

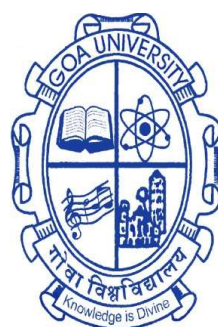
# **A Study of the Factors Influencing Eating Regulation: A Holistic Approach**

A Thesis submitted in partial fulfilment for the Degree of

**DOCTOR OF PHILOSOPHY**

in Management Studies, Goa Business School

Goa University



By

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## **DECLARATION**

I, Kevin Savio D'Souza, hereby declare that this thesis titled "A Study of the Factors Influencing Eating Regulation: A Holistic Approach" represents work which has been carried out by me and that it has not been submitted, either in part or full, to any other University or Institution for the award of any research degree.

Place: Taleigao Plateau.

Date: 14-08-2024

Kevin Savio D'Souza

## **CERTIFICATE**

I hereby certify that the work was carried out under my supervision and may be placed for evaluation.

Dr. Purva Hegde Desai

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## **Acknowledgment**

**"If God brings you to it, He will bring you through it."**

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Kevin D'Souza

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# List of Abbreviations

|         |                                                                                                           |
|---------|-----------------------------------------------------------------------------------------------------------|
| AVE:    | Average Variance Extracted                                                                                |
| BED:    | Binge Eating Disorder                                                                                     |
| BMI:    | Body Mass Index                                                                                           |
| COVID:  | Corona Virus Disease                                                                                      |
| CVD:    | Cardio-Vascular diseases                                                                                  |
| CVI:    | Content Validity Index                                                                                    |
| ED:     | Emotional Disorders                                                                                       |
| FCPS:   | Food Cultural Practices Scale                                                                             |
| HLPCQ:  | Healthy Lifestyle and Personal Control Questionnaire                                                      |
| IRR:    | Inter Rater Reliability                                                                                   |
| KMO:    | Kaiser Mayer Olkin                                                                                        |
| MAAS:   | Mindfulness Attention-Awareness Scale                                                                     |
| MB-EAT: | Mindfulness Based Eating Awareness Training                                                               |
| NCD:    | Non-Communicable Diseases                                                                                 |
| NPCDCS: | National Programme for Prevention and Control of Cancer,<br>Diabetes, Cardiovascular Diseases, and Stroke |
| SDG:    | Sustainable Development Goals                                                                             |
| SDT:    | Self Determination Theory                                                                                 |
| SPSS:   | Statistics Package for Social Sciences                                                                    |
| SREBQ:  | Self-Regulation of Eating Behaviour Questionnaire                                                         |
| STV:    | Subject to Variable                                                                                       |
| USD:    | United States Dollar                                                                                      |
| VIF:    | Variance Inflation Factor                                                                                 |
| WOF :   | World Obesity Federation                                                                                  |

# **Abstract**

## **Background**

The prevalence of obesity has reached epidemic proportions worldwide, posing a significant threat to public health and sustainable development. In addition, cardiovascular diseases are a leading cause of worldwide morbidity and mortality. Understanding the functioning of eating behaviour is crucial for developing targeted interventions and implementing effective preventive measures to reduce the global burden of obesity and cardiovascular morbidity and mortality. Eating behaviour is complex and influenced by many interacting factors, including personal characteristics, social factors, resources available and the environment to which one is exposed. An individual's eating behaviour is associated with weight gain and the onset of lifestyle diseases. Eating regulation has been highlighted in the study as a factor that can potentially impact health. The study examines the association between psychological and environmental factors with eating regulation.

## **Objectives**

This research aimed to identify the factors influencing eating regulation. Further, the study sought to establish psychological and environmental factors as antecedents of eating regulation.

## **Research Design**

The research was completed in two stages. The first stage of the research used an exploratory study and literature review to identify factors associated with eating regulation. The factors identified were operationalized while adapting scales for four of the constructs. The absence of a valid scale to measure food culture necessitated the development of an instrument to measure food cultural practices. The second stage involving a quantitative study tested the variables for their relationship with eating regulation. The study analysed the mediating role of lifestyle habits in the relationship between mindfulness, hardiness, food cultural practices and eating regulation.

A purposive sample of 25 respondents were taken for analysis in the first stage qualitative study. In the second stage quantitative study, convenience and snowball sampling was used for 677 respondents. The study primarily used regression as a technique for hypothesis testing. Associations between demographic variables and eating regulation were tested using Chi-square tests of association.

## **Findings and Theoretical Contributions**

The research addresses gaps in the literature where psychological factors like mindfulness and hardiness have not been tested with eating regulation. The study has introduced the construct of food cultural practices and developed a scale to measure them. The research established the significant direct relationships between mindfulness, hardiness, lifestyle habits and eating regulation. The role of lifestyle habits have been established as a mediating factor between mindfulness, hardiness, food cultural practices and eating regulation. The study contributed to theory by studying multiple factors that impact eating regulation rather than each factor in isolation. While previous research has focused on disordered eating behaviour, this study emphasises an approach which can prevent a situation where there is a need for an intervention.

## **Managerial Implications**

Healthcare and wellness service providers would benefit from understanding the synergies between psychological and environmental factors and eating regulation. Understanding eating regulation using a holistic approach would be beneficial in addressing weight gain. The significant mediating role of lifestyle habits justifies its inclusion in programs targeted at improving healthy eating behaviour. Food cultural practices impact eating regulation through lifestyle habits.

## **Limitations**

Due to the lack of time, the study was cross-sectional. This study, though pioneering in introducing the concept of food cultural practices as an antecedent for eating regulation, has taken the scale for food cultural practices to be unidimensional.



## **Recommendations for Future Research**

This research has shown multiple antecedents of eating regulation that need to be studied synchronously. Future studies may add other factors along with the constructs used in this study. Expansion of the Food cultural practices scale could reveal further dimensions of the instrument.

## **Keywords**

eating regulation, mindfulness, hardiness, food culture, lifestyle habits, obesity



# Chapter 1

## Introduction

The chapter begins with a background of the study, giving the relevance of eating regulation to health, followed by the significance of the research. The theoretical foundation upon which the study is based and the application of the theory to eating regulation has been given. The chapter specifies the study objectives, scope and overview of the methodology used for the research and culminates with an overview of the chapters written in the thesis.

### 1.1 Background

The prevalence of obesity has reached epidemic proportions worldwide, posing a significant threat to public health and sustainable development. The World Obesity Federation (2023) estimates that 770 million adults were obese in 2020, and this number will exceed one billion by 2030 if action is not taken. This alarming trend necessitates urgent research efforts to explore current strategies for controlling obesity. Cardio-vascular diseases (CVDs) are a leading cause of worldwide morbidity and mortality. Despite advancements in medical interventions and healthcare, the prevalence of CVDs continues to rise, placing a significant burden on individuals, families, and healthcare systems. The link between eating behaviour and the development and progression of CVDs has been the subject of intense research in recent decades.

The Sustainable Development Goals (SDGs) established by the United Nations highlight the importance of addressing obesity as a critical component of achieving global health and well-being. SDG 3 focuses on ensuring healthy lives and promoting well-being for all ages.

Target 3.4 within this framework seeks to reduce premature mortality from non-communicable diseases, including obesity-related conditions, by one-third by 2030 (United Nations, 2015). Therefore, comprehending the factors that influence eating regulation is crucial for formulating effective interventions to combat obesity and work towards achieving the SDGs. India has witnessed a significant increase in the prevalence of obesity and overweight individuals. According to a review published in *The Lancet*, the number of obese

individuals in India nearly tripled between 2005 and 2015 (Ahirwar & Mondal, 2019). This rise in obesity rates in India poses a significant threat to public health and impacts sustainable development.

The impact of obesity on India's population has several consequences. Firstly, obesity is a significant risk factor for Non-Communicable Diseases (NCDs), including cardiovascular diseases (CVDs), diabetes, and certain cancers. The burden of these NCDs has been steadily increasing in India and has significant implications for morbidity, mortality, and healthcare costs (Prabhakaran et al., 2016). The association between obesity and NCDs underscores the urgent need to address obesity as a public health priority in India.

Additionally, the economic burden of obesity in India is substantial. The cost of treating obesity-related diseases and the indirect costs associated with decreased productivity and increased healthcare expenditure, significantly strain India's healthcare system and economy. Data from the World Obesity Laboratory has projected that the economic costs of obesity in India will rise from 28.95 billion USD in 2019 to 81.83 billion USD in 2030 (World Obesity Federation, 2022). The financial impact of obesity not only affects individuals and families but also impacts the country's overall development.

Recognising the gravity of the situation, the Government of India has taken steps to address the issue of obesity and promote healthy lifestyles. Initiatives such as the National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases, and Stroke (NPCDCS) and the Eat Right India campaign aim to raise awareness about healthy eating habits, promote physical activity, and prevent obesity and related NCDs (Ministry of Health and Family Welfare, Government of India, 2021).

In conclusion, the rising prevalence of obesity in India has profound implications for public health and sustainable development. It contributes to the burden of NCDs, increases healthcare costs, and poses economic challenges. Addressing obesity through targeted interventions and policies that promote healthy lifestyles is crucial for India to mitigate these impacts and achieve the Sustainable Development Goals related to health and well-being. In the context of the prevention of obesity, understanding eating regulation is of paramount importance. Hence, this study unearths the factors affecting eating regulation holistically.

## 1.2 Significance of the Study

This study holds significant implications for public health, wellness practice, and policy development. By elucidating the mechanisms underlying eating regulation, it can inform the development of interventions that target specific aspects of eating behaviour. These interventions can potentially contribute to preventing and managing obesity, eating disorders, and related health issues. Moreover, the study's findings may guide policymakers in implementing evidence-based interventions and policies to promote healthy eating habits at a population level. Eating habits play a crucial role in regulating energy balance and weight management. The modern food environment, characterized by easy access to calorie-dense and nutritionally poor options, has contributed to obesity. Examining the impact of psychological and environmental influences on eating behaviours is essential for developing targeted interventions that promote healthy eating practices.

Stress, emotions, and mood are psychological factors that can disrupt self-regulation and lead to overeating. There are also psychological resources that can boost eating regulation. Understanding the underlying mechanisms of psychological factors and their relationship with eating habits can aid in developing interventions that promote mindfulness and emotional well-being, ultimately supporting healthy eating behaviours.

Eating behaviours are influenced to a great extent by culture. The norms regarding the type of food, the frequency of meals, and eating patterns are diverse in an Indian context. Practices that stem from cultural observances surrounding food could also impact the control of eating behaviour. Given the variety of food served and the importance of food in Indian culture, the study assesses whether culture can impact eating regulation in an environment that presents food frequently at festivals and celebrations. The study uniquely contributes that culture plays a significant role in the presence of health-enhancing lifestyle practices.

Lifestyle habits such as physical activity, sedentary behaviour and sleep patterns contribute to regulating energy balance and weight management. Investigating the associations between lifestyle habits and eating regulation can provide valuable insights into comprehensive approaches to obesity prevention and control.

This study comprehensively researches the impact of psychological factors like mindfulness and hardiness and environmental factors like food culture and lifestyle habits on eating regulation.

## **1.3 Statement of the Problem**

In the context of obesity prevention, the studies on eating habits face inquiries that necessitate comprehensive investigation. There is a need to encompass the complex interplay between eating habits, psychological factors, food culture, and lifestyle habits. While existing literature acknowledges the importance of understanding these intricate dynamics, there remains a need for in-depth studies that delve into the interactions among these factors and their collective influence on eating behaviour. Bandura's self-regulation theory offers a valuable framework for comprehending self-regulation in different domains. However, the specific context of eating regulation and its antecedents still needs to be explored.

While previous studies have established a link between mindfulness and disordered eating behaviour, a deeper understanding of how mindfulness operates as a preventive measure and its precise mechanisms in influencing eating regulation is warranted. Further, there needs to be more research examining psychosocial factors, notably hardiness, and its impact on eating regulation. The ability to cope with stress and adversity, as represented by hardiness, has been linked to resilience and adaptive coping strategies. However, its relationship with eating regulation warrants investigation.

Lifestyle habits are identified as pivotal factors in the context of eating habits. However, to the researcher's knowledge, there was little research exploring their role as mediators between psychological factors and eating regulation. Lastly, the role of culture in preventing obesity and its integration with lifestyle aspects in the context of eating regulation is largely unexplored despite previous calls for such investigations.

Addressing these gaps through a holistic research can contribute significantly to the understanding of eating regulation. It can pave the way for the developing of effective strategies to promote healthy eating behaviours, offering valuable insights into tackling the global obesity crisis.

## **1.4 Theoretical Foundation for the Study**

Bandura's self-regulation theory (Bandura, 1991) provides a valuable framework for understanding and analysing human behaviour, including complex phenomena such as

eating behaviour. This theory posits that individuals are active agents who engage in self-regulatory processes to guide and control their actions, thoughts, and emotions. Applying Bandura's self-regulation theory to eating behaviour offers insights into the cognitive, motivational, and social factors influencing individuals' eating patterns. This study explores the application of Bandura's self-regulation theory to eating behaviour. The research explores mindfulness and hardiness as psychological factors and food culture and lifestyle habits as environmental factors influencing eating regulation.

Self-regulatory systems lie at the core of causal mechanisms. They serve as a buffer against most outside influences and the essential foundation for deliberate action. Most human behaviour, being purposive, is regulated by forethought. People motivate themselves and guide their actions in an anticipatory, proactive way. In the exercise of self-connectedness, people adopt specific standards of behaviour that serve as guides and motivators to regulate actions anticipatorily through self-reactive influence. Human functioning is, therefore, regulated by an interplay of self-generated and external sources of influence.

Self-regulation operates through psychological sub-functions that must be developed and mobilised for self-directed change. If people cannot control their motivation and behaviours, neither intention nor desire alone have much of an impact. The constituent sub-functions in self-regulation through self-reactive influence are self-observation, judgement process and self-reaction.

Depending on the individual's values and the significance of different activities, they attend selectively to certain aspects of their functioning and ignore those of little importance. As part of the self-regulation process, self-observation provides the information needed for setting realistic goals and evaluating one's progress towards them. For those who know how to alter their behaviour and modifiable aspects of their environment, self-insights can set in motion a process of corrective change.

When people attend closely to their performances, they are inclined to set themselves goals of progressive improvement. The variations of goal setting reflect the diversity of their motivation. Those who set no goals for themselves achieve no change in effort and are surpassed by those who aim to match their previous level of effort, which in turn are outperformed by those who set themselves the more challenging goal of bettering their past endeavour. People have different self-monitoring orientations, varying in how much they

base their decisions on their moral principles or societal norms. Self-regulation refers to self-generated thoughts, feelings, and behaviours toward attaining goals (Zimmerman, 2000).

The control of one's actions is a means of self-regulation that incorporates self-monitoring, awareness of standards, and effort (Sniehotta et al., 2005). Scholz et al. (2009) found that behaviour change was significantly associated with self-regulation activities, including dietary planning and self-monitoring. Only in an environment that supports healthy eating behaviour is a dual strategy that targets behaviour and underlying habits likely to be sustainable in increasing food intake and self-regulation (Naughton et al., 2015).

