

Fetal alcohol syndrome: knowledge and attitudes of family medicine clerkship and residency directors

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Abstract

Fetal alcohol spectrum disorders (FASD) are the leading preventable causes of developmental disabilities with serious permanent consequences. Regardless of the increased awareness of fetal alcohol syndrome (FAS), 13% of women in the United States drink alcohol during pregnancy. Health care professionals do not routinely assess the frequency and quantity of alcohol use by their patients. This study examined the knowledge, skills, and practices of family medicine residency and clerkship directors and assessed the time devoted and format of FAS curricula in the programs. A self-administered anonymous survey was sent to the residency and clerkship directors ($N = 571$). Response rate of clerkship directors was 52% and residency directors 46%. Both groups showed high level of knowledge of FASD and of alcohol counseling practices for pregnant women. Although almost two thirds of the residency programs had FASD integrated in the curriculum, an equivalent fraction of predoctoral programs did not. More than half of the clerkship directors without FASD in their curriculum agreed that a need exists for its inclusion. These findings raise important medical education and policy issues and provide insight into the disparity in FASD content of curricula between predoctoral and family medicine residency programs in the United States. The role of physician counseling in primary prevention of FAS should continue to be stressed in predoctoral and residency education. © 2010 Elsevier Inc. All rights reserved.

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Introduction

Fetal alcohol exposure is established to be the cause of fetal alcohol syndrome (FAS), identified by the constellation of central nervous system dysfunction, facial dysmorphism, and growth deficiency (Jones and Smith, 1973). FAS is the most severe form of a spectrum of effects associated with maternal alcohol, termed fetal alcohol spectrum disorders (FASD). Maternal alcohol use is a leading preventable cause of birth defects and neurobehavioral and developmental abnormalities in children worldwide (Sokol et al., 2003; Wattendorf and Muenke, 2005). Approximately 13% of the U.S. women drink alcohol when they are pregnant (Sokol et al., 2003). FAS is estimated to occur in the range of 1–4.8 per 1,000 births (Sokol et al., 2003). For every child born with FAS, it is estimated that 10 more suffer from alcohol-related spectrum disorders (Sokol et al., 2003).

Because of the high prevalence of FAS, there is a need for health care professionals who are trained in FAS prevention, diagnosis, and treatment. The problem is that health care professionals do not routinely assess the frequency and quantity of alcohol use by their patients. A recent survey of pediatricians in the United States found that most of them were knowledgeable about FAS with regard to the basic science, clinical signs, symptoms, and epidemiology. However, many others were not prepared to use diagnostic guidelines, refer for consultation, or coordinate treatment for children with FAS (Gahagan et al., 2006). A similar survey of 1,000 family physicians in Missouri and five surrounding states corroborated these findings (Mengel et al., 2006). Another study found that psychologists have limited knowledge of FAS and the effects of alcohol on fetal development (Wedding et al., 2007).

To our knowledge, there is no study assessing the knowledge and attitudes of family medicine educators with regard to FASD. This study is designed to assess the knowledge, skills, and practices of family medicine residency program directors and third-year family medicine clerkship directors in the United States. In addition, it examines the format of

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the FAS curriculum in each residency and clerkship program and assesses the time devoted to teach FAS in the family medicine residencies and predoctoral clerkships curricula nationwide.

It is hoped that by this assessment we will be able to identify deficiencies in the curricula of existing family medicine clerkships and residencies with regard to FASD and correct such deficits by recommending the incorporation of high-quality evidence-based FASD educational content within such programs. The survey also aims to create a database of family physicians' FAS-related knowledge, skills, and abilities, which can subsequently be used to develop, implement, and evaluate FAS-related core competencies for family physicians.

