Impact of the Great Recession on mental health, substance use and violence in families with children: A systematic review of the evidence

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Highlights

- We summarised the evidence on the Great Recession and mental health, substance use and violence in families with children.
- Peer-reviewed articles published in English between January 2010 and August 2020 were identified.
- High-quality studies provided evidence that the economic recession of 2008 did hurt children's mental wellbeing.
- Evidence on substance use and child maltreatment was more uncertain.
- Counter-cyclical investments in social, education and health services targeted also at families with children are crucial in alleviating human suffering in economic recessions.

Abstract

Objectives

This review summarises the existing evidence on the effects of the Great Recession on mental health, substance use and violence in families with children and discusses the policy and service-system implications of this evidence.

Methods

Peer-reviewed articles published in English between January 2010 and August 2020 were identified through a systematic search of the main scientific databases, citation records, and manual searches of individual journal sites. Studies focusing on children, or their parents, that included an exposure variable measuring the Great Recession and had an outcome related to mental health, substance use or violence were included. A risk of bias assessment and narrative synthesis were provided.

Results

In total 40 studies were analysed. Most of the studies were deemed to have a moderate risk of bias (29), nine had a high risk of bias and two had a low risk of bias. High-quality studies provided evidence that the economic recession of 2008 (termed 'the Great Recession' in this paper) did hurt children's mental wellbeing. The evidence regarding substance use in families with children was scarce but there were some indications that the recession increased drug and alcohol use among economically vulnerable subgroups. Studies with individual level data from the US showed that the Great Recession increased the risk of child maltreatment, but little evidence of this was found in several ecological and population level time-trend analyses.

Implications

Counter-cyclical investments in and further integration of social, education and health services targeted not only at adults but also at families with children are crucial in alleviating human suffering

in economic recessions. Subsequent research with the combination of high-quality individual and aggregated level data is warranted to assess the potential effects of recessions on substance use and violence in families with children. During the unprecedented economic changes following the COVID-19 pandemic, it is crucial to monitor timely mental health, substance use and violence in families at risk.

1. Introduction

The COVID-19 pandemic and subsequent lockdowns across are likely to precipitate with unprecedented speed a new global economic recession. At the time of writing (November 2020), the length and depth of the looming recession remains unclear. Unemployment with all the ensuing stress, uncertainty and economic scarcity has already increased substantially, affecting a large share of families and children around the world. There clearly is then urgent need for an accessible review of the evidence on how an economic recession can affect families. In particular, this type of evidence can assist policymakers in the planning, prioritising and targeting of interventions. Furthermore, health professionals and social workers need to better understand the potential consequences of a reduction in economic opportunities on mental health generally and as a trigger for violence in families in order to pursue appropriate actions. The situation at hand is in many ways unique and unprecedented. Therefore, consequences cannot be fully predicted though analysis and projections can be drawn from our experience of previous recessions.

Although the underlying causes were completely different, the global recession of 2008, often termed as the Great Recession, offers an applicable point of comparison concerning the COVID-19 recession consequences in terms of mental health, substance use and violence in families with children. A number of previous reviews concluded that the Great Recession widened social inequalities in health (Heggebø, Tøge, Dahl, & Berg, 2019), impacted adult mental health (Frasquilho et al., 2015, Oyesanya et al., 2015) and affected the health of vulnerable population groups (Glonti et al., 2015, Heggebø et al., 2019, Karanikolos et al., 2016, Margerison-Zilko et al., 2016). The effects on physical health outcomes, health behaviour and self-rated health are inconsistent (Bacigalupe et al., 2016, Catalano et al., 2011, Karanikolos et al., 2016, Parmar et al., 2016) although recent reviews claim that higher quality studies tend to highlight the negative effects of the recession on physical health (Saez et al.,, Thompson et al., 2019). Nevertheless, the health implications of the Great Recession present as complex, being both context and geographically dependent. The effects are likely moderated by the

depth of the crisis, the phase of economic recovery and the policy measures and social policy systems in place (Karanikolos et al., 2013).

A previous systematic review showed that the impacts of the Great Recession have also been extended to children's health and that the recession has increased violence against children in the US, disproportionately affecting the most vulnerable groups (Rajmil et al., 2014). This previous review, published in 2014, did not, however, focus on other family members and more evidence has accumulated since then which merits more detailed scientific scrutiny. To the best of our knowledge, no other reviews exist that focus on the Great Recession and these outcomes as they relate to families. This represents an important gap in the literature because mental health, substance use and family violence not only measure the human costs of recessions but also help target policy interventions in the social, health and education sectors.

These three outcomes – adverse mental health, substance use and violence in families – are suitable to be reviewed together because they are highly interrelated and policy-relevant. The outcomes manifest different facets of the potential human suffering linked to the recession. Furthermore, the outcomes constitute an important service integration approach from the perspective of developing and renewing public services and interventions. Childhood exposure to mental health problems, substance use and violence have also long-lasting detrimental effects on various health and social outcomes throughout life (Bair-Merritt et al., 2006, Hughes et al., 2017, Kalmakis and Chandler, 2015), which makes their prevention and early detection highly policy-relevant.

2. Objectives

This review provides an assessment of the evidence regarding the impact of the Great Recession on mental health, substance use and violence in families with children (Table 1). We define our population of interest, families, as members of households with children aged less than 18 years living with their parents. We include a broad range of outcomes focusing on mental health, substance use and domestic violence. We follow the WHO's comprehensive definition of mental health and include

all outcomes related to psychological wellbeing (mental disorders, psychological wellbeing), stress and coping with stress (World Health Organization, 2014). Substance use is defined as the use of any drugs (including alcohol) with substantial adverse consequences. Domestic violence is defined as violence or abuse of any form in a domestic setting (including child maltreatment, abuse, neglect) (Krug, Mercy, Dahlberg, & Zwi, 2002).

Table 1. Focus of the review in PICO framework.

Population	Families (children mostly aged less than 18 or their parents) in OECD countries.
Intervention	The economic recession in 2008 onwards (the Great Recession).
Comparison group	Not affected by the Great Recession / before or after comparison (time-series analysis).
Outcome	Mental health, substance use and domestic violence.

We do not specify the end date of this recession, but instead rely on the definitions in the reviewed studies. We explicitly do not focus on governmental responses to the Great Recession, but rather on the economic effects of the recession. We do not focus on physical health or other social outcomes, such as education outcomes, because their relationships with the recession may appear more complex, and consequently they need to be reviewed separately.

After presenting the empirical data, we highlight the main findings, discuss the research limitations in this study and sketch out research agenda for further work in this area. Moreover, we suggest a number of policy and service system implications designed to better meet the challenges caused by economic recessions and their aftermath.

3. Methods

3.1. Search strategy and study selection process

We aimed to identify relevant peer-reviewed papers published in English. We focused on papers published, or accepted for a publication, from the beginning of 2010 (assuming that relevant studies on the effects of the Great Recession were not published before that) to August 2020. Our focus is on OECD countries (the list of OECD countries is provided in the supplementary materials).

The relevant papers were identified via four streams. First, we started with a systematic search of six most relevant major databases (Medline Ovid, Embase Ovid, PsycInfo Ovid, CINAHL Ebsco, Econlit Ebsco and IBSS ProQuest). The search strategy and final search strings are provided in the supplementary materials. After deleting duplicates and abstract screening, conducted by AH, full texts were reviewed. Second, the citations to (according to Google Scholar) and the reference lists of the influential previous reviews (Burgard and Kalousova, 2015, Catalano et al., 2011, de Goeij et al., 2015, Karanikolos et al., 2016, Parmar et al., 2016, Rajmil et al.,, Tsai and Coyne, WAHLBECK and MCDAID, 2012) and individual studies (Karanikolos et al., 2013, Ruhm, 2000, Stuckler et al., 2009) on the topic were screened, conducted by AH. Third, we screened the reference lists of the selected papers from streams one and two. We also screened all subsequent studies citing these papers, conducted by AH and HH. Fourth, additional manual screening of key public health and mental health-focused journals (Journal of Affective Disorders, BMJ, BMJ Open, Plos One, Plos Medicine, European Journal of Public Health, Social Science and Medicine, Lancet) were made with the search term 'the Great Recession', to make sure that no relevant papers were missed.

