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Determinants of Socio-Cognitive Factors Shaping and Influencing Mindful Eating Behaviors and Food Choices among University Students: A Qualitative Study

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Abstract

Background: Mindful Eating, characterized as non-judgmental awareness of bodily and emotional sensations associated with food consumption, has been recognized for its potential to enhance both physical and mental well-being. However, the socio-cognitive factors and beliefs that shape the practice of Mindful Eating, especially among university students, remain underexplored. This study aims to investigate the socio-cognitive influences, such as social context and cognitive awareness that contribute to students' perceptions and practices of Mindful Eating. The research addresses the question: What socio-cognitive factors influence Mindful Eating practices among university students, and how do these factors shape students' food choices?

Method: This qualitative, exploratory study employed focus group discussions to explore university students' perceptions and beliefs regarding Mindful Eating. A purposive sample of 16 students from Riphah International University, Islamabad, Pakistan, participated in two focus groups. The discussions provided qualitative insights into students' awareness of Mindful Eating, the socio-cognitive influences affecting their eating behaviors, and the role of social settings in shaping their food choices. Data were analyzed thematically to identify key themes and subthemes.

Results: The findings indicate that although students demonstrated awareness of Mindful Eating, their knowledge of its practical application was limited. Social influences, particularly the presence of friends and family, were found to negatively affect eating habits and the ability to practice Mindful Eating. In contrast, cognitive benefits associated with Mindful Eating, such as enhanced focus and mental clarity, were recognized. Participants indicated that food choices were influenced by taste, health considerations, and social context, with no significant difference observed between healthy and unhealthy food options at the university café.

Conclusion: This study highlights the importance of increasing awareness of Mindful Eating among university students and suggests that interventions should target both cognitive benefits and the reduction of negative social influences to foster healthier eating habits. Further research with a more diverse sample is warranted to generalize these findings.

Keywords: Socio cognitive factors, mindful eating behaviors, food choices, a qualitative study

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Background

The prevalence of overweight and obesity among European adults has reached approximately 50%, while in Asia, particularly Pakistan, obesity rates are also rising, with an estimated 41.3% of adults classified as overweight or obese (Fatima et al., 2024; Fatima et al., 2022; Kubany et al., 2000; Najmadini et al., 2024; Preissner et al., 2022). This necessitates effective strategies to promote healthier lifestyle behaviors and mitigate associated health risks(Han et al., 2024). Mindful eating (ME) has emerged as a promising approach, characterized by sustained attention to the sensory attributes of food (e.g., smell, taste, texture) and a non-evaluative awareness of bodily and emotional sensations related to eating(Davies et al., 2022; Han et al., 2024). Systematic reviews and meta-analyses highlight ME's efficacy in addressing obesity-related behaviors, including food cravings, overeating, and consumption of energy-dense foods(Andriani et al., 2024; Preissner et al., 2022; Warren et al., 2017). Additionally, ME has been linked to increased fruit and vegetable intake, healthier snacking choices, slower eating pace, and improved satiety regulation(Alberts et al., 2010; Warren et al., 2017). Unlike formal mindfulness exercises, ME is practiced informally in everyday food-related contexts, fostering long-term behavioral adaptation (Preissner et al., 2022). Given the necessity of integrating ME into individuals' lifestyles for sustained health benefits, identifying key factors influencing its adoption is crucial (Preissner et al., 2022).

Theoretical models such as the Liverpool Mindfulness Model emphasize motivation, intention, positive outcome expectations, and attitudes as determinants of mindfulness practice(Ajzen, 2012; Prochaska & Diclemente, 1986; Rezende et al., 2024; Teixeira et al., 2015). Prior research has identified attitudes, habits, action planning, and social norms as predictors of ME engagement. However, limited empirical work has explored specific socio-cognitive factors and beliefs associated with ME, including perceived benefits, motivational influences, and past engagement in related behaviors. To address this gap, determinant studies employing robust theoretical frameworks are needed to inform the development of tailored ME interventions(Ajzen, 2012; Minari et al., 2024; Prochaska & Diclemente, 1986; Rezende et al., 2024). The I-Change Model (ICM) provides an integrative framework for understanding health behavior adoption, distinguishing between pre-motivational, motivational, and post-motivational phases. By examining the awareness, motivation, and action-related factors governing ME adoption, this study aims to provide insights that facilitate the effective implementation of ME interventions among university students (Minari et al., 2024; Prochaska & Diclemente, 1986; Rezende et al., 2024).

Mindfulness was developed originally from the Buddhist traditions, which combines meditation and contemplation (Intarakamhang et al., 2020). Kabat-Zinn (1982), defines mindfulness as an ability to draw attention to experiences, which occur in the present moment and to accept them without any judgment. Mindfulness towards eating can be described as focusing sustained attention to the food's sensory components, like the taste, smell, texture etc. It can also be defined as the non-evaluative awareness of emotional and bodily sensations that related to experience of eating (Mantzios, 2020). Young generation should be given guidance and help to cope with stress as well as negative factors that promotes fast food, causes Binge Eating Disorder, and bad eating habits (Aslam et al, 2022).

