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**Perspectives of Canadian Health Care Providers on Fetal Alcohol Spectrum Disorder: A brief report exploring 15 years**

**Running Title:** HCP Perspectives on Alcohol use in Pregnancy & FASD

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**ABSTRACT**

Initiatives have been implemented to provide training to health care providers (HCPs) on the adverse health outcomes associated with alcohol use during pregnancy, including the risk of fetal alcohol spectrum disorder (FASD). The purpose of this exploratory study was to compare two cross-sectional data sets of HCP perspectives over 15 years. In 2002 and 2017, two samples of HCPs received a survey on FASD. The findings from these surveys may inform the development of ongoing educational initiatives to help HCPs with screening for alcohol use during pregnancy and early diagnosis and prevention of FASD.

**RÉSUMÉ**

Des projets ont ®t® mis en î uvre pour offrir une formation aux fournisseurs de soins de sant® (FSS) au sujet des r®sultats cliniques ind®sirables li®s ¨ la consommation dôalcool pendant la grossesse, notamment le risque de trouble du spectre de lôalcoolisation f î tale (TSAF). Lôobjectif de cette étude exploratoire était de comparer deux ensembles de données transversales sur les

points de vue des FSS sur une période de 15 ans. En 2002 et 2017, deux échantillons de FSS ont participé à un sondage sur le TSAF. Les résultats du sondage peuvent servir à orienter lô®laboration de projets de formation continue pour aider les FSS à effectuer le dépistage de la consommation dôalcool pendant la grossesse, ¨ pr®venir le TSAF et ¨ poser un diagnostic précoce, le cas échéant.

**Introduction**

Alcohol is a teratogen and consumption during pregnancy can lead to a vast array of complex neurodevelopmental abnormalities including, Fetal Alcohol Spectrum Disorder (FASD).[1] Alcohol consumed at any time throughout gestation may increase the risk of developing FASD.[1] The national prevalence of FASD in Canada is estimated at approximately 1.1-5.3 per 1000 children.[2] It should be noted, however, that this is likely an underestimate as the majority of studies that measure FASD prevalence acknowledge the high risk for misdiagnosis.[3] These data suggest an urgent need to improve screening and surveillance of alcohol-use during pregnancy to support women, and increase early diagnosis and prevention of FASD.

In Canada, it is recommended that all prenatal health care providers (HCPs) screen for alcohol use during pregnancy, and offer appropriate prescriptions and referrals for cessation support.[3] Despite this mandatory requirement, alcohol-use during pregnancy, and consequently FASD, has been an ongoing health concern with an increasing trajectory.[2, 4, 5] The Public Health Agency of Canada conducted a large inter-disciplinary survey between March 2001 and October 2002 to better understand the perspectives of maternal HCPs about alcohol use in pregnancy and FASD.[6] Since 2002, Canadian clinical practice guidelines for alcohol and pregnancy have been updated, and with further research advancements on both prenatal alcohol use and FASD, it was time to reassess the practices of HCPs on FASD screening and diagnosis. Thus, the objective of this exploratory project was to describe the perspectives of HCPs related to FASD and alcohol

use during pregnancy, and to identify where gaps in knowledge or practice still exist or have emerged over 15 years.

**Methods**

This is an exploratory study, comparing two cross-sectional examinations. The original 2002 survey was sent by mail with a cover letter to a random sample of 5,361 HCPs that were selected from membership lists obtained from the Canadian Paediatric Society, Canadian Psychiatric Association, Canadian Association of Midwives (CAM), the College of Family Physicians of Canada (CFPC) and the Society of Obstetricians and Gynaecologists of Canada (SOGC). Clinicians received follow up phone calls, including the opportunity to complete the survey by telephone or electronically. The 2002 study was approved by the Conjoint Health Research Ethics Board. The 2017 online survey used convenience sampling and was disseminated to Canadian HCPs through 4 professional association membership lists with a cover letter: the SOGC, CFPC, CAM, and the Canadian Association of Perinatal and Womenôs Health Nurses. In 2017 we did not follow up with participants and fewer recruitment organizations were contacted (therefore exact number of participants invited is unavailable), and this impacted the sample size. Regardless of this difference in recruitment, similar sectors of HCPs completed the surveys and are represented at both time points. The 2017 survey received ethics approval from the Ottawa Health Science Network Research Ethics Board (REB #20170407-01H). After reviewing the study information, participants provided implied consent by completing the online survey.

