ENERGY DRINKS — HITS THAT HARM THE HEALTH OF ADOLESCENTS

How is the consumption of energy drinks impacting on the health of adolescents? Sarah Patrick

Introduction

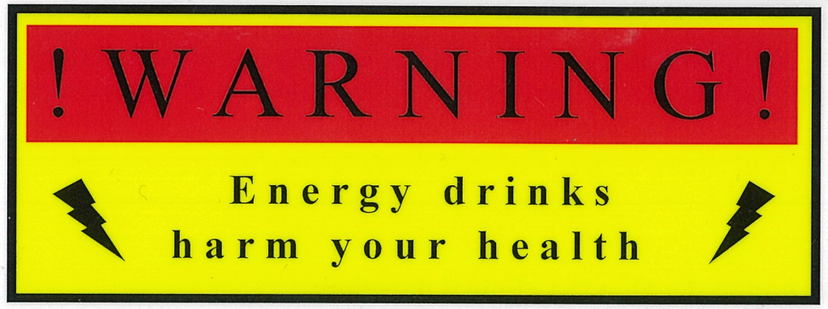
Energy drinks sales have increased at an alarming rate worldwide, and adolescents are highly represented in purchase figures raising concerns in both the scientific and general public communities of what effects these products are having on adolescent health (Pennington, Johnson, Delaney, & Blankenship, 2010). Adolescents are attracted to energy drinks for their perceived benefits, however are often unaware of the harmful effects that they potentiate (Pennington et al., 2010). What can health professionals do about this problem?

What are energy drinks?

Also known as an energy shot or energy supplement non-alcoholic beverage these are classified as dietary supplements (Thomson & Schiess, 2010). Multiple 'energy enhancing' ingredients include: high levels of a psychoactive stimulant (usually caffeine), large amounts of sugar, water soluble B vitamins (B12, thiamine and riboflavin), amino acids (such as taurine), and unknown quantities of guarana and ginseng (Breda, et al., 2014; Smith et al. 2000). Retail units are often non-resealable containers ranging 250 -600ml in size providing caffeine exposure of 75-240mg (Thomson & Schiess, 2010). Energy shot sizes range 30-120ml with caffeine exposures of 10-300mg per retail unit (Thomson & Schiess, 2010).

What are the officials saying about them?

The Ministry of Health (MOH) and the World Health Organisation do not recommend that young people consume energy drinks (Ministry of Health, 2012; World Health Organisation, 2014). The MOH state an adverse effect level of caffeine exposure as 3mg/kg/bw/day (as cited in Thomson & Schiess, 2010). The Institute of Environmental Science and Research Ltd state that following the consumption of one retail unit (in addition to baseline dietary intake) approximately 40% of teenagers would exceed this adverse effect level (Thomson & Schiess, 2010).



How do energy drinks impact on health?

Health risks are predominantly due to the effects of caffeine (Seifert, Schaechter, Hershorin, & Lipshultz, 2011). Caffeine causes alterations to regular physiological processes by replacing inhibitory neurotransmitter adenosine, triggering the release of neurotransmitters in the brain and a surge of circulating catecholamines thus stimulating the cardiovascular, gastrointestinal, peripheral and central nervous systems (CNS). Excessive stimulation can cause: heart palpitations, dizziness, convulsions, tachycardia, hypertension, irritability, nervousness, anxiety, tremors, disturbed sleep, diuresis, metabolic acidosis, hypocalcaemia, increased body temperature and gastric secretions and gastrointestinal tract irritation (Seifert et al., 2011).

Why are energy drinks particularly harmful to the health of adolescents?

The adolescent body is under rapid growth (particularly the CNS in its final stages of development) necessitating good quality sleep and nutrition. Consumption potentiates a negative cycle of inadequate sleep, increased consumption, increased health concerns, physical dependence and addiction (Pennington et al.,2010). Caffeine impacts negatively on bone mineralisation by hindering intestinal calcium absorption (Seifert et al., 2011). Caffeine withdrawal symptoms in adolescents can cause headaches, fatigue, irritability, anxiety and poorly focused when abstaining from exposures as little as 50mg caffeine (Seifert et al., 2011). Other potential problems include cognitive impairment, behaviour modification, sensation seeking, binge drinking, usage of tobacco and other harmful substances, an increased risk for depression and injuries that necessitate medical treatment (Seifert et al., 2011).

Recommendations

Adolescents need to be informed of the side effects and possible health risks from drinking energy drinks (Pennington et al., 2010). Health professionals, in particular public health nurses and primary healthcare providers, need to be informed and equipped to educate adolescents and families about the consequences of consuming energy drinks, and the signs of caffeine intoxication, withdrawal symptoms and dependency (Pennington et al., 2010). Screening for energy drink consumption should occur on every contact with adolescents to identify those at risk of caffeine toxicity and their consumption habits such as the type, quantity, frequency, as well as drink mixing habits (Pennington et al., 2010).

Conclusion

Adolescents who consume energy drinks are vulnerable to a wide range of negative health outcomes including caffeine toxicity, disturbed sleep, cardiac abnormalities and mood disturbances (Seifert et al., 2011). Health care providers must be aware of consumption consequences, screen for energy drink consumption to identify those at risk of caffeine toxicity and adverse health effects and be ready to deliver appropriate education to adolescents and families (Pennington et al., 2010).

