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Fetal Alcohol Spectrum Disorder and Interviewing: A Systematic Review Highlighting Clinical and Legal Implications and Recommendations.

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Abstract

Background

Individuals with fetal alcohol spectrum disorders (FASD) are estimated to be nineteen times more likely to encounter the criminal justice system (CJS) in comparison to individuals without FASD. During encounters with the CJS, investigative interviews are employed to obtain accurate information from suspects, victims, or witnesses of crime.

Methods

A systematic search using PRISMA guidelines was performed to identify empirical studies published that have explored the questioning of the FASD population within the CJS and the vulnerabilities of FASD-impacted individuals during investigative interviewing.

Results

A total of 383 studies were identified from the databases searched and seven further studies were identified from Google Scholar. After deduplication, abstract and title screening, the full text of 23 studies were assessed for inclusion and five were included in the narrative synthesis of results. Two papers were empirical studies focused on the performance of FASD-impacted individuals during investigative interviewing. While the first study found the FASD population

susceptible to suggestions, the second (a case study), identified the ploys employed during investigative interviewing to obtain a confession. Three papers studied the wider vulnerabilities of FASD-impacted individuals and found diminished psycho-legal abilities, increased risk of recidivism, and biological, psychological, and social factors that render FASD-impacted individuals vulnerable to CJS encounters.

Conclusion

Despite the greater likelihood of CJS encounters, the result of this review highlights the slim evidence base useful to establish the vulnerabilities of FASD-impacted individuals within the CJS.

Keywords: *Fetal Alcohol Spectrum Disorder; FASD; Fetal Alcohol Syndrome; FAS; Police interview; Investigative interview; interrogative interview; Forensic Context; Criminal Justice System.*

Introduction

The consumption of alcohol in pregnancy can result in fetal alcohol spectrum disorder (FASD). FASD is a spectrum of four related conditions regarded as a continuum; this continuum is recognised to include fetal alcohol syndrome (FAS), partial fetal alcohol syndrome (pFAS), alcohol-related neurodevelopmental disorder (ARND), and alcohol-related birth defects (ARBD) (Hoyme et al., 2016). A diagnosis of Neurobehavioral Disorders associated with Prenatal Alcohol Exposure (ND-PAE) has been proposed in the Diagnostic and Statistical Manual 5 (DSM 5) of the American Psychiatric Association (Hagan et al., 2016). In the UK, the Scottish Intercollegiate Guidelines Network (SIGN, 2019) recently adopted the nomenclature of 'FASD with dysmorphic features' and 'FASD without dysmorphic features'. Alcohol, being a teratogen, produces a wide range of impairments that can be identified in those with FASD; central to this are neuro-cognitive deficits and executive function impairments (Kodituwakku, 1995). Executive function describes the processes involved in the regulation of goal-oriented behaviour and with FASD; impairments in this function are due to prefrontal cortex damage. Consequent to this, coordination and self-regulation may be affected (SIGN, 2019). This could result in behavioural problems highlighted as aggressive, violent, and sexualised behaviours, which may culminate in frequent encounters with the criminal justice system (Streissguth et al., 2004). The criminal justice system (CJS) comprises several agencies which, aside from other roles, are responsible for prosecuting suspects in connection with committed crimes. Generally, the encounters of individuals with the CJS would be in one of three possible forms: as victims, witnesses, or suspects. Systematic review evidence demonstrates that individuals with FASD are nineteen times more likely to encounter the CJS in comparison to their neurotypical counterparts (Popova et al., 2011). Several risk factors are associated with the criminal justice encounters of the FASD population, and these risk factors are identified as,

but not limited to, low social economic status, placement instabilities, and substance misuse (Streissguth et al., 2004). These risk factors overlap with the pathways to offending proposed by Corrado (2011), which include prenatal risk, childhood maltreatment, extreme child temperament, and personality disorder pathways. While the pathways may theoretically interplay, the prenatal risk factor pathway appears to be the strongest factor implicated in influencing the CJS encounters of FASD-impacted individuals (Corrado, 2011; Roebuck et al, 1999). In gathering the requisite evidence to administer justice, the CJS employs investigative interviews to gather information from suspects, victims, or witnesses of crimes (Kassin et al., 2010; Williamson, 2007). Investigative interviewing is defined as “the questioning of a person regarding his involvement or suspected involvement in a criminal offence which is required to be carried out under caution” (Police and Criminal Evidence Act (PACE), 1984). The aim of interviewing is to obtain relevant, accurate, and complete information. While interviews have been employed over centuries, it has been argued that the historical purpose of CJS interviews was obtaining confessions rather than obtaining the truth surrounding a crime (Leo, 2009). Consequently, interview techniques like the Reid technique (developed and commonly employed in the U.S.) have been critiqued to generate false confessions and miscarriages of justice (Gudjonsson, 2003; Kassin, 2008). The Reid technique involves three components: factual interview, which inductively analyses the suspects involvement in the suspected crime; the behaviour analysis component, which analyses the verbal and non-verbal cues from suspects when ‘behaviour-invoking’ questions are asked by interviewers; and an interrogation component which involves nine multiple steps. The nine interrogation steps of the Reid technique include presentation of possible justifications why the suspect was not wrong in committing the crime; an alternative reason, which accuses the suspect of having an ‘evil mind’ is also put forward to the suspect and the objections of the suspect and

