

Research article

# Overweight and obesity and associated factors among medical representatives in Kathmandu valley

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## ABSTRACT

**Background and Objectives:** Overweight/obesity is rising problem both in developed and developing countries. This condition is important because it can lead to many chronic health conditions and is responsible for both morbidity and mortality. Medical Representatives (MRs) is one of those jobs which require minimum physical activity with good salary. MRs spends most of the day time meeting doctors of different locations. These factors make them vulnerable to overweight/obesity.

**Material and Methods:** This study is cross sectional study in Kathmandu Valley. MRs of different company were the part of this study. Anthropometric measurements weight and height were used to calculate BMI and BMI was used to classify whether individual was normal or overweight/obesity. Semi-structured questionnaire was used to assess dietary and other lifestyle factors. Data were analyzed in SPSS to find out relationships between different factors and overweight/obesity.

**Results:** The prevalence of overweight/obesity was found to be 64.93%. Men were significantly more overweight/obese than women. Age, Income and most of the dietary/lifestyles factors were found to be significant with overweight/obesity.

**Conclusion:** Prevalence of overweight/obesity among MR was found to be high. MR job can be considered vulnerable to overweight/obesity because of alteration in many dietary and lifestyle factors.

**Key Words:** overweight, obesity, BMI, Lifestyle, chronic diseases

## INTRODUCTION

Contradicting popular belief, obesity has become commonplace in many low- and middle-income countries. The prevalence of cardiovascular risk factors including obesity has increased in such countries, particularly in South Asia [1]. This paper enrolls its

definition of low- and middle-income countries from the World Health Report 2008 [2]. The International Day for Evaluation of Abdominal Obesity Study in 2007 reported that South Asians have the highest prevalence of abdominal obesity [3]. Likewise, a comparative study of obesity prevalence determined a high obesity burden in India

and Pakistan, especially in women [4]. Moreover, obesity is seen to be increased in women in other South Asian countries, including Nepal and Bangladesh, between 1996 and 2006 (from 1.6% to 10% and from 2.7% to 8.9%, respectively) [5].

Nepal's increasing trend toward urbanization presents large health challenges, whose consequences are at an early stage. As diets rich in fiber and complex carbohydrates shift toward diets that include more sugars and fats, the urbanization process precipitates greatly increased levels of lifestyle-related risk factors. Changing dietary habits can shift a society's disease pattern from infectious, communicable diseases' dominance towards a status of double-disease burden with increasing prevalence of obesity and non-communicable diseases (NCDs) [7].

The responsibility of the Medical Representatives (MRs) in any setting involve the process of selling via contacting potential customers, identifying their needs, persuading them that your products or services (rather than those of competitors) can best satisfy those needs, closing the sale by agreeing the terms and conditions, and providing an after-sale service. This job is demanding, it demands lot of time. It is certain that they have very busy schedule and a very sedentary lifestyle with very limited physical activity. Food they eat at day time is outside home mostly in restaurants and hotels. Therefore there is high probability they eat unhealthy food which can contribute to overweight and obesity. This group of the employee on field barely maintain their food timings and are mostly dependent on ready to eat foods in Nepal. There is no concrete evidence to prove the statements, however the professionals on the areas are practicing this ill health practice since decades that have

been given minimal or no concern at all. Non-communicable diseases have reflected the behavioral factors being the most likely risk factors for the occurrence of the diseases. The ready to eat foods, limited physical activity and the behavioral factors of alcohol drinking and smoking are the leading causes contributing to NCD.

There is no single study done regarding overweight/obesity status in MRs. This study will help to know the job specific overweight/obesity status among MRs. So this study is planned to assess Prevalence and associated factors of overweight/obesity among Medical Representative of Kathmandu valley. This study will also give a base to understand the relation between the dietary habit of MR in Kathmandu contributing to obesity and also give an understanding on occurrence of Non-communicable diseases in them.

