

Prevalence of Obesity consequences its impacts on health & working performance evidence from Saudi Arabia

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Abstract: The prevalence of Obesity is one of the major issues in the entire world. Being overweight or Obesity causes many fatal diseases which are further converted into chronic diseases. According to a cautious survey, more than 1 million people are obese in the world & this ratio is increasing day by day due to the high consumption of junk food, sweetened beverages, white sugar & sedentary lifestyle. The ratio of Obesity is different in different groups of ages, it is different in adults, adolescents in children & old age people. In our present research, we target 973 people, both gender male & female, with different groups ages 15 to 45 years, within 6 cities of the Kingdom of Saudi Arabia. We perform our research for the evaluation of three factors, Prevalence of obesity, Obesity impacts on health, & Obesity impacts on work performance, for this purpose we use a conceptual cross-section descriptive research method to obtain the data collection for our findings & results. The survey was conducted using different platforms interview over the mobile phone, online Facebook & LinkedIn survey using google supported questionnaire. We choose 973 people as a sample for research among the 973 population sample there were 732 respondents & this candidate participated in the survey with 384 males & 348 females respectively in 6 cities of Saudi Arabia, Makkah, Madinah, Jeddah, Taif, Tabuk including capital city Riyadh. Among these 732 respondents, 523 peoples are unweighted obese & rest of the 209 respondents are weighted obese. In our present research prevalence of Obesity BMI body mass index was $BMI \geq 30$ on the basis of BMI we concluded our remarks, results & implications policy.

Keywords: Obesity prevalence, Obesity Impact, Health Impact, Working performance, Obesity in Saudi Arabia, BMI,

JEL Classification: I12, I18, I19,

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1. Introduction

Nowadays it's very important to understand health-related matters carefully, Mostly because of ignorance, illiteracy & some other reasons people never think about Obesity & they never considered Obesity as a disease, but if we go through the Obesity & overweight problems & challenges it is revealed that Obesity is very fatal & bad disease that is not only harmful to health but also its consequences affect the daily lifestyle & working performance (Ali, et al. 2022 IJFM 1(1)). Being overweight or Obesity is now considered a universal disease by WHO (World Health Organization) it has a very bad impact on daily life routines. In Saudi, Arabia Obesity is increasing among people of different age groups & gender with different sizes, but it's increasing among adult more both males & females than in other groups, Normally obesity is increasing every year by some ratio in Saudi Arabia & there is no decreasing trend in obesity revealed until now. Normally it has been seen in Saudi Arabia that local citizens work very less & stayed at home because of the high ratio of expatriate workers in the country. Mostly in every industry & department, the labor work is performed by foreign workers so in this case local citizens only do office work. The other problems associated with Obesity are that many fatal diseases are only caused by increasing overweight or Obesity such as T2 Diabetes mellitus, peptic ulcer, hypertension, depression, anxiety, cardiovascular(CV), liver problems, & many other diseases, but it is still unclear that cancer & lung disease caused due to obesity.

In 2000 a survey was conducted in Saudi Arabia to measure the prevalence of Obesity at that time prevalence of Obesity among adults was 35% & in 2013 this prevalence ratio was 28.7%, on the flip side in Oman prevalence was 21% in Bahrain 26% Oman 28% & Yemen 17% in UAE it was increasing by 40% & 32% respectively. So the ratio of Obesity prevalence & its impacts on working performance was badly affected because of laziness & sedentary lifestyle.

According to a previous survey by WHO World Health Organization the Obesity in KSA ratio is 34% almost & overweight measurement is about to be 66% (World Health Organization Saudi Arabia 2016). This ratio of Obesity is still not stagnant, it's increasing in a different size because of the high consumption of junk food & sweet things. Mostly it has been seen in practical life lazy person or those people whose lifestyle is sedentary & they don't do much work or hard work they become obese quickly comparatively the people who are active & did hard work participate in different games & athlete people, these type of people are not much obese because of their working & lifestyle.

Being overweight & obese both are fatal for health & body development, these non-communicable diseases have very bad effects on health & there is no ambidexterity regarding the obesity consequences on health lifestyle & work performance in practical routine life. Furthermore, obesity also have economic impacts, usage of money for health coverage, and a life expectancy rate decrease, it also mitigates the productivity level, adding more healthcare cost also increase the burden on the economy, disability rate increases, so overall economically obesity is not good (Ali, et al. 2022 IJFM 1(1)).