denials of guilt by the suspect are refuted and further questioning is employed to extract a confession (Inbau, Reid, Buckley, & Jayne 2013). Consequently, authors have highlighted the manipulative and confrontational inclination of the Reid technique which may generate false confessions (Gudjonsson, 2003; Cleary & Warner, 2016). In the UK, following cases of miscarriages of justice, the PEACE model was established in 1992 (Central planning and training unit (CPTU), 1992). PEACE is an acronym for Preparation and Planning (before interview commencement), Engage and Explain (initial phase of an interview where the interviewer establishes the reason for the interview), Account (the suspect's account of the story is obtained), Closure (a summary of the information gathered is re-presented to the suspect for possible modification) and Evaluate (post-interview analysis by interviewers to determine if further interviewing is necessary). The PEACE interview technique was designed as a transparent, less confrontational approach to lessen the risk of false confessions and accommodate for interviewee vulnerabilities during investigative interviewing (Williamson, 2007). Kassin et al., 2011 advocate for the use of the PEACE method due to its conversational approach. The impact of interviewee vulnerabilities during CJS encounters has been highlighted in the literature (Adams-Quackenbush et al., 2019; Farrugia & Gabbert, 2020; Herrington & Roberts, 2012; Milne et al., 2011). Gudjonsson (2010) reviewed the impact of interviewee psychological vulnerabilities as potential risk factors on the outcome of criminal justice cases.

Psychological vulnerabilities are 'psychological characteristics or mental states which render a witness prone, in certain circumstances, to providing information, which is inaccurate, unreliable or misleading' (Gudjonsson, 2006, p. 68). Four types of psychological vulnerabilities were identified: 'abnormal mental', which includes anxiety, phobias, and mood disturbance; 'mental disorders' including learning disabilities and mental illness; 'personality vulnerability'

(e.g., suggestibility, compliance, and acquiescence); and 'intellectual function vulnerability' (e.g., borderline IQ scores) (Gudjonsson, 2006). Due to the potential for vulnerabilities amongst those with FASD, several articles have articulated the need for recognition of FASD within the CJS. This is because vulnerabilities impact the ability of individuals within the CJS to cope with the rigour and mental demands of interviews. To perform well in an interview, these vulnerable individuals must be able to provide correct and detailed accounts, and understand the implications of answers provided during investigative interviewing (Gudjonsson, 2006).

O'Mahony and colleagues (2012) highlight the impact of questions format during questioning and proposed the use of alternate response questions during investigative interviewing of vulnerable suspect. In a 2011 article, Gagnier et al. highlighted the general need for closer examination of FASD by the criminal justice system while Pei et al. (2018) highlights the risks, needs, and capacity of FASD-impacted individuals within the criminal justice system. Passmore and colleagues (2018) explored the attitudes, knowledge, experiences and practices of youth custodial workforce in Australia and found lack of FASD knowledge. Moreover, other professionals such as social workers, who may be useful in preventing future justice system encounters in individuals with FASD, have been evidenced to have low levels of knowledge of FASD (Gilbert et al., 2021).

Individuals with FASD are highlighted to be vulnerable due to executive function impairments from the teratogenic effect of alcohol aside other factors e.g., head injury (Brintnell et al., 2019). However, this is the first scoping systematic review to be published on FASD and investigative interviews. The systematic review aimed to identify studies which have explored the questioning of the FASD population within the CJS and the vulnerabilities of FASD-

impacted individuals. Because there were very few studies that met the criteria, the review was widened to include wider literature that reflects the potential vulnerabilities of the FASD population during CJS encounters. Although there are narrative reviews (O'Mahony et al., 2012; Brown et al., 2017; Brown et al., 2020) that outline the theoretical risks faced by those with FASD in the CJS, this is the first attempt to systematically identify empirical studies that investigate these vulnerabilities.

Methods

Protocol and registration

As a narrative scoping review, this review did not fit the criteria for publication on PROSPERO.

Eligibility criteria

Studies were considered eligible if they (a) involved investigative interviewing either as suspects, victims, or witnesses of crime OR explored other areas of vulnerability in the CJS; AND (b) were based on primary empirical research involving persons with FASD; AND (c) were published in the English Language; AND (d) were peer reviewed.

Information sources

Eleven online databases were searched on the 15/3/2021: CINAHL, ERIC, EBSCO, MEDLINE (searched via EBSCO host), Web of science, SalfordUniversityJournals@Ovid, APA PsycArticles Full Text, Books@Ovid February 15, 2021, Ovid MEDLINE(R) 1946 to March Week 1 2021, APA PsycExtra 1908 to February 08, 2021, APA PsycInfo 1806 to March Week 2 2021. See table 1 for the search strategy. The reference lists of identified articles were also searched for articles that could be relevant to this review. In addition to the formal searches (detailed in Table 1),

a free text search on Google scholar was employed using terms related to “FASD police interrogation” or “FASD police interview.”

