Smoking Status among Young Adults from 20-25 Years Old: Comprehensive Data Analysis Related to Multiple Health Indexes

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Abstract: As we all know; smoking is still a daily habit of choice for many people. To find out if multiple health indicators can influence the smoking status among young adults which are from 20-25 years old in America, cross-sectional statistical analysis on gender, family income, body weight, and blood pressure (BP) was applied for a comprehensive understanding. The results have shown that each factor had different levels of influence on smoking status. The conclusion can this be made that the smoking status is related to various health indicators instead of one specific element in reality.

1. Introduction

Smoking is a widespread socially learned habit, which is apersonal choice. Although people have already known the harm of nicotine, few people choose to drop the cigarettes initiatively [1]. Different types of research have indicated that smoking can cause cardiovascular disease, lung cancer, and other respiratory diseases [2]. Also, nicotine was addictive properties, which is the reason why people are addicted to smoking. Furthermore, the nicotine intake will lead to acute cardiovascular diseases and affect the immune system [2].

In the previously reported works, smoking status was studied by finding the relationship between the smoking and one particular factor. However, there is no cross-sectional analysis of multiple factors when the smoking status is studied. Our study aims to determine if the smoking status is related to some health indexes or if some other factors may influence the smoking status. These findings can be used by health authorities in the government to appeal people for quitting smoking for their health.

2. Methods

The National Health and Nutrition Examination Survey (NHANES) is a program of studies designed to assess the health and nutritional status of people in the United States. It has been regularly applied from 1971 to 1994. From 1999, NHANES became continuous. About 5,000 individuals of the noninstitutionalized civilian resident population of the United States were interviewed at home and complete the health survey every year. The health examination is conducted in a mobile examination center (MEC). The standardized environment guarantees the high quality of NHANES data [3].

In the NHANES2015, there were 15,327 samples selected from 30 different survey locations. 9, 971 of them completed the interview, 9,544 of them were examined. In this analysis, the age, gender, BMI, family income, smoking status, alcohol intake, drug use history, and blood pressure data of young adults from 20 to 25 years old, 547 people in total, have been selected as the target population. Besides, the focus of comparisons between gender, family income, sedentary activities minutes, blood

pressure (BP), and smoking status data have been organized and sketched. The expectation for the analysis was to find the specific relationship between each pair of data, four pairs in total.

3. Results and discussion

3.1 Statistics of Gender, Age group, BMI, and Family Income on Population

3.1.1 Gender

In the selected dataset, there are 264 males, 48.26% of the total number of participants, and 283 females, which is 51.74% of the total number of participants (Table 1).

3.1.2 Age

The age group of the selected dataset is from 20 years old to 25 years old, so the average age is around 23 years old, and the standard deviation of is 1.688 (Table 1). Based on the average age, we know that this database records the following fundamental health indicators for young people.

Table 1. Statistics of Gender, Age group, BMI, and Family Income among Population

	Group	Sample Size (n)	Percentage (%)	Mean	Standard Deviation
Gender	Male	264	48.26	-	-
	Female	283	51.74		
Age Group	20-22	248	45.34	22.68	1.688
	23-25	299	54.66		
BMI	Underweight (<18.5)	26	4.753	-	-
	Normal (18.5-24.9)	205	37.48		
	Overweight (25-29.9)	136	24.86		
	Obese (>=30)	152	27.79		
Family Income	< $45,000	263	48.08	-	-
	$45,000 - $ 54,999	66	12.07		
	>$54,999	182	33.27		

3.1.3 BMI

BMI is divided into four categories, which are Underweight, Normal, Overweight, and Obese, based on their values (Figure 1). For the BMI value is smaller than 18.5, it is underweighted. For the BMI value is falling into the range of 18.5 to 24.9, it is normal. If the BMI value falls into the range of 25 to 29.9, it is classified as overweight. Finally, obesity is classified when the BMI value greater than 30 [4]. In the database, 4.753% of participants were underweight, 37.48% were normal, 24.86% were overweight, and 27.79% were obese (Table 1). The percentage of abnormal BMI is relatively high in this selected dataset. In this case, young adults are more likely to have a relatively high BMI value, which is an unhealthy indicator. Fast food becomes the first choice of many young adults due to the convenience and less time-consuming with the development of society. High sugar and high-

fat content in these fast foods and the bodyweight will increase quickly if fast food is chosen frequently [5]. What is more, many young adults need to or are willing to sit inside instead of doing some exercise [5]. The body weight tends to increase even more accessible if there are more eating and less movement.