According to the world obesity organization in Saudi Arabia, overall obesity prevalence is among men at 19.2% & overweight 42.7%, in women 21.4% are obese & 32.7% are heavyweight, or overweight, in boys the ratio of obesity & overweight respectively 3.6% & 5.8% & ratio of obesity among young girls are 4% & overweight is 7% the obesity & overweight data compiled by World Obesity Organization the national risk for obesity in Saudi Arabia is 7% & this ratio 7/10 this score is a composite obesity risk score & according to WHO this ratio of increasing obesity is at highest risk level regarding 2025 targets for treatment indicator among the childhood stunting level, this ratio also affectst the growth level & development among children. Apart from Saudi Arabia, the obesity level among other countries during 2020 is 7.5/11 according to data compiled by WHO (World Obesity Organization,2020).

Many studies focus on dietary habits the major studies focus on young adults & students it is realized from the survey about Kind Saud University students they consume junk food & sweetened beverages of different cold drink brands & the result among 312 students most of them were obese (37Abdel-Megeid FY, Abdelkarem HM, Saudi Med Journal 2011).

Due to being overweight & obese mortality rate also increased & this is now considered the 5th most dangerous factor for life expectancy & its leading factor for the global mortality rate about 3 million adults die around the year because of being overweight & obese, 44% dies because of the diabetes

burden 23% ischemic diseases & 7% to 40% because of the cancer burden die in the world these all disease is associated with obesity & overweight, In Saudi Arabia mortality rate is 27% because of obesity & overweight (World Health Organization).

65% population of the world is lived in those countries where more people die because of obesity & overweight in spite of underweight or normal weight people. In 2008 1.4 million adults & 20 old age, or other were obese among all these statistics 200 million were men & 300 million were women, and Obesity rate doubled comparatively in 1980, and more than 40 million children are overweight under the age of 5 years (European Association of the Obesity study).

In Saudi Arabia more than half of adult people are obese & 1 out of 5 are considered obese, In this alarming condition of obesity increasing it is essential to be aware of the impacts of obesity among adults, middle & old age people, because most of the people don't know much about obesity health damages, Now Saudi Arabia also wants to bring empowerment in their working company they want to encourage local citizen for work to achieve that goal it is most important to sustain the healthy lifestyle. A healthy workforce can bring good results for productive work & country's economy as compared to unhealthy workers (World Bank Group).

2 Research Methodology

2.1 Research Design

The study research was designed among 6 main cities of Saudi Arabia with a cross-sectional research method future research will extend to other regions & cities.

2.2 Sample Design

In the present research study, we use the sample of 973 candidates from 6 cities of KSA in different regions of urban areas and some rural areas also include among these 973 candidates 732 candidates respond major portion consisting of females candidates with a response rate of 84% & male candidate response rate was 68%. The present sample design was selected between the age of 15-45 years old. We use stratified proportion quota sampling techniques for acquiring the respondent's data. We use 2 age groups as a median of our research 21-25 & 26-30 years old as the mean group of our research (BinDhim N.F.2020). The mean age group was 26-30 with maximum response rate & power of working performance & actively participated in curricular activities as well & the average performance rate of the mean group is high & with a positive attitude, 70% percentile in good performance & most of the mean age group are active & free from disease like diabetes Mellitus, hypertension, anxiety, peptic ulcer, etc.

2.2 Selection of Participant

In the present research project, our target participants & respondents were only Arabic native citizens although there are big numbers of expatriates who live in KSA & the obesity ratio among expatriates also high. Moreover, our research focus was male candidates more than females but females respond more than male candidates miraculously. Most domestic females have limited to their homes very few numbers of females do jobs so this was another tricky point for our research (Sharik Association for Health Research Sp 2020). Participants were contacted using different tools of social media google questionnaire, Facebook & mobile phone calls, etc.

2.3 Outcome of Survey Design

For the present research survey, we use our self-made questionnaire in the questionnaire we use different questions about obesity prevalence, causes & consequences, and obesity impacts on health & before obesity how they feel & after obesity what is their condition & work performance, how they feel during work & work is easy with obesity & participation in different activities, etc. Our questionnaire also uses a demographic explanation of participants e.g gender, age, male or female & education, etc. BMI body mass index used according to the center disease control CDC explains BMI below 18.5Kg/m² is considered underweight, and from 18.5 to 24.5Kg /m² is normal weight & from

25kg to 29.9Kg/m² is overweight & more than the 30kg/m² is considered as obese(CDC Central of Disease Control USA 2020).