Table 1. Search and study selection

	Search terms
S1	Terms related to FASD FASD OR FAS OR "foetal alcohol" OR "fetal alcohol*" OR "partial fetal alcohol" OR "partial foetal alcohol" OR "alcohol-related neurodevelopmental disorder*" OR "alcohol-related neuro-developmental disorder*" OR "alcohol-related birth defects" OR "Prenatal alcohol exposure" OR "Pre-natal alcohol exposure" OR PAE OR ARND
S2	Terms related to police/forensic interviews (forensic OR criminal* OR "forensic interview*" OR "crim* interview*" OR offend* OR police OR "investigative inter*" OR "police interview*" OR interrogat* OR "interrogat* interview*" offense OR offence OR violen* OR crime* OR arrest* OR charged OR convicted OR officer* OR "law enforcement*" OR "police suspect interview*" OR "police interrogat*" OR "police interview*" OR Garda OR caution* OR custody OR pre-arrest OR detainee OR detained OR custodial).

The titles and abstracts were screened by DG. RM, CA, and PC independently screened the results and compared the eligibility of the included studies with the inclusion criteria. The adapted search strategies employed in each of the above databases are attached as appendices 1,2 and 3. No limits on the publication dates of articles were set to ensure that relevant articles were not missed.

Data collection process and data items

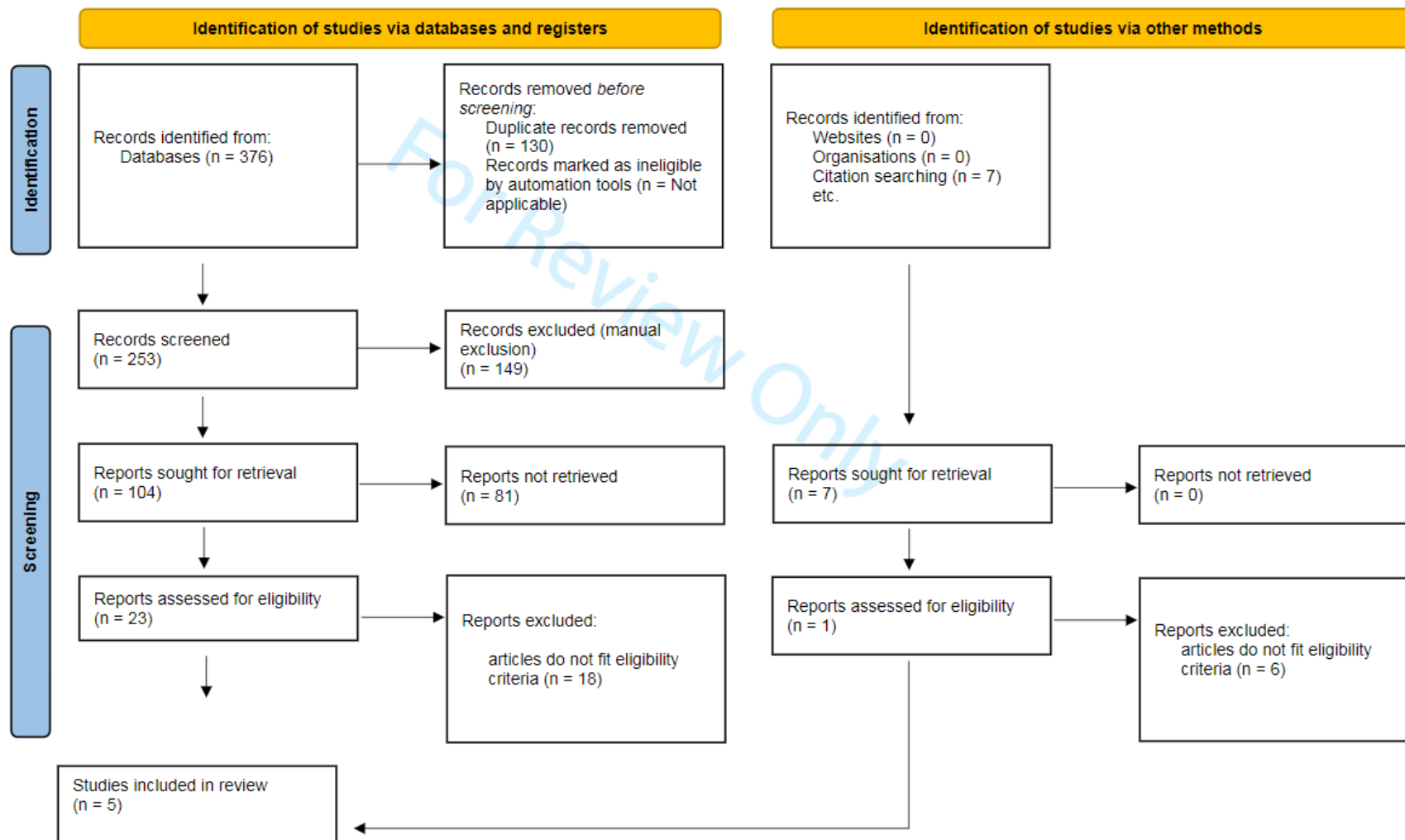
A data extraction sheet was employed to extract the data from the included studies. The data extracted included the author(s) names, title of publication, publication year, study setting, the tools employed, the results of the studies and conclusion of each study. The author of one study was contacted as the full text was inaccessible at the time of the search and the author sent across the full text. Co-authors reviewed the data extraction sheets independently and evaluated the quality of included studies.