Materials and methods

Staff of the Southeastern Fetal Alcohol Syndrome Regional Training Center at Meharry Medical College conducted this study between January and May 2008. An anonymous 17-item survey was sent electronically (e-mail) to all family medicine residency directors who were on the 2008 membership list of the American Association of Family Medicine Residency Directors and to clerkship directors of family medicine departments in the United States. A hard copy of the questionnaire with paid return postage was also mailed out to all invitees 1 week after the online survey. The hard copy surveys included a statement requesting the recipient to disregard the survey if they had already responded online. Two e-mail follow-up reminders (2 weeks apart) urging participation were addressed to recipients who had not participated yet (SurveyMonkey® feature enabled us to follow-up with nonrespondents only, thereby eliminating unnecessary follow-up with those who responded while adhering to anonymity).

A total of 571 surveys were sent out. Responses were received from 70 clerkship directors and 199 residency directors from all regions of the United States (response rate of 52 and 46%, respectively).

Questionnaire

The questionnaire was adapted from surveys developed by previous researchers to assess provider knowledge and awareness of FAS (Gahagan et al., 2006; Nanson et al., 1995). Each questionnaire consisted of varying response options depending on question content, for example, multiple-choice options, true–false items, Likert-type scales, and free-text entries. The survey was piloted to a select group of providers at the Meharry Medical College before administration to assess completion time, appropriateness of wording, and readability. To facilitate comparison of responses between groups, the content of the questionnaire for the residency and clerkship directors was essentially identical.

The first set of items on the questionnaire sought information on geographical location of the program and whether the program was rural, urban, or semi-urban. The next set of questions inquired about the curriculum content of the programs (whether FASD education is included, educational format, time devoted to teaching FASD, and the percentage of faculty involved with teaching FASD). Respondent knowledge of FASD, attitude to FASD, and clinical experience with FASD were solicited with the use of a third set of eight questions. Questions were intentionally limited to 17 questions (two pages) to encourage participation and completion. The time required to complete the entire survey was estimated to be 4 min.

Ethical considerations

The survey was directed by the principal investigator and carried out by the project coordinator and a student intern. Participation in the survey was voluntary and anonymous. The study was approved by the Institutional Review Board of Meharry Medical College.

Statistical analysis

Manual data entry was carried out by staff and automatically by electronic survey participants onto SurveyMonkey from where frequency tables were constructed. To facilitate intergroup comparisons, we divided all respondents into two groups (residency directors and clerkship directors). Continuous variables (e.g., time devoted to teaching FASD) were coded as categorical variables in the survey instrument. Comparisons between the two groups of respondents were then made in terms of responses using chi-square tests. The level of significance was set at a *P* value of less than .05.

Results

Of a total of 571 surveys distributed, 269 were returned. The response rates were 70/135 (52%) for clerkship directors and 199/436 (46%) for residency directors.

Program characteristics

Table 1 shows a breakdown of characteristics of the programs. Majority of predoctoral and residency programs that responded to the survey were located in urban areas of the Southeast and Midwest regions of the United States. Residency programs were more likely to be located in rural areas than predoctoral programs ($P < .05$). More than half of the residency programs were community-based university-affiliated programs.

FAS teaching in curriculum

Table 2 shows the extent of FASD content, time devoted to teaching FASD, instruction format, and degree of faculty involvement with FASD in the existing curriculum of

Table 1
Location, practice, and program structure characteristics

	Predoctoral programs		Family medicine residency programs	
	<i>n</i>	%	<i>n</i>	%
Location (region)				
Northwest	0	0	14	7.0
West	4	5.7	13	6.5
Southwest	5	7.1	17	8.5
Midwest	21	30.0	59	29.6
Northeast	19	27.1	45	22.6
Southeast	21	30	51	25.6
Practice*				
Rural	6	8.6	31	15.6
Urban	46	65.7	89	44.7
Suburban	14	20.0	74	37.2
Other ^a	4	5.7	5	2.5
Program structure				
University based	n/a	n/a	28	14.1
University administered	n/a	n/a	23	11.6
Community based	n/a	n/a	28	14.1
Community based, university –affiliated	n/a	n/a	117	58.8
Freestanding	n/a	n/a	3	1.5

n/a = not applicable.

* $P < .05$.