Mindful eating consists of listening to internal body cues, that are satiety and hunger, and avoidance of overconsumption of food as well as utilization of external cues, which are reduced the portion sizes, eating slowly and decreasing distractions during eating for assistance in achieving awareness (Monroe, 2015). The latest operational definition of mindful eating integrates all the components into a phrase that defines mindful eating's nuanced facets. Every component of Mindful Eating points towards a wider concepts of maladaptive and adaptive eating. It can also be used to assess where a person falls on the spectrum of the patterns of eating (Peitz et. al., 2021). When someone eats mindfully, the attention is restored and slowed which makes eating intentional rather than automatic. By recognizing physical hunger as well as fullness cues, the individual is able distinguish between true and emotional physical hunger. The individual is also able to increase the awareness of the triggers due to which the person eats without being hungry (Lattimore, 2020). Salvo et al. (2021) conducted a mixed method study on obese and overweight women in Brazil. The qualitative analysis of the data identified that after the sessions of mindful eating, individuals has greater self-acceptance, self-awareness and compassionate perspective regarding themselves.

The results of a study with people having serious mental illnesses developed a program to increase self-regulation and self-efficacy on the basis of mindful eating. The results concluded that individuals ate with less distraction, greater awareness and cognitive restraint as well as engaging lesser in emotional eating and over eating by the end of this program (Gidugu & Jacobs, 2018). A cross-sectional study conducted in Pakistan came to the conclusion that people's food decisions are influenced by their emotional states. It was determined that there is no significant difference in men and women's levels of knowledge regarding mindfulness. Findings also showed that both genders respond almost equally to mindful eating (Aslam et al., 2022).

Mindful eating has an inverse relationship with binge eating behavior as well as mood state among university students and is the significant negative predictor of the disordered eating behavior in population with high risk (Giannopoulou et. al., 2020). Demirbas and colleagues (2021) concluded in their study that women with obesity and overweight engaged in mindful eating lesser than the women with normal weight. University students have started consuming fast food by choice although it lacks in nutrition and causes obesity. Important determinants included in obesogenic eating habits model of students are cultural beliefs about food, stressors, and attitudes towards student life, and inconsistent strategies for weight control resulted in weight gain (Sadia et al., 2021). Determining the individuals' level of mindful eating might have cumulative and remarkable impact on obesity as well as food addiction in the longer run. It might be suggested as an important strategy for controlling food addiction among young

individuals. (Kaya et. al., 2022).

There is a rise in excess weight among university students in Pakistan and it is driven by the maladaptive eating behaviors of students (Sadia et al., 2021). Few of the factors that determine the eating behaviors and dietary intake of students are cost, taste, habituation to specific food items, peer influence, knowledge and perception of nutritional benefits, cooking skill, campus lifestyle, pressure of exams, and availability of equipment for cooking (Kabir et. al., 2018).

Some of these factors may lead to unhealthy and mindless eating habits that contribute to unhealthy weight gain as well as illnesses related to diet among students (American College Health Association, 2019). There are benefits of mindful eating but there is limited research that investigates socio-cognitive factors and beliefs associated with mindful eating among university students. This is an under researched area according to the limited access and surfing capacity of the researcher. A study was conducted in Pakistan and they concluded that their study was useful in gaining insight into the society's knowledge of mindful eating, responses to various food cues and dietary habits. However, more research and interventions are required in this specific area because many people are now showing an interest in mindful eating and require guidance as well as programs so they can use it in their everyday lives (Aslam et. al., 2022). The focus of existing studies is often on adult population, which makes it challenging to come to conclusions that address unique context of university students specifically. Moreover, the interaction between socio-cognitive factors, like peer influence, academic stress, and beliefs about mindful eating are still underexplored in Pakistan.

This research aims to bridge the gap in the literature by exploring and understanding the definition and perception of Mindful Eating. It also aims to analyze the socio-cognitive factors and beliefs related to mindful eating among university students. The findings can contribute valuable insights to inform development of interventions and availability of healthy food items in the universities especially for students. The results might help in developing effective strategies for promoting healthy behaviors as well as overall well-being of university students.

Method

Research Design

This study employed an exploratory qualitative research design to enhance understanding of Mindful Eating (ME) among university students. Exploratory qualitative research is particularly useful for defining ambiguous problems, generating insights, developing hypotheses, and establishing future research priorities (Stevens et al., 2013). It enables the identification of key variables relevant to causal or descriptive research and informs the development of theoretical models.Focus group discussions were chosen as the primary data collection method. Focus groups are widely utilized in exploratory research as they facilitate in-depth discussions among participants, allowing for diverse perspectives on the topic under investigation. Each focus group comprised 8 to 12 participants, engaging in discussions moderated by a trained facilitator to ensure a structured and productive exchange of ideas (Stevens et al., 2013). Ethical approval for the study was obtained from Riphah International University.

