Master of Science in Public Health

EFFECTS OF SOCIAL MEDIA ON YOUNG ADULT'S FOOD CHOICES AMONG UNIVERSITY STUDENTS OF RAWALPINDI, PAKISTAN

By

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(362877-PIO/MSPH-2021)

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To

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DECLARATION

In submitting this dissertation, I certify that I have read and understood the rules and regulations of DPH and QAU regarding assessment procedures and offences and formally declare that all work contained within this document is my own apart from properly referenced quotations.

I understand that plagiarism is the use or presentation of any work by others, whether published or not, and can include the work of other candidates. I also understand that any quotation from the published or unpublished works of other persons, including other candidates, must be clearly identified as such by being placed inside quotation marks and a full reference to their source must be provided in proper form.

This dissertation is the result of an independent investigation. Where my work is indebted to others, I have made acknowledgments.

I declare that this work has not been accepted in substance for any other degree, nor is it currently being submitted in candidature for any other degree.

_____   _____

(Dr. Ume Sughra)   **(Nayab Shahid)**

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Date: 15-02-2023   Date: 15-02-2023

ABSTRACT

Background

The etiology of eating concerns is multifactorial, and exposure to social media is considered to be a contributor. Although traditional media, such as television and magazines, have been examined extensively in relation to eating concerns risk, the influence of social media has received relatively more attention and trends in the contemporary world.

Objective

To assess the effects of social media on young adults food choices among university students and to find out the association between social media and the food choices among university students.

Materials and methods

This was a cross- sectional study carried among university students of Rawalpindi. The tool of the study was self-administered questionnaire a validated   the scale of effects of social media on eating behavior

Results

The sample of the study was 292 university students, among them 61.5% were females. About 93.6% of the individuals were living in cities and 42 % of the respondents were influenced to use social media for food choices because of peer pressure. The use of social media and food choices shows significant relation with health awareness, peer pressure, duration of social media usage and frequency of usage with a significant p-value < 0.05.

Conclusion

The results from this study illustrates the fact that more use of social media by university students effects their eating habits and this is serious topic to be looked for with respect to public health as it may lead to incidence of chronic diseases related to un healthy eating.

Keywords: eating habits, social media, obesity,

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In the name of Allah, the most Merciful and Beneficent

First of all, I am thankful to Allah Almighty, the most merciful and beneficent, for making the journey of my life till this point, including the completion of my thesis, which is a blessing indeed. I would also like to extend my gratitude to my dearest friends, who owe me a big time for their support throughout my research work. I humbly thank all those who have supported me in this regard.

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I owe my supreme gratitude towards my parents for their unconditional love and support for me. They have always supported me in each and every phase of the life. Whatever I am and wherever I am, is just because of the altruistic love of my parents. Their prayers have made me strong enough to face every problem and difficulty of the life.

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LIST OF ABBEREVIATION

SESMEB	The scale of effects of social media on eating behaviors
WHO	World health organization
SPSS	Statistical package for social sciences
IRB	Institutional review board

CHAPTER I: INTRODUCTION

In a relatively short amount of time, social media has revolutionized so much about the way we live. Amidst big-picture changes to things like relationships and work, one often overlooked area of social media's influence is our diet.(Husnain and Toor 2017)

It's an age of science and technology and the influence of social media inflicted our lives. The saturation of media and digital environment effects the behavior of users including thorough marketing. The World Health Organization has identified food marketing, this includes advertising unhealthy food items and junk food which badly affects health of individual. In many countries there is a restricted marketing and advertising on eating unhealthy.(Aslam, Khan et al. 2021)

The literature suggests that there is a prevalence of overweight and obesity in young adults and it's on rise globally with consequences of other long term health effects. There is a strong evidence that marketing of food including unhealthy food with high saturated fats and salts and sugars adds to overweight and obesity.(Zahid, Jamali et al. 2021)

These consequences are increasing day by day. There is a consensus about this food marketing in developed world that this social media influence on food choices influence children's behavior , infringe their rights , including the right to healthy life and this seems not to be exploited. However, much of the existing literature on this for young people's interaction with marketing and its effects has been made for advertising on television as youth depends most of the time online.(Hejazi and Mazloom 2009)

Physical inactivity or having a sedentary lifestyle is being identified as the fourth common risk factor leading to mortality causing an estimated 3.2 million deaths globally and due to technological advancements. The statement of the problem is sedentary lifestyle of teens nowadays would eventually lead them to having certain health and social problems because nowadays teens in this century are now more focused on games on their gadgets and socialize on the internet instead of going out. With that said this leads to teens having less exercise than usual thus having a sedentary lifestyle which also contributes to social isolation where one prefers to be alone and not interact with others that said alone will affect ones social life which lead to bigger cases such as health problems physically whereas it may lead to *obesity* and socially where as it may lead to shyness and insecurity

that will limit one's social life. "Fast foods are likely to contribute to over consumption. A sedentary lifestyle interacts with over consumption and minimal exercise which produces obesity."(Krishnan and Zhou 2019)

The advertisers of food stuff have extensive social media presence including on social media and media sharing platforms, where they promote their products and brands. In social media most of the advertisement of food is for unhealthy food stuff and beverages, they survey reports that 56% to 80 % of food advertising online is unhealthy.(Mumtaz and Malik 2018) Furthermore, as the food companies has extensive following online, including teens so their activities and new products reaches large audience. The food product with greatest potential risk amongst teens are almost all brands with unhealthy portfolio. The youth and adolescents are at risk of exposure to unhealthy food because of their very high level of involvement in internet and advertisements.(Qutteina, Nasrallah et al. 2019)

Although youth is well aware of the hidden intention of advertising companies, they hypothesized to lack the spirit to defend against its effects. The companies says that it depends on self-control of viewer's. Furthermore, specific features of digital media advertising may reduce cognitive ability to refrain the side effects of marketing. The brands on social media regularly create impressive content to sale their food stuff and also engages with user's social networking, inserting themselves into presenting brands as liked by friends, peers and celebrities. Thus, despite being advertising literate, adolescent are likely to be vulnerable to unhealthy eating habits.(Qutteina, Nasrallah et al. 2019)

