

MEDIATING ROLE OF NEUROTICISM IN BETWEEN EATING PATTERNS AND COPING STYLES IN OBESE POPULATION

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Abstract

The purpose of this quantitative study was to determine the linkage between eating patterns and coping styles with mediating role of neuroticism in obese Population (both male and female). Correlation research design was used to collect data through purposive and snowball sampling. Demographic questionnaire of three factor eating questionnaire tfeq-18, brief cope to problem experienced inventory (Brief-COPE) and neuroticism subscale of big five personality inventory were used. The correlation analysis shows the weak significant positive correlation of neuroticism with uncontrolled eating, cognitive restraint and emotion focused coping. Findings also indicate the weak significant positive correlation of uncontrolled eating with emotion focused coping and avoidant coping styles. There is also a weak significant positive correlation. Moreover, neuroticism partially mediates the relationship between eating patterns and coping styles as indicated by indirect effect of mediation analysis. Study findings has important implications in clinics through targeted interventions, personalized treatment plans, prevention strategies and improved understanding of underlying psychological factors individuals can gain better understandings of other psychological and clinical factors that contribute to unhealthy eating patterns and maladaptive coping styles. Research has important implications in both psychology and literature this can inform the development of psychological assessments that builds individuals under time for neuroticism with assessing risk related to eating patterns and coping styles. Despite the limitations thesis contribute in inspiring future research in literature by considering importance of Personality trait in understanding mental health and human behavior.

INTRODUCTION

Obesity is defined as a disease that involves multiple factors arises, from the interaction between genotype and environment. It is also defined as excessive weight caused by calories imbalance consumed by an individual. Body mass index BMI is used to evaluate whether an individual falls under the criteria of

obesity or not. The BMI calculation for adults is by dividing weight in kilograms by height in meters squared. BMI of 25.0 to 29.0 kg/m² is considered as overweight while BMI of 30kg/m² or higher comes under Obesity. Worldwide almost 2.1 billion people are suffering from obesity (chronic, relapsing,

progressive) disease with a rising prevalence linked with greater rates of mortality as well as lower quality of life. The existing literature suggests that unhealthy coping styles of individuals with deficits in emotion dysregulation and high level of neuroticism are crucial in progression of obesity (Dąbrowska et al. 2020).

According to Pardo Obesity (2023) is a global health epidemic affecting people across cultures and continents. In Pakistan obesity is at alarming state, placing significant challenges to individual wellbeing and public health. Obesity is rising among young adults both men and women. Obesity measurement at population level is same for both sexes and for all ages of adults. Individuals most population is living in the areas where obesity kills more people than underweight. Research shows the obesity Epidemic of 2016, more than 1.9 billion 18 years older were overweight. In 2016, the percentage of young adults were 39% with overweight and 13% were obese. More than 5 million individuals die every year because of harmful effects of obesity.

According to Asian Pacific cut off, in Pakistan the generalized obesity was 57.9% (42% in men and 58% in women) and ratio of central obesity was 73.1% (37.3% in men and 62.7% in women). The prevalence of obesity in Punjab is 60% in Khyber Pakhtunkhwa 59.2% while Baluchistan 82.1% followed by Punjab 73.3% (Omer, 2020). Another study has been conducted to find the prevalence of obesity in Pakistan with the association of link to know the risk factors associated with obesity in young adults. Among obese, males and females were 57.63% and 42.37% respectively. Young adults between the age of 18-26 with 31.64% were obese. They were not suffering from any metabolic disease. The prevalence of obesity increased dramatically from 90's to 2016. According to WHO nearly 1 in 4 people are clinically obese. The prevalence is high in urban areas, 62% of residents being obese as well. The global concern is raised with increasing obesity rates worldwide. The etiology of obesity is multifactorial. Obesity threshold is raised since mid-70s of last century. Obesity increases risk of morbidity by placing overwhelming effects on health (Basit et al. 2021).

Neuroticism places curve linear relationship with obesity because greater severity of neurotic traits is associated with both high BMI. Those with high Neuroticism are more prone to engage in unhealthy

behaviors such as emotional eating which can contribute to weight gain. Neuroticism places negative impact on individuals' life they contribute to weight gain.