Research Questions

This study aims to investigate the conceptualization, beliefs, and socio-cognitive determinants of Mindful Eating (ME) among university students. Specifically, the study addresses the following research questions:

Conceptualization and Perception of Mindful Eating

1. How do university students define and interpret Mindful Eating?
2. What are the perceived benefits and challenges associated with the practice of Mindful Eating?

Socio-Cognitive Determinants of Mindful Eating

1. What cognitive and social factors influence students' engagement in Mindful Eating?
2. How do decision-making processes, including pre-consumption thoughts and food choices, relate to ME practices?
3. To what extent do social influences, such as peer presence, affect the adoption and maintenance of Mindful Eating behaviors?

Participants

The target population for this study consisted of university students enrolled at Riphah International University, aged between 19 and 26 years. University students were selected as the focal demographic to align with the study's objectives. To ensure a diverse representation of perspectives, participants were recruited from multiple academic disciplines, semesters, and degree programs. Individuals with prior knowledge of mindful eating were excluded to maintain the integrity of the study's exploratory nature. A total of 16 students participated, as the research aimed to investigate the phenomenon rather than achieve data saturation. Additionally, time constraints influenced the determination of the sample size.

A purposive convenience sampling strategy was employed for participant recruitment. This method of non-probability sampling combines convenience sampling, which makes it easier to find participants, and purposive sampling, which makes sure that participants meet specific criteria related to the research goals (Etikan et al., 2016). Each focus group discussion comprised 8 to 10 participants, with an additional 1 to 2 participants recruited as a contingency to ensure adequate attendance.

Procedure

Ethical approval for this study was granted by Riphah International University. Prior to participation, all individuals were provided with an informed consent form detailing the study's objectives, procedures, and ethical safeguards. Participants were informed of their right to voluntary participation and their ability to withdraw from the study at any stage without consequences. Confidentiality and anonymity were strictly maintained, ensuring that all collected data were used exclusively for research purposes. A comprehensive observation of the university cafeteria was conducted over several weeks following topic selection. Photographs of various food items were taken, and their caloric values were calculated. The data were systematically recorded in an Excel sheet, and frequently selected food items were identified to construct an activity chart.

Figure 1: Dietary Preference Activity Chart

Two focus group discussions were conducted. The first session lasted 50 minutes, while the second lasted 1 hour and 20 minutes. At the conclusion of the discussions, an activity utilizing the activity chart was conducted.

Triangulation was employed to enhance the validity and credibility of the findings (Noble & Heale, 2019). Triangulation can take multiple forms, including data triangulation, investigator triangulation, theory triangulation, and methodological triangulation (Denzin, 2017). This study utilized methodological triangulation, incorporating both cafeteria observations with caloric assessments and focus group discussions to ensure comprehensive data collection.

Tool Development

A semi-structured focus group guide was developed based on consultation with the research supervisor and a review of existing literature and theoretical models on Mindful Eating. The phenomenological approach was utilized in constructing the question guide, as phenomenology seeks to understand individuals' perceptions and meanings associated with their experiences (Williams, 2021).

The question guide was initially developed in English and later translated into Urdu to ensure comprehension among all focus group participants. An activity component was incorporated at the end of the guide, utilizing the activity chart.

The guide began with a welcome note, followed by ground rules, introductory questions, transition questions, and closing questions (Breen, 2006). The activity was included at the conclusion to assess students' food preferences. The guide comprised 35 questions, allowing the moderator to prioritize questions that elicited in-depth discussion while maintaining flexibility to explore emergent topics during the focus group sessions.

Qualitative Data Analysis

Reflexivity was integral to this study, involving critical reflection on knowledge generation and the researcher's professional background, as well as its potential influence on the research process (Komalasari et al., 2022).

Reflexive Thematic Analysis (RTA) was employed to analyze the focus group discussion data. RTA is a systematic method used to identify, analyze, and interpret patterns within qualitative data (Braun & Clarke, 2019). The six phases of RTA were rigorously followed:

1. Familiarization with the dataset,
2. Coding,
3. Generating initial themes,
4. Reviewing and refining themes,
5. Defining and naming themes, and
6. Writing up the findings (Braun & Clarke, 2019).

Initially, the data were repeatedly reviewed to ensure familiarity. Codes were then generated and grouped to form initial themes. These themes underwent further review and refinement before final definitions and names were assigned, culminating in the identification of major themes.

Results

In the present study, five distinct themes emerged from the analysis of the focus group data, each reflecting key aspects of the participants' experiences and perceptions related to mindful eating. These themes were developed through an in-depth examination of the data, and each theme was further divided into subthemes with relevant codes to capture the nuances of participants' responses. Table 1 provides a comprehensive overview of the identified themes, their associated subthemes, and the relevant codes that were generated during the data analysis process. These themes collectively provide a rich understanding of how participants define, perceive, and practice mindful eating, as well as the cognitive, emotional, and social factors that influence this behavior. The following section provides a detailed description of each theme, supported by direct quotes and illustrations from the data.

