

# Australian psychologists' knowledge, confidence, and practices in fetal alcohol spectrum disorder diagnostic assessment

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## Abstract

**Background:** Fetal alcohol spectrum disorder (FASD) is a neurodevelopmental disorder caused by prenatal alcohol exposure (PAE). There are many documented barriers to FASD diagnostic assessment, including a limited number of trained clinicians. This study aimed to establish baseline levels of Australian psychologists' knowledge and practices in FASD assessment to develop training and improve future diagnostic capacity.

**Methods:** An online survey was completed by 106 Australian psychologists. The survey elicited respondents' demographics, knowledge about FASD, confidence in various aspects of assessment and perceived future training needs.

**Results:** Respondents reported a broad understanding of the FASD diagnostic term and potential harm of prenatal alcohol exposure (PAE). However, most respondents were not confident in their ability to conduct the psychometric assessments that provide a diagnostic assessment of FASD or ask about PAE. There was a significant positive correlation between the number of correct knowledge items and the psychologists' confidence in conducting FASD assessments. The clinical neuropsychologists demonstrated significantly greater knowledge and confidence in applying FASD diagnostic criteria and assessing PAE than school, clinical, and other psychologists. Most psychologists were more confident in their ability to apply the diagnostic criteria for other neurodevelopmental disorders.

**Conclusions:** Recognition of FASD is growing in Australia, however, further work is required to improve clinicians' understanding of and confidence in completing FASD assessments. Most participants indicated a preference for online training to learn more about FASD assessment.

## KEYWORDS

FASD, neurodevelopmental disorder, PAE, psychological assessment, psychologists

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## INTRODUCTION

Fetal alcohol spectrum disorder (FASD) is a lifelong neurodevelopmental condition associated with prenatal alcohol exposure (PAE; Bower et al., 2016). Alcohol is a teratogenic agent which can have adverse effects on the developing fetus as ethanol can cross the placenta at any point of pregnancy (Bower et al., 2017). The impact of alcohol on the fetus is variable and impacted by different factors, such as timing and dose of alcohol consumption in pregnancy, maternal age, metabolism of alcohol, genetic factors, body composition, and epigenetic and comorbid factors such as smoking (Aiton, 2021). In Australia, FASD is considered a recognized disability that may entitle an individual to support from the National Disability Insurance Scheme (NDIS) depending on functional impairment. Nonetheless, there are several barriers to diagnosis, including limited diagnostic capacity (Commonwealth of Australia, 2021), reluctance to diagnose based on stigma (Bell et al., 2016) and limited referral pathways (Panton et al., 2022).

The Australian Guide to the Diagnosis of FASD (Bower et al., 2016) outlines two diagnostic categories: FASD with three sentinel facial features and FASD with less than three sentinel facial features. Both require severe impairments in three of a possible 10 neurodevelopmental domains: brain structure/neurology, motor skills, cognition, language, academic achievement, memory, attention, executive functioning, affect regulation and adaptive behavior, and social communication. The Australian Guide to the Diagnosis of FASD (Bower et al., 2016) is currently under review, with stakeholder consultation highlighting four key priorities related to diagnostic criteria, guideline content, dissemination, and implementation (Hayes et al., 2022).

Psychological assessment is one of the core competencies assessed as part of the National Psychology Exam (NPE), which is currently a prerequisite for General Registration with the Australian Health Practitioner Regulation Authority ([AHPR], Psychology Board of Australia, 2019), as well as the Accreditation Standards for Psychology Programs used by the Australian Psychology Accreditation Council (APAC) for undergraduate and postgraduate psychology studies in Australia (APAC, 2022). In theory, Australian psychologists should have the knowledge to administer, score, and interpret psychometric tests used in FASD diagnostic assessments (e.g., assessments measuring cognition, attention, academic achievement, memory, executive functioning, adaptive behavior, and affect regulation) as psychologists are required to demonstrate knowledge and understanding of test selection, administration, scoring, and interpretation of these psychometric assessments for the NPE. However, to the best of our knowledge, no literature exists examining Australian psychologists' understanding, practices, and training needs regarding FASD assessment and diagnosis.

The Australian Guide to the Diagnosis of FASD (Bower et al., 2016) recommends a multidisciplinary team (MDT) approach, including a pediatrician, psychologist, speech pathologist, social worker, and an occupational therapist for FASD assessment and diagnosis. However, Panton et al. (2022) identified a lack of multidisciplinary teams within Australia, with their project aiming to

improve FASD diagnostic capacity, as well as developing a consistent approach to diagnosis within Australia, thereby increasing FASD awareness, knowledge, and advocacy.

Reid et al. (2020) surveyed health and education professionals from Australia and New Zealand who had completed some form of FASD training, varying from 1 h to 3 months, and found an increase in participation in FASD assessments and the likelihood they would ask about PAE. However, there is no current literature specifically examining Australian psychologists' practices and confidence in assessing PAE, despite addressing and reducing PAE being an important public health issue (Popova et al., 2017). Estimates of PAE prevalence in Australia vary, with a recent systematic review of large Australian cohort studies estimating PAE prevalence in Australia at 48% (Young et al., 2022), whereas data from the National Drug Strategy Household Survey indicates around 35% of women drink alcohol during pregnancy, with 49% of women drinking prior to pregnancy recognition and 25% of women drinking after pregnancy recognition (Australian Institute of Health and Welfare, 2020).