2.4 Problem statement

During the research, we have to use only the Arabic language because most of the participants are unable to speak English, and only students have a little edge in speaking English over the rest of the participants who need to correspond in the English language. Another problem was how to include female participants because, in traditional Arabic culture, it is strictly prohibited to communicate with females. And females are also facing challenges & problems because of obesity as well during the pregnancy season they suffer a lot so it was very important to also include them miraculously females' response rate was more than males. The research was only limited to obesity impacts on health working performance & prevalence so it is important to carry out more research to address the other chronic issue related to obesity. Our research area was 6 main cities of Saudi Arabia & our results were only based on those cities & respondents on the other side result may be different when conducting surveys in other cities & rural areas of Saudi Arabia because a big population lived in rural areas.

2.5 Research Scope and Objective

The main objective of our research was to understand the prevalence ratio among adults because in students it is increasing in high ratio because of the high consumption of junk food. We need to analyze the ratio of prevalence among different regions & groups of age with different professions. How to overcome obesity prevalence in Saudi Arabia & how to control the number of diseases because of obesity. It is very important in Saudi Arabia to control & address the obesity problems & carry out more & more research about obesity awareness among all classes & regions of the people. Because according to WHO obesity is also considered an achronic disease that causes further disease.

2.6 Research Gap

Until now the prevalence of obesity is addressed but comprehensive research about the health damages & working performance efficiency among obese & non-obese peoples still need to carry out in-depth research & analysis which is very important because obesity is that disease creates laziness and idleness which affect the working performance in daily life among student businessman & employee & domestic workers ladies & gents as well. So our team started work on the three factors of obesity prevalence, its health impact & working performance impacts with respect to demographic variables.

2.7 Data Analysis

The prevalence of obesity & its health impacts & work performance was calculated using frequency & percentile, weighted prevalence work performance & health impacts calculated on the basis of regional population as well according to the 2017 census of Saudi Arabia (General Authority of Statistics 2017 Census Report). We use multivariate regression analysis for obesity investigation work performance & health impacts among different gender & age groups. We presented results with 95% CI and a P-Value <0.05 for statistical analysis of the data.

3.Results

3.1 Demographics & Response Rate

Of the 973 participants contacted, 732 participants responded and completed the interview with a response rate of 75.23%, across the 6 administrative regions of Saudi Arabia. 384 participants were male female with the respective percentage of, 52.46% & 47.54%, and the mean age was 30.5 ± 16.3 [Range:15 to 45], and the median age was 30. [Table 1](#) shows the demographic characteristics of the participants.

Table 1 Demographic Characteristics of Participant

Variables		Portions n(%)	
Regions	Female	Male	Total
Riyadh	81(49.7)	82(50.3)	163 (3.2)
Makkah	80(49.08)	83(50.92)	163 (3.2)
Madinah	70(43.20)	92(56.8)	162 (2.85)
Tabuk	75(46.02)	88(53.98)	163 (3.02)
Jeddah	80 (49.38)	82(50.62)	162 (3.2)
Taif	80 (50)	80 (50)	160 (3.2)

Age group		Female	Male	Total
15-20		45 (52.94)	40 (47.06)	85(1.8)
21-25		60 (48.8)	63 (51.22)	123(2.52)
26-30		70 (42.94)	93 (57.06)	163 (2.79)
31-35		100(49.02)	104 (50.98)	204(4.16)
36-40		80 (39.02)	125 (60.98)	205 (5.25)
		56 (29.02)	137 (70.98)	193 (6.65)
Sex	Total			
Male	562			
Female	411			
41-45				

** $P \leq 0.05$

According to our results in the age group prevalence rate was less in 15-20 years old the rate of prevalence was 1.8% & the highest rate of prevalence was in the age group 41-45 years old the rate was 6.65% the mean group was 26-30 years old that was the best group in terms of obesity prevalence with 2.79% rate 163 respondents. The worst case scenario was in groups 36-40 years old with a high prevalence rate of 5.25% in 205 respondents.

In terms of city prevalence the best city was Madinah with less prevalence rate of almost 2.85 with a percentile of 14% almost and rest 4 cities have almost the same prevalence rate of 3.2 with a percentile of 17%. The overall average prevalence rate was 17% in 6 cities.

