

**KNOWLEDGE, BELIEFS, BEHAVIOURS, AND DECISION MAKING
ASSOCIATED WITH ALCOHOL CONSUMPTION
DURING PREGNANCY IN AN URBAN PRENATAL POPULATION.**

by

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A thesis
submitted to the University of Manitoba
in partial fulfilment of the requirements
for the degree of

MASTER OF NURSING

Faculty of Nursing
University of Manitoba
Winnipeg, Manitoba, Canada

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Associated with Alcohol Consumption
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**A Thesis/Practicum submitted to the Faculty of Graduate Studies of The University
of Manitoba in partial fulfillment of the requirements of the degree
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Master of Nursing**

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DEDICATION

To my partner Tom, for his gentle encouragement, endless support, and true friendship.

To my son Liam, my little shining star, who unknowingly was the final breath of inspiration in this endeavour.

ABSTRACT

Despite the age old warnings against the use of alcohol during pregnancy, and the abundance of scientific research that links Fetal Alcohol Syndrome (FAS) and Fetal Alcohol Effects (FAE) with prenatal maternal alcohol ingestion, FAS/FAE remains one of the leading causes of birth defects and mental retardation. It is critical to explore the reasons why women may choose to drink alcohol during their pregnancies to identify areas which may direct interventions and future research.

A descriptive cross-sectional survey was completed using Becker's Health Belief Model (1974) as a guide to exploring the phenomena of alcohol consumption during pregnancy. A researcher designed self-reporting questionnaire that incorporated previously used tools and open-ended questions was used to gather information from the 117 pregnant study participants regarding their knowledge, beliefs, behaviours, and decision making related to alcohol consumption during pregnancy.

A small number of study participants continued to drink during their pregnancy. They tended to be older, Caucasian, more educated, in a higher family income bracket, and with slightly lower knowledge scores. In general, the study sample possessed a high knowledge level and high levels of perceived susceptibility and severity to FAS/FAE. The most common benefit cited by participants for abstaining from alcohol during pregnancy was for health reasons, especially related to the baby. The most common barrier to abstaining was related to alcohol being an enjoyable

part of the woman's lifestyle.
Recommendations are made for health care education,
practice, future research, and refinement of the research
questionnaire.

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CHAPTER 1

OVERVIEW OF THE STUDYStatement of the Problem

Fetal Alcohol Syndrome (FAS) is the leading cause of environment-related birth defects and a common cause of mental retardation in North America (Canadian Medical Association Policy Summary, 1993). It is a complex of birth and developmental defects associated with prenatal maternal ingestion of alcohol (Aase, Jones, & Clarren, 1995; Dedam, McFarlane, & Hennessy, 1993). However, FAS represents only the most severe outcome on a continuous spectrum of adverse effects, which may include learning and behaviour disorders, growth retardation, and deficits in memory and attention (Smith, Lancaster, Moss-Wells, Coles, & Falek, 1987; Streissguth, Barr, Olson, Sampson, Bockstein, & Burgess, 1984). A less severe form of FAS is known as Fetal Alcohol Effect (FAE) in which the child displays some, but not all, of the signs of FAS.

The worldwide incidence of FAS is approximately 0.97 per 1,000 births (Abel, 1995) while the National Institute of Alcohol Abuse and Alcoholism reports an incidence of 1-3 per thousand live births (1990). The reported frequency of FAS among some minority groups is much higher. Confirmed FAS among some United States native tribes is 8.5 per 1,000 births, with the incidence of FAE estimated to be three times as common as FAS (Keltner, 1993). In an aboriginal community in British Columbia, the prevalence of FAS is one in five children (Robinson, Armstrong, Moczuk, & Loock, 1992). Chudley and Moffat found that 1 in 10 children on a Manitoba First

Nations Reserve was a victim of alcohol teratogenesis (Square, 1997), and that for every child identified with FAS/FAE, it has been postulated that there are probably 2 to 3 others with behavioural and learning disabilities caused by exposure to alcohol in utero. There are no national data on the incidence of FAS in Canada (Casiro, 1997).

The tragedy of this irreversible syndrome is that it is 100 percent preventable. The majority of pregnant women do not wish to harm their unborn children yet the incidence of substance abuse, including alcohol, during pregnancy is increasing (Birth Defects Monitoring Program, 1995; Haack & Budetti, 1993; Osborn, Harris, & Weinburg, 1993). While dollar estimates vary, it has been suggested, from an economic standpoint, that it costs the United States approximately 2.4 billion dollars per year for the special education, training, and support of fetal alcohol victims (Abel & Sokol, 1986). The Canadian Centre for Substance Abuse estimates that it costs \$1.4 million to care for 1 FAS child for extra health care, education, and social services (Square, 1997). Some of the most significant aspects of the total burden of FAS are not measured in any of the studies, namely the pain and suffering (both physical and emotional) experienced by victims of FAS and their families (Bloss, 1994). The loss of human potential may be the most tragic cost of drinking during pregnancy. There is a critical need to understand the attitudes of women who choose to consume alcohol during pregnancy to ensure that future preventive interventions be directed in the most appropriate and effective

manner.

The purpose of this study was to describe and explore this phenomenon. A self-administered questionnaire examined knowledge, beliefs, behaviours, and decision making associated with alcohol consumption during pregnancy. The Health Belief Model (Becker, 1974) was utilized as the theoretical framework for the study (Appendix A). The study design is descriptive and focussed on the population of pregnant women who were at least 24 weeks gestation and attended selected urban obstetric health care agencies in Winnipeg, MB, Canada.

The study has significance for the fetus, the family, and society as a whole, in that any information gained through the study may increase understanding and help to decrease the incidence of FAS and alcohol related birth defects (ARBD) in the future. This could result in protection of the fetus from harm due to alcohol, and freedom of the family and society from the psychosocial, emotional, and financial burdens that may be involved with caring for an individual with FAS. Because nurses are in an optimal position for identification, education, counselling, intervention, and referral of "at risk" individuals, studies in this area have potential value for the nursing profession, and the individual nurse (Ad-Hoc Committee on FAS/FAE, MARN, 1995).

Research Questions

The research questions that will be addressed are:

1. What are pregnant women's knowledge levels about the risks of drinking alcohol during pregnancy, and FAS/FAE?
2. What is the perceived susceptibility of the women's unborn children to FAS or FAE?
3. What is the perceived severity of FAS or FAE to pregnant women's unborn children?
4. What factors do women consider when making the decision to drink alcohol, to decrease drinking alcohol, or to abstain from drinking alcohol?
5. What are the perceived benefits and barriers to abstention of alcohol during pregnancy?

Definition of Terms

For the purpose of this study, the following definitions will be used:

1. Alcohol consumption - the intake of any liquor containing ethyl alcohol (Webster, 1992), as identified by responses of study participants. A "drink" is considered to be approximately one unit or 15 g of ethyl alcohol. In this study, one drink equals:
 - 1 12 ounce bottle of beer (4%), or
 - 1 4 ounce glass of wine (12%), or
 - 1.5 ounce of liquor (80 proof)

2. Beliefs - any proposition or hypothesis held by a person relating any two or more psychological elements or objects (Becker, 1974) as identified by perceived susceptibility, perceived severity and perceived threat of alcohol consumption on the fetus.
3. Decision making - the process by which choices are made, especially important decisions affecting others and made by virtue of one's position (Webster, 1992), as identified by responses of the study participant.
4. Health Behaviour - any activity undertaken by a person who believes him/herself to be healthy for the purpose of preventing disease, or detecting disease in an asymptomatic stage (Kasl & Cobb, 1966), as identified by responses of the study participants.
5. Perceived severity - an individual's view of the potential impact of learning that their child has FAS/FAE/ARBD, for example, the consequences of contracting the condition (Becker, 1974), as identified by the responses of the study participants.
6. Perceived susceptibility - a person's belief that there is a subjective risk of contracting a particular health condition, or a vulnerability to a particular condition (Becker, 1974). In this study, the specific health condition is FAS/FAE/ARBD.

Conceptual Framework

Becker's Health Belief Model (1974) (Appendix A) advocates that for an individual to take action to avoid a disease, they would need to believe:

- (1) that they were susceptible.
- (2) that the occurrence of the disease would have at least moderate seriousness on some component of their life.
- (3) that taking a particular action would be beneficial and outweigh the barriers.

The three components of the Health Belief Model will be examined individually, with reference made to the proposed study. The components are: individual perceptions, modifying factors, and the likelihood of action.

Individual Perceptions

In this study, perceived susceptibility refers to the subjective risks of having a baby that is born with FAS/FAE. This perception may have wide variations between individuals, ranging from complete denial, to believing there is a remote chance, to a belief that there is a real danger of having a child that has FAS/FAE. Perceived susceptibility is at least partly dependent on knowledge of the risks associated with drinking during pregnancy.

Perceived seriousness may be judged by the degree of emotional arousal created by the thought of FAS/FAE, as well as the kinds of difficulty an individual believes a disease will create for them. This perception also varies from individual to individual and is partly dependent on knowledge of FAS/FAE.

Modifying Factors

The cues to action are the instigating event that is needed to set the process in motion (Becker, 1974). They may be internal for example, a perception of bodily states, or external for example, communications with a physician or public health nurse, a television advertisement or a poster, or a government label on an alcoholic beverage. The required intensity of a cue deemed sufficient to trigger behaviour varies with different individual perceptions.

In the study, questions will be asked that will elicit from each study participant, which cues are effective to trigger abstinence behaviour from alcohol during pregnancy. Demographic, socio-psychological, and structural variables serve to condition both individual perceptions and perceived benefits of abstaining from alcohol during pregnancy. The study will gather information about demographic and psychosocial variables and will examine knowledge about the risks of drinking during pregnancy.

Likelihood of Taking Action

The perceived likelihood of abstaining from alcohol during pregnancy is a function of the perceived benefits of that action versus the perceived barriers of that action. Perceived benefits are influenced by knowledge and beliefs, and norms and pressures of each social group. Benefits of abstention an individual might acknowledge are safety of the developing fetus, and decreasing the chance of raising a handicapped child.

Perceived barriers for this study are the difficulties that an individual might encounter in trying to abstain from drinking

alcohol such as, addiction, social pressures, and partners who drink.

The study will ultimately examine the three components of the Health Belief Model as they relate to alcohol consumption in pregnancy: 1) the individual perceptions of pregnant women, 2) modifying factors in the woman's life, and 3) the likelihood of action or abstention from alcohol during pregnancy (Appendix A). By identifying areas that need to be focussed on in order to prevent FAS/FAE/ARBD, one is able to effectively plan future health interventions and teaching. Perhaps this might be to heighten public awareness and knowledge of the perils of alcohol consumption during pregnancy and thereby, increase individual perceptions of susceptibility and seriousness of FAS/FAE/ARBD. This may also minimize barriers or increase perceived benefits of abstention from alcohol during pregnancy.

CHAPTER II

REVIEW OF THE LITERATURE

There is an abundance of literature on the clinical description of FAS and FAE, scientific studies linking alcohol to the specific birth defects, hypotheses as to the mechanism of cause, biomedical and clinical concerns, and the incidence in specific populations. Much of this research, however, has paid relatively little attention to psychological and social determinants of maternal drinking behaviour (Stratton, Howe, & Battaglia, 1996). There is a relatively small amount of research that deals with the aspect of why women choose to drink or not to drink during pregnancy. Findings of the literature will be discussed under five main headings: (1) Pregnancy and Alcohol: The Historical Perspective; (2) FAS and FAE Biochemical Research; (3) North American Incidence of FAS/FAE; (4) Knowledge and Susceptibility of ABRD; and (5) To Drink Alcohol or not to Drink Alcohol.

Pregnancy and Alcohol: The Historical Perspective

To many, the label of Fetal Alcohol Syndrome is relatively new, but warnings against drinking alcohol during pregnancy have been around for centuries. In ancient Carthage and Sparta, couples were forbidden to drink wine on their wedding night in an effort to stop the conception of malformed babies, and Plato was emphatic that parents should not drink alcohol while trying to conceive (Reid, 1992). In the Bible (Judges 13:3), an angel

admonishes a soon-to-conceive woman to "drink no wine or strong drink" (Turbak, 1994). In 1725, during the great gin epidemic in England, the College of Physicians warned the House of Commons that alcohol was too often the cause of "weak and feeble", distempered children (Dedam, McFarlane, & Hennessy, 1993). Novelist Charles Dickens and others wrote about the flawed youngsters born of gin-drinking mothers. An early study in 1905 noted that alcohol-drinking parents produced five times as many "dullards" as abstainers.

Between 1905 and the 1970's, there was an apparent lack of effort to explore the linkages between alcohol and birth defects. In 1955 and 1965, reports by Keller and Montague stated that alcohol would not harm the fetus (Reid, 1992). In the 1960's, one distinguished anthropologist wrote that "alcohol in the blood that would kill the mother is not even enough to irritate the tissues of a child", and that "alcohol has no apparent effect on a child before birth" (Turbak, 1994). Some physicians have even prescribed a calming nightly drink for their pregnant patients.

In 1967, French physicians Paul Lemoine and Andre Lemarche observed independently a large number of children with the same symptoms: a small head, short nose, drooping eyelids, convex upper lip, and misshapen ears. The one commonality that these children shared, was that their mothers had all drunk significant amounts of alcohol while pregnant.

Finally in 1973, the distinct pattern of abnormalities was

labelled as "Fetal Alcohol Syndrome".

FAS/FAE Biochemical Research

FAS criteria

Since the term FAS was coined by Smith and Jones in 1973, it was noted that babies born to alcoholic women were frequently and uniformly malformed and often grew to be children who were mentally retarded (Iber, 1980). Criteria for the diagnosis of FAS was developed, and consisted of a positive history of maternal alcohol ingestion during pregnancy, with the newborn exhibiting manifestations in three areas:

- (1) growth deficiency in height, weight, or both (Larroque & Kaminski, 1998; Day, Zuo, Goldschmidt, Larkby, & Cornelius, 1999).
- (2) central nervous system damage including microcephaly, or a history of delayed development, hyperactivity, attention deficit, learning disabilities, intellectual deficits or seizures (Guerri, 1998; Larroque & Kaminski, 1998).

Autopsy reports, magnetic resonance imaging studies, and positron emission tomography studies have more recently provided information about the unique effects of prenatal alcohol exposure has on the developing brain (Roebuck, Mattson & Riley, 1998). Streissguth, Barr, Olson, Simpson, Bookstein, and Burgess (1994) found that the consequences of maternal drinking during pregnancy are measurable fourteen years later in the form of performance deficits in exposed

children. The handicapping effect of FAS was also noted by Steinhausen & Spohr (1998) in a long-term study of FAS children.

- (3) facial anomalies such as short palpebral fissures, flat midface, lack of philtrum, and thin upper lip (Dedam, McFarlane, & Hennessy, 1993; Streissguth, Aase, & Clarren, 1991; O'Connor, Sigman, & Brill, 1987).

By 1990, there had been over 2,000 scientific publications of accumulated evidence documenting the effects of alcohol consumption during pregnancy (Pietrantonio & Knuppel, 1991). As of 1996, there had been over 5,000 publications of research and observation relating to FAS/FAE.

Proposed etiology

Alcohol readily crosses the placenta and can cause a wide range of fetal disturbances. Fetal alcohol damage is a consequence of altered cell growth, differentiation, proliferation, migration, and regulation (Abel & Hannigan, 1995). Infant development is thought to be impaired directly by fetal exposure to either alcohol (ethanol) or its metabolite, acetyl aldehyde, any time during gestation. The exact mechanism is unknown, although there are several hypotheses:

- (1) Studies comparing zinc deficiency and adequate zinc diets in mice suggest that zinc deficiency potentiates the teratogenicity of alcohol. Zinc is required for DNA synthesis and cell division.
- (2) Alcohol readily crosses the placenta and approximates maternal blood levels very quickly (Verklan, 1989). The

fetus has a decreased ability to metabolise the alcohol due to the deficiency of the hepatic enzyme alcohol dehydrogenase (Dow & Riopelle, 1987), and therefore, relies on passive diffusion across the placenta and maternal elimination of the alcohol. The high concentrations of alcohol in the maternal-placental-fetal system cause multiple alterations in the biochemical and physiologic processes (Weiner & Rosett, 1985).

- (3) There may be an alcohol-induced autoimmune response in the mother that may cross-react and interfere with the development of the fetal brain and possibly other tissues, thus contributing to severely abnormal brain formation and other congenital deformities (Foster, 1986). Brain damage reported in animal and/or human studies includes disrupted neural crest development (Cartwright & Smith, 1995), neuronal loss (West, Chen, & Pantazis, 1994; Goodlett & West, 1992; Maier, Miller, Blackwell, & West, 1999), disrupted corpus callosum (Riley, Mattson, & Sowell, 1995), and damage in the hippo campus and cerebellum (West, Hamre, & Cassall, 1986; Maier, Miller, Blackwell, & West, 1999).
- (4) Alcohol elimination from the amniotic fluid is approximately two times slower than that from maternal blood. The fetus is exposed to higher levels of alcohol for longer periods of time than the mother (Tramner, 1985; Marchessault, 1988).
- (5) Several theorists have suggested that the father has a contribution to FAS/FAE. A study in rats showed clear neurochemical deviations in offspring after prolonged

paternal inhalation exposure to ethanol (Nelson, Brightwell, Mackenzie-Taylor, Burg, & Massani, 1988). Three possible mechanisms involved in the effect of paternal ingestion of drugs on fetal outcome:

- a) an alteration in the normal metabolic and endocrinologic function of the father affecting the fetus indirectly (Soyka & Joffe, 1980)
- (b) damage to the spermatozoa themselves (Cicero, 1994; Soyka & Joffe, 1980)
- (c) the potential of the drug within the ejaculate to affect either the intrauterine environment or the newly fertilized ova (Soyka & Joffe, 1980)

Teratogenic effects are linked to timing and level of exposure (Guerri, 1998). The nature of the resulting birth defects reflects the stage of embryonic development when toxicologic insult occurred. Alcohol exposure during different periods of brain development results in regional differences in cell loss and illustrates the variability of alcohol-induced neuronal loss (Maier, Miller, Blackwell, & West, 1999). Ethanol interferes with all stages of brain development (Guerri, 1998). Studies have suggested that first trimester exposure is associated with organ and musculoskeletal anomalies, whereas second and third trimester exposures are associated with growth, intellectual and behavioural deficits (Meyers, Kotch, & Riley, 1990; Aaronson, 1989; Aronson & Olegard, 1987; Rosett, Weiner, & Lee, 1983; Sulik, 1983). It is the number of drinks per occasion and the resultant high blood alcohol level (BAL), rather than a

relatively constant lower BAL, that appears to be a major risk factor for ARBD (Abel & Hannigan, 1995).

Genetic influences

There is a non-uniform occurrence of FAS in different populations (Abel & Hannigan, 1995). The effects of teratogens can be modified by genetic differences in fetal susceptibility and resistance (Streissguth & Dehaene, 1993; Smith et al., 1987). Clinical data on sixteen pairs of twins (five monozygotic MZ, and eleven dizygotic DZ) born to alcohol abusing mothers from France and the United States were evaluated by Streissguth and Dehaene (1993) to show that the rate of concordance for diagnosis of FAS/FAE was 5/5 for MZ and 7/11 for DZ twins. The twin pairs had equivalent alcohol exposure, yet the alcohol teratogenesis appears to be more uniformly expressed in MZ than DZ twins. This study may reflect the influence of genes in individuals exposed to alcohol in utero, however, there is no scientific evidence to support the hypothesis that FAS is more prevalent in certain cultures because of genetic influences (May, 1991; Abel & Hannigan, 1995). The small sample size in the above study is understandable due to the rarity of the combination of twins in alcohol abusing mothers.