Myths about a safe time, amount, and type of alcohol consumed during pregnancy persist among health professionals, with only 45% of health professionals routinely asking about alcohol use in pregnancy (Payne et al., 2005). Societal tolerance of alcohol use, as well as conflicting messages around the risk associated even with low amounts of alcohol, can mean health professionals' views on the National Health and Medical Research Council guidelines to avoid alcohol in pregnancy are impacted in part by personal experience or opinion (Bagley & Badry, 2019; Crawford-Williams et al., 2015a, 2015b).

In a current coroner's inquest into the suicides of 13 young people in the Kimberley (WA), the lack of diagnostic capacity was highlighted as a barrier not just to FASD assessment and diagnosis but to early intervention (Fogliani, 2019). Early diagnosis and intervention are the most cost-effective methods for reducing the impact of neurodevelopmental impairments (Blackburn & Williams, 2013), as well as secondary impacts associated with FASD. Secondary impacts can include mental health problems, contact with the justice system, inappropriate sexual behavior, educational disengagement, and unemployment (Fitzpatrick & Pestell, 2017; Fogliani, 2019; Olson & Montague, 2011).

The FASD Model of Care (Department of Health, State of WA, 2010) recommended that training for child development assessments should consider PAE as a potential cause for neurodevelopmental impairment. The need for screening for FASD in at-risk groups, including children in care, "children referred to school psychology services for behavioural and learning difficulties" (p. 25) and children diagnosed with an intellectual disability without a clear genetic etiology, were also highlighted and then reinforced in the recent National FASD Strategic Action Plan 2018–2028 (Department of Health, 2018).

In O'Connor et al. (2022), child psychologists were successfully trained not only to determine neurocognitive/behavioral impairments using *the Clinical Guidelines for Diagnosing Fetal Alcohol Spectrum Disorders* (Hoyme et al., 2016), but also to determine PAE and measure growth delay, sentinel facial features, and occipital

frontal circumference. Additionally, Campbell (2019) found that educational psychologists in the United Kingdom could make useful contributions to assessment through consultation due to their strategic position across settings to support case formulation about the needs of students with FASD. The literature highlights that psychologists can play an important role in the early recognition, diagnosis, and intervention for individuals with FASD (Wedding et al., 2007).

While research and current clinical practice indicate that psychologists are integral to the assessment and diagnosis of FASD, little is known about Australian psychologists' knowledge and attitudes toward conducting FASD diagnostic assessments. Psychologists were last surveyed about their knowledge of FASD, including the harms of PAE, in a 2003 study of American psychologists by Wedding et al. (2007) who reported 11% of psychologists felt that occasional use of alcohol would not harm the fetus. Seventy-one percent of psychologists reported that a lack of relevant training was the most significant barrier to diagnosis, with 65% reporting they felt "very" or "somewhat" unprepared to identify children with fetal alcohol syndrome (FAS) and 82% feeling unqualified to manage or coordinate the care of children with FAS. The authors report the clear need for additional resources and specific clinical guidelines to increase psychologists' ability to prevent, recognize, diagnose, and treat children with FAS, which could "make a genuine contribution to public health" (p. 212, Wedding et al., 2007).

In the two decades since this survey was conducted, the FASD landscape has changed significantly and yet there is no updated information about psychologists' knowledge and training needs to identify and support individuals with FASD. A recent systematic review of the literature examining knowledge, attitudes, and practices of FASD in health, justice, and education professionals (McCormack et al., 2022) highlighted a gap in the research of psychologists' understanding of FASD, with most surveys focused on health-care providers, with Wedding et al. (2007) the only survey of psychologists identified. A 2022 Canadian study surveyed "FASD clinicians" including psychologists and neuropsychologists about the measures used in FASD assessments; however, this data amalgamated responses based on clinic location rather than profession and only looked at psychologists who already conduct FASD assessments, with a focus on adherence to the Canadian guidelines (Flannigan et al., 2022).

This article examines Australian psychologists' levels of knowledge of FASD, confidence in conducting psychometric assessments that form part of the FASD assessment, and current clinical practices assessing FASD in order to create future training improving psychologists' knowledge and confidence in FASD assessment.

## METHODS

### Survey development

An exploratory survey was developed after examining existing surveys in the literature previously used to evaluate the knowledge, attitudes and practices of Psychologists (Wedding

et al., 2007), health professionals (Bagley & Badry, 2019; Crawford-Williams et al., 2015a, 2015b; Payne et al., 2005), juvenile justice officers (Passmore et al., 2018), and other professionals (Johnson et al., 2010). Gaps related to the knowledge and attitudes of psychologists regarding FASD were identified and items adapted to ensure terminology reflected current clinical practice. The survey was reviewed by a Professional Advisory Group consisting of four registered psychologists and clinical neuropsychologists working across health, education, and private practice settings. Feedback was provided via email and incorporated into the survey.

### Measures

The survey included 43 items related to demographics (seven items), attitudes and knowledge of FASD (20 items), confidence in FASD assessment (seven items), current practice regarding assessing for PAE (six items), and future training requirements (three items). Response options included 5-point Likert scales (e.g., "I feel confident in my ability to conduct diagnostic assessments for FASD"—strongly agree, somewhat agree, neither agree nor disagree, somewhat disagree, and strongly disagree), multiple choice (e.g., certain demographic items, PAE screening methods, and training preference items), and an open-ended item to expand on their concern for assessing for PAE (see Appendix S1 for survey items).