Obesity Prevalence & Distribution

The national weighted prevalence of obesity (BMI \geq 30) was 28.55%, and the prevalence for the unweighted sample was 26.87%. [Table 2](#) shows the prevalence of obesity by region, age group, and gender in the study sample.

Table 2

Obesity prevalence in the sample (BMI \geq 32) city-wise, by age group & gender,

Region	Prevalence Ratio(n)
Riyadh	(17.97%) 94
Makkah	(12.42%) 65
Maddinah	(10.89%) 57
Tabuk	(18.73%) 98
Jeddah	(19.88%) 104
Taif	(20.07%) 105
By Age Group	Percentage%
15-20	(8.98%) 47
21-25	(27.91%) 146
26-30	(19.50%) 102
31-35	(18.16%) 95
36-40	(13.00%) 68
41-45	(12.42%) 65
Gender Segregation	Percentage%
Male	(24.15%) 235
Female	(29.59%) 288
Total	(26.87%) 523

** $P \leq 0.05$

According to gender prevalence rate was high in females at 29.59% & in males, the rate is 24.15% almost the combine prevalence rate including both gender froup wise & city-wise the average prevalence rate is 26.87% which is a high ratio of prevalence than other studies in other studies we also see the overall prevalence rate is 24% or 22% as well. Results can be different when other cities can include & more respondents can participate.

Obesity Impacts on health

Percentage of other health problems associated with Obesity among all the respondents, with respect to age group & their daily lifestyle.

Table 3

Age group	Obese or Non-obese	Diabetese Mellitus%	Depression	Axiety	Hypertension	Lung Diseas	Lifestyle lazy or active	Daily Exercise
15-20 years	Obese Non-Obese	9.8% 2.0%	15% No	33% No	7.18% No	1.2% No	Lazy 13% Active	5% 8%
21-25 years	Obese Non-Obese	7.9% 3%	15% 8.7%	12% 10%	5% 6.7%	1% No	Lazy 9.8% Active	1% 3%
26-30 years	Obese Non-Obese	11.89% 6.7%	7.03% 3%	4.5% 2%	5% 7.7%	1.4% Nil	3% Active 4% Active	4% 7%
31-35 years	Obese Non-Obese	24.6% 13.55	30.6% 5%	15% 3.4%	27% 2%	6.78% Nil	Lazy 2% Active	0.90% 1.5%
36-40 years	Obese Non-Obese	17% 6.9%	43% 15%	33% 11%	36% 10%	17% Nil	0.9% Active 1% Active	0.50% 1%
41-45 years	Obese Non-Obese	45% 17.8%	56% 12%	37% 17%	15.8% 9.8%	6.78% 1.4%	Lazy Lazy	0.10% 1%

** $P \leq 0.05$

According to health impacts because of obesity in all groups ages include females the best group is 26-30 years age with low of every disease Diabetes Mellitus, Depression, Anxiety & lung disease. Respondents in groups 26-30 years old are more healthy & agile compared to other group members with respect to age & gender demographically. The worst case scenario is in the group aged 41-45 years age because of the high ratio of disease & laziness a major portion of this group is idle so they are able to get rid of obesity in the usual way.

Obesity Impacts on working Performance among group age 15-30 years old 3 group.

Working performance of Students among different age groups including male & female because during our research survey, we select students from 15-30 years of age with both genders. We analyze the working performance of the 15-30 years age group using WPI Slow or Normal & with working efficiency Level low & high with the expression of working mind attitude Positive or negative on the basis of their level, Obese or non-obese.

Table 4

Age group	Obese or Non-obese	Working Performance Indicator Level	Participation in different activities	Efficiency Level	Work Attitude	Portion	Percentile%
15-20	Obese	Poor	No	Low	Negative	65	76.48%
	Non-Obese	Normal	No	Better then Low	Positive	20	23.52%
21-25	Obese	Normal	Yes	Low	Positive	95	77.23%
	Non-Obese	High	Yes	High	Positive	28	22.77%
26-30	Obese	Slower then normal	No	Low	Negative	135	82.82%
	Non-Obese	Good	Yes	Better then Low	Positive	28	17.18%

** $P \leq 0.05$

According to work performance the age group between 21-25 was is the best group in the first 3 groups from age 15-30 years, their work attitude was positive working efficiency also better than other groups the average percentile rate was 22.77% with 123 candidates in worst case scenario the group age between 15-20 years performance is low efficiency is low work attitude is also not much good the total percentile rate was 23.52% in 85 respondents.

