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## **Abstract**

**Background:** Between 5 and 30% of children in high income countries live with a substance misusing parent; the majority of which is below dependent levels. However, little is understood about the impact of non-dependent parental substance misuse upon children.

**Methods:** We searched the international literature, using rigorous systematic methods to identify studies examining parental substance misuse and adverse outcomes in children. The inclusion criteria was: cross-sectional, longitudinal, case-control and cohort studies; of children aged 0-18 years whose parents are high risk substance misusers; reporting on their health, psychological, substance use, educational and social outcomes.

**Results:** We identified 36 papers (from 33 unique studies), most of which were assessed as being of medium to high methodological quality (n=28). Parental non-dependent substance misuse was found to be associated with adversity in children, with strong evidence of an association with externalising difficulties (n=7 papers, all finding an association) and substance use (n=23 papers, all finding an association) in adolescents and some evidence of a adverse health outcomes in early childhood (n=6/8 papers finding an association). There is less evidence of an association between parental substance misuse and adverse educational and social outcomes. The body of evidence was largest for parental alcohol misuse, with research examining the impact of parental illicit drug use being limited.

**Conclusion:** Methodological limitations restrict our ability to make causal inference. Nonetheless, the prevalence of adverse outcomes in children whose parents are non-

dependent substance misusers highlights the need for practitioners to intervene with this population before a parent has developed substance dependency.

Parental substance misuse is a prevalent and substantial child protection concern worldwide (HM Government 2015, Canfield, Radcliffe et al. 2017). There is well-established evidence documenting the harmful effect of parental substance dependency has upon the child throughout their life course (Cleaver, Unell et al. 2011). Children whose parents are dependent upon substances are more likely to suffer an injury (Bijur, Kurzon et al. 1992, Advisory Council on the Misuse of Drugs 2003), as well as an injury of greater severity (Damashek, Williams et al. 2009) and experience health problems which their parents may not respond effectively to (Cleaver, Unell et al. 2011). Pre-school children are at risk of delays in cognitive and language development (Barnard 2007), and greater likelihood of education deficits (Royal College of Physicians 1995). They go on to have lower educational performance in adolescence (Kolar, Brown et al. 1994), resulting in poor life chances (Cleaver, Unell et al. 2011). Parental substance dependency has been found to negatively affect the structures and functions of the family (Velleman and Templeton 2007). This includes disrupting family routines and rituals (Holland, Forrester et al. 2014), affecting the quality of the relationship between the parent and the child (Cleaver, Unell et al. 2011), lower levels of parent-child supervision (Kandel 1990), harsh parenting (Kelley, Lawrence et al. 2015), higher prevalence of domestic violence and other traumatic events (Sprang, Staton-Tindall et al. 2008) and family deprivation (Holland, Forrester et al. 2014).

Many factors have been highlighted as possible mechanisms which impact upon the child, these include: direct exposure to alcohol and/or drug use and to other users (Advisory Council on the Misuse of Drugs 2003); ineffective parenting practices and a reduction in parenting capacity brought about by the intoxicating effect of the substance and/or withdrawal from it (Kandel 1990, Miller, Smyth et al. 1999); a lack of parental emotional availability and warmth (Suchman, Rounsaville et al. 2007) as well as greater likelihood of

experiencing trauma such as abuse or neglect as a child (Dube, Anda et al. 2001). Due to the potential negative impact on the child, parental substance dependence is often identified as a risk factor in child welfare and child protection assessments. In the England 18% of all child in need assessments identify parental drug misuse and 19% identify parental alcohol misuse (Department for Education 2016). In the US parental substance misuse has been associated with up to two-thirds of all child maltreatment cases (Traube 2012).

It has been estimated that 162,000 children (1%) in England may live with a dependent opiate using parent (Department for Work and Pensions 2017) and between 189,119 (1%) and 207,617 (2%) children who live with an alcohol dependent parent (Pryce, Buykx et al. 2017). A far larger number of children are likely to live with substance misusing parents, whose use does not meet the diagnostic criteria for dependence. Research estimates that between 5% and 30% of children in European countries live with at least one parent who misuses substances (European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) 2010), 10.5% of children in the US and 13% of children in Australia (Dawe, Frye et al. 2007). In the UK 30% of children aged under-16 years live with at least one parent who misuses alcohol and 8% with a parent who misuses illicit drugs (Manning, Best et al. 2009). Moreover, 14% of UK infants (aged under 1 year) are exposed to parental problem drinking or illicit drug misuse (Manning 2011), whilst US research estimates 13% of mothers are misusing alcohol one year after delivery (Liu, Mumford et al. 2015).

### *Study objectives*

Despite the high prevalence of parental substance misuse which is below the diagnostic criteria for dependence, little is understood about the impact of such patterns of parental substance misuse upon children. As the number of children living with a substance misusing parent is higher than those living with a substance dependent parent, the greatest burden of harm on a population level is likely to be experienced by these children. The furthering of knowledge in this area is fundamental to enable effective and early responses to address the needs of the families affected. This rapid evidence assessment reviews published evidence reporting on adverse health, psychological, substance use, educational and social outcomes of children of non-dependent substance misusing parents. We limit our review to high risk patterns of parental substance misuse.