### **1.4.1 Application of Theory to Eating Behaviour**

Eating behaviour can be explained by the theory of self-regulation using several aspects:

**Self-Observation and Monitoring:** Bandura's theory emphasizes the role of self-observation and monitoring in self-regulation. In the context of eating behaviour, individuals who are more attentive to their food choices, portion sizes, and satiety cues are better able to regulate their eating. Research has shown that individuals who engage in self-monitoring, such as keeping food diaries or using social media to track their food intake, exhibit better control over their eating behaviour (Sharps et al., 2019).

**Self-Evaluation and Standards:** Bandura's theory suggests that individuals compare their behaviours against internalised standards or goals. In the context of eating behaviour, individuals who have framed healthy eating goals or standards are more likely to regulate their food intake accordingly. Habitual behaviour is goal-driven, as shown in research where individuals' food consumption patterns were motivated by expectations of enjoying these meals (Kruglanski & Szumowska, 2020).

**Self-Reinforcement:** Bandura's theory posits that individuals reinforce or punish their behaviours based on their perceived efficacy and the outcomes they experience. In terms of eating behaviour, individuals who reward themselves for making healthy food choices or adhering to their dietary goals are more likely to continue engaging in those behaviours (Di Maio et al., 2022).

**Social Modelling and Social Support:** Bandura's theory highlights the influence of social modelling and social support in self-regulation. In the context of eating behaviour, individuals' food choices, portion sizes, and eating patterns can be influenced by observing and imitating the eating behaviours of others. Additionally, social support from family,



friends, or healthcare professionals can facilitate adopting and maintaining healthy eating habits (Walker-Clarke et al., 2022).

This research explores the complex dynamics of eating regulation by examining the interplay between psychological factors, food culture and lifestyle habits, ultimately helping to identify strategies for promoting sustainable eating behaviours and addressing the global obesity crisis. The research contributes to the scientific knowledge base surrounding eating regulation through a multidimensional approach. It provides evidence-based recommendations for policymakers, healthcare professionals, and individuals seeking to improve their dietary habits and overall well-being. A literature review is presented to consolidate the existing knowledge, identify research gaps and arrive at the study's objectives. The subsequent chapters of this thesis will present the research methodology, data analysis, and study findings.

## **1.5 Objectives of the Study**

The study set out to achieve the following objectives:

1. Identify the antecedents of eating regulation by including psychological factors like mindfulness and hardiness and environmental factors such as lifestyle habits and food culture as part of a holistic approach.
2. Evaluate the mediating role of lifestyle habits between psychological factors and eating regulation, if any.
3. Evaluate the moderating role of food culture between psychological factors and eating regulation, if any.

## **1.6 Scope of the Study**

The study aimed to identify the antecedents of eating regulation and explore the significant relationships between them. The psychological factors included mindfulness and hardiness, and the environmental factors included lifestyle habits and food cultural practices. The study sample included adult men and women with a minimum age of 18. The sample for the qualitative study was selected based on purposive sampling. Twenty-five respondents were selected for the exploratory in-depth interviews. The data for the qualitative study

was collected between March 2019 and August 2019. For the quantitative study, 800 respondents were targeted, of which the valid responses were 677. The data for the quantitative study was collected between September 2019 and March 2020.

## **1.7 Overview of Methodology**

In the first research stage, the study assimilated the existing literature from Scopus-indexed journals on food behaviour and its associated factors. An exploratory study was also conducted to corroborate the findings from the literature and unearth any significant factors that might emerge from the responses of the interviews. A combination of the literature review and the exploratory study identified research gaps and constructs for the study. Accordingly, the constructs were chosen for the conceptual model. The proposed relationships between the constructs were used to frame hypotheses. Existing scales from the literature were adapted for eating regulation, mindfulness, hardiness and lifestyle habits. Since there was no existing scale for food culture, the scale development process was followed. Scale validation was done for all constructs. The conceptual model was tested using regression in SPSS. The results of the data analysis guided the findings and conclusion.

## **1.8 Organization of the Thesis**

### **Chapter 1: Introduction**

This chapter gives a context of eating regulation with its significance regarding the potential to improve health and well-being through eating habits. The theoretical foundation upon which the study is based has been elaborated, along with applying the theory for eating behaviour. The aim of the study and its scope, with an overview of the methodology and the organisation of the thesis, have been given in this chapter.

### **Chapter 2: Literature Review**

The extant research pertinent to eating regulation has been presented in this chapter. It includes eating regulation, psychological factors like mindfulness and hardiness, and environmental factors in the form of culture and lifestyle habits. This chapter culminates in arriving at the research gaps for the study and framing the hypotheses.

### Chapter 3: Research Methodology

The study procedure that was followed is explained in this chapter. First, the qualitative study that was done is explained, followed by the questionnaire development. The quantitative study is then applied to test the hypotheses using regression in SPSS.

### Chapter 4: Data Analysis and Results

The statistical analysis of the data collected is explained, followed by the interpretation of the results. The key findings of the data analysis will be presented here.

### Chapter 5: Findings and Theoretical Contributions

The critical theoretical contributions of the study demonstrating the enhancement to the existing body of literature on eating regulation are presented in this chapter. The role of lifestyle habits, justification for including food culture and psychological resources in impacting eating regulation will be discussed here. The study's implications for managers, limitations and future research agenda are proposed in this chapter.

### Chapter 6: Managerial implications

This chapter provides practical suggestions on how to use mindfulness and hardiness to influence eating regulation. The chapter interprets the findings that are helpful to policymakers, the health and wellness industry, and individuals. The study suggests that psychological and cultural factors influence eating regulation either directly or through lifestyle habits. It interprets eating regulation to be a contributor to wellness and encourages the development of psychological resources such as mindfulness and hardiness.

### Chapter 7: Limitations, Future Research and Conclusions

The concluding chapter gives the limitations of the study, and how future studies may be guided by the findings of this research. The conclusion section has a brief overview of the thesis findings.

# **Chapter 2**

## **Literature review**

The extant research pertinent to eating regulation and the constructs under study have been presented in this chapter. It includes an overview of the literature on eating behaviour, self-regulation, and how it has been applied to eating behaviour. The literature review also examines factors associated with eating regulation and focuses on psychological factors like mindfulness, hardiness, and environmental factors in the form of culture and lifestyle habits. From the available literature, the unexplored gaps are identified. This chapter culminates in arriving at the research gaps for the study and framing the hypotheses.

### **2.1 Methodology Used for the Literature Review**

The literature for the study was taken from Scopus-indexed journals with a minimum impact factor of 1.0. The journals were selected from publishers like Elsevier, Sage, Taylor & Francis, Emerald, Springer, Wiley and Bio Med Central. The methodology ensured that good quality and high-impact articles were used for the review. The search terms used for the articles included self-regulation, eating self-regulation, eating regulation, regulation of eating, psychological resources, mindfulness, hardiness, resilience, physical activity, health, obesity, lifestyle disease prevention, NCDs, CVDs, lifestyle, habits, sleep, obesity prevention and eating habits. Two hundred articles were collected, of which ninety-five articles were considered relevant to eating regulation, and the period included articles from 1991 to 2021. The articles were examined for conceptual understanding, framing definitions for the study, and identifying potential antecedents, including enablers and barriers that could impact eating regulation.

Figure 2.1: Literature review process for the study



Source: Researcher's compilation

## 2.2 Literature on Eating Behaviour and Theories Used

The research reviewed alternate theories relevant to eating behaviours and approaches to promote good eating habits and remedy unhealthy behaviours. The review was done to identify successful approaches and theories used to prevent problematic eating and use these strategies to improve eating habits. The table below depicts how varying approaches are used in the context of eating behaviours.

Table 2.1 Theories used in the context of eating behaviour

| Theory                                                              | Summary                                                                                                                                                                                                                                                                                                                                                                                                                          | Study findings                                                                                                                                                    |
|---------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Self-determination theory (Ryan & Deci, 2017)                       | Individuals are naturally motivated to satisfy their basic psychological needs for autonomy, competence, and relatedness. When these needs are fulfilled, people are more likely to engage in intrinsically motivated behaviours that align with their true selves. SDT has been applied to various areas, including education, work, healthcare, and personal development, to understand and enhance motivation and well-being. | Peer pressure predicted controlled motivation and autonomous motivation, and that motivation predicted eating behaviours and binge eating (Barberis et al., 2022) |
| Self-control theory of self-regulation (Muraven & Baumeister, 2000) | Self-control is a limited resource and may deplete over time after resisting temptations and vigilance over one's behaviour.                                                                                                                                                                                                                                                                                                     | Positive affect resulted in excessive food consumption (Devonport et al., 2019)                                                                                   |
| Goal setting theory (Karoly, 1999)                                  | How individuals assess their objectives and self-regulation steers them toward these goals, offers valuable, context-specific insights and enhances the motivation that drives their performance.                                                                                                                                                                                                                                | Technology-based interventions that specified diet-related goals were effective in increasing fruit and vegetable consumption (O'Brien & Palfai, 2016)            |

|                                           |                                                                                                                                                       |                                                                                                                                                                                                                                                                                 |
|-------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Regulatory focus theory (Higgins, 1997)   | People have two distinct regulatory orientations (approach and avoidance), influencing their behaviour and decision-making.                           | Specific training in approaching healthy foods and avoiding unhealthy foods was significantly associated with curbing unwanted food cravings.                                                                                                                                   |
| Theory of Planned behaviour (Ajzen, 1991) | Individuals form intentions to engage in behaviour based on their attitude toward the behaviour, subjective norms, and perceived behavioural control. | A higher level of fruit and vegetable availability at home was related to more positive perceived behavioural control and attitude towards fruits and vegetables and subsequently, greater intention to consume higher quantities of fruits and vegetables (Lwin et al., 2020). |

Source: Researcher's compilation

While there are alternate theories used in studying eating behaviour, the study chose to apply the self-regulation theory by Bandura (1991), as it encompasses the components of goal-directed intentions, self-monitoring, and reaction based on the judgement of one's behaviour. This approach allows flexibility in observing one's behaviour, making judgements regarding its salience, and then taking appropriate action congruently with eating behaviour. Bandura's model outlines the progression for transforming externally guided behaviour into internalised behaviour. As a result, self-regulation is viewed as a fundamental explanatory factor and emphasises the significance of external elements as regulatory mechanisms.

## **2.3 A Brief Synthesis of the Literature on Self-Regulation From 1991 To 2021**

The social cognitive theory of self-regulation suggests that individuals possess self-reflective and self-reactive capabilities that enable them to exercise some control over their thoughts, feelings, motivations and actions (Bandura, 1991). Self-regulation occurs through goal setting because setting a goal is, first and foremost, a discrepancy-inducing process (Latham & Locke, 1991). Karoly (1993) questioned setting goals in terms of one's standards and interpreted goal setting as dynamic, where the goals could be either self-directed or framed based on external sources of influence. Higgins (1997) differentiated self-regulatory focus into two approaches: promotion and prevention. A promotion-oriented individual is more likely to achieve goals with high commitment. In contrast, a prevention-oriented individual would tend to focus on avoiding mistakes while satisfying others' expectations.

Muraven and Baumeister (2000) point out that self-control is an essential resource in self-regulation and is limited. Self-control may get depleted for an individual faced with multiple tasks requiring the exertion of self-control. Prioritising those tasks assumes importance in the order of their relevance to goal attainment. The self-regulatory approach was successful in reducing binge eating and alcohol abuse, among other risk factors for personal and interpersonal problems (Tangney et al., 2004)

Fishbach and Dhar (2005) found that setting specific and concrete sub-goals in goal pursuit may be a more effective method of self-regulation. Mood states were pivotal in self-regulation failures (Garg et al., 2007). An experimental study found that participants consumed 30% more hedonic foods after watching a sad movie than they did after watching a happy movie.

Khare and Chowdhury (2015) found that self-regulation is achieved through relevant information on food nutrition and health. The type of motivation that reduced the susceptibility to succumb to temptations in food choices boosted the success of self-regulation efforts (Milyavskaya et al., 2015). In the study, "want-to" goals were found to have higher subjective value than "have-to" goals by devaluing the perceived benefits of temptations. Self-regulation is highlighted for its effectiveness in various health behaviours in the health domain, including recovery from illness, disease prevention, increased consumption of nutritious foods and other dietary behaviours (McClelland et al., 2018).



Sussman et al., (2021) examined the role of bias in achieving self-regulation. The study highlighted that infrequently consumed foods may be perceived as less harmful and mitigate the impact of self-regulation. The research suggests that policy interventions must address the issue of infrequently consumed foods that can result in self-regulation failure.

## **2.4 Eating Regulation**

The regulation of eating behaviour is a highly intricate process involving the interplay of physiological, psychological, and environmental factors. Psychological factors, such as cognitive processes, emotions, and individual differences, contribute to eating regulation. Cognitive factors, including food preferences, taste perception, and cognitive restraint, influence food choices and portion sizes (Masterson et al., 2019). Stress, emotions and mood can disrupt eating regulation and contribute to disordered eating patterns (Dakanalis et al., 2023). Individual differences, including genetic predispositions and personality traits, further modulate eating behaviour and response to food cues. The environment in which individuals live and interact significantly impacts eating regulation. Socio-cultural factors, societal norms, and food availability could influence food choices, eating patterns, and portion sizes.

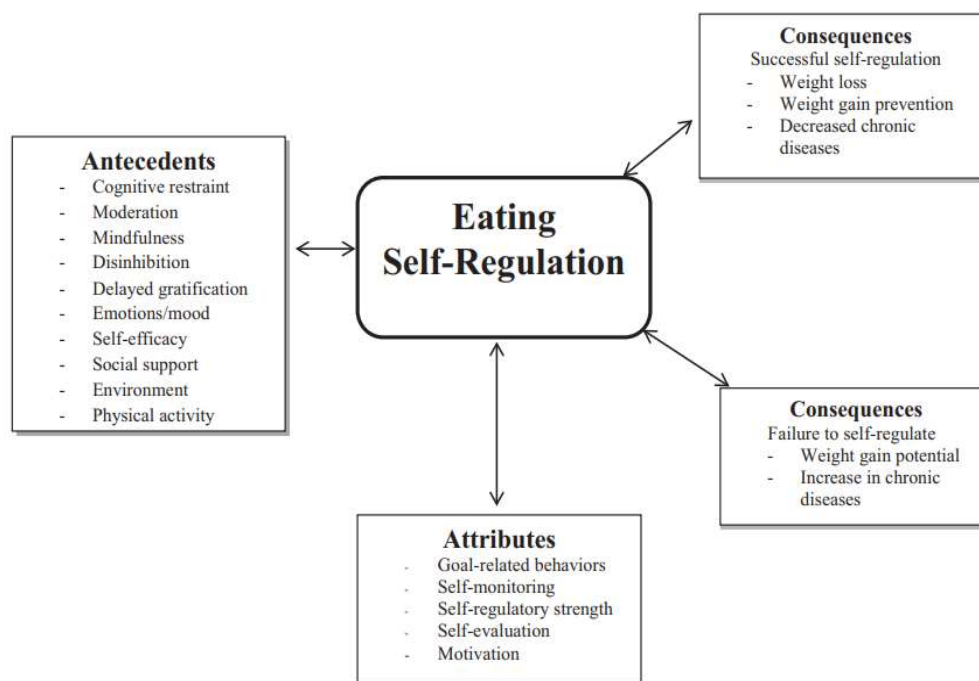
Understanding the intricacies of eating regulation is crucial in addressing the rising global burden of obesity, eating disorders, and other related health issues. An extensive literature review on eating regulation provided insights into the factors that contribute to enhancing or disrupting eating patterns. It helped to unravel the underlying mechanisms of unhealthy eating behaviour and identify potential avenues for prevention and intervention.