## **MATERIAL AND METHODS**

A structured questionnaire was developed. The questionnaire had been designed to collect socio-demographic information, food frequency, and dietary diversification, diet pattern. Self-administered questionnaire in Nepali language had been provided to the respondents and were explained about the questions. The research was approved by ethical research committee of CAFODAT College. Total 250 Medical Representatives were randomly selected for research, out of which 231 accepted to participate in the study and gave appointment.

## **RESULTS**

Out of 231 MRs 147 were men and 84 were women. Among men (147), the prevalence of overweight/obesity was found to be 67.34%,

while among women (84), the prevalence of overweight/obesity was found to be 60.71%.

Percentage of overweight/obesity among overweight/obese men of 22-24 years old was found to be 14.14% whereas among overweight/obese women of 22-24 years old was found to be 7.84% and total percentage of 22-24 years old overweight/obesity among overweight/obese MRs was found to be 12%. Percentage of overweight/obesity among overweight/obesity men of 24-26 years old was found to be 25.25% whereas among overweight/obese women of 24-26 years old was found to be 13.72% and total Percentage of overweight/obesity among overweight/obesity men of 24-26 years old overweight/obesity MRs was found to be 21.33%. Percentage of overweight/obesity among overweight/obesity men of above 26 years old was found to be 60.60% whereas among overweight/obese women of above 26 years old was found to be 78.43% and total Percentage of overweight/obesity among overweight/obesity men of above 26 years old overweight/obesity MRs was found to be 66.66%.

Among overweight/obesity MRs, percentage of overweight/obesity present in low income men was found to be 13.13% whereas in low income women was found to be 17.64% and in low income group (both male and female combined) was found to be 14.66%. In total overweight/obesity MRs, percentage of overweight/obesity present in low middle income men was found to be 36.36% whereas in low middle income women was found to be 39.21% and in low middle income group (both male and female combined) was found to be 37.33%. In total overweight/obesity MRs, percentage of overweight/obesity present in upper middle income men was found to be 30.30% whereas in upper middle

income women was found to be 29.41% and in upper middle income group (both male and female combined) was found to be 30%. In total overweight/obesity MRs, percentage of overweight/obesity present in high income men was found to be 20.20% whereas in high income women was found to be 13.72% and in high income group (both male and female combined) was found to be 18%.

Among MRs in study group, percentage of overweight/obesity present in men who eat meat at least once a day was found to be 67.67% whereas in women who eat meat at least once a day was found to be 86.2% and in total group (both male and female combined) was found to be 74%. In total overweight or obese MRs, percentage of overweight/obesity present in men who try to eat fiber was found to be 5.5 % whereas in womenwho try to eat fiber was found to be 5.5% and in total group (both male and female combined) was found to be 6.66%.

In total overweight/obesity MRs, percentage of overweight/obesity present in men who try to avoid fat and cholesterol was found to be 40.40% whereas in womenwho try to avoid fat and cholesterol was found to be 64.70% and in total group (both male and female combined) was found to be 48.66%.

In total overweight/obesity MRs, percentage of overweight/obesity present in men who eat fruit more than 2 times was found to be 20.20% whereas in women who eat fruit more than 2 times was found to be 31.37% and in total group (both male and female combined) was found to be 24%. In total overweight/obesity MRs, percentage of overweight/obesity present in men who eat fruit less than or equal to 2 times was found to be 79.79% whereas in low middle income women who eat fruit less than or equal to 2 times was found to be 68.62% and in low

middle income group (both male and female combined) was found to be 76%.

Among MRs of study group, percentage of overweight/obesity present in men who skips breakfast was found to be 26.26% whereas in women who skips breakfast was found to be 19.60% and in total group (both male and female combined) was found to be 24%.

In total overweight/obesity MRs, percentage of overweight/obesity present in men who eat 3 meal per day was found to be 15.15% whereas in women eat 3 meal per day was found to be 7.84% and in total group (both male and female combined) was found to be 12.66%. In total overweight/obesity MRs, percentage of overweight/obesity present in men eat 4 meal per day was found to be 30.30% whereas in women eat 4 meal per day was found to be 39.21% and in total group (both male and female combined) was found to be 33.33%. In total overweight/obesity MRs, percentage of overweight/obesity present in men who eat more than 4 was found to be 54.54% whereas women who eat more than 4 was found to be 52.94% and in upper middle income group (both male and female combined) was found to be 54%.

