


Knowledge, Attitudes, and Practices Towards Fetal Alcohol Spectrum Disorder in New Zealand Educators: An Online Survey

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Abstract

Background: Fetal alcohol spectrum disorder (FASD) is a common form of developmental disability but may be poorly understood by professionals working with people with FASD. The aim of the research is to understand the FASD knowledge, attitudes, awareness, and practices among people employed by the education sector in Aotearoa New Zealand and identify gaps in knowledge.

Methods: We conducted an online survey of New Zealand Education professionals. The survey focused on the following areas: Awareness of FASD; Knowledge and beliefs about FASD; Impact of FASD on professional practice; and Training needs. **Results:** Of the 419 participants, most had some knowledge of FASD and its effects on learning; however, there are still gaps that need to be addressed so educators can provide support to individuals living with FASD. **Conclusion:** There is a need to improve workforce capacity and develop guidelines that address the needs of front-of-line staff working with children with FASD in education settings.

Keywords

fetal alcohol, education professionals, teachers, knowledge, attitudes, practices, survey

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Introduction

Fetal Alcohol Spectrum Disorder (FASD) is a diagnostic term that describes the neurological and physical effects of prenatal exposure to alcohol (Harding et al., 2019). The most recent estimate of global prevalence estimates that 7.7 per 1000 children are affected by FASD (95% confidence interval 4.9 – 11.7), although the prevalence is likely much higher in countries where there is a pervasive drinking culture (Lange et al., 2017). In Aotearoa New Zealand, the Ministry of Health estimate 1 to 3 in every 100 live births are affected by alcohol (Ministry of Health, 2018). Symptoms of FASD include restricted growth, diminished neurological and cognitive functioning, characteristic facial features, and behavioural problems. Primary effects of FASD, such as difficulties with memory, cognition, language, executive function, social skills and attention are common (Alati et al., 2006). These difficulties affect an individual's functional abilities and can lead to early school failure, poor mental health, substance misuse, and engagement with the justice system (Streissguth et al., 1996; Rangmar et al., 2015).

Many children with FASD in New Zealand schools are likely undiagnosed, or worse, misdiagnosed and receiving support and interventions that are not informed by or appropriate to a diagnosis of FASD. Early identification of FASD and referral for multi-disciplinary diagnosis is a protective factor against secondary issues and adverse life outcomes such as school disruption, trouble with the law and confinement (Streissguth et al., 2004), and is essential to ensure the needs of individuals with FASD are appropriately managed (Petrenko et al., 2014). Without support, children with FASD are likely to experience difficulties in education settings, which can in turn lead to school exclusion and stand downs (Streissguth et al., 1996). Research shows that school suspensions or exclusion have detrimental effects on learning outcomes and mental health, and are correlated with early entry into the criminal justice system (Valdebenito et al., 2019).

Role of Educators in Supporting Individuals with FASD

The school environment is considered one of the key community organisations that can facilitate interventions between those with FASD and their families (Streissguth et al., 1997; Petrenko et al., 2014). Community cooperation between families and the school is important in the care and education of students with FASD (Turner, 2006). Teachers have an important role in the screening process for FASD and are often the first professional to recognise neurodevelopmental delays (Turner, 2006). Knowledgeable and well-trained teachers and school staff are essential for children with FASD to reach their full potential, maximise academic achievement, reduce school failure and school drop-out rates (Ruiz, 2004). Despite this, very little research has been conducted on the knowledge, attitudes, and practices of those working in the education sector with regards to FASD.

It is important that teachers have an accurate understanding of the difficulties that students with FASD face so they can respond effectively to those challenges and develop appropriate expectation of students with FASD. If teachers' expectations are above or below what is appropriate, this can impact on students expectations, leading to negative self-fulfilling prophecies, affecting student behaviour and resulting in negative school experiences (O'Connor, 2003). Training teachers so they have empathy and understanding towards students with FASD may also enhance students' ability to form social relationships in the future (Turner, 2006).

Educator's Knowledge, Awareness, and Experience with FASD

While knowledge, attitudes, and practices towards FASD have been studied extensively in health settings, there is limited research in education settings. In New Zealand, only two previous studies

have explored professional knowledge and attitudes towards FASD. A survey of health professionals (N=241) found that only one third of participants thought that health professionals were sufficiently aware of FASD (Wouldes, 2009). A qualitative study of professionals working in justice, health and education highlighted a lack of support, formalised training and understanding regarding FASD (Sherwood, 2020).

Of studies that have investigated knowledge, awareness and experience of FASD amongst educators, most have identified a substantial lack of skills and knowledge required to effectively support students with FASD and their families (Binns, 2000; O'Connor, 2003; Pei, Job, Poth, O'Brien-Langer, & Tang, 2015; Ruiz, 2004; Turner, 2006). Research in the US has suggested teachers are using broad labels such as 'learning disabled' and often have little information on the specific characteristics and needs of students with FASD (Turner, 2006). Across surveys, most educators demonstrate a basic understanding of FASD characteristics, variability and causes (O'Connor, 2003; Ruiz, 2004), with Resource Teachers: Learning and Behaviour (RTLb), who frequently work with children with special needs, found to be better equipped at working with children FASD and demonstrated more specific understanding of FASD (O'Connor, 2003).

A survey of Alaskan professionals across health, justice and education (N=2,292) found that general knowledge of Fetal Alcohol Syndrome (FAS) was relatively high amongst educators (N=775) and social workers (N=340) at more than 90% accuracy (Johnson et al., 2010). A Californian study (N=32) identified that educators knew some of the behavioural characteristics of FASD children, that it can impact birth weight, and that there is variability in the condition (Ruiz, 2004). However, a study of educators in Florida (N=114) found that while 81% of respondents agreed that people with FAS have brain damage, 80% believed that people with FAS will grow out of the effects demonstrating an inconsistency in knowledge about the long-term effects of FASD (Turner, 2006).