Additionally, investigating the role of specific self-regulatory processes, such as self-monitoring, goal setting, and social support, can guide effective strategies for promoting healthy eating habits. Bandura's self-regulation theory offers a valuable framework for understanding and addressing eating behaviour. It was deemed pertinent to use eating regulation as a system of conscious personal management to promote healthy eating in this context. Eating regulation for this study included guiding one's thoughts, behaviour and attention towards healthy eating. Subsequently, the study adapted the Self-Regulation of Eating Behaviour questionnaire (Kliemann et al., 2016) to measure eating regulation.

By promoting self-regulation of eating, individuals can develop sustainable and long-lasting healthy eating habits, leading to better overall dietary health. Self-regulation is only likely to last in an environment that supports healthy eating behaviour, and a combined strategy of focusing on behaviour and the underlying habits may effectively improve food intake. (Naughton et al., 2015). Knowledge of personal psychological factors contributes to better predicting functioning and treatment outcomes in improving eating behaviour (Farstad et al., 2016).

The figure below depicts prior research's antecedents, attributes and outcomes of eating self-regulation.

Figure 2.2: Antecedents, attributes and outcomes of eating self-regulation



Source: Reed et al.,2016

The study developed a further understanding of the mechanisms that influence eating regulation. The resources that would impact eating regulation were identified using a preventive approach.

Eating regulation allows individuals to tailor their eating behaviours to their needs and preferences, promoting a sense of autonomy and personal responsibility (Schüz et al., 2017). Eating regulation could support a personalised approach to improving eating behaviour.

Recent research calls for a better understanding of how consumers can resist temptations and practice control restoration through self-regulation, e.g., maladaptive or destructive behaviours such as distress and anxiety and increased consumption of alcohol and cigarettes, medicine, and unhealthy food choices (Billore, 2023).

The extant literature suggests that psychosocial factors, lifestyle, and a motivating culture are needed for an individual to achieve eating regulation. Research undermines the need to study the effectiveness and importance of eating regulation in promoting healthy eating behaviours and preventing eating disorders. As eating regulation is the central construct in the study, it was necessary to identify the antecedents of eating regulation. The need for further exploration of the antecedents of eating regulation has been highlighted in previous research (Reed et al., 2016). From the literature available, the study primarily focused on the most relevant psychological and environmental factors to arrive at a conceptual model of the factors affecting eating regulation.

## 2.5 Psychological Factors in the Context of Eating Regulation

Eating regulation is a complex process that involves a variety of factors, including biological, psychological, and social. Psychological factors play a significant role in eating regulation and can influence the amount and type of food that is eaten. Psychological factors can impact eating regulation in several ways, including:

**Body image:** Perception of body shape and weight can profoundly impact eating behaviour. People dissatisfied with their body image are more likely to engage in disordered eating behaviours, such as dieting, binge eating, and purging. Negative comments on social media about individual appearance led to disordered eating (Hummel & Smith, 2015).

**Perfectionism:** Perfectionistic people are more likely to have rigid rules about food and eating and are also more likely to engage in unhealthy weight control behaviours. Research has proven that perfectionism is related to eating pathology (Cresswell et al., 2022)

**Self-esteem:** People with low self-esteem are more likely to use food to cope with negative emotions and are more likely to be dissatisfied with their body image. Interventions targeted at boosting self-esteem prevented the worsening of eating disorders (Rossi et al., 2023).

**Emotional eating:** Eating in response to emotional triggers, such as stress, anxiety, or boredom, is another common psychological factor that can lead to disordered eating. According to prior studies, people with Emotional Disorders (EDs) frequently turn to irregular eating as a substitute when unable to regulate their unpleasant emotions (Bento et al., 2017).

**Dietary restraint:** Dieting can lead to a cycle of restriction and binge eating, ultimately making it more difficult to regulate eating. While some studies showed that dietary restraint predicts food addiction (Wiss & Avena, 2020), longitudinal studies prove that food addiction leads to dietary restraint (Rios et al., 2023).

Research has used psychological factors to seek remedial interventions for disordered eating, dietary restraint, unhealthy eating and pathological eating behaviours. This study researched a preventive approach using psychological factors for individuals without eating disorders. The psychological factors in this study were enablers in their relationship with eating regulation.

In order to understand the beneficial impact of psychological factors on eating regulation, the study assessed positive attributes that can aid individuals in boosting eating regulation. Literature examining psychological resources in the context of health was examined in their potential to enhance eating regulation.

### **2.5.1 Mindfulness**

In recent years, mindfulness has gained significant attention for its potential to promote positive health outcomes. Mindfulness involves purposefully paying attention to the present moment without judgment, cultivating a non-reactive and accepting stance toward one's experiences. Mindfulness is a potentially successful intervention for improving eating behaviour and promoting healthier food choices in the context of eating behaviour. This literature review aims to provide an overview of the existing research on the relationship between mindfulness and eating behaviour, including its effects on various aspects of eating behaviour and the potential mechanisms underlying these effects.

#### **Mindfulness and Food Intake:**

Several studies have explored the relationship between mindfulness and food intake. Mindful eating, characterised by a non-judgmental awareness of food-related thoughts, feelings, and sensations, has been associated with lower caloric intake, improved satiety, and

increased enjoyment of food (Mason et al., 2015). Mindfulness-based interventions have effectively reduced overeating and promoted healthier food choices (Mantzios et al., 2015). These findings suggest that mindfulness may help individuals develop a more balanced and attuned approach to eating, leading to better portion control and food selection.

#### **Mindfulness and Emotional Eating:**

Emotional eating refers to food consumption in response to negative emotions or stress. Mindfulness is proposed as a strategy to address emotional eating by promoting awareness of emotional triggers and developing alternative coping mechanisms. Research suggests mindfulness interventions can reduce emotional eating and increase adaptive emotion regulation skills (Daubenmier et al., 2016). Mindfulness-based interventions, in particular, have demonstrated efficacy in promoting mindful eating practices, enhancing self-regulation, and reducing emotional and external eating (Tapper et al., 2018). By cultivating non-reactivity to emotions and enhancing self-compassion, mindfulness may help individuals break the cycle of using food as a primary coping mechanism.

#### **Mindfulness and Binge Eating:**

Recurrent episodes of consuming large amounts of food accompanied by a sense of loss of control are characteristics of Binge Eating Disorder (BED). Mindfulness-based approaches, such as mindfulness-based eating awareness training (MB-EAT), have shown promise in reducing binge eating episodes and improving psychological well-being among individuals with BED (Kristeller et al., 2014). By promoting a non-judgmental and accepting attitude toward thoughts and sensations, mindfulness may help individuals develop a more balanced relationship with food and alleviate the emotional distress associated with binge eating.

#### **Mindfulness and Body Weight Regulation:**

The association between mindfulness and body weight regulation has also been investigated. Some studies have found that higher levels of dispositional mindfulness are associated with lower body mass index (BMI) and reduced risk of obesity (Mason et al., 2018). Mindfulness-based weight loss interventions have shown mixed results, with some studies reporting modest weight loss and improvements in body image and self-esteem (Olson et al., 2017), while others have found no significant changes in weight outcomes (Godsey, 2013).

The literature supports the potential of mindfulness-based interventions in positively influencing eating behaviour. Mindfulness can reduce emotional eating, improve food choices, mitigate binge eating, enhance satiety responsiveness, and attenuate the intensity of food cravings. The underlying mechanisms involve increased body awareness, disruption of

automatic eating patterns, improved self-regulation, and reduced stress and emotional distress. The existing evidence suggests that mindfulness holds promise as a valuable tool in promoting healthier eating behaviours and supporting overall well-being. This review examined the literature on mindfulness and its specific association with eating regulation. There is extensive literature that focuses on the use of mindfulness to prevent disordered eating. Rather than reacting to situations where eating behaviour has already been affected, it would be prudent to take a more proactive and preventive approach to understand the mechanisms through which mindfulness may influence eating regulation. Research has called for using mindfulness as an early intervention to prevent eating-related disorders (Osborne et al., 2022).

### 2.5.2 Hardiness

Hardiness is a psychological construct that refers to a person's ability to cope with stress and adversity. Individuals high in hardiness tend to perceive stressful situations as opportunities for growth and are more likely to adopt adaptive coping strategies.

It encompasses three components (3 C's): control, commitment, and challenge. **Control** leads the person to believe that no matter how bad things get, efforts must be made to keep trying to turn the stresses from potential disasters into growth opportunities. The second C of hardy attitudes is **commitment**, which involves believing that no matter how bad things get, staying involved with whatever is happening is crucial rather than sinking into detachment and alienation. The third C of hardiness is **challenge**. A person strong in the challenge component accepts that life is stressful and sees those stressful changes as an opportunity to grow in wisdom and capability by what is learnt through trying to turn them into an advantage. This approach enables a person to learn from failures as well as successes. The person does not feel entitled to easy comfort and security. Instead, the person feels that fulfilment can only be gained by turning the stresses into growth opportunities.

Persons high in hardiness involve themselves in whatever they are doing (commitment), believe and act as if they can influence the events forming their lives (control), and consider change to be not only expected but also a stimulus to development (challenge). While limited research specifically investigates the relationship between hardiness and eating regulation, studies have examined the association between hardiness and related constructs such as stress, emotional eating, and resilience. For example, research has shown that individuals with higher hardiness levels are more resilient in the face of stress (Bartone, 2006) and are less likely to engage in maladaptive coping behaviours, including emotional eating (Bartone

et al., 2008). Hardiness is a protective factor that attenuates the harmful effects of stress on health, allowing individuals to overcome situations with commitment and be able to face challenges (Vagni et al., 2021). Recent literature suggests continued research on intervention approaches that target individual psychology and behaviour concerning eating and physical activity, leading to a more refined approach to weight loss management (Ostendorf et al., 2021). There is a need for more research into certain psychosocial elements that affect eating behaviour and an overview of the psychosocial facilitators and obstacles to healthy eating (Walker-Clarke et al., 2022).

Despite the potential relevance of hardiness to eating regulation, there needs to be more literature directly examining the role of hardiness in shaping eating behaviours. Investigating potential mediating or moderating variables of the relationship between hardiness and eating regulation would be valuable. For example, examining whether the relationship between hardiness and eating regulation is influenced by factors such as daily routines, stress levels, or social support could provide a more nuanced understanding of the mechanisms involved. While limited research directly examines the relationship between hardiness and eating regulation, the study used the opportunity to explore this area. Examining the role of hardiness in shaping eating behaviours and examining potential mediators and moderators could contribute to a better understanding of the psychological factors involved in promoting healthy eating habits and inform the development of interventions to improve eating regulation.

## **2.6 Environmental Factors in the Context of Eating Regulation**

Findings show that in order to combat the present obesity epidemic, it is critical to deploy integrated methods that target both individual and environmental influences on eating choices (Hoenink et al., 2023). The study considered factors that could create or prevent obesogenic environments in the context of eating behaviours. The obesogenic environment is defined as ‘the whole range of social, cultural and infrastructural conditions that influence an individual’s ability to adopt a healthy lifestyle’ (Foresight, 2007). Research demonstrates that while teenagers’ BMI increased due to an obesogenic environment and their body satisfaction declined, social support for healthy behaviours favourably impacted BMI and body perception (Yayan & Çelebioğlu, 2017).

Several lifestyle variables, such as smoking, excessive alcohol consumption, drug use, inactivity, and insufficient chronic stress management, have been linked to the development of illness. Changing lifestyle by following a genetic constitution, including diet and physical activity, can help prevent or limit the development of diseases (Kopp, 2019).

Eating behaviours could be affected by social norms surrounding food. Food is frequently consumed in a social setting amid shared expectations of social groups. An individual's eating behaviour in a large group can differ from eating when alone or in a smaller group. Behavioural modification may include activities like synchronising eating behaviours, tracking food intake, and changing how one feels about the food. The body of evidence is mounting, indicating that the social context of eating may play a significant role in the emergence and maintenance of obesity and that social impacts on eating are strong and ubiquitous. In order to improve one's eating habits, it may be helpful to emphasize others' intentions and acts (Higgs & Thomas, 2016). With a background of prior literature, this study assimilated the potential environmental factors relevant to eating and included them for research in the context of eating regulation.

### **2.6.1 Lifestyle Habits**

Lifestyle habits, including behaviours related to diet, physical activity, sleep, and stress management, can play a significant role in shaping individuals' eating regulation. Understanding the impact of these lifestyle habits on eating behaviours is crucial for promoting healthy eating habits and preventing diet-related diseases. This literature review examines the existing research on the influence of lifestyle habits on eating regulation, highlighting the role of physical activity, sleep patterns, and stress management in shaping individuals' eating behaviours.

**Physical Activity and Eating Regulation:** Physical activity is a lifestyle habit influencing eating. Research suggests that physical activity may help regulate appetite hormones, reduce emotional eating, and improve body awareness, leading to more mindful eating practices (Juarascio et al., 2018). Regular physical activity was associated with improved appetite control, decreased food cravings, and better control of food intake (Ludy et al., 2019). Additionally, incorporating physical activity into daily routines can enhance overall well-being and promote a positive relationship with food, resulting in healthier eating behaviours (Bennie et al., 2019). The research addresses the highlighted need for further studies on



how physical activity accounts for better self-regulation in the context of eating (Annesi, 2011).

**Sleep Patterns and Eating Regulation:** Research evidence suggests that sleep patterns significantly impact eating behaviour. Inadequate sleep duration and poor sleep quality have been associated with increased food cravings, higher caloric intake, and a greater likelihood of consuming unhealthy foods (Spaeth et al., 2013). Sleep deprivation can disrupt hormonal regulation, leading to imbalances in appetite-regulating hormones, such as leptin and ghrelin, which may contribute to overeating and weight gain (Markwald et al., 2013). Irregular sleep patterns impact hunger, food cravings, food reward, and portion size, all of which have been shown to cause excessive food intake and possible weight gain (Yang et al., 2019). Healthy sleep habits, including adequate sleep duration and good sleep quality, are essential for promoting optimal eating patterns and maintaining a healthy weight.

**Stress Management and Eating Regulation:** Stress significantly influences eating regulation. Chronic stress can lead to emotional eating, cravings for high-calorie foods, and losing control over food intake (Groesz et al., 2012). Effective stress management strategies, relaxation techniques and social support have been shown to improve eating habits by reducing stress-related eating (Mason et al., 2018). Developing healthy coping mechanisms for managing stress is crucial for maintaining healthy eating behaviours.