We included studies that simultaneously i) focused on children mostly aged 18 or less or their parents, ii) investigated explicitly an exposure to the Great Recession in the OECD countries iii) used quantitative methods (with a comparison group or time-period) and iv) focused on a mental health, substance use or domestic violence-related outcome. We excluded studies either i) not focusing on the outcomes of interest (e.g. the following outcomes: physical health, health behaviour other than substance use, life satisfaction or happiness scales, and other social, economic and educational measures), ii) not including an explicit exposure to the Great Recession (e.g. studies focusing on the social determinants of health, or macroeconomic conditions and health in general, without the explicit

aim of studying the effect of the Great Recession) or iii) not primarily focusing on families, children or parents or not including a subgroup analysis for these groups (e.g. intimate partner violence when there was no analysis focusing on the 'families with children' context). We further excluded qualitative investigations, book chapters reviews, comments, working papers and other grey literature.

3.2. Data extraction and synthesis

From each of the selected studies, we extracted a population (country, time-period and population group), exposure variable (operationalisation of the Great Recession exposure) and outcome variable, methods and key finding(s). Given the heterogeneity in outcomes, populations, study settings and time-periods, we reviewed the included studies in a narrative fashion. Formal quantitative synthesis of the results was deemed inappropriate given the substantial heterogeneity of the studies. We analysed the key findings thematically regarding mental health, substance use, violence and maltreatment.

3.3. Critical appraisal

Included studies were critically appraised by AH and HH. We adopted the risk of bias assessment tool put forward for similar purposes by Parmar et al. (2016). This tool was designed to assess the risk of bias in studies investigating the health outcomes of the Great Recession. We discuss the limitations of this approach in the limitations section.

The tool included seven domains: selection (non-representativess) bias, ecological fallacy, confounding bias, reporting bias, time bias, measurement error in the exposure variable and measurement error in the outcome variable (Parmar et al., 2016). In each of these domains, the risk of bias was assessed on a three-point scale (scores 1 = no risk of bias, 2 = moderate risk of bias and 3 = high risk of bias). **Selection (non-representativeness) bias** was defined as the extent the sample and the method used in the study allowed for an inference to a meaningful population of interest. Studies without a meaningful population of interest or highly unlikely to represent such (e.g. studies not explicitly mentioning whether the sample is representative) were given a score of three. Studies somewhat likely to represent a meaningful population of interest were scored two (e.g. surveys with

low to satisfactory response rates). Studies highly likely to represent a wider population were scored one (e.g. studies with full population register data or studies with high response rates). Ecological studies and nationally representative surveys were also included in this category. This bias is not to be confused with the bias due to selection to a treatment group, often discussed in economics literature. The **Ecological fallacy** domain was scored three when studies used aggregate data on outcomes, and one when individual-level data were used in the outcome.

Confounding bias was defined as the extent to which shared causes of both the outcome and the exposure were not controlled for. Descriptive studies not considering any confounding variables were scored three. Studies considering some confounding factors (e.g. age, sex, pre-existing time-trend and sociodemographic variables) but not all were scored two. Studies considering all confounding or the most important factors (e.g. via lag-dependent variable, within-persons/region or differences-in-difference modelling) were scored one. Without a definitive list of the most important confounding variables only panel setting analyses were included in category one. **Reporting bias** was defined as the extent to which papers included a detailed description of the key aspects of the study design. Studies reporting all relevant aspects of the study (aims, study sample size and its features, models used and limitations) were scored one. Studies with an inaccurate description of the study scored three.

The **time bias** domain was scored according to the extent to which studies considered a) data spanning a period of more than 10 years b) the time at least three years after the crisis onset period (2008) c) the potential lagging effects of the crisis. Studies considering all of these were scored one, studies considering two were scored two and studies considering one or none were scored three. **Measurement error in the exposure variable** was defined as the accuracy of the exposure variable to the Great Recession. Studies using more than one macroeconomic or individual level exposure variable were scored one. Studies considering one macroeconomic or individual-level exposure to the Great Recession were scored two. Studies comparing only time trends were scored three. **Measurement error in the outcome variable** was scored one when the outcome used was clinically

confirmed, assessed by two sources (e.g. parent and teacher) or obtained from administrative data not likely to be misreported. Studies were scored two in this domain when a validated self-reported measure was used and three when self-reported un-validated or likely to be misreported data on an outcome was used. An overall score of 1 was given when none of the domains was a high risk of bias, 2 when one or two domains were rated as high risk of bias and 3 when more than two domains were rated as high risk of bias.

4. Results

The article selection process is described in PRISMA format (Moher, Liberati, Tetzlaff, Altman, & Group, 2009) in Fig. 1. In total, 40 studies (Arroyo-Borrell et al., 2017, Balbo et al., 2020, Berger et al., 2011, Briody et al., 2020, Brooks-Gunn et al., 2013, Cotti and Simon, 2018, Finkelhor et al., 2014, Gassman-Pines et al., 2014, Golberstein et al., 2019, Huang et al., 2011, Johnson et al., 2017, Kiernan, 2019, Kokkevi et al., 2018, Layte and McCrory, 2018, Lazaratou et al., 2017, Lee et al., 2013, Liu and Lim, 2020, McKenna et al., 2017, Medel-Herrero et al., 2020, Millett et al., 2011, Motti-Stefanidi and Asendorpf, 2017, Nguyen, 2013, Pabilonia, 2017, Rajmil et al., 2013, Rajmil et al., 2015, Rathmann et al., 2016, Schaller and Zerpa, 2019, Schenck-Fontaine and Gassman-Pines, 2020, Schenck-Fontaine et al., 2017, Bubonya et al., 2019, Cui and Zack, 2013, Currie et al., 2015, Pfoertner et al., 2014, Reinhard et al., 2018; D. Schneider, Harknett, & McLanahan, 2016; W. Schneider et al.,, Schneider et al., 2017, Wood et al., 2016, Wood et al., 2012, Zozaya and Vallejo) were included. The sources of the identified articles were as follows: 38 were identified via the systematic search, and 2 were identified via citations to a previous review.