Previous studies also highlight the lack of experience and education related to FASD in educators (Binns, 2000; Ruiz, 2004; Turner, 2006). Research among educational psychologists discovered that half of educational psychologists surveyed (N=31) had been involved in FASD casework in the last 5 years; however, researchers identified a lack of knowledge about FASD was a key barrier to providing support for individuals with FASD (Campbell, 2019). Similarly, 64% of educators indicated they had not knowingly taught a child with FAS (O'Connor, 2003). A survey of Alaskan educators (N=271) found that those who had more direct experience with students with FASD were more knowledgeable and had greater confidence and better perceived skills than those who had dealt with fewer FASD students (Binns, 2000).

There is limited literature regarding the extent to which FASD is understood among people employed by the education sector, or of their current knowledge, attitudes, experiences, and practices in relation to FASD. Lack of knowledge or awareness of FASD is a major barrier for families when attempting to access services and support for FASD (Chamberlain, Reid, Warner, Shelton, & Dawe, 2017; Petrenko et al., 2014). It is important to develop a well-trained and well-informed workforce to ensure that children with FASD receive interventions and support that are informed by their diagnosis and enable them to succeed in an education setting. The aim of the research is to understand the FASD knowledge, attitudes, practices and awareness among people employed by the education sector and identify gaps in knowledge and training to develop resources and build workforce capacity in educators working with children and families impacted by FASD.

Methods

Design

We developed an online survey to examine knowledge, attitudes, and practices of people working in education sector or studying in education related fields in New Zealand. Our survey drew on cognitive behavioural models that link knowledge, awareness and attitudes with behaviour (Rimer & Glanz, 2005). In this context we were interested in broad awareness of FASD as a disorder, as well as knowledge and beliefs about FASD. We conducted a systematic review of previous surveys of FASD knowledge across health, justice, education, and social settings in order to identify the relevant questions. The survey was developed with reference to previous surveys conducted in health (Payne, Elliot, D'Antoine, O'Leary, & et al., 2005; Wouldes, 2009) and justice settings (Cox, Clairmont, & Cox, 2008; Mutch, Watkins, Jones, & Bower, 2013). We also included questions or responses specific to the New Zealand context, such as the use of local resources (e.g., Te Pou, Te Kete Ipurangi).

The survey focused on the following areas: Awareness of FASD; Knowledge and beliefs about FASD; Impact of FASD on professional practice and experience with FASD; and Training and information needs relating to FASD. Participants were also asked to provide demographic information (i.e., age, gender, ethnicity), location, role in the education sector, and professional background. The survey consisted of multi-choice and true-false questions, with a small number of open-ended questions, and took around 5-10 minutes to complete.

Study Population

Participants were eligible to participate in the survey if they were aged ≥ 18 years; able to read and speak English; currently employed in the New Zealand education sector or studying in an education related field (e.g., teachers training, social work); and are not in an administrative role – i.e., they have contact with children. All those working outside of the education setting were excluded. We aimed for a sample size of 300 participants with 50 participants from each of the following categories: primary and secondary teachers, early childhood teachers, teacher aides, clinicians, and social workers.

Recruitment

Participants were recruited over eight weeks from September to November 2021 via social media platforms (Facebook, Twitter) and e-newsletters to professional groups. We sent email invitations to Māori medium schools and early childhood centres (Kura Kaupapa Māori and Kohunga Reo) across New Zealand inviting their staff to participate in the survey. Social media posts and survey links were also shared amongst provider and advocacy networks including the FASD Care Action Network (FASD-CAN) and Australia New Zealand FASD Clinical Network (ANZFASD-CN). On completion of the survey the participants were invited to enter a prize draw to receive 1 of 10 \$50 vouchers.

All participants were informed of the survey before taking part via the participant information sheet. As the survey was anonymous, by completing the survey participants gave consent for their answers to be used in their research. We obtained ethics approval from the Auckland Health Research Ethics Committee (Ref: AH23200).

Analysis

All data was collected via an online survey in a REDCap database and exported to SPSS (IBM Corp, 2017) for data analysis. Due to the appearance of spam responses, we excluded all surveys completed in less than 2.5 minutes unless they also included responses to the open-ended questions, indicating probable authentic engagement with the questions. Continuous variables were summarised as frequencies, means (standard deviation), medians and interquartile range. Categorical variables were summarised as frequencies and percentages and comparisons made using Chi-square tests and Kruskal-Wallis tests to assess statistical significance ($H(df); p \leq .05$).

Open-ended answers were exported to NVivo (QSR International Pty Ltd, 2020) for analysis. Qualitative analysis was conducted by the second author (JM) using reflexive thematic analysis (Braun & Clark, 2022), beginning with familiarisation and then coding of open-ended responses using semantic codes (Terry et al., 2017). Thematic maps were built connecting codes to central themes, which were reviewed by the first and second authors (JC and JM).

Results

In total, 836 people responded to the online survey invitation. We excluded 84 responses that were not educators or did not complete the screening questions and excluded 333 responses made in less than 2.5 minutes. Our final sample consisted of 419 participants (Table 1).

The largest group of professionals in our sample were primary school teachers ($n=108$, 25.8%), followed by secondary school teachers ($n=73$, 17.4%), and RTLB and learning support (including Special Education Needs Co-Ordinators and Learning Support Co-Ordinators) ($n=64$, 15.3%). A total of 37 clinicians (8.8%), which included 17 psychologists and 20 speech language therapists, participated in the survey. Participants in the other category ($n=43$, 10.3%) included Tertiary Educators, Education Students, Principals and *Tumuaki* (Māori leaders), and Iwi (tribal) Education Providers.

More than 80% of the sample identified as female. Most participants identified as New Zealand European (71.8%), with 10.7% identifying as Māori and 3.3% Pacific Islander. Almost two-thirds of the sample were from suburban areas (63.5%) and most participants had been working in the education sector for 11 or more years (54.7%). The demographic characteristics of the sample were similar to the demographics reported in the school workforce data collection (Education Counts, 2021), although our sample was more skewed towards female participants.

Awareness and Knowledge of FASD

Few participants reported that they were not aware of FASD prior to the study (Table 1). Of those that were aware of FASD prior to the survey, the most common sources of information about FASD were colleagues (40.2%), own research (37.8%), and education sessions (37.6%). Only 28.3% reported that they learnt about FASD from professional resources, which included online resources provided by the Ministry of Education (i.e., TKI: Te Kete Ipurangi).