Cultural influences

For many years, American Indians have been stereotyped in American arts and literature as having great problems with alcohol (Westermeyer, 1974), yet the scientific evidence on this topic is mixed (May, 1991; Bray, 1989). The "drunken Indian" stereotype has been perpetuated and is generally believed by lay persons and

professionals alike, leading many to suggest a cultural susceptibility. Morbidity and Mortality Weekly (1994) reported that American native Indians drank twice as much as non-natives, and Asante and Robinson (1990) reported a higher prevalence of FAS in native Indians than in non-natives. In a survey of Navajo native Indians (May & Smith, 1988), 63 percent indicated that they believed there was a physical weakness among Indians that others do not have. The biological deficit myth that proposes a less effective metabolism of alcohol by natives has no support from recent research. One study by Tenna, Mix, Schaeffer, and Gilbert (1971) did show a slight deficit in alcohol metabolism rates between Canadian Indians and non-Indians but the study was highly criticized due to flawed methodology. In another Canadian study that corrected the identified problems of the previous study, Indians metabolised alcohol more rapidly than non-Indians (Reed, Kalant, Griffins, Kapur, & Rankin, 1976). It is suggested that reasons for these differences in the incidence rates of FAS/FAE/ARBD should be sought in socio-cultural variables.

The differences among ethnic groups and cultures with respect to social or behavioural characteristics may increase the risk for FAS for one group over another. FAS is more prevalent in the USA and Germany than in Italy and the United Kingdom even though the total per capita alcohol consumption is similar for these countries. Infants of women in cultures where alcohol is consumed regularly at meals are found to be less at risk for FAS than those in cultures where drinking behaviour is periodic (ie. clustered on weekends) or where alcohol abuse is characterized by bingeing (Abel

& Hannigan, 1995).

Bray and Anderson (1989) question the notion that there is more FAS among native children than non-native children. There is a lack of published research in Canada on the prevalence of FAS in the non-native population and therefore, it is difficult, if not impossible, to make a valid comparison of the prevalence rates for natives and non-natives.

Abel and Hannigan (1995) reported that for racial group combined with poverty, FAS occurred seven times more frequently among African American, and thirty times more frequently with native Indians. They found that African American women were more likely to be abstainers than Caucasian women, but among the women who drank, African Americans are more likely to drink heavily and to develop ARBD than Caucasians. African American and Native American women tended to drink more in bouts (binging), whereas Caucasian alcoholic women are more likely to drink constantly throughout the week.

There is no convincing evidence that African-American or Native Americans are at greater risk for FAS/ARBD than Caucasian Americans because of some genotypic population differences or any biological factor (Abel & Hannigan, 1995).

Safe level?

There is no "safe" level of alcohol consumption during pregnancy. Literature on human consumption is not clear and most articles advise abstinence from alcohol during pregnancy. Alcohol consumption during pregnancy can affect the development of the

child, at levels well below those associated with FAS (Larroque & Kaminski, 1998). Studies of animals and humans demonstrate that binge drinking may have more devastating effects on the fetus than intake of the same dose of alcohol over a longer period of time (Osborn, Harris, & Weinburg, 1993; Abel & Hannigan, 1995).

Knupfer (1991) examined the research literature on the results of drinking during pregnancy and reported that there was no evidence that light drinking (< 2 drinks per day) is harmful to the fetus. Knupfer identified several defects in the research: the method of averaging the number of alcoholic drinks consumed obscures the blood alcohol levels and therefore, the different effects of light drinking and bingeing are confused (Knupfer, 1991; Abel & Hannigan, 1995), and the heaviest drinking category consists of those who drink two or more drinks per day so the person who drinks two drinks per day and the person who drinks ten or more drinks per day are in the same category. Knupfer also states that the studies rarely take into account all other factors which might be the real cause of the damage to the fetus and which are correlated to heavy drinking, for example, poor diet. It is suggested that advice to abstain from light drinking during pregnancy may be a part of the popular anti-alcohol tide, and might be influenced by prejudices against women drinking (Knupfer, 1991).

Study limitations

Limitations to many of the studies were that many human studies relied on memory recall, this self-reporting technique may be unreliable and inaccurate (Midnik, 1982; Smith, 1990), and there is a likelihood that there is confounding polydrug use. The average

daily consumption reported is a derived measure, and may be potentially misleading because it ignores episodic patterns of high levels of consumption with resultant high blood alcohol levels (Abel & Hannigan, 1995). Studies use different definitions for terms such as "excessive", "heavy", and "moderate" and therefore, may not be compared. The animal studies cannot be generalized to human populations, however, it should be noted that there have been remarkably similar findings in animal and human studies, with reference to critical periods, critical doses, and symptomology (Becker, Randall, Salo, Saulnier, & Weathersby, 1994). This may be of benefit to the future identification of the potential mechanism, and evaluation of interventions in human populations.

North American Incidence

It is noted that FAS ranks in the top three causes of mental retardation in North America, along with Down's Syndrome and neural tube defects (Remkes, 1993; Dedam, McFarlane, & Hennessy, 1993; Osborn, Harris, & Weinburg, 1993; Robinson, Armstrong, Moczuk, & Loock, 1992; Pietrantonio & Knuppel, 1991; Barbour, 1990; Abel & Sokol, 1987). The worldwide incidence is .97 per 1,000 live births (Abel, 1995). The Centre for Disease Control (1995) reported that there is a fourfold increase in cases of FAS since 1979. This may reflect an actual increase in frequency of FAS, or better awareness, detection, and reporting of FAS/FAE by health care professionals. FAS appears to be more common in some ethnic groups than in the population as a whole. Per 10,000 total

births of different ethnic groups, incidences were as follows: Asians 0.3, Hispanics 0.8, Whites 0.9, Blacks 6.0, and Native Americans 29.9 (Alcohol Alert 13, 1991).

Native American populations

Among Native Indians, the incidence of FAS varies among different cultures and tribes (Bray, 1989; May, 1991). Navajo and Pueblo cultures have a prevalence similar to the overall North American population, while the Southwest Plains Indians reported a prevalence of 1 FAS birth per every 102 births (Keltner, 1993; May, 1991). A recent study among schoolchildren in one Manitoba Ojibway community reported an epidemic, with 1 in 10 children diagnosed with FAS/FAE (Square, 1997). In twenty-three communities in British Columbia and fourteen communities in the Yukon Territory, the rate of FAS/FAE described in children under sixteen years of age was 26 and 46 per 1,000 live births, respectively (Robinson, Conry & Conry, 1987). Godel, Pabst, Hodges, Johnson, Froese, and Joffres (1992) studied 162 Inuit, native, and Caucasian women in ten communities in the Inuvik Zone, NWT. Thirty-four percent drank alcohol during their pregnancy with binge drinking most prevalent among Inuvik and Native mothers. This marked prevalence and its effect on the newborn are public health concerns in the NWT. These numbers may underestimate the actual numbers of affected individuals because a diagnosis relies heavily on trained clinicians to identify the cluster of symptoms. Some physicians still show genuine reluctance to make the diagnosis with strict adherence to criteria; others do not consider FAS in making a differential diagnosis; and some continue to deny that such a

syndrome exists at all (Keltner, 1993; Little, 1990). Several factors, such as cultural influences, patterns of alcohol consumption, nutrition, social influences and metabolic differences have been suggested to play a role in the varying rates of FAS.

A study by Kvigne, Bull, Welty, Leonardson, and Lacina (1998) examined the relationship of prenatal alcohol use with maternal and prenatal factors in American Indian women. One hundred and seventy-seven Northern Plains Indian women were screened for substance use via a self-administered questionnaire. It was found that women who drank during pregnancy were more likely to be single, have less education, to consume more alcohol more frequently before pregnancy than did women who drank before but not during pregnancy. Women who drank alcohol during their pregnancy were more likely to smoke cigarettes and use illicit drugs, to have parents who drank, to feel they drank the same or more than other pregnant women, or to have experienced more relationship breakups and physical and emotional abuse. Some of these characteristics have also been found in study samples which consist of non-Native women. Self-reporting is also a limitation of this study.

African American populations

In the case of African Americans, the risk of FAS remains approximately seven fold higher than for whites, even after adjustment for frequency of maternal alcohol intake, occurrence of chronic alcohol problems, and parity.

A prospective study of low income primiparous African American (n=255), Mexican-American (n=525), and Mexican immigrant (n=764) women was conducted in 22 prenatal care clinics in Los Angeles,

California (Zambrana & Scrimshaw, 1997). Significant ethnic differences were found in the use of alcohol, cigarettes, and illicit drugs. African-American women were more likely than Mexican-origin women to report use of substances before and during pregnancy. Women who continued to use substances during pregnancy were less likely to be living with the baby's father, to have planned the pregnancy, to report having been able to go for prenatal care as soon as they wanted, and were more likely to be identified as a medical risk.

This again raises the question of genetic susceptibility, the nature of which is unknown.

Alcohol and smoking

Brooten et al. (1987) surveyed 308 pregnant women who were registering for their first prenatal visit in an urban clinic. The purpose of the study was to describe their nutrition, caffeine, cigarette, and alcohol intake in early pregnancy. Instruments used were a 24 hour dietary recall form (which included tobacco and alcohol use). Twenty percent of subjects were interviewed following completion of the dietary recall form to identify any foods that might not have been recorded by the women. Thirteen percent of those surveyed acknowledged alcohol consumption, and 83 percent of that group also smoked. This statistic also concurs with several other research findings that women who smoke are more likely to drink (Abel & Hannigan, 1995; MMWR, 1994; Sedula, Williamson, Kendrick, Anda, & Byers, 1991). Two percent acknowledged heavy drinking (two or more drinks daily), as compared to 9 percent reported by Abel and Sokol (1987). Beer was

the most frequent type of alcohol consumed, perhaps due to the commonly held presumption that beer is less harmful than hard liquor. The study showed that levels of alcohol consumption were high in early pregnancy, at the time of fetal development. Adult women were less responsible in alcohol and tobacco consumption than teenagers. This has implications for the continuation of education and guidance for all pregnant women to promote optimal pregnancy outcomes. Limitations of this study are that the instrument relies on accurate recall, the 24-hour time period may constitute an atypical period for some women and therefore, may not reflect a women's usual habits. Subjects may tend to under report their consumption of alcohol due to guilt feelings or social desirability. Also, the study sample was largely an urban black population from a lower socio-economic class, and therefore, results can not be generalized to the larger population.

A comparative descriptive analysis was done by Prager et al. (1984) to describe drinking and smoking behaviour of married mothers before and during pregnancy according to maternal race and Hispanic origin, age and education. Data was obtained through unweighted respondent questionnaires from the National Natality Survey and the National Fetal Mortality Survey. Questionnaires were mailed approximately six months after delivery to 7,825 mothers of liveborn infants, and 4,814 mothers of stillborn infants to assess demographic and social characteristics, and prenatal behaviour (including drinking and smoking). Non-respondents to two mailed questionnaires received a telephone interview, which was abbreviated and modified in the sense that it

included only smoking and drinking behaviour after the pregnancy. This resulted in the total sample size decreasing to 4,405 mothers of liveborn infants, and 2,616 mothers of stillborn infants. Results showed that when respondents received pregnancy confirmation, alcohol consumption was reduced. There was a more pronounced reduction in drinking alcohol than in smoking. Drinking during pregnancy was most common among white mothers (58 percent), and more prevalent among older and more educated mothers. Comparisons between mothers of live born and stillborn infants showed very similar results: the prevalence of drinking increased with the increasing years of education, but mothers of the stillborn infants were more likely to be abstainers from alcohol. This study was based on the results of married women so it cannot be generalized to all women. Perhaps smoking and drinking behaviours of unmarried and married women differ. The response rate for this study was 56 percent, and if the 44 percent of non-responding mothers are more likely to be drinkers or smokers, the estimates presented may be low. As in any study that uses self-reporting of alcohol consumption, study participants may have under reported due to social pressures and guilt feelings.

Fox, Sexton, and Hebel (1987) studied the patterns of alcohol consumption among pregnant women who participated in a randomised controlled trial of a smoking cessation intervention. The average alcohol intake for both groups was reduced primarily prior to registration for prenatal care. The smoking cessation intervention reduced smoking during pregnancy but had no effect on alcohol intake. The intervention for one habit was not extended to other

behaviours by the woman herself.

The relationship between cigarette smoking and alcohol consumption during pregnancy by Danish women and their spouses was studied as a potential source of fetal morbidity (Rubin, Krasilnikoff, Leventhal, Berget, & Weile, 1988). Seventy percent of Danish women and eighty percent of their spouses consumed alcohol during pregnancy. There was a significant correlation between maternal and paternal smoking, and maternal and paternal drinking. It was found that those in the abstainer and rare drinking categories were more likely to be younger, in a lower social class, less highly educated, and primiparous.

One-hundred postnatal Irish women were interviewed by Daly, Kiely, Clarke, and Matthews (1992) to establish the level of alcohol and cigarette consumption during pregnancy, and the level of knowledge to potential adverse effects. Seventy-eight percent continued to consume alcohol during pregnancy, although sixty-six percent of the women decreased their alcohol consumption considerably. Thirty-eight percent reportedly binged on at least one occasion. Fifty-eight percent of the women were aware of the harmful effects of alcohol during pregnancy, while ninety-three percent said they were aware of the harmful effects of smoking during pregnancy. Only eleven percent of the women said that a physician had mentioned the hazard of smoking in pregnancy. These results demonstrate a greater lack of knowledge to the effects of alcohol consumption in pregnancy, when compared to the level of knowledge about the risks of smoking.

Bolumar, Rebagliato, Hernandez-Aguado and Florey (1994) did a

cross-sectional study of 1,004 pregnant women between 12 and 18 weeks gestation who were attending the antenatal clinic of the main regional hospital of Valencia, Spain. They investigated possible changes in smoking and drinking habits during pregnancy. Thirty-seven percent of drinkers stopped smoking. High levels of alcohol consumption were limited to a small group.

Alcohol and drug use

Alcohol and drug use is reported to be more prevalent in urban areas and less prevalent in rural areas (Iber, 1980). The prevalence of drug use among pregnant women in a rural Midwestern setting was described by Matti and Caspersen (1993). This descriptive prospective study examined urine specimens, and the records of the first prenatal visit in a convenience sample of 202 women enrolled for prenatal care. It was found that 3.9 percent of the study population had evidence of perinatal drug use, as compared to the 11 percent prevalence reported by Abel and Sokol (1987). The study purpose was to examine drug use in general, and alcohol was included. The major limitation of this study is the use of urine testing to determine drug use. A positive toxicology test result indicates only that a particular substance has been used within a specific period before testing. Testing was limited to the first prenatal visit only, and this does not take into consideration the incidence of relapse that may occur later in pregnancy. Another drawback to this study is the small convenience sample.

Gladstone, Levy, Nulman, and Koren (1997) reported an observational study where they attempted to characterize pregnant

women who engage in binge drinking and other risk behaviour. They based results on a retrospective review of records (n=23,791). They found that women who admitted to engaging in binge drinking were significantly younger, more likely to be single, to be white, and often report use of cigarettes, cocaine, marijuana, and other illicit drugs.

FAS and FAE occur with alarming frequency in our society. Despite the abundance of research linking prenatal drug ingestion with the irreversible effects of FAS/FAE, many women still choose to drink alcohol during their pregnancy. It is not always youth and minorities who make this choice. Older, more educated, white women have also been shown to consume alcohol during pregnancy.

Knowledge and Susceptibility of ARBD

Knowledge and risk awareness

Being aware and knowledgeable about the possible harmful effects of alcohol consumption during pregnancy, and understanding the concept of susceptibility, are the first steps in changing health behaviour. A descriptive survey done by Robinson, Armstrong, Moczuk, and Loock (1992) attempted to examine knowledge of FAS among 123 Aboriginals in Vancouver and Victoria, B.C. Interviews consisted of a structured set of questions including demographics, personal history, questions about how alcohol affects the fetus, FAS, and acquaintance with someone with FAS. Almost all respondents recognized that alcohol consumed during pregnancy could affect the fetus and 80 percent believed there was no safe amount. Over 40 percent of the study population knew someone with FAS.

The study revealed that there had been limited teaching about alcohol, however, virtually all were aware of the danger of maternal drinking during pregnancy. The authors suggest that further prevention strategies need to target urban and reserve based Native Indian populations known to have alcohol-related problems. The male partner must also be involved, not only because they influence the drinking environment of the women, but they also play an important role in supporting non-drinking behaviour (Robinson, Amstrong, Moczuk, & Loock, 1992).

A study by Testa and Reifman (1996) examined whether differences in perceived riskiness of alcohol consumption during pregnancy was related to self-reported alcohol consumption among a community sample of 159 pregnant women. It was found that the perceived risk of drinking during pregnancy was lower among women who had previously given birth to a healthy child and among women with greater numbers of previous alcohol problems. Most healthy births were attributed by the mothers to be due to maternal behaviour, while the few women who experienced adverse pregnancy outcome did not attribute the outcome to drinking or other behaviour. Consistent with other studies (Smith, Lancaster, Moss-Wells, Coles, & Falek, 1987; Waterson & Murray-Lyon, 1989), pregnant women with greater numbers of alcohol problems reported drinking more.

A descriptive study by Fox, Brown, Koontz, and Kessel (1987) examined the perceptions of the risks of smoking and heavy drinking during pregnancy. This National study population consisted of

18,499 women and men between the ages of 18-44. The Health Promotion and Disease Prevention Questionnaire was completed and respondents were classified by age, sex, race, level of education, family income, smoking status, and drinking status. Eighty percent of participants associated heavy drinking with increased risks of miscarriage, mental retardation, low birth weight, and birth defects (including FAS). Women were more likely than men to express some opinion, for example, "definite" as compared to "probable", and were more aware of the risks. The group, as a whole, was not very knowledgeable about FAS: Fifty-five percent had heard of the term, but less than one in four correctly identified it from a choice of three definitions. Seventy-one percent of respondents incorrectly identified FAS as "being born addicted to alcohol" (Fox, Brown, Koontz, & Kessel, 1987). The younger age group (18-29) were more likely to respond that smoking or drinking alcohol increases pregnancy risks, as compared to the older group (30-44). There were no significant differences between the responses of African Americans and Caucasian Americans. Fewer heavy drinkers had heard of FAS, and were less likely to identify it correctly. This study included a large sample, with a very diverse group of participants but one must query whether the questions measure knowledge of the risks of smoking and heavy drinking, gauge attitudes toward these habits, or merely assess something about the willingness of different groups to make guesses, confess ignorance, or passively acquiesce to answers implied in the questions.

