Knowledge and awareness of cardiovascular risk factors among young adults

Roshan A1, Kavitha S2*, Sridevi G3, Vishnu Priya V2, Gayathri R2

1Saveetha Dental College, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, Tamil Nadu, India
2Department of Biochemistry, Saveetha Dental College, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, Tamil Nadu, India
3Department of Physiology, Saveetha Dental College and hospitals, SIMATS, Chennai, Tamil Nadu, India

Article History:
Received on: 24 Jul 2020
Revised on: 29 Aug 2020
Accepted on: 16 Sep 2020

ABSTRACT

Cardiovascular diseases (CVD) are becoming a major cause of death worldwide. Understanding the risk factors for CVD could provide important perception towards the etiology, course, prevention, and treatment for this key health problem. Aim of the survey was to create awareness on the cardiovascular risk factors among young adults. A self-administered questionnaire was prepared and circulated via an online platform. The data were analysed and the results represented as a bar graph. The data were analysed with SPSS software (SPSS). In this survey, about 52% of the young adults were aware of cardiovascular risk factors, about 57.4% of subjects agreed that smoking is a risk factor for cardiovascular disease, but 42% were not aware of it. 65.3% are aware that elevated blood pressure is also a risk factor for CVD. 56.4% knew that obesity increases a person’s risk of cardiovascular disease, but 44% did not agree with that. The survey concluded that there was moderate awareness among young adults about the risk factors of cardiovascular disease, and hence more health awareness should be created for common cardiovascular diseases.

INTRODUCTION

Cardiovascular disorder (CVD) is a collection of disorders influencing the heart in blood vessels, and it involves coronary artery disease (CAD) such as angina and myocardial infarction. Other CVDs involve stroke, cardiac failure, hypertension heart disease, cardiomyopathy, congenital heart disease, irregular heart rhythms, valvular heart disease and rheumatic heart disease (Bucholz et al., 2018). It is well known that CVD risk factor in young population is associated with an elevated risk of death (Lynch et al., 2006). In India, CVDs are the leading explanation for death. At the same time in terms of disease burden, CVD holds the third place while infectious and parasitic diseases and unintentional injuries hold the first two places. In India, deaths due to CVDs increases at a rapid pace. During 1990 the death due to CVD was 1,17 million, which was increased to 1,59 million, while in 2010, it was 2,03 million (McGurnaghan et al., 2019). The most significant step in strengthening cardiovascular disease prevention is to turn the behaviour into an entrenched lifestyle such a change would be more efficient and cost-effective. If the risk factor is well
known, the identification of individuals with these factors can prevent significant deaths by complementary preventive programs (Cao et al., 2020). CADs are associated with a number of risk factors, which can be modifiable and nonmodifiable. The modifiable risk factors include high BP; high levels of blood cholesterol; smoking; diabetes; overweight or obesity; lack of physical activity; unhealthy diet and stress. Those that can't be regulated (conventional or nonmodifiable) include age (increase in age is associated with increased risk of CAD); sex (men are at high risk than women); race background and family history (Hajar, 2016). Patients with chronic kidney disease (CKD) often develop cardiovascular disease (VD), and retinopathy (Grunwald et al., 2020). During the advancement of cardiovascular disease, the molecular myocardial systems (e.g., a proteome) undertake multiple and distinct profiling of directed animal types of social disease systems changes (Chung et al., 2020). Most recently, a study stated that Type 1 diabetes (T1D) and obesity are closely correlated with the risk of CVD and may begin in the pediatric era (Zucchini et al., 2020).

