

# COLLEGE STUDENTS' KNOWLEDGE ABOUT FETAL ALCOHOL SPECTRUM DISORDER

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## ABSTRACT

### Background

Fetal Alcohol Spectrum Disorders (FASDs) are the leading known preventable birth defects in North America. Knowledge surveys about FASD have been conducted with various health and allied healthcare providers and have proven useful in identifying gaps in knowledge and differences among provider groups to support prevention efforts. To date, no research has been conducted exploring FASD knowledge among college students.

### Objective

This study explored FASD knowledge in a sample of college students, a group at particularly high risk for alcohol-exposed pregnancies. Findings are compared to professionals in several healthcare and affiliated professional groups who were previously surveyed with the same FASD-related items.

### Methods

Surveys from 1,035 college students at a northwestern university were analyzed. Included with the ACHA-National College Health Assessment II were questions regarding FASD. College students' knowledge was compared with that of professionals in key healthcare and affiliated positions to define their relative awareness of FASD risk.

### Results

Overall, findings revealed adequate FASD knowledge among college students. Although minor differences emerged when comparing students and professionals' responses, most respondent groups answered with an 85% accuracy rate or higher.

### Conclusion

College students demonstrated adequate knowledgeable about FASD. Future research must explore whether such knowledge translates into lower risk behavior and consequent reduction in alcohol-exposed pregnancies.

**Key Words:** *Alcohol; fetal alcohol spectrum disorders; fetal alcohol syndrome*

Fetal Alcohol Spectrum Disorders (FASDs) are a constellation of growth, physical, and mental sequelae that arise in a fetus or embryo due to maternal consumption of alcohol during pregnancy. The full disorder, known as Fetal Alcohol Syndrome (FAS), is marked by facial abnormalities, low birth weight, diminished motor

skills, organ deformities, and behavioral problems, to name the primary characteristics. It is estimated that between 0.5 and 2 per 1,000 individuals are born with FAS every year.<sup>1</sup> Other manifestations of FASD are currently known by several terms including Partial Fetal Alcohol Syndrome (PFAS), Alcohol-Related

Neurodevelopmental Disorder (ARND), and Alcohol-Related Birth Defects (ARBD). These manifestations of alcohol-affected births evidence many of the same symptoms, often carry with them risks for secondary disabilities, and are estimated to occur in approximately 4.5 per 1,000 live births<sup>2</sup> or more. Some researchers estimate that 1% of all births in the United States manifest symptomatology along the spectrum of fetal alcohol disorders.<sup>1</sup> Despite increased knowledge related to the dangers of prenatal alcohol exposure and two public health advisory warnings by Surgeons Generals in 1981 and 2005, 10% of pregnant women continue to report drinking alcohol regularly and up to 4% binge drinking.<sup>4,5,6</sup>

College women are at particular risk for having alcohol-exposed pregnancies for several reasons. First, rates of alcohol consumption and alcohol abuse are higher among college students than non-college peers.<sup>7,8</sup> Second, recent research suggests that alcohol consumption among female college students is increasing, including a sharp rise in frequent binge drinking.<sup>9</sup> Third, although most sexually active college women use contraceptives, alcohol consumption is associated with increasingly ineffectual use of contraception. For example, in highlighting the dangers of becoming pregnant while concurrently drinking alcohol, Ingersoll and her colleagues<sup>10</sup> found that in a sample of 2,012 college women, 13% were risk drinkers who used ineffective contraception and 31% were risk drinkers who failed to use condoms consistently. For these reasons alone, college students are a prime target for primary FASD prevention efforts. An additional reason to target college students for FASD prevention is that through their education and professional training, they may gain employment in key positions through which they might have opportunities to conduct prevention efforts with others.<sup>11</sup> In other words, educating college women about FASD will not only help reduce their

personal risk but may carry long-term benefits for others as these students transition into relevant professional roles.

