permanent job, temporary job, interim, specific employment contract, in school, study at university or out of university, training school, block release training school, trainee in education, integrating into workplace, job seeking, unemployed	Measure: SF-36 Mental Health Inventory (MHI-5) Analysis: Stepwise forward logistic regression	Adjusted on age and gender, unemployment (OR = 2.22, 95% CI 1.55, 3.18), job seeking (OR = 1.85, 95% CI 1.36, 2.50), integrating into the workplace (OR = 2.21, 95% CI 1.49, 3.28), and block release training school (OR = 1.59, 95% CI 1.02, 2.46) were all associated with increased odds of poor mental health compared to those in permanent jobs Markers of precarious employment, such as temporary job (OR = 1.30, 95% CI 0.86, 1.95) and specific employment contract (OR = 1.48, 95% CI 0.92, 2.37) were not associated with poorer mental health compared to those in permanent jobs
Domene; 2017; Canada	Prospective cohort	<i>n</i> = 793 participants aged 17–21 years in Wave 6 of the National Longitudinal Survey of Children and Youth	Type of work: full-time employed, not full-time employed (included part-time and unemployed)	Measure: Center for Epidemiologic Studies-Depression (CES-D) scale Analysis: Hierarchical linear models	Compared to not being in full-time employment, being employed full-time was associated with lower levels of depressive symptoms at Wave 6 (coef = - 1.77, SE = 0.55), and a slower decrease in depressive symptoms at Waves 7 and 8
Kiran; 2007; Turkey	Cross-sectional	<i>n</i> = 726 participants aged 15–20 years in three high schools	Weekly working hours: > 30 h, < 30 h	Measure: Youth Self-Report (YSR) scale Analysis: Logistic regression	Compared to working less than thirty hours a week, participants who worked more than thirty hours a week did not have significantly increased adjusted odds of anxiety/depression symptoms as measured by the YSR (OR = 1.8, 95% CI 0.90, 3.71)

Table 1 (continued)

First author; year; country	Study design	Analytic sample	Exposure	Outcome measure(s) and analysis	Results
Sharaf; 2020; Egypt	Prospective cohort	$n = 1187$ participants aged between 17 and 29 years at Wave 1 (2009) of Survey of Young People in Egypt	Precarious employment: non-regular wage employees in regular jobs); precarious employment (part-time permanent wage workers, temporary and informal full-time wage workers, casual and informal full-time wage workers, part-time and temporary informal wage workers)	Measure: Self-Reporting Questionnaire-20 (SRQ-20) Analysis: Poisson fixed effects regression	Among males, comparing precarious workers to non-precarious workers, the IRR for symptoms of mental disorder was 1.292 (p value < 0.05) When precarious employment was treated as a categorical variable among males, compared to non-precarious employment those in part-time permanent employment (IRR 1.566, p value < 0.001), temporary and informal employment (IRR 1.188, no p value), casual employment (IRR 1.025, no p value), part-time, temporary, and informal employment (IRR 1.841, no p value) and part-time and casual employment (IRR 1.692, p value < 0.001) showed increased incidence rate ratios for number of symptoms of mental disorder Precarious employment was only treated as a binary variable for females, with an IRR of number of symptoms of mental disorder of 1.029 (no p value) among females working in precarious employment compared to females in non-precarious employment
Psychosocial workplace exposures Fineran; 2009; USA	Cross-sectional	$n = 106$ female high school students, aged 14–18 years	Sexual Experiences Questionnaire (SEQ) to measure sexual harassment at work	Measure: Mental health scale from Bowen and Richman's School Success Profile Analysis: Hierarchical linear regression	Girls who had experienced sexual harassment at work did not have significantly different mental health scores from girls who did not experience sexual harassment at work (coef = 0.05, SE = 0.27)

Table 1 (continued)