Participants were asked to self-rate their knowledge of FASD. Almost 50% of participants categorised their knowledge as a basic understanding of FASD and its effects in general. Around of 40% categorised their knowledge as a good understanding of FASD. Only 10% categorised themselves as having only an awareness of FASD or no knowledge/awareness of FASD. We found a significant difference in self-rated knowledge by role ($H(7) = 21.525, p = .003$), with a significant pairwise comparison between Clinicians and Secondary School Teachers ($z = -76.298, p = .011$) and Clinicians and Teacher Aides ($z = -85.886, p = .030$). Clinicians and RTLBs had the highest self-rated knowledge

Table 1. Baseline characteristics of participants showing count and percentage.

	Overall	Primary school Teachers	Secondary School Teachers	Early Childhood Educators	Teacher Aides	RTLb and Learning Support	Clinician	Social Worker	Other
N	419	108	73	54	32	64	37	5	43
Age M (SD)	43.8 (12.2)	43.3 (11.2)	42.1 (13.5)	46.8 (12.9)	48.0 (11.0)	39.3 (10.7)	37.8 (16.6)	46.28 (12.8)	
Gender									
Male	50 (11.9)	18 (16.7)	8 (11.0)	3 (5.6)	5 (15.6)	5 (7.8)	8 (21.6)	5 (100)	3 (7.0)
Female	341 (81.4)	87 (80.6)	60 (82.2)	46 (85.2)	26 (81.3)	54 (84.4)	28 (75.7)	0	35 (82.4)
Gender Diverse	5 (1.2)	0	1 (1.4)	1 (1.9)	1 (3.1)	1 (1.6)	0	0	1 (2.3)
Prioritised ethnicity									
Māori	45 (10.7)	6 (5.6)	3 (4.1)	9 (16.7)	6 (18.8)	9 (14.1)	0	1 (20.0)	11 (25.6)
Pacific	14 (3.3)	5 (4.6)	0	1 (1.9)	2 (6.3)	4 (6.3)	1 (2.7)	0	1 (2.3)
Non-Māori/Non-Pacific	354 (84.5)	96 (88.9)	69 (94.5)	44 (81.5)	24 (75.0)	51 (79.7)	35 (94.6)	4 (80.0)	31 (72.1)
Location									
Inner City	62 (14.8)	14 (13.0)	9 (12.3)	12 (22.2)	5 (15.6)	5 (7.8)	9 (24.3)	0	8 (18.6)
Suburbs	266 (63.5)	79 (73.1)	49 (67.1)	24 (44.4)	19 (59.4)	46 (71.9)	21 (56.8)	4 (80.0)	24 (55.8)
Rural	86 (20.5)	15 (13.9)	15 (20.5)	18 (33.3)	8 (25.0)	13 (20.3)	6 (16.2)	1 (20.0)	10 (23.3)
Years in Education									
Less than 1 year	20 (4.8)	5 (4.6)	0	2 (3.7)	1 (3.1)	1 (1.6)	3 (8.1)	3 (60.0)	5 (11.6)
1-2 years	31 (7.4)	8 (7.4)	3 (4.1)	2 (3.7)	6 (18.8)	4 (6.3)	6 (16.2)	1 (20.0)	1 (2.3)
3-4 years	51 (12.2)	15 (13.9)	12 (16.4)	6 (11.1)	2 (6.3)	4 (6.3)	6 (16.2)	1 (20.0)	5 (11.6)
5-10 years	84 (20.0)	22 (20.4)	17 (23.3)	14 (25.9)	8 (25.0)	6 (9.4)	8 (21.6)	0	9 (20.9)
11 or more years	229 (54.7)	58 (53.7)	41 (56.2)	30 (55.6)	14 (43.8)	49 (76.6)	14 (37.8)	0	23 (53.5)
Aware of FASD									
No	10 (2.4)	2 (1.9)	1 (1.4)	3 (5.6)	3 (9.4)	0	0	0	1 (2.3)
Yes	378 (90.2)	98 (90.7)	67 (91.8)	46 (85.2)	26 (81.3)	61 (95.3)	35 (94.6)	5 (100)	39 (90.7)

of FASD: almost two-third of Clinicians and more than half of RTLBs rated their knowledge as a good understanding of FASD. Less than 30% of Teacher Aides and Secondary School Teachers rated themselves as having a good understanding of FASD. There was also a significant different in self-rated knowledge by ethnicity ($H(2) = 7.262, p = .026$), with a significant pairwise comparison between Māori participants and Non-Māori/Non-Pacific participants ($z = -43.330, p = .036$). Most Māori educators rated their knowledge of FASD as a good understanding of FASD (65.0%).

Participants were asked to identify the features required for an FASD diagnosis, specifically, alcohol exposure during pregnancy, neurological impairment across multiple behaviours or functions, and central nervous system abnormality. Most participants were able to identify two or more features of an FASD diagnosis from the list provided (68.7%), however, only 20% were able to identify all three features. While most participants identified exposure to alcohol during pregnancy and neurological impairment across multiple behaviours or function as features of FASD, only 31% identified central nervous system abnormality as a feature of FASD (Figure 1).

Participants estimated the prevalence of FASD in New Zealand. Only 17.7% of participants correctly estimated the prevalence of FASD at 1 in 50, with most participants underestimating prevalence (57.3%). Clinicians and RTLBs were the most accurate in estimating the prevalence of FASD.

Attitudes and Beliefs Towards FASD

Participants were asked which of the following domains were affected by FASD through a series of true-false questions: ability to communicate, ability to control their emotions, learning and memory, judgment, and ability to feel remorse. Figure 2 shows the percentage of participants that were correct in their responses. More than 80% of participants correctly identified learning communication, emotional regulation, and learning and memory as domains affected by FASD. However, 83.8% of participants believed FASD affected a person's judgement, which is not one of the primary domains affected by FASD, and 64% believed FASD affected a person's ability to feel remorse.