Engaging in regular physical activity, following healthy sleep habits, and adopting effective stress management strategies are critical elements in fostering healthy eating behaviours. Integrating these lifestyle habits into daily routines can enhance individuals' ability to self-regulate food intake, make healthier food choices, and prevent diet-related diseases. Further research is warranted to include diet and physical activity in public policy (Ruiz-Roso et al., 2020). Given that eating regulation is the focus of this study, there is scarce evidence to demonstrate the impact of physical activity, daily routine and social and mental balance on eating regulation. The relevant aspects of lifestyle habits were highlighted, and research was conducted concerning their impact on eating regulation.

### **The operationalisation of lifestyle in the context of health behaviour**

Lifestyle encompasses daily activities that individuals consider acceptable routine behaviours and significantly contribute to health. This study explored health-promoting

lifestyles among cancer survivors (Tabriz et al., 2023). In another study, lifestyle included a favourable diet, physical activity, non-smoking, moderate alcohol intake and average weight. This operationalisation was used when studying the relationship between adherence to healthy lifestyles and the incidence of diabetes and mortality among individuals with diabetes (Schlesinger et al., 2020). Lifestyle was characterized by combining a reduced-calorie healthy diet, increased physical activity, and behavioural counselling for studying behavioural lifestyle interventions for moderate and severe obesity (Lv et al., 2017). Lifestyle incorporated a Physical Activity component, behavioural training for a balanced diet, and quality of life for studying obese individuals (Baillot et al., 2015). Lifestyle included diet, physical activity and behavioural intervention in a review of the long-term effects and economic consequences of treatments for obesity and implications for health improvement (Avenell et al., 2004).

In the present research, the definition of lifestyle habits excluded eating because lifestyle habits were tested as an antecedent for eating regulation.

### **2.6.2 Food Culture**

Culture shapes individuals' beliefs, values, and behaviours, including their eating habits and dietary choices. The ecology of eating is an essential aspect of health and weight control. Researchers wishing to understand eating behaviour would be well advised to pay attention to the environment that cultures have created (Rozin et al., 2003). Understanding the influence of culture on eating behaviour is essential for addressing the global challenge of promoting healthy eating behaviours and preventing diet-related diseases. This literature review examines the existing research on the relationship between culture and food, highlighting the cultural factors influencing food choices, portion sizes, meal patterns, and the development of eating disorders.

**Cultural Factors Affecting Food Choices:** Food preferences and dietary practices vary significantly across cultures due to various cultural factors. These factors include traditional food customs, religious beliefs, social norms, and cultural symbols associated with food. For example, studies have shown that individuals from cultures that prioritise a plant-based diet, such as Mediterranean or Asian cultures, tend to have healthier eating patterns and lower rates of obesity and chronic diseases (Satija et al., 2016). On the other hand, cultures that promote a Westernized diet, characterized by high consumption of processed foods, fast

foods, and sugary beverages, often exhibit poor eating regulation and higher rates of obesity and related health problems (Popkin, 2015).

**Portion Sizes and Meal Patterns:** Culture also influences portion sizes and meal patterns, essential for eating regulation. In some cultures, large portions are perceived as a sign of abundance and generosity, leading to overeating (Rolls et al., 2002). In contrast, cultures that prioritise regular family meals and discourage snacking between meals may promote healthier eating habits and better regulation of food intake (Fulkerson et al., 2008). Other studies have shown that consuming meals with family can support self-regulation for adolescents (De Wit et al., 2015). Similarly, cultures emphasising portion control and mindful eating, such as Japanese or French cultures, tend to have lower obesity rates (Grosso et al., 2017). Cultural norms related to meal quantity, frequency, timing, and social aspects of eating can impact eating regulation.

**Eating Disorders and Cultural Influences:** The relationship between culture and eating regulation extends to the development of eating disorders. Cultural ideals of beauty, body image, and thinness can significantly influence individuals' attitudes toward food and their desire for weight loss. Cross-cultural studies have revealed variations in the prevalence and manifestation of eating disorders, highlighting the role of cultural norms and values in shaping individuals' eating attitudes and behaviours (Hoek, 2006). Western cultures, in particular, have been associated with promoting thinness as an ideal, leading to increased rates of body dissatisfaction and disordered eating behaviours (Keel et al., 2007).

Culture can profoundly influence eating habits, shaping individuals' food choices, portion sizes, meal patterns, and attitudes toward food and body image. Traditional food customs, religious beliefs, social norms, and cultural symbols associated with food can play a role in determining individuals' eating behaviours. The underlying causes of excess energy intake are multifactorial, and the role of culture in obesity risk in different nations is poorly understood in this context (Dao et al., 2021).

Understanding the cultural factors influencing eating regulation is essential for designing culturally appropriate interventions and public health strategies to promote healthy eating habits and prevent diet-related diseases. Research should continue to explore the complex interactions between culture, individual factors, and environmental influences on eating regulation. A critical gap concerning food culture emerged: the study needed to find a measure of food culture and thus set out to develop a reliable and valid scale.

## 2.7 Operational Definitions

The operational definitions of the constructs were derived after the literature review and the study context.

Table 2.2 Sources of Operational Definitions

| Definition        | Source that the definition was adapted from | Context of the study                                                                         |
|-------------------|---------------------------------------------|----------------------------------------------------------------------------------------------|
| Eating regulation | Carver & Scheier, 1998                      | Behavioural self-regulation                                                                  |
| Mindfulness       | Black, 2011                                 | A brief definition of mindfulness                                                            |
| Hardiness         | Lambert et al., 2003                        | Psychological hardiness, workplace stress and related stress reduction strategies            |
| Lifestyle habits  | Darviri et al., 2014                        | Development of a tool assessing self-empowerment through a constellation of daily activities |

Source: Researcher's compilation

**Eating regulation** is defined as a system of conscious personal management that guides one's thoughts, behaviour, and attention toward healthy eating. The regulation process comprises self-observation, judgment and reaction.

**Mindfulness** is the degree to which one has a clear awareness, including thoughts, emotions, sensations, actions, of surroundings and complete attention to the experiences occurring in the present moment.

**Hardiness** is a personality trait comprising three attitudes: commitment, control, and challenge.

**Lifestyle habits** are a set of routine activities consisting of physical activity, daily routine, and mental and social balance of an individual.

**Food cultural practices** represent food-related practices followed, owing to belonging to a culture/community.

## 2.8 Research Gaps

Based on the literature review, the research gaps in the field of eating regulation were synthesized as follows:

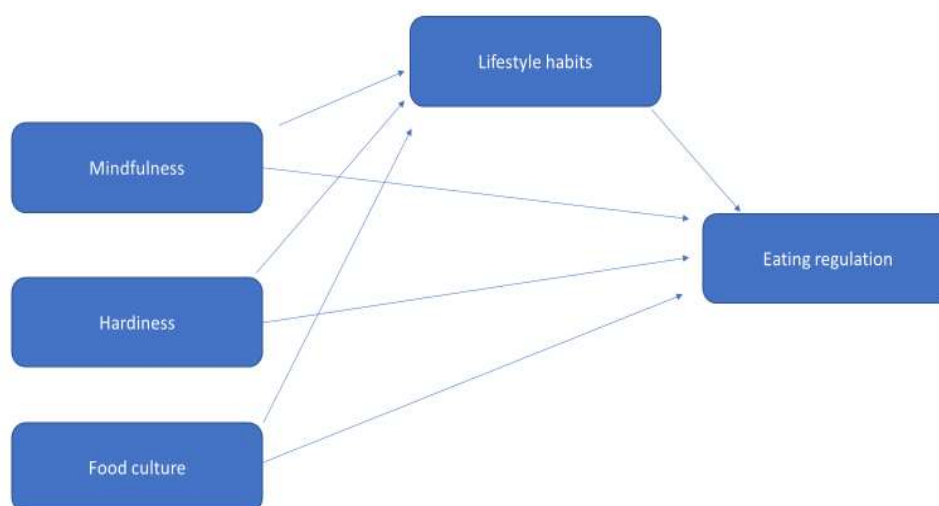
1. Limited research on the interplay between eating habits, psychological factors, food culture, and lifestyle habits: While the text highlights the importance of understanding the complex dynamics of eating regulation, there is a need for more comprehensive studies that explore the interactions between various factors influencing eating behaviour. The studies could include investigating how psychological factors, cultural influences, and lifestyle habits (e.g., physical activity, social and mental balance, sleep patterns) collectively affect eating regulation. Future studies should address the need to understand the factors influencing eating regulation (Reed et al., 2016). Bandura's self-regulation theory provides a valuable framework for understanding and analysing human behaviour, including eating behaviour. However, the text suggests that there needs to be more research on the impact of physical activity on self-regulatory skills in the context of eating (Annesi et al., 2011). Applying Bandura's self-regulation theory to eating behaviour requires further research.
2. There is a limited understanding of the mechanisms underlying the effects of mindfulness on eating behaviour. While there is existing research on the relationship between mindfulness and eating behaviour, there is still a need to unravel the specific mechanisms through which mindfulness influences eating regulation. The need for the use of mindfulness as a preventive measure has been stressed in previous research (Osborne et al., 2022). Further investigation is required to understand better how being aware of a situation and a present-oriented consciousness can contribute to the effects of mindfulness on eating regulation.
3. Ostendorf et al. (2021) have called for an investigation into psychosocial factors impacting eating behaviour. Hardiness, identified as the ability to cope with stress

- and adversity, has been linked to resilience and adaptive coping strategies. However, the literature indicates limited research investigating the relationship between hardiness and eating regulation.
4. Research has emphasized the importance of further research on promoting a healthy lifestyle (Ruiz-Roso et al., 2020). Though lifestyle habits have been identified as essential factors in the context of eating habits, their role has yet to be explored as a mediator between psychological factors and eating regulation.
  5. Previous research has stressed the need for studies examining the role of culture in preventing obesity ( Dao et al., 2021). The research did not find literature associating food culture while integrating lifestyle aspects with eating regulation thus presenting a research gap for this study.

The synthesis of the research gaps highlights the need for more comprehensive and interdisciplinary research that explores the interactions between various factors influencing eating regulation. Applying Bandura's self-regulation theory to eating behaviour uncovers the underlying mechanisms of mindfulness on eating behaviour and examines the relationship between hardiness and eating regulation. By addressing these research gaps, the study contributes to a better understanding of eating regulation. It helps develop effective strategies for promoting healthy eating behaviours and addressing the global obesity crisis.

## 2.9 Proposed Conceptual Model 1

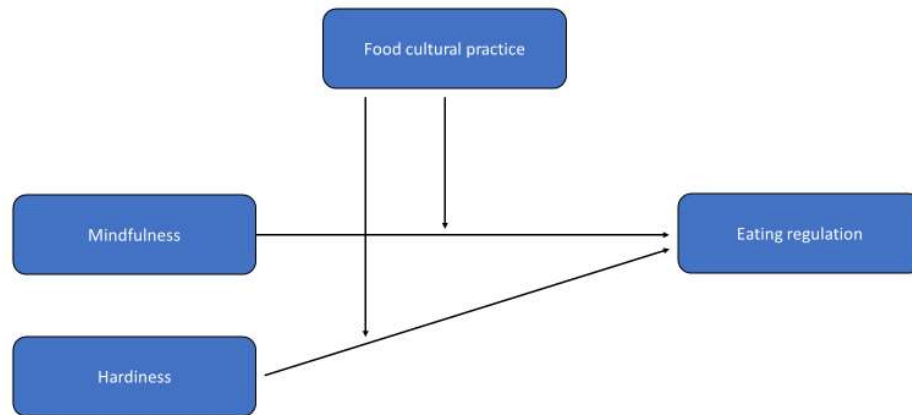
Figure 2.3: Proposed conceptual model 1



Source: Researcher's compilation

## 2.10 Proposed Conceptual Model 2

Figure 2.4: Proposed conceptual model 2



Source: Researcher's compilation

# Chapter 3

## Research Methodology

The chapter details the research questions framed as a consequence of the literature review and qualitative exploratory study. The research questions were used to frame the hypotheses for the study. Based on the hypotheses, the proposed models are presented, along with the methodology that was used to test the hypothesis. Since a mixed methods approach was used, the procedures followed for the qualitative and the quantitative study are described.

### 3.1 Overview of the Research Methodology and the Research Question

The first stage used a literature review to identify the research gaps. Based on the research gaps, further literature identified constructs relevant to the research. The literature suggested that eating regulation is a potent dependent variable and identified mindfulness, hardiness and lifestyle habits as critical, independent variables in the context of eating regulation. Extant literature was also used to operationalise the constructs for research and identify the existing scales for the constructs adapted for this study.

Research gaps identified through the systematic literature review posed the following enquiries:

What are the psychological antecedents that can impact eating regulation?

What are the environmental aspects that impact eating regulation?

What are the enablers/barriers of eating regulation?

Is there a combination of these factors that holistically impact eating regulation?

Which of the antecedent factors has a more significant impact on eating regulation?



### **3.1.1 Initial Research Objectives**

Based on the research questions, the following objectives of the study were framed:

1. Identify the antecedents of eating regulation by including psychological factors like mindfulness and hardiness and environmental factors like lifestyle habits.
2. Evaluate the mediating role of lifestyle habits between psychological factors and eating regulation, if any.

## **3.2 Mixed Methods Approach**

The research used a mixed methods study approach in two stages: qualitative first stage and second stage of quantitative research.

### **3.2.1 First Stage Qualitative Study**

Using exploratory interviews, a qualitative study was conducted to understand the respondents' perception of healthy eating and combined the factors identified in the literature to corroborate the findings. The second stage used a quantitative study to identify relationships between the factors impacting eating regulation.

Food culture emerged as a relevant factor from the exploratory interviews, and further relevant literature about food culture was added to the literature review.

### **3.2.2 Second Stage Quantitative Study**

Existing scales from the literature review were adapted for measuring 4 constructs, and a new scale was developed for food cultural practices, which was not previously found in the literature. As there was no existing scale for food cultural practice, the scale development process was followed, and the questionnaire, which included adapted scales for the study, was validated. Inter-rater reliability achieved a consistent level of agreement with experts for the items in the questionnaire. Content validity was done to avoid subjective judgements or interpretations and ensure that the measurement instrument or research tool adequately represents the construct or phenomenon under investigation.

The exploratory study responses necessitated the inclusion of food culture in the study. Therefore, the objectives after the exploratory study were suitably changed to include food cultural practices. The finalised research objectives are given below.

### **3.3 Final Research Objectives**

1. Identify the antecedents of eating regulation by including psychological factors like mindfulness and hardiness and environmental factors such as lifestyle habits and food culture as part of a holistic approach.
2. Evaluate the mediating role of lifestyle habits between psychological factors and eating regulation, if any.
3. Evaluate the moderating role of food culture between psychological factors and eating regulation, if any.

#### **3.3.1 Research Questions**

Based on the research objectives, the following research questions were framed:

**Research question 1:** Do psychological factors, such as mindfulness and hardiness, influence eating regulation?

**Research question 2:** Do environmental factors like lifestyle habits and food cultural practices influence eating regulation?

**Research question 3:** Is there a combined influence of psychological and environmental factors on eating regulation?

**Research question 4:** Could lifestyle habits mediate the relationship between the antecedent factors and eating regulation?