An important initial step in developing prevention efforts is to identify the targeted individuals' extant level of knowledge. Such data provide the basis upon which to plan prevention efforts and campaigns. Knowledge surveys about FASD have been conducted with various health and allied healthcare providers and have proven useful in identifying gaps in knowledge and differences among provider groups.<sup>12</sup> To date, no research has been conducted exploring FASD knowledge among college students. The current study seeks to fill this gap by surveying college students to determine their current level of knowledge about FASD risk, as well as general FASD knowledge. Findings are compared to professionals in several healthcare and affiliated professional groups who were previously surveyed with the same FASD-related items.<sup>12</sup>

## METHODS

### Participants

To obtain our sample, 3,000 students were selected randomly from among students attending the University of Alaska Anchorage (UAA). Students were sent an email invitation to participate in an online survey (described below) designed to assess student health to provide better prevention and treatment services and support for UAA students. Of the 3,000 students, 1,052 completed the survey, yielding a response rate of 35.1%. This response rate is comparable to those obtained for other universities participating in this survey. Of the 1,052 students, 17 were excluded due to missing gender, ethnicity, or age, leaving a final sample of 1,035 participants. Table 1 provides demographic information for these participants.

**TABLE 1** Participants' Demographic Characteristics

Demographics	<i>N</i>	%
Gender		
Male	351	33.9%
Female	684	66.1%
Race/Ethnicity		
American Indian / Alaska Native	61	5.9%
Asian and Pacific Islander	94	9.1%
Bi-racial/Multi-racial/Other	130	12.6%
Black – Not Hispanic	28	2.7%
Hispanic or Latino	34	3.3%
White	688	66.5%
Year in School		
Freshman	302	29.2%
Sophomore	220	21.3%
Junior	172	16.6%
Senior	182	17.6%
Graduate or Professional	102	9.9%
Non-Degree Seeking	29	2.8%
Other or Missing	28	2.7%
Student Status		
Full-Time	748	72.3%
Part-Time	259	25.0%
Other or Missing	28	2.7%
	<i>M</i>	<i>SD</i>
Age	24.7	8.5

**Instrumentation*****ACHA-National College Health Assessment II (ACHA-NCHA II)***

The American College Health Association was commissioned by the University of Alaska Anchorage (UAA) to administer the ACHA-NCHA II survey to a random sample of UAA students. This survey includes a broad range of questions relevant to college students, organized within the categories of general health; disease and injury prevention; academic impacts; violence; abuse relationships, and personal safety; alcohol, tobacco and other drug use; sexual behavior; nutrition and exercise; mental health; and sleep. UAA requested that five questions regarding student knowledge about Fetal Alcohol

Spectrum Disorder (FASD) be added to the ACHA-NCHA II survey. Responses to these questions are the focus of this paper.

Of the five FASD-related questions, three inquired about knowledge of FASD risk and two tapped general FAS knowledge. The three risk questions asked participants to indicate whether they believed it was okay for pregnant woman to have an occasional alcoholic beverage; what they thought was the most alcohol that a woman could drink during pregnancy; and when they believed it might be safe to drink during a pregnancy.

Response formats to these three questions varied depending on the nature of the question (1 = strongly agree to 4 = strongly disagree for the first question; 0, 1 to 2, 3 to 4, or 5 or more drinks

for the second question; and never during pregnancy, 1<sup>st</sup> trimester, 2<sup>nd</sup> trimester, and 3<sup>rd</sup> trimester for the third question). The two general knowledge items asked whether participants believed that FASD was associated with a set of

birth defects and whether these effects last through adulthood. These two items were scored on a 4-point likert-scale (1 = strongly agree to 4 = strongly disagree). Exact wording of all items is provided in Table 2.

**TABLE 2** Percent of Participants Answering FAS Knowledge Questions Correctly, by College Students and Professional Group<sup>1,2</sup>

	College Students <sup>+</sup> (n=1,035)	Corrections (n=480)	Educators (n=743)	Physicians (n=237)	PH Nurses (n=105)	Social Workers (n=329)	Substance Abuse Counselors (n=308)
<i>Percent providing correct response to the following questions about FAS risks:</i>							
<b>Basic Knowledge about FAS Risk</b>							
1. Is it okay for a pregnant woman to have an occasional alcoholic beverage? (percentage answering no)	93.4%	91.4%	91.7%	82.7%***	97.1%	94.7%	94.1%
2. What do you think is the most alcohol that a woman could drink during her pregnancy that would probably be safe for her developing baby? (percentage answering 0 drinks)	85.0%	83.9%	82.3%	66.7%***	87.6%	88.2%	93.4%***
3. When do you think that a woman could drink during her pregnancy that would probably be safe for her developing baby? (percentage answering never)	86.4%	86.4%	84.5%	72.4%***	88.6%	90.6%*	92.2%**
<b>General FAS Knowledge</b>							
4. People with FAS have a set of birth defects	91.2%	82.5%***	86.2%***	87.2%	85.7%	85.9%**	89.7%
5. People with FAS have these effects through adulthood	91.5%	92.3%	91.6%	93.4%	98.1%*	95.3%*	91.6%