Theme 1: Students' Definition and Perception of Mindful Eating

1. Definition of Mindful Eating

The majority of participants described mindful eating as an act of paying deliberate attention to the sensory experience of eating, such as the taste, texture, and smell of food. Many emphasized that mindful eating involves eating without distractions, thereby fostering greater awareness of the act itself. Table 1 provides a detailed summary of participant definitions, which ranged from focusing on the food's sensory attributes to avoiding distractions such as mobile phones or television during meals (see Table 1).

For instance, Participant 2 defined mindful eating as "eating without distractions, focusing on the food, and being conscious of what is being consumed," which reflects an emphasis on attentional control and sensory awareness.

2. Importance of Sensory Experiences

Sensory factors, particularly the smell and taste of food, were frequently cited as integral to mindful eating. Participants noted that focusing on these sensory aspects helped to enhance their enjoyment and practice of mindful eating. Table 1 outlines the responses of participants in relation to sensory factors.

As an example, Participant 4 reported that their brother would only eat food if it smelled good, suggesting that sensory enjoyment plays a significant role in mindful eating practices (see Table 1). It illustrates how sensory factors, including taste and smell, contribute to the mindful eating experience.

3. Impact of Knowledge on Mindful Eating Practice

Participants who had a deeper understanding of nutrition and healthy eating practices were more likely to engage in mindful eating behaviors. These individuals reported making more conscious decisions regarding food choices. Table 1 summarizes how participants' knowledge influenced their mindful eating habits.

Specifically, Participant 2 noted that after gaining more knowledge about nutrition, they began making healthier food choices, reflecting the impact of nutrition education on eating habits (see Table 1).

4. Mindful Eating as a Health-Enhancing Practice

Participants generally viewed mindful eating as contributing to healthier eating patterns, which in turn promoted physical well-being. Many reported that mindful eating helped them better manage portions and make healthier food choices, even when indulging in less nutritious foods. Table 1 provides a summary of participant responses regarding the health benefits of mindful eating.

For example, Participant 11 indicated that mindful eating allowed them to control portions during “cheat meals,” suggesting that awareness and attention to food intake can mitigate the negative impacts of indulgence (see Table 1).

5. Negative Aspects of Mindless Eating

Mindless eating, characterized by distractions such as watching television or emotional eating, was commonly reported as leading to overconsumption and poor dietary choices. Table 1 outlines the participants' views on the negative consequences of mindless eating.

For example, Participant 11 shared that mindless eating, especially when influenced by emotional states, often led to feelings of guilt, which are linked to unhealthy eating behaviors (see Table 1). It represents the cognitive and emotional effects of mindless eating.

6. Advantages of Mindful Eating

Numerous cognitive and emotional benefits were associated with mindful eating, including enhanced mental clarity, better energy levels, and improved overall health. Table 1 summarizes these benefits as reported by participants.

Participant 4, for example, reported feeling more energized after meals when practicing mindful eating, indicating a link between mindfulness in eating and positive physical outcomes (see Table 1). It depicts the health and cognitive benefits of mindful eating, emphasizing the connection between mindful eating practices and improved energy and productivity.

7. Disadvantages of Mindful Eating

Although most participants recognized the advantages of mindful eating, a few highlighted challenges, particularly the mental effort required to remain mindful of food choices. In social contexts, the pressure to conform to group eating norms could also undermine the practice of mindful eating. Table 1 outlines the difficulties participants reported in maintaining mindful eating habits.

For example, Participant 8 noted that the stress of constantly monitoring calorie intake could detract from the relaxation aspect of meals, potentially leading to negative psychological outcomes (see Table 1).

8. Future of Mindful Eating

The participants expressed optimism regarding the growing awareness of mindful eating and its potential for widespread adoption in the future. They anticipated that an increased focus on mindful eating could lead to healthier eating patterns across society. Table 1 summarizes participant views on the future trajectory of mindful eating.

As an example, Participant 1 suggested that the widespread adoption of mindful eating could help prevent diet-related diseases, indicating a potential societal shift toward healthier eating habits (see Table 1).

Theme 2: Socio-Cognitive Factors and Effects of Mindful Eating

1. Negative Effects of Friends and Family on Mindful Eating

Social influences were often reported as negative factors that hindered mindful eating. Peer pressure and family dynamics sometimes led participants to consume foods they otherwise would not have chosen, particularly when eating in social settings. Table 1 provides a summary of how friends and family impacted participants' eating habits.

For example, Participant 6 shared that their friends’ preference for spicy foods led them to eat foods they would have avoided on their own, reflecting the powerful role of social influence in eating behaviors (see Table 1). It illustrates the impact of peer pressure on food choices.

2. Positive Effects of Friends and Family on Mindful Eating

conversely, participants also identified positive influences from family and friends, such as encouragement to make healthier food choices or to adopt mindful eating practices. Table 1 highlights how social support contributed to participants' adoption of mindful eating.