In total MRs with obesity or overweight, percentage of overweight/obesity present in men who eat 1 in-between snacks per day was found to be 54.54% whereas in women who eat 1 in-between snacks per day was found to be 15.68% and in total group (both male and female combined) was found to be 41.33%. In total overweight/obesity MRs, percentage of overweight/obesity present in men who eat 2 in-between snacks per day was found to be 25.25% whereas in women eat 2 in-between snacks per day was found to be 60.78% and in total group (both male and

female combined) was found to be 37.33%. In total overweight/obesity MRs, percentage of overweight/obesity present in men who eat more than 2 in-between snacks was found to be 20.20% whereas women who eat more than 2 in-between snacks was found to be 23.52% and in total group (both male and female combined) was found to be 21.33%.

In total overweight/obesity MRs, percentage of overweight/obesity present in men who did low physical activity was found to be 64.64% whereas in women who did low physical activity was found to be 72.54% and in total group (both male and female combined) was found to be 67.33%. In total overweight/obesity MRs, percentage of overweight/obesity present in men who did moderate physical activity was found to be 20.20% whereas in women did moderate physical activity was found to be 19.60% and in total group (both male and female combined) was found to be 20%. In total overweight/obesity MRs, percentage of overweight/obesity present in men who did high physical activity was found to be 15.15% whereas women who did high physical activity was found to be 7.84% and in total group (both male and female combined) was found to be 48%.

Among overweight/obese MRs, percentage of overweight/obesity present in men who have current use tobacco including cigarette was found to be 69.69% whereas in women who have current use tobacco was found to be 5.88% and in total group (both male and female combined) was found to be 48%.

**Table 1: Characteristics of overweight/obesity in MRs in Kathmandu valley**

Variable	N	Men N (%)	Women N (%)	Total
<b>All</b>	231	99(66%)	51(34%)	150 (64.93%)
<b>Age in years</b>				
22-24	51 (35.29%)	14(14.14%)	4(7.84%)	18 (12%)
24-26	48 (66.66%)	25(25.55%)	7(13.72%)	32 (21.33%)
Above 26	132 (75.75%)	60 (60.60%)	40(78.43%)	100 (66.66%)
<b>Income</b>				
Low income (<25000)	75 (29.33%)	13 (13.13%)	9 (17.64%)	22 (14.66%)
Lower middle income (25000-35000)	68 (82.35%)	36 (36.36%)	20 (39.21%)	56 (37.33%)
Upper middle income (35000-45000)	54 (83.33%)	30 (30.30%)	15 (29.41%)	45 (30%)
High income (>45000)	34 (79.41%)	20 (20.20%)	7(13.72%)	27 (18%)
<b>Dietary variables</b>				
<b>Eat meat at least once a day</b>	139 (79.85%)	67 (67.67%)	44 (86.27%)	111 (74%)
<b>Try to eat fiber</b>	17 (58.82%)	5 (5.5%)	5(9.80%)	10 (6.66%)
<b>Avoid fat and cholesterol</b>	121 (60.33%)	40 (40.40%)	33(64.70%)	73 (48.66%)
<b>Fruit</b>				
>2 times	45 (80%)	20 (20.20%)	16(31.37%)	36 (24%)
<= 2 times	186 (61.29%)	79 (79.79%)	35(68.62%)	114 (76%)
<b>Skipping breakfast</b>	97 (37%)	26 (26.26%)	10(19.60%)	36 (24%)
<b>Number of meals</b>				
3	54 (35.18%)	15 (15.15%)	4(7.84%)	19 (12.66%)
4	83 (60.24%)	30 (30.30%)	20(39.21%)	50(33.33%)
>4	94 (86.17%)	54 (54.54%)	27(52.94%)	81(54%)
<b>Number of in-between snacks</b>				
1	105 (59.04%)	54 (54.54%)	8(15.68%)	62 (41.33%)
2	88 (63.63%)	25 (25.25%)	31(60.78%)	56 (37.33%)
>2	38 (84.21%)	20 (20.20%)	12(23.52%)	32 (21.33%)
<b>Physical activity</b>				
Low	125 (80.8%)	64 (64.64%)	37(72.54%)	101 (67.33%)
Moderate	47 (63%)	20 (20.20%)	10(19.60%)	30 (20%)
High	59 (32%)	15 (15.15%)	4(7.84%)	19 (12.66%)
<b>Current tobacco use (Including cigarette)</b>	150 (48%)	69 (69.69%)	3 (5.88%)	72(48%)
<b>Drinking alcohol (per week)</b>				
Never	116 (55.17%)	25 (25.25%)	39(76.47%)	64 (42.66%)
1	26 (50%)	7 (7.77%)	6(11.76%)	13 (8.66%)
2	60 (66.66%)	35 (35.35%)	5(9.80%)	40 (26.66%)
3	25 (84%)	20 (20.20%)	1(1.96%)	21 (14%)
>3	14 (85.71%)	12 (12.12%)	0	12 (8%)