Two United States national health surveys in 1985 and 1990 were used by Dufour, Williams, Campbell, and Aitken (1994) to determine changes in knowledge of: a) FAS and, b) risks of drinking alcohol during pregnancy, in men and women between the ages of 18 and 44. The vast majority (89-92%) of women in 1990 believed that heavy drinking during pregnancy "definitely" or "probably" increased chances of miscarriage, mental retardation, low birth weight and birth defects, and had heard of FAS (73%). These beliefs were all significantly higher than those found in 1985 (87-88%, and 62% respectively). A significantly lower percentage of men than women believed in the stated risks of heavier drinking during pregnancy, had heard of FAS, and could correctly describe the syndrome. Similarly, a cross-sectional study done in Norway between 1984 and 1990 showed that a larger percentage of women than men thought that women should abstain from alcohol upon onset of pregnancy (Ihlen, Amundsen, & Tronnes, 1993). Although there was an overall higher awareness of risks of drinking alcohol during pregnancy, the level of knowledge of FAS was disturbing. Dufour et al. recommended that more prevention and education efforts are needed to inform men and women of the dangers of heavy drinking, and of any drinking during pregnancy. Author's noted that changes between 1985 and 1990 cannot be attributed to the alcoholic beverage warning labels because warning labels were not present on bottles until 1990.

An Australian study (Oei, Anderson, & Wilks, 1986) surveyed ninety-five men and ninety-seven women between the ages of fourteen and thirty on their attitude to, and awareness of FAS. Although

there was a high awareness of the problems and risks associated with the consumption of alcohol during pregnancy, there was a low awareness of the specific effects to offspring, and the quantities and frequency of consumption of alcohol which would have teratogenic effects. Fifteen percent of the sample thought it would take more than five drinks per day to cause harm to the fetus, and eighteen percent of the population thought that women should drink in moderation during pregnancy. These findings indicate that there was still not enough public awareness at the time of the study.

Youth beliefs and knowledge about the risks of drinking during pregnancy were examined by MacKinnon, Williams-Avery, and Pentz (1995) in questionnaires that were distributed to 13 to 20 year olds. Although eighty-one percent of the sample believe that alcohol can harm the fetus, males and younger persons were less likely to report this. A substantial proportion of respondents believe that occasional heavy use is not harmful and suggest a safe level of drinking that is higher than the Surgeon General's abstinence recommendations. Only 72 percent have heard of FAS, and more than one third incorrectly report that it describes a baby born addicted to alcohol, that the syndrome can be inherited, and that it can be cured (MacKinnon, Williams-Avery, & Pentz, 1995).

Lack of public knowledge and awareness of FAS is not the only barrier to decreasing the frequency of alcohol consumption during pregnancy. Several studies cite lack of knowledge or experience of the physicians. Nanson, Bolaria, Snyder, Morse, and Weiner (1995) studied the knowledge, clinical experience, and perceived needs for

resource material for Saskatchewan physicians in regard to FAS and ARBD. In a mailed survey, they found that pediatricians were most likely to be aware of FAS and to have diagnosed at least one case of FAS. Family Practitioners and General Practitioners who graduated before 1974 were less likely than more recent graduates to be aware of FAS and to ask their patients about alcohol use during pregnancy. All groups reported a need for more information about FAS and resources. Little, Snell, Rosenfeld, Gilstrap, and Grant (1990) noted a lack of FAS diagnoses in all of the charts of 40 children whose mothers had obstetric records that noted a history of substance abuse. Many physicians in a study by Rosett, Weiner, and Edelin, (1981) were reluctant to inquire about alcohol use in pregnancy due to lack of knowledge or time, or the supposition that the patient wouldn't tell them the truth anyway. Asante and Robinson (1990) reported the reluctance of some British Columbia physicians to identify maternal alcohol consumption and FAS/FAE. The Pregnancy Outreach Program of British Columbia was developed to attempt to decrease risk behaviour associated with poor pregnancy outcomes, and to educate physicians and other health care workers.

The Pregnancy Risk Assessment Monitoring System (PRAMS) utilizes a population-based survey of Oklahoma women with a recent live birth to examine the rates of alcohol consumption before and during pregnancy. One in four Oklahoma mothers report that their health care provider did not talk to them about the harmful effects alcohol can have on their baby.

Jones-Webb, McKiver, Pririe, and Miner (1999) found that

physician advice regarding alcohol use during pregnancy is protective against maternal smoking and drinking during pregnancy.

Mandatory testing for prenatal alcohol consumption has been suggested by Abel and Sokol (1987). They compare the idea to mandatory PKU testing which has an incidence that is one-tenth that of the FAS incidence. Given the cost associated with FAS, screening at the time of preconception or prenatal care visits using available questionnaires should be at least as cost effective. A dollar spent on prevention could result in considerable savings in treatment costs.

Learning methods and FAS awareness

Stychar, Griffith, and Conry (1990) had two study purposes: They wanted to identify how pregnant women learned about the effects of alcohol and tobacco use, and they wanted to identify the relationship between learning, health beliefs, and behaviour. The study population consisted of 128 primigravidas from eight hospitals in British Columbia. The ex post facto design involved one hour interviews which asked open and closed-ended questions at one to six days postpartum. Seventy-five percent consumed alcohol before pregnancy and these women reduced their intake by 82 percent during pregnancy. Women who engaged in "other-initiated" (family, friend, physician) conversations about the risk of alcohol consumption during pregnancy, reportedly drank less alcohol. Forty-eight percent of study participants identified that there is not a safe level of alcohol during pregnancy. A limitation of this study is that it requires that subjects recall various resources,

advice given, and account for time spent in learning.

With the recent "war on drugs" in the US, evaluation of the effectiveness of the associated community education programs is necessary. In a large study of the drinking patterns of 2,266 women during their pregnancy, Waterson and Murray-Lyon (1989) found that mass media (newspapers, magazines, books, television) was of great influence in encouraging a reduction of drinking in the study sample.

Kaskutas and Graves (1994) described the relationship between exposure to multiple sources of health messages, behaviour, and awareness in their observational quasi-experimental study. Adult women and men (n=4,017) participated in a National telephone interview that questioned their awareness of FAS via exposure to media advertisements, posters in restaurants and bars, and government warnings on alcoholic beverage containers. Women were more likely than men to have knowledge regarding FAS, and people who had been exposed to multiple messages were more likely to have knowledge of FAS. Reduced alcohol consumption due to health concerns was associated with exposure to two and three different sources. The study did not assess the number of times each type of message was exposed, nor did it assess physician messages. This study supports the public health approach of using multi-faceted strategies.

In a study by Lelong, Kaminski, Chwalo, Bean, and Subtil (1995) 176 women were interviewed using a structured questionnaire in prenatal clinics and postpartum wards to identify influencing

factors towards abstaining from alcohol consumption during pregnancy. Most women were aware that alcohol and tobacco could be harmful to their babies, however, heavy drinkers recognized this risk less often. Sixty percent of the women thought that two drinks per day was a reasonable level of consumption during pregnancy. The study subjects identified their husbands and physicians or midwives as influential in decreasing their alcohol consumption. The results point to the potential for more active intervention on alcohol reduction by health personnel during prenatal care.

The impact of alcoholic beverage warning labels has been the focus of several studies. In 1994, Hankin surveyed 3,572 inner-city African-American women who initiated prenatal care and found that high risk drinkers reduced the amount of alcohol they consumed, however, the decrease was small. Women who needed the warning the most, those drinking at risk levels, did not change the amount of alcohol they consumed after the warning label was implemented. This result was also noted in studies by Testa and Leonard (1995), and Sokol (1983). Rankin found that most of the pregnant risk drinkers in her sample had previously been pregnant and that women who had previously given birth view alcohol as less dangerous than women who lack such experience. She speculates that an illusion of invulnerability arises because most women have healthy babies (or believe them to be so). The alcoholic beverage warning label resulted in a modest effect on drinking behaviour by pregnant women. Loney, Green, and Nanson (1994) recommend a wider range of preventative actions, beyond public education and

mandatory warning labels on alcoholic beverages.

Hankin, Firestone, Sloan, Ager, Sokol and Martier (1996) studied 17,456 inner city African American pregnant women to compare the impact of the Federal Alcoholic Beverage Warning Label on multiparae and nulliparae, in an effort to examine whether parity was an important predictor of who heeds the warning label. The time series analysis indicated that multiparous women are not heeding the warning label to the same extent that nulliparous women do. Perhaps they may feel that their offspring are less vulnerable to ARBD. This study emphasizes the need to also target multiparous women for intensive, individualized prevention efforts. Limitations of this study include: a) the results are not generalizable to broader populations due to the unique nature of the study population (inner-city African-American women), b) the self-reporting of drinking was the basis of the outcome measure, and c) there is questionable causality as there may have been some other reason why multiparous women do not heed the beverage warning label.

In a Canadian study (Casiro, Stanwick, Pelech, Taylor, & Child Health Committee, 1994), the effects of a television campaign on the public awareness of the risks of drinking alcohol during pregnancy were examined. Three thousand women between the ages of 15 and 45 who attended physician offices, health clinics, and nursing stations in Manitoba were surveyed before and after a television public awareness campaign. A 30 second message on alcohol and pregnancy was broadcast over a 10 week period by 5 Manitoba television stations. The advertisement was shown a total

of 585 times in prime time and non-prime time slots in English, French, and Cree. The findings suggest that there was an increase in the knowledge level of the women after the television campaign. A significantly higher proportion of women thought that drinking alcohol during pregnancy could cause mental, physical, and behavioural abnormalities in the baby. Limitations of the study were that two separate groups of women were surveyed before and after the campaign, the noted increased awareness may not result in behaviour changes, and the study population was not a true random sample and therefore, the results may not be generalized to the entire Manitoba female population.

Calabro, Taylor, and Kapadia (1996) conducted a study to determine whether health education materials were more effective when written at a lower rather than a higher reading level. Among English-speaking participants, the educational material written at the lower reading level was shown to be more effective, however, Spanish-speaking participants did not show any differences. Study authors recommended using easy-to-read educational materials, but not to rely on written material to communicate important messages. Face-to-face counselling about abstaining from alcohol during pregnancy is also necessary.

Alcohol and attitudes

Ihlen, Amundsen, and Tronnes (1993) investigated the changes in consumption of alcohol among pregnant women between 1984 and 1990, and the general population changes in attitudes toward drinking during pregnancy during the same time frame in a Norwegian population. This cross-sectional study utilized a questionnaire

for pregnant women, and a personal interview for the general population as outcome measures. The women were interviewed about their alcohol consumption at their routine seventeenth week gestation ultrasound examination and also filled out a self-administered questionnaire at the hospital immediately after giving birth. Data on alcohol consumption during the last four months of pregnancy was charted in two samples of mothers five years apart. It was found that alcohol consumption was reduced by half from 1985-1990.

Personal interviews in an equal number of women and men in 1985 and 1990 were used to determine attitudes towards use of alcohol during pregnancy. Participants were asked a mix of closed and open-ended questions. A general trend of changed attitudes was found towards either abstinence or reduction of alcohol use in pregnancy. A larger percentage of women than men thought that women should abstain from alcohol upon the onset of pregnancy.

To Drink Alcohol, or Not to Drink Alcohol

Why?

In 1990, Barbour did a qualitative study that examined the reasons why pregnant women chose to drink alcohol or not to drink alcohol. A small sample of twenty women were interviewed in their third trimester of pregnancy. The open-ended questionnaire was developed by Barbour to gather qualitative data about selected health beliefs and behaviours of pregnant women. Factors that emerged as having an impact on the drinking behaviours of subjects in this study included habit, knowledge and beliefs,

perceived benefits versus perceived risks, social situations and social pressure, perceived role/influence of the significant other, and source of information about alcohol and pregnancy (Barbour, 1990). Of the fourteen women that drank before pregnancy, 57 percent reported a continuation of drinking during pregnancy. Most subjects had knowledge that was incomplete, unclear, or inaccurate. Several subjects reported they had switched from "hard liquor" to beer, reflecting the common misconception that beer is less harmful (Barbour, 1990). Many women in the study described friends or family members who had ingested alcohol during pregnancy and had normal children. Over 60 percent of the study participants had been given information either in writing or in their childbirth education classes that had reassured them that an occasional drink was not likely to be harmful. Small sample size, and the qualitative study design prohibit any attempt to generalize results of this study to other populations.

In a study of 2,266 women attending an antenatal clinic, Waterson and Murray-Lyon (1989) found that the most common reason described by women to give up/reduce smoking and alcohol consumption was their concern for their baby.

In a telephone survey of 781 Michigan residents, Abbey, Smith, and Scott (1993) examined the reasons for drinking alcohol and alcohol consumption. Significant predictors of alcohol consumption were gender, friend's alcohol consumption, coping, and social motives. Men were found to consume significantly more alcohol than

women, and men were reported to feel that both coping and social reasons were more important to them than to the women. African Americans consumed significantly less alcohol than Caucasians. While African Americans rated drinking to cope with stress as more important, Caucasians rated drinking to be more sociable as more important.

As with many other health problems, denial to an individual's susceptibility to the particular concern may be a barrier to taking a preventative action. Most theories regarding health changing behaviours identify perceived risk as an important factor in explaining the behaviour change process. When people perceive their risks of a particular adverse health outcome to be high, they are more likely to take preventative health actions to decrease the risk (Kreuter & Stretcher, 1995). Studies show that many people underestimate their risk of health-related problems. Weinstein (1980) termed this underestimation of risk an "optimism bias" in his theory of Unrealistic Optimism. It is important for health promotion and intervention to identify and try to reduce inaccurate and inappropriate risk perception.

Who?

Smith, Lancaster, Moss-Wells, Coles, and Falek (1987) interviewed 267 women receiving prenatal care at a large metropolitan hospital in the United States to determine whether women who continued to drink during pregnancy could be differentiated from women who discontinued alcohol use during their second trimester of pregnancy based on biological, social, and

behavioural data. Subjects were primarily African American (94%), of low socio-economic status, and unmarried (65%). It was found that subjects in the drinking category differed from the control group in their use of caffeine-containing beverages, cigarettes and marijuana use during pregnancy, and were more likely to associate with men who drank also (Smith et al., 1987).

Floyd, Decoufle and Hungerford (1999) reported risk factors for frequent drinking during the periconceptual period as ascertained from the United States National Center for Environmental Health, Maternal and Infant Health Survey. Risks included one or more of the following: being unmarried, being a smoker, being white non-Hispanic, being 25 years of age or older, or being a college graduate.

A Canadian study by Gladstone et al. (1997) reported that pregnant women surveyed in a clinic (n=3800), or women counselled by telephone (n=23,791) who admitted to drinking alcohol during their pregnancy were significantly younger than those who did not drink during their pregnancy, were more likely to be single, and to be Caucasian. Those who reported binge alcohol consumption often reported using cigarettes, cocaine, marijuana, and other illicit drugs.

Prevalence rates in Saskatoon on prenatal exposure to alcohol, tobacco, psychoactive drugs, and caffeine were examined by Muhajarine, D'Arcy, and Edouard (1997). Personal interviews were conducted with 605 pregnant women. The most commonly used substance was caffeine (87 percent), followed by alcohol (46 percent). Risk behaviours were more prevalent among women with

lower educational and income levels, Aboriginal or Metis background, those not living with a partner, those with a previous birth, and in some cases, younger women.

Dejin-Karlsson, Hanson, and Ostergren (1997) also found that in spite of the official Swedish alcohol recommendations for total abstinence during pregnancy, more socially active and more highly educated women continue drinking alcohol, with wine being the beverage of choice. It was suggested that this was possibly more of a social behaviour rather than to cope with stress caused by insufficient psychosocial resources. Younger women, or those with fewer years of education tended to stop drinking to a higher degree, but those who continued to drink during their pregnancy tended to drink beer or binge.

Social support

Alcohol consumption by women is closely connected to alcohol consumption by their partner, and to consumption in their immediate environment (Bresnahan, Zuckerman, & Cabral, 1992; Hammer & Vaglum, 1989; Rubin, 1988; Smith et al., 1987). The greater likelihood of alcohol use among other family members suggests that the drinking behaviour of the continued-drinker group may be heavily influenced by familial attitudes toward alcohol use.

Five studies focussed on the levels of social support of pregnant women, and the effects on their drinking behaviour. Aaronson's (1989) correlational study explored the effects of several measures of social support (perceived and received, general and specific) on three health behaviours during pregnancy: abstinence from alcohol, cigarettes, and caffeine.

Five hundred and twenty-nine pregnant women who were sampled from a number of private obstetricians' offices as well as from several large health centres including those with nurse-midwifery clinics, completed written questionnaires and participated in telephone interviews. General measures of perceived social support were calculated using a valid and reliable Personal Resources Questionnaire (PRQ) that measured five aspects of general support: worth, intimacy, social integration, nurturance, and assistance. Specific measures of the women's perceived social support were determined by asking questions about significant others and their feelings about, for example, her drinking during pregnancy. Specific received support measures were determined by asking questions about family members' specific behaviour, for example, if anyone in the woman's home drank alcoholic or caffeinated beverages and/or smoked. Findings demonstrate that both perceived and received support contribute to pregnant women's adherence to recommended health behaviours. General social support was not a significant predictor of any of the behaviours studied. Results provide strong support for actively involving the family in prenatal care. Because this study has a homogeneous, middle class sample, the results can not be generalized to ethnically diverse or lower socio-economic groups.

A correlational descriptive study which assessed health behaviours, anxiety levels, and social support of 47 pregnant women was reported by Albrecht and Rankin (1989). Health

behaviours were assessed by a Health Behaviour Demographic Questionnaire. Anxiety levels were assessed with the State Trait Anxiety Inventory, and social support was measured with a Personal Resource Questionnaire. It was found that pregnant smokers, who were more likely to have higher levels of education, were also more likely to be alcohol drinkers during their pregnancy. There was a significant relationship between higher anxiety scores and decreased amount of support. The majority of women with high anxiety scores were older, had been married longer, were well educated with professional or managerial careers. Women with less support had a higher prevalence of alcohol consumption. This study has implications for the further development of nursing interventions to enhance health coping strategies in the workplace, and to decrease the job-related stress during pregnancy.

Bresnahan, Zuckerman, and Cabral (1992) studied the psychosocial correlates of drug and heavy alcohol use among 1,226 pregnant women. Results from the questionnaire showed that women with substance using partners were five times more likely to be substance users, compared with women who do not report substance abuse by a partner. It has been proposed that women are often introduced to drugs by men and they continue to use drugs and alcohol within the context of their relationship to men. For example, it has been suggested that the drug is the common bond that helps maintain the relationship (Bresnahan, Zuckerman, & Cabral, 1992). This study highlights the importance of considering women and families within the context of their relationships.

Women who use drugs and large amounts of alcohol within the context of their relationship to their partners face the double loss of a primary coping mechanism (drug use) and a primary love relationship when professionals recommend they stop their substance use. Because the relationship likely has a basis in the use of substances, when a pregnant woman rejects alcohol, she is also seen to reject the man and the relationship. Though pregnancy or a new baby may be a strong motivating factor to pregnant women who enter treatment, a drug using partner may be a potentially imposing barrier.

In a Norwegian study of 3,997 pregnant women and their husband's alcohol consumption during pregnancy, Hammer and Vaglum (1989) found that the husband's alcohol consumption significantly impacted on the wife's alcohol consumption. Women in traditional occupations used significantly less alcohol than women in male dominated professions. Smith, Lancaster, Moss-Wells, Coles, and Falek (1987) also reported that pregnant women in their study most often drank with other family members.

Ihlen, Amundson, Sande, and Daae (1990) interviewed 416 Danish women at their seventeen week gestation ultrasound regarding the use of alcohol, tobacco, legal and illegal drugs. They found a significant decrease in alcohol consumption, and a correlation between the use of intoxicants by pregnant women and the use of such substances by other significant persons in the environment. There was no correlation between socio-economic status and the use of intoxicants.