**Research question 5:** Could food cultural practices moderate the relationship between the antecedent factors and eating regulation?

After framing the research questions, the hypotheses were derived for the study.

#### **3.3.2 Proposed Hypotheses (Model 1)**

The following hypotheses were formulated based on the study objectives:

**H1:** There is a significant relationship between mindfulness and eating regulation.

**H2:** There is a significant relationship between hardiness and eating regulation.

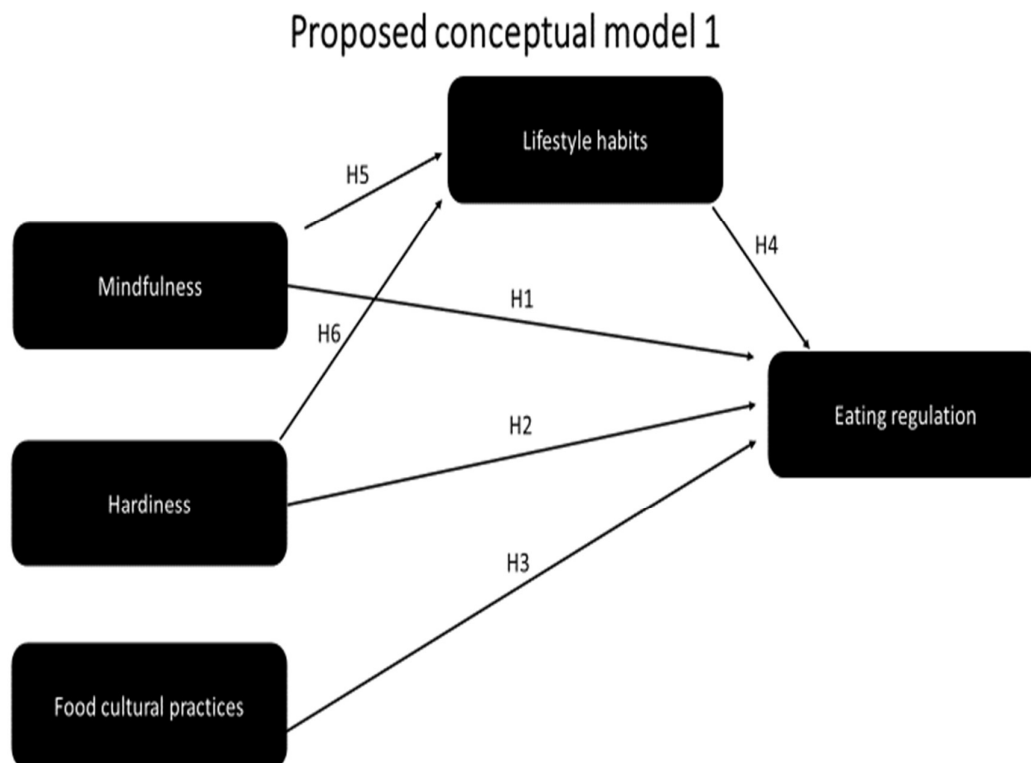
**H3:** There is a significant relationship between food cultural practices and eating regulation.

**H4:** There is a significant relationship between lifestyle habits and eating regulation.

**H5:** Lifestyle habits mediate the relationship between mindfulness and eating regulation.

**H6:** Lifestyle habits mediate the relationship between hardiness and eating regulation.

Figure 3.1: Hypotheses in proposed model 1



Source: Researcher's compilation

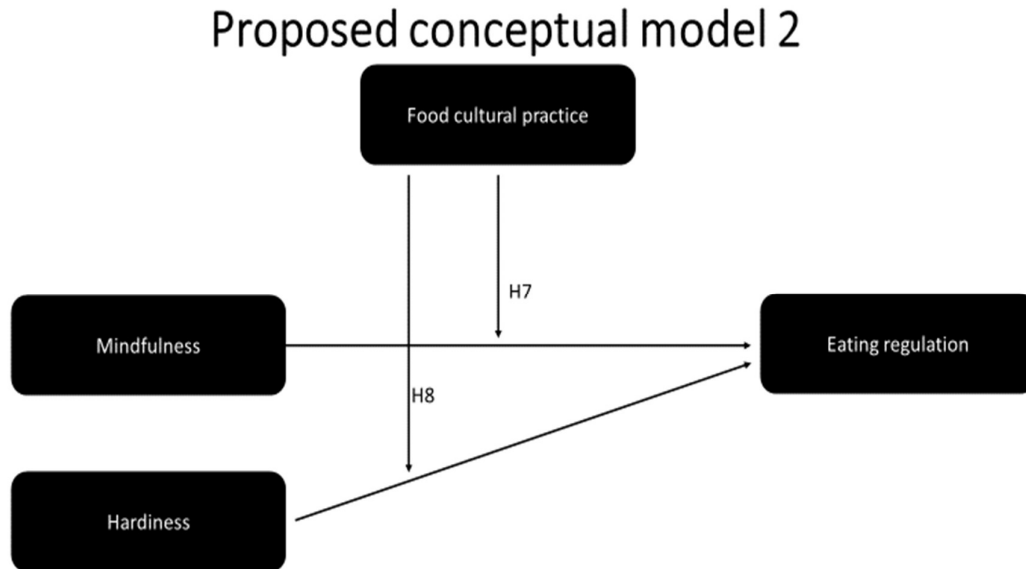
### 3.3.3 Proposed Hypotheses (Model 2)

If food cultural practice was unrelated to eating regulation, the study tested the moderating effect of food cultural practices.

**H7:** Food cultural practice moderates the relationship between mindfulness and eating regulation

**H8:** Food cultural practice moderates the relationship between hardiness and eating regulation.

Figure 3.2: Hypotheses in proposed model 2



Source: Researcher's compilation

### 3.4 Study Population

There were two study samples taken for conducting qualitative and quantitative studies separately.

#### 3.4.1 Sampling for the Qualitative and Quantitative Studies

The sampling for the qualitative and the quantitative studies is described separately for each stage of the study.

#### 3.4.2 Sampling Frame for the First Stage Qualitative Study

The qualitative study was done with exploratory interviews. The exploratory interviews aimed to collect as varied responses as possible to understand the antecedents of eating regulation. Purposive sampling was used to collect responses for the study. An attempt was made to interview a sample of differing age groups, gender, occupations, educational qualifications, family type (nuclear/joint), health status (chronic illness), dietary habits and alcohol consumption. The researcher personally approached participants willing to answer a

face-to-face interview, specifying that the responses would be detailed and recorded for transcription. The interview started after the respondents granted consent. The researcher ensured that the sample chosen was reasonably representative and unbiased by selecting a broad cross-section of adults with different eating habits.

### **3.4.3 Sampling Size for the Qualitative Study**

When using a grounded theory approach to qualitative inquiry, researchers typically use qualitative sample sizes of 20–30 to determine data saturation (Creswell, 1998). Data may be collected until additional interviews yield no new information or themes (Mason, 2010). Thematic saturation for this research was reached with a sample size of 25 participants.

### **3.4.4 Sampling Frame for the Second Stage Quantitative Study**

The criteria for answering the quantitative study questionnaire were a minimum age of 18 and internet access. The quantitative study questionnaire was shared online through social media. Initially, convenience sampling was used to send the questionnaires by email to known respondents. The sample was chosen based on their willingness to answer the survey. Respondents who completed the questionnaire were asked to refer more respondents to the researcher. Further responses were collected using snowball sampling. The collection of responses continued till the desired sample size was reached.

### **3.4.5 Sample Size for the Quantitative Study**

The Subject to Variable ratio (STV ratio) of 10:1 was followed (James et al., 2013). Based on the number of variables (45), the required minimum sample size was 450 respondents. There were 677 responses included in the final analysis.

### **3.4.6 Data Collection**

The data was collected in two stages: a qualitative study and a quantitative study. The data for the qualitative study was collected between March 2019 and August 2019. The data for the quantitative study was collected from October 2019 to March 2020.

### **3.5 Qualitative Study**

Qualitative research offers a valuable approach to unravel the intricate dynamics and gain deeper insights into individuals' food choices, motivations, and experiences. Holloway (2008) supports the utilisation of semi-structured interviews, as they prove effective in eliciting the viewpoints, emotions, and attitudes of participants, a relevance observed in this study. Qualitative research is characterised by its ability to capture the richness and complexity of human experiences, making it particularly well-suited for studying eating habits. One of the strengths of qualitative studies is the focus on understanding subjective meanings and interpretations individuals attach to their food choices. Researchers can delve into the underlying motivations, emotions, and cultural influences shaping individuals' eating habits by utilising interviews, focus groups, and observations. This in-depth exploration provides valuable insights that quantitative research may need to capture.

In the first stage, a qualitative study using interviews was done to explore the antecedents of eating regulation and also attempted to synthesise the literature on eating regulation to identify potential antecedents.

#### **3.5.1 Questionnaire for the Exploratory Study**

The questions for the exploratory study were framed to understand factors related to eating regulation. The questionnaire used to conduct the exploratory study is attached in Annexure 1. With the study objective in focus, the research primarily looked at enablers, barriers to eating behaviour and potentially unearth new factors previously not found in literature concerning eating habits. Respondents were asked about their eating habits, including whether they eat at home or out frequently. They were asked to elaborate on several aspects of their eating habits, such as regular meal timings, whether they feel their current eating habits are appropriate and whether they have the support and resources needed to eat healthy food.

Further questions were asked regarding their perceptions and attitudes toward healthy eating, their knowledge of healthy eating and whether they consider it essential to follow good eating habits. Those who intend to improve their eating habits, were asked whether they have a specific goal of improving their existing habits and whether they are taking steps towards healthier eating habits. Respondents were also asked to elucidate why they feel confident about maintaining eating habits or whether they faced any challenges. They were also asked

what foods they consume frequently and whether those foods help or hinder their eating goals. Respondents were also asked about their attitudes towards eating healthy foods.

### 3.5.2 Procedure Followed for the Exploratory Study

The qualitative study sought to understand the psychological and environmental factors that influence eating regulation. The research used inductive and deductive reasoning to understand the factors that influence eating regulation. Inductive reasoning was used to identify patterns and themes in the data, while deductive reasoning was used to test hypotheses about the relationship between different factors.

Figure 3.3: Process followed for the exploratory study



Source: Researcher's compilation

1. Before the interview, consent was obtained from the participants, and it was clear that the data collected would be used only for research purposes. Prior permission was taken from the respondents to record the conversation in audio format for later transcription.
2. The data collection process ensured that any information the respondents gave was confidential and anonymous. No participant was identifiable in any of the data collected. Only response numbers were assigned to each participant.
3. The data was stored securely on a password-protected computer with sole access to the researcher to maintain confidentiality.

Purposive sampling was used to select participants of diverse backgrounds to maximise the richness of the data. The target respondents were chosen from different age groups, employment status, family structure, economic status, educational background and professions to elicit varied responses. Open-ended questions were used to guide the conversation. An attempt was made to obtain detailed responses while encouraging participants to express their thoughts and opinions freely.

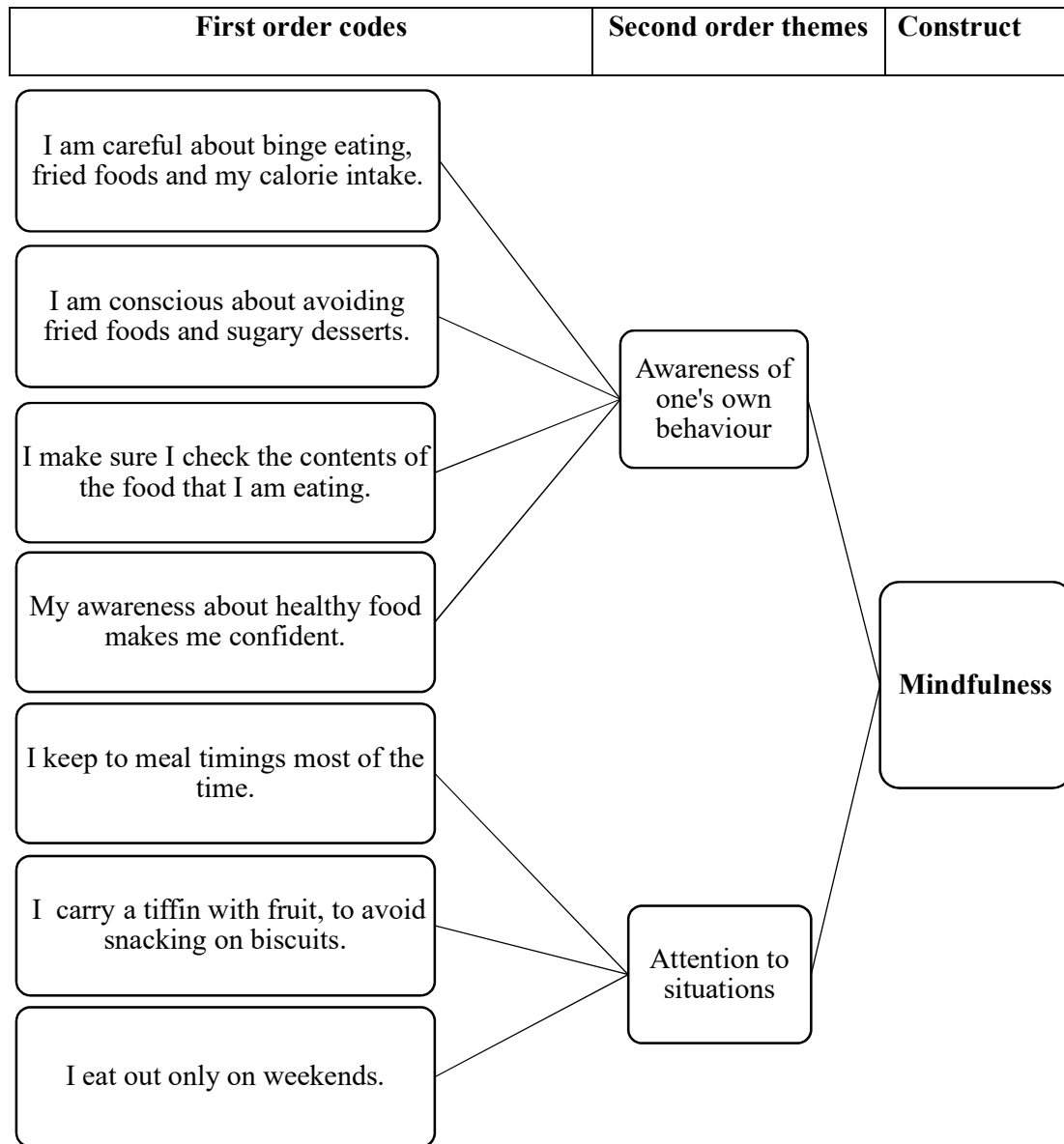
The interview was conducted at a location chosen by the respondent. It began with the researcher introducing himself, explaining the purpose of the study and reassuring the participants about the confidentiality and voluntary nature of their participation. Efforts were made to listen attentively to participants, allowing them to share their experiences and perspectives fully. Follow-up questions were asked to seek clarification and get examples to delve deeper into their thoughts and experiences. Participants were allowed to guide the interview and explore new themes while ensuring the research objectives were addressed. Audio recording of the interviews was done with the participants' consent while taking notes. This process was done to ensure accurate transcription to facilitate data analysis.