In a previous study, the awareness of CVD risk and barriers to prevent were evaluated among American women (Mochari-Greenberger et al., 2010). In the study by Chinju George, the knowledge on risks of CVD was assessed among people above 30 years of age (George and Andhuvan, 2014). Physical inactivity also contributes to obesity, which increases the risk for cardiovascular as well as various other deadly disorders like cancer, diabetes etc. (Shukri, 2016). Thyroid cancer is the most widespread endocrine malignant cancer (Ma et al., 2019). Glioma is the prime cause of cancer in adolescent people, and it accounts for about 80% of all malignant tumours (Li et al., 2020). Naturally occurring medicinal plants can inhibit the growth of various cancers (Rengasamy et al., 2018; Gan et al., 2019). Adiponectin is considered to be one of the key factors for obesity, and it is believed to be an important link of the connection between obesity and breast cancer (Mohan et al., 2015). Physical activity increases the antioxidant status, which is potential to reduce the risk of deadly disorders (Ramya, 2018). The present study is aimed to assess and create awareness of the risk factors associated with CVD among young adults.

MATERIALS AND METHODS

A self-administered questionnaire was designed based on the risk factor of cardiovascular disease, and the questionnaire was distributed through an online google form among young people. In light of the responses, the factual examination was performed. The analysis of the results was done using SPSS software and represented as a bar graph. The Pearson Chi-square analysis was also done in comparison with the age group of the respondents.

RESULTS AND DISCUSSION

The results of the present survey are represented in the following bar charts.

Figure 1: Bar graph showing the age distribution of the respondents

Figure 2: Bar graph on the gender distribution of the respondents

The questionnaire was attended by 101 participants out of which 61.39% of the participants were aged 30-40 years, 22.77% were about 23-30 years, as shown in Figure 1. Figure 2 depicts that about 57.43% of females and 42.57% of males participated in this survey. A study revealed that the risk factor score was high in males compared to females (Henry, 2005). In Figure 3, it depicts that 57.43% are aware that smoking is a major CVD risk factor, but 42.57% were not aware of it. In Figure 4, it depicts that 65% were aware that high blood pressure is a key risk factor for CVD. Nearly 47% of CVD globally are due to elevated BP (Wu et al., 2015). Figure 5 depicts that 63% of participants agreed obesity increases the risk of CVD. A similar study was...
Figure 3: Bar graph showing the percentage distribution of awareness on smoking as a risk factor associated with heart disease

Figure 4: Bar graph showing the percentage distribution of awareness on high blood pressure as a risk factor for heart disease

Figure 5: Bar chart showing the percentage distribution of awareness on obesity as a CVD risk factor

Figure 6: Bar chart showing the percentage distribution of awareness on family history as a key CVD risk factor

Figure 7: Bar chart showing the percentage distribution of awareness on age as a CVD risk factor

Figure 8: Bar chart showing the percentage distribution of awareness on diabetes as a CVD risk factor
Figure 9: Bar chart showing the percentage distribution of awareness on physical activity can prevent CVD.

Figure 10: Bar chart showing percentage distribution of awareness on the symptoms associated with heart disease as chest pain and shortness of breath.

Figure 11: Bar chart showing the percentage distribution of awareness on healthy lifestyle practices to prevent heart diseases.

Figure 12: Bar graph shows the association of age group with an awareness of smoking as a CVD risk factor.

Figure 13: Bar graph shows the association of age group with awareness about obesity as a CVD risk factor.

Figure 14: Bar graph shows the association of age group with awareness on age as a risk factor for heart disease.
found where it concluded that obesity was more widespread (56%) and in the North Indian sample (27%) (Chaturvedi et al., 2008; Wu et al., 2015). Figure 6 depicts that 63.3% agreed with the fact that persons with a family history of CVD are a major risk for CVD, but 36% did not agree with that. Relevant to that study, 67% has agreed that a person with family history has higher chances of getting CVD (Pierpont and Moller, 2012). Figure 7 shows that 53% are not aware that older people have a higher risk for CVD rest were not aware of it; it shows a lack of awareness among the study respondents. A similar study reported that only a few participants were aware that increased age is associated with a high risk of CVD (George and Andhuvan, 2014). Figure 8 shows 71% of subjects were aware that men with diabetes are more prone to CVD than women with diabetes, and very few are not aware of it.