3.1.4 Family Income

The percentage of smaller than $45,000 per year was 48.08% for family income, and the percentage of greater than $54,999 per year was 33.27%, while the percentage which was from $45,000 to $54,999 per year was 12.07% (Table 1). The number of participants with annual family income from $45,000 to $54,999 was the lowest.

Weight Categories	BMI (kg/m²)
Underweight	< 18.5
Healthy Weight	18.5-24.9
Overweight	25-29.9
Obese	30-34.9
Severely Obese	35-39.9
Morbidly Obese	≥40

Figure 1. Adult BMI Ranges

3.2 Statistic of Smoking States, Alcohol Intake, Drug Use, and BP on Population

In order to know more about the health indexes of participants, we analyzed the data of smoking status, alcohol intake, drug use, and blood pressure.

3.2.1 Smoking Status

It is divided into three states for smoking status: smoke every day, smoke some days, and do not smoke at all. 13.53% of participants smoked every day, 6.033% of participants smoked some days, and 9.506% of participants didn't smoke at all (Table 2). So, most participants did smoke, and the proportion of smoking for young adults is high. According to previous research, many people had their first cigarettes after 18 years old, and it is tough for them to quit after that [6]. Hard to quit smoking is the main reason for having a high smoking percentage, especially among young adults.

BLOOD PRESSURE CATEGORY	SYSTOLIC mm Hg (upper number)		DIASTOLIC mm Hg (lower number)
NORMAL	LESS THAN 120	and	LESS THAN 80
ELEVATED	120 – 129	and	LESS THAN 80
HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 1	130 – 139	or	80 – 89
HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 2	140 OR HIGHER	or	90 OR HIGHER
HYPERTENSIVE CRISIS (consult your doctor immediately)	HIGHER THAN 180	and/or	HIGHER THAN 120

Figure 2. Blood Pressure Categories

Table 2. Statistic of Smoking States, Alcohol Intake, Drug Use, and Blood Pressure (BP) among Population

	Group	Sample Size (n)	Percentage (%)
Smoking States	Every Day	74	13.53
	Some Days	33	6.033
	Not at all	52	9.506
Alcohol Intake	Yes	348	63.62
	No	129	23.58
Drug Use	Yes	61	11.15
	No	409	74.77
Blood Pressure (BP)	Normal	333	60.88
	Elevated	91	16.64
	High BP stage 1	66	12.07
	High BP stage 2	12	2.194

3.2.2 Alcohol Intake

63.62% of participants drank alcohol for the alcohol intake, while 23.58% of participants didn't drink alcohol (Table 2).

3.2.3 Drug Use

Most participants, which accounts for 74.77%, didn't use drugs, but 11.15% used drugs (Table 2).

3.2.4 Blood Pressure

BP consists of systolic BP and diastolic BP. Also, it can be divided into four stages based on the values of both systolic BP and diastolic BP (Figure 2). When systolic BP is less than 120, and diastolic BP is less than 80, this is the normal BP. For elevated, systolic BP falls into the range of 120 to 129 while diastolic is still less than 80. When systolic BP is in the range of 130 to 139, and diastolic BP is in the range of 80-89, the BP is classified as high BP stage I. When systolic BP is equal to 140 or greater and diastolic BP is equal to 90 or greater, it is classified as high BP stage II [7]. 60.88% of participants had normal BP, 16.64% of participants were elevated, 12.07% had high BP stage I, while 2.194% had high BP stage II (Table 2).

3.3 Cross-sectional Analysis

According to Table 3, there is a trend between each pair of data. In general, the percentage of everyday smokers is the highest (13.53%), of some-day smokers, is the lowest (6.033%), and of non-smokers is in the middle (9.506%). If we plot these percentages data (Figure 3), the shape will look like the image of a positive quadratic function. Previous research shows that the most common reasons to smoke appeared in the sample are: 1). peer influence, 2). stress management and relaxation, and 3). projected social image, appetite suppression, and weight concerns [8]. Therefore, based on the extent of distinction, it is necessary to analyze each of them.