High neurotic individuals are more prone to stress which disrupts the sleep patterns and increase the likelihood of weight gain. Such individuals also face difficulty in adhering to healthy eating and exercise routines due to their emotional state (Buczowska et al., 2022). Experimental studies reveals that greater stress level is associated with more food consuming behavior. Emotional eater Individuals believe that when they make a speech (stress induction) they consume more fat foods. Emotional eaters engage in eating to cope stressful situation and other negative emotions. Some individuals use avoidance coping only to avoid and to suppress emotions related to body. Some seeks social support (friends, family, groups) for stress management. Coping strategies can vary from Individual to individual. People with obesity face more difficulty in dealing stressful situations like discrimination than normal weight individuals. Individual differences were identified in normal and obese individuals coping strategies and association was examined in BMI, eating behaviors and coping styles. Findings of the research suggest that individual score high in passive coping styles like isolation and emotional eating (Varela et al., 2019).

Individuals' experiences and coping strategies are unique but the interplay between the neuroticism, emotional eating and coping styles can vary.

Neuroticism is a personality trait that is defined as individuals' tendency to experience negative emotions. Coping styles are the ways that individuals used to cope with negative emotions and emotional eating that arises due to emotional trigger. Individuals high in neuroticism are more actively using emotional eating to cope with negative emotions. Some individuals engage in problem focused coping, which actively address the underlying issues that cause negative emotions. Individuals using avoidant coping are likely to did emotional eating as a way to avoid negative emotions (Headey, 2014).

Emotional eating is linked to neuroticism and coping styles. Those individuals who experience negative emotions more intensely are more likely to engage in emotional eating to cope with stress. Instead of addressing their emotions directly, they turn to food

for comfort. Coping styles also interplay those individuals who use maladaptive coping such as emotional eating for dealing with stress. In the context of the relationship among neuroticism, coping styles and emotional eating in obese population neuroticism in the obese population, neuroticism can be seen as a mediator. Neurotic individuals are more associated with emotional eating as a coping mechanism, that contributes to obesity in young adults. Between Emotional Eating and coping styles, the neuroticism serves as a bridge influencing how individuals cope with obesity through food (Bennett & Cooper, 2020).

As per the **Self-Regulation theoretical framework** issues emerged in regulating emotions are considered as the cause of disrupt eating patterns from a self-regulation standpoint. This theory focused on decision making skills and individuals capacity for behavior regulation on facing any emotional distress. Those who did emotional eating find it difficult to comprehend, manage emotions and may turn to food as a calming mechanism. Self-regulation perspective highlights the significance of developing healthy coping strategies as well as enhancing emotional awareness and regulation abilities. Individuals use strategies like mindfulness and alternative healthy coping to better cope their emotions to reduce Maladaptive eating patterns (Coulthard et al., 2023). With the rise in the rates of obesity along with its positive correlations with psychological measures, an interest in other factors at the level of personality and behavior that contribute to unwanted health trends is emerging. The research question that the study tries to answer is how the neuroticism, one of the most defining personality traits associated with emotional instability, can be correlated to the eating pattern and coping styles of obese individuals. In particular, the proposed study aims at analyzing how individual

differences in neuroticism relate to both eating behaviors and coping mechanisms, as well as to see whether the mediation role that this individual difference plays in the relation between eating patterns and coping styles holds. The hypothesis is that “there will be positive correlation between eating patterns and neuroticism and negative correlation between adaptive coping styles and positive correlation between maladaptive coping styles”. Moreover, the tendency known as “neuroticism should mediate the connection between eating patterns and coping styles” and reveal the potential roles of emotional regulation characteristics on coping style under the condition of obesity (Liu et al., 2020).

Method and Materials

Participants and Sampling Strategies

Correlational research design was employed in present study to find relation among Neuroticism, Emotional Eating and Coping Styles in Obese population (Young Adults). For this study sample of young adults aged 18-27 (100 women & 100 men) collected from various Hospitals and Clinics, Community Centers, Online Platforms and Nutritionists of Lahore through purposive and snowball sampling. The sample aim to be diverse in terms of age, gender, and socioeconomic background to enhance the generalizability of the findings. This study included population of young adults both genders having BMI above 30 percent indicating obesity. This research includes participants that were willing to provide informed consent and willing to complete self-report questionnaires. This study excluded individuals with a history of diagnosed eating disorders (e.g., anorexia nervosa, bulimia) also Individuals with medical conditions that significantly affect weight and eating behavior (e.g., metabolic disorders) and Individual with any other diagnosed mental disorders.