Three hundred and ten couples in Jerusalem who delivered at

four major Jewish hospitals completed questionnaires to determine spousal concordance for high risk behaviours among expectant parents (Dunn, 1985). The results showed a high degree of spousal concordance for alcohol, smoking, and caffeine consumption. Dunn recommended that health care professionals work with expectant couples as a family unit to change risk behaviours. Spouses influence each other and can motivate and support each other in changing their risk behaviour.

In a study by Lelong et al. (1995), 176 women were asked who could be helpful in decreasing their alcohol consumption. Most women mentioned their partner, and their doctor or midwife.

The role of education and social support of pregnant women with regard to health behaviours, cannot be under emphasized (Stephens, 1985). Information alone may not be sufficient motivation to enable women to discontinue alcohol use. Literature suggests that a social network which recognizes the potential risks of drinking during pregnancy and is supportive of a pregnant woman's desire to avoid alcohol may help her to reduce or stop drinking. A social network that dismisses warnings about the dangers of alcohol consumption may fail to discourage pregnant women from drinking.

Effective prenatal intervention programs must include strategies that address the needs of the chronic alcohol abuser as well as the social drinker; the former constitutes the highest risk group for adverse pregnancy outcomes (Smith et al., 1987).

Conclusion

In summary, the literature reveals historical warnings against the use of alcohol in pregnancy. A plethora of current scientific findings have linked a definite pattern of birth defects to prenatal alcohol ingestion, yet the incidence of FAS and FAE continues to soar in North America. There is a wide variation of prevalence rates among specific cultural groups and certain social groups, and conflicting findings with regard to identified risk groups. Initial studies reported that women more likely to drink during pregnancy had less social support, less education, less family income, and were of Aboriginal or African American heritage. Contrastingly, more recent studies have also identified pregnant drinkers as having higher life stress levels, higher levels of education and income, being Caucasian, and over twenty-nine years of age. A conclusion that one may make from conflicting reports is that by studying a greater variation of women from different backgrounds, we have found that alcohol consumption by pregnant women is not just one group's problem. Because studies have tended to focus on isolated pockets of people, it has been difficult to discern the reality of this phenomenon. The reasons why women choose to drink alcohol during their pregnancy has had relatively little attention (Stratton, Howe, & Battaglia, 1996; Schorling, 1992). Some studies have reported a lack of education and knowledge of the risks of perinatal alcohol abuse, although information alone may not be sufficient motivation to enable some women to discontinue alcohol use in pregnancy. Social support has been shown to influence health behaviour, and the lack of support

has been shown to be an important factor in decision making. Support from the partner, family, and social systems is an important factor for determining alcohol consumption in pregnancy (Stevens, 1985; Dunn, 1985). An assessment of lack of susceptibility to having a child with birth defects may also play a role in why a woman would choose to drink during pregnancy. This issue is a very complex one, and using the Health Belief Model as a conceptual framework, this study attempted to describe women's assessments and thoughts about alcohol consumption during pregnancy.

CHAPTER III

METHODOLOGYIntroduction

One of the greatest tragedies of children with FAS/FAE and ARBD is that it is 100 percent preventable and 100 percent irreversible. The financial, emotional, and social burdens of each ARBD child is immeasurable. Despite isolated attempts to educate and prevent ARBD, the incidence of FAS/FAE remains high, and in some communities is at an epidemic proportions (Square, 1997; Robinson, Armstrong, Moczuk, & Loock, 1992). This study was designed to explore the knowledge, beliefs, attitudes, behaviours, and reasons that women give for drinking alcohol or not, during pregnancy. The information gathered could potentially be used to direct future preventative efforts in an appropriate direction.

This chapter will outline the design and methodology used for this qualitative and quantitative study. The setting, sample population and size, criteria for sample selection, subject recruitment, instrumentation, procedure, ethical considerations, and methods of data collection and analysis will be reported.

Research Design

The design of this study is a descriptive cross sectional survey. A researcher-developed self-report questionnaire with open and closed ended questions provided the researcher with quantitative and qualitative data on knowledge and beliefs about FAS/FAE and the risks of drinking during pregnancy, and how and why women made the choice of consuming alcohol and other substances,

such as caffeine and nicotine, during pregnancy. Because there are social issues related to the subject matter, a questionnaire was chosen to provide women with some degree of anonymity in answering questions. The questionnaire was designed using modified questions/questionnaires from other researchers (Testa & Leonard, 1995; Casiro et al., 1994; Rosett, 1981; Weinstein, 1980), with a combination of open and closed ended questions.

Settings:

The data was collected from a variety of settings in an attempt to capture the diversity of the population. The following settings in Winnipeg, MB were used:

- 1) St. Boniface General Hospital
 - a) Outpatient Obstetric Clinic
 - b) Fetal Assessment Unit
- 2) Health Sciences Centre
 - a) Outpatient Obstetric Clinic
 - b) Adolescent Obstetric Clinic
 - c) Fetal Ultrasound Unit
- 3) Obstetrician Private Practice

By using multiple settings in different areas of Winnipeg, an attempt was made to capture data from women from a wide range of socio-economic, cultural and ethnic backgrounds. By sampling women from tertiary care centres, clinics, prenatal classes, and adolescent programs, it was hoped that the information gained from the study would be more representative of society at large.

Personal contact was chosen as the method of both recruitment

and data collection rather than utilizing a mailed survey in order to improve the chances of mother's participation (Diekmann & Smith, 1989). Although an attempt was made to ensure privacy during completion of the questionnaire, the researcher was near by to answer questions, allay anxiety, and clarify items on the questionnaire (Cantanzaro, 1988).

Sample

The sample population of interest for this study was pregnant women who were at least 18 years of age and 24 weeks gestation. A convenience sample of one-hundred and twenty-six pregnant women from health care settings in Winnipeg, MB was chosen based on the following criteria:

- 1) at least 18 years of age.
- 2) able to read, understand, and write in English
- 3) willing to give informed consent for study participation.
- 4) at least 24 weeks gestation.

A sample of 126 pregnant women who were at least 18 years of age and 24 weeks gestation was sought to gather data. An attempt to gather information from women of various backgrounds was made.

With the use of nonprobability sampling, the researcher must provide detailed information about the sample so that others may assess it's representativeness (Wood & Brink, 1989). This was addressed through the collection and summarization of subject demographic information.

Subject Recruitment

To recruit subjects, the principal investigator identified potential subjects through discussions of study criteria with health care providers (physicians, nurses) at each setting. Potential subjects were first approached by an employee of the institution they were attending and asked if they would allow the researcher to contact them (Appendix C). If the potential subject agreed to this, they were given a verbal and written explanation (Appendix D) of the study by the researcher. If the pregnant woman consented to be a study participant, informed consent was obtained, the consent form was signed (Appendix E), and the questionnaire was administered (Appendix F).

Instrumentation

There is not a specific tool that has been developed for this type of study, therefore a suitable instrument (Appendix F) was developed by combining several previously used tools. Demographic data and obstetrical information was collected to describe the sample. Information on drinking and smoking before and during pregnancy for both the pregnant woman and her significant other was collected. The T-ACE was incorporated to assess for problem drinking, and the knowledge of risks was determined by a five question true/false quiz designed by Casiro et al. (1994). A check list of information sources served to identify helpful teaching aids. Susceptibility, severity, and seriousness were determined by questions using a visual analogue rating scale. Visual analogue and open ended short answer questions were used for subjects to

describe benefits and barriers to changing drinking behaviour during pregnancy. An open ended question was used to determine what factors were involved in the decision making process of the pregnant woman. Finally, there was an opportunity for subjects to make any additional comments on the questions asked.

The questionnaire was pilot tested with a group of 5 women. It was scrutinized for clarity, appropriate wording, readability, ability to elicit the intended information, and length of time to complete. Comments were used to improve the questionnaire and changes were forwarded to a group of experts for approval.

Procedure

Approval of access to all of the health care institutions was obtained. Administrative personnel for each institution were contacted, and a request for their assistance and cooperation in carrying out the study was made. Information regarding the study was given to inform staff of the purpose and procedure of the proposed study. A schedule was made and circulated, and contained specific dates and times for data collection at each institution.

Data collection took place over a three week period (N=126).

The questionnaire was administered by person.

Initial permission for the researcher to approach potential subjects was obtained by an employee of the particular institution (Appendix C). With permission, the researcher approached appropriate subjects at the designated institutions in the agreed upon time frame, and stated the purpose of the study (Appendix D).

The subjects were invited to participate in the study. Those

consenting signed the consent form (Appendix E) and filled out the questionnaire (Appendix F). A quiet setting was found to fill out the questionnaire, but many of the subjects chose to complete the questionnaire in the waiting area. The researcher circulated during the time of questionnaire completion so that she was accessible to answer questions or provide clarification of questions, as necessary. One subject requested to take the questionnaire home to complete it and then mailed it to the researcher. Completed questionnaires were placed in sealed envelopes and returned to the investigator.

All subjects were given identical information regarding confidentiality, anonymity, and the right to discontinue participation at any time.

Ethical Considerations

Ethical review was obtained from the Ethical Review Committee of the Faculty of Nursing at the University of Manitoba (Appendix G). Formal access to the involved health care agencies was obtained prior to commencement of data collection. This study involved no manipulation of variables, or experimental conditions imposed on the subjects or their fetuses.

Prospective subjects were given written (Appendix D) and verbal explanations of the study, and invited to participate. Informed consent (Appendix E) was obtained and subjects were assured that their participation was strictly on a voluntary basis and that there would be opportunity to discontinue participation at any time if the subject wished, without discrimination. There was

a risk of subject embarrassment due to the socially sensitive issue of alcohol consumption during pregnancy. Confidentiality measures, such as completing the questionnaire anonymously, placing it in a sealed envelope, and storing it securely for ten years in a locked file cabinet were attempts to deter feelings of embarrassment, and assist with improving accuracy or validity of data, as much as possible. There were no known risks associated with participation in the study, and subjects were informed that there would be no direct benefits to them for their involvement, other than the recognition that they would be contributing to the generation of information that may be of benefit to community health in the future. There were no monetary costs of participation, nor remuneration for such participation.

Subjects were assured of confidentiality. They were not identified in any way and raw data is stored in a locked filing cabinet for ten years, at which time it will be destroyed. Only the investigator, the thesis committee, and a statistical consultant had access to the raw data. Although the researcher has knowledge of who has participated in the study because of the signed consent forms, the names and questionnaires were not matched and therefore, the data remains anonymous to the investigator, also.

Participants were given the option of obtaining a copy of the study findings. A summary of the findings has been compiled and mailed to three participants who wished to receive a copy. This opportunity was provided during the recruitment phase and/or at the completion of the questionnaire. Also, study summaries have been

sent to the participating institutions.

Each participant was offered an information pamphlet on the effects of drinking during pregnancy/FAS upon completion of the questionnaire. Because the women were not identifiable and some were not knowledgeable about the risks of drinking during pregnancy, an information pamphlet may have influenced future behaviour.

Also, at the end of the questionnaire, a note was included that if questions were answered in a certain way, it may be harmful to the woman and/or her baby and that she should discuss this with her health care provider.

Data Analysis

Upon completion of the data collection, quantitative data was scored, coded, and entered onto computer statistical analysis software SPSS, and content analysis was done for the qualitative questions.

Demographic data and the obstetrical data were summarized with descriptive statistics. Calculations of frequency distribution, measures of central tendency, and variability completely describe a set of data (Polit & Hungler, 1991). Questions that have a yes/no/unsure response were summated by response and reported as a group percentage. The true or false questions that relate to knowledge (Casiro et al., 1994) were analysed in the same manner. On questions that utilized the visual analogue scale (VAS), each response received a score of 0 - 100, depending on where the respondent drew a mark across the 100 mm length line. The group

mean was determined for each of the VAS questions. Multiple choice answers were tallied and reported as the percentage of respondents who made each choice.

The four questions that compose the T-ACE Questionnaire, a screening instrument for problem drinkers, were examined as an entity for each respondent. Two affirmative answers of a potential four classified the respondent as a "problem drinker". All respondents categorized as problem drinkers were reported as a percentage of the study sample.

Content analysis was used to summarize the qualitative data from the open-ended questions. Content analysis is useful for quantifying information in an objective and systematic way (Polit & Hungler, 1987). Qualitative analysis was done using a content analysis format as described by Polit and Hungler (1993).

The data analysis process began with organization of the material by devising a method for indexing the content. Indexing involved the development of a coding scheme that related the major topics under investigation. Once a coding scheme was developed, the data was reviewed for content and coded according to the topic that is being addressed (Polit & Hungler, 1993). Conceptual files were then created to facilitate review of topical areas. Induction, or the process of developing generalizations from specific observations, was used to search for themes in the data. Finally, the researcher "strived to weave the thematic pieces together into an integrated whole" (Polit & Hungler, 1993) by interrelating the various themes. Chi

square tests were used to compare different variable means of interest.

Conclusion

In summary, a descriptive cross sectional survey was distributed by the researcher to a convenience sample (N=126) of pregnant women of at least 18 years of age and 24 weeks gestation. An attempt was made to collect data from a variety of settings to capture a diverse population. The tool that was used is a composite of several tools. Ethical review was obtained from the University of Manitoba Faculty of Nursing Ethical Review Committee, and approval of access to all health care institutions was obtained. Potential subjects received written and oral explanations of the study, and signed a consent form before filling out the questionnaire. Measures to ensure subject confidentiality were enforced. Data was analysed using SPSS computer software for quantitative data, and content analysis was done for qualitative data. Demographic and obstetrical data was analysed using descriptive statistics.

CHAPTER IV

RESULTSData Analysis

The purpose of this study was to explore five questions:

1. What are pregnant women's knowledge levels about the risks of drinking alcohol during pregnancy, and FAS/FAE?
2. What is the perceived susceptibility of the women's unborn children to FAS or FAE?
3. What is the perceived severity of FAS or FAE to pregnant women's unborn children?
4. What factors do women consider when making the decision to drink alcohol, to decrease drinking alcohol, or to abstain from drinking alcohol?
5. What are the perceived benefits and barriers to abstention of alcohol during pregnancy?

One hundred and twenty-six pregnant women who were at least twenty-four weeks gestation completed the study questionnaire (Appendix F). One hundred and seventeen of those questionnaires were included in the study.

Data were coded and transcribed onto a computer file by the investigator. The SPSS computer program was used for quantitative data analysis. Demographic data was summarized with descriptive statistics. Open ended questions were analysed using content analysis.

This chapter reports findings from the data analysis. The

sample characteristics will be described, then the research questions will be addressed. Finally, data will be examined for possible relationships between various demographic variables as it relates to prenatal alcohol consumption.

The Sample

The total sample included 126 pregnant women who were seeking prenatal care in antenatal clinics or fetal assessment units in two tertiary care hospitals, or seeking prenatal care at a six physician obstetrical practice in urban Winnipeg. Nine questionnaires were discarded because they were not complete, leaving an end total sample of 117.

Potential subjects were invited to complete the questionnaire or to learn more about the study by the antenatal, fetal assessment, or office personnel. Once the potential subject agreed to be approached by the researcher, contact was made and the study was explained. After the woman agreed to participate in the study, she was given the questionnaire and envelope, and invited to complete the questionnaire in a private room, if desired. The time of completion ranged between 7 and 25 minutes; some completed it prior to their appointment, some completed it after their appointment, while others began it before their appointment and completed it after.

Demographic Data

The average age of the study participants was 28, with a range of 18 to 44 years of age, a mode of 29, and a standard deviation of

6.0. Eighty-six percent were married, 11 percent were single, and 3 percent were separated or divorced. Minimum education level attained was grade 8 while the maximum education level completed was 17+ years or graduate study. The average number of years of education attained was 13 years, with a standard deviation of 2.2 and a mode of 12 years. The family income ranged from less than \$10,000 to more than \$100,000 per year. The average family income was in the \$40,000 to \$49,000 range, with a standard deviation of 2.9, and a mode in the \$30,000 - \$40,000 range. Eighty-two percent of participants were Caucasian, 9.5 percent were aboriginal, 2.6 percent were African American, 0.9 percent were Asian, 2.5 percent were of mixed background, and 2.5 percent considered themselves to be of "other" background.

Maternal and Obstetrical History

The number of pregnancies for each participant ranged from one to eight. On average, the current pregnancy was the second, with a standard deviation of 1.4, and a mode of 2. Sixty-eight percent stated that this was a planned pregnancy while 32 percent stated that the current pregnancy was unplanned. The average gestation of study participants was 34 weeks with a range between 24 to 41 weeks, three modes of 36, 37, and 38 weeks, and standard deviation of 4.4. Eighty-seven percent had at least some caffeine intake (in the form of coffee, tea, cola or chocolate) during the pregnancy and seventy-six percent reported that they were non-smokers. Of the 24 percent who smoked, the average number of cigarettes per day

was 2, with a mode of 5 cigarettes per day. There was a range of 1 to 18 cigarettes per day and a standard deviation of 4.2. Twenty percent of the study participants claimed that they abstained from drinking alcohol at all times. Of the eighty percent who drank before their pregnancy, only 9.4 percent drank during their pregnancy. The alcoholic drinks of choice were as follows: 9 drank wine, 4 drank beer, and 1 drank liquor.

TABLE 1

The Sample: Demographic Variables/Maternity History

Variable	Range	Mean	Standard Deviation
Age	18 - 44	28.2	6.0
Education (years)	8 - 17+	13.2	2.2
Income (in thousands)	<10 - >100	40 - 49	2.9
# of Pregnancies	1 - 8	2.3	1.4
Gestation (weeks)	24 - 41	34.2	4.4

TABLE 2

Demographic/Maternity History Frequency Distributions

Variable	Frequency	Percent
Marital Status		
Married	101	86.3
Single	13	11.1
Divorced/Separated	3	2.6
Ethnicity		
Caucasian	96	82.0
Aboriginal	11	9.5
African American	3	2.6
Asian	1	0.9
Mixed	3	2.5
Other	3	2.5
Pregnancy		
Planned	79	67.5
Unplanned	38	32.5
Caffeine Consumption		
Yes	102	87.2
No	15	12.8
Tobacco Use		
Yes	29	24.8
No	88	75.2
Alcohol Intake		
None	23	19.7
Before pregnancy only	94	80.3
Before & during pregnancy	11	9.4

The Excluded Group

Nine participants were excluded from the study because the questionnaires were incomplete. Six participants needed to leave prior to completing the questionnaire, two participants had omitted one entire page of the questionnaire, and one questionnaire was partially completed by the husband of the participant even after

the researcher explained that it was to be completed by the pregnant woman.

Based on the available information, the average age of the excluded group was 25 years, with a range of 18 to 33 years. Six were married, two were single, and one was separated or divorced. The education level completed ranged from grade 9 to grade 12, with an average education level completed being grade 10.5. Eight of the nine women who were excluded from this study used caffeine, and three of the nine women smoked. Although statistical testing was not done, there appears to be little difference between those included and those excluded from the study.

TABLE 3

The Excluded Group: Demographics and Maternity History

Variable	Range	Mean	Standard Deviation
Age	18 - 33	25.0	5.7
Education (years)	9 - 12	10.5	1.1
# of Pregnancies	1 - 6	2.8	1.8
Gestation (weeks)	25 - 39	34.3	4.9

Research Question #1

What are pregnant women's knowledge levels about the risks of drinking alcohol during pregnancy, and FAS/FAE?