Table 3. Statistic of Smoking Status by Gender, Family Income, Sedentary Activities Minutes, and Blood Pressure (BP)

		Every Day (sample size & % of the entire sample & adjusted % of the specific group)	Some Days (sample size & % of the entire sample & adjusted % of the specific group)	Not at all (Sample size & % of the entire sample & adjusted % of the specific group)
Gender	Male	41 & 7.460 & 15.53	21 & 3.839 & 7.955	30 & 5.484 & 11.36
	Female	33 & 6.033 & 11.66	12 & 2.193 & 4.240	22 & 4.022 & 7.774
Family Income	< $45,000	43 & 7.861 & 16.35	15 & 2.742 & 5.70	28 & 5.119 & 10.65
	$ 45,000 - $ 54,999	11 & 2.011 & 24.44	4 & 0.7313 & 8.89	2 & 0.3656 & 4.44
	> $ 54,999	13 & 2.377 & 7.14	12 & 2.193 & 6.59	13 & 2.377 & 7.14
Sedentary Activities Minutes (min/week)	Low Activity(<150min/wk)	4 & 0.7313 & 9.76	6 & 1.097 & 14.63	6 & 1.097 & 14.63
	Medium Activity(150-300min/wk)	28 & 5.119 & 14.14	11 & 2.011 & 5.56	16 & 2.925 & 8.08
	High Activity(>300min/wk)	42 & 7.679 & 13.73	16 & 2.925 & 5.23	3 & 0.5484 & 0.98
Blood Pressure (BP)	Normal	51 & 9.324 & 15.32	21 & 3.839 & 6.31	25 & 4.570 & 7.51
	Elevated	7 & 1.280 & 7.69	2 & 0.3656 & 2.20	15 & 2.742 & 16.48
	High BP stage I	7 & 1.280 & 10.61	6 & 1.097 & 9.09	8 & 1.463 & 12.12
	High BP stage II	2 & 0.3656 & 16.67	0 & 0 & 0	2 & 0.3656 & 16.67
Total		74 & 13.53	33 & 6.033	52 & 9.506

3.3.1 Smoking Status by Gender

From Table 3, it can be observed that the percentage of male smokers (11.30%) is more than the percentage of female smokers (8.226%), while the percentage of male non-smokers (5.484%) is also more than the percent of female non-smokers (4.022%). In this sample, the number of males is lower than the number of females, which means that males smoke more than females [9].

3.3.2 Smoking Status by Family Income

From Table 3, it can be observed that the percentage of smokers whose family income is lower than $45,000 (16.35%) is higher than the percentage of smokers whose family income is higher than $54,999 (7.14%). From the previous studies, it has been concluded that people whose family income is lower at childhood are more likely to smoke after turning to adults [10].
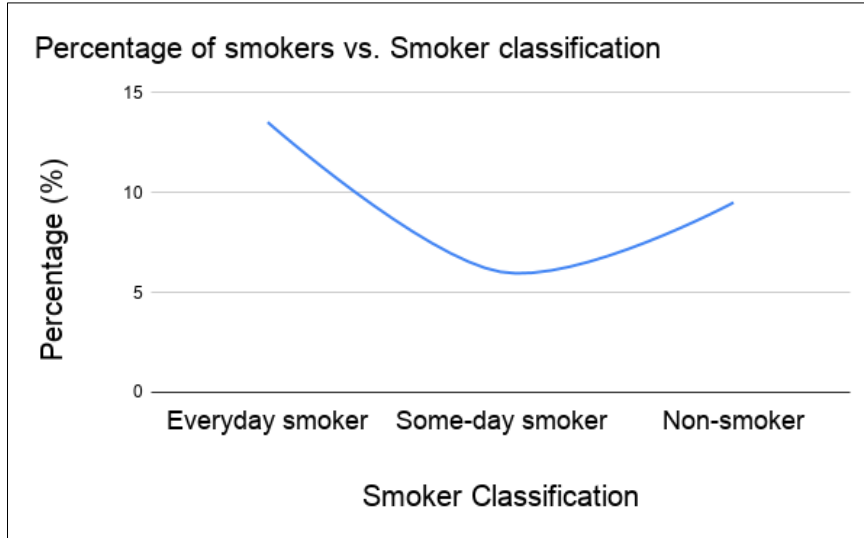