## **Methods**

The international literature was searched in November 2016 using electronic databases Medline (OVID), PsychoINFO (OVID), CINAHL (EBSCO), SCOPUS, Applied Social Science Index and Abstract (ProQuest), International Bibliography of Social Science (ProQuest), ProQuest Criminal Justice (ProQuest), ProQuest Social Science Journals (ProQuest), ProQuest Sociology (ProQuest), Social Service Abstracts (ProQuest), Sociological Abstracts (ProQuest). Due to population flux and changes in economic conditions we restricted our search for evidence to publications from 1998 onwards. A search strategy using mesh terms, thesaurus headings, Boolean and proximity operators was adapted for each database and implemented.

### *Review inclusion criteria*

Two researchers independently screened all titles and abstracts using specified inclusion and exclusion criteria, retrieving full papers for all potentially eligible studies and evaluating in full text. Discrepancies at each stage was resolved by discussion or by consulting a third researcher if consensus could not be reached. Studies adopting a cross-sectional, longitudinal, case-control and cohort design were included if the sample consisted of children aged 0-18 years whose parents were high risk substance misusers. To be included, studies must report on parental substance misuse which meets one of the following criteria:

- a pattern of alcohol consumption that leads to the presence of physical or psychological problems (typically over 35 units per week for women and over 50 units per week for men);
- frequent illicit drug misuse (more than once per month as defined by the Crime Survey for England and Wales);
- alcohol or illicit drug abuse defined as: a maladaptive pattern of drinking/drug use, leading to clinically significant impairment or distress, as manifested by at least one related problem in a 12-month period (failure to fulfil major role obligations, use in situations in which it is physically hazardous, alcohol or drug-related legal problems, having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of alcohol or drugs) (American Psychiatric Association 2013).

Further, studies were required to include comparison samples of children whose parents were not substance misusers. The condition of interest was adversity experienced by the child defined as any negative health, psychological, child substance use, educational and social effect. A health harm includes direct impact (e.g. brought about by accidental ingestion by the child or exposure to the substance or contaminated environments) or indirect impacts (e.g. child physical injury, health service usage, fatality); psychological harm such as internalising (e.g. emotional or behavioural problems that are focused inwards such as depression, anxiety, dissociative disorder and eating disorder) and externalising problems (e.g. behaviours that are directed toward the external environment including physical aggression, disobeying rules and antisocial and offending behaviours); substance use by the child includes early onset of alcohol and/or drug use, frequent use, experience of alcohol and/or drug problems; educational impact includes school attainment, punctuality, truancy or suspension and social impact includes parent-child relationship quality, family functioning and home environment, parent supervision and experience of abuse.

Papers were excluded if:  $\geq 50\%$  of the parent sample were dependent upon substances other than tobacco (defined as those with a diagnosis of dependence, in receipt of agonist prescribing or attendance at treatment services); insufficient detail is reported for the review team to confidently assess the criteria for high risk substance misuse levels; were reporting on a qualitative study or were not published in English. The methodological quality of each study included was assessed according to the criteria presented in the quality assessment tool for systematic reviews of observational studies (QATSO) (Wong, Cheung et al. 2008). This scale is based on a cumulative score across five items: external validity, reporting (two items), bias, and confounding factors. Studies achieving 67% or more in scoring were regarded as high quality, 34-66% medium and less than 34% low quality. We have standardised the language used within the review when referring to all studies meeting the criteria for high risk parental substance misuse. We use the term parental substance misuse when referring to studies which report on parents who misuse alcohol and/or drugs. When the source study examines only alcohol or drug misuse we use the term parental alcohol misuse or parental drug misuse respectively. Within the tables and figures however we will include further clarification relating to the specific levels reported upon within the source studies.

## **Results**

INSERT FIGURE 1

*Description of studies*

We identified 36 papers (reporting on 33 unique studies) which reported upon adverse outcomes of children of non-dependent parental substance misusers. The majority (n=17) of the studies were conducted in the US; 5 in the UK; 12 in other European countries and 2 other countries worldwide (Australia, Korea). The sample sizes of the included studies ranged from 30-740,618 (mean sample 23,896). We assessed 13 studies as being of high methodological quality, 15 of medium quality and 8 of low quality. We have divided the adverse child outcomes into physical health, psychological wellbeing, child substance use, educational and social. Figure 1 provides further details of the flow of the studies identified for the review and the summary of findings for the included studies are presented in table 1.

### *Child health impact*

Six unique studies showed a significant positive association between parental substance misuse and negative child health outcomes. Baker et al (2014) and Tyrrell et al (2012) conducted high quality large UK population-based matched nested case-control studies investigating the association between maternal alcohol misuse and other risk factors for accidental child injury aged 0-5 years. Children whose mother's medical record showed a history of alcohol misuse were found to have a twofold higher odds of long bone fracture (OR 2.33, 95% CI 1.13 to 4.82,  $p < 0.05$ ) (Baker, Orton et al. 2015) and a fivefold higher odds of medicinal poisoning (OR 5.44, 95% CI 1.99 to 14.91,  $p < 0.01$ ) (Tyrrell, Orton et al. 2012) compared to those without a record of maternal alcohol misuse. A large, high quality, retrospective population study based on Finnish health care registers found that children of substance misusing mothers were hospitalised due to injury or illness significantly more frequently and for longer than children whose mothers did not misuse substances. Inpatient care episodes per 1000 children was almost double in the group of children with substance

misusing mothers to that of the comparison group (2117 versus and 1184) with a mean duration of 3.3 days and 2.4 days respectively (Raitasalo, Holmila et al. 2015). This association was most pronounced in mothers who misused both alcohol and drugs. Remaining studies were of low quality therefore caution should be applied when considering results. These studies reported that poor diet (Jeffreys, Hirte et al. 2009), low weight (below the 10<sup>th</sup> percentile) (Joya, Papaseit et al. 2009) and increased rates of dental problems (Cornelius, Clark et al. 2004, Jeffreys, Hirte et al. 2009) in children were associated with substance misuse by parents. Whilst studies have found no correlation between parental alcohol misuse and sleep in children (Tarokh and Carskadon 2010, Tarokh, Van Reen et al. 2012).