Risk of bias within studies

Commensurate to the study design, different tools were employed to assess the risk of bias within individual studies. The Critical Appraisals Skills Programme (CASP) qualitative checklist was used to assess the risk of bias within qualitative studies; psychological assessment studies were evaluated using the Quality Assessment Checklist for Survey Studies in Psychology (QSSP) & Guide (Protogerou & Hagger, 2020); the included case study was evaluated by the Critical Appraisal Guidelines for Single Case Studies (Atkins & Sampson, 2002). Below is the Prisma diagram displaying the systematic search:

Figure 1:

PRISMA Flow Diagram for Systematic Search (Page et al., 2021)



Results

Study selection

A total of 383 studies were identified from the databases by the search strategy and seven studies were identified from Google Scholar. After deduplication, 253 studies remained, and their titles were screened for eligibility. After title screening, 149 studies were excluded, while the abstracts of 104 studies were assessed for eligibility. Eighty-one studies were excluded after abstract screening while the full text of 23 studies were assessed for inclusion. Finally, only five articles were included in the qualitative synthesis of results. See Figure 1.

Study characteristics

The characteristics of the studies in this review included two studies from the United States and three from Canada. Three out of the five studies were psychological assessment studies; one was a qualitative study; one was a case study (See Table 2). Two of the identified studies met the criteria of investigative interviewing while three studied the wider vulnerabilities of individuals with FASD.

Quality of studies (Risk of bias)

Three of the five included studies in this review were deemed as high quality studies – one qualitative study and two psychological assessment study. One psychological assessment study was rated as “questionable quality” whilst the case study was rated as “low quality.” See Table 2.

Table 2: Study characteristics table

	Author	Setting and population	Methodology
1	Brown, N. N., Gudjonsson, G., & Connor, P. (2011)	U.S.A Justice involved individuals with FASD	Psychological assessment study
2	Greenspan, S., & Driscoll, J. H. (2016).	U.S.A FASD-impacted individual undergoing investigative interviewing	Case study
3	McLachlan K; Roesch R; Viljoen JL; Douglas KS (2014)	Canada Justice involved youths with FASD	Psychological assessment study.

4	McLachlan, Kaitlyn Roesch, Ronald (2013)	Canada Justice involved youths with FASD	Psychological (forensic) assessment study
5	Pei, Jacqueline Leung, Wing Sze Wence Jampolsky, Fia Alsbury, Brooke (2016)	Canada individuals with an FASD and professionals who work with clients with an FASD within the justice system	Qualitative Study

Synthesis of results

FASD and investigative interviewing

Two studies studied the performance of individuals with FASD sample during investigative interviewing (Brown et al., 2011; Greenspan & Driscoll, 2016).

In a United States (US) based pilot study, Brown and colleagues (2011) recruited seven male participants comprising three Caucasians and four African Americans. The Gudjonsson suggestibility scale (Gudjonsson, 1984) was employed to assess interrogative suggestibility of the FASD sample, and no control group was recruited for the study. The GSS provides scores on the following measures: immediate and delayed recall; 'yield 1' and 'yield 2' which measure acceptance of interviewers' suggestions before and after negative feedback respectively; 'shift' which is a measure of the number of answers changed after receipt of negative feedback; and 'total suggestibility' which provides an indication of the overall suggestibility of examinees. Compared to normative values obtained from the general population, the immediate recall for the story elements of the GSS was significantly lower in the FASD sample. The FASD sample also demonstrated poorer scores in the delayed recall performance on the GSS. Compared to normative values, the 'shift' score was higher in the FASD sample, indicating a higher change in responses after receipt of negative feedback and total Suggestibility score in the FASD sample was significantly higher than both normative groups.

Greenspan and Driscoll (2016)'s study was a case study based on an audio-taped investigative interview of an FASD- impacted individual in the United states. The researchers witnessed the different ploys employed by the interviewer to obtain confession from the individual despite initial denial of guilt. There was a total of ten different ploys: false friendliness, concealing

true purpose, creating an incentive to cooperate, reading Miranda rights quickly and without real probe, asking many irrelevant questions, easing indirectly into dangerous territory, seizing on a minor inaccuracy, telling a lie about incriminating evidence, mixing truth or hypothetical truth with fiction, and suggesting a culpability-minimizing theory. Greenspan and Driscoll (2016) further discussed the cognitive deficiencies that place individuals with FASD at risk during investigative interviewing, the impact of correctly categorising a manipulative situation on vulnerability, the impact of the theory of mind perspective on vulnerability during investigative interviews, and the impact of deficient communication processing deficiency on the vulnerabilities of FASD-impacted individuals.