Participant 2, for example, noted that her friends helped her make healthier food choices, reflecting the role of positive social influence in supporting mindful eating practices (see Table 1). It represents the supportive role of family and peers in promoting healthy eating habits.

3. Cognitive Effects of Mindful Eating

Many participants reported that mindful eating improved their cognitive functioning, leading to better focus and increased energy levels. Table 1 summarizes participant responses related to the cognitive benefits of mindful eating.

Participant 8, for instance, explained that they felt more focused and productive after meals when they practiced mindful eating, highlighting the potential cognitive enhancements associated with this behavior (see Table 1).

Theme 3: Environmental Influences on Eating Behaviors

This theme explores the impact of environmental factors on eating behaviors, particularly the influence of societal norms, fitness-related pressures, and gender-based disparities in food consumption.

1. Social Pressure on Food Choices and Fitness

Several participants highlighted the role of social pressure in shaping dietary habits, particularly for women. Societal expectations and media portrayals contribute to specific food choices and concerns about body image. One participant stated *“Social media is idealizing this concept; we never knew about it."* (Participant 11). Conversely, some individuals expressed indifference toward fitness-related concerns: *“No, I don't care about fitness at all."* (Participant 16)Participants also linked societal pressure to the practice of mindful eating. One respondent elaborated on how social expectations influence food consumption, particularly among women: *"There is societal pressure... you know females are discriminated against. People talk if we eat more and say, 'Why are you eating more? You will gain weight.' Because of this, females monitor their food intake, including what and how much they consume."* (Participant 4)

2. Emphasis on Dieting and Fitness

Participants discussed the growing focus on diet and fitness, emphasizing that exercise often promotes healthier food choices. One respondent explained: “For example, if you go for a morning walk, you will make better food choices throughout the day because you are aware that you have worked hard and burned calories." *(Participant 8)*

However, some participants noted that the motivation behind weight loss is often appearance-driven rather than health-related. One participant articulated this concern:

"If you want to look good, then you have to stay fit. It’s not about staying fit to stay healthy." *(Participant 15).*

3. Gender Stereotypes in Food Consumption

Several participants addressed gender-based disparities in food distribution and portion sizes. A participant expressed concern about differential treatment based on gender*:* “I have a problem with the fact that food portions are distributed unequally based on gender." *(Participant 10).*Another participant highlighted the cultural practice of prioritizing male family members during meals, often leaving women with limited food options*:* “In my village, women tell me they have never eaten a good piece of meat or chicken because, in their households, men eat before them." *(Participant 11)*

Theme 4: Eating Habits and Household Norms

This theme examines students' eating behaviors at home, including mealtime routines and food preparation practices

1. Mealtime Routines and Eating Behaviors

Participants described their home mealtime habits, emphasizing that dinners are typically shared with family members. Many respondents noted that family meals involve discussions about daily activities, food, or television consumption, while some reported eating in a distraction-free environment. One participant shared: “When I eat with my family, I tend to overeat." *(Participant 11)* Others highlighted how distracted eating contributes to overconsumption*:* “If I eat unconsciously while watching a drama or doing some work, I end up eating more." *(Participant 6)*In contrast, a participant from a family that values food appreciation noted: "We don’t talk much during meals, but after we are done eating. We don’t use phones or watch TV while eating." *(Participant 8)*

2. Decision-Making in Menu Selection and Cooking

The responsibility for meal planning and preparation was primarily assigned to mothers, as reported by participants. However, in some households, fathers influenced menu selection. One respondent described the process in her household:"In Asian households, my mother and aunt manage the home and spend half the day asking everyone about what to cook. From 2 to 3 suggested dishes, they select the easiest one to prepare for dinner." *(Participant 12)Another participant described the dynamic in her family:*"In my family, my father instructs my mother on how to cook. He says, ‘I will make food, and you just have to watch me.’" *(Participant 3)*

Theme 5: Food Preferences and Concerns at the University Cafeteria

This theme addresses students' concerns regarding food availability, quality, and affordability at the university cafeteria, as well as their food preferences.

1. Challenges Faced at the Cafeteria

Participants identified several issues, including high food prices, the prevalence of unhealthy options, poor taste, and unhygienic food conditions. One respondent commented: “Expenses are actually high." *(Participant 7)*Many students expressed concern about the limited availability of nutritious food options, noting that unhealthy items dominate the cafeteria menu due to popular demand: “Most people prefer unhealthy food." *(Participant 2)Another participant pointed out that unhealthy food is often more visually appealing and prepared faster than healthier alternatives:* “Unhealthy food items attract people and are made quickly." *(Participant 8)* Additionally, several participants raised concerns about food hygiene standards at the cafeteria.