The knowledge levels of study participants was ascertained by six questions. Five of these questions were answered with a "true/false/don't know" response, and one was a multiple choice answer. Knowledge scores ranged from zero to six, with an average score of five, and a standard deviation of 1.1. The median score were five, and the mode was six. Forty-eight percent of study participants answered all of the six questions correctly. Seventy-nine percent of the respondents answered at least five of the six questions correctly, and ninety-two percent answered at least four of the six questions correctly. Eight percent scored less than 50 percent.

TABLE 4

Knowledge Scores Frequency Distribution

Variable	Frequency	Percent
Score (out of six)		
0	1	1
1	0	0
2	2	2
3	6	5
4	15	13
5	36	31
6	56	48

Questions number one and two were answered the most successfully. The first question asked whether alcohol ingested by the mother reaches the fetus, and was answered correctly by 94 percent of subjects. The second question asked if drinking alcohol during pregnancy could harm the fetus, and was answered correctly by 97 percent of the participants.

Questions number three and six were answered the least successfully. The third question asked if the risk to the fetus depended on the mother's age, and was answered correctly by 79 percent of the study subjects. The sixth question was a multiple choice question that asked for a simple definition of Fetal Alcohol Syndrome, and was answered correctly by 74 percent of the subjects. Twenty-six percent of participants incorrectly believed that a child with Fetal Alcohol Syndrome was born drunk or addicted to alcohol.

Question number four asked if the risk to the fetus is the same for all alcoholic drinks and was answered correctly by 90 percent of the participants. Question number five asked if there is a safe amount of alcohol that can be drunk during pregnancy and was answered correctly 88 percent of the time.

When asked about their role in preventing FAS/FAE, 86 percent of the respondents correctly answered that FAS/FAE can be completely prevented. Twelve percent of the study sample felt that their actions had a large effect on the occurrence of FAS/FAE. Two respondents (2 percent) answered affirmatively to both of the above options. No participants responded that they had no or little effect on the occurrence of FAS/FAE/ARBD in their

fetus.

When asked to estimate the incidence of FAS/FAE in Canada each year, responses ranged from 0 to 90 percent, with a mean of 21.5 and a standard deviation of 18.9. The mode was 10 percent, with the second most common estimation being 30 percent. The breakdown of estimations for the yearly percentage of FAS/FAE incidence is as follows:

TABLE 5

Estimated yearly incidence of FAS/FAE in Canada

incidence FAS/FAE (%)	number of responses	Percent
0 - 5	19	16.4
6 - 10	19	16.4
11 - 15	13	11.2
16 - 20	12	10.0
21 - 50	36	31.0
51 - 100	7	6.0
unsure	10	8.6

Knowledge sources

The study participants were asked to list the sources that contributed to their knowledge of FAS/FAE and the effects of alcohol consumption during pregnancy. The most frequently cited media for gaining this knowledge was newspapers and magazines (82 responses), and television (81 responses). Fifty-seven women

credited family and friends with offering information, 51 women credited physicians and nurses, and 36 stated that they got FAS/FAE information from school. Radio advertisements were an information source for 26 women, alcoholic beverage warning labels were a source for 22 women, and 6 women wrote that they "just guessed". Other sources of information noted by 15 women included: teacher inservices (3), common sense (2), work (2), pregnancy books (2), prenatal classes (2), common knowledge (1), husband (1), Addictions Foundation of Manitoba (1), "information gathered over the years" (1), and having "seen it first hand" (1).

TABLE 6

Sources of Knowledge: Frequency Distributions

<u>Variable</u>	<u>Frequency</u>	<u>Percent</u>
Knowledge Source		
newspaper or magazine	82	70
television	81	69
family and/or friends	57	49
doctor or nurse	51	44
school	36	31
radio	26	22
alcohol beverage label	22	19
"other"	15	13
<u>guessed</u>	<u>6</u>	<u>5</u>

When asked to list the sources of information on FAS/FAE and the perils of alcohol consumption during pregnancy, 37 percent of participants had exposure to one or two sources of information, 44 percent of the women had exposure to three or four sources of information, 13 percent had exposure to five or six sources of information, and 6 percent of the respondents had exposure to seven or eight sources of information.

Research Question #2

What is the perceived susceptibility of the women's unborn children to FAS or FAE?

Questions that rated risk and perceived susceptibility utilised a visual analogue scale in which the study subject made a mark on the line where they perceived their risk to be. One end of the line was marked as "very high risk" and the other end of the line was marked as "very low risk". The line was 100 mm in length and therefore, the mark corresponded with the percentage of risk to a particular situation.

When asked to consider their perceived risk of having a baby with something wrong, where 0 was considered to be no chance at all and 100 was considered to be an extremely high chance, responses ranged from 0 to 93. The group mean for the risk of having a baby with something wrong was 27.8, with a standard deviation of 19.3. The median was 23 and the mode was 20.0. Many participants made a comment as to the reason that they felt this

way. Reasons noted for this were: age, previous miscarriage or having had a previous baby with health problems, diabetes, smoking, being around pot smoke, being adopted and not knowing family history, family history, maternal health problems, and being paranoid.

When asked about their perceived chance of their baby being born with something wrong due to alcohol consumption, where 0 was considered to be no chance at all and 100 was considered to be an extremely high chance, responses ranged from 0 to 100. Eighty-one percent of respondents felt that the risk was between 0 and 30. The other 19 percent of participants felt that the risk of having a baby with a problem related to maternal alcohol consumption in pregnancy was between 68 and 100. The group mean was 20.1, with a standard deviation of 34.8. The median was 2.0 and the mode was 0.

Study participants were asked to compare themselves with other women of the same age and in the same neighbourhood, and rate their perceived risk of having a baby with something wrong due to alcohol consumption. Zero represented no chance at all and 100 represented an extremely high chance. Responses ranged from 0 to 99. Seventy-four percent of respondents placed the mark between 0 and 10. Ten percent marked the line between 71 and 100. The group mean was 13.9, with a standard deviation of 26.9. The median was 2.0 and the mode was 0.

FAS/FAE exposure

Awareness of health care issues often relates to a person's exposure to the issue. Seventy-one percent of the study

participants did not know any person with FAS/FAE. Twenty-one percent of the women had acquaintances who had FAS/FAE (for example, neighbours, school mates, students), and 10 percent had relatives or good friends with FAS/FAE. Some respondents know of individuals with FAS/FAE who are acquaintances and relatives or friends.

Research Question #3

What is the perceived severity of FAS or FAE to pregnant women's unborn children?

The severity of having a child with FAS/FAE was measured by a visual analogue scale question where 0 indicated that it would not be serious at all, and 100 indicated that it would be extremely serious. Responses ranged from 0 to 100. Fifty-three percent of the study participants placed a mark on the line between 90 and 100. Fourteen percent placed their mark between 71 and 90, 5 percent placed their mark between 51 and 70, and 3 percent placed their mark between 41 and 50. Two percent placed their mark between 11 and 30, and 17 percent placed their mark at 0 to 10. The group mean was 73.0, with a standard deviation of 37.5. The median was 96.0 and the mode was 100.0.

Research Question #4

What factors do women consider when making the decision to drink alcohol, to decrease drinking alcohol, or to abstain from drinking alcohol?

Study participants answered a three part question that queried why women consumed alcohol, decreased alcohol consumption, or stopped drinking alcohol during pregnancy. Some women could potentially fall into 2 different categories (for example, alcohol consumer and decreased alcohol consumption, or decreased alcohol consumption and abstainers), and a number of those women did make comments in both sections. Answers were grouped according to the response and content analysis was done for each category.

Twenty-three of the 117 study participants reported that they were non-drinkers. Ninety-four of the 117 participants stated that they drank before they became pregnant but only 11 of those 94 women reported that they consumed alcohol during their pregnancy.

Alcohol consumers

When the eleven study participants who continued to consume alcoholic beverages during their pregnancy were questioned as to why they did so, 10 women responded that they did so mainly on social or special occasions. One subject wrote that she "enjoyed having a glass of wine with a nice dinner and felt that as a special treat it was something she deserved", and another woman wrote that she drank "to join in celebrating special occasions". "I

had one glass of wine on my anniversary. I enjoy it with a special occasion or a meal". Three women commented that they enjoyed the taste of alcohol. "I have a few sips of my husband's beer if it is really hot. Why? Because it is cold and just to taste".

It was noted that several women wrote comments that implied that they believed that the effects of alcohol on the fetus is more harmful in the earlier part of pregnancy. Three women stated that they drank because "the baby was almost completely term". As one wrote, "I have read about the effects of alcohol and pregnancy but felt that a single glass on a rare occasion during latter pregnancy would not affect my baby". Another woman confessed that she had a glass of wine on special occasions - after the first trimester".

Two women said that they drank "out of habit", while two other subjects drank to "relieve perceived stress".

Two women stated that they continued to drink because they did not realize that they were pregnant. As is often the case, one woman wrote, "I did drink in the first month of pregnancy (quite heavily on one occasion) but I didn't know I was pregnant". The other subject also regretted her lack of knowledge of being pregnant and said, " I had an occasional drink around Christmas (brandy) which I wouldn't have had if I had known that I was pregnant".

TABLE 7

Categories For Choosing to Drink

Category	Frequency
1. Social or special occasions	10
2. Enjoy the taste	3
3. Baby near to term gestation	3
4. Habit	2
5. Stress relief	2
6. Didn't know that they were pregnant	2

Decreased alcohol consumption

This study included 94 women who consume alcohol. Eighty-three of those women abstained during pregnancy. The eleven participants who continued to drink throughout their pregnancy may also have decreased their consumption, and therefore, may fall into this category.

Those that decreased alcohol consumption during pregnancy stated that they did so for three main reasons. Nine women commented that the baby's health was their primary concern. One woman wrote that "the literature that I have read indicates that alcohol affects the baby's health and development" and another woman explained that "the negative effects are transferred to the child/fetus through the blood, and it could hurt my baby if I

drink too much". Some stated that "it was not worth the risk of potential harm to the baby". Three women referred to wanting to give the fetus every chance with the best environment possible.

Maternal health was a stated concern for two women. One woman stated that she decreased alcohol consumption during pregnancy because she feels sick if she drinks too much. Another woman wrote that in the first trimester, she "couldn't drink even if she wanted to".

TABLE 8

Categories for Choosing to Decrease Alcohol Intake

Category	Frequency
1. Health/benefit of baby	9
2. Health of mother	3

Abstainers

Twenty-three of the study participants professed to be non-drinkers before and during pregnancy. Of the other 94 women who comprise the study sample, 83 allegedly abstained from alcohol consumption during pregnancy. "Health reasons" was the most frequent reason given for abstaining from alcohol during pregnancy. Ninety-nine women commented that they abstained for the health of the baby (71), to prevent FAS (20), for their own health (4), or because drinking alcohol was "unhealthy" (4). A

poignant statement by one participant sums it up for so many of the participants: "I believe that I want to give my child every chance to have a healthy life. Drinking any amount of alcohol may take that chance away. My child is more important than a drink". Four women simply wrote that they "didn't believe in drinking alcohol during pregnancy".

"Guilt" was noted by 3 women as the force that helped them to abstain. They stated that they "would feel guilty and would not be able to forgive themselves, especially if something then happened to the baby". One woman wrote that "it's only nine months, and I can live without it (alcohol) for that time period - I couldn't live with myself if anything were to go wrong".

Three respondents stated that abstaining was "an informed choice", and that "it was an easy compromise", and that "it was not a big sacrifice to improve the health of her baby. It is not worth compromising the baby's health". One woman wrote that "drinking during pregnancy is just plain dumb".

TABLE 9

Categories for Choosing to Abstain from Alcohol

Category	Frequency
1. Health Reasons	99
a) health of baby	71
b) FAS prevention	20
c) health of mother	4
d) unhealthy behaviour	4
2. "Don't Believe in it"	4
3. Guilt	3
4. Easy Compromise	3

Research Question #5

What are the perceived benefits and barriers to abstention of alcohol during pregnancy?

Participants were questioned regarding abstaining from alcohol consumption during pregnancy and if they thought this would be good or not good. Women were also asked if there were reasons that they could not decrease or abstain from alcohol during pregnancy. They were given the opportunity to explain what they felt aided them to make the decision to abstain from or

decrease alcohol intake during pregnancy and also, what inhibited them to do so. Responses were divided into the categories of benefits and barriers.

Benefits to alcohol abstention during pregnancy

When asked if they thought that it would be good to stop or decrease drinking alcohol during pregnancy, participants used a visual analogue scale, where 0 indicated that this would not be very good and 100 indicated that this would be very good. Answers ranged from 45 to 100. Ninety-five percent of the respondents placed their mark between 91 and 100, 3 percent placed their mark between 81 and 90, and 1 percent placed their mark between 61 and 70. The one respondent who put their mark at 45 stated that she thought that "everything was okay in moderation". The group mean was 97 with a standard deviation of 7.7. The mode was 100.0.

A vast majority of the women surveyed commented on wanting to abstain for reasons relating to health. One hundred and thirteen of the respondents commented that a motivating factor to alcohol abstention during pregnancy was for the health and development of the fetus, "to prevent FAS", for the health of the mother, and for simply "health reasons".

Most of the comments that related to the health of the baby (83) referred to not wanting to harm the baby, to "ensure normal physical development of the baby", "to decrease the risk of baby being born with birth defects", and to "prevent the baby from getting FAS". There were several responses that talked of more

specific symptoms of FAS/FAE. Two of the study participants identified themselves as school teachers who worked with FAS/FAE children and one stated that she is aware of the harmful effects. Two women stated that they did not want their child to have a "learning disability growing up", and one woman referred to the "lifelong damage in a person" caused by alcohol. One respondent wrote of the tragedy when "a child unnecessarily does not reach it's full potential", and one woman commented that "it is not good to drink because the baby is getting drunk too, and baby can get Down Sindrum". The normal development of the baby was a benefit cited by 12 study participants for abstaining from alcohol during pregnancy. Six respondents mentioned the health of the mother as being a factor in abstaining, and seven women simply stated that "health reasons" (undefined) were the incentive for halting alcohol consumption.

Guilt appeared to be an important factor for at least eight women. One respondent queried, "who wants to live with the damaging effects it could leave your child with?". Another participant expressed that she "didn't think that she could live with herself if she drank and the baby then had problems".

The fact that there is no known safe amount of alcohol to safely consume during pregnancy was noted by 7 women to be a deterrent, and therefore a benefit, to not drinking while pregnant. "Nobody is sure what amount of alcohol is safe, or what

effect that it will have at certain times during the pregnancy, so it's better not to drink". Because there is no proven "safe" amount, these women felt that drinking any amount was too much of a risk, and they did not want to take a chance. Six other women specifically stated, "why take a chance?".

Three women stated that they "didn't believe in it", while two women thought that consuming alcohol while pregnant "didn't make sense". Two participants thought that "it wasn't necessary, after all, we're only talking nine months here!".

TABLE 10

Benefits to Alcohol Abstention

<u>Category</u>	<u>Frequency</u>
1. Health Reasons	113
a) health of baby/prevent FAS	83
i) to prevent learning disabilities	2
ii) to prevent lifelong damage	1
iii) ensure baby's full potential	1
iv) prevent Down Syndrome	1
b) to ensure normal development of baby	12
c) health of mother	6
d) health reasons (unspecified)	7
2. Lack of knowledge re: safe amount of alcohol	7
3. Why take a chance?	6
4. Don't believe in it	3
<u>5. Not necessary</u>	<u>2</u>

Barriers to abstaining from alcohol during pregnancy

The participants were asked to mark a visual analogue scale (VAS) to indicate reasons that they could not stop drinking/barriers to stopping drinking where 0 represented no reason, and 100 represented many reasons. Answers ranged from 0 to 100. Ninety-three percent placed their mark between 0 and 10, and 96 percent placed their mark between 0 and 20. One percent placed their mark between 51 and 60, and the remaining 3 percent placed their mark between 81 and 100. The group mean for this question was 5 with a standard deviation of 16.1. The mode was 0.

Study participants were offered an opportunity to explain why they could not decrease or stop drinking alcohol during pregnancy. A variety of responses was yielded by a small number of women. Many participants either left this question blank or responded that it was not applicable to them or their situation. Some women appeared to answer the question as it applies to themselves, and some women appeared to answer the question as it applies to another person with a drinking problem.

Five women responded that alcohol was a part of their lifestyle and that they did not feel that they were doing any harm to themselves or their babies by drinking occasional small amounts. One woman felt that having a few drinks was "an enjoyable way to conclude a busy and frenetic week".

"No reason is good enough", seemed to be the sentiment of four women who felt that there is no "good" reason why a mother could/would not stop consuming alcohol during her pregnancy. Another woman stated that "logically there is no reason not to stop. Whatever I have had has been purely out of habit".

Three respondents mentioned that addiction/dependency would be a possible reason why a woman would continue to drink during her pregnancy, and that "an alcoholic would need help". —

One participant wrote that "the only one that I can think of is will power", while one participant cited "stress" as a reason one would continue to drink, and one participant stated that she "did not understand why people can not stop drinking".

TABLE 11

Barriers to Alcohol Abstinence

Category	Frequency
1. Part of lifestyle/enjoyable	5
2. No reason	4
3. Addiction	3
4. Will power	1
5. Stress	1

Alcohol Related Behaviours During PregnancyAlcohol consumption

The study participants were asked how much alcohol they drank before pregnancy and during pregnancy. They were asked what type of alcohol they drank, how many times each week they consumed the specific type of alcohol, and how many of each beverage they consumed each time. Of the 117 study participants, 23 (19.7 percent) classified themselves as non-drinkers in that they did not drink alcohol before or during the pregnancy. Ninety-four (80.3 percent) respondents stated that they drank alcohol before pregnancy, but stopped with the pregnancy. Eleven (9.4 percent) of the 94 women who drank alcohol before the pregnancy, admitted to drinking alcohol during the pregnancy.

Of the 94 women who drank alcohol before their pregnancy, 38

percent drank beer, 44 percent drank wine, and 36 percent drank liquor. Of the 11 women who admitted to drinking alcohol during their pregnancy, 4 drank beer, 9 drank wine and 1 drank liquor.

When asked if their drinking pattern had changed within the last year, 61 percent of the women said that they drank less. Thirty-seven percent responded that there was no change in alcohol consumption in the last year (this reflects non-drinkers), and 2 percent stated that they were "unsure". No women reported drinking more alcohol.

Problem drinkers

One study participant admitted to seeking help for drinking during her pregnancy. All other subjects either denied seeking help or stated that the question was not applicable to them.

The T-ACE Questionnaire was incorporated into the survey as a tool to identify problem drinkers. Two or more positive responses indicate potential problem drinkers. Seventy-three percent of the respondents had no positive answers, and 22 percent answered positively once. Three respondents (2.5 percent) had 2 positive answers, and three respondents (2.5 percent) scored three positive answers, therefore, 5 percent would be considered to be problem drinkers according to the T-ACE scoring tool. There were no participants who scored four positive answers. The first question in the T-ACE asks how many drinks it takes to feel high. Answers ranged from 0 to 7, with an average of 2.4 drinks and a standard deviation of 2.0. The mode was 2.0 drinks. The second question in the T-ACE asks if people have annoyed you by telling

you that you drink too much. Four respondents (4 percent) answered yes, 105 respondents (95 percent) answered no, and one woman (1 percent) was unsure. The third question in the T-ACE asks if you have ever felt that you should drink less. Eleven participants (10 percent) answered yes, 91 participants (86 percent) answered no, and 4 participants (4 percent) were unsure. The fourth question on the T-ACE asks if you have ever had a drink first thing in the morning to steady your nerves or get rid of a hangover. No study subjects answered this question positively.