^aMostly combination of categories outlined earlier (urban–suburban, rural–suburban, etc.).

predoctoral and residency programs. Although only one third (34%) of the predoctoral directors reported FASD as being included in the teaching curriculum, in the case of residency directors a majority (61%) reported the inclusion of FASD in their curriculum ($P < .001$). Predoctoral programs were more likely than residency programs to not have any time devoted to teaching FASD (54 vs. 33%, $P < .01$). The most common teaching format for both predoctoral and residency programs were formal conference lectures (20 and 33% of programs, respectively). No predoctoral programs and very few residency programs (2%) offered online tutorials for FASD education. Majority (61%) of the predoctoral programs had <25% of faculty members teaching FASD. A similar picture was evident in the case of residency programs.

Knowledge and beliefs

A set of questions was included in the survey instrument to assess provider knowledge of FAS (Table 3). Almost all predoctoral/clerkship and residency directors correctly identified neurodevelopmental problems associated with FAS. A knowledge question in this study was how prevalent the respondents perceived FAS to be compared with Down's syndrome. An equal proportion of respondents in each group (90%) answered "false" to the question "Down's syndrome is more common than FAS," indicating good and similar level of knowledge between the two groups.

Participants were asked to indicate how much alcohol is safe for a pregnant woman to drink. An overwhelming majority of both predoctoral directors (94%) and residency directors (90%) reported that no amount of alcohol was safe. A similar reply was obtained in response to the next question item; approximately 86 and 84% of predoctoral and residency directors, respectively, answered in the affirmative to the question "do you consider complete abstinence from alcohol to be the only absolute safeguard against FAS?"

FAS diagnostic experience

Slightly more than half of the predoctoral directors and residency directors (51 and 57%, respectively) had ever made a diagnosis of FAS (Fig. 1). Specific follow-up questions were administered to predoctoral directors only. Although up to eight patients were suspected by predoctoral directors of having FAS in the 3 months period preceding the survey, only one patient was diagnosed with FAS or referred to confirm a diagnosis of FAS during the same time period. Approximately 81% of residency directors reported not suspecting FAS, diagnosing FAS, or referring to confirm a diagnosis of FAS in the 3 months preceding the survey (data not shown).

Clinical behavior and attitudes

The majority of predoctoral and residency directors reported counseling all female patients of pregnancy age about alcohol use and its consequences during pregnancy (90 and 91%, respectively). There were no significant differences in counseling practices between the two groups (Table 3).

Preferred educational format

Participants were asked what educational format they consider most beneficial in establishing or implementing an FAS curriculum at their program (Table 4). The most commonly recommended formats among predoctoral programs were case-based discussions and online tutorials (27 and 25%, respectively). Residency directors preferred case-based discussions (29%), in-class lectures (26%), and online tutorials (24%) for delivering FAS educational content. Continuing medical education conferences and role playing/videotaped sessions were ranked low in terms of perceived educational benefit by both groups of respondents.

Discussion

It is difficult to consider a disease in a differential diagnosis list if the health care provider has limited knowledge of the disease. In this study, clerkship and residency directors demonstrated an equivalent and high level of knowledge of FAS. An overwhelming majority of respondents

Table 2
FASD content, instruction format, and faculty involvement in teaching curriculum

	Predoctoral programs		Residency programs	
	<i>n</i>	%	<i>n</i>	%
FASD included in curriculum				
Yes**	24	34.3	121	60.8
No	45	64.3	78	39.2
Not included, but there is a need for it	29	41.4	66	33.2
Not included because there is no need for it ^a	16	22.9	12	6.0
Missing	1	1.4	—	—
Time devoted to teaching FASD (h)				
None*	38	54.3	65	32.7
<1	3	4.3	8	4.0
1–2	10	14.3	73	36.7
3–4	2	2.9	10	5.0
>4	5	7.1	11	5.5
Do not know/not sure	10	14.3	20	15.1
Missing	2	2.9	2	1.0
Format ^b				
Online tutorial	0	0	5	1.7
Conference lecture	17	19.8	95	32.8
CME lecture	5	5.8	18	6.2
Rotations	8	9.3	59	20.3
Case-based learning	10	11.6	40	13.8
Other	10	11.6	13	4.5
None	31	36.0	52	17.9
Missing/skipped question	5	5.8	8	2.8
Percent faculty that teach FASD (predoctoral programs/clerkships) or have FASD expertise (residency programs)				
None	18	25.7	0	0
<25	43	61.4	141	70.9
25–50	2	2.9	27	13.6
51–75	0	0	5	2.5
>75	0	0	9	4.5
Other	0	0	14	7.0
Missing	7	10.0	3	1.5

FASD = fetal alcohol spectrum disorders.

