INTER RELATIONSHIP BETWEEN STRESS AND OBESITY AMONG ADULTS

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ABSTRACT

There are several reasons why stress leads to obesity. Stress can activate a neural stress response network and trigger eating without hunger. Stress induces the secretion of glucocorticoids and insulin, leading to increased intake of comfort foods high in fat and sugar. However, there is also a possibility that stress can lead to reduced food intake and body weight loss. While stress can lead to under- or overeating, chronic life stress is more likely to be associated with a greater preference for foods high in sugar and fat. The present study was conducted with the following objectives: to assess the prevalence of obesity in adults in the age group of 30-59 years, to diagnose the level of stress using DASS-21 questionnaire and to check the interrelationship between stress and obesity. The study conducted in 200 adult males and females between the age group of 30-59 in Ernakulam district. Their demographic status, anthropometric profile, biochemical analysis, dietary intake were assed using self-structured questionnaire. The stress level was analysed using DASS-21 questionnaire.The result of the study showed that there is a negative correlation between stress and obesity. So one variable increases while the other decreases, and vice-versa. .This might be because of the working condition and lifestyle activities. However, there remains little evidence of chronic stress associated with obesity in the general population

INTRODUCTION

"*Nothing is worth the health. Nothing is worth poisoning yourself into stress, anxiety and fear*" – Steve Maraboli

Stress is often defined as any sort of change that causes physical, emotional, or psychological strain. Stress is that the body's response to anything that needs attention or action. Stress is often short-term or long-term. Both can cause a spread of symptoms, but chronic stress can take a significant toll on

the body over time and have long-lasting health effects. (Elizabeth Scott, 2020). Stress is typically associated with the pending present event. (Ailsa Allaby, 2022).

Obesity may be a complex disease involving an excessive amount of body fat. Obesity is not just a cosmetic concern. It is a medical problem that increases the danger of other diseases and health problems, like heart condition, diabetes, high vital sign and certain cancers. (Goldman L, et al,2021). Consistent with World Health Organisation (WHO), Overweight and obesity are defined as abnormal or excessive fat accumulation which will impair health.

  The prevalence of obesity has rapidly escalated and now represents a serious public health concern. Although genetic associations with obesity and related metabolic disorders like diabetes and disorder are identified, together they account for a little proportion of the incidence of disease. Environmental influences like chronic stress, behavioral and metabolic disturbances, dietary deficiency, and infection have now emerged as contributors to the event of metabolic disease. (K. L. Tamashiro, 2011)

Many pathways connect stress and obesity, two highly prevalent problems facing society today. First, stress interferes with cognitive processes like executive function and self-regulation. Second, stress can affect behavior by inducing overeating and consumption of foods that are high in calories, fat, or sugar; by decreasing physical activity; and by shortening sleep. Third, stress triggers physiological changes within the hypothalamic-pituitary-adrenal axis, reward processing within the brain, and possibly the gut microbiome. Finally, stress can stimulate production of biochemical hormones and peptides like leptin, ghrelin, and neuropeptide Y. (Tomiyama, 2018)

Prevalence of stress induced obesity in India is 40.3%. Zonal variations were seen as follows: south highest at 46.51% and east lowest at 32.96%. Obesity was higher among women than men (41.88% vs. 38.67%), urban than rural (44.17% vs. 36.08%), and over 40 than under 40 (45.81% vs. 34.58%). (Murali Venkatrao,2021). In this context, the present study entitled 'Inter relationship between Stress and Obesity among adults' was carried out with following objectives:

- To assess the prevalence of obesity in adults in the age group of 30-59 years.
- To check the interrelationship between stress and obesity in adults.
- To diagnose the level of stress using DASS-21 questionnaire.