Figure 3. Percentage of Smokers vs. Smoker Classification

3.3.3 Smoking Status by Sedentary Activities Minutes

From Table 3, it can be observed that the percentage of smokers who have a low-level sedentary activity time (9.76%) is lower than the percentage of smokers who have a medium-level (14.14%) or high-level sedentary activity time (13.73%) (Figure 4). We can approximate sedentary activity time as BMI. A less sedentary activity time refers to a higher BMI; in other words, non-smokers are more likely to be obese. Previous experiments have proved that smokers are less likely to be overweight and central obese than non-smokers [11].
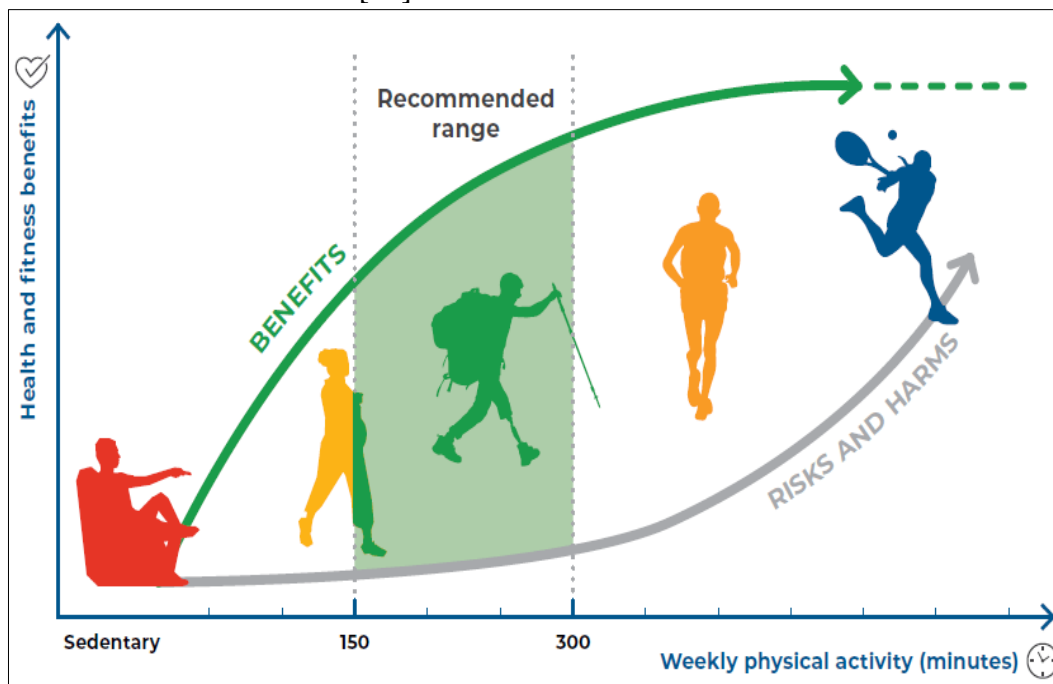

Figure 4. Classifications of Sedentary Activities Minutes

3.3.4 Smoking Status by BP

From Table 3, it can be observed that the percentages of smokers who have the lowest (15.32%) or highest BP (16.67%) are higher than smokers whose BP is in the middle (7.69%, 10.61%). Compared to non-smokers, it is concluded that the BP readings of smokers are mostly in the high BP extreme and low BP extreme [12].

3.4 Discussion

It is significant to know about the outcomes brought by smoking, especially for young adults. Compared to older adult smokers, younger adult smokers have been proved to be affected more easily by the peer influence and social factors, procrastination, and projected social images [13]. From previous discoveries, a lower household income can affect people's intelligence, school achievement, conduct problems, and exposure to parental and peer smoking, which is closely related to smoking measures at age 25 as well [10]. Another case is regarding appearance concerns. While most smokers believe smoking can control their appetite and keep them slim, it has been found that smokers are less satisfied with their appearance than non-smokers, which means they will be unsatisfied with their bodies and weights all the time even if they have lost a lot of weight [14]. The pathological thoughts will continuously harm these smokers, which leads to a sick body, for example, having an extreme low or extreme high BP.

4. Conclusion

According to the comprehensive analysis of young adults with the age from 20 to 25 years old, smoking status has the relationships with different health indexes. In general, there are four major conclusions: 1). among young adults, male smokers are more than female smokers; 2). smokers with a lower household income are more than smokers with a higher household income; 3). active smokers are more than inactive smokers; 4). smokers in a low or high extreme BP are more than smokers with a BP in the middle range.

Thus, here is the question: "Can we change this terrible status?" Luckily, the answer is "Yes". Except for gender, which is difficult for most people to change, the other three variables are changeable. First, one needs to have the determination to make changes. Then, people should try to distract attention from smoking to something else that the person is interested in. For example, one can control his or her weight by exercising, which provides both physical and mental health. Even if someone cannot quit smoking instantly, smokers should try their best to create better economic conditions for their future children, so that they will be less likely to addicted to smoking than their parents. We sincerely hope that people can live a better life and be themselves - you do deserve it.

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