* $P < .01$. ** $P < .001$.

^aA follow-up question to this item requested further information regarding reason why the respondent selected this option. Most of the respondents who answered in the affirmative to this question felt fetal alcohol syndrome is already covered in the pediatrics curriculum.

^bMultiple responses to this question were allowed.

correctly identified neurodevelopmental features associated with FAS and recognized FAS as being more common than Down's syndrome. The importance of sufficient knowledge of FAS among health care educators cannot be overemphasized. Clerkship and residency directors determine the format and, to a large extent, the content, structure, and time allocated to teaching different topics in medical schools and residency programs. The level of knowledge of FAS among faculty in leadership positions will influence the priority with which the teaching of FAS is accorded in our predoctoral and graduate medical programs.

No level of alcohol consumption in pregnancy has been established to be safe (U.S. Department of Health and Human Services, U.S. Department of Agriculture, 2000). Approximately 86% of predoctoral directors and 84% of residency directors in this study considered complete abstinence to be the only protection against FAS. This statistic is encouraging and replicates findings by others. A Canadian

survey found that more than 90% of providers (obstetricians/gynecologists, family physicians, and midwives) recommend abstinence from alcohol during pregnancy, and family medicine physicians were more likely to do so than obstetricians or midwives (Tough et al., 2004). Similar results have been reported among other professions (Caley et al., 2008).

A U.S. *Healthy People 2010* national goal is to increase the proportion of pregnant women in the United States who abstain from alcohol from 86% in 1996–1997 to 94% by 2010 (U.S. Department of Health and Human Services, 2000). Attaining this goal will require a high level of commitment from primary care providers toward screening for alcohol use in pregnant women and women of childbearing age. Providers who recommend abstinence from alcohol during pregnancy are more likely to screen for alcohol use in pregnancy and to discuss alcohol use with all women of childbearing age (Tough et al., 2004).

Table 3
Provider knowledge of FAS

	Predoctoral programs		Residency programs	
	<i>n</i>	%	<i>n</i>	%
Which of the following problems is associated with FAS?				
Delayed development	1	1.4	1	0.5
Birth defects	0	0	0	
Lower IQ	0	0	1	0.5
Behavioral problems	0	0	0	
All the above	68	97.1	194	97.5
Missing	1	1.4	3	1.5
Down syndrome is more common than FAS				
True	6	8.6	12	6.0
False	63	90.0	179	89.9
Missing	1	1.4	8	4.0
How many drinks per week are safe for a pregnant woman?				
0	66	94.3	177	88.9
1	3	4.3	8	4.0
2	0	0	5	2.5
3	0	0	0	0
4	0	0	1	0.5
Missing	1	1.4	8	4.0
Do you consider complete abstinence from alcohol to be the only absolute safeguard against FAS?				
Yes	60	85.7	167	83.9
No	7	10.0	25	12.6
Missing	3	4.3	7	3.5

FAS = fetal alcohol syndrome.

Targeted provider education emphasizing the importance of refraining from alcohol use may therefore positively impact provider attitudes and practices.

The U.S. Preventive Services Task Force (2004) emphasizes the importance of primary care screening of child-bearing-aged women for alcohol use and highlighting the risk of alcohol use in pregnancy as essential for prevention of FAS or FASD. The finding that more than 90% of our respondents counsel all women of pregnancy age about the dangers of alcohol use during pregnancy is testimony to the value placed by family physicians in the United States regarding the importance of physician counseling as a method of primary prevention of FAS. Our results

replicate findings from a similar survey of Michigan physicians, where 94% of family physicians felt the need to emphasize the dangers of drinking during pregnancy and majority believed that doing so can reduce the incidence of FAS (Abel and Kruger, 1998).