### Procedures

A link to the Qualtrics online survey was emailed to participants via professional networks, including past and present students of the Graduate Certificate in the Diagnosis and Assessment of FASD at the University of WA, the Australia New Zealand FASD Clinical Network, School Psychologists Association of WA, LinkedIn, Facebook psychology groups and the University research repository page of the coauthors. A snowball sampling method (Goodman, 1961) was used, with existing participants asked to forward the link to the survey among their professional networks. The participant information sheet prefaced the survey information to be collected and participants were required to consent in order to access the survey.

### Participants

Participants were psychologists with provisional or general registration with AHPRA. One hundred and fifty-four psychologists responded, with 48 incomplete responses (i.e., no answers beyond consent or initial demographic questions) removed, leaving a total of 106 participants. See Table 1 for further demographic information.

## Data management and analysis

No incentives were provided to the participants and the research was undertaken with ethics approval from the UWA Human Research Ethics Committee (2021/ET000667). The survey was completed on Qualtrics and survey data was exported directly to IBM SPSS Statistics Version 28 for analysis. Shapiro–Wilk tests were

TABLE 1 Demographics of respondents.

Characteristics	N	%
<b>AHPRA registration pathway</b>		
Provisional registration	50	47.2
Endorsement	31	29.2
Clinical	13	
Clinical neuropsychologist	15	
Education and developmental	2	
General registration	23	21.7
PhD	2	1.9
<b>Length of time working, years</b>		
0–3	26	24.5
4–6	26	24.5
7–10	18	17
10–15	10	9.4
>15	26	24.5
<b>Gender</b>		
Female (including transgender female)	89	84.0
Male (including transgender male)	17	16
Nonbinary	0	0
<b>Workplace<sup>a</sup></b>		
School/Education	51	48.1
Private practice	32	30.2
Health department	13	12.3
Other (including Disability, Nongovernment Organizations, Justice, Child Protection and Research)	12	11.3
<b>Age of clients<sup>a</sup></b>		
Early childhood (0–4)	24	22.6
Primary school (5–11)	55	51.9
High school (12–18)	72	67.9
Adults	41	38.7
<b>State or Territory</b>		
WA	63	59.4
SA	12	11.3
TAS	10	9.4
VIC	7	6.6
NSW	6	5.7
QLD	6	5.7
Not reported	2	

<sup>a</sup>Multiple responses were possible for these questions.

used to confirm normality of data. Frequency tables were used to examine demographic variables and knowledge items. NVivo was used to analyze word responses of participants' concerns in asking about PAE and create a word cloud of the most common responses.

## RESULTS

### Demographics

Respondent demographics are shown in Table 1. There was a range of registration types, as well as years in the workforce. Most participants were female (84%), which is reflective of the gender figures reported by AHPRA (80.4% of Australian psychologists are female, 19.6% male; AHPRA, 2022). Participants were able to select multiple options for their workplace and the age of clients they work with, as psychologists may work across different sectors and with different populations. Due to the snowball sampling method used, there was a high number of WA psychologists in the sample given the location of the research team; however, responses did not differ significantly between psychologists across Australia. A one-way ANOVA was used to compare the difference in the number of correct knowledge items by psychologists from different states and territories. The ANOVA results showed that there were no significant differences in mean knowledge items scores between groups:  $F(5, 98) = 5.09, p = 0.769$ .

### Knowledge, attitudes, and confidence

The majority of respondents had heard of FASD (99.1%) and responded that there was no safe amount of alcohol to consume in pregnancy (92.5%) or safe time to consume alcohol in pregnancy (95.3%). Most participants personally knew someone who consumed alcohol during pregnancy before (79.2%) and after (55.7%) realizing they were pregnant.

The majority of respondents were familiar with the Australian Guide to the Diagnosis of FASD (60.4%; Bower et al., 2016) and with the psychometric tests used in FASD assessments (52.8%), but only 31.1% reported feeling confident in their ability to conduct the diagnostic assessments required for a FASD diagnosis and ability to apply the FASD diagnostic criteria. Respondents were more confident in their ability to apply the diagnostic criteria for intellectual disability (91.5%), attention deficit hyperactivity disorder (81.1%), autism spectrum disorder (72.7%), and specific learning disorder (72.6%). The majority of respondents were not confident in their ability to assess for PAE (58.5%). The percentage of respondents who correctly answered knowledge items is reported in Table 2.

Increased confidence in ability to apply the diagnostic guide, assess prenatal alcohol exposure, and conduct FASD and ID diagnostic assessments was significantly positively correlated with the number of correct knowledge items (see Table 3).

## Comparison between psychologists

### Knowledge and confidence items

The differences in mean scores on confidence items between clinical neuropsychologists ( $n=15$ ), school psychologists ( $n=51$ ), clinical psychologists ( $n=13$ ), and other psychologists ( $n=27$ ; working in disability, NGOs etc.) can be seen in [Figure 1](#). School psychologists were identified by workplace, with clinical psychologists and clinical neuropsychologists identified by endorsement.