FASD and wider vulnerabilities in the CJS

Three studies were identified to empirically research the wider vulnerabilities of the FASD-impacted population during CJS encounters. The first study by McLachlan and colleagues (2014) evaluated the psycho-legal abilities of a sample of individuals with FASD, the second study by McLachlan and colleagues (2018) assessed the risk of re-offending and encounters with the CJS in youths with FASD, while the third study explored the CJS experiences of individuals with FASD (Pei et al., 2016).

In a psychological assessment study based in Canada, McLachlan and colleagues (2014) assessed the psycho-legal abilities of 100 young offenders; 50 of the sample were young offenders diagnosed with FASD (assessed by the study's multidisciplinary team) and had no more than 3 years of contact with the criminal justice system; the remaining 50 (control group) were young offenders who did not have FASD or prenatal alcohol exposure and had recently been in contact with the criminal justice system. The psychological tools employed in this study included the Wechsler Abbreviated Scale of Intelligence (WASI), Canadian Rights

Comprehension Supplement, Grisso's Miranda Instruments, Wide Range Achievement Test, Rights comprehension confidence, Fitness Interview Test-Revised. Results from this study highlighted impaired understanding of their rights during arrests in the FASD-impacted sample group. Despite this impairment, the individuals with FASD demonstrated confidence in their abilities. For the Fitness to Stand trial measure, individuals with FASD demonstrated impairments in comparison with the neurotypical sample. Out of the individuals with FASD, 76% (n = 38) demonstrated impairments in the understanding scale; 24% (n = 12) also had impairments in the communication scale.

McLachlan and colleagues (2018) evaluated the validity of two risk assessment tools (SAVRY and YLS/CMI) in predicting the risks of re-offending in youth with FASD in comparison to a control group. SAVRY is the Structured Assessment of Violence Risk in Youth, while YLS/CMI is the Youth Level of Service/Case Management Inventory. The study involved 50 youths with FASD and 50 without FASD who were in contact with the justice system. 81% of the sample were males and the age range of participants was within 12 – 23. The FASD sample, despite being of similar age at the time of contact with police, had reported police charges a year earlier when compared to the comparison group. With respect to recidivism, there was a significantly higher likelihood of reoffending in youth with FASD and at a faster rate. Protective factors were found to be lower in FASD-impacted youth. The protective factors considered in the context of this study include resilient personality traits, strong social support, and strong commitment towards school.

Pei and colleagues (2016), using snowballing alongside a qualitative design, employed semi structured interviews to explore the experiences of individuals with FASD within the Canadian CJS. Individuals with FASD were recruited alongside professionals working with FASD-

impacted individuals. For the purpose of this review, only data on the FASD individuals were extracted. The inclusion criteria for the FASD group included an FASD diagnosis, previous CJS encounter, and individuals aged 19 years or more. Biological, psychological, and social factors were identified by participants (with FASD) as risk factors for encounters with the CJS. Identified themes included: 'primed to enter the system' where participants narrated the extent that prenatal exposure predisposes encounters with the CJS; and 'Hindered within the system' Participants felt trapped within the CJS, expressing the difficulty in leaving the CJS after the first encounter. A reason highlighted for this re-entry, aside from recidivism, was the difficulty in abiding with bail or release conditions leading to repeated CJS encounters.

Discussion

This scoping review set out to identify the existing empirical evidence surrounding vulnerability during investigative interviews as well as vulnerabilities in the CJS more generally. The review has demonstrated that the topic of FASD vulnerability with the CJS is under-explored, with only two studies meeting the criteria for vulnerability in investigative interviewing, and three studies exploring vulnerabilities in the wider system.

Summary of evidence

Only two papers – a U.S based pilot study and a case study – were identified that investigated the performance of FASD-impacted individuals during investigative interviewing. Although the two studies were characterised by small sample sizes, hence the results not generalisable, the findings highlight the vulnerability of individuals with FASD. The findings from both studies

are consistent with the findings from the study by Clark and colleagues (2008) which found vulnerability to manipulation as reported by caregivers (of FASD-impacted individuals). The caregivers highlighted that 92% of the individuals with FASD they work with are vulnerable to manipulation. The second identified study (Greenspan & Driscoll, 2016), was based on the recording of an investigative interview of an FASD-impacted individual, found that the interviewer employed ten different ploys to produce an admission of guilt from the suspect. The findings from Greenspan and Driscoll (2016) are consistent with the findings of Leo (1996) on non-FASD populations, which revealed that investigative interviewers employed a mean of 5.62 tactics per interview. Greenspan and Driscoll (2016, pp. 1) concluded that “for an adolescent or adult to stay out of jail, it requires a level of meta-cognition in which the intentions of a manipulator (whether a co-criminal or an interviewer) are thought about on a functional and abstract level. Unfortunately, people with FASD operate on a concrete and non-reflective level, which is why so many people with that disorder end up in jail or prison.”