Social Support

Social support, especially from the significant other, has been suggested to be an important factor in a woman's behaviour in regard to drinking alcohol in pregnancy (Bresnahan, Zuckerman, & Cabral, 1992; Hammer & Vaglum, 1989; Rubin, 1988; Smith et al., 1987). The questionnaire included questions on the baby's father and his drinking behaviour, his encouragement (or lack of) in his partner's alcohol abstention during pregnancy, and how difficult the women felt it was to resist alcohol when her significant other, friends, and the environment encouraged it.

Prior to the pregnancy, 69 percent of the father's drank beer, 21 percent drank wine, and 34 percent drank liquor. During the pregnancy, 63 percent drank beer, 18 percent drank wine, and 27 percent drank liquor. When asked if the baby's father's alcohol consumption habits changed in the past year, 69 percent of the women responded that his habits had not changed, 25 percent of the women responded that the baby's father drank less alcohol, 3 percent of the women responded that the baby's father drank more

alcohol, and 3 percent stated that they were unsure.

Seventy-five percent of the respondents said that the baby's father encourages them not to drink, and 16 percent responded that he did not care or left the decision up to them. Six percent said that this question was not applicable to their situation, and 3 percent did not answer this question.

When asked how hard it would be to resist an alcoholic beverage if their partner was trying to get them to drink, where 0 indicated that it would be not hard at all to resist and 100 would be extremely hard to resist, answers ranged from 0 to 100. Eighty-eight percent of women placed their mark between 0 and 10. Six and one-half percent of women placed their mark between 91 and 100, and the remaining 5.5 percent felt that it would be somewhere between not very hard and very hard. The group mean for this question was 8.5, with a standard deviation of 24. The mode was 0.

When asked how hard it would be to resist an alcoholic beverage if their friends were trying to get them to drink, where 0 indicates that it is not very hard at all and 100 indicates that it is extremely hard, answers ranged from 0 to 100. Ninety-two and one half percent of the respondents placed their mark between 0 and 20. Three percent thought that it would be very hard to resist, placing their mark between 91 and 100. The remaining 4.5 percent thought that it would be somewhere between not very hard and very hard. The group mean for this question was 8.1, with a standard deviation of 22.4, and a mode of 0.

When asked how hard it would be to resist an alcoholic beverage when others were drinking, where 0 indicates that it is

not hard and 100 indicates that it is extremely hard, answers ranged from 0 to 97. Ninety-one percent of the respondents placed their marks between 0 and 20, 1 percent placed their mark between 91 and 100, and 1 percent placed their mark between 61 and 70. One percent of participants placed their mark between 51 and 60, 2.5 percent placed their mark between 41 and 50, and 1 percent placed their mark between 31 and 40. The group mean was 5.5 with a standard deviation of 14.0 and a mode of 0.

Health provider influence

Seventy-six percent of the participants admitted that they had been asked about their alcohol consumption by a physician or a nurse. Eighteen percent stated that they had not been asked and 6 percent stated that they were unsure if they had been asked. When asked if they had ever felt that they were being judged about their behaviour in regard to alcohol consumption, 14 percent said that they had felt judged, 81 percent stated that they did not feel judged, 4 percent stated that they were unsure, and 1 percent stated that they did not care whether or not they were being judged. Two participants included the comment that "women who drink when they are pregnant should be judged".

Safe environments

Because of the sensitivity of the issue of alcohol consumption during pregnancy, and fear of punishment to offenders, some women may not fully disclose their drinking behaviour to others. It was noted that a safe environment is necessary for many women to discuss their behaviour openly and truthfully. When asked who is

"safe" to talk to about a problem with alcohol, participants listed the following people:

- health care staff eg. physicians, nurses, counsellors (33)
- community services eg. Addictions Foundation of Manitoba, Alcoholics Anonymous, Child and Family Services, pastor, support group, women's circle (17)
- family or spouse (14)
- friends (7)
- anyone that would listen (2)
- no one (1)

Traits that participants felt were necessary to feel safe to talk about a problem with alcohol were as follows: not being judged (7), confidentiality (3), understanding (3), support/assistance (3), knowledgeable people who have "heard stuff like that before" (3), privacy (1), a listener (1), trust (1), confidence in self (1), and nothing (1).

Correlations

The most common method of describing a relationship between two variables is through statistical correlation procedures. Pearson's correlation was the first of the correlation measures developed and is the most commonly used (Burns & Grove, 1993). The correlation coefficient r is a value ranging from +1.0 to -1.0. The higher the absolute value of the coefficient, the stronger the relationship. A -1 indicates a perfect negative (inverse) correlation and a +1 indicates a perfect positive linear

relationship (Hassard, 1991). A score of zero indicates that there is no linear relationship. Traditionally, an r of .1 to .3 is considered a weak linear relationship, .3 to .5 is considered a moderate linear relationship, and above a .5 a strong linear relationship (Burns & Grove, 1993). It must be noted that a positive or negative r value is reflective of the way in which an instrument is scored and is not a judgement value by the researcher.

A variety of correlations were examined using Pearson's correlation coefficient. Relationships between demographic and obstetrical data, were compared to drinking behaviour, and knowledge levels. Results will be compared to findings reported in the literature in Chapter V.

Knowledge

With regard to knowledge, the knowledge scores were compared to T-ACE scores, drinking behaviours (abstinence, drinking prior to pregnancy, and drinking during pregnancy), the perceived risk of the baby having something wrong with it due to alcohol consumption, perceived severity of having a FAS/FAE child, and perceived ability to resist alcohol.

There was a moderate negative (due to the way the instrument was scored) linear relationship ($-.315$) at the 0.01 level between knowledge and the perceived ability to resist alcoholic beverages when other people are drinking alcohol, and a moderate positive linear relationship ($.320$) at the 0.01 level between knowledge scores and those that continued to drink during pregnancy. In this study sample, the higher a subject scored on the knowledge

test, the less hard it was for the subject to resist alcohol from their partner, friends and in a drinking environment. The women that continued to drink in pregnancy had lower knowledge scores than those that never drank, or those that discontinued alcohol consumption during pregnancy.

Abstainers

For the sub-population of women who professed to be non-drinkers at all times, there is a weak positive linear relationship with the planning of this pregnancy (.208), significant at the 0.05 level, and a moderate negative (due to the way the instrument was scored) linear relationship (.414), significant at the 0.01 level, between teetotalers and race. The women who were teetotalers were more likely to have an unplanned pregnancy, and were less likely to fit into the Caucasian category and more likely to have classified themselves as Aboriginal, African American, Asian, other or mixed.

There was no significant correlation between non-drinkers and age, marital status, education, income, number of pregnancies, gestation, caffeine consumption, smoking behaviour, knowledge, or their susceptibility.

Alcohol consumption before pregnancy

With women who drank before pregnancy, there is a weak negative (due to the way the instrument was scored) linear relationship (-.208), significant at the 0.05 level, with regard to the planning of the pregnancy, and a moderate negative (due to the way the instrument was scored) linear relationship (-.345) significant at the 0.01 level with T-ACE scores. Women who drank

before pregnancy were more likely to have planned their pregnancy, and are more likely to have a high T-ACE score or be problem drinkers.

There was no significant relationship between women who drank before the pregnancy and age, marital status, education, income, the number of pregnancies, gestation, caffeine consumption, smoking behaviour, knowledge score, and susceptibility.

Alcohol consumption during pregnancy

For women who continued to consume alcohol during pregnancy, there is a weak negative (due to the way the instrument was scored) linear relationship ($-.212$), significant at the 0.05 level with age and a negative (due to the way the instrument was scored) linear relationship ($-.202$), significant at the 0.05 level, with those who consumed alcohol during the pregnancy and the education level achieved. There is a moderate negative (due to the way the instrument was scored) linear relationship ($-.324$), significant at the 0.01 level, with family income. Women who drink alcohol during pregnancy are slightly more likely to be a greater than average age, are more likely to have above the sample average number of years of education, and are more likely to have a higher average family income.

There were no significant correlations found between women who consume alcohol during pregnancy and marital status, level of education attained, race, number of pregnancies, planning of the pregnancy, gestation, caffeine consumption, smoking behaviour, T-ACE score, encouragement from the significant other, or the susceptibility of having a baby with FAS/FAE.

T-ACE scores

When calculating correlations with T-ACE scores, there was weak negative (due to the way the instrument was scored) linear relationship (-.237), significant at the 0.05 level, with family income, and a moderate positive linear relationship(.380), significant at the 0.01 level, between T-ACE scores and caffeine consumption. Women with higher T-ACE scores (indicative of possible problem drinking) were more likely to have lower family incomes, and consume more caffeine.

There was no significant relationship between T-ACE scores and: age, marital status, education, race, the number of pregnancies, planning of the pregnancy, gestation, smoking behaviour, and knowledge scores.

In summary, correlations have indicated that women with higher levels of knowledge of FAS/FAE find it easier to resist the temptation of drinking from their significant other, friends, and environments that consist of other drinkers. Higher levels of knowledge are also related to those who chose to abstain from alcohol during their pregnancy. Women in this study who abstained from alcohol at all times were more likely to have unplanned pregnancies, and are also more likely to classify themselves as Aboriginal, African American, Asian, "other", or mixed heritage. Women who drank prior to pregnancy were found to be more likely to have higher T-ACE scores, and have planned pregnancies. The women who chose to consume alcoholic beverages during their pregnancy were more likely to be of greater than average age, have a higher

education level, and have a higher average family income. The women in this study who had high T-ACE scores were shown to have lower incomes and drink more caffeine than the average study participant.

Chapter V will discuss the implications of the findings reported from the data analysis.

CHAPTER V

DISCUSSION

This study was designed to explore and examine the knowledge, beliefs, attitudes, behaviours, and reasons that women give for drinking alcohol or not, during pregnancy. The conceptual framework utilized to direct the study was Becker's Health Belief Model (Appendix A). This model advocates that in order for an individual to take action to avoid a disease, in this case FAS/FAE, they would need to believe:

- (1) that they are susceptible
- (2) that the occurrence of the disease would have at least moderate seriousness on some component of their life.
- (3) that taking a particular action would be beneficial.

The three components of the Health Belief Model are:

- (1) individual perceptions
- (2) modifying factors
- (3) likelihood of taking action

Individual perceptions as they applied to this study included the perceived susceptibility to and the perceived severity of FAS/FAE. The modifying factors included cues to action (for example, education, communications, and awareness) and modifying variables such as demographics, sociopsychological, and structural variables. The likelihood of taking action was largely dependent on the perceived benefits and perceived barriers to abstaining from alcohol during pregnancy, which is the desired health behaviour. These components were measured by a questionnaire (Appendix F) that was administered to a sample group of 117

pregnant women in health facilities in Winnipeg, Manitoba, Canada. The questionnaire included questions on demographics and obstetrical history, as well as quantitative and qualitative questions about beliefs, behaviour, knowledge, and decision making with regard to alcohol consumption during pregnancy.

Each research question was examined individually, and its relationship to the Health Belief Model will be discussed. Responses from the study questionnaire have been incorporated into the appropriate category of the model.

Data analysis suggests several possible interpretations and conclusions about the sample and the concepts studied. These will be reviewed, followed by a discussion of limitations of the study, implications for nursing and health care practices, and recommendations for future nursing research.

Knowledge

Knowledge is a structural variable in this study and is considered to be a modifying factor, as per Becker's Health Belief Model (Appendix A). It serves to condition, along with demographic and socio-psychological variables, both individual perceptions and perceived benefits of abstaining from alcohol during pregnancy.

As demonstrated by the total knowledge scores, the knowledge level of study participants was relatively high. Ninety-two percent of the participants answered four of the six knowledge questions correctly. Only 8 percent had a score of less than 50 percent. Most women (94 percent) knew that alcohol ingested by

the mother reached the fetus, and 97 percent of the respondents were aware that this could harm the fetus. The definition of FAS was chosen correctly by 74 percent of the subjects, as compared with a study by Fox, Brown, Koontz, and Kessel (1987) where less than 25 percent of participants answered the same question correctly. Eighty-eight percent of the women acknowledged that there is no safe amount of alcohol that can be drunk during pregnancy. The knowledge level in this study was comparable to the knowledge level reported by Robinson, Armstrong, Moczuk, and Loock (1992), despite the fact that Robinson et al.'s sample consisted of 123 Aborigines from British Columbia who had very little teaching about FAS/FAE.

Knowledge levels appear to have significantly improved from levels measured by other researchers as reported in the literature. However, one must be cautious in making such comparisons due to differences in study samples, purposes, data collection tools, and study designs.

There are several possible explanations that may provide some insight into the study knowledge level. The high knowledge level may be a reflection of:

- 1) educational efforts in Manitoba that have increased public awareness to the dangers of alcohol consumption during pregnancy,
- 2) multiple cues to action, including: mass media campaigns, advice from family/friends/health care workers, or knowing someone with FAS/FAE, or
- 3) the nature of the study sample. The members of this

group are all seeking prenatal care, and their demographic characteristics (age, education, income, marital status, and ethnicity) are not representative of other study samples or the population as a whole.

The leading sources of knowledge, or cues to action, for this study's participants were newspapers and magazines (82 percent), television (81 percent), family and friends (57 percent), and physicians/nurses (51 percent). This is slightly different from a British Columbia study by Stychar, Griffith, and Conry (1990) which reported that conversations with family, friends and physicians were the most common source of knowledge of the perils of alcohol consumption during pregnancy. Perhaps this difference reflects the methods of public education that were used at that time in that particular community. This study may also reflect the success in Manitoba of using mass media to reach a larger and more diverse target group. Waterson and Murray-Lyon (1989) previously found that mass media (newspapers, books, magazines, and television) was a great influence in encouraging a reduction in drinking during pregnancy.

The majority of people in this study (81 percent) had been exposed to one to four sources of information, with most participants (23 percent) being exposed to two sources. It is encouraging to see that 22 percent of the sample was exposed to three sources and 22 percent of the sample was exposed to four sources of information. Kaskutas and Graves (1994) found that people who are exposed to multiple sources of information are more likely to have knowledge of FAS. Eighty-six percent of this study

sample were exposed to multiple messages and this may be an important factor in the high knowledge levels.

When examining the data for possible correlations, it was found that women with higher knowledge scores found it easier to resist alcohol even when encouraged to drink by a partner, friend(s), or being in a drinking environment. Having knowledge of FAS/FAE increases the perceived threat of the disease, and thereby, increases the likelihood of abstaining from alcohol during pregnancy. Knowledge also conditions the perceived benefits of abstaining from alcohol which in turn, increases the likelihood that they will not drink during their pregnancy. With these study participants, knowledge was a stronger influencing factor than social support.

Women with lower knowledge scores were found to have a greater chance of drinking during pregnancy. As outlined in the Health Belief Model, a lower knowledge level decreases the perceived threat of the disease, decreases the perceived benefit of not drinking, and thereby decreases the likelihood of abstaining from alcohol during pregnancy.

Knowledge is a key element in abstaining from alcohol consumption during pregnancy. Participants in this study had high levels of knowledge which likely influenced their abstinent behaviour.

Perceived susceptibility

Most theories on changing health behaviour identify perceived risk or susceptibility as an important factor in explaining or

influencing the behaviour change process. Perceived susceptibility is at least partly dependent on the knowledge of risks associated with drinking during pregnancy. Individual perceptions in the Health Belief Model are composed of perceived susceptibility and perceived severity. A greater perceived susceptibility to having a child with FAS/FAE would result in a greater perceived threat of FAS/FAE and thereby, a greater likelihood of abstaining from alcohol during pregnancy. A women's perceived risk was discerned from the data of three visual analogue scale (VAS) questions, a question about previous exposure to FAS/FAE (awareness), and an estimation by the subject of the annual Canadian incidence of FAS. It was found that susceptibility is a very subjective experience.

Women were asked about their perceived risk of having a baby with something wrong with it, and many women identified that they thought their risk was low because they were engaging in all of the suggested health behaviours (good diet, no smoking or drinking alcohol, exercise, rest). Many other women perceived their risk to be moderate, identifying such reasons as age (5), health conditions (diabetes, HIV, skin condition), previous poor outcome pregnancies (miscarriages, baby with a heart defect), environmental or behavioural risks (smoking, being around marijuana smoke), and "just feeling that way".

It was interesting to note that women with the same identified condition perceived their risks to such different degrees. One diabetic respondent placed her VAS mark between 0 and 10, while 2

other diabetic participants placed their marks between 21 and 30. Another diabetic woman felt that her risk was between 41 and 50. Perhaps this variation reflects the different types and severities of diabetes, different stages of the disease, differences in coping strategies or outlook, or other factors in their lives.

Also, some women appeared to overestimate their risk of having a baby with something wrong. One woman identified her perceived risk as very high because she was a smoker, while a participant with HIV felt that she had a moderate risk. Several women thought that they had moderate risk but they "weren't sure why", felt that "there's always a chance", or believed that there was a "50/50 chance".

When questioned about the chance of having a child with something wrong due to alcohol consumption during pregnancy, 73 percent of respondents felt that there was very little or no risk, and 8 percent felt that they had low to moderate risk. Because 91 percent of the study participants abstained from alcohol during pregnancy, it is logical that at least 81 percent would perceive the risk to be low, however, one would expect that 91 percent of the respondents would indicate that there was no risk at all. The remaining 19 percent of the study participants felt that the risk for them was moderate to extremely high. The explanation for this may be because:

- 1) the subjects actually do perceive the risk to be moderately to extremely high,
- 2) the respondent answered as if they were alcohol drinkers

- even if they were abstainers,
- 3) they possess inaccurate information about FAS/FAE,
 - 4) the question was misread or misinterpreted, or
 - 5) some other undetermined reason.

When the participants compared themselves with other women of the same age and in the same neighbourhood and rated their risk of having a child with something wrong due to alcohol consumption during pregnancy, 74 percent felt that their risk was very low.

In comparing the three VAS responses, women perceived that their risk of having a child with something wrong that was not alcohol related, was higher than their perceived risk of having a child with FAS/FAE. Because the majority of the study participants (90.6 percent) allegedly abstained from alcohol consumption during their pregnancy, this statistic is not surprising.

Awareness of, or prior contact with FAS/FAE is a modifying variable (both a structural variable and a cue to action) that also influences a person's perceived susceptibility. This did not prove to be a strong factor in this study. Those who were exposed to a person with FAS/FAE composed only 29 percent of the population. Despite 71 percent of the sample not knowing anyone with FAS/FAE, there was a significant percentage of the sample that abstained or decreased alcohol consumption during pregnancy. This could be explained by there being enough other influencing factors (individual perceptions, modifying factors, and perceived benefits) to encourage pregnant women not to drink during their pregnancies.

Another finding was the estimated annual Canadian FAS/FAE incidence made by the study participants. Responses ranged from 0 to 90 percent. The group mean was 21.5 with a standard deviation of 18.9 and a mode of 10. These are gross overestimations of the Canadian FAS/FAE incidence. A possible explanation for this is that there have been several areas of epidemic incidences of FAS/FAE reported in the media in recent years, and many of the public may generalise these statistics to the province or country.

