

AWARENESS ON SEDENTARY LIFESTYLE, OBESITY AND CARDIOVASCULAR DISEASES AMONG UNDERGRADUATE STUDENT POPULATION

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ABSTRACT

Sedentary lifestyle has become a huge concern in one's life, in which physical inactivity has become a major health problem. Prevalence of sedentary life is increasing nowadays and is seen more commonly in the student population. Sedentary lifestyle leads to obesity is an important health concern which is increasing day by day around the globe. It affects the whole body which mainly causes cardiovascular problems. The Aim of this research is to bring awareness about sedentary lifestyle, obesity and cardiovascular disease in the student population. A questionnaire of a total 15 questions were prepared and was uploaded through surveyplanet. The responses were collected and then interpreted as pie charts and bar graphs. A total of 100 undergraduate college students have taken the survey. The data was analysed by IBM-SPSS software where descriptive statistics and chi square test was done, where the results are plotted as graphs and pie charts. A total of 100 college students have taken up the survey in which 47% were male and 53% were female. In a question pertaining to how many people were following a healthy diet- 74 % have answered yes and 26% said no. The next question was about exercising everyday in which 62 % said yes while 38% said no. In which 47% males and 15% females have answered yes. 97% agree that sedentary lifestyle leads to complications such as obesity. 90% of the students are aware about the increase in sedentary lifestyle among students. 69% have answered that unhealthy diet, lack of physical activity, smoking etc were the common causes of obesity. 95% agree that obesity causes respiratory problems. Almost 95 % students agree that obesity causes systemic diseases such as diabetes and hypertension which will ultimately lead to cardiovascular problems. Chi square test was done between gender and people who are following a healthy diet and exercising daily where $p < 0.05$ which is statistically significant. Our study showed that almost all students were aware about sedentary lifestyle and its complications, but the females in the study have shown that they do not follow a healthy diet and do not exercise regularly which makes them prone to obesity and ultimately cardiovascular problems. To avoid these problems, awareness has to be spread in colleges about the seriousness of obesity and its harmful effects and how to prevent it.

Key words: Awareness; Cardiovascular diseases; Obesity; Sedentary lifestyle.

INTRODUCTION

Sedentary lifestyle has become a huge health concern in one's life in which physical inactivity has become a major concern (Warren *et al.*, 2010). Sedentary lifestyle involves lack of physical inactivity, eating junk food, all these lead to obesity and cardiovascular problems and many more health problems (Barnes, 2012). Following a sedentary lifestyle these days has been increasing and it's increasing at an alarming rate among students (Tapera *et al.* , 2017).

Obesity has become a severe epidemic health problem. It is continuing to be increasing among students (Bray, 1996; Tayem *et al.*, 2012). Obesity leads to so many disorders such as diabetes, hypertension, cardiovascular problems and many more (Warren *et al.*, 2010; Baig *et al.*, 2015). Studies showed that obesity also causes problems in thyroid function (Menon and Thenmozhi, 2016). Obesity also affects you psychologically by being bullied by the society which leads to a state of depression. Adolescence is a change which occurs between childhood and adulthood. Whatever is learnt in this phase will be impacted in adult life (Unicef and Others, 2007).

Studies revealed that following a sedentary lifestyle displayed antecedents of CVD which are arterial stiffness, endothelium-dependent dilation, and insulin sensitivity (McGavock, Anderson and Lewanczuk, 2006). Cardiovascular disease (CVD) mortality and morbidity rate are increased in individuals who are obese (Akil and Ahmad, 2011), due to the deposition of adipose tissue. Abdominal obesity is known to be a big risk factor for CVD (Van Gaal, Mertens and De Block, 2006). Obesity is mostly associated with hypertension, diabetes, elevated levels of fibrinogen, dyslipidemia all of which are risks for CVD. Obesity exacerbates cardiovascular disease through a number of mechanisms such as systemic inflammation, hypercoagulability and renin-angiotensin system (Zalesin *et al.*, 2008). Constant hypertension leads to stroke, heart failure, myocardial infarction and elevation of arterial pressure (CDC, 2020). All of this is caused by obesity which is the root problem for all these diseases. These problems are now seen to be increasing among the youth (Akil and Ahmad, 2011) which can be a serious problem in the near future. Measures such as proper diet, Proper fitness have to be taken care of in order to prevent these problems. Improper fitness, unhealthy diet and all other factors such as smoking can all lead to obesity which directly causes cardiovascular problems, diabetes , hypertension and many more diseases.