Table 1: Demographic Characteristics of Study Sample (N=200)

Variables	Frequency	Percentage
Gender		
Male	83	41.3
Female	117	58.2
Education		
Matric	7	3.5
Intermediate	41	20.4

Bachelor's	131	65.2
Masters	20	10.0
Marital Status		
Single	176	87.6
Married	20	10.0
Divorced	3	1.5
Family System		
Nuclear	118	58.7
Joint	81	40.3
Birth Order		
Only Child	18	9.0
Eldest	67	33.3
Middle Child	75	37.3
Youngest Child	40	19.9
Monthly Family Income		
Below 50,000	45	22.4
Above 50,000	78	38.8
Above 1,00,000	37	18.4
Above 2,00,000	40	19.9
Body Mass Index		
Low risk obesity	41	20.4
Moderate risk obesity	74	36.8
High risk obesity	85	42.3

Measures

Informed Consent Form

In consent form the purpose of the study will be explained to participants and they will be asked for their voluntary participation. Moreover, their written agreement for participant will also be included in the form.

Demographic information Form

Participant's age, name, gender, religion, education, birth order, marital status, monthly income and presence of any diagnosed mental illness were included in this demographic form.

Neuroticism Subscale of Big Five Personality Inventory

Over the year's Big Five Personality Inventory was developed by many psychologists including Paul Costa, Robert McCrae and Lewis Goldberg. Raymond Christal and Ernest Types first identified Big Five Personality Inventory in 1960s. The 44-item "Big Five Inventory" (BFI) was developed in 1998 by psychology professor Verónica Benet-Martinez of University of California at Davis and Oliver John of Berkeley

Personality Lab. Emotional instability, moodiness, and sorrow are traits associated with neuroticism. Those with high neuroticism frequently struggle with anxiety, irritability, depression, and mood swings. People who score lower on this personality trait are typically more emotionally stable and resilient. The neuroticism subscale in the Big Five Inventory consists of eight items with three items having reverse scoring (2, 5, 7). People will be asked to rate each sentence on a scale of 1 to 5 by marking how much they agree or disagree with it. The Cronbach's alpha values of the scale is 0.74–0.83 (Benet-Martinez & John, 1998).

Three Factor Eating Questionnaire (tfeq-18)

Karlsson et al. (11) developed the Three-Factor Eating Questionnaire Revised 18-item version (TFEQ-R18). I am a condensed form of the Stunkard and Messick TFEQ that consists of three distinct measures that represent cognitive constraint, emotional eating, and unrestrained eating. It has eighteen pieces total. Three components of eating behavior are measured by the TFEQ-R18: emotional eating, uncontrolled eating, and cognitive constraint. A 4-point Likert scale is used

for each question; 1 means never, 2 means rarely, 3 means occasionally, and 4 means always. Higher scores suggest that the eating behavior may exist. According to Lauauzon et al. (2004), the Cronbach's alpha values exceed the typical value of 0.70.

Brief Coping Orientation to Problem Experienced Inventory (Brief-COPE)

A popular instrument for evaluating a wide variety of coping mechanisms in reaction to stressors is the Brief COPE Inventory. It is a streamlined version of the COPE Inventory that was created by Charles Carver and has been used in many research with a variety of individuals and environments. The following 14 coping mechanisms are examined in 28 items of this questionnaire: venting, positive reframing, planning, humor, acceptance, religion, self-blame, active coping, avoidance coping, substance abuse, use of emotional support, use of instrumental support, behavioral disengagement, and positive reframing. The Brief COPE sub-scales have Cronbach's alphas ranging from 0.50 to 0.90. The psychometric characteristics of the Brief COPE Urdu are good in a sample of university students from Pakistan. Asma Nisa and Salma Siddiqu created the Brief COPE's Urdu translation in 2020 (Carver, 1997; Nisa & Siddiqu, 2020).