METHODOLOGY

The area selected for the study was Cochin Cooperation, Ernakulam District, Kerala. A total of 200 subjects belonging to the age group of 30-59 years from the population were selected. Among the 200 selected subjects, their stress levels were assessed using DASS 21criteria and level of overweight and obesity were also diagnosed using BMI and the number of obese patients were found out in each level of stress. A questionnaire was designed to obtain the data. The questionnaires were distributed to the subjects who had no access to digital media and the rest were given the questionnaires as Google forms. The Depression, Anxiety and Stress Scale - 21 Items (DASS-21) is a set of three self-report scales designed to measure the emotional states of depression, anxiety and stress. The questionnaire method was administered among 200 subjects and the data were collected and analyzed. The IBM SPSS Version 23 was used to carry out data analysis.
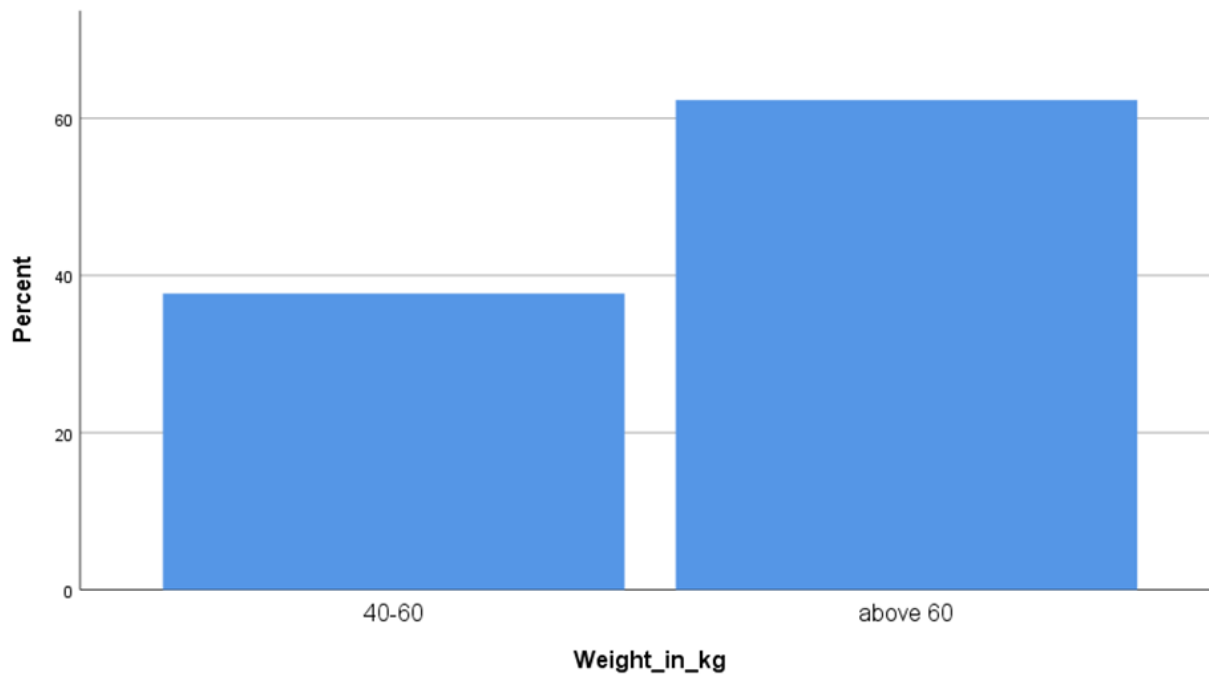
RESULTS AND DISCUSSION

The results and discussion of the study entitled "**Interrelationship between Stress and Obesity**" was discussed under the following heads.

Assessment of Anthropometric profile of the subjects

Nutritional anthropometry is defined as the measurement of human body at various ages and levels of nutritional status.

Table 1: Weight of the Selected Subjects

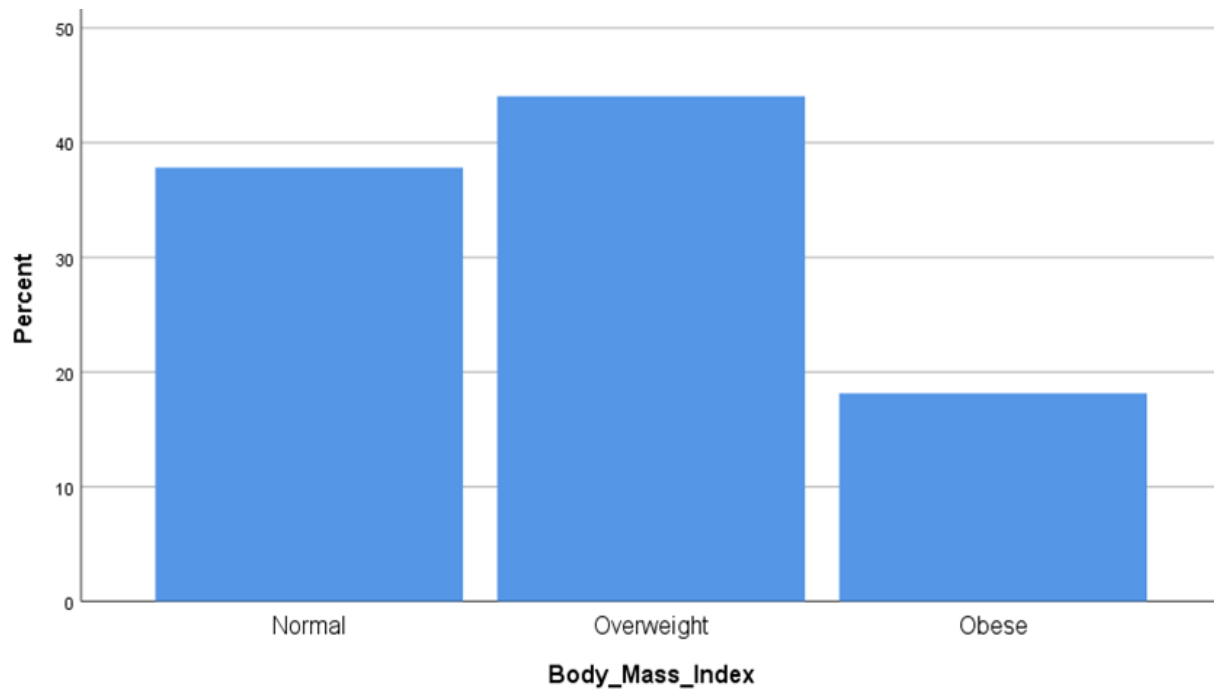| Weight	Frequency	Percentage (%)
40-60	76	37.7%
Above 60	124	62.3%