One of the most vital daily practices that affect overall performance of human being throughout the day. Most of the external factors effect this daily practice and social media significantly affects this practice. The social media is defined as internet based channels that allows users to interact selectively and opportunistically either in real time, with audience who derive value from user generated content and perception of interaction with others.(Qutteina, Nasrallah et al. 2019)
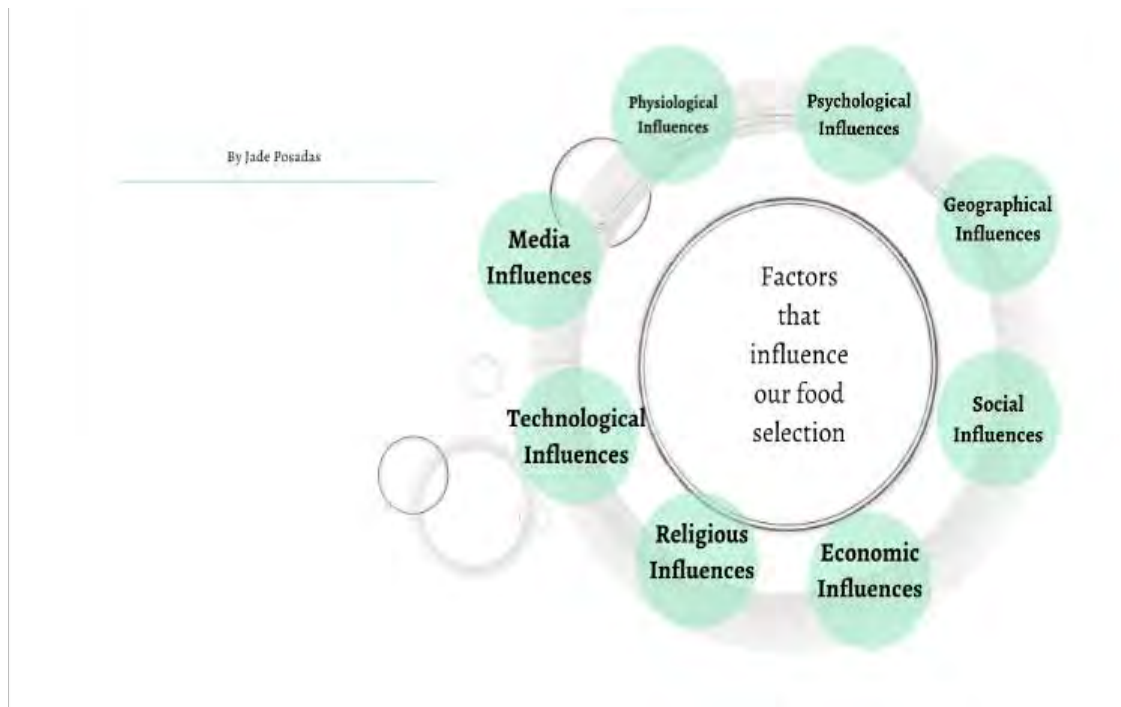
Figure 1 Factors influencing food Selection(Hebden, Chan et al. 2015)

A research conducted in Saudi Arabia shows that 98.3% of the population had account on social networking sites. The use of social media is increasing in developing countries. In 2021, 4 billion people around the world are using social media. The most widely used application in Saudi Arabia is twitter including the health related stuff on it. The way social media is changing the food habits of people is through advertisement, news and posts on different platforms. The popularity of social media influencer depends on a more favorable attitude among the followers toward purchasing products and brands. In Saudi Arabia social media influencers mainly promote restaurants that serve food.(Abdulsalam and Bakarman 2021)

Furthermore, obesity is the most significant health concern worldwide, and the number of people suffering from obesity is on rise, with more than 1.9 billion (39%) of adults over weight. Obesity is often associated with greater risk for developing metabolic syndrome including hypertension and diabetes.(Ertz and Le Bouhart 2022) . Obesity worldwide is often associated with poor eating habits. The use of social media is associated with eating disorders and negative body image and unhealthy food decisions have been linked to social media image – related interactions among media family. In addition, watching videos posted by individuals on social media platforms leads to health crises by eating junk food all the time that significantly impacts the younger generation's

health, this could be due changes in the eating behavior, eating timing and also sleeping hours.(Consavage Stanley, Harrigan et al. 2022)

Over the past decade, social media has allowed internet users to interact on unlimited topics, including health and weight management. However, with the continued growth of social media and its expanding impact, it is vital to understand how social media impacts eating disorders. For example, people can easily be influenced by social media posts without realizing it when making food-related decisions. (Harriger, Evans et al. 2022)

Currently, obesity and overweight is a main global health problem plaguing almost the whole planet. Studies show that in 2005 1.6 billion adults were overweight and 400 million adults were obese. As it is portrayed, obesity and overweight is a problem of the contemporary societies that cannot be confronted. According to a recent study of the World Health Organization, it is predicted that there will be 2.3 billion overweight adults by 2015 in the world and more than 700 million of them will be obese. Also it is important to realize that obesity and overweigh are modern problems of the societies since statistics referring to these problems did not exist 60 years ago. Therefore, it is clear that obesity and overweight apart from genetic predisposition and psychological disorders might derive as well from the modern sedentary lifestyle that is highly affected by the recent technological development and from poor nutrition as there is an increase in convenience food. However in order to understand the extent and significance of the problem it is important to define and analyse overweight and obesity and its determinants related to social media use, the problem of contemporary world.(Au and Cosh 2022)

It is hard to remember a time we habitually took photos of food before eating it , but during COVID and some times before it arranging a food and spread and holding phone high above the table to get a perfect overhead shoot to upload become so common for Instagram feeds or documenting the recipe of food on stories.(Au and Cosh 2022)

1.1 RATIONALE:

There is need for a strategy to tackle the problem of too much influence of social media with eating habits and the junk food in particular.(He, Li et al. 2022) Lack of general amenities and necessities in the social, cultural and health aspects with reference to social media including its influence on health and disease. As a part of professional approach towards the study subjects, regular healthy eating related stuff on social media should be provided for detection of early symptoms and planning of preventive strategies. A comprehensive care especially in subjects suffering with social

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media exposures should be provided. Studies in literature have related social media and food choices and its bad effects on health. This study aims to find out the relationship of food choices with social media.

1.2 OBJECTIVES:

1. To find out the effects of social media on young adult's food choices among university students.
2. To find out the association between social media and the food choices among university students.

CHAPTER II: LITERATURE REVIEW

2.1 Peers and food online

In this time of social media most of the individuals are dependent on social media for their daily stuff to carry out. The young individuals are particularly susceptible to social effects and facilities of social media as they are motivated to interact with their peers and share the fantastic living. Apart from this sharing a variety of content with friends and family serves a number of psychological incentives including self-expression and connecting with others. Adolescents give careful consideration to the image they present on social media and food related sharing and caring is one of them. The sharing of food related stuff exaggerate the hunger and love for food which may lead to many non- communicable diseases because of unhealthy eating.(Allah Pitchay, Ganesan et al. 2022)

2.2 The Normative model of eating

As the social media sites allow users to connect with friends extensively, this is also a powerful means of transmitting norms, ideas, behaviors and likes. The normative model of eating indicates that eating is directed by situational norms, eating behaviors of those around and social approval of that particular food brand. (Ahn and Shamim 2022)The youth practices more unhealthy eating in universities than at home because of various reason; either being in hostel of unaware of skilled cooking so they prefer buying food through apps and get them at their door step. Peers are often thought to be more trustworthy than brands, and effects of online advertising are reported to be amplified when this is endorsed by a peer.(Gilmartin, Gurvich et al. 2022)

2.3 Celebrities and food Choices

Social media allows users to interact not only with peers but also view content posted or shared by the famous icons of the time, who have role model status for young people. The social media users can gain the illusion and push by the celebrities regarding eating stuff, following updates about new brands of food and in the similar way post their pictures in the famous restaurant for family and friends, and this makes the chain of share information and promotes the brand, so people are

more indulged into unhealthy eating. The literature shows that the above mentioned behavior is so dopaminergic that one cannot self-control over such unhealthy eating habits.(Zhang, Li et al. 2022)