The surveys were divided into 4 parts with questions to evaluate: General Knowledge; Prevention Issues; Diagnostic Issues; and Background Information. For the purpose of the current study, only the questions that were asked in both surveys about FASD were evaluated

and compared. The selected items are reported in Figure 1. Chi-square analysis was used to identify differences in responses from the 2002 and 2017 surveys for all HCPs for questions pertaining to FASD perspectives. Responses were categorized by specific professions. Fisherôs exact test was used when there were multiple expected cell counts less than 5. All $p<0.05$ were deemed statistically significant. Statistical Analysis Software (SAS) version 9.4 was used for the analyses.

**Results**

A total of 468 HCPs completed the 2017 survey and were compared to 1090 HCPs from 2002. Participants were excluded if the survey was incomplete. The 2017 convenience sample included Family Physicians (n=107); Midwives (n=195); and Obstetrician/Gynaecologists (n=166). The comparator group from the 2002 survey consisted of Family Physicians (n=740), Midwives (n=125), and Obstetricians/Gynaecologists (n=225).

The comparative analysis on perspectives surrounding FASD is presented in Figure 1. In 2002, significantly more Family Physicians and Midwives ñstrongly agreed/agreedò that FASD was an identifiable syndrome, yet more ñstrongly disagreed/disagreedò or were ñneutral/undecidedò in 2017. Obstetrician/Gynaecologists demonstrated no significant change in their responses to the statement that ñFASD is an identifiable syndromeò. When asked whether alcoholôs effect on fetal development remain unclear, more HCPs ñstrongly disagreed/disagreedò in 2002, whereas in 2017, respondents were more likely to be ñneutral/undecidedò or ñstrongly agreed/agreedò. More Obstetrician/Gynaecologists ñstrongly agreed/agreedò that alcohol effects on fetal development were unclear in 2002 compared to 2017. The data from 2002 for each HCP group indicated that the rates of FASD were significantly different among cultures and ethnic groups, whereas in 2017, the HCP groups agreed that the rates were similar. Finally, there was

agreement across the cohorts that alcohol exposure during pregnancy is a significant risk factor for permanent brain damage. Of note, due to the differing sampling methods at the two time points there is variability in the number of respondents from each health sector, however a Fisherôs exact test was completed to account for sample size differences.

**Discussion**

This brief report compared two cross-sectional examinations over 15 years and provided an exploratory overview of practising HCPsô perspectives towards FASD. In 2017, there was a significant decrease in the number of practising Family Physicians and Midwives who considered FASD an identifiable syndrome. Similarly, more Family Physicians were undecided about whether or not alcoholôs effects on brain development were known in 2017 than 2002.

The significant decrease in Family Physicians considering FASD an identifiable syndrome may speak to the age groups they see and the sign and symptoms they use to identify FASD. For example, Family Physicians likely see children across age groups and may therefore assess non-visible indicators of FASD that appear later in life, such as neurological and behavioural markers. Whereas Obstetrician/Gynaecologists see newborns and therefore rely on easily recognizable features, such as facial characteristics.[7] Recently, Andrews et al., reviewed the main features Family Physicians use to identify and screen for FASD and findings showed that facial characteristics, developmental delays, central nervous system features, and growth milestones were most often referenced.[8] Most children with FASD do not have the easily recognizable physiognomy,[9] therefore it is plausible that the Family Physicians in the recent cohort recognize that diagnosis requires further analysis of developmental markers that may appear at later stages of development.

Similarly, in 2017, there was a decrease in the percentage of Family Physicians, who reported knowing the brain effects of prenatal alcohol exposure, compared to the 2002 cohort. This suggests that as research advancements are made, and effective screening and treatment options are developed, continuing medical education opportunities need to be offered to HCP who care for children throughout their lives. A positive finding was that more HCPs agreed in 2017 that FASD is similar across ethnic and cultural groups than in 2002. Previous investigations have suggested that pre-existing biases about high-risk populations, who may be perceived more likely to use alcohol during pregnancy (e.g. women from lower income backgrounds, Indigenous populations ), resulted in reduced screening behaviours and the potential to overlook women who required cessation support.[9] As a result, the SOGC recommends that HCPs screen ***all*** pregnant women for alcohol use,[3] in order to improve equitable and culturally-sensitive delivery of prenatal care, and prevent inherent biases that can impact the quality of care women receive.[9]

Strengths of the current study include two large and diverse samples of maternal HCPs. Limitations include the lack of a validated assessment tool. Additionally, differences in sampling methods across the two time points and the organizations contacted for recruitment may increase the risk for reporting bias, therefore it should be acknowledged that the findings cannot offer causal inferences to time. Despite these limitations, the findings of this brief report may be used to inform future targeted educational initiatives for HCPs to improve early recognition of prenatal alcohol exposure and improve delivery of antenatal care, as well as an increased awareness and understanding of FASD.