First author; year; country	Study design	Analytic sample	Exposure	Outcome measure(s) and analysis	Results
Houle; 2011; USA	Prospective cohort	$n = 735$ participants in 2004 wave of the Youth Development Study, aged 14–15 in initial 1988 wave	Workplace sexual harassment assessed through questions based on the Inventory of Sexual Harassment and the Sexual Experiences Questionnaire (SEQ)	Measure: General Well-being Scale of the Current Health Insurance Study Mental Health Battery Analysis: Ordinary least squares regression	In separate models, workplace sexual harassment at ages 19–26 (coef = 0.202, SE = 0.078), 29–30 (coef = 0.217, SE = 0.062), and 30–31 years (coef = 0.673, SE = 0.143) was associated with increased depressive symptoms at age 30–31. Harassment at ages 14–18 was not significantly associated with depressive symptoms at age 30–31 (coef = 0.046, SE = 0.049). When prior and contemporaneous workplace sexual harassment were included in the model, only sexual harassment experienced at age 30–31 was associated with depressive symptoms at age 30–31 (coef = 0.512, SE = 0.162).
Milner; 2017; Australia	Prospective cohort	$n = 10534$ participants aged $< = 30$ years across 13 waves of the Household, Income and Labour Dynamics in Australia survey	Psychosocial job quality: job control, job demands and complexity, job insecurity, unfair pay	Measure: Mental Component Summary (MCS) from SF-36 Analysis: Fixed effects regression	Within-person results showed that compared to the reference group, people not in the labour force, being in a job with the best psychosocial job quality was associated with a slight improvement in mental health (coef = 0.75, 95% CI 0.40, 1.10). When a person worked in a job with two (coef = - 0.60, 95% CI - 0.97, - 0.23) or three or more psychosocial adversities (coef = - 1.68, 95% CI - 2.18, - 1.17), there was a decrease in mental health compared to those not in the labour force. Job insecurity was associated with the greatest decrease in mental health (coef = - 1.43, 95% CI - 1.69, - 1.17).

Table 1 (continued)

First author; year; country	Study design	Analytic sample	Exposure	Outcome measure(s) and analysis	Results
Mortimer; 2004; USA	Prospective cohort	Approx. $n = 760$ participants in the St Paul Youth Development Study, aged 14–15 years in Wave 1 and 26–27 years in final wave	<p>Early work stressors: time pressure, noxious working conditions, work overload, lack of clarity in job responsibilities, responsibility for things outside one's control</p> <p>Adult work stressors: extrinsic (e.g. wage satisfaction) and intrinsic (e.g. opportunities to learn skills) rewards and work hours</p>	<p>Measure: General Well-being Scale of the Current Health Insurance Study Mental Health Battery</p> <p>Analysis: Ordinary least squares regression</p>	<p>Work stressors experienced during high school were associated with increased depressive symptoms while participants were in high school (coef = 0.173, SE = 0.039)</p> <p>When contemporaneous work stressors are included in the analysis, high school work stressors are not associated with depressive affect at age 21 (coef = -0.10, SE = 0.044), although contemporaneous work stressors are associated with depressive affect at age 21 (coef = 0.160, SE = 0.052). However, exposure to work stressors in high school moderates the influence of subsequent stressors on mental health (coef = -0.021, SE = 0.009)</p> <p>Work stressors experienced in high school have no long-term additive effect on depressive affect at age 26/27 (coef = 0.017, SE = 0.042), although contemporaneous work stressors are associated with depressive affect at age 26/27 (coef = 0.182, SE = 0.049)</p>

Table 1 (continued)

First author; year; country	Study design	Analytic sample	Exposure	Outcome measure(s) and analysis	Results
Svane-Petersen; 2020; Denmark	Prospective cohort	<i>n</i> = 955573 individuals from The Danish Work Life Course Cohort study aged 15–30 who entered the Danish labor market between 1995–2009	Job control as measured by a Job Exposure Matrix (JEM)	Measure: Incident main diagnosis of depressive disorder from in- or outpatient treatment from register data Analysis: Cox proportional hazards models	Individuals working in occupations with lower levels of job control in the past year had a higher risk of incident depressive disorder (HR = 1.27, 95% CI 1.16, 1.38) compared to individuals in jobs with higher levels of job controls, after accounting for accumulated level of job control, life course SES including education, and other covariates The association between accumulated level of job control and depressive disorder after controlling for past year job control and covariates was HR 1.19 (95% CI 1.00, 1.42) The association between past year job control and risk of incident depression was similar among men (HR 1.38, 95% CI 1.19, 1.61) and women (HR 1.19, 95% CI 1.08, 1.32)

Table 2 ROBINS-E risk of bias assessment

Studies	Confounding	Selection	Measurement of exposure	Departure from exposure	Missing data	Measurement of outcomes	Reported results	Study-level RoB judgment
Blanquet 2017	S	S	S	NR	S	M	L	S
Domene 2017	M	M	S	L	S	M	L	S
Fineran 2009	S	S	S	NR	M	M	L	S
Houle 2011	M	M	M	M	L	M	L	M
Kiran 2007	S	M	S	NR	S	M	S	S
Milner 2017	M	L	M	L	L	M	L	M
Mortimer 2004	M	M	M	M	S	M	L	S
Sharaf 2020	M	S	S	M	S	M	S	S
Svane-Petersen 2020	L	L	M	L	L	L	L	M
Item-level judgment	M	S	S	M	S	M	L	