Participants were asked whether the statements in Figure 3 were true or false. Around two-third of participants affirmed that people with FASD have permanent brain damage. A large majority of participants rejected the statement that people can grow out of FASD, that FASD is only relevant to people under 18 years, and that diagnosis would not improve outcomes for those affected by FASD. Participants were ambivalent as to whether birth mothers who drink when pregnant know it can harm the baby, with 39% identifying the statement as true. Half of the participants were unsure whether programmes for children with autism spectrum disorder work for FASD and 27.6% identified the statement as false.

Experiences and Practices with FASD

When asked if FASD was relevant to their work in the education sector, more than 80% of participants reported that FASD was relevant or highly relevant to their work. Only 14.6% reported that FASD was irrelevant or highly irrelevant. There was a significant difference in relevance by role ($H(7) = 16.17, p = .024$), although there were no significant pairwise comparisons. The majority of RTLB (64.3%), Clinicians (61.8%), and Primary Teachers (57.3%) indicated that FASD was highly relevant to their work. Participants were asked to estimate the percentage of students/children in their care that they think may have FASD. Only 12.2% estimated that they had had no students with FASD, with most estimating that less than 5% or 5-10% of students in their care had had FASD (54.5%).

Three-quarters of education professionals indicated that they would change their practices or behaviour if someone in their care was known to have FASD. When asked to explain their answer

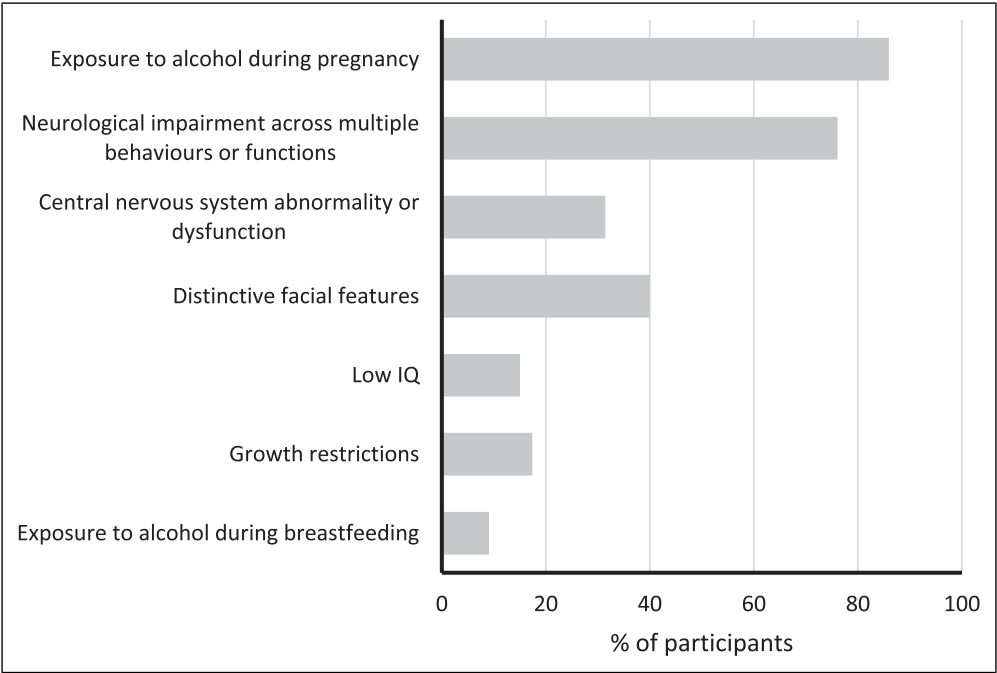


Figure 1. Percentage of participants identifying each feature as part of the FASD diagnosis.

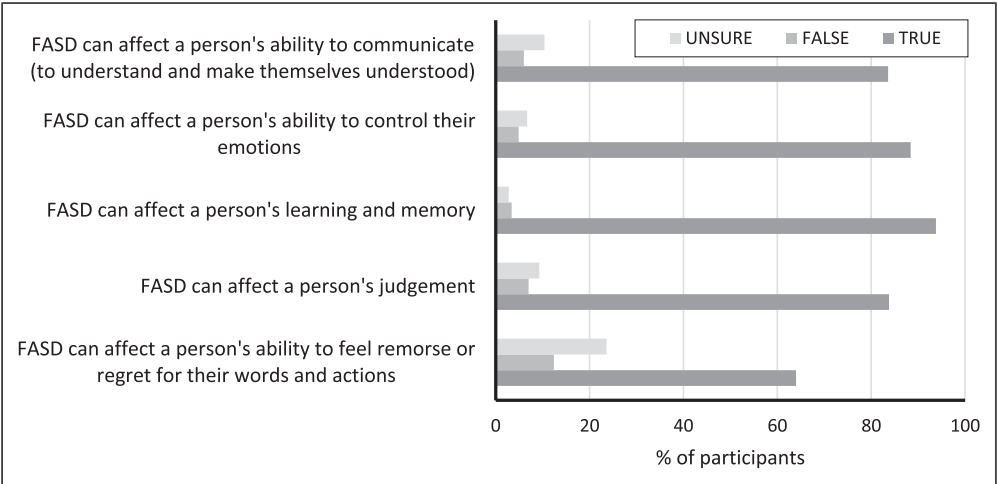


Figure 2. Percentage of participants endorsing the domain as affected by FASD.

(n=326) many educators pointed to the value of the diagnosis in informing planning and providing insight into behaviour. Educators also recognised that children with FASD would need accommodations and different approaches to support their learning. Some educators described specific strategies that they would put in place, such as changing communication strategies and putting