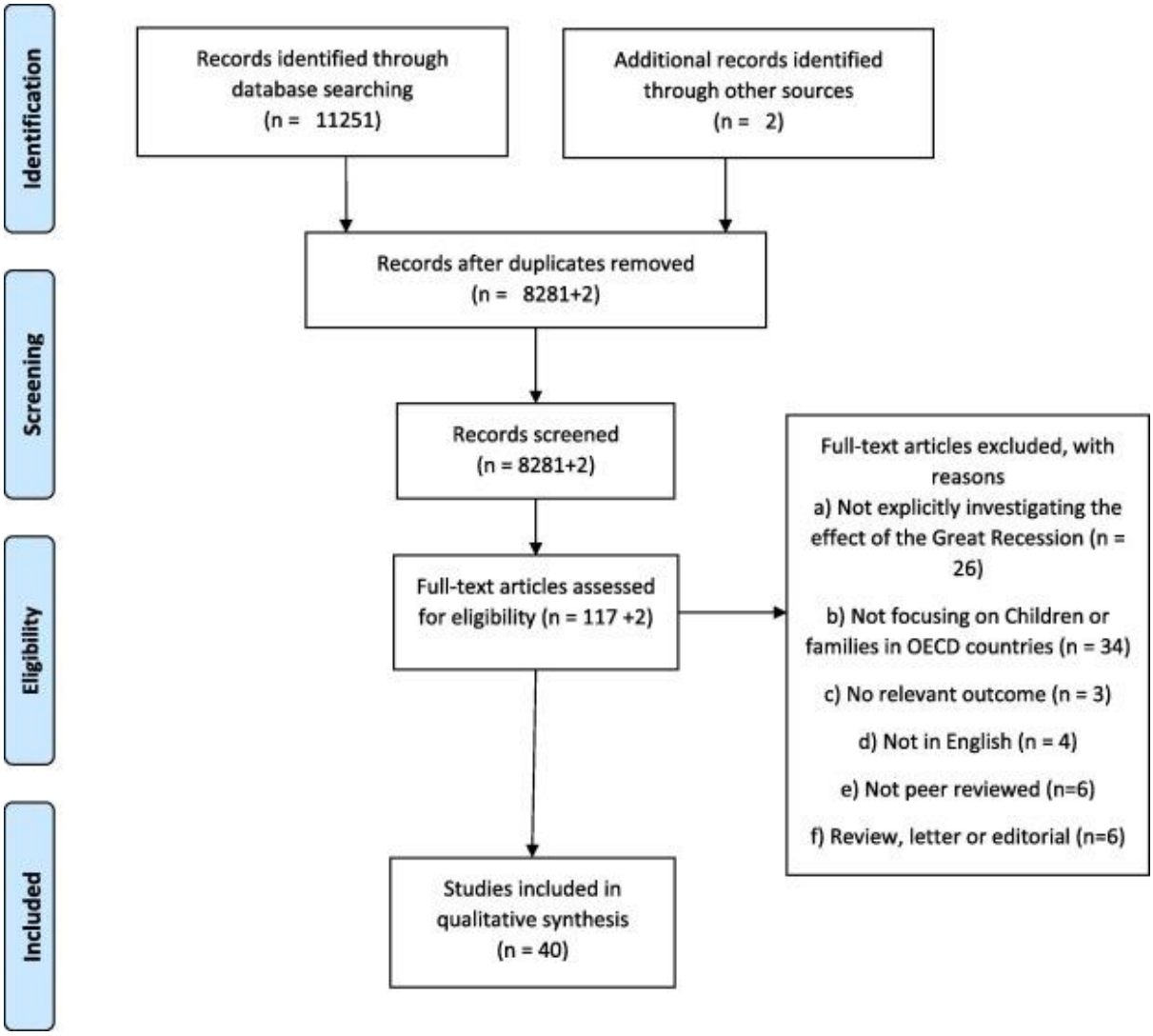

Fig. 1. PRISMA Flow chart of the included studies.

The extracted data from the papers are shown in Table 2, Table 3, Table 4. Most of the included studies (n = 24) were from the US. The rest used samples from Ireland (n = 4), Spain (n = 4), Greece (n = 3), Australia (n = 1), the UK (n = 1) and many countries simultaneously (n = 3). Children's outcomes were the primary focus of 34 studies while mothers' outcomes were the primary focus of 6 studies. No studies were identified that focused on the outcomes of fathers.

Table 2. Description of the studies focusing on mental health outcomes.

First author and year	Population	The Great Recession exposure(s)	Mental health outcome(s)	Study design (methods)	Key finding	Risk of bias overall score
Arroyo-Borrell 2017	Spain; 2006–2011; Spanish National Health Survey; Children aged 4–14.	Time-period comparison.	Strengths and Difficulties Questionnaire (Emotional symptoms; Behaviour problems; Hyperactivity; Peer problems; Antisocial behaviour).	Repeated individual-level cross-sectional study (mixed effect logistic regression).	No significant changes in children's mental health problems between the pre- (2006) and post-recession (2011) period. The association between low maternal socioeconomic status and mental health was no greater after than before the onset of the crisis. The association between parent's unemployment and mental health problems was stronger in 2011 than in 2006.	2
Briody 2020	Ireland; 2001–2011; Irish Lifeways Cohort Study; Mothers.	Local-level unemployment rate.	Mental wellbeing scales (GHQ-12 and CESD, other outcomes outside the scope of this review).	Longitudinal individual-level study with aggregated measures on the exposure (individual fixed effects linear probability regression).	A higher local unemployment rate was associated with a higher risk of reporting poor mental well-being.	2
Bubonya 2019	Australia; 2004–2010; The Longitudinal Study of Australian	Local-level expectations shocks due to the Great Recession.	Teacher- and parent-rated Strengths and Difficulties Questionnaire (Total score,	Longitudinal individual-level study with aggregated measures on	No detectable effect of community-level expectation shocks on	2

First author and year	Population	The Great Recession exposure(s)	Mental health outcome(s)	Study design (methods)	Key finding	Risk of bias overall score
	Children; Children and their parents.		internalising and externalising score); Mother's psychological distress (Kessler 6).	the exposure (linear regression with difference-in-differences approach).	mental health among boys or mothers. Among girls, the Great Recession exposure was associated with modest increases in parent-rated mental health problems and externalising behaviours but not when teacher-reported scales were used.	
Cotti 2018	The US; 2004–2012; The National Health Interview Survey; Children aged 0–17.	Dow Jones Industrial Average - stock index.	Emotional difficulties in 6 months (other outcomes outside the scope of this review).	Repeated individual-level cross-sectional study with linked data on exposure (linear regression).	No significant association between the stock index and emotional difficulties in the pooled sample. In the female subsample, there was a significant association between the index and the emotional difficulties measure.	2
Cui 2013	The US; 2001–2010; the National Health and Nutrition Examination Survey. Children aged 12–17.	Time-period comparison.	Number of reported mentally unhealthy days during the last month.	Repeated individual-level cross-sectional study (logistic regression).	Mentally unhealthy days increased in the financial crisis. This was particularly prevalent among adolescent groups from middle- and poor income status families.	3

First author and year	Population	The Great Recession exposure(s)	Mental health outcome(s)	Study design (methods)	Key finding	Risk of bias overall score
Currie 2015	The US; 2003–2010; Fragile Families and Child Well-being Study; Mothers.	State- and local-level unemployment rate.	Self-reported depression and drug use (other outcomes outside the scope of this review).*	Longitudinal individual-level data with aggregated measures on the exposure (individual fixed effects logistic regression).	An increase in the unemployment rate was linked to drug use, but the effects were heterogenous. No overall effect of the state level unemployment rate on mother's risk of depression was observed. An increase in the unemployment rate was associated with a decreasing risk of depression among white mothers and an increasing risk among Hispanic mothers.	2
Gassman-Pines 2014	The US; 1997–2009; Youth Risk Behavior Survey; Adolescents.	Statewide job losses.	Suicidal ideation, suicide plan and suicide attempt in the past 12 months.	Repeated individual-level cross-sectional study with aggregate level data on the exposure (probit Regression).	Job losses at the state-level was associated with an increase in girls' and non-Hispanic Blacks' suicide-related behaviour.	2
Golberstein 2019	The US; 2001–2013; National Health Interview Survey; Children aged 4–17.	State-level unemployment rate; housing price index.	Likely Psychological Problem; Strengths and Difficulties Questionnaire; Special Education or Early Intervention Services for	Repeated individual-level cross-sectional study with aggregate level data on the exposure (linear and probit regressions).	Worsening economy was associated with worsening mental health outcomes of children in almost every subgroup examined. Parental	1