Similarly Henry (2005) found that most of the population accepted that men with diabetes have more chance of getting CVD. Figure 9 depicts that 62.3% of subjects were aware that those who are regular physical activity are less prone to CVD, but 37.62% were not aware of it. Relevant to this, a study was found where more population supported that regular physical activity will decrease the chance of CVD (Valle et al., 2004). Figure 10 shows that 52.48% of subjects knew about common symptoms of cardiovascular disease, but 47.52% did not know about it. Comparatively, it was found that 95% of participants were aware of the symptoms of heart disease (George and Andhuvan, 2014). Figure 11 shows that 52.48% were aware of risk factors of cardiovascular disease, but 47.52% were not aware of it. An opposing study was found where 65% of the respondents were not aware of any risk factors (Lynch et al., 2006). Figure 12 shows that 53.47% of subjects were aware that a healthy lifestyle and diet leads to less cardiovascular disease, whereas 46% of subjects were not aware of it. Relevant to this study, the prevalence rate for hypertension was 49% for males and 51.3% for females residing in urban areas and 53.5% for males and 59.6% for females residing in rural areas. The awareness among the age group of 30-40 years was better than the participants of other age groups (Pearson’s Chi-square value-6.357, DF-2, p-value-0.042 <0.05). The risk of hypertension was higher in the urban area population with a smoking habit, inappropriate salt intake, sedentary lifestyle, obesity or a diagnosis of hypercholesterolemia (Mathes et al., 2009).

This study reports a statistically significant association of age groups with an awareness of smoking as a CVD risk factor. The study respondents aged 30-40 years were more aware of smoking being a risk factor for CVD (Chi-square test P-value-0.042). The participants aged 30-40 years are having better awareness than the participants of other age groups (Pearson’s Chi-square value-2.989, DF-2, p value-0.001<0.05) (Figure 13). This study also reports a statistically significant association of age group with awareness about obesity CVD risk factor. The study respondents aged 30-40 years were more aware of obesity being a risk factor for CVD. (Chi-square test, p-value-0.001 statistically significant) The differences in awareness among the age groups are not statistically significant (Chi-square value-2.446, DF-4, p-value-0.654 >0.05) (Figure 14). There is no association between the age group and the awareness on age as a risk factor for cardiovascular disease (Chi-square test, p-value-0.654). Also, a statistically significant association of age group with awareness about common symptoms of heart disease was noted (Chi-square test, p-value-0.024). The participants aged 30-40 years were more aware of common symptoms of heart disease (Chi-square value-0.798, DF-2, p value-0.024<0.05) (Figure 15).

The use of natural products is used widely nowadays to treat many lifestyle disorders (Menon et al., 2016; Rengasamy et al., 2016). The use of traditional and alternative medicine in various diseases is documented in many studies (Ponnulakshmi et al., 2019; Wu et al., 2019). Previous studies have demonstrated that 4-shogaol from ginger may be a novel anticancer agent (Chen et al., 2019). Garcinol has also shown strong activity against breast cancer and leukemia (Jainu et al., 2018). Bionanotechnology has a pivotal role in the development of novel therapies (Ke et al., 2019; Wang et al., 2019). The awareness of the risk factors of CVD among the young population plays a key role in decreasing the onset
of heart diseases among them and also in their future life. This can be attained by leading a healthy lifestyle by managing modifiable risk factors.

CONCLUSION

The study can be concluded that the awareness about the risk factors of CVD among adults of age 30-40 years was more compared to other age groups, and therefore measures to improve awareness is needed which can be imparted by health education as a community initiative.

ACKNOWLEDGEMENT

The author expresses their sincere thanks to Saveetha Dental College for extending full support to complete this study.

Funding Support

The authors declare that there is no funding support for this study.

Conflict of Interest

The authors declare that they have no conflict of interest for this study.

REFERENCES

Bucholz, E. M., Gooding, H. C., de Ferranti, S. D. 2018. Awareness of Cardiovascular Risk Factors in U.S. Young Adults Aged 18–39 Years. *American Journal of Preventive Medicine*, 54(4):e67–e77.