2.4 Recall, Recognition and Attention

The effects of hierarchy of food advertisement indicates that the recall and recognition influence of brand attitudes and eating behaviors lead to weight-related outcomes. After the add is viewed it remains in mind unless the person ate that food either explicitly or implicitly so the greater cognitive aspect leads to early recall. As the use of media increases and multiple device viewing becomes a national norm, it is reported that 10% off all advertisements are entertained so it is important to inspect the mere content of social media and promote healthy eating related ads too. (Pearce, Fuchs et al. 2022)

The eye tracking is widely used index of attentional selection with longer and greater number of fixations associated with more favorable opinion of items, and this can lead to unhealthy eating patterns in young people. As a matter of fact unhealthy food items attract greater than healthy and non-food items. The social content is thought to play a significant role in add recall, awareness and intent to purchase. A study concluded that repeated exposure to advertising triggers recall and recognition, positive attitudes and normalization of promoted products, and subsequently, when exposed to relevant cues, intent to purchase or consume. (Fleming-Milici and Harris 2020).Theories of social norms of eating can be nested within this model and these indicate that social groups establish norms for appropriate foods. In social media, social norms of food are displayed, disseminated and reinforced, as young people do not just see food advertising but can also choose to share it with their 'imagined audience' of peers , and in turn can also assess their peers based on such content.(de Valle and Wade 2022) Given the networked and fluid nature of social media, where – in contrast to broadcast media—advertising is presented to users not only from companies themselves but also via multiple other sources, including peers and celebrities who may be considered more trustworthy than brands, the study also examined effects of the source of advertising posts viewed. The study investigated adolescents' responses to advertisements for three types of products in social media: unhealthy food, healthier food, and non-food. It also measured effects of the source of these social media advertising posts. It is novel owing to its inclusion of healthy, unhealthy and non-food items, the social contexts of advertising received by adolescents in social media, and in combining objective measures of attention using

eye-tracking technology not only with brand memory but also with self-report of social responses.(Tylka, Rodgers et al. 2023)

2.5 The relationship between food culture and social media

The literature shows that individual is playing a great role in changing food culture in 21st century. However, it has been found that with the influence of social media people are interested to buy food online and if not they try recipes which they see on social media. Thus the media has great effects on eating habits of people. The literature showed that longer exposure times to social media were indirectly linked to an irrepressible urge to eat via increased impulsivity. High impulsivity scores were also indirectly related to food craving via food restriction. A better understanding of the links between social media, food craving and eating behaviors could help researchers and clinicians to better guide young adults in their use and appropriation of social media food contents. By knowing more precisely the processes at work behind exposure to social media, it can become possible to undertake awareness actions in order to prevent the development of subsequent eating issues.(Sutinen and Närvänen 2022)

Figure 2 Determinants of Food Choices(Pelly, Thurecht et al. 2022)

2.6 COVID-19 and use of social media for food

During COVID 19 there was a hike that online food purchase become the part of business and people were more found of getting food delivered at door step. This was the time where because of quarantine the social media get involved more into the lives of people and more food related apps were developed. Whole of the world was in crises and people made it a business to make and deliver food at door steps. However, the university students got more conscious about food choices on social media.(Jun, Yoon et al. 2022)

2.7 Social Media and unrealistic expectation of body image

It is common to see among youth how they spend money to eat junk food which they watch on social media. This detrimental action could be of danger to health in long run if it persists and continues. The food industries have much interest to sell their product as much as possible to this public. They could do any thin to make the advertisement fancy to sell their brand which is the major cause of obesity and related health concern. This later on becomes the root cause of many metabolic diseases and a major concern of public health professionals at present.(Fazzino 2022)

2.8 Social media and health awareness

The literature depicts that communicating eye-catching visual imagery of food, fitness, and body ideals among adolescent peers played a primary role of influence in several modalities. Videos and pictures allow for creative design feature elements that may increase engagement. Entertaining videos with appealing graphics, relatable scenarios, and music were employed effectively in development of food safety videos. These videos increased food safety practices. The shared images of food in social media may reflect a lifestyle that adolescents admire or want to promote. Positive framing of fruits and vegetables that were colorful and aesthetically pleasing may be indicative of a certain status worth sharing. Sharing food images or videos that were perceived as preferable by peers reflect endorsements and may encourage the likelihood of behavior adoption and health awareness to youth.(Keser, Bayındır-Gümüş et al. 2020)

2.9 Obesity; The public health challenge of our time

Obesity has become the public health issue of the day—and for good reason. The data outline a dismal picture and a more foreboding future. The prevalence of obesity has doubled in adults and children and tripled in adolescents over the past 2 decades. Two thirds of Americans are overweight or obese. Each year in the United States, 400 000 deaths and $117 billion in health-care and related costs are attributable to obesity.(Watanabe-Ito, Kishi et al. 2020)

Lifestyle preferences, cultural environment, education, socioeconomic level bad eating habits play a pivotal role in rising prevalence of obesity worldwide. The literature suggests that it is important

to emphasize that all the given causes of obesity are predicted. It is essential to build sustainable strategies for healthy lifestyle. The most difficultly step is to have self-control for their health about unhealthy eating habits. There is no doubt that the primary prevention is the main strategy for controlling this growing public health problem.(Pearce, Fuchs et al. 2022)

2.8 OPERATIONAL DEFINITIONS

2.8.1 Quality of Life

Quality of life has been defined as the perception of an individual towards culture and values and linked with their goals and expectations.

2.8.2 Food Choices

Food choices refers to how people decide what to buy and how to eat, a list of factures depend on culture, heritage and personal factors perceptions and convenience to buy.

2.8.3 Social media and food choices

This refers to the way individuals chose their food to eat by using social media plat form either to order or avail the delivery services.

2.8.4 Eating habits

This encompasses food choice and motives, feeding practices, dieting, and eating-related problems such as obesity, eating disorders, and feeding disorders.

CHAPTER III: METHODOLOGY

3.1. Research Design
A quantitative research approach using cross sectional study was carried out to assess the association of social media with food choices among university students.

3.2. Study Duration
Study period for the current research was six months from September 2022 to February 2023.

3.3. Study Setting
The study was conducted in Al-Shifa School of Public Health ,which is Part of Pakistan's premier eye hospital located in the vicinity of Rawalpindi District.

3.4. Research Participants
The research participants were students who were present in the institute during the data collection and those who met the inclusion and exclusion criteria.

3.4.1. Inclusion criteria
1. Young adults who use social media frequently
2. Both   gender

3.4.2. Exclusion criteria
1. Students who are not social media users
2. All individuals those except students

3.5. Sampling Strategy

Desired sample was collected using non-probability simple random sampling strategy from students in Al-Shifa school of Public Health.

The sample size of 292 was calculated by using proportion formula with previous study.(Watanabe-Ito, Kishi et al. 2020)

$n=z^2\,p\,q/e^2$	
74% prevalence	**z =1.96 at 95%CI**
e=5%	
Sample(n)=292±5%	

3.6 Data collection instrument

3.6.1. Questionnaire design

Data were collected using a self-administered questionnaire **First section**: history questionnaire consisting of demographic part age, gender, work experience and social factors.
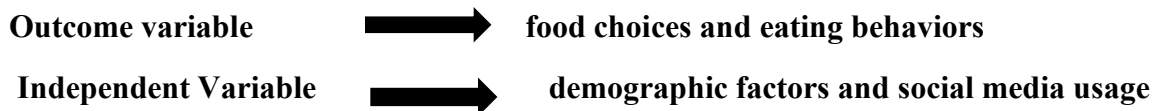
 The Second section: consists of food choices and social media.

