Research Article

A cross-sectional study to assess the awareness of the presence of trans-fat in packaged food items and their harmful effects in a metropolitan city of central India

Ruchita Banseria[1], Sunil Gothwal[2], Sanjay Dixit[1], Satish Saroshe[1]

[1]Department of Community Medicine, MGM Medical College, Indore, Madhya Pradesh, India.
[2]Department of Medicine, Maharaja Agrasen Medical College, Agroha, Hisar, Haryana, India.
Correspondence to: Ruchita Banseria, E-mail: ruchibanseria@gmail.com

Received May 29, 2016. Accepted June 13, 2016

Abstract

Background: Trans-fat has been shown to be consistently associated, in an intake-dependent way, with risk of coronary heart disease, which is the main contributor to the global burden of disease.

Aim and Objectives: To assess the level of awareness about trans-fat in packaged foods among college students and to increase their awareness about trans-fats and their health hazards and to encourage students to go through the nutritional profiles of packaged food before consuming it.

Material and Methods: An educational intervention cross-sectional study was conducted upon 100 students aged 18–22 years randomly selected from two colleges of Indore city. Qualitative interviews were taken from those who gave informed consent. Pre- and post-interventional questionnaire containing questions related to awareness, knowledge, and practices regarding trans-fat was used as study tool. Educational intervention was done by using pamphlets and lectures with audio visual aids. All statistical analyses were conducted in SPSS (version 20). Statistical differences were examined using a Mc-Nemar test for dichotomous data and Wilcoxon sign rank test was used for non-parametric data; *p*-value < 0.05 was considered statistically significant.

Result: In total, 88% subjects were aware about nutrition labels on back of packaged items. But only 13% go through them showing that only written information is not sufficient to reduce the consumption of trans-fatty products.

Conclusion: The study signifies the importance of knowledge, awareness, and consumption behavior of trans-fat among young generation which significantly improves the health of the heart of young generation.

KEY WORDS: Trans-fat, packaged food, nutrition labels, partially hydrogenated vegetable oils (PHVOs)

Introduction

In India, over the past decade along with the persistent high rates of childhood under nutrition, there has been a rapid rise in diet-related NCDs, affecting all sections of society.[1,2] One of the reasons for the rapid rise in NCDs in India has been a rapid change in dietary patterns. The consumption of trans-fatty acids (trans-fat), found in partially hydrogenated oils, is associated with substantially increased risk of coronary heart disease (CHD).[3,4] Partially hydrogenated vegetable oils (PHVOs) are the main source of trans-fat and are used as bakery shortening, as frying oil and, in some cases, in household cooking. Its use has been favored by industry due to its long shelf-life and low cost.[5,6]

There are two main sources of dietary trans-fatty acids (trans-fat). Naturally occurring trans-fat is found in small amounts in the fatty parts of meat and dairy products. Artificial trans-fat comes from foods that contain partially hydrogenated oil and is formed when hydrogen is added to liquid oil turning it into solid fat. Often food manufacturers use artificial trans-fat in food products because it is inexpensive and it increases the food's shelf life, stability, and texture.

Access this article online	
Website: http://www.ijmsph.com	Quick Response Code:
DOI: 10.5455/ijmsph.2016.29052016528	

According to the Food and Drug Administration (FDA), in 1994-96 about 5.6 g of trans-fat was consumed per day. Although *trans*-fats are edible, consumption of *trans*-fats has shown to increase the risk of coronary heart disease[7,8] in part by raising levels of the lipoprotein LDL (so-called "bad cholesterol"), lowering levels of the lipoprotein HDL ("good cholesterol"), increasing triglycerides in the blood-stream and promoting systemic inflammation.[9]

The health consequences of trans-fat consumption are clear – a 2% increase in energy intake from trans-fat has been associated with a 23% increase in the risk of heart disease.[10]

Trans-fat has been shown to be consistently associated, in an intake-dependent way, with risk of coronary heart disease, which is the main contributor to the global burden of disease.[11] The aim of the research was to assess the level of awareness about trans-fat in packaged foods in college students of Indore, to increase their awareness about trans-fats and their health hazards and to encourage students to go through the nutritional profiles of packaged food before consuming it.