A one-way ANOVA was used to compare the difference in mean responses by clinical neuropsychologists ( $n=15$ ), school psychologists ( $n=51$ ), clinical psychologists ( $n=13$ ), and other psychologists ( $n=27$ ; working in disability, NGOs etc., see [Table 4](#)). The ANOVA results showed that there were significant differences in mean confidence scores between groups across most confidence measures: I feel confident in my ability to conduct diagnostic assessments with FASD as they apply to my discipline,  $F(3, 98)=5.18, p<0.002$ ; I am familiar with the psychometric assessments that may be used in FASD assessments,  $F(3, 98)=2.84, p=0.042$ ; I am confident in my ability to apply FASD diagnostic criteria,  $F(3, 98)=4.60, p=0.005$ ; Compared to applying FASD diagnostic criteria, I am confident in my ability to apply the ADHD diagnostic criteria,  $F(3, 98)=0.75, p=0.526$ ; Compared to applying FASD diagnostic criteria, I am confident in my ability to apply the intellectual disability diagnostic criteria,  $F(3, 98)=3.05, p=0.032$ ; Compared to applying FASD diagnostic criteria, I am confident in my ability to apply the autism spectrum disorder diagnostic criteria,  $F(3, 98)=3.16, p=0.028$ ; Compared to applying FASD diagnostic criteria, I am confident in my ability to apply the specific learning disorder diagnostic criteria,  $F(3, 98)=7.44, p<0.001$ ; I feel confident assessing for prenatal alcohol exposure,  $F(3, 98)=2.32, p=0.08$ . Additionally, the difference between groups on the mean correct knowledge items was significant,  $F(3, 98)=3.01, p=0.034$ . See [Table 4](#) for full results of between-group differences in confidence items and number of correct knowledge items.

TABLE 2 Knowledge items with correct responses (total  $n$ ).

Knowledge item	$n$	% correct
Q: If a person has a preexisting diagnosis of ADHD—Combined Subtype, according to the Australian Guide to the Diagnosis of FASD, this would constitute impairment in which of the following domains? A: Attention	84	79.2
Q: In the context of FASD diagnosis using Australian diagnostic guidelines, severe impairment in a neurodevelopmental domain is defined as which of the following A: $\geq 2SD$ below the mean	81	76.4
Q: The three sentinel facial features are? A: Thin upper lip, flat philtrum, and short palpable fissure length	80	75.5
Q: Which of the following is not an area of domain impairment in FASD diagnostic guidelines? A: Visuospatial skills	77	72.6
Q: An impairment in working memory would be considered an impairment in which domain? A: Executive functioning	62	58.5
Q: How many domains of neurodevelopmental impairment comprise a FASD diagnosis? A: 10	40	37.7

## Current practices assessing for PAE

Overall, only 41.5% of participants felt confident assessing for PAE. There were a variety of ways that participants reported assessing for PAE with a significant 16% acknowledging that they did not screen for PAE. A majority of participants indicated they assess for PAE as part of the developmental history (80.2%), with 29.2% checking medical/birth records and 21.7% of participants using the Alcohol Use Disorders Identification Test-Concise (AUDIT-C; Bush et al., 1998).

Respondents reported that their main concern when assessing for PAE was potentially "shaming" the biological mother (59.4%) and 39.6% of respondents reported not knowing how to assess for PAE. A further 17% reported they were not comfortable asking about PAE and 3.8% of psychologists surveyed were unaware of the link between PAE and learning, behavioral, and/or mental health concerns. Additionally, psychologists reported that there is sometimes difficulty in obtaining accurate information (2.7%), not knowing what to do after obtaining the information (0.9%), relevance to the referral question and/or population they work with (3.6%), cultural nuances (0.9%), and lack of additional funding (0.9%) as concerns for assessing for PAE. Only a small number of respondents (9%) reported they were not concerned about assessing for PAE. Psychologists were given the option to elaborate on their concerns assessing PAE by inputting a text response. See [Figure 2](#) for a word cloud of text responses given by participants of their concerns assessing PAE, analyzed, and created with NVivo. The more common themes are in larger font.

The frequency with which psychologists assess for PAE when conducting assessments for different disorders is found in [Table 5](#).

Most psychologists were unaware of state and federal government recommendations for school psychologists to screen for PAE when assessing for intellectual disability (80.2%), learning difficulties (84%), or behavioral concerns (88.7%). These figures represented the overall sample of psychologists. Additionally, 68.6% of psychologists working in education settings in Australia

**TABLE 3** Correlation between number of correct knowledge items and confidence items.

Items	Pearson correlation	Sig. (two-tailed)	Bootstrap bias	Std. error	95% CI	
					Lower	Upper
I am confident in my ability to apply FASD diagnostic criteria	0.543	<0.001	-0.001	0.077	0.378	0.677
I feel confident in my ability to conduct diagnostic assessments with FASD as they apply to my discipline	0.541	<0.001	0.000	0.066	0.409	0.662
I am familiar with the psychometric tests that may be used in FASD assessments	0.164	0.099	0.002	0.104	-0.033	0.371
I feel confident assessing for prenatal alcohol exposure	0.382	<0.001	-0.007	0.108	-0.127	0.307
Compared to applying FASD diagnostic criteria, I am confident in my ability to apply the ADHD diagnostic criteria	0.096	0.340	-0.001	0.089	-0.084	0.265
Compared to applying FASD diagnostic criteria, I am confident in my ability to apply the intellectual disability diagnostic criteria	0.207	0.037	-0.008	0.084	0.035	0.370
Compared to applying FASD diagnostic criteria, I am confident in my ability to apply the autism spectrum disorder diagnostic criteria	0.089	0.372	-0.004	0.101	-0.105	0.280
Compared to applying FASD diagnostic criteria, I am confident in my ability to apply the specific learning disorder diagnostic criteria	0.102	0.307	-0.007	0.108	-0.127	0.307

Bold indicates statistically significant items ( $p < 0.05$ ).

were unaware of state and federal government recommendations for school psychologists to screen for FASD when assessing for intellectual disability, learning difficulties (74.5%) or behavioral concerns (86.3%).