Cao, L., Wang, D., Zhu, C., Wang, B., Cen, X., Chen, A., Zhou, H., Ye, Z., Tan, Q., Nie, X., Feng, X., Xie, Y., Yuan, J., Chen, W. 2020. Polycyclic aromatic hydrocarbon exposure and atherosclerotic cardiovascular disease risk in urban adults: The mediating role of oxidatively damaged DNA. *Environmental Pollution*, 265. Article Number: 114860.

Chaturvedi, V., Reddy, K. S., Prabhakaran, D., Jeemon, P., Ramakrishnan, L., Shah, P., Shah, B. 2008. Development of a clinical risk score in predicting undiagnosed diabetes in urban Asian Indian adults: a population-based study. *CVD Prevention and Control*, 3(3):141–151.

Chen, F., Tang, Y., Sun, Y., Veeraraghavan, V. P., Mohan, S. K., Cui, C. 2019. 6-shogaol, a active constituents of ginger prevents UVB radiation mediated inflammation and oxidative stress through modulating Nrf2 signaling in human epidermal keratinocytes (HaCaT cells). *Journal of Photochemistry and Photobiology B: Biology*, 197. Article Number: 111518.

Chung, N. C., Choi, H., Wang, D., Mirza, B., Pelletier, A. R., Sigdel, D., Wang, W., Ping, P. 2020. Identifying temporal molecular signatures underlying cardiovascular diseases: A data science platform. *Journal of Molecular and Cellular Cardiology*, 145:54–58.

Gan, H., Zhang, Y., Zhou, Q., Zheng, L., Xie, X., Veeraraghavan, V. P., Mohan, S. K. 2019. Zingerone induced caspase-dependent apoptosis in MCF-7 cells and prevents 7,12-dimethylbenz(a)anthracene-induced mammary carcinogenesis in experimental rats. *Journal of Biochemical and Molecular Toxicology*, 33(10). Article Number: e22387.

George, C., Andhuvan, G. 2014. A population-based study on Awareness of Cardiovascular Disease Risk Factors. *Indian Journal of Pharmacy Practice*, 7(2):23–25.

Grunwald, J. E., Pistilli, M., YING, G. S., Maguire, M. G., Daniel, E., Whittock-Martin, R., Parker-Ostroff, C., Jacoby, D., Go, A. S., Townsend, R. R., Gadegbeku, C. A., LASH, J. P., Fink, J. C., Rahman, M., Feldman, H., KUSEK, J. W., Xie, D. 2020. CRIC Study investigators. Progression of retinopathy and incidence of cardiovascular disease: findings from the Chronic Renal Insufficiency Cohort Study. *The British journal of ophthalmology*.

Hajar, R. 2016. Framingham contribution to cardiovascular disease. *Heart Views*, 17(2):78–81.

Henry, S. A. 2005. Health care disparities in cardiovascular disease: A focus on gender. *Gender Medicine*, 2(1):7–12.

Jainu, M., Priya, V., Mohan, S. 2018. Biochemical evidence for the antitumor potential of Garcinia mangostana Linn. On diethylnitrosamine-induced hepatic carcinoma. *Pharmacognosy Magazine*, 14(54):186–190.

Ke, Y., Aboody, M. S. A., Alturaiki, W., Alsagaby, S. A., Alfaiz, F. A., Veeraraghavan, V. P., Micky-maray, S. 2019. Photosynthesized gold nanoparticles from Catharanthus roseus induces caspase-mediated apoptosis in cervical cancer cells (HeLa). *Artificial Cells, Nanomedicine, and Biotechnology*, 47(1):1938–1946.

Li, Z., Veeraraghavan, V. P., Mohan, S. K., Bolla, S. R., Lakshmanan, H., Kumaran, S., Aruni, W., Aladresi, A. A. M., Shair, O. H., Alharbi, S. A., Chinnathambi, A. 2020. Apoptotic induction and anti-metastatic activity of eugenol encapsulated chitosan nanopolymer on rat glioma C6 cells via alleviating the MMP signaling pathway. *Journal of Photochemistry and Photobiology B: Biology*, 203. Article Number: 111773.