### **Procedures**

Following approval by the UAA Institutional Review Board, ACHA was provided with a random sample of 3,000 students attending UAA. ACHA emailed an invitation to these students to participate in the ACHA-NCHA II survey and a hyperlink for doing so. Two reminders were sent to students who had not already completed the survey. Prior to completing the survey, potential participants read and agreed to an informed consent form. Students completing the survey were entered into a raffle for a variety of prizes, including an airline ticket, university parking pass, tuition waiver, and a variety of other items that would appeal to college students. Survey results were obtained from ACHA and analyzed using SAS 9.2.

### **Data Analyses**

Prior to data analysis, variables were recoded to categorize participants into having provided either a correct or incorrect response based on general clinical guidelines on each of the five items. Specifically, responses to the three risk questions were categorized as correct or incorrect as shown in Table 2. For the two general FASD knowledge items, based on general clinical guidelines, participants were categorized as having provided a correct response if they strongly agreed or agreed with the item and as having provided an incorrect response if they disagreed or strongly disagreed.

### **Comparison with Professional Groups**

In addition to providing the percentage of students who answered each of the five questions correctly, we compared these college students' responses to data collected in 2006 from 2,292 individuals employed in Alaska in a range of professions (i.e., corrections personnel, physicians, public health nurses, social workers, substance abuse counselors, and educators) who responded to these same questions in a prior survey (described in more detail elsewhere<sup>12</sup>). For each item, pairwise chi-square tests were conducted to compare college students to each of the six professional groups.

### **FASD Knowledge and Demographics**

To assess the association between general FASD knowledge and gender, ethnicity, and age, we conducted logistic regression separately for each item. Age was first categorized into decades and then inspected, both visually and with the Cochran-Armitage test-for-trend for whether the age effect could be treated continuously. Based on this preliminary analysis, age was entered into each model as a continuous variable. All participants of Hispanic ethnicity answered the general FASD knowledge questions correctly; thus, these participants were removed from the related logistic regression models due to the complete separation of the dependent variables in relation to Hispanic ethnicity.

## **RESULTS**

### **FASD Knowledge among College Students and Professionals**

As indicated in Table 2, college students have ample knowledge about FASD, with between 85% and 93.4% of participants responding correctly, depending on the item. Highest was the recognition that it was not okay for a pregnant woman to have even an occasional alcoholic beverage. Lowest was the percentage of college students who correctly identified zero drinks as the most alcohol that a woman could drink during pregnancy.

In comparing college students and professionals, with few exceptions, all groups answered with 85% accuracy rate or higher. However, some differences in knowledge did emerge. Specifically, physicians were significantly less likely to answer correctly all of the knowledge of FASD risk questions as compared to college students. Substance abuse counselors were significantly more likely to give correct answers than college students to questions about safe amounts a woman can drink during pregnancy and time during pregnancy when a woman can drink safely. Corrections officers, social workers and educators were all significantly less likely than college students to report correctly that people with FAS have a set of birth defects. Public health nurses and social workers were significantly more likely than college students to

report correctly that people with FAS have these effects through adulthood.

### ***Demographic Associations with FAS Knowledge***

In the logistic regression analyses, after adjusting for gender and ethnicity, age was revealed as a significant predictor in all models testing of the three basic knowledge of risk items. The log odds ratio indicated that each 10-year increase in age is associated with a 30%-40% lower odds of correctly answering these items. Age was not a statistically significant predictor of the two general FAS knowledge items. Gender and ethnicity were not significant predictors for any of the five items.