Procedure

First of all, the permission for data collection will be taken from various Hospitals and Clinics, Community Centers, Online Platforms and Nutritionists of Lahore, after the permission is granted, participants will be given informed consent. Participants will be informed about the nature of the study and the time taken to complete the questionnaires. Their confidentiality will be ensured. After giving the introduction and informed consent, the demographic sheet will be filled by the

participants and they will be asked to complete Big Five, TFEQ R18 and Coping Styles questionnaires. Participants have right to withdraw from the study at any time. The scales taken for study will be used after ensuring their permission granted by authors.

Statistical Analysis

Calculate Pearson correlation coefficients to assess the relationships between emotional eating, coping styles, neuroticism, and obesity. Conduct regression analysis to explore how emotional eating, coping styles, and neuroticism predict obesity. Perform mediation analysis to examine whether neuroticism mediates the relationship between emotional eating and obesity. This analysis should assess the direct and indirect effects of emotional eating on obesity through neuroticism.

Ethical Considerations

Before starting a research, ethical approval was taken from the appropriate institutional review boards or ethics committees. Informed consent was obtained from participants after fully informing them about research purpose, method, risks and advantages associated with research. By making sure that sensitive information was safeguarded and anonymity was preserved during collection, scoring and analysis of data. Necessary precautions were taken to guard participants data against loss, misuse and unauthorized access. Ethical considerations were taken account to minimize potential risks to research participants while optimizing the benefits of the study. Participants were allowed to decide whether or not to participate in the study, and guarantee their freedom to leave at any time without incurring any fees. There was also a guarantee given that no participant will be chosen, handled, or assessed unfairly because of their color, gender, sexual orientation, religion, or handicap.

Result

Table 2: Correlation between Eating Patterns, Coping Styles and Neuroticism in Obese Population (N=200).

Variables	1	2	3	4	5	6	7
1.Neuroticism	1	.19**	.09	.16*	.11	.18*	.09
2. Uncontrolled Eating		1	.33**	.20**	.09	.24**	.26**
3.Emotional Eating			1	.15*	-.01	.09	.07
4.Cognitive Restraint				1	.01	.13	.18*
5. Problem Focused					1	.35**	.25**

6. Emotion Focused	1	.40**
7. Avoidant Coping		1

Correlation is significant at the 0.05 level (2-tailed) *

Table 2 shows the correlation between Eating Patterns, Coping Styles and Neuroticism. In a sample of 200 obese population recruited from different areas of Lahore. Correlation coefficient indicates strengths of linear relationship in variables. Results indicate weak significant positive correlation of Neuroticism with Uncontrolled Eating ($r = .19^{**}$), Cognitive Restraint ($r = .16^{*}$) and Emotion Focused Coping ($r = .18^{*}$). Findings also represents weak significant positive Correlation of Uncontrolled Eating with Emotion Focused Coping ($r = .24^{**}$) and Avoidant Coping ($r = .24^{**}$). There is also a weak significant

positive correlation between Cognitive restraint and Avoidant coping ($r = .18^{*}$).

Therefore, the results indicate that obese individuals with Neuroticism personality trait engage in uncontrolled and cognitive restraint eating patterns and use emotion focused coping to deal with their problems. Moreover, obese individuals who use emotion focused and avoidant coping engage in uncontrolled eating pattern. Avoidant coping is specifically related Cognitive restraint eating pattern in obese population.

Table 3: Mediation analysis of neuroticism between the relationship of eating patterns and coping styles

Mediation Path	Path	Coefficient (B)	Standard Error	95% CI for Effect		P
				Lower Bound	Upper Bound	
Direct Effect						
Total Effect	Eating patterns (X) -> Coping Styles (Y)	0.28	0.07	.14	.42	< .001
Direct Effect	Eating patterns (X) -> Coping Styles (Y)	0.26	0.07	.11	.40	< .001
Indirect Effect						
Mediator (Neuroticism)	Eating patterns (X) -> Neuroticism (M)	0.23	0.08	0.06	0.39	
Mediator (Neuroticism)	Neuroticism (M) -> Coping Styles (Y)	0.11	0.06	-0.01	0.23	

Note: X represents the independent variable, Y represents the dependent variable, and M represents the mediator variable. Confidence intervals are at 95%, N=200.