### *Psychological impact*

There is strong evidence of significant positive association between parental alcohol misuse and externalising problems, with all seven papers (reporting on six unique studies) finding a significant and positive relationship (Malone, Iacono et al. 2002, Lee and Cranford 2008, Malone, McGue et al. 2010, Torvik, Rognmo et al. 2011, Kendler, Gardner et al. 2013). Further, two of these studies were assessed as being of medium quality (Rossow, Pape et al. 1999, Lee and Cranford 2008) and the remaining studies were assessed as high quality. Parental alcohol misuse has been found to be associated with conduct problems (Malone, Iacono et al. 2002, Malone, McGue et al. 2010, Kendler, Gardner et al. 2013); most defiant disorders (Malone, Iacono et al. 2002, Malone, McGue et al. 2010); delinquency (Kendler, Gardner et al. 2013); violence (Rossow, Pape et al. 1999) and hyperactivity (Kendler, Gardner et al. 2013). There were mixed findings relating to attention difficulties in the children of alcohol misusers, with one study finding a significant association between

parental alcohol misuse and below diagnostic threshold difficulties (Torvik, Rognmo et al. 2011), whilst two papers from one linked study examining parental alcohol misuse and attention deficit hyperactive disorder found no association (Malone, Iacono et al. 2002, Malone, McGue et al. 2010). Only one study examined the impact of parental misuse of substances other than alcohol (Torvik, Rognmo et al. 2011), finding an association of modest effect size upon child attention and conduct problems. Studies mostly reported association between both mothers' and fathers' substance misuse and child externalising difficulties, one paper reported that the relationship was greater when maternal alcohol misuse was present (Torvik, Rognmo et al. 2011). A further study found gender-modelling associations between the parent and child; maternal alcohol misuse was found to be significantly correlated with rule breaking and aggressive behaviour in girls but not in boys, whilst paternal alcohol misuse was found to be significantly associated with aggressive behaviour in boys, but not girls (Finan, Schulz et al. 2015).

There was limited evidence of a significant association between maternal or paternal alcohol misuse and internalising disorders in children. In a medium quality study using child report measures of parental drinking, both paternal and maternal alcohol misuse were related to depression and anxiety for girls but not for boys (Ohannessian 2012). In a small, medium quality cohort study of Korean school children aged 12-16 years, parental alcohol misuse was found to be positively and significantly associated with internalising disorders (Lee and Cranford 2008). Resilience was found to have a moderating effect. At both low and average levels of resilience a significant positive relationship was found between parental alcohol misuse and internalising behaviours; at high levels of resilience however parental alcohol misuse was not significantly associated with internalising behaviours. Associations in a high

quality study did not reach significance (Malone, Iacono et al. 2002, Malone, McGue et al. 2010).

### *Child substance use impact*

There is a large volume of evidence that parental substance misuse influenced their child's own substance use, with all 23 included papers (reporting on 20 unique studies) finding a significant association. This evidence is mostly of medium to high quality with only two studies being of low quality (Jeffreys, Hirte et al. 2009, Yule, Wilens et al. 2013). Parental alcohol misuse was significantly associated with early onset adolescent drinking, (Kerr, Capaldi et al. 2012), alcohol consumption (Cranford, Zucker et al. 2010, Haugland, Holmen et al. 2013), alcohol intoxication (Rossow, Pape et al. 1999, Haugland, Strandheim et al. 2012, Haugland, Holmen et al. 2013, Haugland, Holmen et al. 2015) and the development of alcohol problems (Lieb, Merikangas et al. 2002, Kendler, Gardner et al. 2013) as well as adolescent illicit drug use (Malone, Iacono et al. 2002, Malone, McGue et al. 2010, Haugland, Strandheim et al. 2012). Heavy parental episodic drinking, but not frequency of parental drinking, was found to be associated with early onset and heavier alcohol consumption (Vermeulen-Smit, Koning et al. 2012). Parental substance misuse, which included alcohol and/or drug misuse, has been found to have significant associations with the substance use of the child. This included: increased prevalence of alcohol use in children (Shorey, Fite et al. 2013, Keeley, Mongwa et al. 2015), frequent alcohol intoxication (Haugland, Strandheim et al. 2012, Keeley, Mongwa et al. 2015) with one study reporting adolescents whose parents are frequently intoxicated are seven times as likely to be frequently intoxicated themselves (OR=6.5 95% CI=2.8-15.1, p<0.001) (Haugland, Strandheim et al. 2012), marijuana use (Hofler, Lieb et al. 1999, Hopfer, Stallings et al. 2003)

and other substance use (Jeffreys, Hirte et al. 2009, Delaney-Black, Chiodo et al. 2011, Shorey, Fite et al. 2013, Keeley, Mongwa et al. 2015). Having two parents who misuse substances was highlighted as being particularly predictive of adolescent substance use (Swaim, Beauvais et al. 2011, Keeley, Mongwa et al. 2015), with regular alcohol use being almost four times as likely (OR= 3.83, CI=1.65-8.89,  $p<0.01$ ) and past year illicit drug use almost six times as likely (OR= 5.90, CI=2.54-13.7,  $p<0.001$ ) as adolescents with two non-substance misusing parents (Keeley, Mongwa et al. 2015).