Material and Methods

This was an educational intervention cross-sectional study, conducted upon 100 students aged 18–22 years randomly selected from two colleges of Indore city. Students less than 18 years of age and more than 22 years of age were not included in our study. Qualitative interviews were taken from those who gave informed consent.

Pre- and post-interventional questionnaire containing questions related to awareness, knowledge, and practices regarding trans-fat was used as study tool.

Educational intervention was carried out by using pamphlets and lectures with audio visual aids.

All statistical analyses were conducted in SPSS (version 20, IBM SPSS Statistics). Statistical differences were examined using a Mc-Nemar test for dichotomous data and Wilcoxon sign rank test was used for non-parametric data; *p*-value < 0.05 was considered statistically significant.

Results

The present study was conducted with the aim of identifying the awareness level regarding the presence of trans-fat in the packaged food items in the age group 18–22 years. In this study 54% were females and 66% were males.

In total, 62% study subjects were aware of the term trans-fat while 38% were unaware of it. After intervention 96% got aware of it. On applying Mc-Nemar test, *p*-value = 0.00 (< 0.05) was found which is statistically significant at 5% confidence interval.

Before intervention 67% thought that trans-fat is harmful. After study it became 91%. Statistically significant *p*-value = 0.001 (< 0.05) was found on applying Wilcoxon sign rank test (Figure 1).

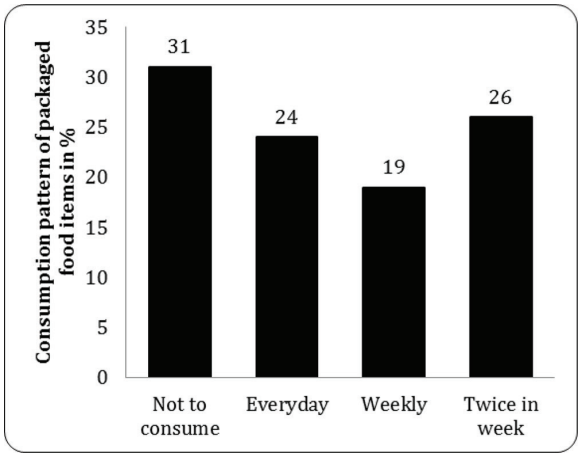

Figure 1: Consumption pattern of packaged food items in %.

Briefly, 31% people prefer not to consume such items before, after intervention it increased to 56%, i.e., *p*-value = 0.002 (< 0.05) which is statistically significant.

In total, 88% were aware about nutritional information is given behind packaged food item, i.e., most of the study population was aware of it but only 13% of them go through it. After intervention 72% say that now they will go through the 'Nutritional Information'.

On asking about trans-fat only 39% said that it is of no use to the body but after intervention knowledge increases to 83%. Statistically significant *p*-value = 0.001 (< 0.005) was found on applying Wilcoxon sign rank test.

When asked about what are the harmful effects of trans-fat 30% know about plaque forming effects, can cause heart diseases and obesity, which increased to 92% after intervention while 65% do not know anything regarding this. Applying Mc-Nemar P value=0.002 (<0.05) which is statistical significant.

Before study 18% say that they prefer to consume packed foods containing trans-fats and after intervention 81% say they will not prefer any packed items containing trans-fat.

Discussion

The present study is to assess the awareness regarding trans-fat and to know about the eating habits of youngsters. Awareness of nutrition is one of the basic rights of everyone. Poor nutrition during the vital points of life can have significant outcome, which may give rise to long-lasting consequences.