 Third section: contains a 5 point Likert scale measuring the effects of social media on eating habits. The tool has a Crohn's back alpha of 0.8.

Item no	Items	Item total
Item 1	Inclusion of a food on social media influences my view of that food	0·459
Item 2	When I use social media I forget that I am hungry	0·318
Item 3	I see and consume any food on social media that are not my food habit	0·562
Item 4	Even though I'm full, I eat a food/dish I see on social media	0·600
Item 5	When I see a news headline about foods/dishes/nutrition on social media, I read the continuation/content of the news	0·399
Item 6	When I see a new food on social media, I search its content	0·323
Item 7	I think that the foods on social media are more beneficial for health	0·540
Item 8	When I see a dish on social media, I look at the recipe and its content	0·362
Item 9	After I started using social media, my fast-food/cook-chill food consumption increased	0·662
Item 10	I follow nutrition news/blogs/pages on social media	0·578
Item 11	Without getting tired I buy/cook a food/dish that I see on social media	0·616
Item 12	I regulate my diet according to shared news/photos/videos about the foods/dishes I see on social media	0·610
Item 13	I am constantly snacking when surfing on social media, and I realise how much I've eaten later	0·592
Item 14	I am interested in foods/dishes shared by celebrities on social media and I consume that food/dish	0·731
Item 15	If I did not use social media, my time for eating would be reduced	0·572
Item 16	When surfing on social media, even though I am full I am snacking	0·666
Item 17	I consume foods/dishes shared by people who have a lot of followers on social media	0·762
Item 18	I think foods/dishes with more like/share on social media are healthier	0·656
Item 19	The foods/dishes that I see on social media arouse my desire to eat	0·500
Item 20	I consume foods/dishes with more news/photo/video likes on social media	0·746
Item 21	I think that foods/dishes with more like/share on social media are more reliable	0·623
Item 22	On the days I use social media for a long time, my desire to eat increases and I eat more	0·659

Figure 3 Effects of Social Media on Eating Behaviors(Keser, Bayındır-Gümüş et al. 2020)

3.6.2. Study variables

Outcome variable ➡ **food choices and eating behaviors**

Independent Variable ➡ **demographic factors and social media usage**

3.7. Data collection process

3.7.1. Pilot testing

Pilot testing was performed before starting the formal data collection procedure by including 10% of the actual sample size. Tool was tested for any future changes. After pilot study, no changes were made in the questionnaire. Data from pilot testing was not included in final analysis.

3.7.2. Formal data collection

Data were collected by the researcher herself and no data collectors were hired. All the workers of selected institute were approached for data collection. Written consent forms were signed by the

factory workers who were taking part in research. After taking consent, respondents were given questionnaires to fill. Data collection was completed in almost two months. All the questionnaire were kept safe and no one had access to them other than researcher.

3.8. Data analysis procedure

Data was coded and was entered in Statistical Package for Social Sciences (SPSS) version 26. After careful data entry, data was checked for any error before proceeding to the further analysis. After data cleaning, data transformation was carried out for certain variables. Data analysis was done in two phases; descriptive analysis and inferential analysis.

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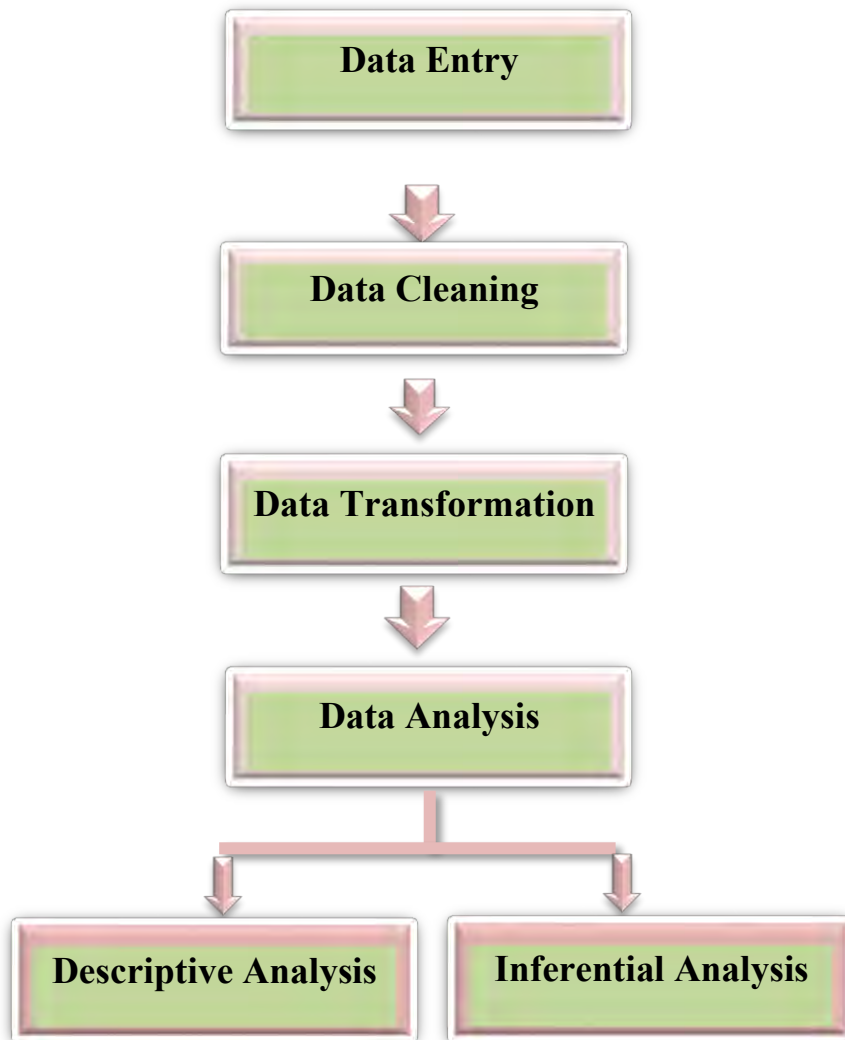
Figure4: Data Analysis Plan

3.8.1. Descriptive Analysis

Descriptive statistics were generated for socio demographic characteristics. For categorical variables, data was summarized in the form of frequencies and percentages and presented in table form, Bar chart and Pie chart.

3.8.2. Inferential analysis

The second phase of analysis was on inferential statistics. Association of social media influence with individual food choices was determined with socio demographic variables using Pearson chi square test of independence. The p-value <0.05 was considered significant.

3.9. Ethical Considerations

Before starting formal data collection, approval from Institutional Review Board (IRB) of Al-Shifa School of Public Health Rawalpindi, Pakistan was taken. Permission letter from the Head of Department of Al-Shifa School of Public Health was obtained regarding access for data collection. Permission was also taken from the HR department of institute for conducting research. The students were explained the purpose of the research and written consent was taken from each participant. Participants were assured for the confidentiality of their data. Data collected from the respondents was kept anonymous and was not shared with anyone. Data was entered in SPSS anonymously. After data entry, hard copies of collected were kept at a safe place.