2. Food Preferences at the University Café

To assess students’ food choices, an activity was conducted at the end of the focus group discussions. The results varied across groups. One participant stated: “Samosas are appetizing." *(Participant 2)* Another participant preferred sandwiches due to their lack of strong odors: “Sandwiches don’t have any smell." *(Participant 8)* Some participants preferred eating specific foods at the cafeteria rather than at home, as one student explained: “You should eat macaroni at the café; you can eat lentils at home." *(Participant 11)*Additionally, nutritional considerations influenced some students' choices: “Biryani is better; it contains proteins, etc." *(Participant 11)*

Following the activity, participants were informed about the caloric content and nutritional value of different food items to enhance their ability to make healthier choices in the future. The findings indicated that there was no significant difference between preferences for healthy and unhealthy food options. However, unhealthy items were favored primarily because they were perceived as more appetizing and were not readily available at home.

Discussion

The rising prevalence of overweight and obesity is a significant public health concern, affecting nearly 50% of adults in Europe and 41.3% of adults in Pakistan (Fatima et al., 2024; Najmadini et al., 2024; Preissner et al., 2022). This trend necessitates evidence-based interventions to promote healthier eating behaviors and mitigate associated metabolic and psychological risks (Han et al., 2024). Mindful Eating (ME) has emerged as a promising approach, emphasizing sustained attention to the sensory properties of food (e.g., taste, smell, texture) and a non-judgmental awareness of physiological and emotional responses to eating (Davies et al., 2022; Han et al., 2024). Systematic reviews and meta-analyses suggest that ME effectively reduces maladaptive eating behaviors, such as food cravings, binge eating, and excessive consumption of high-caloric foods, while promoting healthier dietary patterns and improved satiety regulation (Andriani et al., 2024; Warren et al., 2017).

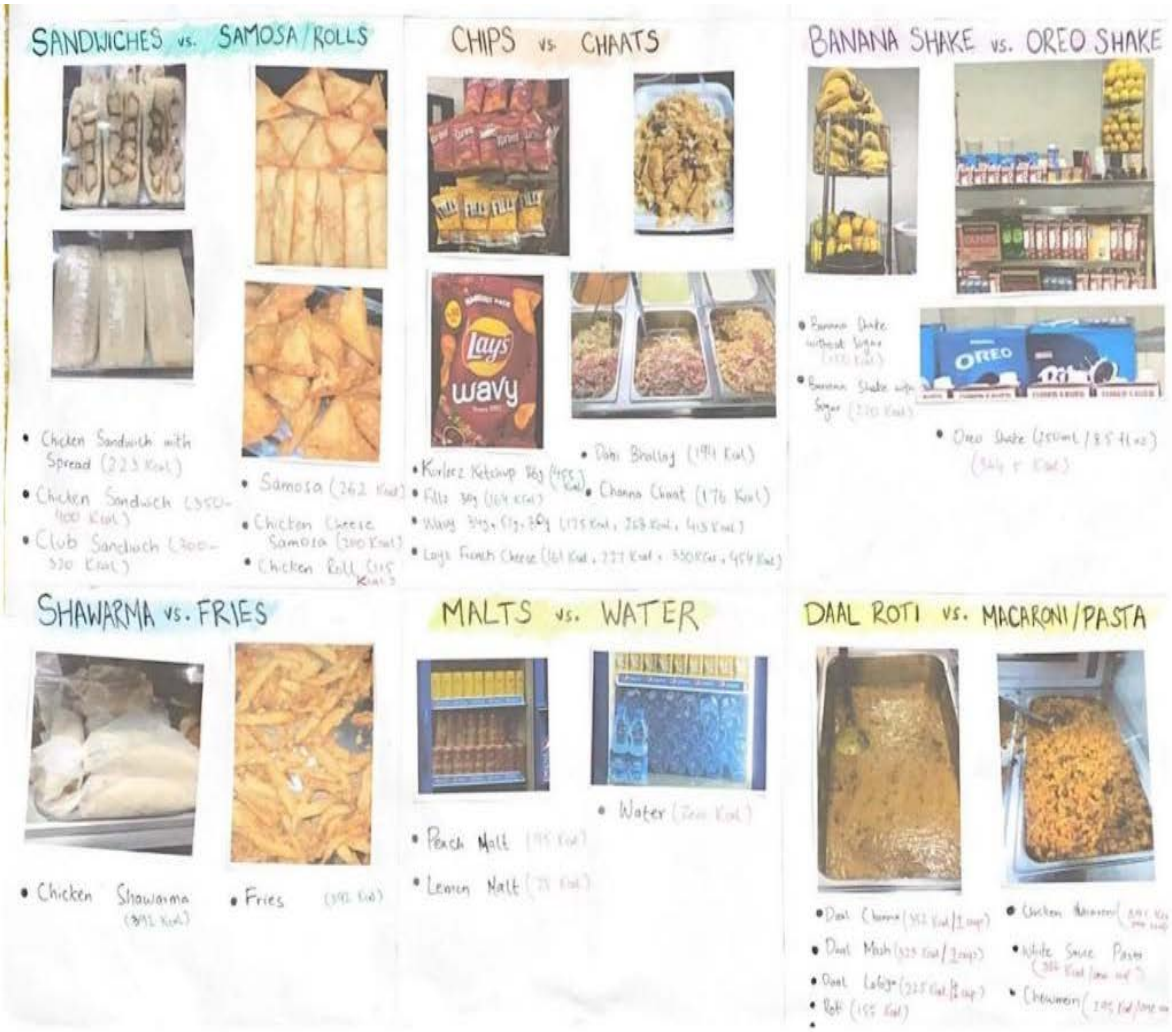
Table 1

Identified Themes, Subthemes, and Relevant Codes from Focus Group Discussions with Supporting Quotations