First author and year	Population	The Great Recession exposure(s)	Mental health outcome(s)	Study design (methods)	Key finding	Risk of bias overall score
			Emotional or Behavioral Problems.		unemployment did not fully explain these associations.	
Johnson 2017	The US; 1991–2014; Monitoring the Future study; Children aged 13–16.	Time-period comparison.	Self-reported depressed mood and aggression.	Repeated individual-level cross-sectional study.	The level of reported depressed mood and aggression was stable and did not change around the Great Recession.	2
Kiernan 2019	Ireland; 2009–2013; Growing Up in Ireland cohort study; Mothers.	Income changes; Several self-reported exposures to the Great Recession.	Eight item Centre for Epidemiological Depression Scale (CES-D); Binary variable of treated for mental health conditions in the previous year; Parental Stress Scale.	Longitudinal individual-level study (individual fixed effects regression).	Changes in disposable income and housing arrears due to the Great Recession predicted a higher risk of depression among mothers. No significant associations were observed with parental stress scale.	2
Layte 2018	Ireland; 2007–2011; Growing Up in Ireland cohort study; Children aged 9 and 13, and their parents.	Self-reported exposure to the Great Recession (several questions).	Strengths and Difficulties Questionnaire.	Longitudinal individual level study (structural equation modelling).	Family experience of the recession was linked to negative changes in parental mental health and child psychological adjustment. There was a direct effect of the recession on child psychological adjustment (not only via	2

First author and year	Population	The Great Recession exposure(s)	Mental health outcome(s)	Study design (methods)	Key finding	Risk of bias overall score
					parents' mental variables).	
Lazaratou 2017	Greece; 2013–2014; Survey of High Schools and Senior High Schools in the Greater Athens Metropolitan Area; Children aged 12–19.	Reduction in pocket money and three items of the Household Food Insecurity Access Scale.	Aggression (The Buss–Perry Aggression Questionnaire).	Individual-level cross-sectional study (linear regression).	The shortage in basic goods due to the Great Recession was associated with a higher aggressive behaviour score among adolescents.	2
Liu 2020	The US (New York State); 1999-2013; Patient level register data on inpatient hospitalisations and emergency visits in New York; Children aged 5-17.	Time-period comparison.	Mental health hospitalisations.	Register-based study (Age-Cohort and Period decomposition analysis).	Birth cohort that experienced the Great Recession during puberty were at risk of mental health hospitalisation. The effects of the Great Recession on hospitalisations were gradual, rather than immediate.	2
McKenna 2017	The UK; 2008–2012; the Millennium Cohort Study; Children aged 7 and 11 years.	Onset of self-reported household financial strain during the Great Recession.	Problematic behaviour (Dichotomised Strengths and Difficulties Questionnaire). Both parent and teacher scored (other outcomes outside the scope of this review).	Longitudinal individual-level study (Poisson regression).	Onset of various forms of household financial strain during the Great Recession was linked to a higher risk of problematic behaviour (both teacher and parent reported).	2
Motti-Stefanidi 2017	Greece; 2005–2013; Surveys in secondary schools; children aged	Time-period comparison.	Reported emotional symptoms and conduct problems.	Repeated individual-level cross-sectional study.	No differences in emotional symptoms between the cohorts before and after the	3

First author and year	Population	The Great Recession exposure(s)	Mental health outcome(s)	Study design (methods)	Key finding	Risk of bias overall score
	around 13 years.				onset of the economic crises. The level of reported conduct problems increased.	
Pfoertner 2014	31 countries; 2005–2010; the World Health Organization collaborative 'Health Behaviour in School-aged Children' study; Children.	National youth and adult unemployment rates; Within-country changes in youth unemployment rate.	Psychological health complaints.	Repeated individual-level cross-sectional study with aggregate level data on the exposure (multilevel logistic regression).	Country differences in the unemployment rates were associated with psychological health complaints. Within country changes in unemployment rates due to the recession were not associated with psychological health complaints.	2
Rajmil 2013	Spain (Catalonia); 2006–2012; Catalan Health survey; Children aged 0–14.	Time-period comparison.	The Strengths and Difficulties Questionnaire total score (other outcomes outside the scope of this review).	Repeated cross-sectional study (linear regression).	No significant changes in mental health between 2006 and 2010–2012.	2
Rathmann 2016	31 countries from Europe and North America; 2005–2010; WHO collaborative 'Health Behaviour in School-aged Children' study; Children aged 11–15.	National youth unemployment rate; within country changes in youth unemployment rate.	Psychological health complaints.	Repeated individual-level cross-sectional study with aggregate level data on the exposure (multilevel logistic regression).	Youth unemployment rate was associated with a higher odds of psychological health complaints. Within country cchanges in youth unemployment were not linked	2

First author and year	Population	The Great Recession exposure(s)	Mental health outcome(s)	Study design (methods)	Key finding	Risk of bias overall score
					to psychological health complaints. Increasing youth unemployment rates within countries were associated with greater socioeconomic inequalities in mental health.	
Schaller 2019	The US; 1996–2012; Medical Expenditure Panel Survey in the US; Children aged 1–16.	Parent's job displacement before and after the onset of the recession in 2008.	Self-rated mental health status of children; summary index of mental health (other outcomes outside the scope of this review).	Longitudinal individual-level study (individual fixed effect regression).	Paternal job loss was associated with worse mental health of children. This association was particularly strong among children in low-socioeconomic status (SES) families. Maternal job loss was not linked to a detrimental effect on child mental health. These findings were similar before and after the 2008 recession.	1
Schneider W 2015	The US; 2007–2010; the Fragile Families and Child Wellbeing Study; 9-year old children.	National Consumer Sentiment Index; Local-level unemployment rate.	Behavioural problems: externalising, internalising; drug and alcohol use; vandalism.*	Longitudinal individual-level data with aggregated measures on the exposure (lagged dependent variable regression).	Higher uncertainty (measured by the consumer sentiment index) was linked to higher rates of behavioural problems among boys in	2

First author and year	Population	The Great Recession exposure(s)	Mental health outcome(s)	Study design (methods)	Key finding	Risk of bias overall score
					single mother families but not among girls. Local unemployment rates were not consistently associated with children's behaviour.	

*

Included also substance use outcome

Table 3. Description of the studies focusing on substance use outcomes.

First author and year	Population	The Great Recession exposure(s)	Subtance use outcome(s)	Study design (methods)	Summary of key findings	Total risk of bias score
Balbo 2020	25 European countries; 2007–2011; European School Survey Project on Alcohol and Other Drugs; Children aged 15–17.	Country-level unemployment rate.	Lifetime consumption of cocaine, ecstasy and inhalants.	Repeated individual-level cross-sectional study with aggregate level data on the exposure (country fixed effects linear probability model).	Increase in the unemployment rate was associated with an increase in the probability of ever having tried inhalants and cocaine and with a decrease in the risk of ever having tried ecstasy.	2
Kokkevi 2018	Greece; 2006–2014; Repeated Health Behavior in School-Aged Children; Children aged 11–15.	Time-period comparison; Family exposure to the Great Recession.	Cannabis use; Alcohol consumption (other outcomes outside the scope of this review).	Repeated individual-level cross-sectional study (chi-square test, latent class analysis and logistic regression).	Cannabis use increased among boys in the Great Recession. Alcohol consumption decreased. Being heavily exposed to the economic crises was associated with cannabis use, and among boys, alcohol use.	2

First author and year	Population	The Great Recession exposure(s)	Subtance use outcome(s)	Study design (methods)	Summary of key findings	Total risk of bias score
Pabilonia 2017	The US; 2003–2011; American Time Use Survey and Youth Risk Behavior Survey; Children aged 15–18.	State-level unemployment rate.	Alcohol use in past 30 days; Marijuana use in past 30 days (other outcomes outside the scope of this review).	Repeated individual-level cross-sectional study with aggregate level data on the exposure (linear probability regression).	Increase in the unemployment rate was generally not linked to alcohol or marijuana use. Significant associations were reported in subgroups e.g. Black and Hispanic boys.	2
Reinhard 2018	Ireland; 2008–2013; Growing Up in Ireland cohort study; Mothers.	Self-reported exposure to the Great Recession (several questions).	Alcohol consumption (other outcomes outside the scope of this review).	Longitudinal individual-level study (individual fixed effects linear probability model).	A reduction in wages due to the recession was linked to an increase in the probability of mothers' consuming 5 or more units of alcohol per week. Spouse's job loss was associated with a decrease in the probability of alcohol use.	2
Zozaya 2020	Spain; 2002–2014; the Health Behavior in School-Aged Children; Children.	Change in the regional-level unemployment rate.	Alcohol consumption (other outcomes outside the scope of this review).	Repeated individual-level cross-sectional study with aggregate level data on the exposure (multilevel regression models).	Regional unemployment was linked to an increase in alcohol consumption. The association was attenuated when individual level variables were controlled for.	2

Table 4. Description of the studies focusing on child maltreatment/family violence outcomes.