The present study targeted the age group of 18–22 years, as this is one the vulnerable time when eating habits changes according to lifestyle. Awareness regarding healthy diet is of utmost importance at this period. Study conducted in Lucknow also targeted adolescence age group (11–21 years) for poor eating habits.[12]

The Food and Drug Administration (FDA) requires that the Nutrition Facts panel list the amount of trans-fat in a serving of food if a serving contains 0.5 g or more of trans-fatty acids, this is listed on the line below the listing of saturated fat.[13]

Previous studies with adults and adolescents have found that use of the nutrition facts panel association with reduction in fat intake.[14–16] Alternatively, our findings show 88% the awareness about nutrition labels on back of packaged items. But only 13% go through them shows that only written information is not sufficient to reduce the consumption of Trans-fatty products.

Trans-fat is also present in sweets, chocolates, spreads, soups, salad dressings and snacks. In rural and urban India the fat consumption is around 20 and 30 g/day, respectively, according to diet studies (National Consumption Survey data by NIN 2009).[17]

In youth the atherosclerotic process begins, which culminates in the development of vascular plaque in the third and fourth decades of life.[18,19] Hence the early intervention is needed to reduce the ill effects of trans-fat but low percentage, i.e., only 30% of study group was aware of plaque forming nature of trans-fat.

Lunch skipping mostly seen among this age group whereas, most of the research carried out in America, Europe and Arab countries indicates; breakfast skipping is most prevalent among them.[20–22]

According to a report in New England Journal of Medicine, consumption of trans-fats results in considerable potential harm with no benefit.[3] Briefly, 39% subjects in this study said that it is of no use to the body but after intervention knowledge increases to 83%. They know very well about the disadvantages of consumption of food containing trans-fat but beside this thing they prefer to eat such foods almost daily. Fast food advertisement is important component of fast food marketing among young generation, including the images of the attractive models eating and positive emotions linked to fast food consumption.[23,24]

WHO has recommended that TFA intake as a % of Energy should not exceed 1%. The total fat intake as a % of Energy should not be less than 15% and should not exceed 30%. The intake of saturated fat (SFA) as a % of Energy should not exceed 10% (7% for cardiac patients).[25] So reduce daily intake of trans-fats by 1% and 2% of energy intake consistent with current dietary recommendations, over a period of 3 years. Promote the use of alternatives of trans-fats. The study concludes that the adoption of food rich in trans-fat among youngsters is common.

Conclusion

The study clearly signifies the importance of knowledge, awareness, and consumption behavior of trans-fat amongs young generation. Thus, awareness of trans-fat significantly improves the health of the heart of young generation.