Previously our team had conducted numerous bioinformatics studies (Thejeswar and Thenmozhi, 2015; Sekar *et al.*, 2019; Johnson *et al.*, 2020), in-vivo animal experimental studies (Seppan *et al.*, 2018) ,online survey analysis (Sriram, Yuvaraj and Others, 2015), morphological and morphometrical studies (Samuel and Thenmozhi, 2015; Choudhari and Thenmozhi, 2016; Hafeez and Others, 2016; Keerthana and Thenmozhi, 2016; Krishna and Babu, 2016; Pratha and Thenmozhi, 2016; Subashri and Thenmozhi, 2016; Nandhini, Babu and Mohanraj, 2018) and genetic studies (Kannan and Thenmozhi, 2016) over the past 5 years. Now, epidemiological surveys are focussed where the idea for this survey is obtained from the current issues in the world. This study based survey tells us about how students are aware of sedentary lifestyle and the complication leading a sedentary lifestyle and how obesity causes cardiovascular problems and many more.

MATERIALS AND METHODS

The study was approved by the institution's review board. Two reviewers were involved in this study. A questionnaire of a total 15 questions were prepared and was uploaded through surveyplanet. The responses were collected and then interpreted as pie charts and bar graphs. A total of 100 undergraduate college students have taken the survey. The data was analysed by IBM SPSS software where descriptive statistics and chi square test was done, where the results are plotted as graphs and pie charts.

RESULTS AND DISCUSSION

A total of 100 college students have taken up the survey in which 47% were male and 53% were female(Figure-1). In a question pertaining to how many people were following a healthy diet- 74% have answered yes and 26% said no. Out of the students who said yes-47% were male and 27% were female(Figure-2).Bes-rastrollo et al reported that consumption of sugar-sweetened soft drinks and fast food intake produces weight gain of approximately 0.4kg/y independent of energy intake and physical activity(Bes-Rastrollo *e t al.*, 2006; Jacobs, 2006). The next question was about exercising everyday in which 62 % said yes while 38% said no. In which 47% males and 15% females have answered yes(Figure-3).Studies revealed that decreased physical activity is strongly associated with the development of obesity(Troiano *e t al.*, 1995; Guillaume *e t al.*, 1997).

97% agree that sedentary lifestyle leads to complications such as obesity(Figure-4).Sedentary lifestyle is a major factor causing obesity and other complications(Troiano *e t al.*, 1995; Bray, 1996; Guillaume *e t al.*, 1997; Bes-Rastrollo *e t al.*, 2006; Jacobs, 2006; Unicef and Others, 2007; Warren *e t al.*, 2010; Barnes, 2012; Tayem *e t al.*, 2012; Baig *et al.* , 2015; Tapera *et al.* , 2017).

90% of the students are aware about the increase in sedentary lifestyle among students(Figure-5). There is an increase in overweight and obese children and adolescentd in both genders for the past 30 years(Must, Gortmaker and Dietz, 1994).

69% have answered that unhealthy diet, lack of physical activity,smoking etc were the common causes of obesity(Figure-6). Ovesen et al stated that genetics, physical inactivity, unhealthy diet, smoking and alcohol are the most of the risk factors associated with obesity(Ovesen, Rasmussen and Kesmodel, 2011).

95% agree that obesity causes respiratory problems(Figure-7). Some studies supported that obesity is linked with exertional dyspnea, obstructive sleep apnea, COPD, asthma and other respiratory distresses(Koenig, 2001; Murugan and Sharma, 2008).