### Training requirements

A total of 87.2% of psychologists were interested in learning more about FASD (including the psychologist's role in assessment and diagnosis). Multiple options were offered for methods of training, with online training the preferred method (80.2%), followed by face-to-face training (52.8%), reading material (51.9%), and videos (47.2%). Similar results were found for options for training to assess for PAE, with online training the preferred method (73.6%), face-to-face training (41.5%), and reading material and videos (31.1% each).

### DISCUSSION

This exploratory study aimed to determine Australian psychologists' understanding, knowledge, and beliefs about FASD, confidence in conducting psychometric assessments that form part of the FASD assessment, as well as current practices assessing PAE and their training needs to improve diagnostic understanding and confidence. Overall, psychologists surveyed were more confident in assessing other neurodevelopmental disorders, such as intellectual disability, attention deficit hyperactivity disorder, autism spectrum disorder, and specific learning disorder, rather than FASD. This was the first study to compare psychologists' confidence in assessing for FASD in comparison to other neurodevelopmental disorders. There were significant differences in both knowledge and confidence between different types of psychologists, with this survey being the first of its kind to compare groups of psychologists. Clinical neuropsychologists had the most knowledge of FASD, as measured by the knowledge items, confidence in their ability to conduct diagnostic assessments and apply the FASD criteria and assess for PAE. This finding may reflect their training, as Master of Clinical Neuropsychology programs focus more specifically on assessment, as well as child, adolescent, and adult psychopathology (Wong et al., 2023).

While most psychologists surveyed were familiar with FASD as a diagnostic term and the psychometric tests used in FASD assessments, only a third of psychologists felt confident in their ability to conduct the diagnostic assessments required for a FASD diagnosis and ability to apply the FASD diagnostic criteria. This is similar to the results of the last survey of psychologists (Wedding et al., 2007), in which only 30% of surveyed psychologists felt prepared to identify children with FAS and alcohol-related disorders. Despite the advances in research and roll out of diagnostic guidelines (Bower et al., 2016), there are striking similarities between the two surveys conducted two decades apart. Understanding of the potential harm of alcohol has improved slightly since 2007 with 95% of Australian psychologists aware that there is no safe time to consume alcohol in

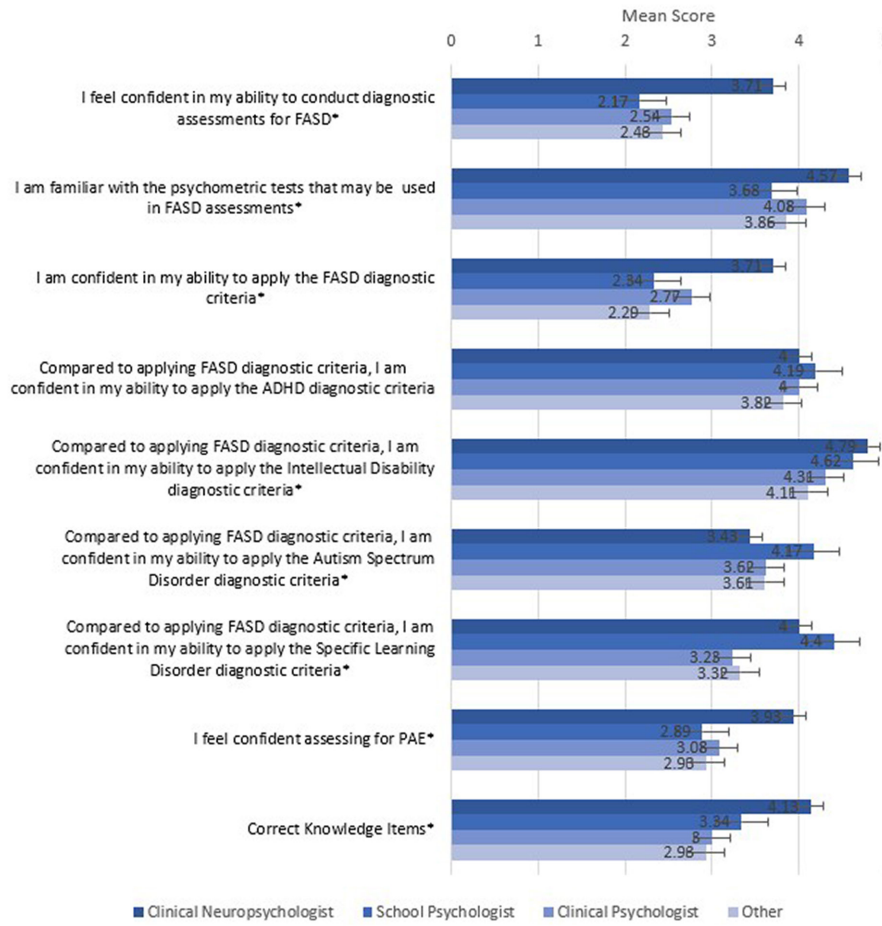


FIGURE 1 Differences in mean scores on confidence items between different psychologists. Higher scores indicate higher levels of confidence and knowledge. Asterisk denotes the items with significant differences between groups.

pregnancy, compared to 88% in Wedding et al. A lack of training was highlighted as a barrier to assessment and diagnosis in both surveys.