The responses to the interview were organised according to themes for easy analysis. Thematic coding was used to identify patterns and themes from the data. The transcripts were analysed to identify recurring ideas, commonalities, and variations among participants' responses. Themes and codes were refined and revised as new insights emerged. Thematic saturation was reached with a sample size of 25 participants, when additional interviews did not yield new information or themes (Mason, 2010). The data was interpreted to draw connections between the themes and research objectives. The findings were compared with the existing literature on eating regulation and identified with constructs relevant to the study's objectives. Responses from the exploratory study were examined primarily as antecedents of eating regulation. The study broadly viewed the antecedents as enablers or barriers to eating regulation. The responses of the exploratory study were taken as first order codes. The statements were then used to identify underlying themes to categorise the responses. The themes were used to determine the potential factors impacting eating regulation. Accordingly, the factors were identified as constructs for measurement. A representation of the process for identifying constructs is given below, with first-order codes, second-order themes and finally, the constructs that potentially impact eating regulation. The interview was semi-structured based on a broad theme of eating regulation.

The details of how the factors affecting eating regulation were derived from the second-order and first-order codes are as follows:



Figure 3.4: Statements coded under mindfulness



Source: Researcher's compilation

#### Interpretation of the statements coded under mindfulness:

The following statements were coded based on mindfulness's attention and awareness aspects. Statements reflected paying attention to thoughts, feelings and sensations without getting carried away.

"I am careful about binge eating, fried foods and my calorie intake."

“I am conscious about avoiding fried foods and sugary desserts.”

“I make sure I check the contents of the food that I am eating.”

“My awareness about healthy food makes me confident.”

These statements were attributed to being aware of situations where one is exposed to different types of food. The awareness as a component of mindfulness can target eating habits to prevent weight-loss or maintenance. Awareness can people eat less and make healthier food choices. This can lead to weight loss or weight maintenance.

Being aware can help to identify the foods that are eaten and also control the quantity of food consumed. Awareness can prevent excessive calorie consumption through sweets. Besides situational awareness, one’s knowledge about nutritional content could help in awareness of the food content and differentiate between those foods that are beneficial and those that are harmful to health. In addition, awareness can lead to better decision-making about food. Awareness can help people to make better decisions about what they eat by helping them to be more aware of hunger cues and emotional reactions to food.

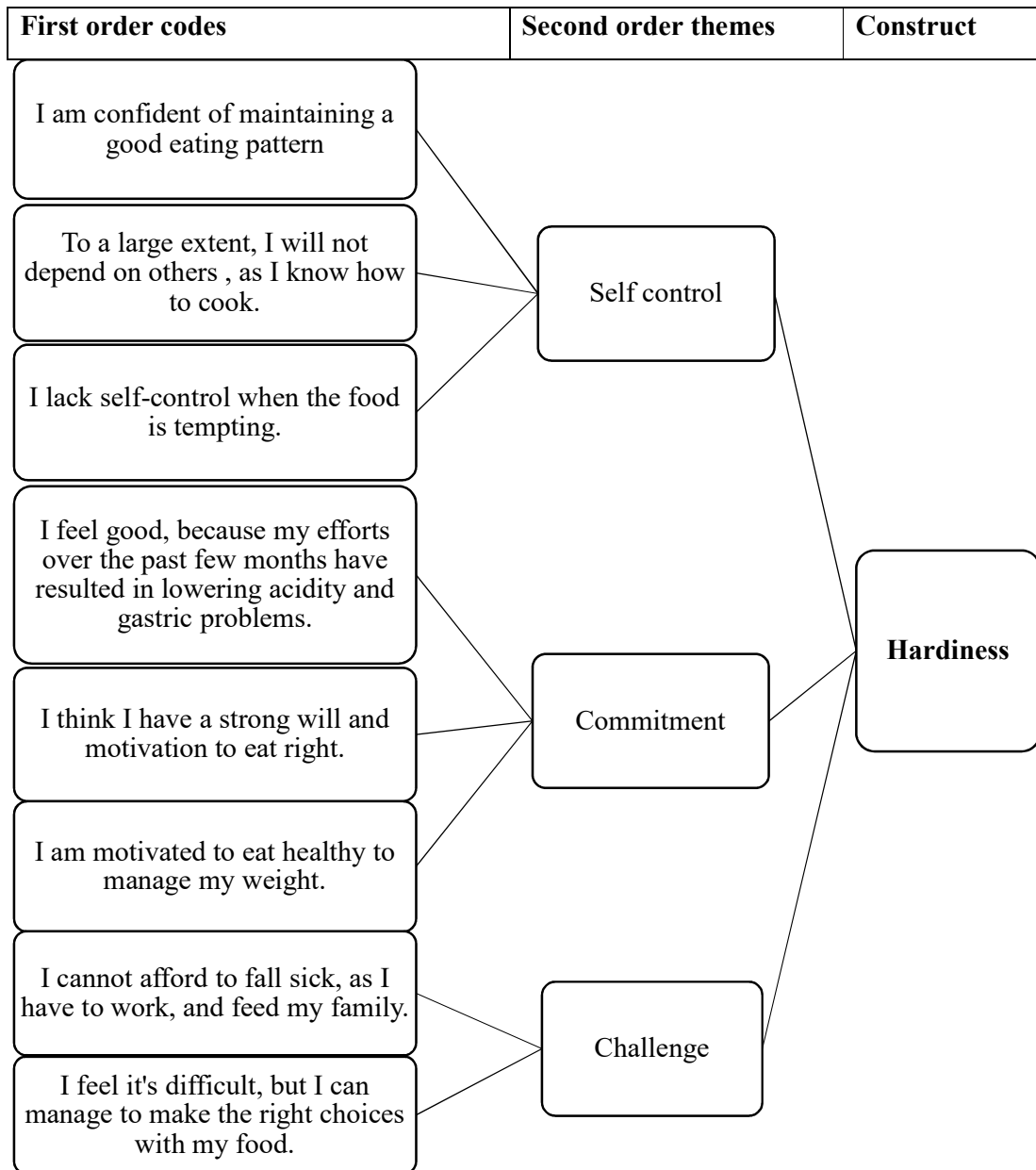
“I keep to meal timings most of the time. “

“I carry a tiffin with fruit to avoid snacking on biscuits.”

“I eat out only on weekends.”

Paying attention to situations can help a person to stay on track with dietary goals. Work schedules can get hectic for people engaged in jobs, causing them to lose track of meal timings and disrupt eating patterns. The timeliness of meal consumption is vital for regulating eating habits. Preventing situations where one is likely to eat foods that deviate from healthy eating can be helpful, as demonstrated in the statement where the respondent consciously tries to eat fruits instead of biscuits. The conscious effort by another respondent to eat out less frequently rather than regularly could reduce exposure to foods where one needs control over the nutritional content.

Figure 3.5: Statements coded under hardiness



Source: Researcher's compilation

### Interpretation of the statements coded under hardiness

The statements that reflected a locus of self-control, commitment to goals and values of healthy eating, and welcoming challenges as a normal part of life were coded under hardiness.

“I am confident of maintaining a good eating pattern.”

“To a large extent, I will not depend on others, as I know how to cook.”

“I lack self-control when the food is tempting.”

Self-control is a crucial component for hardiness. Having the power to control one's actions will likely result in setting eating-related goals for oneself and working towards achieving them. Self-control can aid in eating regulation because it can set specific goals, such as eating healthier foods or losing weight. The control aspect can also help an individual to resist tempting situations when eating. A person with high self-control is less likely to engage in unhealthy eating habits. Self-control is likely to help individuals take charge of the situation and ensure that they take control of their eating habits and not depend on others for their dietary needs. This was seen in the statement “I will not depend on others” By developing a strong sense of control, a person will be more likely to assume personal responsibility about what they eat and to achieve dietary goals.

“I feel good, because my efforts over the past few months have resulted in lowering acidity and gastric problems.”

“I think I have a strong will and motivation to eat right.”

“I am motivated to eat healthy, to manage my weight.”

Commitment is one of the three dimensions of hardiness, a personality trait that helps people to cope with stress and adversity. People who are high in commitment have a strong sense of purpose and values, and they are dedicated to their goals. This commitment can be helpful in controlling eating habits because of their motivation to do so. Motivated people who are committed to their health and well-being are more likely to make healthy eating choices. They are less likely to give in to unhealthy cravings or to make impulsive food decisions. Instead, they will stick to their healthy eating plan, even when difficult. People who are committed to their goals are more likely to persevere in the face of setbacks. They are not likely to give up on their healthy eating goals. People who are committed to their values are less likely to be influenced by external pressures. They will not eat unhealthy foods just because they are available or because their friends are eating them. Instead, they will stick to their healthy eating habits, even if it means saying no to others.

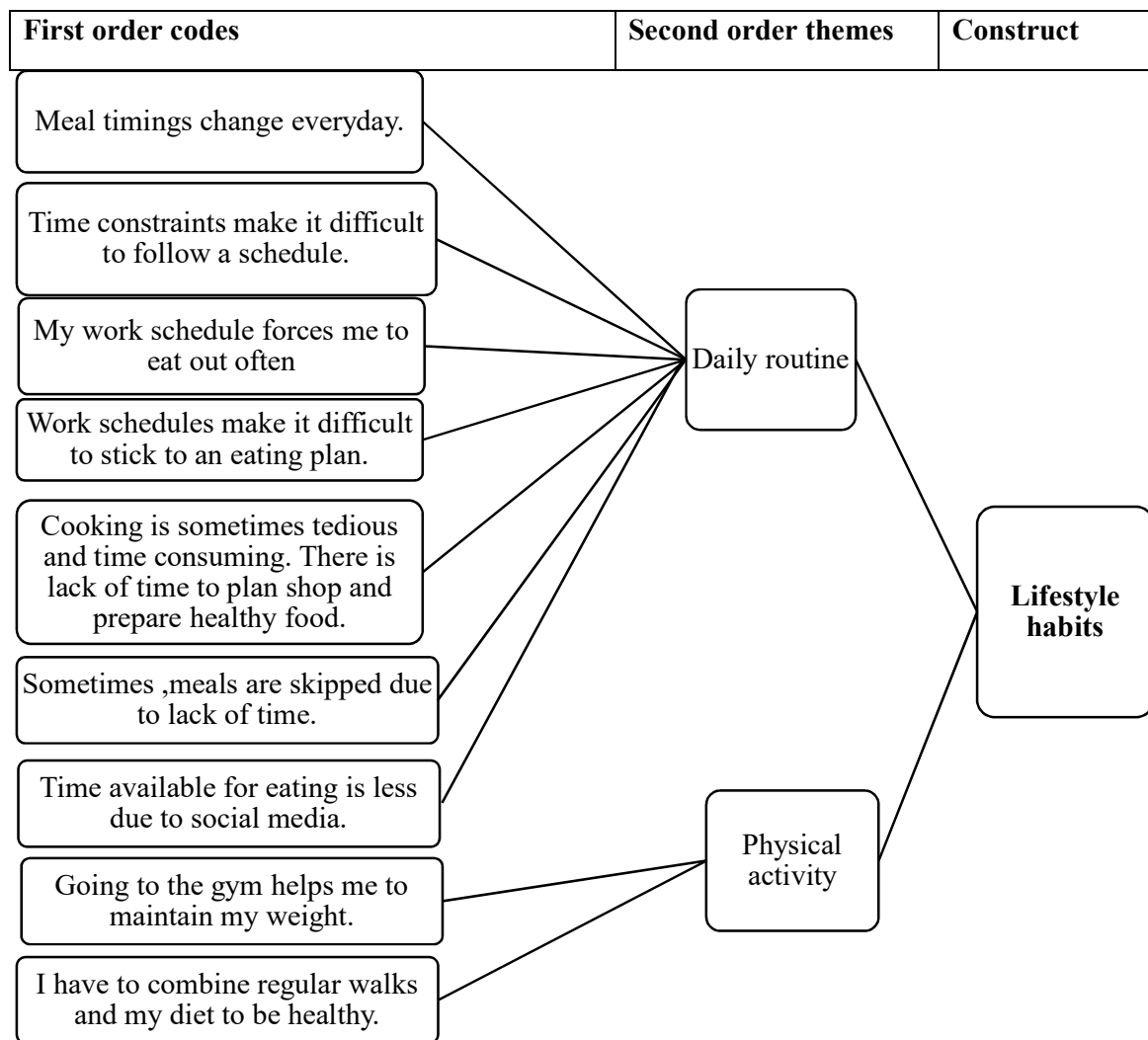
“I feel it's difficult, but I can manage to make the right choices with my food.”

“I cannot afford to fall sick, as I have to work, and feed my family.”

Another aspect of hardiness is challenge, where the individuals by their nature accept that life can be stressful, and it is important to persevere despite challenges. The individuals who can persist despite difficulties are less likely to be discouraged by setbacks. This can be helpful when trying to change eating habits, as there will inevitably be challenges along the way.

Hardy individuals may be able to stay focused on their dietary goals even in the face of adversity. This is important when trying to control eating habits, as there can be times when they feel like giving up. Hardy individuals may also be able to develop coping mechanisms for dealing with the emotional challenges of changing eating habits.

Figure 3.6: Statements coded under lifestyle habits



Source: Researcher's compilation

**Interpretation of the statements coded under lifestyle habits:**

Certain lifestyle practices that were expected to impact eating habits such as meal timings, availability of time to prepare meals, stressful situations that force individuals to alter eating habits were coded under lifestyle habits.

“Meal timings change every day.”

“Time constraints make it difficult to follow a schedule.”

“My work schedule forces me to eat out often.”

“Work schedules make it difficult to stick to an eating plan.”

“Cooking is sometimes tedious and time consuming.”

“Sometimes, meals are skipped due to lack of time.”

When meal timings are inconsistent, it can be difficult to regulate appetite and hunger. This is because bodies have a natural rhythm for eating and digesting food, and when this rhythm is disrupted, it can lead to overeating or undereating. Those who are short on time, may make unhealthy food choices because they are quick and convenient. They may also skip meals altogether, which can lead to hunger and cravings later on.

The statement “My work schedule forces me to eat out often” could mean that eating out can be a major contributor to unhealthy eating habits. Restaurant meals are often high in calories, fat, and sodium, and they can be low in nutrients. Additionally, an increased frequency of eating out can result in overeating, as there tends to be a lack of control of the portion sizes. The response “Work schedules make it difficult to stick to an eating plan” implies that when schedules are unpredictable, it can be difficult to stick to a healthy eating plan. This is because availability of time to cook healthy meals at home may be limited. Additionally, the temptation to eat unhealthy snacks or meals at work may be present, because they are easily available, or are more convenient.