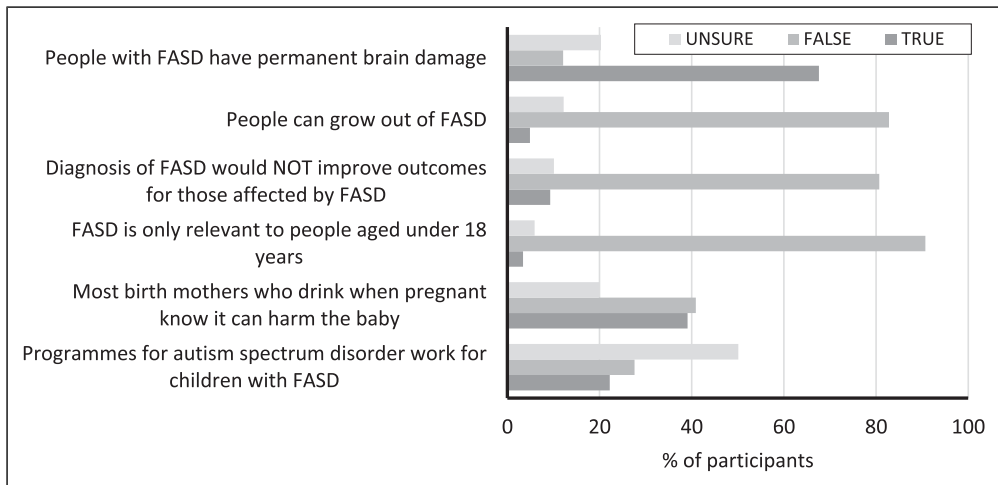


Figure 3. Percentage of participants endorsing statements around attitudes and beliefs towards FASD.

environmental supports in place, while other teachers reported that they would seek more information about FASD. Some educators noted barriers to changing practice and behaviour, such as uncertainty about where to get information and lack of support, as well as the potential to stigmatise children if they were treated different. Educators also emphasised the need for those around the child – teachers, support staff and *whānau* (extended family) and family – to be supported and educated about FASD to provide support for learners. Some educators did not think that the diagnosis would change their practices as their practices were responsive to individual needs regardless of the underlying condition.

Almost 60% of participants reported having a child diagnosed or undiagnosed but suspected of having FASD in their class or assigned to them. Fifteen percent reported that they had suspected a child of having FASD and only 26.1% reported that they had not had a child in their class with FASD. There was a significant difference in experience with FASD by role ($H(7) = 17.870, p = .013$), although no significant pairwise comparisons. More than 70% of primary school teachers reported that they had had a student or child in their care with FASD or suspected to have FASD. When asked about the support provided ($n=254$), almost a third of participants reported that no support had been provided. The types of support provided included wraparound services, training for teachers, referrals, classroom strategies and resources, in class support (i.e., Teacher Aide or Outreach Teacher), RTLB services, and support from healthcare professionals. The main source of support was the Ministry of Education, but support was also provided by the Ministry of Health, Oranga Tamariki (Ministry for Children), cross-sector agencies, and private providers. Educators noted that it was often difficult to get support for children with FASD and when support was provided it was often not timely, inadequate, and only provided for a limited time, to be withdrawn once behaviour improved.

Only 5.4% of educators felt very prepared to support or educate a student with FASD and 39.1% felt moderately prepared to do so, while 11.3% reported that they felt not at all prepared to support or educate a student with FASD. There was a significant difference in preparedness by role ($H(7) = 18.357, p = 0.010$), and significant pairwise comparison between Secondary School Teachers and RTLB ($z = -55.967, p = 0.035$). Half of Secondary School Teacher reported that they felt somewhat or not at all prepared to support or educate a student with FASD, while 51.9% of RTLB reported that they felt moderately prepared to support or educate a student with FASD.

Education and Training Related to FASD

Only 45% of education professionals reported that they had training related to FASD or any other neurodevelopmental disorder in the last five years. When asked to describe their training received ($n=129$), 45 participants specifically referred to training for FASD, while 47 participants referred to training related to autism spectrum disorder. The types of training described included workshops, professional development, online courses and resources, and a small number that reported FASD or Neurodevelopmental disorders (NDD) was part of their tertiary education. The source of training included the Ministry of Education, professional organisations, caregiver-led advocacy organisations such as FASD-CAN and Autism NZ, and social services providers. There was a significant difference in training by role ($\chi^2=43.424$, $p<0.001$), with significant pairwise comparisons between RTLB and Clinicians compared to Secondary and Primary School Teachers, Early Childhood Educators, and Other. A greater proportion of Clinicians (73.5%) and RTLBs (73.1%) had received training compared to Secondary School Teachers (27.0%), Primary School Teachers (42.0%), Early Childhood Educators (39.5%) and Other Education Professionals (19.4%).

We also asked educators whether they were aware of the FASD resources and online training provided by Te Pou – a Ministry of Health funded workforce development provider. More than three-quarters reported that they were not aware of the resources, and only 11.3% reported that they had engaged with the Te Pou resources or online training.

When asked what information would help prepare educators to work with students with FASD the main areas identified were information about FASD (such as the impact of FASD and common challenges associated with FASD), information about how to support people with FASD (such as strategies for addressing behaviour, how to teach specific skills, resources that can be developed), and support for staff (such as in-class support, FASD resource teacher, and specialist or professional support in developing resources and education plans). Several educators noted that this information should be included in their training – both in vocational training and professional development. Information about what resources or services are available was also identified. Educators also reported that it would be useful to have information about the specific student's needs and strengths, what had worked for them in the past, and input from whānau and other service providers involved in the student's care.

When asked to select which of the resources listed would be helpful to their work in the education sector, the most endorsed resources were training workshops about FASD (63.5%), FASD-informed interventions and strategies (63.5%), online resources (57.8%), and referral resources/specialist register (50.4%). Some participants also identified the need for Kaupapa Māori resources.

Educators were asked about the likely challenges for working with an individual with FASD ($n=289$). Educators recognised that students with FASD likely required additional support, but that there were constraints on their ability to provide support. In particularly, large class sizes and the competing needs of students, lack of time or funding to provide 1-on-1 support, insufficient training or information, and difficulty in obtaining a diagnosis or information about diagnosis to inform what support is needed. Another challenge was attitudes towards FASD, for example, discrimination from students, misperceptions of FASD students and their behaviours, unrealistic expectations, and reluctance to accept FASD diagnosis. Stigma and negative attitudes towards FASD were also identified as potential barriers to students receiving an FASD diagnosis or being referred for diagnosis. Communicating with caregivers and whānau was also noted as a challenge, that is, engaging with whānau and getting buy-in, having consistency between school and home, and addressing FASD with whānau.