A significant point highlighted by Greenspan and Driscoll (2016) is the impact of Theory-of-Mind (ToM) impairments, which are commonly found in individuals with FASD (e.g., Kilchenmann et al., 2012). ToM describes the mental ability to understand and predict other people and their behaviour (Apperly, 2011). Impaired ToM has been suggested to impact the suggestibility of individuals (Bright-Paul et al., 2008; Karpinski & Scullin, 2009). An impaired ToM may be one of the contributory factors resulting in greater levels of suggestibility in individuals with FASD during CJS encounters. Three studies that explored the vulnerabilities of justice-involved individuals with FASD were identified. The first study by McLachlan and colleagues (2014) established the vulnerabilities of the FASD population through their diminished psycho-legal abilities. Several inferences can be drawn from the study; for example, diminished psycho-legal abilities infer that the FASD population is vulnerable to

manipulation before and during investigative interviewing. Before the commencement of investigative interviewing, the compromised psycho-legal abilities of individuals with FASD are demonstrated with vulnerabilities in the wider CJS, for example the impulsive waivers of their Miranda rights (McLachlan et al., 2014). This also implies that individuals with FASD may submit to unsupported questioning, thereby becoming vulnerable to providing self-incriminating statements. Vulnerability to self-incriminating statements may arise due to impairments in executive functioning and deficits in comprehension abilities consequent of FASD (Kodituwakku, 1995). Generally, the psychological vulnerabilities present in the FASD population may lead to other outcomes such as false confessions, 'self-deceit', and inability to cope with the demands of investigative interviews (Bingham, 2006; Gudjonsson, 2010). The second study by McLachlan et al. (2013) revealed a higher likelihood of recidivism in youths with FASD in comparison to other high-risk youths. The findings present a piece of empirical evidence that may be useful in alerting the CJS to the plight of individuals with FASD. Both the McLachlan studies had limitations: small sample sizes, inability to include the different wordings of the Miranda warnings used in different settings, and the impracticality of blinding the assessors to the FASD diagnosis status of participants. Results from Pei and Colleagues (2016) study present strong evidence to the 'invisible disability' that is characteristic of the FASD population. The biological (e.g. neurobiological and/or cognitive impairments), psychological, and social factors (e.g. inappropriate treatment and victimization) identified in this study corroborates the findings from the study by Corrado (2011). With these findings, it is useful for the CJS to consider the predisposing factors that could lend the FASD population to encounters with the CJS.

A few authors in the wider literature (Burton et al., 2006; Gudjonsson et al., 1993) have attempted to highlight the extent of vulnerability (in non-FASD populations) unrecognised

within the CJS using empirical studies. Gudjonsson et al. (1993), by clinical assessment of detainees in a UK based study, identified that 15 – 20% required additional support during CJS encounters, in contrast to 4% identified by the police. Also, in the wider literature, Burton et al. (2006) identified a conservative estimate of 24% clinically vulnerable individuals within the UK CJS as opposed to only 9% identified by the police. FASD has not been considered in this wider literature, even though it is plausible that a significant proportion of the individuals identified to require extra support had unrecognised FASD. A contemporary and well publicised example of the impact of vulnerabilities in FASD-impacted individuals is the case of Teina Pora from New Zealand, who served a jail time of over 20 years (Pora v. The Queen (2015) UKPC 9). The release of Teina Pora upon the realisation that his FASD had impacted on the reliability of his confession is indicative of the implications for the CJS once the implications of an FASD diagnosis are fully recognised. However, to attain a unified response from the CJS, more empirical research is needed to highlight the vulnerabilities of FASD-impacted individuals within the CJS.

Aside from the dearth of empirical evidence, there exists other potential reasons why FASD may be unrecognised within the CJS. For example, misdiagnosis, missed diagnosis and underdiagnosis in general in FASD could be contributory to the lack of attention to the vulnerabilities of individuals with FASD within the CJS (Chasnoff et al., 2015). An increase in diagnoses could potentially highlight the prevalence of FASD within the society, which could then drive more research within the CJS. This is because the existing literature has demonstrated that a high rate of encounters with the CJS is a secondary outcome for individuals with FASD (Popova et al., 2011). The co-morbid existence of FASD alongside other neuro-developmental disorders could also serve to complicate the chances of identifying the impact of FASD within the CJS. Some of these co-morbid conditions may include:

AttentionDeficit/Hyperactivity Disorder (ADHD), Autism Spectrum Disorder (ASD), Bi-Polar Disorder, and Conduct Disorder (Rasmussen et al., 2010; Popova et al., 2016; Weyrauch et al., 2017). When FASD is not effectively identified in the cases of individuals, there exists the chance of dismissing the symptoms of FASD as mis-demeanours (Chasnoff et al., 2015).