Table 3 shows the total effect of Eating Patterns on Coping Styles with ignoring mediating role of Neuroticism with Coefficient of 0.28 indicates that by increasing one unit in eating pattern also increases 0.28 units in Coping Styles. Mediation analysis shows the direct effect of Eating Patterns on Coping Styles after controlling for Neuroticism as a mediator. The coefficient of 0.26 shows significant direct effect of Eating Patterns on Coping Styles after accounting influence of Neuroticism. By holding Neuroticism as a constant for a one unit increase in eating patterns there will be also increase of 0.26 units in Coping Styles.

Mediation analysis shows the indirect effect of Eating Patterns on Coping Styles through Neuroticism as a mediator. For the path Eating Pattern -> Neuroticism, the coefficient of 0.23 indicates that increasing one unit in Eating Patterns also increases 0.23 units in Neuroticism.

For the path of Neuroticism -> Coping Styles, the coefficient of 0.11 indicates that with increase of one unit in Neuroticism there will also be increase of 0.11 units in dependent variable (Coping Styles) as well. Results suggests that independent variable (Eating Patterns) has both direct and indirect effect on dependent variable (Coping Styles) through its influence on Neuroticism. Results also shows that

Neuroticism partially mediates the relationship between independent and dependent variables as indicated by significant indirect effect.

Discussion

The current study attempted to determine whether Neuroticism is a mediator in the association between the eating styles and coping styles in an obese population. There is some support of the research hypothesis in the results presented. It was identified that the relationship between eating patterns and Neuroticism was significantly positive although low, which means that people possessing the highest levels of neurotic traits have a higher chance of having disordered eating behavior that is the emotional eating, unguided eating and depending on some instance's strict cognitive restraint. Furthermore, part of the eating behavior and coping-styles relationship was mediated by Neuroticism and, therefore, this factor may act as an intermediary used to connect bad coping with bad eating-related behaviors.

According to past literature, people with high Neuroticism levels tend to report frequent negative emotions, namely, anxiety, mood swings and impulsivity (Widiger & Oltmanns, 2017). These people can resort to food as maladaptive coping strategy to repress or to deal with these emotional conditions. These earlier findings correlate with the current results and indicate that this behavior pattern is especially common among obese groups where foodstuff may be used as a replacement to control their emotions. As an example, some people eat because of emotional reasons, to drown the feelings of sadness or anxiety, a behavior which causes weight gain and maintains the state of obesity.

In addition, the findings confirm the concept that disordered eating behaviors are not smooth. Although emotional and uncontrolled eating are most often associated with loss of control and impulsivity, cognitive restraint eating that has been often associated with rigid control of dietary intake was reported among persons with high Neuroticism. This discovery indicates that part of the neurotic people seeks to have control again in their emotional lives by depriving themselves of food. Nevertheless, these patterns can be counterproductive, creating situation of restriction and bingeing, therefore, disrupting proper adaptive ways of coping. As Westenhofer

(1991) explains, strict dieting may enhance the occurrence of food obsession, and may develop disordered tendencies, even though it is introduced as a method of exercising control.

The other finding of the study was that the eating patterns were negatively associated with the adaptive coping styles. The individuals who turn to food to regulate their emotions would be less likely to enlist helpful coping strategies, problem-solving, social support, or cognitive reappraisal. This corroborates the second hypothesis and is in line with findings of (Gazmararian et al., 2010) who stressed that the practice of a maladaptive coping style makes an individual, less likely to effectively cope with stress. Excessive use of food as an emotion blocker may result in feeling of guilt, body dissatisfactions and the broken relationship with food, which further support emotional health decline.

A high extent of positive correlation was moreover detected between eating patterns and maladaptive coping styles, specifically avoidance and emotion-focused coping ways. These findings emphasize the behavior tendency of neurotics who tend to avoid or cope with the stressors using a short-term release of emotion instead of a long-term problem-solving. These maladaptive associations could also be reinforced by learned behaviors in childhood (e.g., the use of food as a comfort source) (Lee-Winn et al., 2016). This creates an idea of a complex interaction of childhood experience, emotional dysregulation, and personality trait that would perpetuate disordered eating in adulthood.