L low, *M* moderate, *S* Serious, *NR* not relevant

risk, and three at serious risk. Four studies were at moderate risk of bias due to the measurement of exposure and five were at serious risk. In relation to departure from the exposure, three studies were at low risk, three were at moderate risk and for three studies, this domain was not relevant. We judged three studies at low risk of bias due to missing data, one at moderate risk, and five at serious risk. One study was at low risk of bias due to measurement of outcomes, and eight were at moderate risk. Seven studies were at low risk of bias due to the reported results, and two studies were at serious risk. Of the 9 studies, none were judged as being at low risk of bias, three [39, 40, 42] were assessed as having a moderate risk of bias, and six studies were assessed as having a serious risk of bias [34–38, 41]. The results that follow focus only on those studies at moderate risk of bias.

Qualitative synthesis

Of the three studies at moderate risk of bias, one assessed sexual harassment in the workplace [39], one assessed psychosocial job quality [40], and one assessed job control. [42]

Using data from the Youth Development Study and a prospective cohort design, Houle et al. [39] examined the association between workplace sexual harassment at ages 14–18, 19–26, and 29–30 years on depressive symptoms at ages 30–31 years. In fully adjusted regression models including both prior and contemporaneous sexual harassment, only contemporaneous sexual harassment at age 30–31 years was associated with increased depressive symptoms (coef 0.512, SE=0.162), with the authors concluding that more recent measures of harassment explain the effect of previous harassment on depressive symptoms. In further sensitivity analyses, the authors did not find an interaction between gender and sexual harassment.

A study using data from the Household, Income and Labour Dynamics of Australia survey assessed the association between psychosocial job quality (capturing elements of

job control, job demands and complexity, job insecurity, and unfair pay) and an overall measure of mental health among young people aged ≤ 30 years. Using longitudinal linear fixed-effects regression, Milner et al. [40] found that being in optimal quality employment was associated with a slight improvement in mental health within persons (coef 0.75, 95% CI 0.40, 1.10), compared to individuals who were not in the labour force (the reference group). However, there was a stepwise decrease in mental health when a young person was working in a job with 2 (coef -0.60, 95% CI -0.97, -0.23) or 3 or more psychosocial job adversities (coef -1.68, 95% CI -2.18, -1.17).

Finally, Svane-Petersen et al. [42] prospective cohort study of job control and incident main diagnosis of depressive disorder used data from individuals in the Danish Work Life Course Cohort aged 15–30 years who entered the Danish labor market between 1995 and 2009. Job control was assessed using a Job Exposure Matrix (JEM) and incident depression diagnosis was assessed using register data of in- or outpatient treatment. In Cox proportional hazards models, individuals in occupations with lower levels of past year job control had an increased risk of incident depressive disorder (HR 1.27, 95% CI 1.16, 1.38) compared to individuals in occupations with higher levels of job control. In models stratified by gender, the authors found the association between past year job control and risk of incident depression was similar among men (HR 1.38, 95% CI 1.19, 1.61) and women (HR 1.19, 95% CI 1.08, 1.32).

Discussion

Of the nine studies included in this review, six were at serious risk of bias and were excluded from the qualitative synthesis. The three remaining studies, all at moderate risk of bias, indicated that exposure to psychosocial workplace exposures such as sexual harassment and low job control,

as well as poor psychosocial job quality, are associated with deteriorations in mental health among young workers. Taken together, these findings indicate that (1) higher-quality research suggests that exposure to psychosocial workplace exposures negatively impacts the mental health of young people and (2) further, more rigorous research is needed to assess how additional facets of employment conditions and psychosocial workplace exposures impact the mental health of young people.

Two of the three moderate risk of bias studies identified contemporaneous associations between workplace exposures and mental health outcomes among young people. Only one moderate quality study assessed how a workplace exposure impacted mental health outcomes over time among young people. Further, we did not identify any studies exploring what the mechanisms are that may explain these associations. In conjunction with necessary improvements identified through our application of the ROBINS-E RoB tool, the use of more advanced epidemiologic methods, such as mediation analysis, would facilitate an understanding of the mechanisms and pathways by which employment conditions and psychosocial workplace exposures impact mental health outcomes among young people [43].

