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"Your Diet is a Bank Account; Good Food Choices are Good Investment"; COVID-19 and Dieting

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ABSTRACT

Objective: To gain insight into the relationship between dieting and unhealthy eating habits with COVID-19 infections and complications.

Study Design: Cross-sectional survey.

Place and Duration of Study: Pak Emirates Military Hospital, Rawalpindi Pakistan during the month of Jan 2021.

Methodology: This study was carried out through a web-based survey. Google forms were used. It included questions exploring dietary habits, weight changes, weight loss methods, COVID-19 status and severity of symptoms, including ten Open-ended questions and seven closed-ended questions.

Results: A total of 314 participants responded to the survey. They were divided into two groups, Group-A and Group-B. The mean age of the participants was 24.3±4.9 years. Group-A participants were doing dieting during last three years off and on as well as had more severe symptoms of COVID-19. On the other hand, Group-B had mild symptoms of COVID-19. Regarding COVID-19 status, 294(92%) participants in the study recovered from COVID-19, and 30(9.5%) participants suffered from COVID-19 at the time of the survey. The results concluded a positive correlation between the type and duration of dieting and severity of COVID-19 symptoms as well as in weight loss of more than 8kg with COVID-19 symptoms.

Conclusion: Among various factors contributing to the extension and severity of COVID-19, dieting represents one of the possible causes of the severity of symptoms of COVID-19. Understanding its importance is of paramount significance and needs further evaluation.

Keywords: Balanced diet, COVID-19, Dietary habits, Severity of COVID-19, Weight loss.

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INTRODUCTION

COVID-19 has created havoc as well as radically changed the world. The number of deaths, as well as the number of infected people, has jolted the world. The whole human population is being threatened by getting exposed to this pandemic sooner or later.[1] Studies have concluded that COVID-19 have caused long-term consequences in recovered patients by causing peripheral inflammation. Dietary habits and the amount of food consumed can affect the immunity of humans. Degenerative diseases such as obesity, diabetes, cardiovascular pathologies, and inflammatory conditions are more prone in adolescents with poor dietary habits.[2,3] Recent debates on COVID-19 mainly focused on the differences among countries compared to regional differences and diet, which might be pertinent to understanding diet.[4]

Studies have shown that dietary fatty acids have a significant role in immune responses because many foods have antioxidant activity.[5] Therefore, pre-existing eating concerns or diet restrictions may affect the individuals' response to the COVID-19 infections. Increased intake of diets with high saturated fats, sugars, and refined carbohydrates, collectively known as the Western diet (WD) worldwide, contributes to the prevalence of obesity and type-2 diabetes. Moreover, it also acts as a risk factor for severe COVID-19 pathology and mortality.[6] Therefore, people with preexisting eating concerns may be particularly vulnerable to these adverse effects of unhealthy dietary habits.[7] Moreover, healthcare professionals highlighted the vulnerability of individuals with eating disorders during the COVID-19 lockdown, and preliminary studies have shown an increase in symptoms in this population.[8]

This study was done to determine the effect of dieting on susceptibility to infections and to rule out whether dieting can lead to an increased risk of complications of COVID-19. Believing the notion: 'We are what we eat.

METHODOLOGY

This cross-sectional web-based survey was carried out by using google forms during the month of January 2021 at Pak Emirates Military Hospital, Rawalpindi Pakistan. A total of 314 participants were included in the study by convenience sampling, and

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the sample size was calculated by an open EPI calculator. The prevalence of COVID-19 ranges from 3.7 and 6.9% in the female and male populations in Pakistan, respectively.[9]

Inclusion Criteria: Individuals aged 19 to 45 years, of either gender, who did dieting in the last three years were included in the study.

Exclusion Criteria: People with any co-morbidity were excluded from the study.

Study participants were divided into two groups; Group-A participants were those who were on dieting during the last three years off and on, as well as had more severe symptoms of COVID-19, whereas Group-B participants had mild symptoms of COVID-19 and in the last three years were not on any specific weight loss diet.

This study included a newly designed questionnaire validated by one medical educationist and two nutritionists. It included questions exploring dietary habits, weight changes, weight loss methods, COVID-19 status and severity of symptoms, including ten Open-ended questions and seven closed-ended questions. Convenience, as well as the snowball sampling method, was used. Forms were distributed through email after informed consent. The diversity of the group was used for the generalization of results. The target population was contacted after obtaining ERC approval via email. Participants were assured of anonymity and confidentiality. Later, further reminders were also sent via email.

Data was saved in Excel sheets directly from Google forms. For closed and open-ended questions, frequencies/percentages and inductive coding were done, respectively. Chi-square test was applied to find out the association. The *p*-value of ≤0.05 was considered statistically significant.