In this survey, we also assessed curriculum content, format of educational activities, and faculty involvement as it pertains to FASD. Although almost two thirds of the residency programs had FASD integrated into their curriculum, an equivalent fraction of predoctoral programs did not. This finding suggests that a major gap exists in our teaching of FASD between predoctoral and graduate levels of medical education. One explanation for the absence of FASD in the curriculum of a majority of predoctoral programs is that in many medical schools the family medicine clerkship is the shortest rotation and fetal alcohol teaching is often included in the pediatric and obstetric clerkships. It is noteworthy that more than half of the clerkship directors of predoctoral programs without FASD in their curriculum agreed that a need exists for inclusion of FASD in their curriculum.

The most common educational formats advocated by predoctoral and residency directors were case-based discussions and online tutorials. Davis et al. (2008) found that physicians who had practiced for >5 years were more likely to show interest in acquiring FAS education via online courses compared with their counterparts who had been in practice for >20 years. Unfortunately, we did not collect information on length of practice so we are unable to

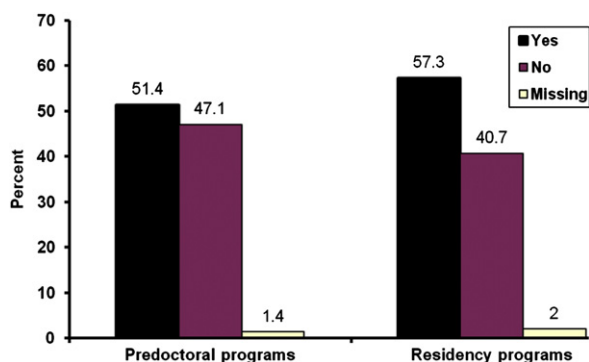


Fig. 1. Response to the question "Have you ever made a diagnosis of FAS?" (*n* = 70 for predoctoral programs and *n* = 199 for residency programs). FAS = fetal alcohol syndrome.

Table 4
Provider practice/behavior and educational format preferences

	Predoctoral programs		Residency programs	
	n	%	n	%
Do you counsel all female patients of pregnancy age about alcohol use and consequences of alcohol use during pregnancy?				
Yes	63	90.0	181	91.0
No	6	8.6	13	6.5
Missing	1	1.4	5	2.5
What would be most beneficial in establishing or implementing an FAS curriculum at your program? ^a				
In-class lectures	20	16.7	100	25.9
CME conferences/lectures	12	10.0	32	8.3
Online tutorials	30	25.0	92	23.8
Case-based discussions	32	26.7	110	28.5
Role play/videotaped encounter of health care provider	12	10.0	39	10.1
Other	5	4.2	4	1.0
Missing	9	7.5	9	2.3

FAS = fetal alcohol syndrome.

^aMultiple responses to this question were allowed.

determine whether this finding is true of our study population. Nevertheless, free online courses are a convenient method of disseminating FAS educational materials to health care providers. Additional studies are needed to document the effectiveness of the different educational formats (including online courses) and to provide the evidence basis for designing comprehensive quality FAS educational programs for frontline health care providers.

This study has at least two limitations. First, although the response rate for our survey compares favorably with reported rates from similar mail surveys of physicians (Abel and Kruger, 1998; Gahagan et al., 2006; Morse et al., 1992; Tough et al., 2004), our findings may not be generalizable to all family medicine physician educators, especially if nonresponders systematically differ from responders. However, Tough et al. (2004) suggest that surveys of physicians with similar response rates may actually be less prone to nonresponse bias than surveys of the general population. Second, the data we present are based on self-report, which is liable to recall bias and social desirability bias. In contrast, the direction of these biases (if present) may be in opposite directions, thereby resulting in a net cancellation of effects.