There were mixed findings as to whether the mothers' or fathers' substance misuse had the strongest association with child alcohol and/or drug use. A study considering the association between fathers' alcohol misuse and alcohol misuse in adolescent boys found a significant and positive relationship (Jennison 2014). Other studies ( $n=9$ ) directly compared the impact of mothers' and fathers' substance misuse. Both maternal and paternal substance misuse correlated with adolescents' alcohol to a similar size of effect (van der Zwaluw, Scholte et al. 2008, Haugland, Holmen et al. 2013, Finan, Schulz et al. 2015, Keeley, Mongwa et al. 2015) and drug use (Finan, Schulz et al. 2015, Keeley, Mongwa et al. 2015), although only fathers' and not mothers' alcohol misuse was positively associated with adolescent drinking (Ohannessian 2012) and the frequency of adolescent intoxication (Cranford, Zucker et al. 2010). One low quality study found that intergenerational transmission of alcohol misuse was not significant between mother and child or father and child (Yule, Wilens et al. 2013) but found significant associations with a large effect between exposure to maternal drug misuse and the development of drug misuse in children (OR= 7.04;  $p= 0.03$ ), but not paternal drug misuse (Yule, Wilens et al. 2013). Whilst two further studies found only maternal alcohol

misuse to be significantly related to child alcohol use (Kerr, Capaldi et al. 2012). Shorey et al (2013) reported that paternal substance misuse was more important in predicting use of a range of substances in both boys and girls. This study found statistically significant associations between paternal substance use and all licit and illicit measures of child substance use except lifetime inhalant use, for both boys and girls.

When also considering child gender, both boys and girls have been found to be significantly more likely to engage with substance using behaviours if their parents misused alcohol, with boys in particular being found to experience a negative effect. Parents' alcohol misuse was significantly associated with weekly drinking in boys but not girls, unless they had been exposed to high frequency parental drinking (Haugland, Strandheim et al. 2012). Indeed, boys who were exposed to parental intoxication were almost four times as likely to drink to intoxication and almost three times as likely to experiment with drugs, compared to boys who were not exposed to parental intoxication. Whilst girls who were exposed to parental intoxication were twice as likely to drink to intoxication and twice as likely to experiment with drugs, compared to girls who were not exposed to parental intoxication (Haugland, Strandheim et al. 2012).

### *Educational and social impact*

Three papers of mixed quality reported on parental alcohol misuse and its association with negative child education outcomes. Using a large cohort of over 740,000 Swedish individuals, Berg et al (2016) conducted a high quality study finding that alcohol-related hospital admissions in parents were significantly associated with lower school performance in

adolescents at age 15-16 years. The effect size of maternal alcohol misuse was stronger for girls than boys whilst the effect size of alcohol misuse by the father was equal for boys and girls. The statistically significant relationship between parental alcohol misuse and educational attainment was lost after including psychosocial factors in the model, including parental psychiatric disorders, illicit drug use, criminality and receipt of welfare benefits (Berg, Back et al. 2016).

School behavioural problems were associated with paternal alcohol misuse in early childhood, with a threefold risk of truancy, absenteeism, suspensions and conduct problems in a medium quality study (Jennison 2014). Family dysfunction, conflict and ineffectual parenting were found to be strongly correlated to adverse school outcomes for children in families with an alcohol misusing father. Notably also were the low levels of attachment and bonding to biological fathers, found to be associated with an increase in school-related behavioural problems of the children. A small low quality study in Australia also found children of substance misusers were more often absent or late for school (Jeffreys, Hirte et al. 2009).

The literature on the social outcomes of children whose parents misuse substances was mixed. Four studies of medium quality considered the association between alcohol misusing parents and the parent-child relationship. Whilst one study showed no significant impact upon the support provided to the child from the parent (van der Zwaluw, Scholte et al. 2008), a further study reported that children of alcohol misusing parents were significantly less likely to feel emotionally close to their father, either due to the impact of alcohol misuse upon the father's behaviour, conflict within the home, abdication of family responsibilities or

estrangement (Jennison 2014). Parental bonding and the parent-child relationship was negatively related to both mothers' and fathers' alcohol misuse in other research (Shorey, Fite et al. 2013). There is conflicting evidence that parental monitoring is negatively associated with parental alcohol misuse. One study reported a significant association between parental alcohol misuse and lower levels of parental monitoring (Shorey, Fite et al. 2013). A further study, however, reported that parents who are alcohol misusers were significantly more likely than an abstainer to leave their child in a place of unknown safety, but unrelated to other measures of neglectful parenting practices (Freisthler, Johnson-Motoyama et al. 2014). Indeed, a number of neglectful parenting practices were significantly more likely in parents who were abstinent or light-moderate alcohol users.