First author and year	Population	The Great Recession exposure(s)	Child maltreatment/family violence outcome(s)	Study design (methods)	Summary of key findings	Total risk of bias score
Berger 2011	The US; 2004–2009; Medical record data from three geographic regions in the US; Children aged 0–4.	Time-period comparison.	Rate of abusive head trauma (AHT).	Ecological study (Poisson regression).	The rate of AHT increased significantly during the Great Recession compared to the pre-recession period. There was no association between the county-level unemployment rate and the rate of AHT.	3
Brooks-Gunn 2013	The US; 2007–2010; Fragile Families and Child Wellbeing Study; Mothers.	Consumer Sentiment Index; Unemployment rate; Home foreclosure rate.	Maternal spanking.	Longitudinal individual-level data with aggregated data on the exposure (lagged dependent variable regression).	Decline in consumer confidence during the Great Recession was associated with more frequent parental spanking.	2
Finkelhor 2014	The US; 2003–2011; national telephone surveys using the Juvenile Victimisation Questionnaire; children 2–17 years old.	Time-period comparison.	Range of family violence outcomes.	Repeated cross-sectional individual-level data (logistic regression).	In the recession period (between 2008 and 2011), there was no evidence of increasing violence or child maltreatment.	3
Huang 2011	The US (Ohio); 2001–2010; Administrative hospitalization data; Children aged 0–2.	Time-period comparison.	Number of nonaccidental head trauma admissions.	Aggregate time-trend comparison.	Significant increase in the number of nonaccidental head trauma was observed in the	3

First author and year	Population	The Great Recession exposure(s)	Child maltreatment/family violence outcome(s)	Study design (methods)	Summary of key findings	Total risk of bias score
					economic recession period, compared to the pre-recession period.	
Lee 2013	The US; 1998–2010; The Fragile Families and Child Wellbeing Study; Mothers.	Changes in local unemployment rate; Changes in the national consumer sentiment index.	Maternal harsh parenting.	Longitudinal individual-level data with aggregated data on the exposure (linear regression).	Deteriorating macroeconomic conditions was associated with harsh parenting. This association was moderated by a certain genotype.	2
Medel-Herrero 2020	The US (California); 2000–2015; Administrative hospitalization data from hospitalizations and emergency department visits; Children aged 0–17.	Time-period comparison.	Number of hospitalizations and emergency service visits due to domestic violence.	Aggregate time-trend comparison.	There was no significant change for child domestic violence hospitalisations and emergency department visits between the pre-recession and recession/post recession periods.	2
Millett 2011	The US (selected states); 2000–2010 (depending on state); Aggregate state-level data on child maltreatment reports and economic indicators.	Unemployment rate; Food stamps usage rate; Labour force participation rate.	Rates of child maltreatment reports.	Ecological study (linear regression).	No evidence for the relationship between the economic indicators and maltreatment rate.	3
Nguyen 2013	The US; 2005–2012; Ecological study on 58	Area-level unemployment rate.	The rate of out-of-home (foster) care per 1000 children.	Ecological study (linear regression).	In some counties in California, there was a	3

First author and year	Population	The Great Recession exposure(s)	Child maltreatment/family violence outcome(s)	Study design (methods)	Summary of key findings	Total risk of bias score
	counties in California (various data sources).				negative association between the unemployment rate and rate of out-of-home care.	
Rajmil 2015	Spain; 2000–2012; MDHD database on childhood hospitalisation Spain.	Time-period comparison.	Hospitalisation due to child maltreatment.	Aggregate time-trend comparison (joint regression).	No significant changes were found in hospitalisations due to child maltreatment during the recession period.	3
Schenck-Fontaine 2017	The US (North Carolina); 2006–2011; North Carolina administrative data on the judicial district level.	Community-level job losses.	Child maltreatment reports at community level.	Ecological study (Poisson and linear regression with judicial district fixed effects).	Job losses were not associated with the frequency of child maltreatment reports. In economically disadvantaged communities, job losses were associated with a higher share of reports that were severe. This effect lasted for 9 months following job losses.	2
Schenck-Fontaine 2020	The US; 2004–2013; Ecological study with data from National Child Abuse and Neglect Data System.	State-level data on job loss.	Total rate of referrals; the rate of physical abuse, neglect and sexual abuse referrals, and substantiation rate.	Ecological study (Poisson regression with state fixed effects).	Involuntary job losses were linked to higher rates of physical abuse reports, but not to other types of child maltreatment. The association with physical abuse were	2

First author and year	Population	The Great Recession exposure(s)	Child maltreatment/family violence outcome(s)	Study design (methods)	Summary of key findings	Total risk of bias score
					larger in states with low levels of income inequality.	
Schneider D 2016	The US; 2001–2010; the Fragile Families and Child Wellbeing Study; Mothers.	Local-level unemployment rate; Household level unemployment and economic hardship.	Controlling interpersonal behavior; Violent behavior.	Longitudinal individual-level data with individual and aggregated measures data on the exposure (lagged dependent variable and individual fixed effects regressions).	Unemployment and economic distress at the household level were linked to a higher risk of abusive behavior. Increases in the local unemployment rate were linked to men's controlling behavior toward their partners after controlling for the household level economic variables.	2
Schneider W 2017	The US; 1998–2010; the Fragile Families and Child Wellbeing Study; Mothers.	National Consumer Sentiment Index; Local-level unemployment rate.	Maternal physical aggression; Maternal psychological aggression; Physical neglect by mothers; Supervisory/exposure neglect by mothers.	Longitudinal individual-level data with aggregated data on the exposure (lagged dependent variable regression).	The local unemployment rate and consumer sentiment index were linked to an increased risk of child abuse and a decreased risk of child neglect. This association was not mediated fully via individual level factors.	2
Wood 2012	The US; 2000–2009; Hospital discharge data from the Paediatric Health	Local-level unemployment rate; Mortgage delinquency rate;	Rate of hospital admissions for physical child abuse.	Ecological study (Poisson regression).	Child physical abuse hospitalisation rate was associated with the current	3

First author and year	Population	The Great Recession exposure(s)	Child maltreatment/family violence outcome(s)	Study design (methods)	Summary of key findings	Total risk of bias score
	Information System; Children aged 0–5.	Foreclosure rates.			mortgage delinquency rate, changes in mortgage delinquency rate and changes in foreclosure rates. No association was observed with the unemployment rate.	
Wood 2016	The US; 2004–2012; Administrative hospitalization data from selected Children's hospitals in the US; Children aged 0–4.	Time-period comparison; Country level employment growth rate; Mortgage delinquency rate; Foreclosure rate.	The rate of abusive head trauma (AHT).	Ecological study (Zero-inflated Poisson regression).	The child abuse head trauma rates were higher in the recession and post-recession period compared to the pre-recession period. There was no association between the AHT rates and county-level recession indicators.	2

Most of the included studies had a moderate risk of bias. Supplementary Table 9 shows the full risk of bias assessment scores. Two studies were scored as having a low risk of bias, 29 scored a moderate risk of bias and nine a high risk of bias. Studies typically published on a later date had a lower risk of bias score compared to those studies conducted closer to the onset of the Great Recession. The most common reason for a high risk of bias score was time bias: very few studies were able to consider, simultaneously, potential lag effects, had a time period of more than 10 years or included data from 3 years after the crisis.