References

1. Khandelwal S, Reddy KS. Eliciting a policy response for the rising epidemic of overweight–obesity in India. Obes Rev 2013; 14 (Suppl 2):114–25
2. Prabhakaran D, Jeemon P, Reddy KS. Commentary: Poverty and cardiovascular disease in India: Do we need more evidence for action? Int J Epidemiol 2013;42(5):1431–5.
3. Mozaffarian D, Katan MB, Ascherio A, Stampfer MJ, Willett WC. Trans fatty acids and cardiovascular disease. N Engl J Med 2006;354:1601–13.
4. USDHHS, U.S. Department of Agriculture. *Dietary Guidelines for Americans*, 6th edn. Washington DC: U.S. Government Printing Office, 2005.
5. Klonoff DC. Replacements for trans fats—Will there be an oil shortage? J Diabet Sci Technol (Online) 2007;1(3):415–22.
6. Coombes R. Trans fats: Chasing a global ban. BMJ. 2011; 343:d5567 – Food and Nutrition Board, Institute of Medicine of the National Academies. *Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids (Macronutrients)*. National Academies Press, 2005. p. 423.
7. Food and Nutrition Board, Institute of Medicine of the National Academies. *Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids (Macronutrients)*. National Academies Press, 2005. p. 504.
8. Mayo Foundation for Medical Education and Research (MFMER). *Trans Fat: Avoid this Cholesterol Double Whammy*. (last accessed on June 8, 2016).
9. Mozaffarian D, Clarke R. Quantitative effects on cardiovascular risk factors and coronary heart disease risk of replacing partially hydrogenated vegetable oils with other fats and oils. Eur J Clin Nutr 2009;63 (Suppl 2):S22–33.
10. Lozano R, Naghavi M, Foreman K, et al. Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: A systematic analysis for the Global Burden of Disease Study 2010. Lancet 2012;380(9859):2095–128.
11. Arya G, Mishra S. Effects of junk food & beverages on adolescent's health – A review article. IOSR J Nurs Health Sci (IOSR-JNHS) e-ISSN: 2320–1959.p-ISSN: 2320–1940 Volume 1, Issue 6 (Jul–Aug 2013), pp. 26–32.
12. Chu YH, Frongillo EA, Jones SF, Kaye GL. Improving patrons' meal selections through the use of point-of-selection nutrition labels. Am J Public Health 2009;99(11):2001–5.
13. Dhaka V, Gulia N, Ahlawat KS, Khatkar BS. Trans fats—Sources, health risks and alternative approach – A review. J Food Sci Technol 2011;48(5):534–41.
14. Temple JL, Jonson K, Recupero K, Suders H. Nutrition labels desease energy intake in adults consuming lunch in the laboratory. J Am Diet Assoc 2010;110(7):1094–7.
15. Satia JA, Galanko JA, Neuhouser ML. Food nutrition label use is associated with demographic, behavioral, and psychosocial factors and dietary intake among African Americans in North Carolina. J Am Diet Assoc 2005;105(3):392–402.
16. Relationship of atherosclerosis in young men to serum lipoprotein cholesterol concentrations and smoking: a preliminary report from the Pathobiological Determinants of Atherosclerosis in Youth (PDAY) Research Group. JAMA 1990;264:3018–24.
17. FSSA. *Food Safety and Standards Authority of India Proposes Regulation of Trans Fatty Acids (TFAs) in Partially Hydrogenated Vegetable Oils (PHVOs)*, 2010. Available at: http://www.fssai.gov.in/Website/LinkClick.aspx?fileticket=SvU1nfLZRrc%3D&tabid=94. (last accessed on June 8, 2016).
18. Berenson GS, Srinivasan SR, Bao W, Newman III WP, Tracy RE, Wattigney WA. Association between multiple cardiovascular risk factors and atherosclerosis in children and young adults. The Bogalusa Heart Study. N Engl J Med 1998;338:1650–6.

19. Mahoney LT, Burns TL, Stanford W, et al. Coronary risk factors measured in childhood and young adult life are associated with coronary artery calcification in young adults: The Muscatine Study. J Am Coll Cardiol 1996;27:277–84.
20. Rampersaud GC, Pereira MA, Girard BL, Adams J, Metzl JD. Breakfast habits, nutritional status, body weight and academic performance in children and adolescents. J Am Diet Assoc 2005;105:743–60.
21. Abalkhail B, Shawky S. Prevalence of daily breakfast intake, iron deficiency anaemia and awareness of being anaemic among Saudi school students. Int J Food Sci Nutr 2002;53:519–28.
22. Mikki N, Abdul-Rahim HF, Shi Z, Holmboe-Ottesen G. Dietary habits of Palestinian adolescents and associated sociodemographic characteristics in Ramallah, Nablus and Hebron governorates. Public Health Nutr 2010;13:1419–29.
23. Folta SC, Goldberg JP, Economos C, Bell R, Meltzer R. Food advertising targeted at school-age children: A content analysis. J Nutr Educ Behav 2006;38:244–8.
24. Harrison K, Marske AL. Nutritional content of foods advertised during the television programs children watch most. Am J Public Health 2005;95:1568–74.
25. WHOlHealthy Diet [Internet]. WHO. [cited June 8, 2016]. Available at: http://www.who.int/mediacentre/factsheets/fs394/en/

How to cite this article: Banseria R, Gothwal S, Dixit S, Saroshe S. A cross-sectional study to assess the awareness of the presence of trans-fat in packaged food items and their harmful effects in a metropolitan city of central India. Int J Med Sci Public Health 2016;5:2570-2573

Source of Support: Nil, **Conflict of Interest:** None declared.