Discussion

New Zealand educators have some knowledge of FASD and its effects on learning but there are gaps that need to be addressed to ensure they can provide appropriate support for individuals with FASD. Most educators were not aware of how prevalent FASD is likely to be in New Zealand, and participants consistently identified the need for information and strategies highly amongst their information needs for supporting students with FASD. Similarly, most educators were unsure of whether autism spectrum disorder programmes could be useful for students with FASD.

Knowledge and experience with FASD varied by professional groups, with RTLB and clinicians showing higher levels of knowledge and experience with FASD compared to teachers and teacher aides at all levels. RTLB and clinicians were more likely to report that they received training related to FASD or neurodevelopmental disabilities compared to primary and secondary teachers and early childhood educators. The low levels of training reported by teachers is reflected in how prepared teachers, especially secondary school teachers, felt to educate and support students with FASD when compared to RTLBs and clinicians. Overall, less than half of our participants had received training related to FASD or neurodevelopmental disabilities, and very few participants had engaged with the resources developed by Te Pou as part of the FASD Action Plan (FASD Working Group, 2016).

Overall, participants were ambivalent as to whether most birth mothers who drink when pregnant know it can harm the baby, suggesting there is stigma towards these women. Previous studies have found that biological mothers of children with FASD are regarded with greater disdain than women with serious mental illness, substance-use disorder or jail experience (Corrigan et al., 2017). Participants in our study recognised that awareness of such stigma could make families reluctant to accept or pursue a diagnosis of FASD, thus posing a major barrier to providing individuals with FASD with effective and evidence-based support.

Compared to previous surveys conducted with education professionals, the self-reported knowledge and preparedness were higher in our sample. For example, in an Australian survey 84% of ECE described knowledge as a little, while only 60% of our sample described themselves as having a basic understanding or awareness (Frances, 2013). This was also reflected in more reported experience of FASD compared to other surveys. Unlike previous surveys where most participants reported that they felt very or unprepared, (Boettcher, 1995; Caley, 2006; Mack, 1995; O'Connor, 2003) more respondents in our survey reported than they felt prepared than unprepared. This may reflect differences in how participants were recruited, as well as differences in the professional groups surveyed – specifically the recruitment of participants in special education and clinical roles. As noted above, there were significant differences in the level of preparedness across professional groups.

In comparison to Wouldes (2009), fewer educators were able to identify the characteristics of FASD compared to health professionals, which is unsurprising given the different educational background of the two groups. As with previous surveys, while knowledge of the specific characteristics of FASD was poor, knowledge of the effects of FASD as they related to the field of education (e.g., deficits related to education) was more accurate (McCormack et al., In Preparation). Educators were generally accurate in identifying challenges associated with FASD such as learning and memory, communication, and emotional regulation, although they also identified challenges that were not considered part of the primary domains affected by FASD.

The literature investigating FASD knowledge has developed several recommendations including pre- and post-service FASD education, dissemination of FASD information and FASD literature to teachers, student screening for prenatal exposure to alcohol and drugs, online training modules, information to aid students with FASD in forming relationships (Turner, 2006). There is a need to create an inclusive learning environment (Pei et al., 2015; Turner, 2006) and to provide information

about the individualisation of learning programs for FASD students, techniques, and alternative resources to aid teaching. Education should focus on functional skills – activities which meet the needs of individuals with FASD and prepare them to live with as little outside support as possible (Turner, 2006).

Strengths and Limitations

Our study is the first to explore the current perceived knowledge, attitudes, and practices of key professionals in the education workforce in New Zealand. It is also one of the few studies that have identified gaps in knowledge and training in educators internationally and is the largest survey of FASD knowledge, attitudes, and practices in education professionals. The response rate was high overall despite very low response rate for some groups, such as social workers who may not identify themselves as working in the education sector. Although we did not set out to test construct validity formally, the close alignment of open and closed responses suggest good face validity.

In developing our survey, we drew on previous literature from justice and health settings (Payne et al., 2005; Wouldes, 2009; Cox et al., 2008; Mutch et al., 2013). By drawing on this wider literature our survey findings can be compared directly to professional groups outside of the education sector. For example, our study found higher rates of awareness of FASD compared justice professionals (Cox et al., 2008), and fewer of our participants reported media as source of information about FASD (Cox et al., 2008; Douglas, Hammill, Hall, & Russell, 2013; Mutch et al., 2013).

There are several limitations to our study. Firstly, we used an online survey, which relied on participants self-selection to take part. Our sample is therefore more likely to have had a previous awareness of FASD, particularly as the survey was shared through advocacy networks related to FASD. As such the survey may overestimate the knowledge and awareness of FASD in New Zealand educators. Secondly, although we included some open-ended response questions, the survey was limited in the extent to which we could explore educators' in-depth experience with FASD. Further qualitative research is warranted to better understanding the challenges and experiences of educators working with individuals with FASD.

Finally, the survey was unvalidated and was not tested for reliability. Some of the questions may have been worded ambiguously, specifically questions related to effect of FASD on judgment and ability to feel remorse. Although a person's judgment and ability to feel remorse are not characteristics of FASD, the combination of domains affected by FASD in an individual might be perceived as poor judgment or lack of remorse, where these might instead represent difficulties in social communication and executive function. A large majority of participants endorsed that FASD can affect a person's judgement, which was an incorrect response under a strict interpretation of the domains affected by FASD.

Policy Implications

Most New Zealand educators recognised that FASD is relevant to their work, however, very few had received training to be able to support individuals with FASD. Our findings suggest that more resources are needed to support educators so that they can meet the needs of students with FASD in their care. This includes education resources to help teachers understand FASD and the common challenges associated with FASD, as well as in-class support and specialist support so they can accommodate the needs of children with FASD. Additional surveillance of educator's knowledge and attitudes should be conducted in order to evaluate the impact of resources and ensure that they are targeted to address the needs of educators over time.

Lack of diagnosis or misdiagnosis of FASD is a major barrier to educators providing support to students with FASD. Without diagnosis students are unlikely to receiving additional support (i.e., teacher aide or learning support) and educators lack the detailed information needed to plan and design learning programmes that are informed by their diagnosis and meet the student's needs. FASD is not recognised by government as a disability in New Zealand and there is limited capacity to diagnose FASD (Gibbs and Sherwood, 2017), therefore, many students with FASD are likely to be misdiagnosed or undiagnosed and therefore not receiving FASD-informed support.