Figure 1 Percentage of participants based on weight

The weight from the selected subjects reveals that 37.7% of participants have weight between 40 -60 and 62.3% were above 60 kg.

Table 2: Body Mass Index of the Selected Subjects

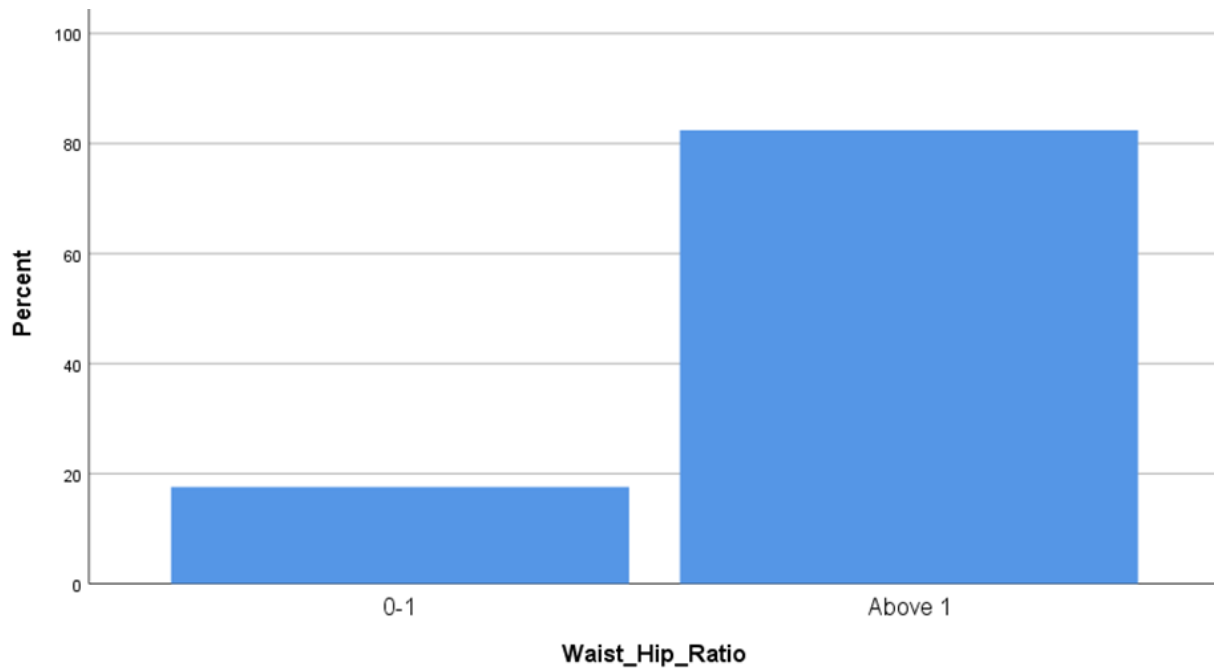| BMI	Frequency			Percentage (%)
	Males	**Females**	**Total**	
Normal	45	35	80	39.7%
Over weight	22	63	85	42.7%
Obese	14	21	35	17.6%

Figure 2 Percentage distribution of body mass index

According to body mass index 39.7% were normal, 42.7% were overweight and 17.6% were obese. Among normal subjects , 45 were males and 35 were females , among overweight subjects , 22 were males and 63 were females and among obese subjects,14 were males and 21 were females.

Table 3: Waist Hip Ratio of the Selected Subjects

WHR	Frequency			Percentage (%)
	Males	Females	Total	
0-1	16	20	36	17.6%
Above 1	65	99	164	82.4%

Figure 3 percentage distribution of WHR

The percentage of participants have WHR 0-1 is 17.6%. In addition, 82.4% have above 1 ratio. Among 17.6% of subjects 16 were males and 20 were females and among 82.4% , 65 were males and 99 were females.