Almost 95% of students agree that obesity causes systemic diseases such as diabetes and hypertension which will ultimately lead to cardiovascular problems(Figure-8,9). Obesity causes impaired glucose tolerance(Tuomilehto *e t al.*, 2001; Knowler *et al.*, 2002). Studies found that sedentary lifestyle leads to increased mortality due to cardiovascular problems, diabetes, hypertension etc(Fang *e t al.*, 2003; Beunza *et al.* , 2007; Hamilton, Hamilton and Zderic, 2007). Chi square test was done between gender and people who are following a healthy diet and exercising daily where $p < 0.05$ which is statistically significant(Figure-3,4). Chi square test was also done between gender and awareness in increase in sedentary lifestyle among students(Figure-10), gender and awareness about factors causing obesity(Figure-11) and gender and awareness about complications of sedentary lifestyle leads to obesity(Figure-12) where $P < 0.05$ for all the graphs which is statistically significant.

Overall our study was in consensus with all other studies which are mentioned here and that obesity has to be managed and treated before anything serious happens.

CONCLUSION

Our study showed that almost all students were aware about sedentary lifestyle and its complications, but the females in the study have shown that they do not follow a healthy diet and do not exercise regularly which

makes them prone to obesity and ultimately cardiovascular problems. To avoid these problems, awareness has to be spread in colleges about the seriousness of obesity and its harmful effects and how to prevent it.

AUTHORS CONTRIBUTIONS B.V.M. Anirudh

Author contributed in the conception, acquisition of data, analysis and interpretation of data, literature review, critical review, drafting the article and in writing the manuscript.

Dr. M. Karthik Ganesh

Author contributed in the design, revising it critically for important and intellectual content, final approval of the submitted version of the manuscript and supervision.

Dr. Nivethigaa. B

Author made formatting and other alignment corrections and supervision.

CONFLICT OF INTEREST

None declared

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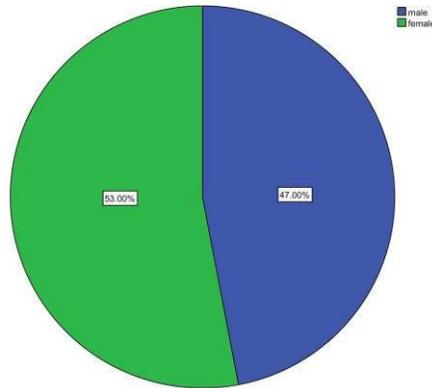


Figure 1: Pie chart showing percentage distribution of males and females participated in the survey. Green colour indicates female students and blue indicates male students. Majority of participants 53% were female and male were 47%.

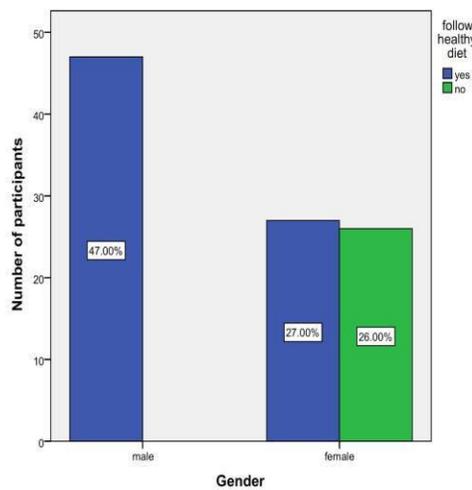


Figure 2: Bar graph showing the association between gender and participants following a healthy diet. Green colour indicates no and blue indicates yes. Males: yes - 47%, Females: yes - 27%, Females: no - 26%. X axis represents the prevalence of following a healthy diet and Y axis represents the number of participants.

Association between gender and people who are following a healthy diet was done using Chi square test showing $p=0.000$ ($p<0.05$) indicating statistically significant. This shows that males are maintaining a healthy diet more than females.