A significant association with a particularly large effect was shown in a high quality study of the number of children of substance misusing mothers who were placed in care (Raitasalo, Holmila et al. 2015). Children of alcohol misusing mothers were five times more likely to be placed in care by their seventh birthday than those raised by non-alcohol misusing parents. Those born to drug misusing mothers were over seven times more likely to be in care by age seven, whilst children whose mothers misused both alcohol and drugs faced a nine-fold increased risk. These relationships persisted after controlling for the child's gender and mothers' socioeconomic status. Once in care, children of substance misusing mothers were discharged 183% faster than those children whose mothers did not misuse substances (Hussey and Guo 2005). This somewhat counterintuitive finding is most likely to relate to an accelerated decision to place the children in permanent care however rather than reunification of the family. Further, the low quality of this study means that findings should be interpreted with caution. A cohort study of children taken into care also reported on the range of abuse children may experience whilst living within substance misusing homes (Jeffreys, Hirte et al.

2009). Due to the small sample size in this study, no statistical testing could be conducted. As such, the existence of a correlation between parental substance use and abuse are unknown.

INSERT TABLE 1

## **Discussion**

It is clear from this evidence that non-dependent parental substance misuse is associated with adversity in children. This evidence is more pronounced when both parents misuse alcohol and/or drugs, or when one or more parent misuses a combination of alcohol and drugs. In early childhood (0-7 years), the evidence from high quality studies suggests an increased likelihood of experiencing an injury or health concern, resulting in the need for medical care. The methodological quality of studies examining an association with diet, child weight and dental health is however of low quality and should be interpreted with caution. Maternal alcohol misuse in particular is highlighted as a key predictor for poorer child health. This may in part relate to the greater role mothers tend to play in the child's early years. However there was a paucity of research considering substances other than alcohol and relating to fathers' substance misuse which may result in a misleading focus on mothers.

The literature suggests that parental alcohol misuse increased the likelihood of externalising problems in children, with a significant association being reported in all studies being of medium or high quality. There was less evidence for an association between parental substance misuse and internalising difficulties such as depression and anxiety. Those showing an association were of medium quality and involved children exposed to parental intoxication

or where family and/or parental factors are present, whilst a high quality study did not find a significant correlation..

There was a large and methodologically robust evidence base consisting of 23 papers all finding a significant and positive relationship between parental alcohol and/or drug misuse and the child's own use. The evidence appeared particularly strong in families where both parents misused substances or when the child was directly exposed to the substance misuse. Social learning theory explains that we learn behaviour from observing, imitating and modelling those around us (Bandura 1997). It is possible that where children observe their parents consuming alcohol and/or drugs, this encourages the development of normative views about substance use. Further, the availability of alcohol or other substances within the home may increase the likelihood of adolescent use (Peeters, Koning et al. 2016).

There is emerging evidence that parental alcohol misuse is predictive of educational challenges, including truancy, school-related behavioural problems and lower educational attainment, although the methodological quality of these studies varied. The involvement of child welfare services as well as out-of-home placements for children were also higher in children whose parents misuse substances. The evidence for an association with other social and relational difficulties is however mixed. There was some suggestion that parental alcohol use was associated with lower levels of parent-child bonding, communication and overall relationship quality. However, evidence of neglectful parenting or inadequate parental supervision was limited and at times contradictory and as such caution should be exercised when drawing conclusions regarding an association between parental substance misuse and the quality of parental supervision. Methodological issues further limit the evidence.

Social workers often interact with families experiencing a wide range of difficulties. Whilst social workers within children's welfare services consider it legitimate within their role to ask parents about their drug and alcohol use, they experience difficulty in identifying parents who are substance misusers (Loughran, Honhman et al. 2010, Galvani, Hutchinson et al. 2013). Typically they relying upon observations of the parent's physical presentation and behaviour, which is unlikely to detect levels of misuse below the diagnostic criteria for dependence (Galvani, Hutchinson et al. 2013). Furthermore, those parents that are identified as being substance misusers often do not receive an intervention, with parents expressing reluctance to engage with specialist drug and alcohol treatment providers as they did not perceive themselves as having a substance misuse problem (Forrester and Harwin 2006). This suggests that early, opportunistic intervention delivered by a non-treatment specialist may be more appropriate.

There is a large amount of high quality evidence which has accumulated to support the effectiveness of alcohol screening and brief interventions with adults who have an alcohol use disorder with non-dependent populations in primary care setting (Kaner, Beyer et al. 2007, O'Donnell, Anderson et al. 2013). However, there are no studies examining the effectiveness of screening and brief interventions with substance misusing parents, including those whose children are involved with child welfare services. This represents a missed opportunity to intervene with this population before a parent has developed substance dependency. Such intervention has the potential to prevent the development of more problematic patterns of use and prevent harm to children. Social worker's should engage in conversations with parents which promoting the parent's ability to link their substance misuse with adverse experiences and risk of negative outcomes for their child. Such an interaction

may replicate the ‘teachable moment’ found to be conducive of behaviour change following the delivery of brief interventions within other settings (Babor and Grant 1992) and improving outcomes for children.

INSERT TABLE 2

### **Limitations**

The evidence examined within this review provides support for an association between parental substance misuse and a number of adverse child outcomes at different stages of development. There are however some notable gaps. In early childhood (0-7 years), the literature focuses upon the relationship between mothers’ substance misuse and child physical health, with a paucity of research examining behavioural problems, parent-child bonding or preparation for school as well as the impact of fathers’ substance misuse. In early adolescence (10-13 years), there is a lack of research into child education outcomes, and in each stage of adolescence (10-18 years), there is a lack of research into parental substance misuse and child health. There is limited research which considers parental illicit drug misuse throughout the child’s development, with the majority of research examining the difficulties in children of alcohol misusing parents.