This finding highlights the need for the development of further training in FASD assessment, test interpretation, and diagnosis (Commonwealth of Australia, 2021; Reid, 2020). Recent government recommendations have been made to allocate Commonwealth funding for FASD diagnostic training, including the delivery of practical training courses, as well as scholarships and/or subsidies for the Graduate Certificate in the Diagnosis of FASD at the University of Western Australia (UWA; Senators Inquiry: Commonwealth of Australia, 2021).

Panton et al. (2022) found that the demand for FASD diagnosis was far greater than the availability of diagnostic services across Australia, with a variety of models (private and government-funded) used. For example, in Tasmania, diagnostic capacity was improved by upskilling school psychologists to complete parts of the FASD diagnostic assessment. Burd and Popova (2019) underscore the need to train health professionals outside of the traditional MDT approach to improve access to assessment and diagnosis, in turn improving access to care.

Most participants indicated a desire to learn more about FASD, with online training being the preferred delivery mode. A study examining custodial officers' training needs to develop FASD knowledge indicated participants had a strong preference for in-person training (Passmore et al., 2018). However, the current participants

exhibited a preference for online training, which may be reflective of the impact of COVID-19 and willingness to consume online content, as well as the difference in levels of education and familiarity with the technology between the two groups. Online training provides valuable flexibility to individuals, as well as being as effective as traditional face-to-face learning in measures of learning outcomes and student satisfaction (Castro & Tumabay, 2021).

### Addressing PAE and stigma

The majority of respondents were not confident in their ability to assess for PAE and cited the possibility of shaming the biological mother and not knowing how to assess for PAE as the main reasons it was not their standard practice to ask about PAE when conducting assessments for a variety of neurodevelopmental disorders. In a narrative review of FASD-related stigma, Roozen et al. (2020) found that biological mothers can be perceived as morally culpable for PAE and any resulting FASD, with one study finding biological mothers were stereotyped as child abusers, lacking empathy and being in denial (Corrigan et al., 2019).

This study echoes the findings of other research (Doherty et al., 2019; *Invisible Disability Report*, Education and Health Standing

TABLE 4 Between group differences between psychologists.

Items	School psychologist	Clinical psychologist	Other
I feel confident in my ability to conduct diagnostic assessments with FASD as they apply to my discipline	Clinical Neuropsychologist	$p = 0.091$ 95%CI -0.12 to 2.48 SE 0.50	$p = 0.016$ 95%CI 0.18 to 2.4 SE 0.42
	School Psychologist	$p = 0.800$ 95%CI -1.43 to 0.69 SE 0.40	$p = 0.836$ 95%CI -1.06 to 0.55 SE 0.31
	Clinical Psychologist		$p = 0.994$ 95%CI -1.24 to 1.02 SE 0.43
I am familiar with the psychometric tests that may be used in FASD assessments	Clinical Neuropsychologist	$p = 0.028$ 95%CI 0.07 to 1.71 SE 0.31	$p = 0.154$ 95%CI -0.17 to 1.60 SE 0.34
	School Psychologist	$p = 0.611$ 95%CI -1.24 to 0.45 SE 0.32	$p = 0.890$ 95%CI -0.82 to 0.47 SE 0.25
	Clinical Psychologist		$p = 0.920$ 95%CI -0.68 to 1.12 SE 0.37
I am confident in my ability to apply FASD diagnostic criteria.	Clinical Neuropsychologist	$p = 0.005$ 95%CI 0.33 to 2.41 SE 0.40	$p = 0.006$ 95%CI 0.31 to 2.55 SE 0.43
	School Psychologist	$p = 0.722$ 95%CI -1.50 to 0.64 SE 0.41	$p = 0.998$ 95%CI -0.76 to 0.87 SE 0.31
	Clinical Psychologist		$p = 0.689$ 95%CI -0.66 to 1.63 SE 0.44
Compared to applying FASD diagnostic criteria, I am confident in my ability to apply the ADHD diagnostic criteria.	Clinical Neuropsychologist	$p = 1.00$ 95%CI -1.05 to 1.05 SE 0.40	$p = 0.954$ 95%CI -0.72 to 1.07 SE 0.34
	School Psychologist	$p = 0.937$ 95%CI -0.67 to 1.05 SE 0.33	$p = 0.453$ 95%CI -0.28 to 1.02 SE 0.32
	Clinical Psychologist		$p = 0.957$ 95%CI -0.74 to 1.10 SE 0.35

TABLE 4 (Continued)