Obesity Impacts on working Performance among group age 31-45 years old 3 group.

Working performance among 31-45 years age group including both gender males & females, In this age group most of the people are business man & employed or attach with other activities & in female, most of them are domestic ladies & perform work at home, some females also connected with a different profession such as doctors teachers, etc.

Table 5

Age group	Obese or Non-obese	Working Performance Indicator Level	Efficiency Level	Work Attitude	Participation in different activities	Portion	Percentile%
31-35	Obese	Poor	Low	Negative	Yes	165	80.88%
	Non-Obese	Normal	High	Positive	Yes	39	19.12%
36-40	Obese	Poor	Low	Negative	No	173	84.40%
	Non-Obese	Good	Better then Low	Positive	Yes	32	15.60%
41-45	Obese	Poor	Lazy	Negative	No	170	88%
	Non-Obese	Normal	Better then Low	Negative	No	23	12%

** $P \leq 0.05$

In the last three groups, the performance rate of the group aged 31-35 was best with a percentile rate of 80.88% on the other hand the worst group was 41-45 years old with a percentile rate of 88% with a maximum low-efficiency level negative work attitude regarding other activities participation rate near to none. So overall the best group was 31-35 years old people. But in all 6 groups, the best group is 21-25 years old regarding work performance, activity participation working attitude & efficiency level. So in terms of work performance, the best group is 21-25 years old.

4. Discussions

In terms of obesity prevalence, we found that the best group is 26-30 years the obesity ratio is less than other groups & worst group was 36-40 years old people in which the prevalence rate is very high. Regarding work performance the high work performance of the age group 21-25 years old & worst performance group age 41-45 years old.

In terms of health problems with the different diseases, the best group was 26-30 years old & worst group was 41-45 years with a high ratio of disease & idle lifestyle.

On the other hand financial matters are also associated with obesity prevalence although the financial factor is not included in our research theme we need to discuss this the richest people in Saudi Arabia don't want to prefer work except a few percentages & they mostly stayed at home & do not do any hard work so they became obese quickly on the other side people with limited source & finance can do hard work & do some other jobs for their living obesity level is less in those people so finance is also a factor of increasing obesity in Saudi Arabia.

One thing more some people are addicted to eating they always like to eat those people also get obese quickly the addicted people don't care about finance as well.

In Saudi Arabia, older people especially married women are more obese than young ladies because of their conservative lifestyle & inferiority complex because of gender disparity.

According to the MOH Ministry of health Riyadh's 20% obesity rate is increasing in females in 2019 in urban areas with formal education & 21% rate in urban areas (Ministry of Health Riyadh,2022).

5. Recommendations

It is a dire need for health practitioners & Ministry of Health KSA to apply some useful measures for obesity reduction in Saudi Arabia and open some health community centers in rural & urban areas to mitigate the knowledge gap in people regarding obesity. Open counseling centers for healthy lifestyle & their benefits & encourage the public to learn about health from those public health centers. Policy makers & health professionals should encourage the public & teach the public about obesity and its consequences & impacts on health to expedite the obesity reduction in the Kingdom of Saudi Arabia.

6. Conclusion and Policy Implications

From our present research, we conclude that obesity level is high in Saudi Arabia from other middle east countries, moreover, the genetics factor is also the cause of obesity, gender disparity sedentary & conservative lifestyle & bad dietary habits are also other reasons of obesity. Lack of knowledge about obesity & its associated disease is also another problem most of the people in KSA don't know that obesity is a disease this is another cause of obesity.

Ethical Consideration

The IRB approval was obtained from the Research Management Board Al-Madinah International University Malaysia in Medical City in August 2021 (MRB 21-367).

Author Contributions

Muhammad Ali contributed to the conceptualization and design of the project preparing the research questionnaire & design the methodology of data collection from respondents, Writing the paper, data analysis & interpretation, Alharath Atiek contribute to writing correction statistical analysis using STATA & obtain the results, Abdoulrahman Aljounaidi, Fariba Azizzadeh and Sebastian Zupok contribution for writing, investigation & generalize the results, Siti Maisara Binti Mohammad Jafre reviews the research project & opinion making.

Declaration of Conflicting Interests

There is no potential conflict of interest exists among the authors from any aspect of the research paper & entire research project for publication, funding, & any other formal reasons. The author(s) declared that there are no potential conflicts of interest exist with respect to the research, authorship, and/or publication of this article.