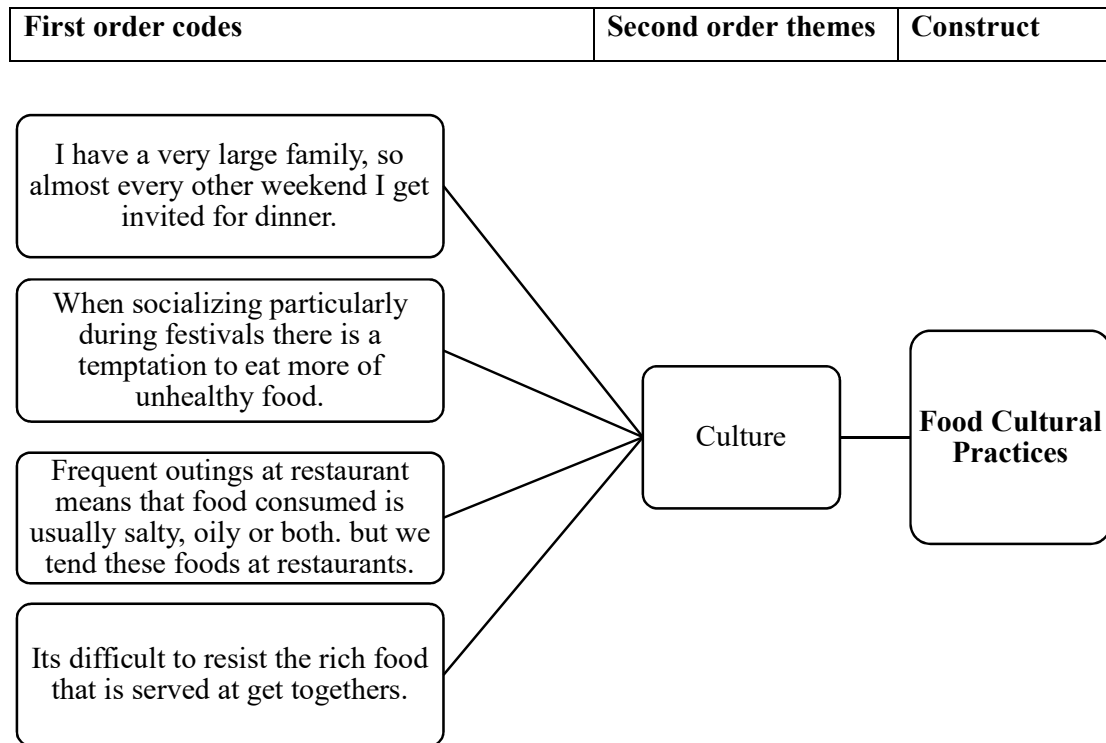
Another respondent mentioned “Cooking is sometimes tedious and time consuming.” Some individuals may experience the lack of time to plan shop and prepare healthy food. Cooking healthy meals can be time-consuming and challenging, especially if time is limited. This can lead to making unhealthy food choices or skipping meals altogether.

“Going to the gym helps me to maintain my weight”

“I have to combine regular walks and my diet to be healthy.”

The statements which mentioned about how going to the gym and regular walks help individuals to maintain their weight and be healthy indicate that lifestyle habits can play a significant role in overall health and well-being. When making healthy lifestyle choices, exercising regularly, and getting enough sleep, are more likely the habits which can result in maintaining a healthy weight and reduce the risk of chronic diseases.

Figure 3.7: Statements coded under food cultural practices



Source: Researcher's compilation

#### **Interpretation of the statements coded under food cultural practices:**

Cultural practices that impact the way in which food is consumed, social situations, get-togethers, and observances pertaining to food as a consequence of belonging to a community were coded under food cultural practices.

“I have a very large family. So almost every other weekend, I get invited for dinner.”.

“When socialising, particularly during festivals, there is a temptation to eat more of unhealthy foods.”

“Frequent outings at restaurants means that food consumed is usually salty, oily or both. But we tend to eat these foods at restaurants.”

“It is difficult to resist the rich food that is served at get-togethers.”

The underlying theme of culture emerged from the responses of the exploratory study. In most cultures, family dinners are a time for social bonding and connection. This is particularly true in Indian culture, where the concept of a joint family is quite common. This can lead to people eating more than they would if they were eating alone. Additionally, family dinners often feature traditional foods that are high in calories and fat. This can make it difficult to regulate eating when surrounded by these foods, and family or friends.

There is a tendency to eat a large quantity of unhealthy foods when socializing, as these foods are often seen as more indulgent and celebratory. For example, during festivals, it is common to eat foods that are high in sugar, fat, and calories. This is because these foods are often seen as a way to show hospitality and to celebrate special occasions. For example, it is common to serve cake, ice cream, and other sugary desserts at birthday parties.

The type of food served at community gatherings tends to have a wide variety, with an emphasis on taste and visual appeal. It is possible that this situation can cause people to serve large portions which can lead to overeating. In addition, it is customary to eat whatever is being offered at a family gathering or social gathering, to please the host of the event. This could lead to consume food in a larger quantity which may not be helpful in achieving healthy eating. There are other instances where the members of a joint family may compromise their own diets, and eat what is prepared for everyone else. The respondents mention “I have a health condition with many food restrictions, but it becomes inconvenient to cook a separate meal for me.”

The interviews unearthed factors that affect eating regulation, among which mindfulness, hardiness, lifestyle habits and culture emerged as significant factors. Mindfulness and lifestyle habits as factors affecting eating practices were concurrent with prior literature. The relationship of hardiness with eating regulation has not been found to be tested in prior research.

Measures for mindfulness, hardiness and lifestyle habits were adapted from the existing literature and used for the quantitative data collection.

The statements pertaining to cultural practices were classified as barriers of eating regulation. The food cultural practices construct was identified after exploratory interviews, as most respondents attributed eating-related practices to their prevalent food culture. The study focussed on the emergent construct of food culture and followed standard procedures



in scale development (Pervan et al., 2009). Upon further literature search, the measure for food cultural practices was not found. Therefore, the statements were used to develop a scale for the measurement of food culture practices as an independent construct. The procedures included construct domain specification, item pool reliability, validity, development, and validation of factor analysis, as elaborated below.

### 3.5.3 Food Cultural Practices Scale Development

The construct domain was specified with the exploratory interviews using questions about food practices influenced by one's culture. The responses from exploratory interviews were compiled, and a pool of items pertaining to food culture was generated to clarify the concept and assess food culture. The first order codes from the interviews were narrowed down into statements as follows:

Table 3.1 Statements used for food cultural practices scale development

| First order codes                                                                                     | Representative statements                                                                                |
|-------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| I tend to observe fasting on a regular basis. I follow it due to my religion.                         | 1. Fasting is one of the observances in my culture.                                                      |
| I fast on certain weekdays.                                                                           |                                                                                                          |
| Fasting is a practice in my family, but I don't observe it                                            |                                                                                                          |
| When socialising, particularly during festivals, there is a temptation to eat more of unhealthy foods | 2. A wide variety of food is served during festivals and celebrations in my culture.                     |
| We can forget who invited us, but we always remember the food that was served at the event.           |                                                                                                          |
| There are too many celebrations which I have to attend every now and then. I tend to overeat there.   |                                                                                                          |
| It is difficult to resist food at a family celebration.                                               | 3. In my culture, it is considered as rude when you refuse to eat food that is served to you as a guest. |
| It is difficult to resist the rich food that is served at get togethers.                              |                                                                                                          |
| It looks bad if we are invited to a celebration and don't eat well.                                   |                                                                                                          |

|                                                                                                                                                  |                                                                                                |
|--------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| I have a very large family. So almost every other weekend, I get invited for dinner.                                                             | 4. A lot of sweets and fried foods are served during festivals and celebrations in my culture. |
| Whenever we visit our friends for a festival, we are offered lots of sweets and fried foods rich in sugar and fats. You cannot refuse to eat it. |                                                                                                |
| We have to serve specific dishes at festivals. Otherwise, the meal is not complete.                                                              |                                                                                                |
| Frequent outings at restaurants means that food consumed is usually salty, oily or both. But we tend to eat these foods at restaurants.          |                                                                                                |

Source: Researcher's compilation

The items identified had a descriptive representation of practices related to food culture, leading to the operational definition of food cultural practices. Food cultural practices are representative of food related practices followed, owing to belonging to a culture/community.

### 3.5.4 Testing of the Food Cultural Practices Scale

#### Reliability and validity

Inter-rater reliability was done with the help of six reviewers (three members from academia, two diet consultants, and one nutritionist). A Fleiss Kappa coefficient of 0.68 indicated a substantial agreement (Landis & Koch, 1977). As part of content validity, the experts rated the statements for relevance, clarity, and simplicity, following which four statements were retained, and one item was dropped, as it was not specific and could cause multi-collinearity. Exploratory factor analysis was performed with the four items using IBM SPSS to identify factors further to assess food culture. The Kaiser-Meyer-Olkin (KMO) coefficient of 0.822 demonstrated the appropriateness of data for factor analysis (Beavers et al., 2013). Bartlett's test of sphericity indicated sufficient correlations required for factor analysis. Principal component analysis was used, and one component was extracted. The cumulative variance extracted was 67.27%. Convergent Validity tests reveal that the Average variance extracted was 0.672. The average variance extracted was higher than the square of correlations between other constructs, hence discriminant validity for the scale was established. Cronbach's alpha for item reliability was 0.724. Composite reliability was 0.818. After conducting the factor analysis, three statements with factor loadings above 0.50 (Hair et al.,

2014) were loaded onto a single factor. The statements retained for measuring food culture are shown in the final questionnaire. A five-point Likert scale from strongly agree to strongly disagree was used for receiving responses. Higher scores indicated agreement with the type of food cultural practices observed by an individual.

#### Food cultural practices scale initial statements

1. Fasting is one of the observances in my culture.
2. A wide variety of food is served during festivals and celebrations in my culture.
3. In my culture, it is considered as rude when you refuse to eat food that is served to you as a guest.
4. A lot of sweets and fried foods are served during festivals and celebrations in my culture.

Fasting was reported as a regular observance for many respondents. However, the item was dropped during content validity, as there was ambiguity in the observance of fasting for respondents. The fasting patterns were not consistent due to the diverse nature of the sample. This was confirmed with Cronbach's  $\alpha$  which increased from 0.671 to 0.724 after the statement regarding fasting was removed.

### 3.6 Quantitative Study

The data was collected between October 2019 and March 2020. The Google form link was shared online, requesting for consent to share information, explaining that the data collected was being used purely for research. Only those who agreed to share the information pertaining to their eating habits were considered eligible for the study. The questionnaire was completed with a valid response rate of 85%.

Table 3.2 Response rate for the questionnaire

| Questionnaires administered | Responses received | Invalid responses | Valid responses | Response rate percentage | Valid response rate percentage |
|-----------------------------|--------------------|-------------------|-----------------|--------------------------|--------------------------------|
| 800                         | 715                | 91                | 677             | 89                       | 85                             |

Source: Researcher's compilation

### **3.6.1 Techniques Used for Analysis**

The tests for normality, linearity, multi-collinearity and homoskedasticity were performed to satisfy the assumptions of linear regression as hypothesis testing was done using regression analysis in IBM SPSS software. The findings were used to arrive at the final model. Chi-square test was also used for descriptive analyses with demographic variables.

### **3.6.2 Questionnaire Development and Item Generation**

The use of a mixed methods study involved the analysis of the qualitative study, combined with a quantitative study. After examining the data from exploratory interviews, the study used an additional literature review. The second literature review matched the constructs from existing literature that reflected the behaviour demonstrated from the responses. Accordingly, measurement scales from previous studies were used for initial framing of the questionnaire. Four constructs with existing scales were identified. The theme of food culture resulted in an additional construct being used for analysis. The existing scales that were adapted to measure the four constructs are given below.

### **3.6.3 Eating Regulation**

The Self-Regulation of Eating Behaviour Questionnaire (SREBQ) (Kliemann et al., 2016) was adapted for this study. The questionnaire included items that assessed monitoring of one's eating habits and observing their salience, appraising the progress made towards dietary goals, and reviewing one's behaviour and adjusting if necessary. The scale items reflected the capacity to control one's thought, behaviour and attention towards healthy eating. The responses ranged on a 5-point Likert Scale from 1(Never) to 5 (Always). Two of the items were reverse coded.

### **3.6.4 Mindfulness**

The Mindfulness Attention and Awareness Scale/ MAAS (Brown & Ryan, 2003) was adapted for this study. While the original scale had 15 items, they had statements varying from situation specific statements (related to social engagement, driving, or eating) to general statements (I do jobs or tasks automatically, without being aware of what I'm doing). The items chosen were not connected to particular activities or experiences. Rather, only general statements that represented trait mindfulness were chosen. Previous research has tested the items for their relevance to distinguish between individuals who exhibit the

characteristic at different levels for mindfulness (Van Dam et al., 2010). Because it can be challenging to self-report mindless states, more generic items may perform better at differentiating between different trait levels (Smallwood et al., 2007). It might be simpler to respond to more general questions given that it is naturally difficult to self-report about states that one is unaware of. Respondents were asked to respond on a semantic differential scale of 1(never) to 5(always). The scoring of all items adapted were reversed, since all the statements were negative (e.g. “I rush through activities without being really attentive to them”). After reversing the scoring, high scores indicated high levels of mindfulness.

### **3.6.5 Hardiness**

The Occupational Hardiness scale (Moreno Jiménez et al., 2014) was adapted as a reliable and valid measure for hardiness. When adapting the scale, the statements were generalised to reflect the trait of hardiness. The scale that was originally developed was designed for employees to assess their occupational hardiness. It had statements pertaining to one’s occupation, which the experts during content validity suggested to change. e.g. From “In my job I feel attracted to tasks and situations involving a personal challenge.” to “I feel attracted to tasks and situations involving a personal challenge.”

This change was made for all items which had job-related and work-related aspects as part of the original statements. Survey respondents were asked to indicate on a Likert scale from 1(Strongly disagree) to 5(Strongly Agree) their agreement with the statements on hardiness. Higher scores were an indicator of higher levels of personal hardiness as an enabler for eating regulation.

### **3.6.6 Lifestyle Habits**

The Healthy Lifestyle and Personal Control Questionnaire / HLPCQ (Darviri et al., 2014) was adapted for the study. The original questionnaire was developed using 5 factors assessing healthy lifestyle. They included dietary health choices, dietary harm avoidance, daily routine, organized physical exercise and social and mental balance. Given that the present study had the central construct directly assessing eating habits, the factors pertaining to daily routine, organized physical activity and social and mental balance were used to measure lifestyle habits. The HLPCQ has been used as a reliable and valid measure to assess lifestyle in health research. As part of the questionnaire, response options indicated the

frequency of adopting positive lifestyle habits. The responses to the questionnaire items were ranked on a semantic differential scale from 1(Never) to 5 (Always).

### 3.6.7 Food Cultural Practices

The items for the Food cultural practices scale were developed from the exploratory study. The responses that were deemed relevant to eating regulation were included. A large number of respondents indicated that the occurrence of religious celebrations and festivals was a barrier in the maintenance of eating habits. Other respondents indicated certain observances in the culture and the type of food served at community gatherings as customary and difficult to avoid. The final scale had 3 items which indicated agreement on a Likert scale of 1(Strongly agree) to 5(Strongly disagree). All statements in the food cultural practices scale were interpreted as barriers to eating regulation. Higher scores on the food cultural practices scale were expected to impact eating regulation negatively.