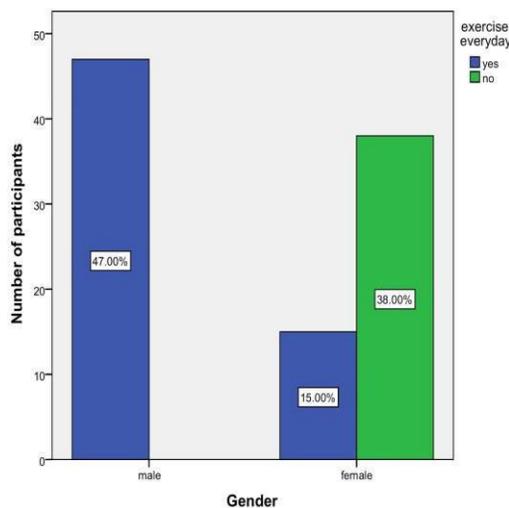


Figure 3 : Bar graph showing the association between gender and participants who are exercising regularly. Green colour indicates no and blue indicates yes. Males response was: yes - 47%, Females response was: yes - 15%, 38% Females responded 'no'. X axis represents the prevalence of exercising daily and Y axis represents the number of participants. Association between gender and participants who are exercising daily was done using Chi square test showing $p=0.000$ ($p<0.05$) indicating statistically significant. This shows that males are exercising more regularly compared to females.

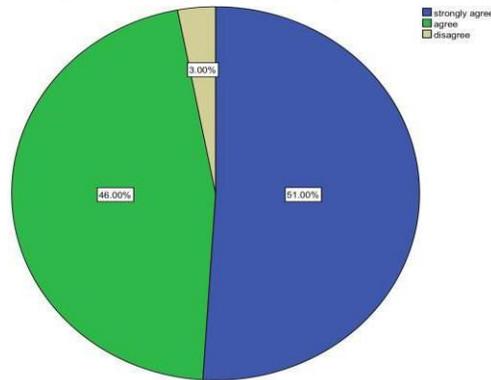


Figure 4 : Pie chart showing the responses of students' opinions on whether that leading a sedentary lifestyle leads to obesity and other complications: Majority of participants 51% answered strongly agree, 46% answered agree and 3% answered disagree .Blue colour indicates strongly agree, green indicates agree and yellow indicates disagree

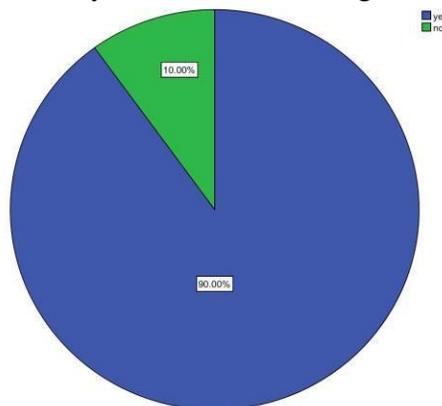


Figure 5: Pie chart showing the responses of students whether they are aware about the increased sedentary lifestyle. Majority of participants 90% answered yes and 10% answered no. Blue colour indicates yes and green indicates no.

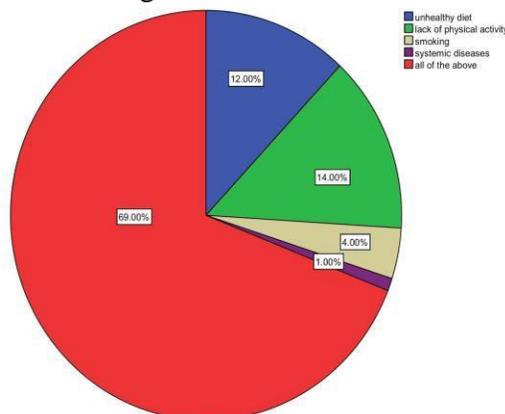


Figure 6: Pie chart showing the responses to the question “factors causing obesity”. Unhealthy diet-12%, Lack of physical activity-14% , Smoking-4%, Systemic diseases-1% , All of the Above- 69% was the majority of responses Blue colour indicates strongly agree, green indicates agree, yellow indicates disagree, purple indicates strongly disagree and red indicates all of the above.