Additionally, all three studies explored in the qualitative synthesis highlighted that experiencing workplace violence, poor psychosocial job quality, and low job control have negative impacts on the mental health of young people. Two of the studies identified the importance of considering additional characteristics when assessing this association, namely gender [39, 42]. This is an approach that should be adopted and expanded in further study, as characteristics such as disability status, immigrant and ethnic background, and First Nations identity may influence the relationship between working conditions and mental health outcomes among young people [26, 44–46]. Such research is more important than ever before, as the COVID-19 pandemic has revealed that the economic repercussions of restrictions will not affect all groups equally [46]. Focusing on these associations will lead to more targeted results which may inform policies and interventions, ultimately leading to reductions in health inequalities.

Evidence from previous economic crises [47] and the current COVID-19 pandemic [10] shows that young people are being hit particularly hard by shutdowns and job losses, providing an even stronger impetus for developing a nuanced understanding of how employment conditions and psychosocial workplace exposures impact the mental health of young people. Policymakers, public health professionals, and society as a whole must ensure that young people not only re-enter work to ameliorate lifelong scarring effects, but are employed in jobs which benefit, or at the very least are not detrimental to mental health. Until this research base exists, we cannot have confidence that

we are doing right by young people and their mental health as they engage in work and bear the economic burdens of the pandemic.

For this area of research to progress, researchers will need to address the issues raised by the application of the ROBINS-E tool. While residual and unmeasured confounding are always a concern in observational studies, this can be counteracted by the careful consideration of potential confounders at the study design stage, as well as the application of methods that minimize the risk of bias due to confounding. The use of longitudinal data will facilitate improved confounder control, particularly by allowing for baseline control of the outcome. A recent systematic review of the effects of unemployment on the mental health of young people reported that when confounders, including baseline mental health were controlled for, the effect estimates decreased and led to mixed results [48]. This indicates the importance of consistently controlling for appropriate confounders.

Additionally, greater transparency regarding study inclusion and exclusion criteria and differences between individuals who did and did not participate in studies would allow readers to better understand the internal validity of the study and interpret results appropriately. While recognizing that participant retention is a perennial challenge, comparison of the characteristics of those who have attrited compared to those retained would likewise permit readers to draw more accurate conclusions about the study's results. Similarly, improved description and handling of missing data, such as through multiple imputation procedures would reduce the risk of bias in studies.

Finally, eight of the nine studies included in this systematic review relied on subjective, self-reported measures of the employment-related exposures and mental health outcomes. This means results may be impacted by dependent and differential misclassification of the exposure related to the outcome (e.g. people with poorer mental health may be more likely to remember or report certain aspects of their employment situation), potentially biasing results in an unknown direction. Self-reported measures of mental health are useful and important measures but could be improved upon in future studies by being paired with more objective sources of data, such as hospital admission data or prescription medication information. Using linked data may allow researchers to 'triangulate' their findings using a combination of subjective and objective measures of mental health to more fully understand the employment-mental health relationship. The use of objective data sources, as well as validated self-report measures of psychosocial workplace exposures and employment conditions (such as The Employment Precariousness Scale [49]) may contribute to more comparable exposures and outcomes across studies. This may also work to resolve complications in the literature arising from differing

definitions and usage of terminology regarding employment-related exposures (e.g. precarious employment), in addition to challenges with measurement.

There are several limitations of this systematic review. The search strategy may have missed relevant articles, and our search may not have been sensitive to studies which were stratified by age group. In addition, this systematic review was limited to published studies in English. Finally, we were unable to conduct a meta-analysis due to variations in the exposures and outcomes of the included studies.

Despite these limitations, a significant strength of this study is the extensive risk of bias assessment that we undertook. Our qualitative synthesis included only studies at moderate risk of bias, focusing only on studies with greater internal validity. As such, our study has highlighted areas for improvement in future work and has relayed results of only better-quality studies.

In conclusion, this systematic review has indicated a dearth of rigorous evidence related to the mental health impacts of employment conditions and psychosocial workplace exposures among young people and has found that even higher-quality studies are still at moderate risk of bias. By improving on key areas relating to bias, such as control for confounding, appropriate handling of missing data, and measurement of exposures and outcomes, researchers can contribute high-quality evidence expounding the relationship between employment conditions, psychosocial workplace exposures, and mental health, thereby informing policy to improve the health of young workers. In light of the coronavirus pandemic, such data-driven policies to protect and improve the health of young people are more important than ever before.

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Availability of data and materials All data presented in this review are available in the included papers. Details on the custom quality assessment tool and its application to single studies are available upon request from the corresponding author.

Code availability Not applicable.

Declarations

Conflict of interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

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