Even though many women were not exposed to anyone with FAS/FAE, their perceived risk of having a child with the disease was relatively high. One would have expected more responses in the zero category and a lower group mean for the risk, especially when 90 percent of the respondents claimed that they did not drink during pregnancy. If women who do not drink during pregnancy answered the question as if they did consume alcohol, this might explain why the perceived risk is higher than expected. If this is the case, then these results are a reflection of their understanding and knowledge of FAS/FAE. This overestimation is also noted in their guess of the annual Canadian incidence of FAS/FAE. When people perceive their risks of a particular adverse health outcome to be high, they are more likely to take preventative health actions to decrease the risk (Kreuter and Stretcher, 1995).

Perceived severity

Perceived severity is the other component of individual perceptions in the Health Belief Model. It is an important factor in the behaviour change process. When one perceives a condition to be serious, this increases the threat of the condition, and in turn, increases the likelihood of taking action. It is also influenced by modifying factors such as knowledge.

Perceived severity was measured in this study by a VAS question where participants were asked how serious it would be to have a child with FAS/FAE. The majority of respondents (67 percent) felt that having a child with FAS/FAE would be moderately to extremely serious.

Possible reasons the remaining 33 percent of women did not perceive FAS/FAE to be a severe event:

- 1) they truly feel that it would not be a serious event.
- 2) a lack of FAS/FAE knowledge/awareness/exposure
- 3) having had a child with FAS/FAE
- 4) misreading or misinterpreting the question (i.e. confusing severe/not severe)

As one participant wrote, "It would be serious in the sense that I did this to my baby and would do everything I could to help my child develop as normally as possible. But not serious in the sense that I would love my child no matter what". Another respondent commented that she "could deal with it, but it would never happen".

In this study, participants generally perceived themselves to

be susceptible and felt that having a child with FAS/FAE would be serious. These individual perceptions probably assisted the women in the study to adequately perceive the threat of having a child with FAS/FAE, and encouraged them to abstain from alcohol during their pregnancy.

Decision making

When it comes to deciding whether to drink, decrease alcohol consumption, or abstain, women were questioned on how they made this decision. The data was compiled from a qualitative question, sorted into one of three categories, and analysed using content analysis. Because the majority of study participants (90.6 percent) abstained from alcohol during their pregnancy, the "abstainer" category had many comments. A relatively small number of women admitted to drinking alcohol during their pregnancy and therefore, the responses in the "alcohol consumer" category were proportionately fewer. It is not surprising that the themes involved in decision making are very similar to the themes noted in the section that reports on the benefits and barriers to abstention.

Alcohol consumers

For those who chose to continue consuming alcohol throughout the pregnancy, the majority (10) mentioned that they drank only on social or special occasions. One respondent commented that she drank to "join in on the celebration", as if she felt that she was excluded from the joyous occasion without an alcoholic beverage.

Three women chose to drink because they "like the taste", and three women explained that the "baby was near to term" and therefore, drinking was somehow less harmful. Two subjects wrote that they drank mostly out of habit, and two more said that it was a method of "stress relief" for them. Two participants explained that they did not know that they were pregnant, and this phenomena was noted by Floyd, Decoufle, and Hungerford (1999) in 45 percent of their study sample.

It was interesting to note that all of the reasons cited for continuing to drink alcohol during pregnancy were self-oriented. Consideration for the developing fetus was only mentioned by three women who incorrectly seemed to believe that there would be no damage if the baby was past the first trimester. It is possible that they did not strongly associate their pregnant condition with a fetus or baby inside them. Whatever the reason, the barriers to abstention outweighed the benefits and therefore, the drinking behaviour was continued. As per the Health Belief Model, this may be the result of:

- a) individual perceptions (lower perceived susceptibility and/or lower perceived severity),
- b) modifying factors (eg. Lower knowledge level, decreased awareness, fewer cues to action, or sociopsychological and demographic variables),

Abstainers

When the women who chose to decrease alcohol consumption or abstain were surveyed, the main reason why they did so was for

health reasons. The health of the baby/to prevent FAS was the most common reason for abstaining. The health of the mother in conjunction with the health of the baby was also a consideration by a small number of participants.

Four women mentioned that they "don't believe in it" (alcohol consumption), and because they did not elaborate on this, it is unclear whether they are referring to alcohol consumption in general, or specifically during pregnancy. This demonstrates a drawback of anonymous surveys in that the researcher cannot clarify written comments.

Three women wrote that guilt was a factor in the decision-making process. This demonstrates the women's knowledge of how FAS/FAE occurs and their understanding that the mother is totally responsible for the damage.

Three women commented that it was an easy compromise for them. This may have been because they did not enjoy the taste excessively, it was not a habit or an addiction, and they did not use alcohol as a coping mechanism or a stress reliever. Perhaps the concern for the baby's health was so much greater than the desire to drink alcohol, that abstaining or decreasing alcohol consumption was not felt to be a sacrifice. For these women, the benefits outweighed the barriers to abstention and therefore, they partook in the recommended health action.

Benefits and Barriers

The perceived likelihood of abstaining from alcohol during pregnancy is a function of the perceived benefits of that action versus the perceived barriers of that action. Perceived benefits are influenced by knowledge and beliefs, and the norms and pressures of each social group. The perceived benefits and barriers of this study sample were ascertained with two VAS questions, and the opportunity for each participant to explain or elaborate on their VAS responses. The responses were very similar to those regarding decision making. Decision making is the process and benefits and barriers are some of the elements that go into decision making.

Perceived benefits

Attitudes of the study participants were most evident when they were questioned about whether they felt that it would be good or not good to stop drinking alcohol during pregnancy. Ninety-five percent of the respondents felt that this would be very good. The vast majority of comments (113) by study participants referred to abstaining from alcohol during pregnancy for "health reasons". Sub-categories within this group included the most common reason, the health of the baby/to prevent FAS (83 responses). Some participants even listed specific components of FAS as benefits to abstention: to prevent learning disabilities, to prevent lifelong damage, to ensure baby's full potential, and to prevent Down Syndrome. Except for the Down Syndrome comment, this reflects the

high knowledge level of the group. Twelve women mentioned that a benefit to abstention from alcohol during pregnancy was to ensure the normal development of the baby. The health of the mother was also specified, and seven respondents simply stated "health reasons" without any elaboration. Other benefits mentioned were mostly interrelated. Seven women mentioned that they abstained because of the lack of knowledge as to a "safe" amount of alcohol that could be consumed during pregnancy. They are not willing to take the risk of potentially harming their fetus and therefore, they do not drink. Some women asked, "why take a chance?". As mentioned earlier, three respondents stated that they "don't believe in it", however, they did not specify exactly what they meant. Two women wrote that it was not necessary and so they did not do it.

Social support

Alcohol consumption by women is closely connected to alcohol consumption by their partner, and to consumption in their immediate environment (Bresnahan, Zuckerman, & Cabral, 1992; Hammer & Vaglum, 1989; Smith et al., 1987). The greater likelihood of alcohol use among other family members suggests that the drinking behaviour of the continued-drinker group may be heavily influenced by familial attitudes toward alcohol use. Social support has been suggested to play an important role in determining a woman's behaviour with regard to alcohol consumption during pregnancy (Aaronson, 1989; Albrecht & Rankin, 1989;

Bresnahan, Zuckerman, & Cabral, 1992; Hammer & Vaglum, 1989; Ihlen, Amundson, Sande, & Daae, 1990; Dunn, 1985; Stephens, 1985). This concept was examined by asking the study participants about their partner's drinking behaviour, if the baby's father encouraged them not to drink, and three VAS related to the ability of the women to resist consuming alcoholic beverages.

In this study, it was reported that 69 percent of the significant others did not change their drinking behaviour during the pregnancy, and 25 percent of significant others decreased their alcohol consumption during pregnancy. Seventy-five percent of the significant others encouraged the women not to drink, while 16 percent reported that their partner "did not care" whether they drank or not. A large number of the men were supportive in the sense that they encouraged their partners to abstain or decrease alcohol intake during pregnancy, but a much smaller group actually supported their partners by decreasing their own alcohol intake.

In the group of women who consumed alcohol while pregnant, 10 partners consumed alcohol during pregnancy, while one did not. Ten of the 11 significant others encouraged the women not to drink. One significant other allegedly "did not care" whether the woman drank or not. The respondent explained that "it's not that he doesn't care. It's MY choice and he respects that. He knows that I'm responsible when it comes to that". Another woman had written that "he's very proud that I don't". Despite the encouragement, these women continued to consume alcohol, although most decreased consumption. One participant commented , "the

questions about the father's drinking habits got me thinking. It would be wonderful if all fathers could be supportive".

Participants were asked about their resistance to alcohol consumption in three VAS questions. The first question asked how hard they would find resisting an alcoholic beverage if their partner were trying to get them to drink. The group mean was 8.5. The second question asked how hard it would be to resist an alcoholic beverage if their friend were trying to get them to drink. The group mean response was 8.1. The third question asked about their resistance to alcohol if they were around others who were drinking. The group mean response was 5.5. In all three situations, the average respondent showed strong resistance. It was hardest (although not hard) for the women to resist their spouse, and slightly less hard to resist their friends. The women were most resistant to drinking alcoholic beverages when in a drinking environment.

One interesting situation demonstrated the impact that cultural values can have on behaviour, and how strongly social support can influence behaviour. One woman responded that it would be extremely difficult to resist alcohol consumption if her partner was trying to get her to drink, although it would be not very hard at all to resist alcohol if her friends were encouraging her to drink or if she was in a drinking environment. If her husband wanted her to drink, then resisting would not have been an option for her. On the contrary, if she was encouraged not to drink by her husband, then she would obey him. This also

emphasises the value of educating and including the social support network in the woman's care.

Ninety-two percent of the women in the study abstained from alcohol during their pregnancy. Only 75 percent of the partners encouraged them not to drink, and only 25 percent decreased their own alcohol consumption. Many men supported their partners in these ways, but there may be other unmeasured sources of support that also are influences. As well, the other elements that compose the Health Belief Model and impact on a woman's non-drinking behaviour (knowledge, perceived susceptibility and perceived severity, cues to action, perceived benefits) may be strong enough to overcome a weak social support system.

Although the literature reports that social support is important in women abstaining from alcohol consumption, the women in this study sample reported that they did not find it difficult to resist alcohol even when those in their support system encouraged them to drink. This indicates that other factors may override the effects of social support.

Perceived barriers

Study participants felt that there were very few reasons why they could not stop or cut back alcohol consumption. The barriers to abstaining that were reported by participants were relatively few, and some women responded objectively rather than subjectively. Five women briefly discussed that alcohol was an enjoyable part of their life, and they did not want to give it up completely. Four women responded that there was no reason that was good enough to consume alcohol during pregnancy. Addiction,

will power and stress were the other barriers cited.

Drinking Behaviour

Of the sample of 117 pregnant women, only 11 continued to drink during their pregnancy. Nine women chose to drink wine, four drank beer and one drank liquor. This did not correlate with Barbour's (1990) or Abel and Sokol's study (1987) in which women switched from drinking hard liquor to beer because of the misconception that beer is less harmful than liquor. This might be explained by an increase in public knowledge and awareness of FAS/FAE, or it may reflect the different study demographics. Wine was the most popular alcoholic beverage and this has been supported by more recent literature, especially in conjunction with this study's alcohol consumer profile. Similar to a large descriptive analysis done by Prager et al. (1984), the women who chose to drink during pregnancy were more likely to be Caucasian, older, more educated and have higher family incomes. Prager's study and this study both are based on samples with a large percentage of married women so this cannot be generalized to all women.

Only one woman in the sample admitted to seeking help for problems with drinking during pregnancy, though six women were identified as potential problem drinkers by the T-ACE tool. As is the case with many addictions, many women may not know that they have a problem. The T-ACE tool may also have identified women who are on the border between heavy and problem drinkers. Correlations that were found to be significant related to drinking

behaviour are:

- 1) Women who drank during their pregnancy were more likely to have higher T-ACE scores. This is consistent with other studies (Rubin, Krasilnikoff, Leventhal, Berget, & Weile, 1988; Smith, Lancaster, Moss-Wells, Coles, & Falek, 1987; Waterson & Murray-Lyon, 1989).
- 2) The women who drank in their pregnancy were more likely to have a planned pregnancy, while those who abstained were more likely to have an unplanned pregnancy. Zambrana and Scrimshaw (1997) had similar findings in their study.
- 3) Women who continued drinking were more likely to be older, have more education and be in higher income brackets. Prager et al. (1984), and Floyd et al. (1999) found a similar sample profile.
- 4) Those who had higher T-ACE scores were more likely to consume caffeine, and be in a lower income bracket.

Limitations of the Study

The generalizability of the study findings is limited due to the geographic distribution of the study sample. All of the study participants live in or within close proximity to the same city, although participants utilized a variety of prenatal services in different locations of the same city. Any conclusions drawn from this study sample may be generalized only to this select population, with limited applicability to other groups of prenatal women.

The use of convenience sampling is a limitation as there is no assurance that the sample derived is typical of the population it is drawn from with regard to critical variables being studied (Polit & Hungler, 1993). Convenience allows for as large a sample size as is possible in often a quicker fashion, however, it "provides little opportunity to control for bias" (Burns & Grove, 1993). Steps taken to decrease possible biases of the results and increase the representativeness of the sample included: multi site sampling to increase the variety within demographic variables; several extraneous variables were explored to help determine representativeness of the sample (eg. demographics and maternal history); inclusion criteria to specify the sample focus (adults with viable fetuses, who can read, write and understand the English language). These steps may help to decrease sample bias, but they also limit the extent of generalizability. Strategies utilised to select the convenience sample were to offer participation to women attending clinics/Fetal Assessment Units/Doctor appointments on specific days who also met inclusion criteria. A drawback to this is that only women seeking prenatal care are included. Perhaps the population of women who do not seek prenatal care have significant differences that would influence how we care for mothers and infants, and how we provide health care to them. The questionnaire used to gather the study data was developed by the researcher. Because there was no specific tool developed for this type of study, several previously used tools were combined. The questionnaire was pilot tested with a group of

five women and scrutinized for clarity, appropriate wording, readability, ability to elicit the intended information and length of time to complete. Comments from the pilot group and also from a group of nurse experts, were used to improve the questionnaire. Despite these preliminary measures, there were some problems with certain questions. In a small number of instances, some subjects appeared to misunderstand a question as evidenced by incongruence between a written answer and a visual analogue scale marking. Subjects reported ranges instead of one number, subjects left blanks instead of writing the number zero, or subjects used phrases like "social drinker" and "not many" which are difficult to quantify. Nine questionnaires were discarded because they were incomplete.

Social desirability must be considered when subjects complete their questionnaire. Despite assurance of anonymity and confidentiality, some subjects may not answer in a way that is congruent with their true feelings. Researcher efforts to provide an environment of safety for subjects included participants not writing their name on their questionnaire, filling out the questionnaire in private, placing the questionnaire in a sealed envelope after it was completed, and assuring subjects that the only people to ever see the raw data would be the researcher and the her thesis chairperson. Written and verbal assurances were given that participants would be completely anonymous and the health care would in no way be compromised. Although these steps were taken to provide anonymity to the participant so that they

would feel comfortable in sharing their true feelings without the fear of repercussions, a drawback to these measures is that the researcher cannot clarify information on the questionnaire with the participant.

Another limitation to this study is that it requires subjects to rely on memory recall. This self reporting technique may be unreliable and inaccurate (Midnik, 1982; Smith, 1990). Study participants may have under reported due to social pressures and guilt feelings but "the researcher must assume that the information provided is accurate" (Burns and Grove, 1990). Unfortunately, there is no objective method of gathering this specific information.

Implications for Nursing and Health Care Practice

The results of this study have several implications for nursing practise.

Firstly, it is important to continue to educate ourselves and non-medical people to the dangers of alcohol to unborn children. Education and knowledge have been shown to affect perceived susceptibility, perceived severity, and the perceived benefits which influences the perceived threat of FAS/FAE. This in turn, increases the likelihood of women abstaining from alcohol during pregnancy.

Ideally, pre-pubescent girls should be educated before pregnancy is a possibility, and because of the effects of social support on women's behaviour, significant others and pre-teen boys

must be included in this endeavour. It is important to continue to educate teenagers and adults because education and awareness are important aspects in influencing abstention behaviour. As this study and others have shown, women from all demographic backgrounds use alcohol during pregnancy, and we must be careful not to stereotype substance users.

Newspapers, magazines, and television have been shown to be an effective method of providing information to people in the many layers of society. Because health care professionals have been identified as an important source of information to preconceptual and prenatal women, it is important to continue to educate and advise our charges. Although education has been shown to be a valuable and necessary tool in health care, it is not sufficient to solve the problem of FAS/FAE/ARBD. It is a complex phenomenon that needs to have alternative solutions. It is important to provide a safe environment where women can be honest about their behaviour and concerns. A non-judgmental, confidential, understanding, and trusting approach has been identified by study participants as being necessary for them to feel "safe" in discussing their concerns. Health care workers are in an optimal position for identification of problems, education, and early intervention.

Recommendations for Future Research

Several recommendations for future nursing research are suggested from this study. Replication of this study with an increased study sample that includes more subjects from minority groups, would provide valuable information about the minorities and allow for a more solid comparison between women from different races. Because the number of participants from Aboriginal and African American groups was relatively small, it is difficult to draw any conclusions from the research data about them. A future study that included minors would further expand the demographic parameters and might yield valuable information about the youth. Replication would also allow for refinement of the research questionnaire, and would serve to help establish further validity and reliability.

Because the data collection for this study took place in health care settings, the data reflects the knowledge, beliefs, behaviours and decision making processes of women who seek prenatal care. Though more difficult to do, valuable information could be obtained by collecting data from women who do not seek prenatal care.

Because social support has been shown to be a very important factor in women's drinking behaviour, a study that included the perspectives of fathers, boys, significant others, and friends might identify further modifying factors that would assist women in abstaining from alcohol consumption during pregnancy. Meyer, Meyer, Howes, Ruhlen, and Pickett (1997) found that health assessment of partners of pregnant women seems promising for

uncovering health problems that would be likely to have an adverse impact on the health of the family.

A final recommendation for future research is to do more qualitative research with pregnant alcoholics or women who have had babies apprehended due to problems with alcohol. The more information that we can obtain regarding how to identify, approach, and assist women who drink, the closer we may get to decreasing the incidence of FAS/FAE.

Conclusion

This study used Becker's Health Belief Model as a guide to exploring the phenomenon of alcohol consumption during pregnancy. A researcher designed questionnaire that incorporated previously used tools and open ended questions was used to gather information from the study participants regarding their knowledge, beliefs, behaviours, and decision making related to alcohol consumption during pregnancy. This methodology was selected to expand upon previously reported findings from mostly quantitative studies which looked at individual aspects of alcohol consumption during pregnancy. This study attempted to explore the phenomenon in a comprehensive manner.