Due to the inclusion of cross-sectional studies, causal relationships cannot be determined. Such naive comparisons of exposed and unexposed groups cannot adequately account for the many potential confounders nor precisely account for the measurement of effect (Fewell, Davey Smith et al. 2007). For example, genetic predisposition (Agrawal and Lynskey 2008) and the interaction between genes and the environment (Cleveland and Wiebe 2003) may

result in intergeneration transmission of substance misuse. Alcohol permissive parenting (Hung, Chang et al. 2015, Ennett, Jackson et al. 2016), adolescent monitoring (Kerr, Stattin et al. 2010), lower parent-child relationship quality (El-Sheikh and Buckhalt 2003, Shorey, Fite et al. 2013, Donaldson, Handren et al. 2016) and greater family conflict (El-Sheikh and Flanagan 2001, Kelly, Toumbourou et al. 2011) have been associated with increased child substance misuse. Furthermore, the direction of a reported relationship cannot be determined. For example, whilst children's conduct difficulties could be a result of parental alcohol misuse, a parent whose child has conduct difficulties may struggle to cope with their child's behaviour and their alcohol consumption may increase in response. Whilst longitudinal studies can highlight the temporal associations between variables and may offer greater insight into causation, such inferences are reliant upon the timing of the behaviour in relation to the outcome. For example, studies examining the impact of parental substance misuse upon internalising difficulties in children may assess children prior to the emergence of any symptoms, or early childhood exposure to parental substance misuse may be undetected due to behaviour change that predates study inclusion (Katikireddi, Green et al. 2017).

### **Further research**

Further research into the impact of parental substance misuse upon the child is needed to address the gaps in the evidence. Specifically, research examining the various impacts of both alcohol and illicit drug misuse throughout the stages of the child's development. Future research should include both fathers and mothers and be sufficiently powered to enable analysis of the impact of mothers versus fathers use upon male and female children and utilise longitudinal design, with regular follow-up throughout the child's development. This would offer opportunity for causal inferences and also enable age-related and temporal

associations to emerge. There is also a need for more high quality research examining the health, educational and social impact of parental substance misuse. The significant variation in how substance misuse patterns are described within research has presented great challenge to this review, and ultimately in the further of knowledge in this area. There is a need for consistency in the use of terminology describing levels of parental substance misuse in future research.

In considering the evidence for the impact of non-dependent parental substance misuse on children, focus invariably is on risks. There is also a need to consider the protective factors that may be present that may enhance child resilience to harm. This review has highlighted evidence that an association between parental substance misuse is greater when both parents are substance misusers. Put another way, the presence of one non-substance misusing parent offers some protection. Using the language of protection, rather than risk, affords an opportunity to view such protective factors as a possible intervention mechanism to enhance resilience. Given the evidence identified that factors such as maternal closeness, attachment and parent-child relationship quality are moderators of adversity (Shorey, Fite et al. 2013), future research should include a range of mediators and importantly, moderators of harm, which may inform intervention development.

## **Conclusions**

The findings of this review suggest that the vulnerability to adverse outcomes is not restricted to children living with substance-dependent parents. Rather, children may be affected by a wider continuum of harmful parental substance misuse; children who are likely to be less

visible to practitioners. Whilst practitioners may find it challenging to identify parents whose use is not within the dependent range (Galvani, Hutchinson et al. 2013), intervening early in parental risk factors including alcohol and drug misuse to safeguard children has been highlighted in guidance for health, social care and third sector partners (Munro 2011, Department of Health 2013, HM Government 2015). As the number of children living with a non-dependent substance misusing parent is likely to be greater than those living with a substance dependent parent, intervening with non-dependent parents is likely to bring about most benefit to children on a population level. Working to promote resilience, and enhance the child's protective factors is also important. Parents who do not misuse substances are a resource to this end. Moreover, intervening before a parent has developed a dependency has the potential to prevent the development of more problematic patterns of use and prevent harm to children.

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**Table 1: evidence of adverse child health, psychological, substance use, educational and social outcomes**

<b>Author, date, country</b>	<b>Cohort number</b>	<b>Age of child participants</b>	<b>Evidence of harm</b>	<b>Study quality</b>
<b>Health impact</b>				
Baker (2015) <i>UK</i>	N=26,117	Birth-5yrs	Children of mothers' who misuse alcohol are twice as likely to experience long-bone fracture	High
Cornelius (2004) <i>USA</i>	N=385	10-16yrs	Fathers' substance misuse is associated with increased likelihood of dental abnormalities in sons	Low
Jeffreys (2009) <i>Australia</i>	N=99	<12mnth-15yrs	Parental substance misuse is reported to be associated with poorer dental hygiene and healthcare usage – no formal statistical testing conducted	Low
Joya (2009) <i>Spain</i>	N=90	18mnth-5yrs	11.8% of children whose parents misuse cocaine are underweight (below 10 <sup>th</sup> percentile) compared to 1.6% children of parents who do not misuse cocaine	Low
Raitasalo (2015) <i>Finland</i>	N=54,519	0-7yrs	Children of alcohol misusing mothers are almost twice as likely to be admitted to hospital	High
Tarokh (2010) <i>USA</i>	N=30	9-10yrs	No association found between parental alcohol misuse and child sleep disturbance	Low
Tarokh (2012) <i>USA</i>	N=48	9-10yrs; 15-16yrs	No association found between parental alcohol misuse and child sleep disturbance	Low
Tyrrell (2012) <i>UK</i>	N=19,528	0 -> 37mnth	Children of alcohol misusing mothers' (recorded in medical records within last year) are five times as likely to suffer medicinal poisoning	High