CHAPTER IV- RESULTS

4.1 Demographic Characteristics of Respondents:

Total 292 students were enrolled in the study. The males were 37.2% and females were 61.5%. About the age of respondents 23% were of more than 20 years of age and 87.9% were doing graduation, 10.9% in masters and 5.7% were in PhD. About 36.1% of the respondents were employed on less than 20000 of wages and 50% were living with family at home, about 48.6 % were living in hostels because of study or work. Out of total sample around 1.7% were living in village, 3.4 % in towns and majority that is 93.6% were living in cities. Eighty nine percent of respondents did not had any chronic disease, 5.1% had one disease and 4.1 % had two or more chronic diseases. About 7.4% of respondents work, 34.1 % study and 57.1 % do both work and study.
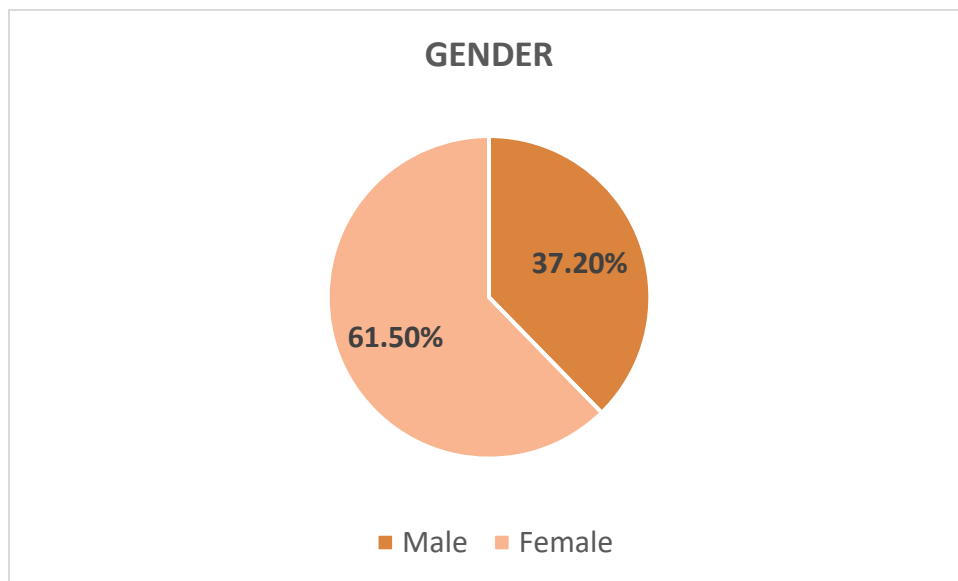
Figure 5 Pie Chart of Gender Distribution

Table 1 Demographic Characteristics of Respondents

VARIABLES	FREQUENCY (N)	PERCENTAGE (%)
Age 1. <20 years 2. >20 years	68 224	23 75.7
Qualification 1. Graduation 2. Masters 3. PhD	218 57 17	87.9 10.9 5.7
Income 1. <20000 2. > 20000	107 185	36.1 62.5
Place of residence 1. At home with family 2. Hostel	148 144	50 48.6
Chronic disease 1. No disease 2. 1 disease 3. 2 or more	265 15 12	89.5 5.1 4.1
Work status 1. Work 2. Study 3. Both	22 101 169	7.4 34.1 57.1
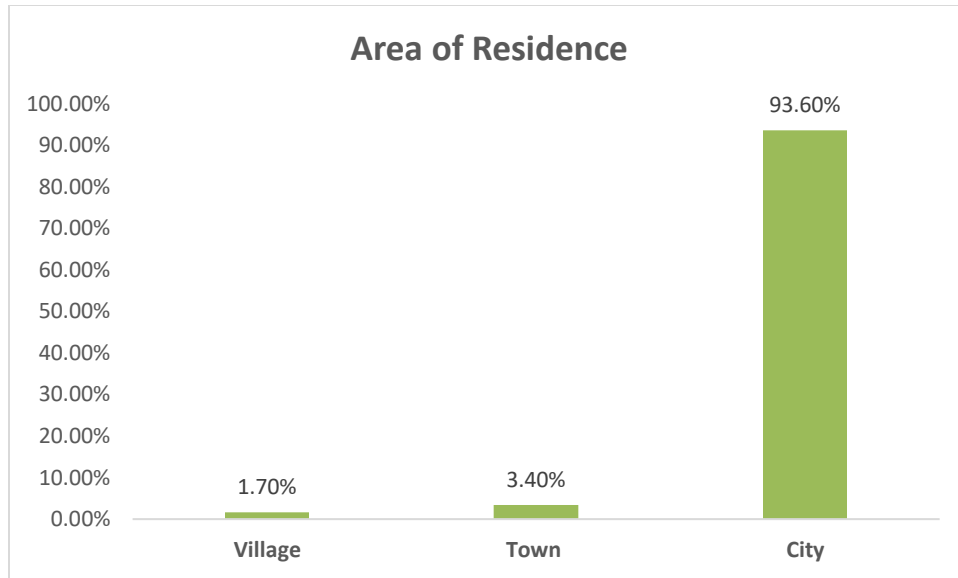
Figure 6 Bar Graph showing Residential Areas of Respondents

2.2 Assessment of Food choices and Social Media

The effect of food choices of respondents due to the use of social media were assessed by a set of questions. The results showed that 6.4% of the respondents were using face book, 4.7 % pint rest, 3 % twitter and 84.5 % were using other food related applications. The frequency of usage was like 59 % were using the apps once a day and 39.5% were using them more than once. The effects of eating habits due to more use of social media shows that 79 % individuals had bad habits due to social media the reason depicted was that 42.2 5 students had no time for cooking, 49.3 % were habitual. Among respondents 54.4% had gastric issues. Eighty six percent individuals reported that the facility of home delivery services and selection of food on social media forces them to eat more junk food. One of the other factor that affected food habits was peer pressure, which effected 42.6 % students. Among respondents 61 % were aware and 37.8 % had no awareness about unhealthy food choices.