Conclusion

New Zealand educators need to be provided with resources and training that address gaps in knowledge and awareness so that students with FASD can be supported and be successful in education.

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References

- Alati R., Al Mamun A., Williams G. M., O'Callaghan M., Najman J. M. and Bor W. (2006). In Utero Alcohol Exposure and Prediction of Alcohol Disorders in Early Adulthood: A Birth Cohort Study. *Archives of General Psychiatry*, 63(9), 1009-1016. [10.1001/archpsyc.63.9.1009](https://doi.org/10.1001/archpsyc.63.9.1009)
- Binns W. R. (2000). *Fetal alcohol syndrome/fetal alcohol effects: A survey of Alaskan educators*. (Doctor of Philosophy Ph.D.), The University of Utah, Ann Arbor. Retrieved from <https://www.proquest.com/dissertations-theses/fetal-alcohol-syndrome-effects-survey-alaskan/docview/304630576ProQuest-Dissertations-&Theses-Global-database/9977467>
- Braun V. and Clarke V. (2022). Conceptual and design thinking for thematic analysis. *Qualitative Psychology*, 9(1), 3-26 <https://doi.org/10.1037/qup0000196>
- Boettcher L. M. (1995). *Alcohol-related birth defects (ARBD): Perspectives of early childhood educators in South Dakota*. (Doctor of Philosophy Ed.D.), University of South Dakota, Ann Arbor. Retrieved from www.proquest.com/dissertations-theses/alcohol-related-birth-defects-arbd-perspectives/docview/304250014/se-2?accountid=8424ProQuest-Dissertations-&Theses-Global-database/9542564
- Caley L. M. (2006). Identifying school nurses' knowledge of fetal alcohol syndrome. *Journal of FAS International*, 4(8), 1-6.
- Campbell Y. (2019). *Meeting the Educational Needs of Children with Fetal Alcohol Spectrum Disorders (FASDs)*. (Doctor in Education Ed.D.), The University of Manchester (United Kingdom), Ann Arbor.

- Retrieved from <https://www.proquest.com/dissertations-theses/meeting-educational-needs-children-with-fetal/docview/2493527087> (28301586)
- Chamberlain K., Reid N., Warner J., Shelton D. and Dawe S. (2017). A qualitative evaluation of caregivers' experiences, understanding and outcomes following diagnosis of FASD. *Res Dev Disabil*, 63, 99-106. <https://doi.org/10.1016/j.ridd.2016.06.007>
- Corrigan P. W., Lara J. L., Shah B. B., Mitchell K. T., Simmes D. and Jones K. L. (2017). The Public Stigma of Birth Mothers of Children with Fetal Alcohol Spectrum Disorders. *Alcoholism: Clinical and Experimental Research*, 41(6), 1166-1173. [10.1111/acer.13381](https://doi.org/10.1111/acer.13381)
- Cox L. V., Clairmont D. and Cox S. (2008). Knowledge and attitudes of criminal justice professionals in relation to Fetal Alcohol Spectrum Disorder. *Journal of Population Therapeutics and Clinical Pharmacology*, 15(2), e306-313.
- Douglas H., Hammill J., Hall W. and Russell E. (2013). *Fetal alcohol spectrum disorders (FASD) within the criminal justice sector in Queensland*. Deakin ACT: Foundation for Alcohol Research & Education. Retrieved from <https://fare.org.au/wp-content/uploads/12-feb-version-3-Douglas-et-al-FINAL-REPORT.pdf>
- Education Counts. (2021). *Teacher Numbers*. Retrieved 29 November, 2021, from <https://www.educationcounts.govt.nz/statistics/teacher-numbers>
- FASD Working Group. (2016). *Taking Action on Fetal Alcohol Spectrum Disorder: 2016-2019: An action plan*. Wellington: Ministry of Health. Retrieved from <https://www.health.govt.nz/publication/taking-action-fetal-alcohol-spectrum-disorder-2016-2019-action-plan>
- Frances K. (2013). Fetal Alcohol Spectrum Disorders: Knowledge and referral pathways in early childhood settings in Western Australia. In OBE B. C., Blackburn C. and Egerton J. (Eds.), *Fetal alcohol spectrum disorders: interdisciplinary perspectives*, Routledge.
- Gibbs A. and Sherwood K. (2017). Putting Fetal Alcohol Spectrum Disorder (FASD) on the Map in New Zealand: A Review of Health, Social, Political, Justice and Cultural Developments. *Psychiatry, Psychology and Law*, 24(6), 825-842. [10.1080/13218719.2017.1315784](https://doi.org/10.1080/13218719.2017.1315784)
- Harding K., Flannigan K. and McFarlane A. A. (2019). *Policy Action Paper: Towards a Standard Definition of Fetal Alcohol Spectrum Disorder in Canada*. Canada: Canada Fetal Alcohol Spectrum Disorder Research Network.
- IBM Corp. (2017). *IBM SPSS Statistics for Windows, Version 25.0*. Armonk, NY: IBM Corp.
- Johnson M. E., Robinson R. V., Corey S., Dewane S. L., Brems C. and Diane Casto L. (2010). Knowledge, attitudes, and behaviors of health, education, and service professionals as related to fetal alcohol spectrum disorders. *International Journal of Public Health*, 55(6), 627-635. [10.1007/s00038-010-0186-8](https://doi.org/10.1007/s00038-010-0186-8)
- Lange S., Probst C., Gmel G., Rehm J., Burd L. and Popova S. (2017). Global Prevalence of Fetal Alcohol Spectrum Disorder Among Children and Youth: A Systematic Review and Meta-analysis. *JAMA Pediatrics*, 171(10), 948-956. [10.1001/jamapediatrics.2017.1919](https://doi.org/10.1001/jamapediatrics.2017.1919)
- Mack F. (1995). *Preschool Teacher Attitude and Knowledge Regarding Fetal Alcohol Syndrome and Fetal Alcohol Effects*. Washington, DC: National Association of Early Childhood Teacher Educators.
- McCormack J. C., Chu J. T., Marsh S. and Bullen C. (In Preparation). Knowledge, attitudes, and practices of fetal alcohol spectrum disorder in health, justice, and education professionals: a systematic review. Manuscript in Preparation
- Ministry of Health. (2018, 10.9.2018). *Fetal alcohol spectrum disorder*. Retrieved 2.7.2019, 2019, from <https://www.health.govt.nz/our-work/diseases-and-conditions/fetal-alcohol-spectrum-disorder>
- Mutch R., Watkins R., Jones H. and Bower C. (2013). *Fetal alcohol spectrum disorder: Knowledge, attitudes and practices within the Western Australian justice system: Final report*. Western Australia: Foundation for Alcohol Research Education; Telethon Institute for Child Health Research. Retrieved from <https://alcoholpregnancy.telethonkids.org.au/SysSiteAssets/media-docs—alcohol-preg-fasd/projects/final-report-fasd-justice-system.pdf>