**Conclusion:**

Although there have been FASD research investments over the past 15 years, it is important to ensure that ongoing education and training opportunities are made available to assist HCPs in addressing alcohol use in pregnancy and preventing FASD.

ADDITIONAL MANDATORY INFORMATION

Brief disclosure statement reporting relationships and activities or absence of same, to be published in the article:

None to disclose

Statement of acknowledgements, if applicable, to be published in the article (enter NA in field below if not applicable). This is where you would, for example, thank any individuals who made substantive contributions but who are not listed as authors or provide details of funding information:

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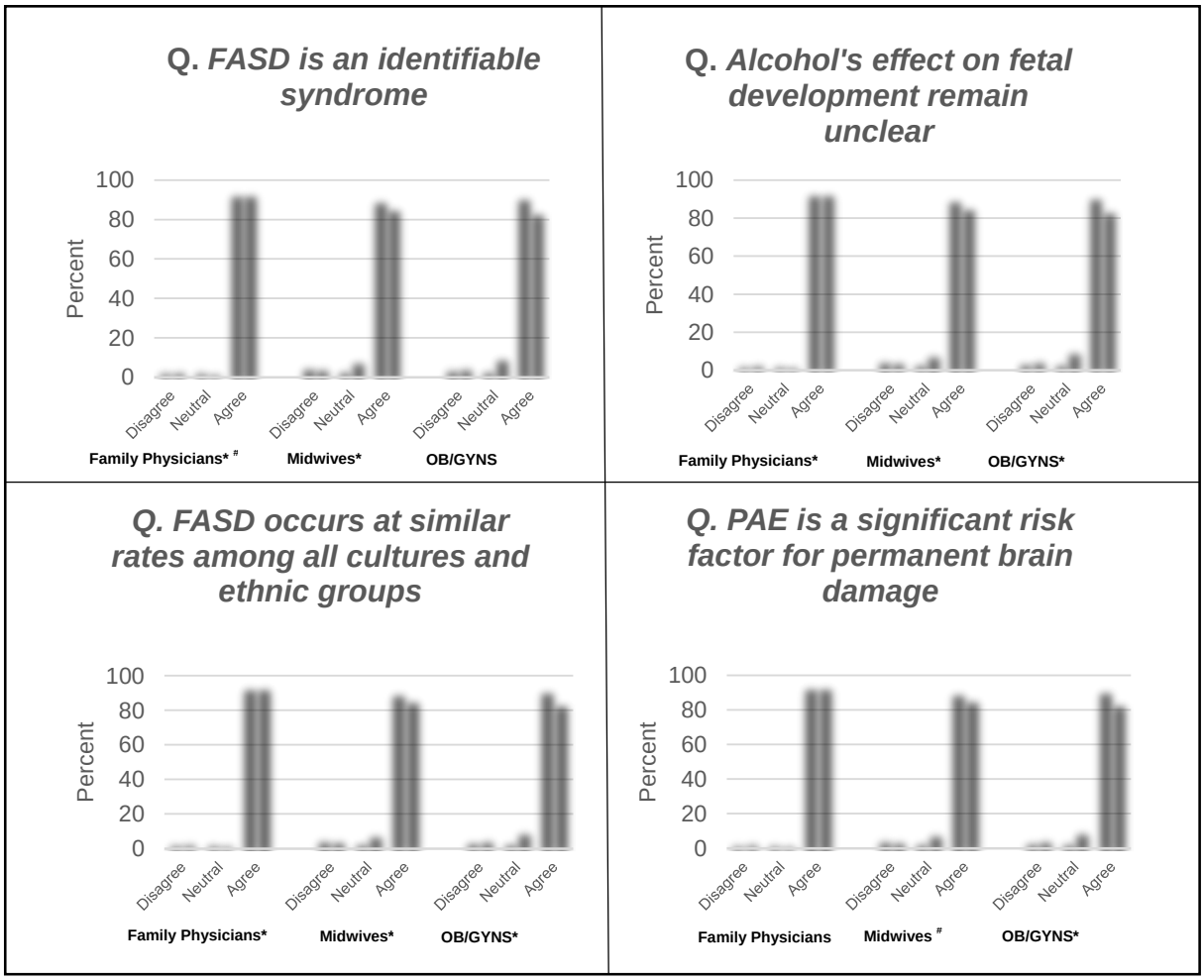
**Figure 1. Comparison of 2002 and 2017 surveys on fetal alcohol spectrum disorders queries.**




Dark grey shading refers to 2002; Light grey shading refers to 2017.
$-^2$ analysis: $*p < 0.05$ #Fisher exact test performed.
Strongly Disagree and Disagree were combined and represented as Disagree; Strongly Agree and Agree were combined and represented as Agree.