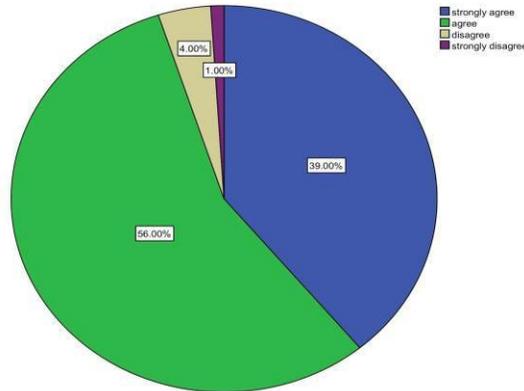


Figure 7 : Pie chart showing the responses of students whether students agree or disagree that obesity causes respiratory problems. Majority of participants 56% answered agree, 39% answered strongly agree, 4% answered disagree and 1% answered strongly disagree. Blue colour indicates strongly agree, green indicates agree, yellow indicates disagree and purple indicates strongly disagree.

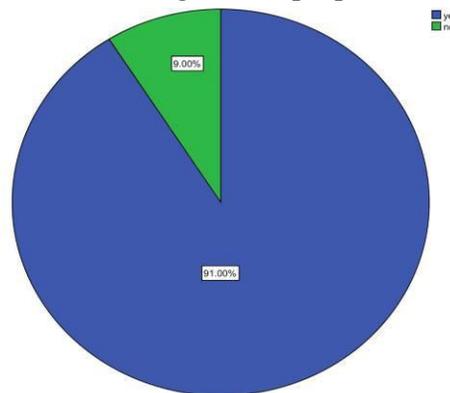


Figure 8 : Pie chart showing the responses of students on the question whether “obesity leads to high blood pressure and diabetes”. Majority of participants 91% answered yes and 9% answered no . Blue colour indicates Yes and Green indicates No.

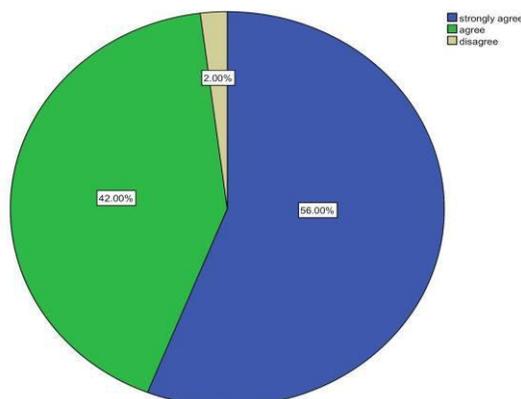


Figure 9- Pie chart showing the responses of students on the question whether “obesity leads to cardiovascular problems. Majority of participants 56% answered strongly agree, 42% answered agree and 2% answered disagree. Blue colour indicates strongly agree, green indicates agree and yellow indicates disagree.

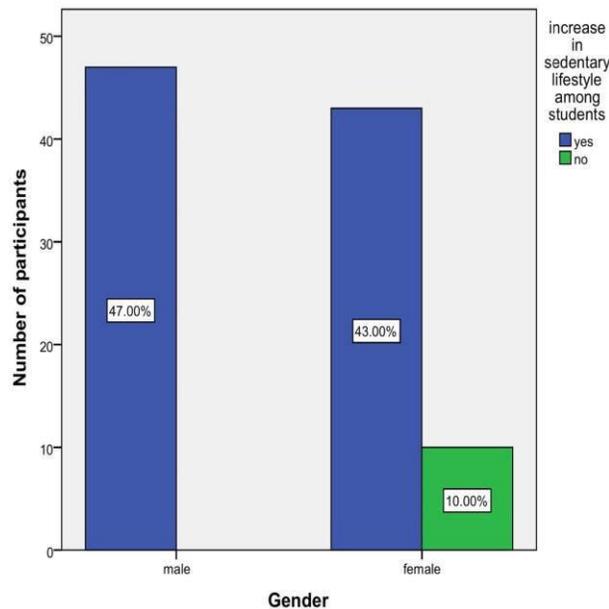


Figure 10: Bar graph showing the association between gender and awareness in increase in sedentary lifestyle among students. Green colour indicates no and blue indicates yes. Males response was: yes - 47%, Females response was: yes - 43%, 10% Females responded no. X axis represents Gender and Y axis represents the number of participants. Association between gender and awareness in increase in sedentary lifestyle among students was done using Chi square test showing $p=0.002$ ($p<0.05$) indicating statistically significant. This shows that males had higher awareness of increase in sedentary lifestyle than females.