MRs, Medical Representatives

Among overweight/obesity MRs, percentage of overweight/obesity present in men who never drank alcohol was found to be 25.25% whereas in women who never drank alcohol was found to be 76.47% and in total group (both male and female combined) was found to be 42.66%. In total overweight/obesity MRs, percentage of overweight/obesity present in men who drank alcohol once a week was found to be 7.77% whereas in women drank alcohol once a week was found to be 11.76% and in total group (both male

and female combined) was found to be 8.66%. In total overweight/obesity MRs, percentage of overweight/obesity present in men who drank alcohol twice a week was found to be 35.35% whereas women who drank alcohol twice a week was found to be 9.80% and in total group (both male and female combined) was found to be 26.66%. Among study group, percentage of overweight/obesity present in men who drank alcohol thrice a week was found to be 20.20% whereas women who drank alcohol

thrice a week was found to be 1.96% and in total group (both male and female combined) was found to be 14%. In total overweight/obesity MRs, percentage of overweight/obesity present in men who drank alcohol more than thrice a week was found to be 12.12% whereas women who drank alcohol more than thrice a week was found to be 0% and in total group (both male and female combined) was found to be 8%.

Linear and multiple regression analysis were done to find to find out association between dependent and independent variable/s. In total overweight/obesity MRs, percentage of overweight/obesity present in men was found to be 66% whereas women was found to be 34% and in total group (both male and female combined) was found to be 64.93%. Men were significantly more overweight/obese than women.