Figure 7 Pie Chart showing Health Awareness among Respondents

Table 2 Assessment of Food Choices and Social Media

Variables	Frequency (n)	Percentage (%)
Platform use for food choices		
1. Face book	19	6.4
2. Twitter	9	3
3. Pinterest	14	4.7
4. Other food related app	250	84.5
Frequency of usage		
1. Once a week	77	26
2. Twice a week	138	46.6
3. Daily basis	77	26
Duration of usage		
1. Once a day	175	59.1
2. More than once	117	39.5
Effects of eating unhealthy		
1. Yes	234	79.1
2. No	58	19.6
Reason of food choices on social media		
1. No time for cooking	125	42.2
2. Habit	146	49.3
3. Other reasons	21	7.1
Any gastric issue		
1. Yes	161	54.4
2. No	131	44.3
Does facility forces to order food		
1. Yes		
2. No	256	86.5
	36	12.2
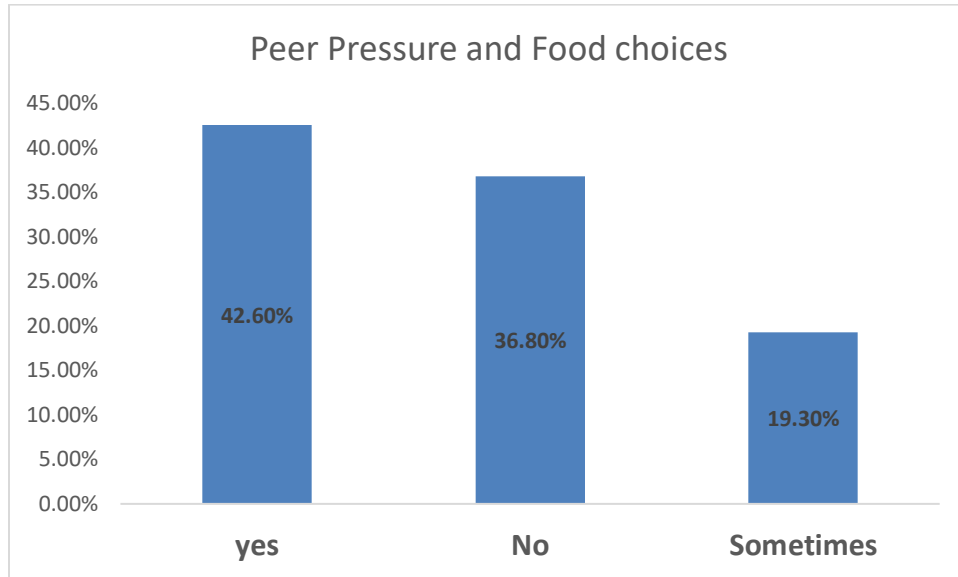
Figure 8 Bar Graph showing Peer Pressure and Food Choices

4.3 Assessment of Effects of Social Media on Food Choices

Social media has strongly inflicted the lives of people. Here are some reported facts about social media usage and food choices. Among respondents 57.4% agreed that inclusion of food on social media influences their view about that food, 41.6 % disagreed that when they use social media they forget about their hunger, 50% of the respondents disagreed about eating any stuff they see on social media. About 66.6 % agreed that even though they are full still ate something they see on social media. Around 57.1 % agreed that they read the content on social media about the food they here on news. About 60.8 agreed that when they see new stuff to consume, they search for its content on social media. Thirty seven percent disagreed that food they consume by orders on social media are healthy for them to eat. About 57.8% agreed that when they see new food on social media they search for its content. Sixty three percent strongly agreed that their more social media use increased their eating habit. Around 55.7 % individuals do not follow nutrition related pages on social media. Around 38.2 % respondents reported that

even though they are tired they cook food they like on social media. Around 50% agreed that they regulate diet according to shared news about the food I see on social media. Forty four percent agreed that they continuously snack when surfing on social media. Around 76.7% agreed that they like eating food on social media shared by celebrities. About 68.6 agreed that if they do not use social media their time for food reduces. Fifty four percent agreed that they snack even though they are full while surfing on social media. Around 68.2% agreed that they consume that food on social media shared by celebrities. Fifty two percent agreed that they think food which have more likes on social media is healthier. Around 54.7% agreed that food they see on social media increase their hunger. Around 67.9 agree that they consume food with more likes on social media. Around 38.5 % agreed that they think food with more likes is reliable.

Table 3 Assessment of Effects of Social Media on Food Choices

Questions	Always(1)		Often (2)		Sometimes (3)		Seldom (4)		Never (5)	
	n	**%**	**N**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Inclusion of a food on social media influences my view of that food.	34	11.5	70	**57.4**	79	26.7	3	1	6	2
When I use social media I forget that I am hungry.	6	2	106	35.8	48	16.2	123	**41.6**	9	3
I see and consume any food on social media that are not my food habit.	4	1.4	24	8.1	71	24	148	**50**	45	15.2
Even though I am full, I eat food/dish I see on social media.	7	2.4	197	**66.6**	45	15.2	32	10.8	11	3.7
When I see a news headline about food /nutrition on social	10	3.4	169	**57.1**	76	25.7	26	8.8	11	3.7

media I read the content of news.									
When I see a new food on social media, I search its content.	22	7.4	180	**60.8**	54	18.2	24	8.1	12	4.1
I think that the foods on social media are more beneficial for health.	8	2.7	82	27.7	58	19.6	110	**37.2**	34	11.5
When I see a dish on social media, I look at the recipe and its content.	6	2	171	**57.8**	69	23.3	36	12.2	10	3.4
After I started using social media, my fast food consumption increased.	188	**63.5**	51	17.2	17	5.7	19	6.4	17	5.7
I follow nutrition news, pages on social media.	11	3.7	45	15.2	49	16.6	165	**55.7**	22	7.5
Without getting tired, I cook a food that I see on social media.	6	2	113	**38.2**	79	26.7	82	27.7	12	4.1
I regulate my diet according to shared news about the food I see on social media.	8	2.7	148	**50**	32	10.8	95	32.1	9	3
I am constantly snaking when surfing on social media, and I realize how much I have eaten later.	17	5.7	132	**44.6**	47	15.9	87	29.4	9	3
I am interested in food shared by celebrities on social media and I consume that food.	29	9.8	227	**76.7**	12	4.1	13	4.4	11	3.7
If I did not use social media, my time for eating would be reduced.	9	3	203	**68.6**	43	14.5	26	8.8	11	3.7

When surfing on social media, even though I am full I am snacking.	13	4.4	162	**54.7**	58	19.6	47	15.9	12	4.1
I consume food shared by people who have a lot of followers on social media.	10	3.4	202	**68.2**	30	10.1	37	12.5	13	4.4
I think foods with more likes/ shares on social media are healthier.	10	3.4	156	**52.7**	58	19.6	56	18.9	12	4.1
The food that I see on social media arose my desire to eat.	32	10.8	162	**54.7**	45	15.2	32	10.8	21	7.1
I consume food with more news/photos/videos on social media.	34	11.5	201	**67.9**	28	9.5	15	5.1	14	4.7
I think that food with more likes/ shares are more reliable.	147	49.7	140	**38.5**	22	7.4	4	1.4	5	1.7
On the days I use social media for a long time, my desire to eat increases and I eat more.	107	36.1	123	**41.6**	34	1.5	17	5.7	11	3.7

INFERENTIAL STATISTICS:

4.4 Association of Food Choices with Socio Demographic Characteristics

Association of food choices influenced by social media with variables was determined using Chi Square Test of Independence after confirming the assumptions of the test. All p-values below 0.05 were considered statistically significant. The summary of association of variables is given below. Results of the Chi square analysis show that food choices are significantly associated with social media use **p-value 0.001.**

The results of Chi square test revealed that individuals who live without family at hostel are more addicted to social media for their food choices n=279, **Chi square=6.78(1) ; p-value=0.009.**