- O'Connor K. D. (2003). *Fetal Alcohol Syndrome awareness among educators*. (Masters of Education M.Ed.), University of Manitoba (Canada), Ann Arbor. Retrieved from [https://www.proquest.com/dissertations-theses/fetal-alcohol-syndrome-awareness-among-educators/docview/305291188/ProQuest Dissertations & Theses Global database](https://www.proquest.com/dissertations-theses/fetal-alcohol-syndrome-awareness-among-educators/docview/305291188/ProQuest%20Dissertations%20&%20Theses%20Global%20database) (MQ89340)
- Payne J. M., Elliot E., D'Antoine H., O'Leary C., & et al. (2005). Health professionals' knowledge, practice and opinions about fetal alcohol syndrome and alcohol consumption in pregnancy. *Australian and New Zealand Journal of Public Health*, 29(6), 558-564. [10.1111/j.1467-842X.2005.tb00251.x](https://doi.org/10.1111/j.1467-842X.2005.tb00251.x)
- Pei J., Job J., Poth C., O'Brien-Langer A. and Tang W. (2015). Enhancing Learning Environments for Students Affected by Fetal Alcohol Spectrum Disorders: An Exploratory Study of Canadian Pre-Service Teacher Knowledge and Conceptions. *Journal of Education Training Studies*, 3(5), 134-143.
- Petrenko C. L. M., Tahir N., Mahoney E. C. and Chin N. P. (2014). Prevention of secondary conditions in fetal alcohol spectrum disorders: identification of systems-level barriers. *Maternal Child Health Journal*, 18(6), 1496-1505. [10.1007/s10995-013-1390-y](https://doi.org/10.1007/s10995-013-1390-y)
- QSR International Pty Ltd. (2020). *NVivo (released in March 2020)*. QSR International Pty Ltd. Retrieved from <https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home>
- Rangmar J., Hjern A., Vinnerljung B., Strömland K., Aronson M. and Fahlke C. (2015) Psychosocial Outcomes of Fetal Alcohol Syndrome in Adulthood. *Pediatrics*, 135 (1), e52-e58. [10.1542/peds.2014-1915](https://doi.org/10.1542/peds.2014-1915)
- Rimer B. K. and Glanz K. (2005). *Theory at a glance: A guide for health promotion practice*. Bethesda, MD: US Department of Health and Human Services, National Institutes of Health, National Cancer Institute.
- Ruiz M. (2004). *A study of fetal alcohol syndrome and fetal alcohol effects among American Indians: A school-based approach*. (Masters of Social Work M.S.W.), California State University, Long Beach, Ann Arbor. Retrieved from [https://www.proquest.com/dissertations-theses/study-fetal-alcohol-syndrome-effects-among/docview/305036630/ProQuest Dissertations & Theses Global database](https://www.proquest.com/dissertations-theses/study-fetal-alcohol-syndrome-effects-among/docview/305036630/ProQuest%20Dissertations%20&%20Theses%20Global%20database) (1421036)
- Sherwood K. N. (2020). *Fallen by the wayside: Young people with fetal alcohol spectrum disorder (FASD) in New Zealand's youth justice system*. University of Otago, Dunedin. Retrieved from <http://hdl.handle.net/10523/9948>
- Streissguth A., Barr H., Kogan J. and Bookstein F. (1996). *Understanding the occurrence of secondary disabilities in clients with fetal alcohol syndrome and fetal alcohol effects*. Washington, DC: Centers for Disease Control.
- Streissguth A., Barr H., Kogan J. and Bookstein F. (1997). Primary and Secondary Disabilities in Fetal Alcohol Syndrome. In Streissguth A. and Kanter J. (Eds.), *The Challenge of Fetal Alcohol Syndrome: Overcoming Secondary Disabilities*. Washington: University of Washington Press.
- Streissguth A., Bookstein F., Barr H., Sampson P., O'Malley K. and Young J. (2004). Risk Factors for Adverse Life Outcomes in Fetal Alcohol Syndrome and Fetal Alcohol Effects. *Journal of Developmental & Behavioral Pediatrics*, 25(4), 228-238.
- Terry G., Hayfield N., Clarke V. and Braun V. (2017). Thematic Analysis. In Willig C. and Rogers W. S. (Eds.), *The SAGE Handbook of Qualitative Research in Psychology* (pp. 17-36). SAGE Publication Ltd. [https://dx.doi.org/10.4135/9781526405555](https://doi.org/10.4135/9781526405555)
- Turner K. W. (2006). Fetal alcohol syndrome: perspectives of a group of educators in northwest Florida. *Californian Journal of Health Promotion*, 4(2), 81-112.
- Valdebenito S., Eisner M., Farrington D. P., Ttofi M. M. and Sutherland A. (2019). What can we do to reduce disciplinary school exclusion? A systematic review and meta-analysis. *Journal of Experimental Criminology*, 15(3), 253-287. [10.1007/s11292-018-09351-0](https://doi.org/10.1007/s11292-018-09351-0)
- Wouldes T. (2009). *What health professionals know and do about alcohol and other drug use during pregnancy*. Auckland: Alcohol Healthwatch. Retrieved from <https://www.ahw.org.nz/Portals/5/Resources/Documents-other/Wh%20hl>