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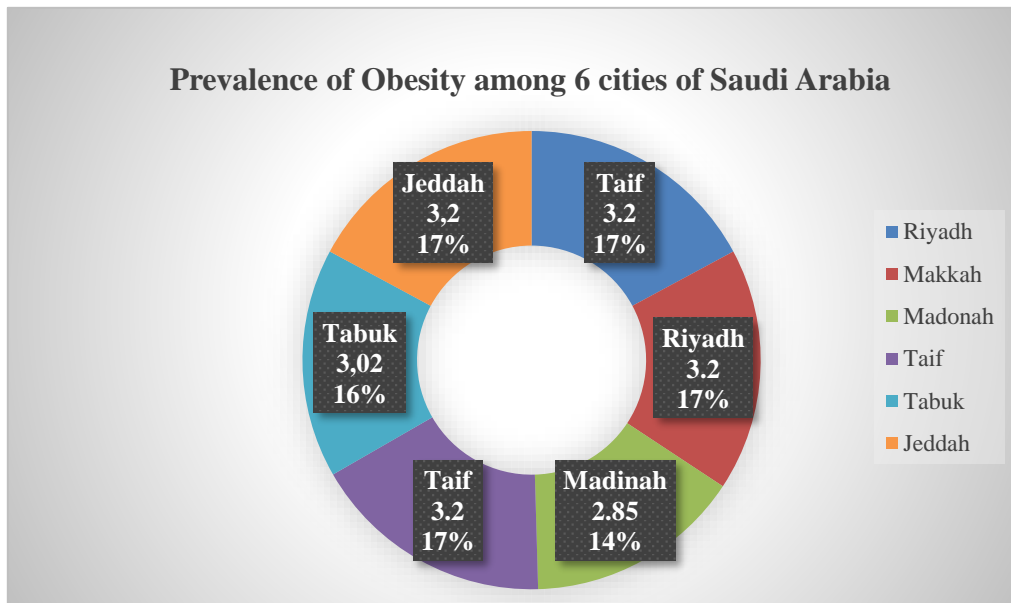


Figure 1 : Prevalence of Obesity in 6 cities of Saudi Arabia.
Source : Author Research

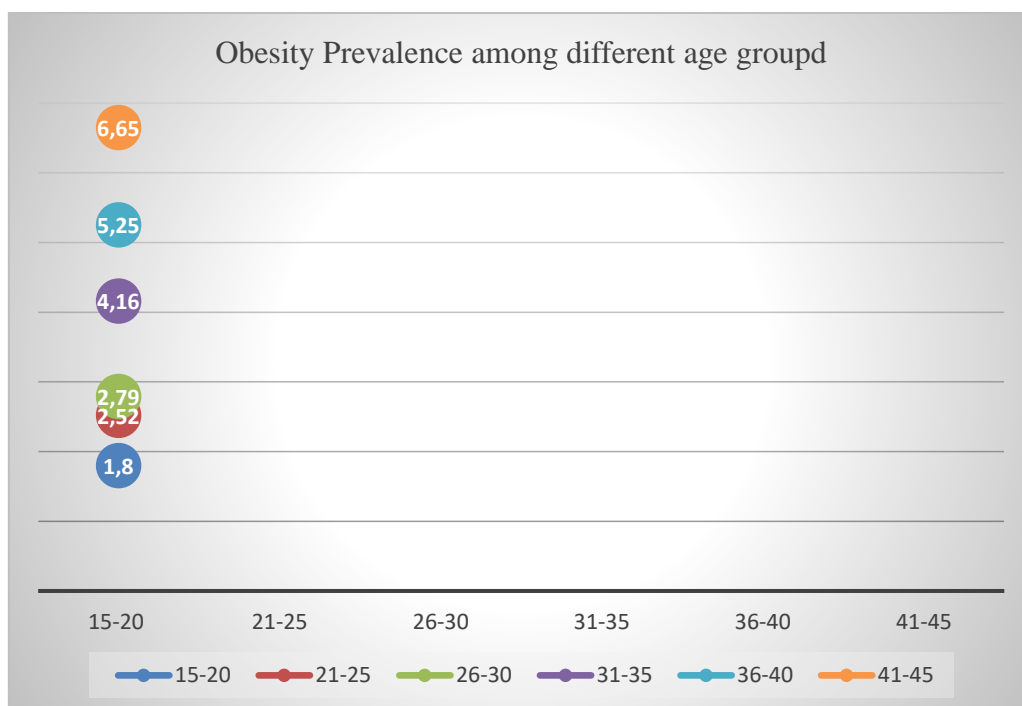


Figure 2: Prevalence of Obesity in different age group using graphical method,
Source : Author Research