Lynch, E. B., Liu, K., Kiefe, C. I., Greenland, P. 2006. Cardiovascular Disease Risk Factor Knowledge in Young Adults and 10-year Change in Risk Factors: *© International Journal of Research in Pharmaceutical Sciences* 829
The Coronary Artery Risk Development in Young Adults (CARDIA) Study. *American Journal of Epidemiology*, 164(12):1171–1179.

Ma, Y., Karunakaran, T., Veeraraghavan, V. P., Mohan, S. K., Li, S. 2019. Sesame Inhibits Cell Proliferation and Induces Apoptosis through Inhibition of STAT-3 Translocation in Thyroid Cancer Cell Lines (FTC-133). *Biotechnology and Bioprocess Engineering*, 24(4):646–652.

McGurnaghan, S. J., Brierley, L., Caparrotta, T. M., McKeigue, P. M., Blackbourn, L. A. K., Wild, S. H., Leese, G. P., McCormon, R. J., McKnight, J. A., Pearson, E. R., Petrie, J. R., Sattar, N., Colhoun, H. M. 2019. The effect of dapagliflozin on glycaemic control and other cardiovascular disease risk factors in type 2 diabetes mellitus: a real-world observational study. *Diabetologia*, 62(4):621–632.

Menon, A., Priya, V. V., Gayathri, R. 2016. Preliminary phytochemical analysis and cytotoxicity potential of pineapple extract on oral cancer cell lines. *Asian Journal of Pharmaceutical and Clinical Research*, 9(2):140–143.

Mochari-Greenberger, H., Mills, T., Simpson, S. L., Mosca, L. 2010. Knowledge, Preventive Action, and Barriers to Cardiovascular Disease Prevention by Race and Ethnicity in Women: An American Heart Association National Survey. *Journal of Women’s Health*, 19(7):1243–1249.

Mohan, S. K., Veeraraghavan, V. P., Jainu, M. 2015. Effect of pioglitazone, quercetin, and hydroxy citric acid on vascular endothelial growth factor messenger RNA (VEGF mRNA) expression in experimentally induced nonalcoholic steatohepatitis (NASH). *Turkish Journal Of Medical Sciences*, 45:542–546.

Pierpont, M. E. M., Moller, J. H. 2012. The Genetics of Cardiovascular Disease. Springer Science & Business Media. ISBN: 9781461294191.

Ponnulakshmi, R., Shyamaladevi, B., Vijayalakshmi, P., Selvaraj, J. 2019. In siliconco vivoanalysis to identify the antidiabetic activity of beta sitosterol in adipose tissue of high fat diet and sucrose induced type-2 diabetic experimental rats. *Toxicology Mechanisms and Methods*, 29(4):276–290.

Ramya, G. 2018. Cytotoxicity of strawberry extract on oral cancer cell line. *Asian Journal Of Pharmaceutical and Clinical Research*, 11(9):353–355.

Wang, Y., Zhang, Y., Guo, Y., Lu, J., Veeraraghavan, V. P., Mohan, S. K., Wang, C., Yu, X. 2019. Synthesis of Zinc oxide nanoparticles from Marsdenia tenacissima inhibits the cell proliferation and induces apoptosis in laryngeal cancer cells (Hep-2). *Journal of Photochemistry and Photobiology B: Biology*, 201. Article Number: 111624.

Wu, F., Zhu, J., Li, G., Wang, J., Veeraraghavan, V. P., Mohan, S. K., Zhang, Q. 2019. Biologically synthesized green gold nanoparticles from Siberian ginseng induce growth-inhibitory effect on melanoma cells (B16). *Artificial Cells, Nanomedicine, and Biotechnology*, 47(1):3297–3305.

Zucchini, S., Fabi, M., Maltoni, G., Zioutas, M., Trevisani, V., Natale, V. D., Cassio, A., Pession, A. 2020. Adolescents with severe obesity show a higher cardiovascular (CV) risk than those with type 1 diabetes: a study with skin advanced glycation end products and intima media thickness evaluation. *Acta Diabetologica*. 