Other Potential vulnerabilities factors

Although not eligible for inclusion in the results of this review, the wider literature demonstrates potential factors that may render individuals with FASD vulnerable during Investigative interviewing. Language deficits in individuals with FASD have been established either as expressive or receptive language deficits (Kodituwakku, 2007; Mattson & Riley, 1998; Church et al., 1997). Expressive language refers to the degree which individuals can express themselves efficiently, while receptive language ability defines the extent of understanding individuals possess of spoken language. It is also noted that individuals with frontal lobe damage (as evident in FASD) may sometimes present as capable and unimpaired due to their verbal language skills (Streissguth, 1998). Streissguth (1998) noted that the parents/carers of individuals with FASD described their children as 'chatty'; this is partly due to reserved language skills in individuals with prefrontal cortex damage (as seen in FASD) and is termed 'frontal lobe paradox' (Teuber, 1964; Walsh, 1985). George and Gilbert (2018) in a review paper, argued for better awareness and accommodation of individuals with frontal lobe paradox within the mental capacity act. One implication of the frontal lobe paradox is that individuals with FASD may not be identified as requiring support to the extent that they require during legal proceeding. As evident from this review, research in this area is again, sparse.

The international classification of diseases (ICD-10) guidelines lists disorders that are categorised as neurodevelopmental disabilities. Based on the ICD -10 guidelines, FASD is grouped as a neurodevelopmental disability. However, part of the criteria employed by the ICD-10 bases the classification of neurodevelopmental disabilities on intelligent quotient (IQ) scores that are lower than 70, i.e., 2 standard deviations below the average. This classification directly relates the IQ score of suspects to their mental capacity and is a measure of suspects' psychological vulnerabilities (World Health Organisation (WHO), 1992). For individuals with FASD, this could present a problem. This is because individuals with FASD (despite their vulnerabilities), demonstrate varying IQ levels, with some exceeding the threshold of 70 (Streissguth, 1991; Clarke, 2008). While individuals with an IQ below 70 would receive support during legal proceedings (WHO, 1992; British Psychological Society (BPS), 2000), FASD impacted individuals with higher than 70 IQ may be unsupported.

Clinical and Legal Implications

There exist significant clinical and legal implications to the vulnerabilities highlighted in this review. As well as deficits in cognitive abilities, the possibility of having 'above average' IQs and the frontal lobe paradox, can lead to individuals being unsupported. They can be vulnerable to waiving of Miranda rights and at risk of performing poorly in investigative interviews, in turn impacting the outcomes. For example, there may exist cases of justice miscarriage in individuals with FASD due to the relatively high IQ scores, verbal fluency ('superficial chattiness'), and diminished psycho-legal abilities. The dearth of empirical evidence relating to these vulnerabilities during investigative interviewing and in the wider CJS makes it difficult to argue for allocation of support during CJS encounters. While the

miscarriage of justice in the case of Teina Pora is widely known, similar cases likely exist within the CJS, especially with the established waivers of 'right to remain silent' (McLachlan et al.,2012; 2014). The Miranda rights, promulgated in 1966, is the right of an individual to remain silent and request the presence of legal aid before the commencement of investigative interviewing. In the UK and other countries, the Miranda rights are known as 'the right to remain silent'. The recitation of the Miranda rights or 'right to remain silent' during arrests of suspects is considered a procedural safeguard. With impulsive waivers of the right to remain silent, individuals with FASD could then be subjected to investigative interviewing without the presence of legal aid. During investigative interviewing, the compromised psycho-legal abilities evidenced in McLachlan's study imply that individuals with FASD may not appreciate the implications of the answers they present. This could disadvantage FASD-impacted individuals and result in unsupported investigative interviews, unfair trials, potentially longer sentences, and repeated encounters with the CJS due to vulnerabilities.

Future Research Directions and Recommendations

The current evidence base is sparse and there is an urgent need for more empirical research to identify the specific vulnerabilities of FASD impacted individuals in the CJS. Several policy implications exist consequent of the dearth of empirical research in the investigative interviewing of FASD-impacted individuals. Firstly, it reflects the lack of sufficient evidence base to alert policymakers to the fate of FASD-impacted individuals within the CJS. Secondly, there exists no robust evidence base to create and implement useful interventions for individuals with FASD during encounters with the CJS.

It will be useful for future research to focus on the vulnerabilities of individuals with FASD within the CJS. While certain courts in the US already recognise FASD as a disability (Douds, Stevens, & Sumner, 2013), there is need for more acceptance in several other settings and countries, and the provision of support. Also, few interview paradigms exist that are useful to assess investigative interviewing, for example, the Round-Robin Methodology (Hudson et al., 2018). Future research may use these investigative interview assessment tools with FASD-impacted individuals to assess the impact of various interview techniques on the interview outcomes. During CJS investigative interviewing and judicial proceedings, it will aid the course of justice if the FASD status of suspects, witnesses or victims is established. While this is difficult to achieve due to diagnostic difficulties, the establishment of prenatal alcohol exposure in individuals within the CJS may be a significant pointer to the possible existence of FASD.

Limitations

The studies identified in this review were characterised by small sample sizes. The FASD diagnosis measures in the different studies were not uniform and the conclusions from this review are based on few empirical studies.