Table 4 Association of food choices with Demographic Characteristics

Variables	Food choices levels		Chi square(df)	P-value
	Positive	**Negative**		
Gender			0.27(1)	0.5
➢ **Male**	4	106		
➢ **Female**	9	173		
Age			0.47(1)	0.4
➢ **< 20 years**	2	66		
➢ **>20 years**	11	213		
Marital status				0.19
➢ **Married**	0	49	3.30(2)	
➢ **Unmarried**	13	222		
➢ **Divorced**	0	8		
Qualification			4.61(2)	0.09
➢ **Graduation**	13	205		
➢ **Masters**	0	57		
➢ **PhD**	0	17		
Income			0.01(1)	0.8
➢ **<20000**	5	102		
➢ **>20000**	8	177		
Place of residence			6.78(1)	**0.009**
➢ **With family at home**	2	146		
➢ **Hostel**	11	133		
Area of residence			0.73(2)	0.69
➢ **Village**	0	5		
➢ **Town**	0	10		
➢ **City**	13	264		
Employment status			1.38(2)	0.50
➢ **Work**	0	22		
➢ **Study**	4	97		
➢ **Both**	9	160		

4.5 Association of effects of social media on Eating Habits

Pearson Chi square test of association was applied to check the association of food choices with effects of social media on eating behaviors after confirming the assumptions of the test. All p-values below 0.05 were considered significant. The scale was computed and eating behaviors were represented as positive and negative, the 0 was taken as negative and 1 as positive. Results showed that frequency of using social media for food choices shows significant results with chi square=6.29; p-value=0.03, with duration to choose food chi square=4.81'p-value=0.02 which is significant. It also depicts significant association with health awareness chi square=8.46; p-value=0.004 and peer pressure about food choices and social media chi square=14.19(1); p-value=0.001 which is highly significant.

Table 5 Association of effects of Social Media on Eating Habits

Variables	Effects of social media		Chi square (df)	p-value
	Positive	Negative		
Chronic disease			1.38(2)	0.50
➤ No disease	13	252		
➤ 1 disease	0	15		
➤ 2 or more	0	12		
Use social media			3.01(2)	0.2
➤ Yes	13	226		
➤ No	0	12		
Social media platform			2.28(3)	0.51
➤ Facebook	0	19		
➤ Twitter	0	9		
➤ Pinterest	0	14		
➤ Other apps	13	237		
Frequency of usage			6.92(2)	**0.03**
➤ Once a week	7	70		
➤ Twice a week	2	136		
➤ Daily basis	4	73		
Duration of usage			4.81(1)	**0.02**
➤ Once a day	4	171		
➤ More than once	9	108		
Effects eating habits			2.95(1)	0.08
➤ Yes	8	226		
➤ No	5	53		
Reason to choose online			2.44(2)	0.29
➤ No time to cook	4	121		
➤ Habit of buying online	9	137		
➤ Other	0	21		
Gastric issue			1.09(1)	0.29
➤ Yes	9	152		
➤ No	4	127		
Delivery facility forces to buy online			1.91(1)	0.16
➤ Yes	13	243		
➤ No	0	36		
Health awareness			8.46(1)	**0.004**
➤ Yes	0	112		
➤ No	13	167		
Peer pressure			14.1(2)	**0.001**
➤ Yes	0	126		
➤ No	11	98		

CHAPTER V: DISCUSSION

There is much influence of social media on our eating habits. The results of this study depicts a strong and consistent association between eating habits and social media in a set of young population of university students. This study measures the association apparent either social media use was measured by frequency and duration of use of social media or food related applications.

This study supports the hypothesis that social media use and certain demographic factors like the residence and peer pressure were independently associated with eating habits. Another study depicts that around 60% people living in cities are more prone to order food from food related application and they eat more junk food including burgers, pizza and high carb diet.(Takeuchi, Fujii et al. 2014)

However, one possible explanation for the results of current study is that the individuals who use more social media are exposed to chronic diseases and gastric issues either because of eating unhealthy or because of lack of physical in activity. Some social media platforms, such as Instagram, Snapchat, Pinterest, are more visually oriented, involving the sharing and viewing of pictures and videos. This study shows that 84.5% of respondents were using food related apps to buy food from online resources. A study conducted shows that using social media for food choices is common in European countries and there are around 70% male users of social media for food related behavior.(Watanabe-Ito, Kishi et al. 2020)

This study suggests that the amount of time spent on social media is related to eating unhealthy food and bad eating habits. The youth is affected by it most. These findings are in line with previous research which shows that sedentary behavior and more screen time is predictor of unhealthy eating behaviors. The research shows that this depends on frequency and usage pattern of individual and on certain demographic factors which effects the behavior of concerned person.(Al Ali, Alkhateeb et al. 2021)

The advertisement of food plays an important role in food choices and prefers among young population. Social media offers an open avenue for food marketers and buyers to advertise their products like exposure to food on television, Facebook, twitter and other food related application like food panda. The results shows that 84.5% of youth use food related application for their food choices. A similarly research conducted shows that individuals who spend more time on television are more likely to consume sweets and soft drinks and less likely to consume fruits and vegetables.

(Shah, Srivastava et al. 2020).With the increase in popularity of web based platforms and target young consumers in marketing campaign. This would likely add to the public health challenge of improving youth's diets, given the demonstrated innovative strategies and efficiency of television advertisements in impacting youth.(Mumena 2021)

This study shows that around 60.8% of our young population does not have health awareness, they don't know how to balance the diet and the prevalence of non-communicable diseases are on rise in Pakistan. In another study the statistics depict that after the awareness campaigns and educating the youth on detrimental effects on health due to more use of junk food; there was a decrease on usage of social media related food habits in 22 % of population.(Nelson and Fleming 2019)

This study suggests that peer pressure affects the population around 42%, as the friends, family and celebrities posts the pictures and stories of food on social media, a trend is followed and people use to eat from that specific brand to be famous. The similar results were shown by the study where around 60% of population follow the eating habits most famous persons.(Nutley, Falise et al. 2021) Although the present study documented associations between the use of social media and unhealthy eating behaviors, which are known to have an adverse impact on obesity, our results did not provide evidence of an association between the use of social media and excess weight before or after adjustment for covariates. Although future studies will be needed to better understand and elucidate the conflicting findings on the link between the use of social media and excess weight.(Scott and Johnstone 2012)

Indeed, the use of social media is not necessarily reflective of a poor lifestyle in general, as it is possible for youth who use social media to be physically active as well. Likewise, in their meta-analysis based on fifty-two independent samples, argued that media-based inactivity may be unfairly implicated in recent epidemiological trends of overweight and obesity among individuals. Regardless, it is important to emphasize that an increase in the amount of time spent on social networking sites would directly decrease the amount of discretionary time available for physical activity.(Krishnan and Zhou 2019)

5.1 Strengths

The current study has used validated and internationally accepted tool for assessment of food choices affected by social media. This tool was widely used before in studies. This tool helped in ruling out the cause of unhealthy food choices. Moreover, the current study is somehow successful in ruling out the cause.

No such study was conducted in Pakistan before which is the major strength of this study. The findings of this study can be generalized to the similar population from other parts of Pakistan due to similar contextual factors.

5.2 Limitations

Despite using a large and diverse sample of university students, our results need to be interpreted in light of the following limitations.

First, the sample was restricted to students within the universities, and therefore does not represent approximately 8 % of students.

Second, causality of the observed associations cannot be determined from cross-sectional data, and future studies using a longitudinal design will be needed to address this issue.

Third, the data are based entirely on self-reports and may, thus, be subject to recall bias.

More refined and precise measures of unhealthy eating behavior would be desirable in future studies, finally, the external generalisability of our findings may be limited to the sample studied.