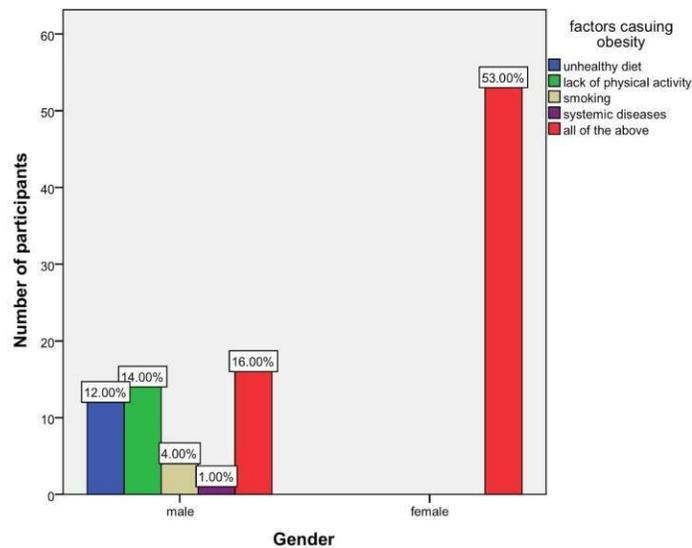


Figure 11: Bar graph showing the association between gender and awareness about factors causing obesity. Blue colour indicates unhealthy diet, green indicates lack of physical activity, yellow indicates smoking, purple indicates systemic diseases and red indicates all of the above. X axis represents Gender and Y axis represents the number of participants. Association between gender and awareness about factors causing

obesity was done using chi square test showing $p=0.000$ ($p<0.05$) indicating statistically significant. This shows that females had higher awareness about factors causing obesity compared to males.

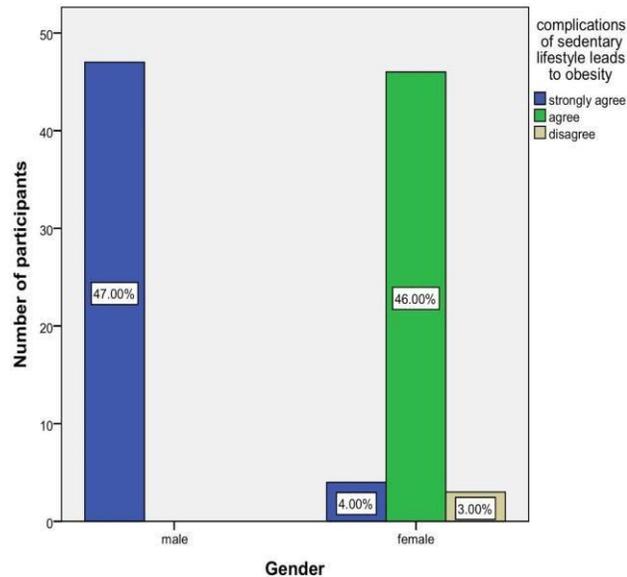


Figure 12: Bar graph showing the association between gender and awareness about complications of sedentary lifestyle leading to obesity. Blue colour indicates strongly agree, green indicates agree and yellow indicates disagree. X axis represents Gender and Y axis represents the number of participants. Association between gender and awareness about complications of sedentary lifestyle leads to obesity was done using Chi square test showing $p=0.000$ ($p<0.05$) indicating statistically significant. This shows that males had higher awareness about complications of sedentary lifestyle leading to obesity than females.