In conclusion, although family medicine educators appear to have good knowledge of FASD and consistently counsel pregnant women against alcohol use, the findings in this report raise important medical education policy issues. This study suggests that in spite of the high knowledge and recognition, diagnosis of FASD remains very low. There is disparity in FASD content of curricula in predoctoral family medicine clerkship and residency programs. Innovative educational approaches, for example, online tutorials, can be used to bridge this gap. The role of physician counseling in primary prevention of FAS should continue to be stressed in predoctoral and graduate medical education curricula so that future generations of providers (medical students and residents) will incorporate these values in their practice.

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References

- Abel, E. L., and Kruger, M. (1998). What do physicians know and say about fetal alcohol syndrome: a survey of obstetricians, pediatricians, and family medicine physicians. *Alcohol. Clin. Exp. Res.* 22, 1951–1954.
- Caley, L., Syms, C., Robinson, L., Henry, M., and Shipkey, N. (2008). What human service professionals know and want to know about fetal alcohol syndrome. *Can. J. Clin. Pharmacol.* 15, 117–123.
- Davis, P. M., Carr, T. L., and La, C. B. (2008). Needs assessment and current practice of alcohol risk assessment of pregnant women and women of childbearing age by primary health care professionals. *Can. J. Clin. Pharmacol.* 15, e214–e222.
- Gahagan, S., Sharpe, T., Brimacombe, M., Fry-Johnson, Y., Levine, R., Mengel, M., et al. (2006). Pediatricians' knowledge, training, and experience in the care of children with fetal alcohol syndrome. *Pediatrics* 118, e657–e668.
- Jones, K. L., and Smith, D. W. (1973). Recognition of the fetal alcohol syndrome in early infancy. *Lancet* 2, 999–1001.
- Mengel, M., Ulione, M., Cook, K., Wedding, D., Rudeen, K., Braddock, S., et al. (2006). Midwest family physicians' knowledge and attitudes about FAS, FASD, and alcohol use during pregnancy. *J. FAS Int.* 4, e7.
- Morse, B. A., Idelson, R. K., Sachs, W. H., Weiner, L., and Kaplan, L. C. (1992). Pediatrician's perspectives on fetal alcohol syndrome. *J. Subst. Abuse* 4, 187–195.
- Nanson, J. L., Bolaria, R., Snyder, R. E., Morse, B. A., and Weiner, L. (1995). Physician awareness of fetal alcohol syndrome: a survey of pediatricians and general practitioners. *CMAJ* 152, 1071–1076.
- Sokol, R. J., Delaney-Black, V., and Nordstrom, B. (2003). Fetal alcohol spectrum disorder. *JAMA* 290, 2996–2999.

- Tough, S. C., Clarke, M., Hicks, M., and Clarren, S. (2004). Clinical practice characteristics and preconception counseling strategies of health care providers who recommend alcohol abstinence during pregnancy. *Alcohol. Clin. Exp. Res.* 28, 1724–1731.
- U.S. Department of Health and Human Services (2000). *Healthy People 2010: Understanding and Improving Health*, 2nd ed. Washington, DC: U.S. Government Printing Office.
- U.S. Department of Health and Human Services, U.S. Department of Agriculture (2000). *Nutrition and Your Health: Dietary Guidelines for Americans*, 5th ed. Washington, DC: U.S. Department of Health and Human Services, U.S. Department of Agriculture.
- U.S. Preventive Services Task Force (2004). Screening and behavioral counseling interventions in primary care to reduce alcohol misuse: recommendations statement. *Ann. Intern. Med.* 140, 554–556.
- Wattendorf, D. J., and Muenke, M. (2005). Fetal alcohol spectrum disorder. *Am. Fam. Physician* 72, 279–282.
- Wedding, D., Mengel, M., Ullione, M., Cook, K., Kohout, J., Ohlemiller, M., et al. (2007). Psychologists' knowledge and attitudes about fetal alcohol syndrome, fetal alcohol spectrum disorders, and alcohol use during pregnancy. *Prof. Psychol. Res. Pract.* 38, 208–213.