Items	School psychologist	Clinical psychologist	Other
Compared to applying FASD diagnostic criteria, I am confident in my ability to apply the Intellectual Disability diagnostic criteria.	Clinical Neuropsychologist	$p=0.453$ 95%CI -0.37 to 1.32 SE 0.32	$p=0.071$ 95%CI -0.04 to 1.40 SE 0.27
	School Psychologist	$p=0.643$ 95%CI -0.38 to 1.00 SE 0.26	$p=0.059$ 95%CI -0.01 to 1.03 SE 0.20
	Clinical Psychologist		$p=0.892$ 95%CI -0.54 to 0.94 SE 0.28
Compared to applying FASD diagnostic criteria, I am confident in my ability to apply the autism spectrum disorder diagnostic criteria.	Clinical Neuropsychologist	$p=0.081$ 95%CI -1.54 to 0.06 SE 0.31	$p=0.949$ 95%CI -1.04 to 0.68 SE 0.33
	School Psychologist	$p=0.302$ 95%CI -0.27 to 1.38 SE 0.32	$p=0.097$ 95%CI -0.07 to 1.19 SE 0.24
	Clinical Psychologist		$p=1.00$ 95%CI -0.88 to 0.89 SE 0.34
Compared to applying FASD diagnostic criteria, I am confident in my ability to apply the specific learning disorder diagnostic criteria.	Clinical Neuropsychologist	$p=0.628$ 95%CI -1.28 to 0.48 SE 0.34	$p=0.245$ 95%CI -0.27 to 1.62 SE 0.36
	School Psychologist		$p<0.001$ 95%CI 0.39 to 1.77 SE 0.264
	Clinical Psychologist		$p=0.995$ 95%CI -1.06 to 0.88 SE 0.37
I feel confident assessing for prenatal alcohol exposure	Clinical Neuropsychologist	$p=0.059$ 95%CI -0.03 to 2.10 SE 0.41	$p=0.107$ 95%CI 0.14 to 2.14 SE 0.44
	School Psychologist	$p=0.972$ 95%CI -1.28 to 0.91 SE 0.42	$p=1.00$ 95%CI -0.87 to 0.80 SE 0.32
	Clinical Psychologist		$p=0.987$ 95%CI -1.02 to 1.32 SE 0.45

(Continues)

TABLE 4 (Continued)

Items	School psychologist	Clinical psychologist	Other
Number of correct knowledge items	Clinical Neuropsychologist	$p = 0.151$ 95%CI -0.21 to 2.48 SE 0.15	$p = 0.03$ 95%CI 0.07 to 2.34 SE 0.42
	School Psychologist	$p = 1.00$ 95%CI -0.74 to 1.47 SE 0.41	$p = 0.975$ 95%CI -0.40 to 1.27 SE 0.32
	Clinical Psychologist		$p = 1.00$ 95%CI -1.12 to 1.26 SE 0.44

Bold indicates statistically significant items ( $p < 0.05$ ).

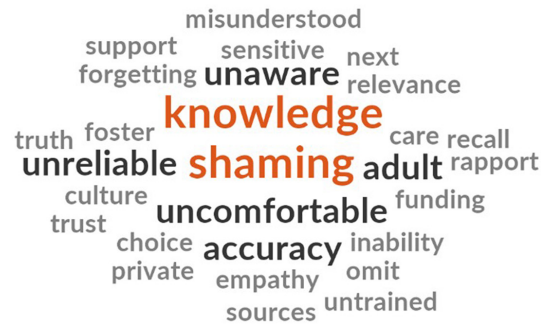


FIGURE 2 Word cloud of responses from psychologists outlining concerns for assessing prenatal alcohol exposure.

Committee, Parliament of Western Australia, 2012) that found a number of barriers to clinicians addressing PAE, including perceptions that women know not to drink during pregnancy, asking about PAE may add shame or guilt and alienate the expectant mother from care, as well as clinicians lacking the skills and resources to adequately support women within the allotted consultation time.

The Australian Medical Association (AMA) reported that clinicians can be reluctant to discuss FASD with their patients because of the perceived stigma associated with consuming alcohol during pregnancy (Commonwealth of Australia, 2021) and that there is a need for ongoing education and training for clinicians to increase knowledge of FASD and improve early identification (AMA, 2016). Corrigan et al. (2017) found that increased levels of knowledge of FASD can lead to increased endorsements of the stigma of the biological mother, underscoring the importance of research in reducing FASD-related stigma (Roozen et al., 2020). In order to overcome the stigma and meet the needs of women and their families, it has been recommended that clinicians should routinely ask about alcohol within the context of health and everyday behavior, seeking to quantify the amount of alcohol consumed, with the assumption that the mother may not know about the harm of PAE (*Invisible Disability Report*, Education and Health Standing Committee, Parliament of Western Australia, 2012).

Addressing and reducing PAE is an important issue in public health due to the social and economic costs, as well as community burden (Greenmyer et al., 2018). For example, a recent mass media public health campaign in Australia ("One Drink" campaign) was found to increase the concern of participants about the consumption of alcohol in pregnancy and positively influence women to reduce (83%) or abstain (33%) from alcohol during pregnancy (Pettigrew et al., 2022). The authors report the utility of public health campaigns in positively influencing individual behavior, and also highlight the relevance to health practitioners in engaging in conversations about the harm associated with PAE.

### Future research directions

A possible future research direction is to further explore the barriers of psychologists in addressing PAE, as well as to gain a better

TABLE 5 Frequency of screening for prenatal alcohol exposure (PAE) in neurodevelopmental assessment.