References

Ministry of Health. (2012). *Food and nutrition guidelines for healthy children and young people (Aged 2-18 years) A background paper.* Wellington, New Zealand: Ministry of Health.

Pennington, N., Johnson, M., Delaney, E., & Blankenship, M. B. (2010). Energy drinks: A new health hazard for adolescents. *The Journal of School Nursing 26*(5), 352-359.

Seifert, S. M., Schaechter, J. L., Hershorin, E. R., & Lipshultz, S. E. (2011). Health effects of energy drinks on children, adolescents, and young adults. *Pediatrics 127*(3), 511-528.

Thomson, B., & Schiess, S. (2010). *Risk profile: Caffeine in energy drinks and energy shots.* Christchurch, New Zealand: Institute of Environmental Science and Research Limited.

World Health Organisation. (2014). Energy drinks cause concern for health of young people. Retrieved from://www.euro.who.int/en/health-topics/disease-prevention/nutrition/news/news/2014/10/energy-drinks-cause-concern-for-health-of-young-people

Rationale

Disseminating research findings as a poster presentation is an effective way to summarise a study (Polit & Beck, 2010). For this reason, I chose to create this poster as a visual medium to communicate my findings in an eye catching and detailed manner (Whitehead & Schneider, 2013b). Awareness of harm caused by energy drink consumption serves as a protective factor against adolescents consuming energy drinks therefore education of such harms is imperative in discouraging consumption (Gallimberti, et al., 2013). My aim in creating this poster was to educate and inform my target audience of Health Professionals in general but in particular Public Health Nurses and Primary Healthcare professionals of the dangers around energy drink consumption (Whitehead & Schneider, 2013b). Through understanding these and implementing the recommendations health professionals are better informed to curtail energy drink consumption and remove this health hazard from the adolescent population (Pennington, Johnson, Delaney, & Blankenship,2010).

PECOT Model (Whitehead, 2013a)

This model was used to source relevant studies and literature and to develop the clinical question:
"How is the consumption of energy drinks impacting on the health of adolescents?"

PECOT Category	Information relating to the question	Explanations
Population	13 – 18 years	• Erikson (1968) describes this psychosocial stage between childhood and adulthood as a period when adolescents seek a sense of identity through exploration and experimentation. This can sometimes involve risk-taking behaviours with the aim of 'fitting in'. • Caffeine has negative impacts on the growing adolescent body which is still developing physically, intellectually and emotionally (Rodgers, 2017).
Exposure	Self reports of the presence of adverse effects by adolescents that consume energy drinks	• Due to minimal previous exposure typically, adolescents have a minimal pharmacological tolerance to caffeine and so are more vulnerable to caffeine intoxication (Finnegan, 2003). • Predominantly cross-sectional studies using self-report measures. Notable absence of rigorous experiments due to ethical constraints (Visram, Cheetham, Riby, Crossley, & Lake, 2016).
Comparison	Self reports of the absence of adverse effects by adolescents who do not consume energy drinks	• Nil caffeine exposure
Outcome	Health in adolescents impacted through consumption of energy drinks	• Consumption of energy drinks has a negative impact on the health of adolescents. • Review of the marketing, sales, and labelling regulations of energy drinks is required • Research is required to ascertain aspects such as patterns of energy drink consumption among adolescents to ensure appropriate education interventions (Visram et al, 2016).
Time	Six-year period of adolescence	• It is assumed that during this time that adolescents are under the control of a caregiver and school authorities

References

Erikson, E. H. (1968). *Identity: Youth and crisis.* New York, NY: W. W. Norton.

Finnegan, D. (2003). The health effects of stimulant drinks. *Nutrition Bulletin 28*, 147-155.

Gallimberti, L., Buja, A., Chindamo, S., Vinelli, A., Lazzarin, G., Terraneo, A., . . . Baldo, V. (2013). Energy drink consumption in children and early adolescents. *European Journal of Pedatrics 172*, 1335-1340.

Pennington, N., Johnson, M., Delaney, E., & Blankenship, M. B. (2010). Energy drinks: A new health hazard for adolescents. *The Journal of School Nursing 26*(5), 352-359.

Polit, D. F., & Beck, C. T. (2010). *Essentials of nursing research: Appraising evidence for nursing practice (7th ed.).* Philadelphia, PA: Lippincott Williams & Wilkins.

Rodgers, C. C. (2017). Health promotion of the adolescent and family. In M. J. Hockenberry, D. Wilson, & C. C. Rodgers, *Wong's essentials of pediatric nursing (10th ed.)* (pp. 448-465). St. Louis, MO: Elsevier.

Visram, S., Cheetham, M., Riby, D. M., Crossley, S. J., & Lake, A. A. (2016). Consumption of energy drinks by children and young people: A rapid review examining evidence of physical effects and consumer attitudes. *British Medical Journal Open 6*, 1-23.

Whitehead, D. (2013a). Searching and reviewing the research literature. In Z. Schneider, D. Whitehead, G. LoBiondo-Wood, & J. Haber, *Nursing and midwifery research methods and appraisal for evidence-based practice (4th ed.)* (pp. 35-56). Sydney, Australia: Mosby Elsevier.

Whitehead, D., & Schneider, Z. (2013b). Writing and presenting research findings for dissemination. In Z. Schneider, D. Whitehead, G. LoBiondo-Wood, & J. Haber, *Nursing and midwifery research: Methods and appraisal for evidence-based practice (4th ed.)* (pp. 372-390). Sydney, Australia: Mosby Elsevier.