4.1. Mental health

Mental health outcomes were used in 20 studies (of which 2 were low risk of bias, 16 moderate risk of bias and 2 high risk of bias studies).

Studies with individual level outcome data and conducted in the US showed consistently that the Great Recession had a detrimental effect on the mental health of children. Golberstein et al. (2019) reported that a worsening economy, measured by the state-level unemployment rate, was associated with the worsening mental health of children in almost every subgroup examined. Parental unemployment did not, however, fully explain the observed associations. In line, Gassman-Pines et al. (2014), using a large school-based survey, report that job losses at state-level were associated with an increase in adolescent girls' and non-Hispanic Blacks' suicide-related behaviour. No significant association was, however, observed in all adolescent pooled models. Consistent with other studies, Schaller and Zerpa (2019), investigating the effect of parental employment on child health with longitudinal data for the period 1996–2012, showed that father's job loss increased the risk of child mental health problems. The authors report that this association was similar before and after the Great Recession (the year 2008) and particularly strong among families with a low socioeconomic status background.

However, different measures of the recession provided varying findings. Investigating the effect of stock market fluctuations on child health, Cotti and Simon (2018), did not find a detectable effect of the market crash in 2008–2009 on emotional difficulties in all children-pooled analysis. A significant negative effect of the stock market decline on mental health was, however, reported among a female subgroup. Liu and Lim (2020) analysed age, cohort and time trends in hospitalisations and emergency visits in New York due to mental health causes. They concluded that the birth cohort that experienced the Great Recession during puberty were at risk of mental health hospitalisation. The authors also suggested that the hospitalisations started to increase gradually a year after the Great Recession and peaked some 3 years after the event. Schneider et al. (2015), analysing the Fragile Families and Child Wellbeing Study (FFCWS), found that a higher uncertainty (measured as national Consumer Sentiment Index) in the Great Recession was associated with a higher risk of behaviour problems

among boys in single-mother families but not among girls. Local unemployment rates, in contrast, were not consistently associated with children's behaviour problems.

Two time-trend analysis from the US showed mixed findings. A time-trend analysis of a nationally representative repeated survey by Cui and Zack (2013) found that a self-reported number of mentally unhealthy days during the past 30 days increased among adolescents in the Great Recession, particularly among those from middle- and low-income families. However, a time-trend analysis, using the Monitoring the Future study, by Johnson et al. (2017) found no significant changes in reported depression mood or aggression around the Great Recession period.

The studies from other countries generally show more inconsistent findings. A study by Arroyo-Borrell et al. (2017), using Spanish National Health Survey data on 4–14-year-olds between 2006 and 2011, did not find significant changes in children's mental health problems before and after the onset of the Great Recession. The association between low maternal socioeconomic status and mental health problems was no greater after the onset of the crisis. Similar findings are reported by Rajmil et al. (2013) using the Catalan Health Survey on the population aged 14 or younger. The authors find no significant changes in the mental health measure before and after the onset of the Great recession (2006 vs. 2012).

Two Greek studies indicated negative effects of the recession. In Greece, Lazaratou et al. (2017) find that high school students more exposed to the crisis (measured as reporting shortages in basic goods due to the Greek crisis) reported a higher aggressive behaviour score. A similar finding was reported in another Greek study (Motti-Stefanidi & Asendorpf, 2017), reporting that the level of conduct problems was higher in a post-recession cohort of secondary school children, compared to the pre-recession cohort but there were no differences in emotional symptoms.

Several studies focused on English speaking countries. In the UK, McKenna et al. (2017) report that an onset of financial strain during the Great Recession was linked to a higher risk of both teacher and parent-reported child's problematic behaviour. An Australian study by Bubonya at al. (2019) finds no

detectable effect of community-level unemployment expectation shocks on mental health among boys or mothers. The study does report a modest effect among girls when using parent-rated, but not teacher-rated, mental health problems as an outcome. In Ireland, Layte and McCrory (2018) report that family experiences of the recession had negative effects on parental mental health and child psychological adjustment. The authors suggest that the Great Recession may have had a direct effect on child psychological adjustment (not only via parents' mental health variables).

Two studies used multi-country study settings. In a multi-country study by Rathmann et al. (2016), a higher country level youth unemployment rate was associated with higher odds of psychological health complaints, but there was no association between changes in youth unemployment rates (2005–2010) within countries and adolescents' psychological health complaints. The study showed that increasing youth unemployment within countries was, however, linked to greater socioeconomic inequalities in mental health. Pfoertner et al. (2014), using the same dataset, report similar findings that adolescents' well-being was associated with the current labour market situation, but not with changes in the youth or adult unemployment rates within countries.

Three studies focused only on the mental health of mothers, all of which indicated some detrimental effects of the Great Recession. A US study using the Fragile Families and Child Wellbeing Study (FFCWS) data by Currie et al. (2015) find no overall effect in terms of the state level unemployment rate on mothers' risk of depression. An increase in the unemployment rate was, however, associated with the decreasing risk of depression among white and married mothers and with an increasing risk among Hispanic mothers. In contrast, a longitudinal study by Briody et al. (2020) using Irish data, shows that an increase in local unemployment was associated with mothers' poor mental well-being. Another Irish study by Kiernan (2019) showed that negative changes in disposable income and housing arrears due to the Great recession predicted a higher risk of depression among mothers of young children while there was no association with parental stress.

In sum, studies from the US showed, with few exceptions, that the recession was linked to worse mental health outcomes in children. The findings, however, seemed to depend upon the measures of

the Great Recession exposure. Studies set in other countries showed more mixed findings. Several studies indicate that the Great Recession had some negative effects on mothers' mental wellbeing.

4.2. Substance use

Substance use-related outcomes were the focus of 5 studies, all of which were deemed to have a moderate risk of bias. In addition, two studies focusing on mental health also included a substance use-related outcome.

Studies provided inconsistent findings regarding the effects on substance use-related outcomes. A multi-country study, using European school surveys on alcohol and other drugs conducted between 2007 and 2011 among adolescents aged 15–17, reports mixed patterns. An increase in the unemployment rate was associated with an increase in the risk of ever having tried inhalants and cocaine but also with a decrease in the risk of ever having tried ecstasy (Balbo et al., 2020). A Spanish study by Zozaya and Vallejo (2020) analysing repeated cross-sectional surveys conducted before and after the onset of the Great Recession, reports a positive association between increases in the regional unemployment rate and alcohol consumption among adolescents. This association was attenuated when individual-level variables were controlled for. A study by Kokkevi et al. (2018) using repeated cross-sectional school surveys in Greece, reports that cannabis use increased among boys in the Great Recession but alcohol consumption decreased in both genders. Among adolescent boys whose families were heavily exposed to the economic crisis, however, alcohol use also increased.

Two studies in the US reported an association between recession measures and substance use in subgroups. Pabilonia (2017) finds that changes in the state-level unemployment rate were not generally linked to alcohol or marijuana use. The author does, however, report positive associations in specific subgroups (including Black and Hispanic boys). Furthermore, Schneider W et al. (2015), cited also in the mental health section, found that a higher level of economic uncertainty (Consumer Sentiment Index) in the Great Recession was linked to a higher risk of the secret early use of drugs or

alcohol among 9-year old boys in single-mother families, although no association was found in the full sample of the FFCWS study.

Two studies focused on mothers and substance use. Among mothers, Reinhard et al. (2018) find inconsistent evidence regarding the link between the Great Recession exposure and alcohol use in an Irish sample. A reduction in wages due to the recession was associated with an increase in the probability of mothers' consuming 5 or more units of alcohol per week, but spouse's job loss was associated with a decrease in the probability of alcohol use. In the US, Currie et al. (2015), cited also in the mental health section, finds that the local unemployment rate increased mother's risk of drug use (without a doctor's prescription).

In sum, individual studies indicated that the Great Recession may have affected the substance use of specific subgroups. However, the evidence on children in general is inconsistent and the link between the Great Recession and substance use may depend upon on the substance use outcome.