Do you screen for PAE when assessing for	Never	Rarely	Sometimes	About half the time	Most of the time	Always
Intellectual disability	15 (14.2%)	10 (9.4%)	16 (15.1%)	3 (2.8%)	23 (21.7%)	35 (33%)
Learning difficulties (SLD or other)	18 (17.0%)	10 (9.4%)	19 (17.9%)	4 (3.8%)	19 (17.9%)	32 (30.2%)
Behavioral concerns	18 (17.0%)	11 (10.4%)	26 (24.5%)	7 (6.6%)	18 (17.0%)	22 (20.8%)

understanding of their knowledge of the link between PAE and neurodevelopmental impairment. While the link between PAE and neurodevelopmental impairments is well established in the scientific literature (DeJong et al., 2019), it is important to understand that the impact of alcohol on the developing fetus is affected by different factors, including timing and dose (Aiton, 2021). The recently published *Australian Evidence-Based Clinical Practice Guideline For Attention Deficit Hyperactivity Disorder* (Australian ADHD Professionals Association, 2022) recommended the assessment of PAE as part of an ADHD assessment, outlining the established research association between PAE and impairments in executive function. State and federal government recommendations have called for the consideration of PAE as part of child development assessments since 2010 (Department of Health, State of WA, 2010) and as recently as in the Senate's inquiry (Commonwealth of Australia, 2021). However, psychologists surveyed were largely unaware of state and federal government recommendations for FASD screening, indicating a significant gap between government recommendations and clinical practice.

The Australian government has a formal FASD action plan (Department of Health, 2018); however, the roll out of recommendations and actions varies across the country. For example, Panton et al. (2022) found Tasmania is successfully upskilling school psychologists to support in completing the psychometric assessments required as part of an MDT FASD diagnosis; however, this approach was not consistent across other states. Another avenue for future research could be training to upskill school psychologists and/or psychologists working in private practice to conduct assessments in conjunction with other private or government health services to improve diagnostic capacity in Australia.

### Future practice and policy considerations

This study focused on the knowledge, confidence, and practices of Australian psychologists in FASD assessment and their familiarity with current Australian diagnostic guidelines. However, internationally, there are some variations with diagnostic classification systems with a lack of consensus in the academic community (Trathen, 2021). The development of necessary training for psychologists to conduct FASD assessments must take the changing diagnostic landscape into account, including revisions to the Australian Guidelines (Hayes et al., 2022) and Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), American Psychiatric Association (APA, 2013). "Neurobehavioural

Disorder Associated With Prenatal Alcohol Exposure" was included in the DSM-5 (APA, 2013) as a condition for further study, outlining impairments in neurocognitive functioning, self-regulation, and adaptive functioning in association with confirmed PAE. Inclusion in the DSM may help improve the accurate identification of affected individuals, as well as broaden diagnostic access (Kable, 2016). Future research examining knowledge of diagnostic criteria will need to factor the variations of diagnostic guidelines into account.

FASD affects all groups, across all cultures and socioeconomic status levels (Bower et al., 2017); however, FASD prevalence rates tend to be higher in vulnerable groups, including children in care (Popova et al., 2019) and children in juvenile justice settings (36%; Bower et al., 2018). One study found prevalence rates of 19.4% of Australian Aboriginal children in the Fitzroy Valley, a remote area in Northern Western Australia (Fitzpatrick et al., 2015). It is important to note that FASD and other issues of harm related to alcohol in First Nations peoples, are inextricably linked to the ongoing impacts of colonization, dispossession, and intergenerational trauma (Commonwealth of Australia, 2021; Fitzpatrick & Pestell, 2017; Fogliani, 2019; Gooda, 2010). Cultural safety is embedded within the core competencies of Australian psychologists, including using culturally safe assessment methods and providing culturally safe care (AHPRA, 2023). Cultural safety is a key component when considering the appropriateness of using various psychometric assessments not standardized with Indigenous populations (Fitzpatrick & Pestell, 2017), as well as when assessing PAE (Fitzpatrick et al., 2013).

### Limitations

When considering the implications of this research, it is important to consider the generalizability of findings from online surveys. While snowballing can affect the representativeness of the sample (Menon & Muraleedharan, 2020), the use of the online survey sent via professional networks ensured some reassurance that it was being completed by psychologists, as AHPRA numbers are typically a requirement when requesting to join professional platforms. This allowed the participants to remain anonymous to the researchers but ensured they would represent the targeted group. Additionally, as the researchers are based in WA, there is an overrepresentation of WA psychologists in the survey. However, a state-based comparison of responses did not differ significantly between psychologists across Australia, which may reflect that

psychologists must register with a national board (AHPRA) and there are no state-based differences in training or work requirements for psychologists.

## CONCLUSION

Australian psychologists were familiar with FASD as a diagnostic term; however, they were significantly less confident in their ability to assess for FASD than other neurodevelopmental disorders and were not regularly assessing for PAE. Our study highlights a clear need for the development of further training for psychologists to consistently and confidently assess for PAE in clinical interviews, as well as improve confidence in the selection and interpretation of psychometric assessments for FASD in order to improve diagnostic capacity. In Australia, limited diagnostic capacity remains a significant barrier, with demand for assessment outstripping availability across the country (Panton et al., 2022). Improving knowledge and changing clinical practice with regard to FASD assessment provides a starting point for increasing early diagnosis, intervention, and prevention.

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## CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

## DATA AVAILABILITY STATEMENT

Data will be made available on request.

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## SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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