<b>Psychological impact – externalising difficulties</b>				
Finan (2012) <i>USA</i>	N=492	Mean 16.15yrs	Mothers' alcohol misuse is associated with rule breaking and aggressive behaviour in girls and fathers' alcohol misuse is associated with aggressive behaviour in boys but not girls or rule breaking	High
Kendler (2013) <i>UK</i>	N=4231	Birth-12yrs	Neither mothers' nor fathers' alcohol misuse is associated with child conduct difficulties 42 months or child conduct symptoms 13yrs or antisocial behaviour at 15 yrs. Fathers' but not mothers' alcohol misuse is associated with hyperactivity at 42 months	High
Lee (2008) <i>Korea</i>	N=482	12-16yrs	Parental alcohol misuse is associated with externalising difficulties in children	Medium
Malone (2002) <i>USA</i>	N=2766	13-16yrs	Fathers' alcohol misuse is associated with conduct disorder and disruptive disorders but not attention deficit hyperactivity disorder or oppositional defiant disorder	High
Malone (2010) <i>USA</i>	N=2766	17yrs	Mothers' alcohol misuse is associated with conduct disorder, disruptive disorders and oppositional defiant disorder (in girls only) but not attention deficit hyperactivity	High
Rossow (1999) <i>Norway</i>	N=10839	12-20yrs	Parental alcohol misuse is associated with violent behaviour in children	Medium
Torvik (2011) <i>Norway</i>	N=8984	13-19yrs	Both mothers and fathers substance misuse is associated with attention difficulties and conduct problems	High
<b>Psychological impact – internalising difficulties</b>				
Lee (2008) <i>Korea</i>	N=482	12-16yrs	Parental alcohol misuse is associated with internalising behaviours in children	Medium
Malone (2002) <i>USA</i>	N=2766	13-17yrs	Fathers' alcohol misuse is not associated with depression in children	High

Malone (2010) <i>USA</i>	N=2766	17yrs	Mothers' alcohol misuse is not associated with depression in children	High
Ohannessian (2013) <i>USA</i>	N=1001	Mean 16.09yrs	Fathers' and mothers' alcohol misuse (mediated by parent-child communication) is associated with depression in boys and girls	Medium
Child's substance use				
Cranford (2010) <i>USA</i>	N=259	9–11yrs; 12– 14yrs; 15– 17yrs	Mothers' alcohol misuse is not associated child alcohol use, fathers' alcohol misuse is associated with number of times the child is intoxicated but not any child drinking, number of drinking days or any intoxication	Medium
Delaney-Black (2011) <i>USA</i>	N=559	14yrs	Current caregiver cocaine misuse is associated with teen cocaine use	Medium
Finan (2015) <i>USA</i>	N=492	Mean = 16.15yrs	Mothers' alcohol misuse is associated with drug use in girls (but not boys) and alcohol use in boys (but not girls), fathers' alcohol misuse is associated with drug and alcohol use in boys but not girls	High
Haugland (2012) <i>Norway</i>	N=2399	Mean 18.3yrs	Being exposed to parental intoxication is associated with child repeat intoxication, frequent alcohol use and experimented with drugs	Medium
Haugland (2013) <i>Norway</i>	N=5032	13-19yrs	Fathers' alcohol use is associated with high alcohol consumption in both boys and girls and alcohol intoxication in girls only. Mothers' alcohol misuse frequent alcohol intoxication in girls and high alcohol consumption in boys.	High
Haugland (2015) <i>Norway</i>	N=2306	Mean 16.2yrs	Both boys and girls are over three times more likely to get intoxicated with alcohol if they have seen their parents intoxicated	Medium

Hofler (1999) <i>Germany</i>	N=1877	14-17yrs	Family history of marijuana misuse is associated with child marijuana use	Medium
Hopfer (2003) <i>USA</i>	N=781	Mean 15.7yrs	Parent marijuana misuse is associated with child marijuana use	Medium
Jeffreys (2009) <i>Australia</i>	N=99	<12mth- 15yrs	Parental substance misuse is reported to encouraged child substance use – no formal statistical testing conducted	Low
Jennison (2014)	N=4648	Mean 16.3yrs	Children are almost 3 times as likely to drink heavily if their father's are alcohol misusers	Medium
Keeley (2015) <i>Ireland</i>	N=2716	15-17yrs	One parent substance misuser is associated with child frequent alcohol use and drug use in past month but not frequent intoxication. A larger effect was found in families were two parent substance misusers	Medium
Kendler (2013) <i>UK</i>	N= 4231	Birth-12yrs	Mothers' alcohol misuse is associated with alcohol, use and problems at 15 years and 18 years, fathers' alcohol misuse is associated with alcohol use at 15 years and 18 years and alcohol problems at 18 years but not 15 years	High
Kerr (2012) <i>USA</i>	N= 125	13yrs	Mothers' and fathers' alcohol misuse is associated with early onset alcohol use	Medium
Lieb (2002) <i>Germany</i>	N= 2427	14-24yrs	Mothers' alcohol misuse is associated with regular alcohol use in children but not with child problematic use. Fathers' alcohol misuse is associated with regular alcohol use and problematic use.	Medium
Malone (2002) <i>USA</i>	N=2766	14yrs	Fathers' alcohol misuse is associated with tobacco, alcohol, illicit drug use and dependence as well as the child having been intoxicated with alcohol. Children whose fathers misuse alcohol are more likely to have alcohol or drug problems	High

