

Alcohol Abuse

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Prenatal alcohol exposure impacts brain function

Alcohol's effects on unborn children include a wide variety of possible disorders and premature birth

When a pregnant mother drinks alcohol so too does her unborn baby, according to Leana Olivier, chief executive at the Foundation for Alcohol Related Research (FARR).

She says alcohol consumed by a pregnant woman moves into her bloodstream and is carried through the placental tissue that separates the mother and baby's blood systems, delivering the alcohol directly to the developing tissues of the fetus. This alcohol is particularly devastating for the baby's brain development, as the alcohol crosses the blood-brain barrier with ease.

"The teratogenic (harmful) effects of alcohol can damage the fetus throughout pregnancy and are not isolated to a particular time of a pregnancy. The severity of the Foetal Alcohol Spectrum Disorder (FASD) depends on the quantity and timing of the mothers drinking during her pregnancy, together with numerous other factors such as: the mother's body mass index, age, food consumption at the time the alcohol was ingested, genetics, and other toxins such as nicotine.

"There is no known safe amount of alcohol pregnant women can drink without raising the risk of damaging their unborn babies. All pregnant mothers who drink alcohol are at risk of having a baby with FASD. Research indicates that even light amounts of alcohol consumption might cause FASD in children, resulting in learning and behavioural problems usually associated with Alcohol Related Neurodevelopmental Defects, which is one of the conditions found in FASD.

"Heavy drinking is defined as an average of about two or more standard drinks per day during pregnancy or 14 drinks per week. Binge drinking is defined as at least five standard drinks on any occasion. Of all the substances of abuse, including heroin, cocaine and marijuana, alcohol produces the most serious lifelong neurobehavioural damage to an unborn baby," says Olivier.

FARR is dedicated to building positive futures in South African communities by significantly reducing birth defects caused by alcohol consumption during pregnancy. The focus of the foundation's major activities is on FASD research, prevention and training.

FASD is an umbrella term, which includes all possible disorders associated with prenatal alcohol exposure; Foetal Alcohol Syndrome (FAS) is the most severe form of these disorders and the leading cause of preventable mental retardation in the world.

It is well known that drinking during pregnancy can cause birth defects, cognitive disabilities, developmental delays, learning difficulties, and behavioural disorders, but most people do not know that alcohol use during pregnancy is one of the known causes of prematurity, according to Teresa Kellerman of the FAS Community Resource Centre.

She says approximately 10% of all



Prenatal exposure to alcohol results in abnormal neurochemical levels that affect behaviour. Photo courtesy FARR

births in the US are classified as pre-term, which is defined as delivery occurring before 37 complete weeks of gestation. Preterm delivery causes the majority of neonatal deaths (except for those related to genetic birth defects) and accounts for more than one half of neonatal hospital nursery costs.

"Increased awareness about the risk of alcohol use during pregnancy can prevent many cases of premature birth, as well as the serious effects associated with FASD."

Kellerman explains the neurology behind the behaviours that are often observed in children with FASD is primarily brain damage, caused by prenatal exposure to alcohol.

She says the most common symptoms of FASD behaviours are: memory deficits (forgetting rules or consequences); impulsivity (acting without thinking); immaturity (stunted social, emotional, or conscience development); and poor judgment (making decisions without regard to risk).

"Prenatal alcohol exposure interrupts brain development and impacts many brain systems, including the regulation and production of various neurotransmitters.

"Children with FASDs have behaviours that indicate they may not produce enough dopamine, serotonin and oxytocin, and they may produce too much testosterone and cortisol. These levels may fluctuate over the course of the day.

"The child who demands constant attention, who pushes other people's buttons to get a reaction, who manipulates others, or who incites drama, may have too little dopamine.

"The child who seems sullen and depressed may have too little serotonin. The child who is hateful and mistrustful may have too little oxytocin. The child who is angry all the time, who intentionally breaks the rules, or who engages in self-abuse, may have several neurotransmitters out of balance."

Kellerman says there are ways to help the brain produce a healthy balance of the neurochemicals so the brain can function better, giving the child more control over behaviour.

"We can help the overall performance and function of the brain by ensuring the child gets adequate rest at night and lots of fluids throughout the day, and by eliminating artificial additives from the diet."