Assessment of Stress among the subjects according to DASS-21

Table 4: Depression level of the Subjects

Depression	Frequency			Percentage (%)
	Males	Females	Total	
Normal	58	36	94	47.2%
Mild	30	32	62	31.2%
Moderate	19	21	40	20.1%
Severe	1	3	4	1.5%

Out of 200 subjects 47.2% were normal, 31.2% were mild, 20.1% were moderate and 1.5% had severe depression. Among the level of depression, 58 males and 36 females were having normal level of depression, 30 males and

32 males were having mild level of depression, 19 males and 21 females were having moderate level of depression and 1 male and 3 females were having severe level of depression.

Table 5: Anxiety level of the Subjects

Anxiety	Frequency			Percentage (%)
	Males	**Females**	**Total**	
Normal	20	32	52	26.1%
Mild	13	7	20	10.1%
Moderate	25	74	99	49.7%
Severe	15	11	26	13.1%
Extremely severe	2	1	3	1%

Based on anxiety among subjects 26.1% were normal, 10.1% were mild, 49.7% were moderate, 13.1% were severe, and 1% is extremely severe. Among the level of anxiety, 20 males and 32 females were having normal level of anxiety, 13 males and 7 males werehaving mild level of anxiety, 25 males and 74 females were having moderate level of anxiety , 15 males and 11 females were having severe level of anxiety and 2 males and 1 female were having extremely severe level of anxiety.

Table 6: Stress level of the Subjects

Stress	Frequency			Percentage (%)
	Males	**Females**	**Total**	
Normal	63	88	181	91%
Mild	8	5	13	6%
Moderate	5	1	6	3%

Based on stress among subjects 91% of the subjects were normal, 6% were mild and 3% were moderate. Among the levels of stress, 63 males and 88 females were having normal level of stress, 8 males and 5 males were having mild level of stress, 5 males and 1 female were having moderate level of stress.

Table 7: Correlation between Obesity and Stress among the subjects.

Correlations			
		BMI	Depression
BMI	Pearson Correlation	1	-.035
	Sig. (2-tailed)		.622
	N	200	200
Depression	Pearson Correlation	-.035	1
	Sig. (2-tailed)	.622	
	N	200	200

In the present study there is no significant relationship between obesity and depression. Here p value is 0.622, which is greater than critical p value.(ie., 0.622>0.01). The direction of the relationship is negative(r=-0.035) i.e., obesity and depression were negatively correlated. So one variable increases while the other decreases, and vice-versa.

Table 8: Correlation of subjects with different level of anxiety and subjects with Obesity

Correlations			
		BMI	Anxiety
BMI	Pearson Correlation	1	-.026
	Sig. (2-tailed)		.720
	N	200	200
Anxiety	Pearson Correlation	-.026	1
	Sig. (2-tailed)	.720	
	N	200	200

There is no significant relationship between obesity and anxiety. Here p value is 0.720, which is greater than critical p value.(ie., 0.720>0.01). The direction of the relationship is negative(r=-0.026) i.e., obesity and anxiety were negatively correlated. So one variable increases while the other decreases, and vice-versa.

4.3.3 Correlation of subjects with different level of stress and subjects with obesity

Correlations		BMI	stress
BMI	Pearson Correlation	1	-.025
	Sig. (2-tailed)		.726
	N	200	200
Stress	Pearson Correlation	-.025	1
	Sig. (2-tailed)	.726	
	N	200	200

There is no significant relationship between obesity and stress. Here p value is 0.726, which is greater than critical p value.(ie., 0.726>0.01). The direction of the relationship is negative(r=-0.025) i.e., obesity and stress were negatively correlated. So one variable increases while the other decreases, and vice-versa.

CONCLUSION

There had been a great impact of stress over health. It was widely seen that because of the stress in life, there had been very less care towards the health and which became a leading cause to obesity and various other lifestyle diseases.In the present study, 200 samples were selected and the data was collected using questionnaire and their stress was analysed using DASS 21. According to DASS 21 criteria was used to find out different types and levels of stress among the subjects. Their weight status was analysed using Body Mass Index (BMI). Almost 50 % of the samples were not having any levels of stress and remaining 50 % were having mild , moderate , severe and extremely severe levels of stress.The present study revealed that 42.7% were overweight and 17.6% were obese but that there is no significant relationship between stress and obesity and the relationship shows negative

correlation. This might be because of the working condition and lifestyle activities. However, there remains little evidence of chronic stress associated with obesity in the general population

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