**Table 2: Association between overweight/obesity with different factors**

Variable	Total	Overweight/obesity	COR (95% CI)	AOR (95% CI)	P-value
<b>Socio demographic</b>					
All	231	150 (64.93%)			
<b>Age in years</b>					
22-24	51	18 (35.29%)	1.00	1.00	
24-26	48	32 (66.66%)	1.07(0.36-3.22)	1.02(0.31-1.39)	
26 or more	132	100 (75.75%)	3.37(1.7-3.02)	3.14 (1.15-2.69)	0.003
<b>Income</b>					
Low income (<25000)	75	22 (29.33%)	1.00	1.00	
Lower middle income (25000-35000)	68	56 (82.35%)	1.19 (1.01-1.44)	3.47 (2.58-4.76)	<0.001
Upper middle income (35000-45000)	54	45 (83.33%)	1.29 (1.04-1.46)	3.51 (2.47-4.32)	<0.001
High income (>45000)	34	27 (79.41%)	2.47 (1.89-3.24)	2.36 (4.09-9.17)	
<b>Dietary variables</b>					
Eat meat at least once a day	139	111 (74%)	2.57 (1.93-3.27)	2.60 (2.37-4.38)	<0.001
Try to eat fiber	17	10 (58.82%)	1.36 (0.90-1.11)	1.25 (0.86-1.01)	<0.001
Avoid fat and cholesterol	121	73 (60.33%)	0.71(0.27,1.73)	0.34(0.11,0.95)	<0.001
<b>Fruit</b>					
>2 times	45	36 (80%)	1.34 (1.41-1.72)	1.21 (1.04-1.32)	
<= 2 times	186	114 (61.29%)	1.09 (1.18-1.39)	1.07 (1.17-1.48)	<0.001
Skipping breakfast	97	36 (37%)	0.72(0.29,1.77)	0.35(0.12,0.96)	<0.027
<b>Number of meals</b>					
3	54	19 (35.18%)	1.00	1.00	
4	83	50(60.24%)	1.05 (0.98-1.13)	0.95 (0.89-1.02)	<0.001
>4	94	81(86.1%)	4.47 (1.06-1.34)	4.24 (1.10-1.46)	
<b>Number of in-between snacks</b>					
1	105	62 (59.04%)	1.00	1.00	
2	88	56 (63.63%)	1.03 (0.97-1.10)	1.02 (0.96-1.09)	<0.001
>2	38	32 (84.21%)	1.15 (1.06-1.21)	1.31 (1.27-1.47)	
<b>Physical activity</b>					
Low	125	101 (80.8%)	1.28 (1.21-1.47)	1.47 (1.14-1.48)	
Moderate	47	30 (63%)	0.78 (0.73-1.11)	0.96 (0.65-1.21)	<0.001
High	59	19 (32%)	0.86 (0.74-0.65)	0.74 (0.69-0.19)	
Current tobacco use (Including cigarette)	150	72(48%)	1.24 (1.13-1.41)	1.38 (1.09-1.55)	<0.001
<b>Drinking alcohol</b>					
Never		116 (55.17%)	1.00	1.00	
1		26 (50%)	1.03 (0.94-0.99)	1.04 (0.89-0.91)	
2		60 (66.66%)	1.1 (0.93-1.14)	1.2 (0.92-1.13)	<0.001
3		25 (84%)	1.71 (1.76-1.61)	1.79 (1.54-1.87)	
>3		14 (85.71%)	1.76 (1.69-1.84)	1.84 (1.71-1.79)	

Age of above 26 was found to be significant with overweight/obesity. The odds of being overweight/obese for those whose age was above 26 was 3.14 times more likely when compared to 22-24 years old (AOR = 3.14 [95%CI:1.15, 2.69]).

Lower middle income (25000-35000), upper middle income (45000-4) and high income (>45000) were found to be significant with overweight/obesity. The odds of being overweight/obese for those who had lower middle income (25000-35000) was 3.47 times more likely when compared to low income (<25000) (AOR = 3.47 [95%CI:2.58, 4.76]). The odds of being overweight/obese for those who had upper middle income (35000-45000) was 3.51 times more likely when compared to low income (<25000) (AOR = 3.51 [95%CI:2.47, 4.32]). The odds of being overweight/obese for those who had higher income (>45000) was 2.36 times more likely when compared to low income (<25000) (AOR = 2.36 [95%CI: 4.09, 9.17]).

Eating meat at least once a day was found to be significant with overweight/obesity. The odds of being overweight/obese for those who ate meat at least once a day was 2.60 times more likely when compared to those who did not eat meat at least once a day (AOR = 2.60 [95%CI:2.37, 4.38]). Trying to eat fiber was found to be significant with overweight/obesity. The odds of being overweight/obese for those who tried to eat fiber was 1.25 times more likely when compared to those who did not eat fiber (AOR = 1.25 [95% CI:0.86, 1.01]).

Avoiding fat and cholesterol was negatively associated with overweight/obesity. Those MRs who avoided fat and cholesterol have 66% less likely chance of being overweight/obese as compared to those who

did not avoid fat and cholesterol. (AOR = 0.34 [95%CI; 0.11, 0.95]).

Eating fruits more than 2 times a day was found to be significant with overweight/obesity. The odds of being overweight/obese for those who ate fruits more than 2 times a day was 1.21 times more likely when compared to those who ate fruits 2 times or less than 2 times a day (AOR = 1.21 [95%CI:1.04, 1.32]).