Kellerman says it has been proposed by philosophers and psychologists that the mature adult can process

hunger, satiety, pressure, gravity, touch, smell, taste, sight, sound;

● Level two (six months to two years) – emotional awareness: anger, fear, trust, pleasure, contentment;

● Level three (age two to six years) – symbolic awareness: language, logic, social relationships, likes and dislikes, dream recall, verbal communication, sense of belonging, egocentric, concrete thoughts;

● Level four (seven to 10 years) – self-awareness: self-image, repression, self-censorship, empathy, daydreams, wishes, hopes, personal rules, self-control, experimental creativity;

● Level five (11 to 14 years) – analytical awareness: abstract concepts, innovative ideas, controlled imagination, problem-solving, willpower, intentional creativity;

● Level 6 (15 to 18 years) – intuitive awareness: inner vision, creative process, spirituality, critical thinking, idealism, future planning.

Kellerman says the healthy, mature adult can process information at all these levels: sensing a cool breeze, feeling hungry, thinking about what to say to a friend, wanting a meeting to go well, and trying to exude self-confidence while imagining the outcomes of a successful partnership plan.

"Social development and conscience development parallel these levels of consciousness. These are neural processes that unfold according to a developmental programme, involving neural connections between different parts of the brain.

"The reticular formation in the brain stem filters incoming information at the lower levels of consciousness. This filtering system can be impacted by prenatal exposure to alcohol, for instance, with interruption of the mye-

lation of nerve cells.

"An individual who has been impacted by prenatal exposure to alcohol may have a stunted social development, an impaired conscience, and may only be able to process information at four, or three, or sometimes just two levels of consciousness, or may not be able to filter information coming in at different levels, depending on the individual's neurological functional ability at any given time.

"The levels at which a person with a FASD might function are likely to be the lower developmental levels. One person with an FASD might be functioning at level three, another at level four, another at level five.

"A few may even function at level six, but not consistently and not predictably. One person with FASD might fluctuate between several levels of development from one moment to another," says Kellerman.

Olivier says FASD is a global challenge and is the main cause of preventable mental disabilities.

"South Africa has the highest reported prevalence in the world, with prevalence rates in the Gauteng, Western, Eastern and Northern Cape provinces ranging from 27 to 290/1000 (2.7%-29%) in different communities.

"Unfortunately no FASD prevalence studies to date have been conducted in provinces such as KwaZulu-Natal, Limpopo, Mpumalanga and North West. We are therefore not able to provide a prevalence rate for the country, but are getting closer to a national prevalence rate.

"There are still many myths around FASD. Some people still believe that a woman must be an alcoholic to have a child with FASD; however, no amount of alcohol is safe during pregnancy.

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foundation for
alcohol related research



WHAT IS THE FOUNDATION FOR ALCOHOL RELATED RESEARCH?

The Foundation for Alcohol Related Research (FARR) was established in 1997 and is registered as a Non Profit Company.



OUR VISION

FARR is dedicated to building positive futures in South African communities by significantly reducing birth defects caused by alcohol consumption during pregnancy. The focus of our major activities is on Foetal Alcohol Spectrum Disorders (FASD).



OUR MISSION STATEMENT

To establish sustainable awareness, prevention, intervention and training programmes designed to eliminate substance abuse with the focus on Foetal Alcohol Spectrum of Disorders (FASD) as a preventable disorder among children in South Africa.



OBJECTIVES

1. To continue to play a leading role in ongoing medical and psycho-social research related to FASD and alcohol abuse in South Africa and abroad as well as monitoring and evaluation of impact
2. The implementation of comprehensive, long-term intervention and prevention programmes in identified at-risk communities in South Africa,
3. To offer education programmes directed at medical professionals, social and health care workers, educators and the general public, and
4. To offer effective employee wellness programmes focusing on substance and alcohol abuse.



FARR FOCUS AREAS

• Awareness and prevention • Diagnosis, management and research • Training and education



FUNDING

FARR obtains funding from various sponsorships and donors. Sustainability of funding remains a constant challenge to FARR. If you are interested in donating or sponsoring FARR, please contact the FARR office.



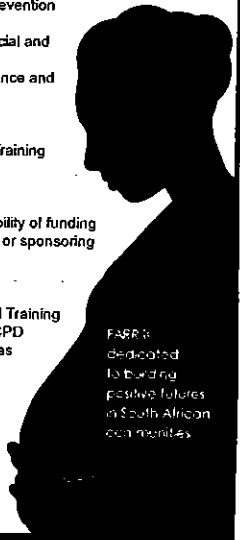
TRAINING

FARR has a Training Academy which is a fully accredited Education and Training Provider with the Health and Welfare SETA. We offer evidence based, CPD accredited training to health, educational and social work professionals as well as employers and community members.

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