4.3. Child maltreatment and family violence

Child maltreatment and family violence-related outcomes were the focus of 15 studies (8 with a moderate risk of bias and 7 with a high risk of bias, Table 4). 14 of these studies came from the US with one from Spain. Eight of these studies used ecological study designs.

Five studies used hospital records for an outcome measure in the US. An ecological study by Berger et al. (2011) reports an increase in the rate of child abuse head trauma cases in three specific US regions after the onset of the recession compared to the time before the recession. Similar findings were reported by Wood et al. (2016) and Huang et al (2011). Wood et al. report that hospital records of the child abuse head trauma rates increased in the recession period and remained at an elevated level after the recession, compared to the period before the recession. There was however no association between county-level recession indicators and child abuse head trauma rates. In another study, Wood et al. (2012) showed that, in the period 2000–2009, child physical abuse hospitalisation rates were associated with local mortgage delinquency rates and changes in foreclosure rates. No

association was, however, observed with the unemployment rate. Contrasting evidence was provided by Medel-Herrero et al. (2020), reporting that there was no significant change in the total number of child domestic violence hospitalisations and emergency department visits between the pre-recession and recession/past recession time periods in California, US (but an increase was observed among men).

Four studies used the FFCWS data, all of which suggested an association between a recession exposure and selected family maltreatment outcome. Brooks-Gunn et al. (2013) found that a decline in the consumer confidence level during the Great Recession was associated with more frequent parental spanking. A similar finding was reported by Lee et al. (2013) using the same data; unemployment rate as a measure of the recession and harsh parenting as the main outcome. The authors also reported that this association was driven by a deterioration in the local unemployment rate and that the association was moderated by certain genetic factors. Using the same dataset, D. Schneider et al. (2016) reported that unemployment and economic hardship at the household level predicted a higher risk of abusive behaviour within families. Furthermore, increases in the regional unemployment rate increased the risk of men's controlling behaviour toward mothers after controlling for the household level economic variables. The risk of child abuse and neglect was investigated by Schneider et al., 2017, Schneider et al.,. The authors report that the exposure to the Great Recession, as measured by the Consumer Sentiment Index and unemployment rate, was associated with an elevated risk of child abuse, particularly in families with a social father. The authors report that the Great Recession was also linked to a decreased risk of child neglect.

Several studies with ecological design provided mixed findings from the US. Using aggregate data from North Carolina (the US) judicial districts, Schenck-Fontaine et al. (2017) report that job losses were not associated with the frequency of child maltreatment reports. In economically disadvantaged communities, however, job losses predicted an increasing share of reports that were severe. In another ecological study, Schenck-Fontaine and Gassman-Pines (2020) used state-level aggregated data on child maltreatment reports and involuntary job losses from the US states. Involuntary job losses were

associated with an increased rate of physical abuse reports, but not associated with other types of child maltreatment. The effect of reports on physical abuse were stronger in magnitude in states with low levels of income inequality. An early ecological study by Nguyen (2013) finds an opposite pattern using county-level data on the rate of out-of-home (foster care) cases and the unemployment rate. The author reports that in many counties there were lower rates of out-of-home cases when unemployment rates were higher. Another ecological study by Millet et al. (2011), using state-level administrative data from seven US states, finds no evidence for the relationship between the economic indicators and the maltreatment rate.

In the US, a nationwide time trend analysis is provided by Finkelhor et al. (2014) who analysed victimisation rates in three nationally representative samples of children aged 2–17 conducted between 2003 and 2011. The study finds no significant changes in reported maltreatment in the recession period 2008–2012 whereas in a longer timeframe, 2003–2012, there was a significant decline.

In sum, studies with individual-level data and specific exposure measures to the Great Recession reported a positive association between the Great Recession and the risk of child maltreatment whereas ecological studies and time-trend studies report more mixed findings. Outside the US context, the only identified study on violence in families with children is provided by Rajmil et al. (2015). This Spanish study with an aggregated time-trend comparison design shows that there were no significant changes in hospitalisation due to child maltreatment in the recession period.

5. Discussion

In line with the previous evidence focusing on adult populations (Burgard and Kalousova, 2015, Frasquilho et al., 2015), the reviewed studies suggested that the Great Recession had a detrimental effect on the mental health of children. The negative effect of recession on child mental health is consistent with existing knowledge on the socioeconomic determinants of child health (Reiss, 2013). High-quality studies included in this review indicated that the negative effect of the Great Recession

on child mental wellbeing was not fully explained by their parents' exposure to the recession (Golberstein et al., 2019, Layte and McCrory, 2018). This implies that the effects of recession are likely to extend beyond those directly affected (Golberstein et al., 2019). Another relevant finding is that children in low-income families were more likely to experience a decline in mental health in the recession than their more affluent counterparts (Cui & Zack, 2013).

The heterogeneity of the reviewed studies implied that formal quantitative comparisons of the effects across studies with varying risk of bias, places, or study populations were not possible. Although single studies reported some sex differences e.g. (Gassman-Pines et al., 2014, Kokkevi et al., 2018, Pabilonia, 2017) and age-group differences (Liu & Lim, 2020), there were no consistent patterns on differential effects by these demographic characteristics. It is also important to note that several time-trend analyses from Europe did not find deteriorating mental wellbeing among children. This may be due to contextual factors, such as socioeconomic safety nets in place, or dissimilar study designs.

There are several plausible mechanisms through which macroeconomic factors may influence child mental health. A commonly used explanation is that a recession increases stress and leads to economic hardships and stress in families, causing a deterioration in parents' mental wellbeing and to harsher parenting practices, all of which, in turn, negatively influence children's mental health (Gassman-Pines et al., 2014, Ristikari et al., 2018). It is also possible that rising unemployment rates, worsening future prospects and uncertainty in general may have a direct influence on children over and above individual-level exposure to the recession (Golberstein et al., 2019, Layte and McCrory, 2018). Some indications exist that parents' direct exposure to the recession and stress may not fully explain the effect on child mental wellbeing (Golberstein et al., 2019, Layte and McCrory, 2018; W. Schneider et al., 2015). Qualitative investigations and quantitative studies comparing different exposure to the recession are thus required in order to provide better insights into these questions.

The connection between economic recessions and substance use appears to be complex and thus not straightforward. There were some signs that subgroups in more vulnerable economic positions were at risk of engaging in substance use due to the recession. A previous review focusing on the adult

population suggested that the net impact of economic declines for men was increasing harmful alcohol consumption (but not for women) (De Goeij et al., 2015). Three of the included studies (Kokkevi et al., 2018, Pabilonia, 2017, Zozaya and Vallejo) found that the recession had had a significant effect on alcohol consumption among specific subgroups (particularly boys affected by the recession at the individual level) but no effects were found in the full samples. Evidence regarding drug use was scarce. Only one study (Currie et al., 2015) focusing on mothers, reported an increased risk of drug abuse due to the recession while another study (Balbo et al., 2020) focusing on adolescents, reported mixed patterns. Altogether, the number of studies was too low to conclude any net effect of the Great Recession on substance use. Robust subsequent research is therefore warranted with population-representative samples and with more specific exposure variables on the Great Recession.

Several studies using individual-level data indicated that the Great Recession increased the risk of child maltreatment and family violence, but these findings relied on a single data source (FFCWS) and may be susceptible to confounding bias. Furthermore, there were several ecological and population representative time-trend analyses that provided mixed findings and were thus unable to verify the effect of the Great Recession on child maltreatment and family violence. Another limitation of this strand of the literature was the heavy focus on the US context. We identified only one study within our inclusion criteria outside the US. Furthermore, the varying recession and the child maltreatment-related outcomes makes the interpretation of the available evidence difficult. We are then understandably cautious when it comes to drawing final conclusions. Thus, we suggest that subsequent research is needed with individual level data on child maltreatment and family violence and with multiple exposure variables measuring the recession.