Malone (2010) <i>USA</i>	N=2766	17yrs	Mothers' alcohol misuse is associated with number of drugs tried and maximum alcohol consumption in children	High
Ohannessian (2013) <i>USA</i>	N=1001	Mean 16.09yrs	Fathers' but not mothers' alcohol misuse is associated with child alcohol use	Medium
Rossow (1999) <i>Norway</i>	N=10839	12-20yrs	Child exposure to frequent parental intoxication is associated with child alcohol intoxication	Medium
Shorey (2013) <i>USA</i>	N=927	14-16yrs	Mothers' alcohol misuse is associated with alcohol use in girls but not boys, cigarette use in boys and girls, marijuana and ecstasy use in boys but not girls. Fathers' alcohol misuse is associated with all measures of alcohol and drug use in both boys and girls	Medium
Swain (2011) <i>USA</i>	N=251	13-18yrs	Both parents' misusing alcohol is associated with child alcohol problems at 18 years	Medium
van der Zwaluw (2008) <i>Netherlands</i>	N= 428	Mean 15.2yrs; mean 13.4yrs	Mothers' and fathers' alcohol misuse is associated with increased level of alcohol use in children	Medium
Vermeulen-Smit (2012)	N=2319	15 yrs	Children are more likely to initiate alcohol use if their mothers' incidental drinking and father heavy drinking, or if both parents are heavy weekend drinkers	High
Yule (2013) <i>USA</i>	N=465	Mean 17.92yrs	Children whose mothers' misuse drugs are seven times more likely to use substance than those children whose mothers do not	Low
<b>Educational impact</b>				
Berg (2016) <i>Sweden</i>	N=740618	16yrs	Mothers' and fathers' alcohol-related hospital admissions is associated with poorer educational attainment. Children are twice as likely not being eligible for secondary school if their mothers or fathers have had an alcohol-related hospital admission. And	High

			almost three times as likely if both parents have had alcohol-related hospital-admissions	
Jeffreys (2009) <i>Australia</i>	N=99	<12mnth- 15yrs	Approximately 1/5 <sup>th</sup> of children whose parents misused substances had poor school attendance and punctuality	Low
Jennison (2014) <i>USA</i>	N=4648	Mean 16.3yrs	Children whose fathers were alcohol misusers when the child was <10yrs twice as likely to have school-related behaviour problems. If there is also martial conflict in the home children are over three times as likely to have school-related behaviour problems	Medium
<b>Social impact</b>				
Forrester (2000) <i>UK</i>	N=50	Birth-18 yrs	68% of parents whose children were on CPR were known to use substances by the social worker. 52% were considered by the social worker to be at levels/patterns of some concern	Low
Freisthler (2014) <i>USA</i>	N=3023	≤12 yrs	Inconsistent results regarding an association between parental alcohol misuse and neglectful supervision by parent	Medium
Hussey (2005) <i>USA</i>	N=126	Mean 9.86yrs	Children whose parents misuse alcohol were discharged from child care 183% quicker. Parental drug misuse was not associated with length of stay	Low
Jeffreys (2009) <i>Australia</i>	N=99	<12mnth- 15yrs	33.3% of children whose parents were substance misusers were recorded as experiencing emotional abuse compared to 8.3% of children whose parents did not misuse substances	Low
Jennison (2014) <i>USA</i>	N=4648	Mean 16.3yrs	Fathers' alcohol misuse is associated with poor father-child bonding	Medium

Raitasalo (2015) <i>Finland</i>	N=54519	0-7yrs	Children of alcohol misusing mothers are five times more likely to be placed in care, seven times as likely if their mothers misuse drug and almost nine times as likely if they misuse both alcohol and drugs drug abusing mothers	High
Van der Zwaluw (2008) <i>Netherlands</i>	N= 428	13-15yrs	Parental alcohol misuse was not associated with social support of adolescents	Medium



**Table 2: Evidence of adversity by age of child: implications for practitioners working with children**

<b>Age of children</b>	<b>Potential impact upon children</b>
Early Childhood (0-7 years)	Greater likelihood of being involved in an accident, self-poisoning incident and sustaining an injury. Requirement for medical attention and admittance to hospital. More likely to require inpatient care for a longer period. Inadequate diet and underweight. Children maybe left in places of unknown safety.
Early adolescence (10-13 years)	Poor dental hygiene resulting in higher likelihood dental problems however may not access dental care. Low shyness, hyperactivity, attention difficulties and conduct problems. Early onset alcohol use, cigarette use and illicit drug use. Externalising and internalising difficulties may begin to emerge.
Middle adolescence (14-16 years)	Externalising difficulties including conduct problems, delinquent behaviour, rule breaking, aggressive behaviour, attention difficulties. Internalising difficulties including depression and anxiety. Regular substance misuse include frequent intoxication, illicit drug use and the development of substance misuse problems, poor school attendance relating to truancy, absenteeism and punctuality. Poor attachment to parents, relationship and communication problems within the family.
Late adolescence (16-18 years)	Violent behaviour, attention difficulties, alcohol and drug problems, school-based conduct difficulties.

Figure 1: flow of studies