CONCLUSIONS

A strong and consistent association between social media use and eating behaviors was found in this study. The results depict that respondents who are more in touch with social media, live in cities and are hostilities have bad eating habits that indirectly effects their health.

Recommendations

There are few recommendations from the results of this study:

- The media and advertising agencies must made content to aware public about unhealthy eating and promote physical activity by behavior chain strategies to reduce the risk of non-communicable diseases.
- There must be proper Monitoring and Evaluation by food regulatory authorities on restaurants and food preparing industries for quality check.
- The youth must be aware to eat healthy and organic food to prevent the risk of getting sick due to unhealthy eating.
- Further studies must be conducted on large population size and on different age groups and ethnic groups to study the eating habits effected by social media.

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Appendix- A　　　　Data Collection Tool

EFFECTS OF SOCIAL MEDIA ON YOUNG ADULT'S FOOD CHOICES AMONG UNIVERSITY STUDENTS OF RAWALPINDI

SECTION 1: DEMOGRAPHICS

1. Your name
   ----
2. Your age
   a) < than 20 years
   b) > than 20 years
3. Your gender
   a) Male
   b) Female
4. Marital status
   a) Married
   b) Unmarried
   c) Divorced
5. Education level
   a) Graduation
   b) Masters
   c) Phd
6. Income per month
   a) Less than 20,000
   b) More than 20,000
7. Place of residence
   a) With family at home
   b) Hostel
8. Area of residence
   a) Village
   b) Town
   c) City
9. No. of chronic diseases
   a) No disease
   b) 1
   c) 2 or more
10. Do you work or study?
    a) Work
    b) Study
    c) Both

SECTION 2: FOOD CHOICES AND SOCIAL MEDIA

11. Do you use social media
    a) Yes
    b) No
    c) Rarely

12. Which social media plat form do you use most for food choices?
    a) Facebook
    b) Twitter
    c) Pint rest
    d) Other food related apps

13. Frequency of usage
    a) Once a week
    b) Twice a weak
    c) Daily basis

14. Duration of usage per day
    a) Once a day
    b) More than once

15. Does social media affects your eating habits?
    a) Yes
    b) No

16. Reason of food choice from social media?
    a) No time for cooking at home
    b) Habit of eating food from restaurants
    c) Other

17. Do you have any gastric issue?
    a) Yes
    b) No

18. Do you think that facility of food delivery at door step force you more to eat junk food?
    a) Yes
    b) No

19. Do you think that peer pressure effects food habits?
    a) Yes
    b) No
    c) sometimes

20. Are you aware of the health effects of eating unhealthy stuff?
    a) Yes
    b) No

SECTION 3: SCALE OF EFFECTS OF SOCIAL MEDIA ON EATING BEHAVIORS

Sr no.	Questions	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1	Inclusion of a food on social media influences my view of that food.					
2	When I use social media I forget that I am hungry.					
3	I see and consume any food on social media that are not my food habit.					
4	Even though I am full, I eat food/dish I see on social media.					
5	When I see a news headline about food /nutrition on social media I read the content of news.					
6	When I see a new food on social media, I search its content.					
7	I think that the foods on social media are more beneficial for health.					
8	When I see a dish on social media, I look at the recipe and its content.					
9	After I started using social media, my fast food consumption increased.					
10	I follow nutrition news, pages on social media.					
11	Without getting tired, I cook a food that I see on social media.					
12	I regulate my diet according to shared news about the food I see on social media.					

13	I am constantly snaking when surfing on social media, and I realize how much I have eaten later.					
14	I am interested in food shared by celebrities on social media and I consume that food.					
15	If I did not use social media, my time for eating would be reduced.					
16	When surfing on social media, even though I am full I am snacking.					
17	I consume food shared by people who have a lot of followers on social media.					
18	I think foods with more likes/ shares on social media are healthier.					
19	The food that I see on social media arose my desire to eat.					
20	I consume food with more news/photos/videos on social media.					
21	I think that food with more likes/ shares are more reliable.					
22	On the days I use social media for a long time, my desire to eat increases and I eat more.					

Appendix-B   Consent Form

Informed Consent Form

I Nayab Shahid am student of MSPH- Final Semester, at Al-shifa School of Public Health, Rawalpindi. I am doing research on Effect of social media on young adult's food choices among university students of Rawalpindi City.

PURPOSE OF THE RESEARCH

The purpose of this study is to assess the effects of food choices by social media.

PARTICIPATION

I do not anticipate that taking this study will contain any risk or inconvenience to you. Your participation is strictly voluntary and you may withdraw your participation at any time without penalty. I request you to answer the questions as honestly as possible. It will take no longer than 10 minutes to complete the Performa. All information collected will be used only for research purpose and will be kept highly confidential. Your identity and your responses will not be identifiable; all data will be stored anonymously. As this is solely a student project no incentive will be provided. Once study is completed, I would be happy to share the results with you if you desire.

Thank you for agreeing to participate in this study. Your feedback is important.

Consent

I have read and understand the information sheet and agree to take part in the study.

Signature_____ **Date**_____

Statement of Confidentiality

The information provided by you shall be anonymous. Researcher is obliged to preserve your confidentiality in the following way:

- Code numbers will be assigned which would be used on all documents included in study.
- Questionnaires returned shall be kept safe with access only to the principal researcher.
- Virtual data files shall be kept separately in an external hard drive, password protected
- And shall be used for the purpose of study only.
- Any information before withdrawal shall be deemed good for including in the study.
- Following may use the health information provided by you in connection with this study

The principal researcher

Research Supervisor

Institutional Review Board Al-Shifa School of Public Health

Appendix –C IRB- Letter

AL-SHIFA SCHOOL OF PUBLIC HEALTH
PAKISTAN INSTITUTE OF OPHTHALMOLOGY
AL-SHIFA TRUST, RAWALPINDI

MSPH-IRB/14-32
27ᵗʰ Sep, 2022

TO WHOM IT MAY CONCERN

This is to certify that **Nayyab Shahid** D/O **Shahid Shafiq** is a student of Master of Science in Public Health (MSPH) final semester at Al-Shifa School of Public Health, PIO, Al-Shifa Trust Rawalpindi. He/she has to conduct a research project as part of curriculum & compulsory requirement for the award of degree by the Quaid-i-Azam University, Islamabad. His/her research topic which has already been approved by the Institutional Review Board (IRB) is **"Effect of social media on young adult's food choices among university students of Rawalpindi"**.

Please provide his/her necessary help and support in completion of the research project. Thank you.

Sincerely,

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Appendix –D Budget

BUDGET ITEM	TRANSPORT	STATIONARY & INTERNET	PRINTING	PUBLISHING
Pilot testing	2000/-	5500/-	4000/-	-
Data collection	10000/-	7500/-	-	-
Thesis write up	3000/-	8500/-	6000/-	20000/-
Total expenditure	15000/-	22500/-	10000/-	20000/-
Grand total	67500/-			

Appendix-E Gantt chart

Activities	September 2022	October 2022	November 2022	December 2022	January 2023	February 2023	March 2023
Literature search	█	█	█	█	█		
Synopsis writing & IRB approval	█	█					
Pilot testing			█				
Data collection & entry				█	█		
Data analysis					█		
Write up			█	█	█	█	
Thesis submission							█