Drawing overall conclusions from all OECD countries together from the presented evidence is challenging. This is because the few included studies outside the US were set in countries with highly different social safety nets and because the depth and length of the Great recession varied substantially between the OECD countries. This calls for researchers to investigate the effect of

recessions on mental health in European countries separately. More specifically, more research is needed to improve the understanding about the extent to which, and ways in which, various social welfare policies in place can alleviate the potential negative effects of economic recessions on children and families.

It is important to emphasise also the heterogeneity of the reviewed studies. The studies used varying study designs, each of which may have a different accuracy level designed to detect the effect of the recession on the selected outcomes. More specifically the included studies measured the Great Recession exposure with dissimilar variables, which are not equivalent and may measure different aspects of the recession. Furthermore, the reviewed studies focused on the exposure of the Great Recession at different - individual, local or country - levels. All of these levels may be relevant for families but via different mechanisms. For example, recession at the national level may introduce general uncertainty and policy changes, such as budget cuts, that affect families (Rajmil et al., 2020), at the local level, recessions can affect neighbourhood social cohesion (Maguire-Jack & Showalter, 2016) and, at the individual level, recession can cause stress and economic hardship. Further research in this area is needed to shed light on how recession affect families at different levels. This is important because understanding the varying mechanisms through which economic recession link to family wellbeing at different levels may help to design effective policies at local and national levels.

Finally, the outcome variables, and their data sources, used varied substantially, each having their limitations. For example, in family violence, while administrative data on child maltreatment can overcome problems with small and selected samples, the data has potential bias due to lack of information on those not being reported to child services and lack of individual level variables (Brownell & Jutte, 2013). Differences in the study designs and the measures used are likely to explain some of the mixed findings. In line with the previous reviews on health effects of the recession (Parmar et al., 2016), due to these many sources of heterogeneity in the reviewed studies, no formal quantitative synthesis was provided and detailed comparison across studies were limited.

5.1. Limitations

This review has important limitations. For assessing the risk of bias, we used a previous tool proposed by Parmar et al. (2016), which was assessed to be the most suitable tool for our purposes. Nevertheless, this tool is not without limitations. For example, it is not always the case that testing multiple measures of the recession is more robust than just one measure. Due to the small variation in the risk-of-bias score and heterogeneity of the study, we were unable to compare the key results across the bias groups. Nevertheless, according to the assessment tool used, most of the studies showed a moderate risk of bias, mainly due to a lack of consideration in terms of lagged effects and short follow-up periods. The varying risk of bias may explain some of the mixed findings.

This review excluded several potentially useful branches of evidence. The review excluded non-English language publications and work not published in peer-reviewed journals. We identified studies mostly from English language countries as evidence from non-English speaking countries is more likely published in local languages. Furthermore, grey literature, including, for example, working papers, preprints, theses and reports, was excluded because of the challenges applying a systematic search on such literature. Finally, we also excluded a body of literature that focused macroeconomic conditions in general but did not test explicitly and separately the effect of the Great Recession on the selected outcomes (e.g. (Cherry and Wang, 2016, Lindo and Jessamyn; Hansen, Benjamin., 2013, Raissian, 2015)). It is difficult to assess the extent to which these exclusions affect the key findings. Explorative searches indicated that several identified working papers and peer-reviewed papers focusing on macro-economic conditions in general and the selected outcomes (Brown and De Cao, Cherry and Wang, 2016, Lindo and Jessamyn; Hansen, Benjamin., 2013, Raissian, 2015) did not contradict our key findings. Nevertheless, studies published in other languages than English may provide needed information regarding the heterogeneity of the effects. Publication bias as it relates to the included studies may also affect the results.

5.2. Policy implications

At the current time of writing (November 2020), the depth and length of the imminent recession following the COVID-19 pandemic is not yet fully known. The early signals indicate, however, that

unemployment will, at least temporarily, increase dramatically to match or even exceed, the levels experienced during the Great Recession. The evidence from reviewed studies was mostly based on an analysis in which the unemployment rate was used as the main exposure variable capturing the effect of the Great Recession. This gives us confidence in terms of our decision to use this type of evidence to guide and to target policy interventions aiming to alleviate the consequences of the recession following the pandemic.

Therefore, two key policy implications stem from the reviewed evidence. First, countercyclical investments in and further integration of mental health and educational and social services targeted not only at adults but also at families with children are crucial in order to alleviate the human suffering in recessions. In this context, it is crucial to emphasise that mental health is more than the absence of mental disorders. The constitution of wellbeing goes beyond the typical social and health problems and service needs based on hardships that appear during economic recessions. From the perspective of strengthening children's resilience, it would be useful to emphasise and strengthen these elements of wellbeing in situations where the parents face unemployment and economic problems (Niemelä et al., 2019).

Second, the potential heterogenous effects of recessions on different population subgroups (Cui and Zack, 2013, Rathmann et al., 2016, Schaller and Zerpa, 2019) calls for the health and social sectors to recognise those people most at risk and to design tailored services for them. Considering society as a complex entity, this is system-level challenge to recalibrate and reorganise public service delivery not only by developing and organising service ecosystems based on cooperation between public, private and NGOs, but also from the perspective of service-integration, new accountability mechanisms, human-centred leadership, and co-creation models. As an outcome from this and looked from the perspective of accountability, service users and beneficiaries of services constitute active agency, and provide bottom up processual information flow between service users and institutions delivering services. Our assumption is that this system-level change requires new ways-of-working and institutional self-organizing and these new enactments bring about the need for further analysis of

how public services are led, organised, planned and delivered (Laitinen et al., 2018, Osborne et al., 2013, Virtanen et al., 2018).

Finally, it is important to make some distinctions between overall government responses in the Great recession and the COVID-19 pandemic economic crisis in 2020. In 2007/2008, to response to the economic recession that shadowed many European countries a number of years, governments introduced market-saving (not correcting) mechanisms by, for instance, bailing out the banks which was followed by economic hardships and austerity policies for many years. In 2020 there has been in many countries a more expansive response to the impact of COVID19 pandemic (for instance, employment support, re-allocation of public spending on social and health care services, and support for businesses). Thus, it seems that the government response during the COVID19 pandemic appears to be stronger to alleviate the hardships caused by the economic recession, which may limit the comparability of the two recession.

6. Conclusions

This review was designed to summarise the available evidence on the effect of the Great Recession on mental health, substance use and violence in families with children. High-quality evidence has shown that the Great Recession had a direct effect on the mental health of children. Moreover, the Great Recession may have increased substance use among vulnerable adolescents and parents. Lastly, individual level studies showed that exposure to the Great Recession may have led to increasing child maltreatment in the US, but this finding was not confirmed in population level time-trend analyses. The results call for targeted measures to support mental health among children facing the consequences of COVID-19 induced recession.

There are number of specific avenues for further research. First, it would be potentially fruitful to study the effects of economic recessions on mental health, substance use and family violence by combining qualitative investigations and quantitative studies to compare different exposure levels to the recession. These investigations would most likely provide interesting insights on these

phenomena, not revealed by quantitative investigation alone. Second, there is clearly still a paucity of research on how service-systems should be re-calibrated and re-organised in situations of pervasive societal shocks to better meet the service needs of users and help build resilience among families with children. The effects caused by economic hardships could also pave the way for new understandings of the concept of wellbeing itself. Our understanding is that wellbeing can be levelled in the case of economic problems (caused by unemployment) by strengthening other drivers affecting the feeling of being safe and being able to more fully develop oneself in order to cope with the difficulties faced in life. This approach is well defined, for instance in the UN's Sustainable Development Goals and in its Convention of the Rights of the Child. Third, potential moderating factors, such as age, gender, and family socioeconomic status, in the effects of the great recession should be investigated. Finally, it is important that potential policies alleviating the negative effects of economic shocks on families are investigated.

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