## **DISCUSSION**

Data indicate that college students demonstrate ample knowledge of FASD, and clearly recognize that FAS is a birth defect that lasts a lifetime. Similarly, results revealed that a large majority of college students have a clear perception that occasional drinking during pregnancy is not safe, suggesting that public health messages about drinking and pregnancy have been effective in shaping college students' attitude about drinking during pregnancy. This interpretation of the effectiveness of public health message is underscored by the fact that accuracy in responding improved as age decreased. Younger respondents are likely to have been exposed to these public health messages for a greater portion of their lives than older respondents, whose beliefs may have been shaped before FASD became a focus in the public media.

Interestingly, despite the fact that nearly all college students hold the belief that occasional drinking during pregnancy is an unacceptable risk, as many as 15% failed to translate this belief into the recognition that this means zero drinks during all weeks of pregnancy. Thus, a significant portion of college students may place themselves at risk for alcohol-exposed pregnancies as they fail to recognize that even drinking early in pregnancy (in fact prior to knowing about pregnancy) bears clear risk for the embryo or fetus. Lest college students be judged as less than knowledgeable, their insight into the risk for

FASD is actually superior to that of physicians, of whom roughly one-third have an incorrect understanding. For a detailed discussion of physicians' and other professionals' responses to these and other FASD-related questions, the reader is referred to Johnson et al.<sup>12</sup>

Clearly public health messages about drinking and pregnancy need to continue but may need to be refined. Messages need to be clear that not drinking during pregnancy means zero drinks at all times. For college women, in theory, this means that their alcohol consumption should be curbed at any time they may be at risk for pregnancy. Given the realities of college life and young adulthood, the message needs to focus more on protecting against pregnancy than advocating absolute abstinence from alcohol throughout child-bearing age. Clear and explicit messages that women of child-bearing age need to make careful decisions about contraception and drinking should not only be targeted at college students but also their healthcare providers, especially physicians.

### **Limitations**

Several limitations must be considered when interpreting these findings. First, although the survey's response rate of 35.1% was comparable to those in other NCHA surveys, it may be that the students who responded to the survey are not representative of the student population in general. Second, the survey sample was 66.1% female, whereas the overall UAA student body is 59.6% female, a statistically significant difference in proportions. One possible explanation for this difference is that female students may have perceived having more vested interest in the issue, resulting in their being more willing to complete the survey. Although gender was not a significant predictor of responses to any of the five questions, the difference in females in the sample versus population may have biased the survey outcome. Third, this survey was conducted in a state in which extensive public information campaigns about FASD have occurred over the past decade, as well as school-based FASD education programs. It may be that students in this survey were more aware of and knowledgeable about FASD than students in other states. Thus, the

knowledge demonstrated by this sample may be an overestimate of college students' knowledge in general. Fourth, the study is limited to the exploration of knowledge and does not provide any information about actual risk behaviors.

### CONCLUSIONS

The risks that college students face are highlighted by the fact that in this sample, at the last vaginal intercourse event, nearly 20% of the students reported having not used contraceptives, and, in the last 12 months, 1.7% reported becoming unintentionally pregnant. Further, 19.3% reported at least one occasion in the last two weeks in which they had five or more drinks of alcohol; 75% reported having consumed alcohol in their lives; and 56% having consumed alcohol in the last 30 days. All of these data point to a group of individuals of child-bearing age who are sexually active, regular or binge drinkers, and inconsistent users of contraceptives. Combined with some misunderstandings about how much alcohol is safe to consume during pregnancy, these data paint a picture of a perfect storm waiting to erupt. For these reasons, even though some knowledge about FASD among college students is relatively universal, this group of individuals may need to be reminded through public health messages that the risk of alcohol to the fetus extends to the time period preceding knowledge of pregnancy. Relative to preventing FASD, public health messages need to be tailored to suggest that women of childbearing age need to protect against pregnancy if they choose to drink or may need to abstain from alcohol if they engage in sexual behaviors that may lead to pregnancy. Emphasis needs to be placed on a greater focus on the multiple risks associated with sexual activity and alcohol consumption, including increased potential for FASD, sexually transmitted infections, and risk for nonconsensual sex, along with the need for advance planning and preparation to mitigate such risks.

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