Skipping breakfast was negatively associated with overweight/obesity. Those MRs who skipped breakfast have 34% less likely chance of being overweight/obese as compared to those who ate breakfast. (AOR = 0.66 [95%CI; 0.39, 1.21]). Also, eating more than 4 times a day was found to be significant with overweight/obesity. The odds of being overweight/obese for those who ate more than 2 times a day was 4.24 times more likely when compared to those who ate 4 times or less than 4 times a day (AOR = 4.24 [95% CI:1.10, 1.46]).

Eating in-between snacks more than 2 times a day was found to be significant with overweight/obesity. The odds of being overweight/obese for those who ate in-between snacks more than 2 times a day was 1.31 times more likely when compared to those who ate in-between 2 times or less than 2 times a day (AOR = 1.31 [95%CI:1.27, 1.47]).

Low physical activity was positively significant with overweight/obesity whereas high physical activity was negatively associated with overweight/obesity. The odds of being overweight/obese for those who had low physical activity was about 1.47 times more likely when compared to those who had moderate physical activity (AOR = 1.47 [95% CI:1.14, 1.48]). Those MRs who

had high physical activity had about 26% less likely chance of being overweight/obese as compared to those with moderate physical activity. (AOR = 0.74 [95% CI; 0.69, 0.19]).

Current tobacco use (Including cigarette) day was found to be significant with overweight/obesity. The odds of being overweight/obese for those with current tobacco use (Including cigarette) was 1.38 times more likely when compared to those without Current tobacco use (Including cigarette) (AOR = 1.38 [95% CI:1.09, 1.55]). Similarly, drinking alcohol 3 and more than 3 times per week were found to be significant with overweight/obesity. The odds of being overweight/obese for those who drank alcohol 3 times per week was 1.79 times more likely when compared to those who drank alcohol 1 or 2 times per week (AOR = 1.79 [95%CI:1.54, 1.87]). The odds of being overweight/obese for those who drank alcohol more than 3 times per week was 1.84 times more likely when compared to those who drank alcohol 1 or 2 times per week (AOR = 1.84 [95%CI:1.71 1.79]).

## DISCUSSION

Overweight/obesity prevalence was found to be significantly more in male MRs as compared to female MRs. Similar result was found in different Asian population. Study done in clinical students in Malaysian medical student found that significant one of the risk factors associated with overweight/obesity among these students was male gender (adjusted odds ratio [OR] 2.1; 95 percent confidence intervals [CI] of 1.1 and 4.1; p is equal to 0.03) [8].

Similar result was found in the national nutrition and health survey in Taiwan. The showed that the prevalence of overweight

and obesity were 22.9% and 10.5% for males and 20.3% and 13.2% for females, respectively, using the Taiwanese definition (BMI—24—<27 kg/m<sup>2</sup> and >27 kg/m<sup>2</sup>, resp.) [9]. this result was found to be opposite of national research in which overweight/obesity (women 32.87% and men 28.77%, p<0.001) was higher among women [10].

It was found that age (Above 26) is significantly associated with overweight/obesity. This could be because it is likely that people gain weight as their age increases as shown in research [11]. Lower middle income and upper middle income were positively associated with overweight/obesity. Income gives more freedom in choosing and consumption of foods. Similar result was found in research done by Grabner in 2012 [12]. This research highlights education and income have associations with BMI. High income group had less prevalence of BMI as compared with lower middle income and upper middle income. This result may seems like odd but similar finding was found in research done by Grabner in 2012. Looking at the effect of income, an extra USD 1,000.- in real personal income is associated with a modest decrease in BMI of about 0.005–0.016 units for men and 0.04–0.07 units for women [12].

Similar type of mixed result that is increase and decrease in BMI as income gets higher can be found in different studies. Our results are consistent with a review [13], concluded that in developing countries, obesity is no longer a disease of high economic group, and the trend of obesity is moving towards low economic status populations. Similar to the results of our study, in another study in Syria [14] obesity was more prevalent is in the low economic group while overweight was seen



more commonly in the high economic status group. However, these two observations had no statistical significance, and they studied the economic status, while we only reviewed the economic status. In other studies, obesity is more prevalent in people with high economic status [15] and higher average family income [16].