RESULTS

A total of 314 participants responded to the survey. The mean age of the participants was 24.3±4.9 years. Regarding COVID-19 status, 294(92%) participants included in the study were already recovered from COVID-19, 20(6.3%) participants were still suffering from COVID-19 at the time of the survey. Regarding COVID-19 status, 294(92%) participants in the study recovered from COVID-19, and 20(6.3%) participants suffered from COVID-19 at the time of the survey. Time duration after becoming COVID-19 negative was; 4 months in 77(26.1%), 6 months in 71(24.1%), 1 month in 60(20.4%), 2 weeks in 51(17.3%) and 1 week in 35(11.9%) of the participants. The type of dieting done by participants in Group-A included a protein diet 57(36.3%), no or low carbohydrate diet 39(24.8%), keto diet (35, 22.2%) and intermittent fasting 26(16.5%). The weight changes during the last three years were 8.5±2.3Kg. The frequency of dieting was once per year 77(49%), twice per year 43(27.3%) and thrice per year 37(23.5%). Participants were also inquired about using fruits, vegetables, eggs, milk, fish, meat and nuts in their diet. The participants who suffered from COVID-19 had a history of weight loss during the disease ranging from 2Kg to 6Kg.

It was found that the participants who were involved in dieting twice and thrice per year had more severe symptoms of COVID-19, which included oxygen dependence 21(26%), changes in HRCT 15(18.7%), admission in ICU 10(12.5%), changes in blood reports 34(42.5%). On the other hand, the participants who were dieting once per year had mild flu-like symptoms and breathing difficulties. The results concluded that the type and duration of dieting and weight loss of more than 8kg had affected the severity of COVID-19 symptoms, both in male and female participants, as shown in the Table.

Table: Dieting, Weight Loss and COVID-19 Symptoms Severity (n=314)

Parameters	Study Groups		*p*-value
	Group-A Severe Symptoms (n=157)	Group-B Mild Symptoms (n=157)	
Weight loss >8kg weight loss	79(11.8%)	56(35.6%)	0.001
Dieting Once/year	77(49%0	83(52.8%)	0.025
Dieting Twice/year	43(27.3%)	62(39.4%)	0.010
Dieting Thrice/year	37(23.5%)	12(7.6%)	0.001

DISCUSSION

COVID-19 has caused lifestyle changes worldwide, including restrictions on daily activities and dietary habits.[10] Believing the notion: 'We are, what we eat, it has been found in our study that those patients who were following dietary restrictions pre-COVID had more severe symptoms and delayed recovery from disease, as already shown in one of the studies that exposure to the thin-ideal concept as well as diet culture has led to eating disorders and food-specific anxieties which ultimately led to low immunity.[11] Contrarily many studies have shown that obesity and being overweight expose them to severe symptoms

and negative prognosis. Potential pathophysiological mechanisms that may explain the strong association include the. Chronic pro-inflammatory state, excessive oxidative stress response, and impaired immunity contribute to the possible pathophysiology seen in obese individuals.[12]

It has been found in our study that the type of diet also affected the severity of symptoms, nearly similar to one of the studies showing that a few countries like Germany, Poland, Austria, the Czech Republic, Slovakia, and Croatia exhibited lower COVID-19 mortality rates as compared to Italy, Spain and France. Among many factors which resulted in a difference in mortality in these regions, diet differs considerably between these countries.[13,14] In one of the studies done by Marty *et al*. in 2021, the motives for food choices were assessed, which included ethical reasons, health status, convenience, visual appeal, natural content, weight control, mood, price, etc., the lockdown period in France was related to a decrease in the nutritional quality of diet on average, which could be partly explained by changes in food choice motives.[15] Similarly, our study showed that those who already had decreased nutritional quality of diet due to thin-ideal concepts had more difficulties in breathing and HRCT changes. In their study, Das *et al.* concluded that the coronavirus (COVID-19) pandemic had caused stress and anxiety, which threatens the psychological well-being of populations worldwide and may also affect body image outcomes.[16] Dietary guidelines by World Health Organization (WHO) for the COVID-19 pandemic highlighted the relevance of a balanced diet to support the immune system and reduce and avoid chronic diseases and infections.[17] A study by Muscogiuri *et al*. showed that malnutrition might have a role to play as many Indian states with a high prevalence of underweight and anaemia have reported the highest number of COVID-19 cases.[18] Thence undeniably, the importance of a balanced diet for preventing COVID-19 and other diet-related chronic diseases cannot be denied as it may impact mortality due to COVID-19.[19] Our study also concluded that maintaining a balanced diet and healthy weight is invariably important to fight viral diseases and COVID-19.

CONCLUSION

The COVID-19 pandemic is multifaceted and braids several social, cultural and economic aspects. Many factors affect the extent and severity of COVID-19, but diet is also considered one of the possible causes of the severity of symptoms of COVID-19. Therefore, understanding its importance is of paramount significance and needs further evaluation.

Conflict of Interest: None.

Author's Contribution

Following authors have made substantial contributions to the manuscript as under:

AS: Conception, data interpretation, drafting the manuscript, critical review, approval of the final version to be published.

ZK: Data acquisition, data analysis, data interpretation, critical review, approval of the final version to be published.

UU: & US: Study design, critical review, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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