Themes	Subthemes	Relevant Codes	Supporting Quotations
Theme 1: Students' Definition and Perception of Mindful Eating	Definition of Mindful Eating	Conscious awareness, avoiding distractions, attentional control, sensory focus	"Eating without distractions, focusing on the food, and being conscious of what is being consumed." (Participant 2)
	Importance of Sensory Experiences	Taste, smell, texture, food enjoyment	"My brother only eats food if it smells good, or else he won't eat it." (Participant 4)
	Impact of Knowledge on Mindful Eating Practice	Increased awareness, nutrition knowledge, food choices	"Since studying nutrition, I now evaluate my food choices before eating." (Participant 2)
	Mindful Eating as a Health-Enhancing Practice	Portion control, healthy eating habits, physical well-being	"I even eat my cheat meals mindfully after thinking a lot. I used to eat a big plate of pasta; now, I feel full after a small plate." (Participant 11)
	Negative Aspects of Mindless Eating	Overeating, emotional eating, guilt, distractions	"When I binge eat due to stress, I don't even remember what I ate." (Participant 11)
	Advantages of Mindful Eating	Mental clarity, improved energy, overall well-being	"Mindful eating makes me feel more energized and focused." (Participant 4)
	Disadvantages of Mindful Eating	Social pressure, mental effort, calorie monitoring	"Thinking about calories all the time makes it hard to enjoy meals." (Participant 8)
	Future of Mindful Eating	Awareness, behavior shift, prevention of diet-related diseases	"So if the food choices will be good, we will be able to prevent diseases." (Participant 8)
Theme 2: Socio-Cognitive Factors and Effects of Mindful Eating	Negative Effects of Friends and Family	Peer pressure, unhealthy food choices, social eating norms	"With friends, I eat spicy food I would normally avoid." (Participant 6)
	Positive Effects of Friends and Family	Encouragement, support for healthy choices, habit reinforcement	"My friend's healthy eating habits influenced me to eat salads regularly." (Participant 1)
	Cognitive Effects	Improved focus,	"Now when I eat mindfully or

	of Mindful Eating	better decision-making, enhanced productivity	exercise, my brain is very clear. My focus level has increased, and my energy levels are very good." (Participant 8)
Theme 3: Environmental Influences on Eating Behaviors	Social Pressure on Eating and Fitness	Body image concerns, weight-related expectations, fitness trends	"People comment on how much we eat, making us self-conscious." (Participant 4)
	Increased Focus on Dieting and Staying Fit	Exercise influence, balanced diet, appearance-driven weight loss	"For example, if you go for a morning walk, you will make better food choices throughout the day because you know you have worked hard and burned calories." (Participant 8)
	Gender Stereotypes Related to Eating	Food portion discrimination, male preference in serving	"In my village, women tell me they have never eaten a good piece of meat or chicken because, in their households, men eat before them." (Participant 11)
Theme 4: Eating Habits and Norms at Home	Meal Times and Eating Habits	Family meals, eating environment, social interactions	"I tend to overeat when eating with family." (Participant 11)
	Decision-Making in Menu Selection and Cooking	Parental influence, cultural food norms, autonomy in meal choices	"In Asian households, my mother and aunt manage the home and spend half the day asking everyone about what to cook. Then, from 2 to 3 suggested dishes, they choose the easiest one to prepare for dinner." (Participant 12)
Theme 5: Food Preferences and Concerns at the University Cafeteria	Challenges at the Cafeteria	High costs, unhealthy food prevalence, hygiene concerns	"Healthy options are limited and expensive." (Participant 7)
	Food Preferences at the Café	Taste-driven choices, unhealthy but appealing food items, nutrition awareness	"Samosas are appetizing, and I prefer them over healthier options." (Participant 2)

Figure 1 illustrates the Food Preference Activity Chart employed as a methodological tool during the focus group discussions.



Unlike structured mindfulness practices, ME is often practiced informally within daily eating contexts, fostering long-term behavioral changes (Preissner et al., 2022).