Conclusion

Despite the fact that persons impacted by FASD have a greater likelihood of CJS encounters, the evidence base to establish the vulnerabilities of FASD-impacted individuals within the CJS is meagre. Two papers were found to empirically study the vulnerabilities of FASD-impacted

individuals during investigative interviewing - a pilot study and a case study. Three papers were identified to study the wider vulnerabilities of justice-involved individuals with FASD. As a result of this dearth of empirical evidence, awareness about FASD within the CJS is low. Consequently, individuals with FASD pass through the CJS on multiple occasions, remaining unrecognised and unsupported. This could result in the unintentional miscarriage of justice as these individuals may be wrongly accused, remanded, or handed sentences that may otherwise not be served if the psychological vulnerabilities associated with FASD are established.

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Appendices

Appendix 1: Search strategies

Table A.1 PsycInfo search strategy

S/N	Search Terms	Results	Databases searched	Limiters
S1	FASD OR FAS OR "foetal alcohol" OR "fetal alcohol*" OR "partial fetal alcohol" OR "partial foetal alcohol" OR "alcohol-related neurodevelopmental disorder*" OR "alcohol-related neuro-developmental disorder*" OR "alcohol-related birth defects" OR "Prenatal alcohol exposure" OR "Pre-natal alcohol exposure" OR PAE OR ARND	12467	SalfordUniversityJournals@Ovid, APA PsycArticles Full Text, Books@Ovid February 15, 2021, Ovid MEDLINE(R) 1946 to March Week 1 2021,	Peer reviewed journals, human based research, English language, Original articles, no publication year limits.
S2	forensic OR criminal* OR forensic interview* OR crim* interview* OR offend* OR police OR "investigative inter*" OR police interview* OR interrogat* OR interrogat* interview* offense OR offence OR violen* OR crime* OR arrest* OR charged OR convicted OR officer* OR "law enforcement*" OR police suspect interview* OR police interrogat* OR police interview* OR Garda OR caution* OR custody OR pre-arrest OR detainee OR detained OR custodial	229217	APA PsycExtra 1908 to February 08, 2021, APA PsycInfo 1806 to March Week 2 2021	
S1 AND S2		94		
Result after deduplication		79		
Result after 1st screening		41		
Relevant articles		3		

B. CINAHL Search strategy

S/N	Search Terms	Results	Databases searched	Limiters
S1	FASD OR FAS OR "foetal alcohol" OR "fetal alcohol*" OR "partial fetal alcohol" OR "partial foetal alcohol" OR "alcohol-related neurodevelopmental disorder*" OR "alcohol-related neuro-developmental disorder*" OR "alcohol-related birth defects" OR "Prenatal alcohol exposure" OR "Pre-natal alcohol exposure" OR PAE OR ARND	6,596		
S2	forensic OR criminal* OR forensic interview* OR crim* interview* OR offend* OR police OR "investigative inter*" OR police interview* OR interrogat* OR interrogat* interview* offense OR offence OR violen* OR crime* OR arrest* OR charged OR convicted OR officer* OR "law enforcement*" OR police suspect interview* OR police interrogat* OR police interview* OR Garda OR caution* OR custody OR pre-arrest OR detainee OR detained OR custodial	413,560	CINAHL, ERIC, EBSCO host, MEDLINE	Peer reviewed, English language, abstract available, human
S1 AND S2		203		
Result after deduplication		202		
Result after 1st screening		29		

C: Web of Science Search strategy

S/N	Search Terms	Results
S1	TI=(FASD OR FAS OR "foetal alcohol" OR "fetal alcohol*" OR "partial fetal alcohol" OR "partial foetal alcohol" OR "alcohol-related neurodevelopmental disorder*" OR "alcohol-related neuro-developmental disorder*" OR "alcohol-related birth defects" OR "Prenatal alcohol exposure" OR "Pre-natal alcohol exposure" OR PAE OR ARND)	16,288
S2	TI=(forensic OR criminal* OR forensic interview* OR crim* interview* OR offend* OR police OR "investigative inter*" OR police interview* OR interrogat* OR interrogat* interview* offense OR offence OR violen* OR crime* OR arrest* OR charged OR convicted OR officer* OR "law enforcement*" OR police suspect interview* OR police interrogat* OR police interview* OR Garda OR caution* OR custody OR pre-arrest OR detainee OR detained OR custodial)	511,928
S1 AND S2		79
Result after deduplication		77
Result after title screening		34

Appendix 2: Table A2 – Quality appraisal table

S/N	Author	Quality Appraisal	Appraisal tool employed
1	Brown, N. N., Gudjonsson, G., & Connor, P. (2011)	Questionable quality	Quality Assessment Checklist for Survey Studies in Psychology (Q-SSP) and Guide
2	Greenspan, S., & Driscoll, J. H.. spectrum disorders in adults: Ethical and legal perspectives (2016).	Low quality	Critical appraisal guidelines for single case study research
3	McLachlan K; Roesch R; Viljoen JL; Douglas KS (2014)	High quality	Quality Assessment Checklist for Survey Studies in Psychology (Q-SSP) and Guide
4	McLachlan, Kaitlyn; Roesch, Ronald (2013)	High quality	Quality Assessment Checklist for Survey Studies in Psychology (Q-SSP) and Guide
5	Pei, J., Leung, W. S. W., Jampolsky, F., & Alsbury, B. (2016) Alsbury, Brooke (2016)	High quality	CASP qualitative appraisal tool