The study examined the individual perceptions and modifying factors that influenced a woman's likelihood of taking the recommended preventative health action to prevent the occurrence of FAS/FAE. With this study sample, the individual perceptions and modifying factors strongly influenced the perceived threat of FAS/FAE and thereby, resulted in a large percentage of the women

forgoing alcohol consumption during their pregnancies. A small number of the study participants continued to drink, and this sample subset was examined to identify areas which influence positively and negatively, a woman's likelihood to abstain from drinking. Differences between the subsets were identified and the women in this study sample who chose to consume alcohol during their pregnancy were found to be older, Caucasian, more educated, in a higher family income bracket, with slightly lower knowledge scores. These modifying factors influence the barriers to taking the preventative action. By using the Health Belief Model, we can identify areas to focus on with future preventative actions.

In general, the study sample possessed a high knowledge level, and most of the women revealed a high, possible overestimated level of susceptibility, and a high level of seriousness with FAS/FAE. The most common benefit cited for abstaining from alcohol during pregnancy was for health reasons, especially related to the baby. The most common barrier to abstaining was related to alcohol being an enjoyable part of a woman's lifestyle. The strong majority of the sample (90.6 percent) abstained from alcohol during pregnancy, and many of the 9.4 percent of the women who chose to continue drinking decreased the amount that they drank. The T-ACE tool identified six women who may have alcohol related problems.

The profile of the pregnant alcohol consumer in this study does not concur with some of the earlier reported sample characteristics. This may be a reflection of the study sample demographics, or it may provide support to the assertion that

certain groups have historically been understudied and that the original profile of the pregnant alcohol consumer may not be accurate.

The qualitative data extracted from this study generally supports previous findings related to benefits and barriers to abstention from alcohol during pregnancy and decision making.

Several suggestions have been made with regard to health care education, practice, future research, and refinement of the research questionnaire. Results from this study demonstrate the effectiveness of past and present efforts to educate the public on FAS/FAE, at least with certain populations. The results also make one aware that we must continue with our efforts to achieve our goal of eradicating FAS/FAE by the most effective means possible. This includes education of all women and men beginning in childhood, identification of women at risk, early intervention, and supporting preconceptual and prenatal women in whatever way possible. One thing is certain: prevention is the key to saving many lives from FAS/FAE and that is reason enough for relentless pursuit of our goal.

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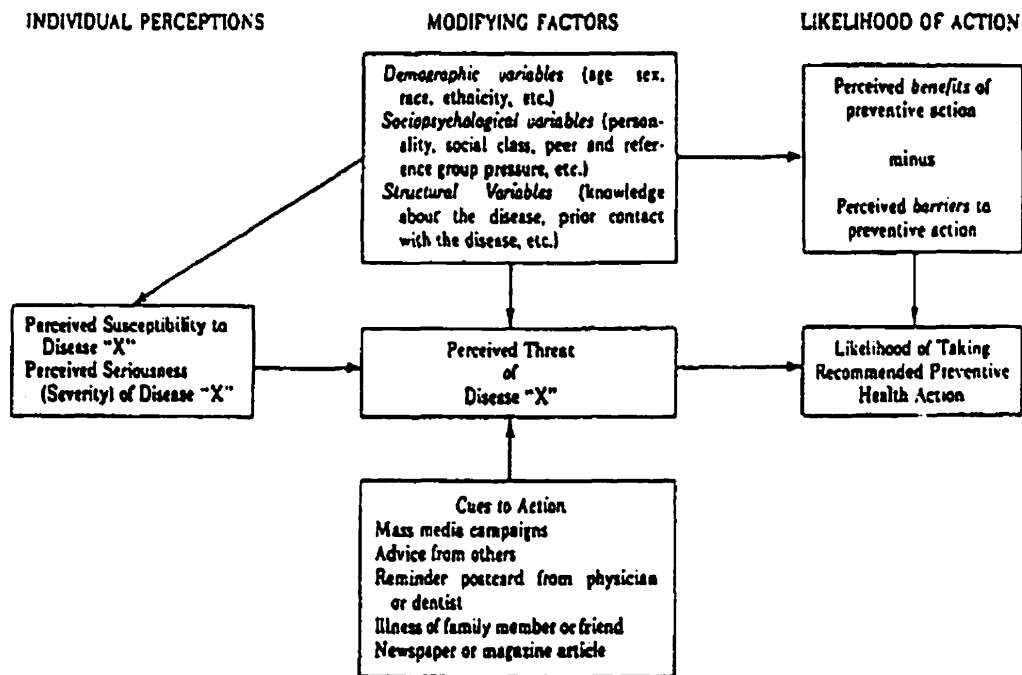
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Appendix A

The Health Belief Model

From: Becker, M. H. (1974). The health belief model and personal health behaviour. Thorofare, NJ: Charles B. Slack, Inc.



The "Health Belief Model" as predictor of preventive health behavior

Appendix B

General Criteria For Evaluating Research

- Step 1. Research Problem**
1. Is the problem clearly and concisely stated?
 2. Is the problem adequately narrowed down into a researchable problem?
 3. Is the problem significant to nursing?
 4. Is the relationship of the identified problem to previous research clear?
- Step 2. Literature Review**
1. Is the literature review logically organized?
 2. Does the review provide a critique of the relevant studies?
 3. Are the gaps in knowledge about the research problem identified?
 4. Are important relevant references omitted?
- Step 3. Theoretical or Conceptual Framework**
1. Is the theoretical framework easily linked with the problem, or does it seem forced?
 2. If a conceptual framework is used, are the concepts adequately defined and are the relationships among these concepts clearly identified?
- Step 4. Research Variables**
1. Are the independent and dependent variables operationally defined?
 2. Are any extraneous or intervening variables identified?
- Step 5. Hypotheses**
1. Is a predicted relationship between two or more variables included in each hypothesis?
 2. Are the hypotheses clear, testable, and specific?
 3. Do the hypotheses logically flow from the theoretical or conceptual framework?
- Step 6. Sampling**
1. Is the sample size adequate?
 2. Is the sample representative of the defined population?
 3. Is the method for selection of the sample appropriate?
 4. Are the sample criteria for inclusion into the study identified?
 5. Is there any sampling bias in the chosen method?
- Step 7. Research Design**
1. Is the research design adequately described?
 2. Is the design appropriate for the research problem?
 3. Does the research design control for threats to internal and external validity of the study?
 4. Are the data collection instruments described adequately?
 5. Are the reliability and validity of the measurement tools adequate?
- Step 8. Data Collection Methods**
1. Are the data collection methods appropriate for study?
 2. Are the data collection instruments described adequately?
 3. Are the reliability and validity of the measurement tools adequate?
- Step 9. Data Analysis**
1. Is the results section clearly and logically organized?
 2. Is the type of analysis appropriate for the level of measurement for each variable?
 3. Are the tables and figures clear and understandable?
 4. Is the statistical test the correct one for answering the research question?
- Step 10. Interpretation and Discussion of the Findings**
1. Are the interpretations based on the data obtained?
 2. Does the investigator clearly distinguish between actual findings and interpretations?
 3. Are the findings discussed in relation to previous research and to the conceptual/theoretical framework?
 4. Are unwarranted generalizations made beyond the study sample?
 5. Are the limitations of the results identified?
 6. Are implications of the results for clinical nursing practice discussed?
 7. Are recommendations for future research identified?
 8. Are the conclusions justified?

From: Beck, C. T. (1989). The research critique: General criteria for evaluating a research report. JOGNN, 19(1), 19.

Appendix CSubject Approach Script

"Hello Ms. X (or first name). Cathy Kavanagh Yeo is a Master's of Nursing Student from the University of Manitoba and she's doing a study on women's behaviours, beliefs and knowledge of drinking and substance use during pregnancy. There are questions about caffeine and alcohol consumption, cigarette use, your partner, and questions that attempt to identify problem drinkers. The study involves one anonymous questionnaire which will take approximately 10 minutes to complete. Please be assured that your participation is entirely optional and if you do not wish to participate, it will not affect your health care. Your health care provider will not be informed as to who participates and who does not participate in the study. Are you interested in talking to her about being included in her study?"

If Ms. X gives permission for the researcher to talk to her, the employee will thank Ms. X and notify the researcher that she has agreed to hear more about the study.

If Ms. X is not interested in hearing more about the study, the employee will thank her.

Appendix DIntroduction to the Study

Hello, my name is Cathy Kavanagh Yeo and I am a Masters student in the Faculty of Nursing at the University of Manitoba. I am doing a study on the knowledge, beliefs, behaviours, and decision making of pregnant women and their significant others, related to drinking alcohol and caffeine, cigarette smoking, and your perception about risks during pregnancy. It will also include a screen to detect problem drinkers. This study has been approved by the Ethical Review Committee of the Faculty of Nursing at the University of Manitoba. You were selected as a potential candidate for the study because you are at least 18 years of age, are at least 24 weeks pregnant, are seeking prenatal care at a health care institution where study data is being collected by an independent researcher, and you are able to speak, understand, and write in English. Your participation is optional and if you do not wish to participate, your refusal will not affect your health care. Your health care provider will not be informed as to who participates and who does not in the study.

There are no immediate benefits to taking part in this study, but the information you give me may help us to understand more about how women think and act in relation to drinking alcohol and using other substances while pregnant.

If you decide to participate, you will fill out one anonymous questionnaire, which will take approximately 10 minutes.

Your participation will remain completely confidential. Your name will not appear on any questionnaire, and myself and my thesis chair will be the only ones to see the questionnaires. No one will be able to identify you by what you have written.

You may fill out the questionnaire in private but I am near by in case you have any questions. If you decide to participate and wish to have a summary of study findings, please write your name and address below. A summary of findings will also be sent to this institution if you wish to obtain the information that way.

Thank you for your time and consideration.

Name _____

Address _____

City/Province/Postal Code _____

Appendix E

Consent Form

You are invited to take part in a research study entitled: "Knowledge, beliefs, behaviours and decision making associated with alcohol consumption during pregnancy". The primary researcher is Cathy Kavanagh Yeo and she is a Masters student in the Faculty of Nursing at the University of Manitoba. The study examines knowledge, beliefs, behaviours and decision making of pregnant women and their significant others with regards to alcohol and caffeine consumption, cigarette smoking, and your perception about risks during pregnancy. The questionnaire also includes a screening tool to identify problem drinkers. The study has been approved by the Ethical Review Committee of the Faculty of Nursing at the University of Manitoba.

You have been selected as a potential candidate for the study because you are at least 18 years of age, are at least 24 weeks pregnant, are seeking prenatal care at a health care institution where study data is being collected by an independent researcher, and you are able to speak, read and write in English. Your participation is optional and if you do not wish to participate, your refusal will not affect your health care. Your health care provider will not be informed as to who participates and who does not in the study.

If you agree to take part in the study, you will be asked to fill out one anonymous questionnaire which will take about 10 minutes to fill out.

While your participation may have little benefit to you personally, it is hoped that the shared responses of all who take part may help us to understand more about how women think and act in relation to drinking alcohol and using other substances while pregnant. The cost to you is the time and effort that you spend to complete the questionnaire.

Your participation will be completely confidential. Your name will not appear on any questionnaire, and no one will be able to identify you by what you have written. The questionnaire will be seen only by myself and my thesis Chair.

If you wish, at the end of the study a summary of what I find will be sent to you in the mail. I will also send a copy of study findings to this institution and you may wish to obtain the information that way.

Your signature on the reverse side of this page indicates only that you agree to take part in the study. You will be given a copy of this form.

Please contact the study supervisor if you have any questions (Dr. Annette Gupton at 474-6220).

Thank you very much for filling out the questionnaire.

I agree to participate in this study.

Your signature _____ date _____

Researcher Sig. _____ date _____

Cathy Kavanagh Yeo R.N, B.N.

Appendix F

DEMOGRAPHIC DATA SHEET

GENERAL INFORMATION

1. Age _____ (in years)
2. I am: (circle one)
- 1 single
- 2 married/living common-law
- 3 separated/divorced
- 4 widowed
3. Education: (circle the last grade or year of education completed)

GRADE SCHOOL				HIGH SCHOOL				UNIVERSITY/COLLEGE				GRADUATE				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17+

4. Family income (yearly): (circle the number that most closely shows your total family income in 1997 before taxes)
- 1 BELOW \$10,000 7 \$60,000-\$69,999
- 2 \$10,000-\$19,999 8 \$70,000-\$79,999
- 3 \$20,000-\$29,999 9 \$80,000-\$89,999
- 4 \$30,000-\$39,999 10 \$90,000-\$99,999
- 5 \$40,000-\$49,999 11 ABOVE \$100,000
- 6 \$50,000-\$59,999
5. I am: (circle)
- 1 WHITE 3 BLACK 5 OTHER
- 2 ABORIGINAL 4 ASIAN 6 MIXED

MATERNITY HISTORY

6. Number of times that I have been pregnant (including this one): (circle)
- 1 2 3 4 5 6 7 8 9 10+

7. This pregnancy was: (circle)
 1 unplanned 2 planned
8. How many weeks pregnant are you? _____
9. Average caffeine intake and amount I eat/drink during pregnancy: (circle & write amount). If you do not drink or eat the following drinks/food, please write "0" on the line.
- 1 coffee (cups per day) _____
- 2 tea (cups per day) _____
- 3 coke (glasses per day) _____
- 4 chocolate (bars per day, pieces of cake) _____
10. Number of cigarettes I smoke per day: (circle)
 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17+
11. How much alcohol do you drink?

One drink equals: one 12 ounce bottle/can of beer (4%) or
 one 4 ounce glass wine (12%) or
 1.5 ounces of liquor (80 proof).

	Before Pregnant	After Pregnant
Beer: How many <u>times</u> per week?	_____	_____
How many <u>cans/bottles</u> each time?	_____	_____
Ever drink more?	yes no	yes no
Wine: How many <u>times</u> per week?	_____	_____
How many <u>glasses</u> each time?	_____	_____
Ever drink more?	yes no	yes no
Liquor: How many <u>times</u> per week?	_____	_____
How many <u>drinks</u> each time?	_____	_____
Ever drink more?	yes no	yes no

12. Has your drinking of alcohol changed during the past year? (Circle)

1 yes 2 no 0 unsure

13. If yes, how has it changed?

1 I drink alcohol more 2 I drink alcohol less

14. a) If you drink alcohol during pregnancy, why do you do so?

b) If you decrease the amount of alcohol you drink during pregnancy, why do you do so?

c) If you stop drinking alcohol during pregnancy, why do you do so?

After the next 2 questions, put a vertical (up & down) mark through the line (eg. ___/___) where you feel it should be. The closer the line is to each end, the more you feel that way.

example:

My chances of winning the lottery are:

No Chance _____ Extremely
At All _____ High Chance

If you thought your chances of winning the lottery were very high, you would place your vertical mark through the lines as follows:

No Chance _____ / _____ Extremely
At All _____ High Chance

15. Do you think that it would be good to stop drinking or decrease drinking alcohol when you are pregnant?

Not good _____ Very good

Why do you think that it would be good or not good?

16. Are there certain reasons why you think that you cannot decrease or stop drinking alcohol when you are pregnant?

No Reason _____ Many reasons

Please list reasons: _____

17. Have you ever tried to get help for problems with alcohol during pregnancy?

1 yes 2 no 3 unsure

18. If you have a problem with alcohol, who is "safe" to talk to?

(please list) _____

19. What do you need to feel "safe" to talk about your problem with alcohol consumption? _____

20. How many drinks does it take to make you feel high? _____

21. Have people annoyed you by telling you that you drink too much?

1 yes 2 no 0 unsure

22. Have you felt you should drink less alcohol?

1 yes 2 no 0 unsure

23. Have you ever had a drink first thing in the morning to steady your nerves or get rid of a hangover?

1 yes 2 no 0 unsure

24. How much alcohol does the baby's father drink?

	Before Pregnant	After Pregnant
Beer: How many <u>times</u> per week?	_____	_____
How many <u>cans/bottles</u>		
each time?	_____	_____
Ever drink more?	yes no	yes no
Wine: How many <u>times</u> per week?	_____	_____
How many <u>glasses</u> each time?	_____	_____
Ever drink more?	yes no	yes no
Liquor: How many <u>times</u> per week?	_____	_____
How many <u>drinks</u> each time?	_____	_____

25. Has his drinking changed during the past year? (circle)

1 yes 2 no 0 unsure

26. If yes, how has it changed?

1 He drinks more. 2 He drinks less.

27. Does the baby's father : (Circle)

1 encourage you to drink

2 encourage you not to drink

3 not care whether you drink or not

For the following questions, please circle:

T=true F=false DK=don't know

28. The alcohol that I drink does not reach my T F DK
baby.

29. Drinking alcohol while I am pregnant can harm my baby. T F DK
30. The risk to my baby depends on my age. T F DK
31. The risk to my baby is the same for all types of alcoholic drinks (for example: beer, wine, spirits). T F DK
32. There is no known safe amount of alcohol that can be drunk while I am pregnant. T F DK
33. A child with Fetal Alcohol Syndrome is born: (circle)
- 1) drunk
 - 2) addicted to alcohol
 - 3) with certain birth defects
 - 4) other (specify) _____
34. Circle the sources that helped you answer the above questions:
- 1) newspapers, magazines
 - 2) family, friends
 - 3) nurse, doctor
 - 4) television
 - 5) radio
 - 6) school
 - 7) alcoholic drink warning label
 - 8) I just guessed
 - 9) other (specify) _____
35. Has your doctor or nurse ever asked you if you drink alcohol during pregnancy?
- 1 yes 2 no 3 unsure

36. Have you ever felt that you are being judged when you are asked about drinking alcohol during pregnancy?

1 yes 2 no 3 unsure

The following questions ask you to rate how much risk that you think there is to you and to your unborn child. I am interested in your perception about risks. Make your "best guess" of your risk and your unborn child's risk.

After each of the following questions, please put a vertical (up and down) mark through the line to indicate how much risk you think there is for each item. Describe why you chose to make your answer.

37. My chances of having a baby with something wrong are:

No Chance _____ Extremely
At All _____ High Chance

Why do you feel this way? _____

38. My chances of having a baby with something wrong because of drinking alcohol are:

No Chance _____ Extremely
At All _____ High Chance

Why do you feel this way? _____

39. Compared to a pregnant woman of my age, in my neighbourhood, my chances of having a baby with something wrong due to drinking alcohol are:

No Chance _____ Extremely
At All _____ High Chance

46. When other people are drinking alcoholic drinks, how hard is it to say no and stick to soda or non-alcoholic drinks?

Not Hard _____ Extremely
At All _____ Hard

47. Any further comments/information that you wish to share about the questions on this questionnaire:

PLEASE NOTE: If you answered "no" to question #15, or "yes" to questions #16,21,22, or 23, your behaviour may be harmful to you or your baby. We suggest that you discuss this with your health care provider.

Appendix G

The University of Manitoba
FACULTY OF NURSING
ETHICAL REVIEW COMMITTEE

APPROVAL FORM

Proposal Number N97/32

Proposal Title: "Knowledge, Beliefs, Behaviors, and Decision Making Associated With Alcohol Consumption During Pregnancy in an Urban Prenatal Population"

Name and Title of
Researcher(s): Catherine Kavanagh Yeo

Date of Review: November 3, 1997

APPROVED BY THE COMMITTEE: February 11, 1998

Comments: Approved with clarifications and revisions.

Date: February 11, 1998

Wanda Chernomas
Wanda Chernomas, PhD, RN Co-Chairperson
Assistant Professor
University of Manitoba Faculty of Nursing

NOTE:
Any significant changes in the proposal should be reported to the Chairperson for the Ethical Review Committee's consideration, in advance of implementation of such changes.

Revised: 92/05/08/seN97