The mediatory analysis also dwells upon the advantages of the hypotheses that the field of Neuroticism is critical in the relationship between eating styles and coping styles. Neuroticism is also on the rise when eating behavior rises, in particular when emotional eating or uncontrolled eating is involved, which in turn is associated with more maladaptive coping. It indicates that emotional instability can not only be a determinant of eating behavior but also make individuals unable to pursue healthier coping mechanisms. These findings agree with the psychoanalytic theory of personality which indicates that the failure to resolve internal conflicts and emotions dysregulations linked to problems in eating (Freud, 1923/1961).

This study has a valuable layer that can be placed on these findings, which is their cultural context since the study was carried out in Lahore, Pakistan. The desire to achieve ideal body image and the negativity of expressing emotions can also enhance the Neuroticism-eating-coping relationship. Culture where physical appearance is severely valued and emotional vulnerability tabooed may encourage people to internalize body dissatisfaction and rely on food to get emotional satisfaction. Such a dynamic points at the necessity of culturally attuned interventions that pay attention to both personal aspects of emotional eating contributing to it, as well as to societal influences that promote poor coping and emotional eating.

Also, as a result of the stigma associated with obesity, low self-esteem, self-criticism, and higher levels of psychological distress can be experienced all of which are traits common among individuals with high Neuroticism. Such people might be caught up by a negative affect and maladaptive functioning without the means or the assistance to emerge. The inability to find the proper mental and nutrition help was revealed too as one of the factors as those people left without any help tend to self-soothe themselves by means of food which continues the cycle of their psychological and physical struggles.

In addition, the results are consistent with those of previous research carried out on youths in the U.S., and other countries, which revealed that high scores in Neuroticism (results in) high disordered eating patterns and poor coping styles (Theodoratou & Argyrides, 2024).

These findings have been stable across the ages and cultures which implies that Neuroticism is one of the very important variables determining person character with regards to relations to obesity behaviors and hence a major target of investigation as well as intervention.

Conclusion

This paper shows that personality characteristics, especially, Neuroticism, should be addressed when analyzing the connection between eating habits and copings among obese individuals. The results highlight that those who have a high score on Neuroticism are more likely to perpetrate maladaptive eating and coping measures that lead to the

development and existence of obesity. These findings naturally lead to implications on clinical practice, especially on the matter of guided tailor-made interventions against emotional control, stress control, and healthy dietary choices.

Limitations and future recommendations

Though the current research has interesting implications of the mediation role of the Neuroticism between eating patterns and coping styles among obese population, it must be admitted that there are various limitations. The writers had to base the study on self-report questionnaires since it was the means to evaluate Neuroticism, eating habits, and coping patterns. The approach can have social desirability bias or false reporting, which can be an issue to reliability and validity of the information. The study was carried out in Pakistan, Lahore and it might not completely represent the effect of cultural difference on eating habits, coping styles and displaying issues of Neuroticism. There are cultural differences in body image and expression of emotions, and eating habits, and they may affect the outcome substantially. This is because of the absence of longitudinal data thus the inability to make causal inferences. It is not apparent whether Neuroticism contributes to disordered eating and maladaptive coping or that the behaviors strengthen the neurotic tendencies with time. There was no discussion of environmental or familial factors, which is quite wide-ranging, including parenting styles, and support systems that sometimes can be influential with regard to the development of eating and coping styles. Also, not all the participants might have gained access to adequate psychological or nutritional assistance that could have been affecting their coping mechanisms and the tendency to use food as an emotional support tool. The absence of such resources, be it stigma, affordability or accessibility, might drive people to binge eating or other coping mechanisms of self-help. This puts an emphasis on a systemic problem that might reduce the effect of interventions in the absence of addressing it at a community or policy level.

It is important that future studies look at longitudinal designs where they can measure changes to such relationships over a period of time and study other mediating or moderating variables like depression, self-esteem, or social support. In addition, the

multidimensional nature of the needs of individuals with obesity may be more efficiently met with the help of the intervention programs that combine psychological evaluation with dietary and behavior support.

Authors Contribution

All authors made substantive intellectual contributions to this study to qualify as authors.

Ms. Komal Batool conceived the idea, designed the study, collected data and performed the statistical analysis. She also wrote an initial draft of the manuscript.

Dr. Muneeba Shakil re-drafted parts of the manuscript helped with analysis and provided helpful advice on the final revision of the draft.

All authors were involved in writing the manuscript.

All authors have read and approved the final manuscript.

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