Eating meat at least once a day was found to be positively associated with BMI. Similar result was found in research done in China which showed that Compared with people on a balanced diet, those who eat more meat (OR 1.47, 95% CI 1.29 to 1.68) are more likely to put on weight[17]. Eating more meat are risk factors for being overweight and obese, which is consistent with previous studies [18]. In this study an unexpected finding was that making a conscious effort trying to eat fiber were associated with overweight/obesity. Other studies have also found this association between intake of fiber and obesity [19]. It is possible that in this study where intention to try to eat fiber, this did not correspond to the actual eating pattern. On the other hand, MRs who were overweight or obese might have already adopted healthier eating behaviour in order to lose weight. Since the study design was cross-sectional, causality between dietary variables and overweight/obesity could not be established.

MRs who tried to avoid fat and cholesterol was negatively associated with BMI. This finding can be confirmed by other researches. Regular consumption of high-fat foods will lead to weight gain [202].

Fruit consumption more than 2 times a day was found to be positively associated with overweight/obesity in our study group. Similar result was found in research done by Ham that investigation on the correlation

between the intake level of fruits in adolescents and BMI found a significant positive correlation between fruit intake frequency at dinner and body weight as well as BMI [21]. However, this study has also its limitations. The level of fruit intake was assessed based on the frequency not the serving size, which is not the most accurate assessment. Therefore, a generalization of this research results may be difficult. However, the present study is meaningful because fruit intake is separately assessed as an independent food group. This research is deemed to have enough value to facilitate more follow-up studies and be utilized for proper fruit intake instruction guidelines for adolescents. Unlike previous reports showing that fruits and vegetables intake can prevent obesity, a larger consumption of fruits may possibly cause weight gain or obesity due to their high sugar content [22, 23].

Skipping breakfast was found to be negatively associated with overweight/obesity. Adding breakfast may add more calories in diet leading weight gain. Similar result was found in the research where they found that adding breakfast increased the weight gain [24]. Whereas, eating meals more than 4 times per day was found to be positively associated with overweight/obesity. This is may be with increase in the meal it is likely that energy intake also increases. Similar result was found in the research where participants who ate >3 meals/d experienced a relative increase in BMI: the more meals and snacks per day, the greater the increase in BMI [25].

Taking snacks more than 2 times per day was found to be positively associated with overweight/obesity. This may be due to increase in calorie intake. Similar result was found in the research done by Murakami et al. where they found that snacking frequency

associated with an increased likelihood of overweight/obesity and central obesity in US adults [26].

High physical activity was found to be negatively associated with overweight/obesity. Physical activity increases the energy consumption which may burn the reserve energy source in body. Similar result was shown in systematic analysis where they found that physical activity is associated with significant and beneficial changes in fat percentage, waist circumference along with systolic blood pressure, insulin, low-density lipoprotein cholesterol, and total cholesterol, as well as with small non-significant changes in diastolic blood pressure, glucose, and high-density lipoprotein cholesterol [27].

Current tobacco use (Including cigarette) was found to be positively associated with overweight/obesity. Longitudinal study of 7,565 participants, demonstrated greater weight gain among active than never smokers over a 50 month follow-up period [28]. Similarly, drinking alcohol 3 and more than 3 times per week were found to be positively associated with overweight/obesity. Alcohol is the second calorie dense nutrient after fat. Alcohol gives 7 kcal/g, which is more than carbohydrate and protein. Alcohol consumption increases calorific intake. There have also been studies that have found a general positive association between alcohol intake and weight gain [29-31].

## CONCLUSION

Prevalence of overweight/obesity among MR was found to be high. Men MRs were significantly more overweight and obese than women. Age, Income and most of the dietary/lifestyles factors were found to be

significant with overweight/obesity. MR job can be considered vulnerable to overweight/obesity because of alteration in many dietary and lifestyle factors.

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