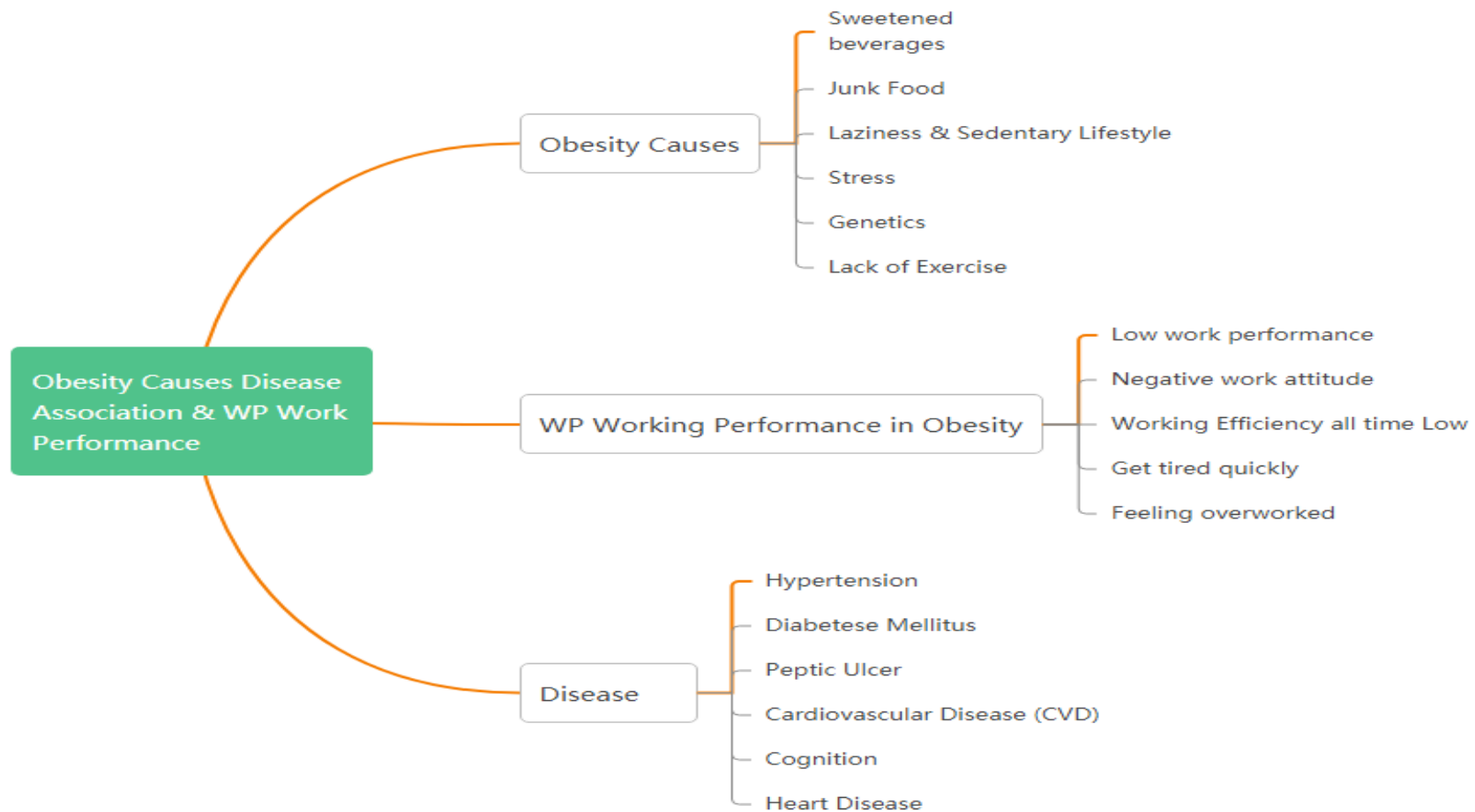


Figure 3: Obesity Model Association with Disease, Causes & Work performance level.

Source : Author Research