Despite its documented benefits, ME adoption remains limited, warranting a deeper investigation into the socio-cognitive determinants underlying engagement in this practice (Preissner et al., 2022). Theoretical frameworks, such as the Liverpool Mindfulness Model, highlight motivation, intention, attitudes, and expected outcomes as crucial factors influencing mindfulness-related behaviors (Ajzen, 2012; Teixeira et al., 2015). However, empirical research examining specific motivational and cognitive predictors of ME remains scarce. Notably, constructs such as perceived benefits, habitual tendencies, social norms, and prior engagement in mindful practices may significantly influence ME adherence (Rezende et al., 2024; Minari et al., 2024). To address this research gap, determinant studies grounded in robust theoretical models are essential for designing targeted ME interventions.

The I-Change Model (ICM) provides a comprehensive framework for understanding health behavior adoption by delineating three key phases: pre-motivational (awareness and knowledge), motivational (intention formation), and post-motivational (behavioral enactment and maintenance) (Minari et al., 2024; Prochaska & DiClemente, 1986; Rezende et al., 2024). By applying this model to ME, researchers can identify critical leverage points for intervention development. For instance, increasing awareness of ME's benefits, strengthening motivational drivers (e.g., self-efficacy, positive reinforcement), and facilitating action planning may enhance sustained engagement in ME practices (Han et al., 2024). Furthermore, integrating ME into existing behavioral change frameworks, such as the Transtheoretical Model of Behavior Change, could optimize intervention efficacy by tailoring strategies to individuals' readiness stages (Prochaska & DiClemente, 1986).

Mindfulness, rooted in Buddhist contemplative traditions, emphasizes present-moment awareness and non-judgmental acceptance of internal and external experiences (Intarakamhang et al., 2020). Kabat-Zinn (1982) conceptualized mindfulness as the ability to direct attention intentionally to current experiences while disengaging from habitual cognitive patterns. When applied to eating behaviors, mindfulness fosters a heightened awareness of food choices, portion sizes, and physiological hunger and satiety cues (Mantzios, 2020). Given the increasing prevalence of stress-induced overeating and disordered eating patterns among young adults, fostering ME through structured psychoeducational programs could play a pivotal role in preventing obesity and related metabolic disorders (Aslam et al., 2022).

In conclusion, the findings underscore the importance of ME as a sustainable behavioral strategy for promoting healthier eating patterns and reducing obesity-related risks. Future research should explore the socio-cognitive mechanisms governing ME adoption and evaluate the effectiveness of theory-driven interventions tailored to diverse populations. Additionally, longitudinal studies assessing the long-term impact of ME on metabolic health outcomes would provide valuable insights into its efficacy as a public health strategy.

Limitations and Implications

This study relies on self-reported data, which may introduce social desirability and recall biases. The cross-sectional design limits causal inferences. Additionally, the sample consists of university students, restricting generalizability to broader populations. Future studies should incorporate longitudinal designs and objective measures of mindful eating behaviors.

Findings highlight key socio-cognitive factors influencing mindful eating, informing targeted interventions for obesity prevention. Integrating mindful eating into health programs can foster sustainable dietary habits. Future research should explore cultural influences and intervention effectiveness in diverse populations.

Conclusion

This study highlights the significance of mindful eating (ME) as a sustainable behavioral strategy for promoting healthier dietary patterns and mitigating obesity-related risks. While university students recognized the benefits of ME, overall awareness remained limited, and social influences were more frequently perceived as barriers than facilitators. Cognitive factors, however, were positively linked to enhanced self-regulation and decision-making in eating behaviors. These findings underscore the need for targeted interventions that enhance ME awareness and address both social and cognitive determinants. Future research should explore the underlying socio-cognitive mechanisms governing ME adoption and assess the efficacy of theory-driven interventions across diverse populations. Additionally, longitudinal studies evaluating the long-term metabolic and psychological effects of ME could provide critical insights into its potential as a public health strategy.

Ethical Considerations

The study was reviewed and approved by the Ethics Review Committee of the Department of Psychology, Riphah International University, Gulberg Greens Campus. Islamabad, Pakistan. Written informed consent was obtained from all participants before data collection, ensuring voluntary participation. Participants were informed of their right to withdraw from the study at any stage without any consequences. The study adhered to the ethical principles outlined in the Declaration of Helsinki (2013) and followed the ethical guidelines established by the American Psychological Association (APA, 2017). All collected data were anonymized and kept confidential, ensuring compliance with data protection regulations.

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Availability of Data and Materials

The datasets generated and analyzed during the current study are available from the corresponding author upon reasonable request, ensuring compliance with data-sharing policies.

Authors' Contributions

Laiba Ahsan and Anzah Babar conducted the research under the supervision of Dr. Nida Nosheen. They were responsible for data collection and analysis, while other team members provided guidance in conceptualization, methodology, and manuscript preparation. All authors contributed to the final manuscript and approved its submission.

Competing Interests Statement

The authors declare no conflicts of interest regarding the publication of this article.

COPE Compliance Statement

This study complies with the ethical standards outlined by

the Committee on Publication Ethics (COPE). The authors affirm that the work is original, free from fabrication, falsification, and plagiarism. All necessary permissions for data collection and participant inclusion were obtained, and the study does not involve any unethical practices.

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