### 3.6.8 Inter Rater Reliability

Since there were more than two experts chosen to rate the questionnaire for its reliability, the Fleiss Kappa statistic was used. Fleiss Kappa is a measure to assess the agreement between the raters of the questionnaire. Since it considers the agreement that can happen by chance, it is typically believed to be a more reliable measurement than a simple % agreement calculation. The value of kappa may range from -1 to +1. A kappa value of +1 denotes perfect agreement. A value of -1 denotes a perfect disagreement between raters. If kappa is assumed to be equal to 0, this means that there is no correlation between the observers' judgements and that any agreement or disagreement is caused purely by chance. Experts were asked to assign a construct to each of the statements, to ascertain the agreement between them. The raters were briefed about the operational definitions of the constructs, and the purpose of the study. They were asked to assign one construct out of eating regulation, mindfulness, hardiness, lifestyle habits and food culture. The following table represents the individual values for agreement between raters.

Table 3.3 Statistics for Inter-rater reliability

| Statistic               | Value   |
|-------------------------|---------|
| P bar                   | 0.75636 |
| Pe                      | 0.22129 |
| Fleis Kappa coefficient | 0.68713 |

Source: Researcher's compilation

The Fleiss Kappa coefficient of 0.68 indicated substantial agreement between raters, giving justification for including the items for the study.

### **3.6.9 Content Validity**

Content validity refers to the degree to which a test measures an intended area, and experts in the field are asked to judge whether the instrument is content valid in accordance with the researched theme.

#### **Methodology for content validity:**

There were 6 experts with a minimum professional experience of 15 years (3 academicians and 3 practising dieticians) who were requested to review the statements based on Relevance, Clarity and Simplicity of the content in each of the dimensions. In the rating sheet the expert was required to rate the Relevance, Clarity, Simplicity for all the statements in the questionnaire:

The ratings were given as follows:

- 1- not relevant
- 2- item needs some revision
- 3- relevant but needs minor revision
- 4- very relevant

The following benchmarks were used

I-CVI (Item level Content Validity Index) acceptable values :

Items having more than 0.83 for Relevance, Clarity or Simplicity were retained in the scale.

S-CVI (Scale level Content Validity Index) acceptable values :

0.90 and above indicate excellent scale level content validity

After receiving the ratings from reviewers, CVI was calculated as follows:

After assessing the content validity in terms of relevance, clarity and simplicity, it was found that the items chosen for the study had acceptable values of 0.8 and above for I-CVI, and S-CVI values of above 0.90 and therefore, items having more than 0.83 for Relevance, Clarity or Simplicity were retained in the scale. (Polit & Beck, 2006).

After receiving the ratings from reviewers, CVI was calculated as follows:

Table 3.4 Content validity for the questionnaire

| <b>RELEVANCE</b> |                   |             |           |                         |           |
|------------------|-------------------|-------------|-----------|-------------------------|-----------|
|                  | Eating Regulation | Mindfulness | Lifestyle | Food Cultural practices | Hardiness |
| Scale CVI/AVE    | 0.99              | 1.00        | 1.00      | 1.00                    | 1.00      |
| Total agreement  | 5.00              | 7.00        | 13.00     | 4.00                    | 15.00     |
| S-CVI/UA         | 0.93              | 1.00        | 1.00      | 1.00                    | 1.00      |

| <b>CLARITY</b>  |                   |             |           |                         |           |
|-----------------|-------------------|-------------|-----------|-------------------------|-----------|
|                 | Eating Regulation | Mindfulness | Lifestyle | Food Cultural practices | Hardiness |
| Scale CVI/AVE   | 0.98              | 1.00        | 1.00      | 1.00                    | 1.00      |
| Total agreement | 5.00              | 7.00        | 12.00     | 4.00                    | 15.00     |
| S-CVI/UA        | 0.93              | 1.00        | 0.85      | 0.97                    | 0.86      |

| <b>SIMPLICITY</b> |                   |             |           |                         |           |
|-------------------|-------------------|-------------|-----------|-------------------------|-----------|
|                   | Eating Regulation | Mindfulness | Lifestyle | Food Cultural practices | Hardiness |
| Scale CVI/AVE     | 0.98              | 0.98        | 1.00      | 1.00                    | 0.97      |
| Total agreement   | 5.00              | 6.00        | 14.00     | 4.00                    | 13.00     |
| S-CVI/UA          | 0.93              | 0.85        | 1.00      | 0.71                    | 0.86      |

Source: Researcher's compilation



A total of 45 items were used for the final questionnaire after Inter-rater reliability and content validity was completed.

### 3.6.10 Final Questionnaire

Table 3.5 Construct wise scale items used for the questionnaire

| Sr. no. | Construct                | Scale item                                                                                                     | Reference             |
|---------|--------------------------|----------------------------------------------------------------------------------------------------------------|-----------------------|
| 1       | <b>Eating regulation</b> | I get easily distracted from the way I intend to eat.                                                          | Kliemann et al., 2016 |
| 2       |                          | Whenever I feel that my diet needs to improve, I make changes.                                                 | Kliemann et al., 2016 |
| 3       |                          | I can remember what I have eaten throughout the day.                                                           | Kliemann et al., 2016 |
| 4       |                          | I can resist the foods that I find unhealthy.                                                                  | Kliemann et al., 2016 |
| 5       |                          | I give up too easily on my eating intentions.                                                                  | Kliemann et al., 2016 |
| 6       | <b>Mindfulness</b>       | I find it difficult to stay focused on what's happening in the present.                                        | Brown & Ryan, 2003    |
| 7       |                          | It seems like I am running on automatic without much awareness of what I am doing.                             | Brown & Ryan, 2003    |
| 8       |                          | I rush through activities without being really attentive to them.                                              | Brown & Ryan, 2003    |
| 9       |                          | I get so focused on the goal I want to achieve, that I lose touch with what I am doing right now to get there. | Brown & Ryan, 2003    |
| 10      |                          | I do Jobs or tasks automatically without taking notice of what I'm doing.                                      | Brown & Ryan, 2003    |
| 11      |                          | I find myself preoccupied with the future or the past.                                                         | Brown & Ryan, 2003    |
| 12      |                          | I find myself doing things without paying attention.                                                           | Brown & Ryan, 2003    |

|    |                  |                                                                                                     |                             |
|----|------------------|-----------------------------------------------------------------------------------------------------|-----------------------------|
| 13 | <b>Hardiness</b> | I involve myself seriously in what I do.                                                            | Moreno Jiménez et al., 2014 |
| 14 |                  | I consider the work that I do is of value to society                                                | Moreno Jiménez et al., 2014 |
| 15 |                  | I identify myself with my work.                                                                     | Moreno Jiménez et al., 2014 |
| 16 |                  | I do not mind putting all my efforts in the work that I do.                                         | Moreno Jiménez et al., 2014 |
| 17 |                  | My daily work satisfies me.                                                                         | Moreno Jiménez et al., 2014 |
| 18 |                  | My own enthusiasm makes me go ahead with the completion of any activity.                            | Moreno Jiménez et al., 2014 |
| 19 |                  | I do everything I can to make sure I control the results of my work.                                | Moreno Jiménez et al., 2014 |
| 20 |                  | Things are only obtained from personal effort.                                                      | Moreno Jiménez et al., 2014 |
| 21 |                  | The control of situations is the only thing that ensures success.                                   | Moreno Jiménez et al., 2014 |
| 22 |                  | Things go well when you prepare for them thoroughly.                                                | Moreno Jiménez et al., 2014 |
| 23 |                  | When you work seriously and thoroughly, you control the results.                                    | Moreno Jiménez et al., 2014 |
| 24 |                  | Even when it requires greater effort, I choose to do things that represent a new experience for me. | Moreno Jiménez et al., 2014 |
| 25 |                  | I am mainly attracted to innovations and novelties in procedures.                                   | Moreno Jiménez et al., 2014 |
| 26 |                  | I feel attracted to tasks and situations involving a personal challenge.                            | Moreno Jiménez et al., 2014 |
| 27 |                  | To the extent I can, I try to have new experiences in my daily activities.                          | Moreno Jiménez et al., 2014 |

|    |                                |                                                                                    |                             |
|----|--------------------------------|------------------------------------------------------------------------------------|-----------------------------|
| 28 |                                | When possible, I look for new and different situations in my daily life.           | Moreno Jiménez et al., 2014 |
| 29 | <b>Lifestyle habits</b>        | I exercise continuously for 20 minutes at least 3 times per week.                  | Darviri et al.,2014         |
| 30 |                                | I exercise in an organized manner.                                                 | Darviri et al.,2014         |
| 31 |                                | I go to a gym/yoga session / structured physical training                          | Darviri et al.,2014         |
| 32 |                                | I get adequate physical exercise for my body.                                      | Darviri et al.,2014         |
| 33 |                                | I make sure that I sleep at the same time each day.                                | Darviri et al.,2014         |
| 34 |                                | I follow a scheduled program for my daily activities.                              | Darviri et al.,2014         |
| 35 |                                | I get at least 6-7 hours of sound sleep everyday                                   | Darviri et al.,2014         |
| 36 |                                | I concentrate on positive thoughts during difficulties.                            | Darviri et al.,2014         |
| 37 |                                | I express my feelings freely                                                       | Darviri et al.,2014         |
| 38 |                                | I feel that I have a good balance of time between work, personal life and leisure. | Darviri et al.,2014         |
| 39 |                                | I feel that I am mentally relaxed.                                                 | Darviri et al.,2014         |
| 40 |                                | I take time out for relaxation.                                                    | Darviri et al.,2014         |
| 41 |                                | I share my personal problems and worries with others.                              | Darviri et al.,2014         |
| 42 |                                | I ensure that I keep in touch and have regular contact with my relatives /friends. | Darviri et al.,2014         |
| 43 | <b>Food cultural practices</b> | A wide variety of food is served during festivals and celebrations in my culture.  | Exploratory study           |

|    |  |                                                                                                       |                   |
|----|--|-------------------------------------------------------------------------------------------------------|-------------------|
| 44 |  | In my culture, it is considered as rude when you refuse to eat food that is served to you as a guest. | Exploratory study |
| 45 |  | A lot of sweets and fried foods are served during festivals and celebrations in my culture.           | Exploratory study |

Source: Researcher's compilation

### 3.6.11 Quantitative Study Data Collection

The research used SPSS software to test the assumptions for performing regression analysis. An attempt was made to recruit respondents across diverse age groups, family status, occupations, weight status, vegetarians, non-vegetarians, alcohol consumers, and non-alcohol consumers. Participants were assured of the confidentiality of the data. No participant was identifiable in any of the data collected. Case numbers replaced all names in the study. Upon testing the regression assumptions, the study administered the survey to 800 respondents which produced 677 valid responses.

### 3.6.12 Assessing Internal Consistency of Items

The Cronbach's alpha coefficient assesses the internal consistency or reliability of a set of survey items. This statistic determines whether a group of items consistently assesses the same attribute. It is a frequently used statistic when developing and evaluating a new survey or evaluation tool. The Cronbach's alpha for the 45-item questionnaire was 0.895, indicating good reliability. The individual Cronbach's alpha for each measure were as follows:

Eating regulation(5 items): 0.741 (acceptable reliability)

Mindfulness (7 items): 0.855 (good reliability)

Hardiness (16 items): 0.887 (good reliability)

Lifestyle habits (14 items): 0.894 (good reliability)

Food cultural practices (3 items): 0.724 (acceptable reliability)

# Chapter 4

## Data Analysis and Results

This chapter starts with the sample description. Further, it gives descriptive statistics. It then proceeds to state how the study met assumptions for regression analysis, as linear regression analysis was used to test the hypotheses. The regression tables give the testing of hypotheses. Each regression table is followed by an interpretation of the results.

### 4.1 Sample Description

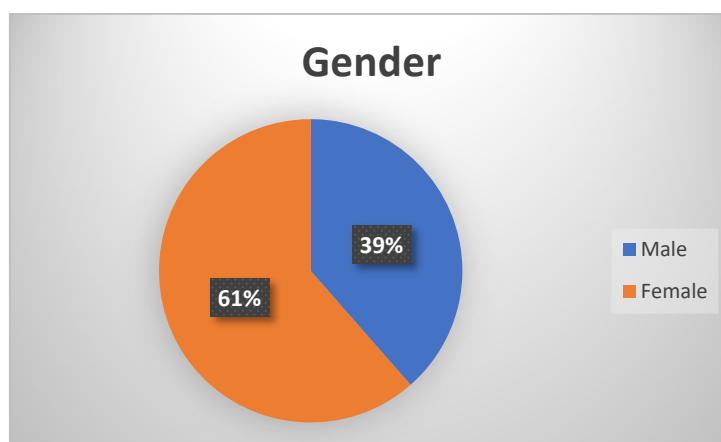
800 respondents participated in an online survey that assessed mindfulness, lifestyle habits, food cultural practices, and eating regulation. The inclusion criteria for participation were a minimum age of 18 having access to the internet. The researcher took informed consent from all respondents to answer the survey. Out of 764 responses received, 715 were complete, indicating an overall response rate of 89%. In the final sample, the study considered 677 responses valid. 38 responses were deleted (33 due to having more than 5% answers with missing values, 4 responses were outliers and dropped during data cleaning, and 1 respondent seemed unengaged, as evidenced by giving the same response for every single item.)

Table 4.1 Gender of the respondents

| Gender | N   | %      |
|--------|-----|--------|
| Male   | 261 | 38.60% |
| Female | 416 | 61.40% |
| TOTAL  | 677 | 100%   |

Source: Researcher's compilation

Figure 4.1: Gender of the respondents



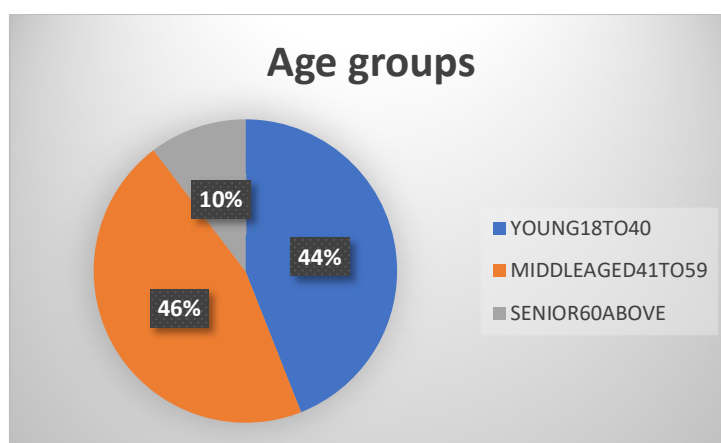
Source: Researcher's compilation

Table 4.2 Age groups of the respondents

| Age Groups             | N   | %      |
|------------------------|-----|--------|
| Young (18 to 40)       | 298 | 44.00% |
| Middle-aged (41 to 59) | 309 | 45.60% |
| Senior (60 and above)  | 70  | 10.30% |

Source: Researcher's compilation

Figure 4.2: Age groups of the respondents



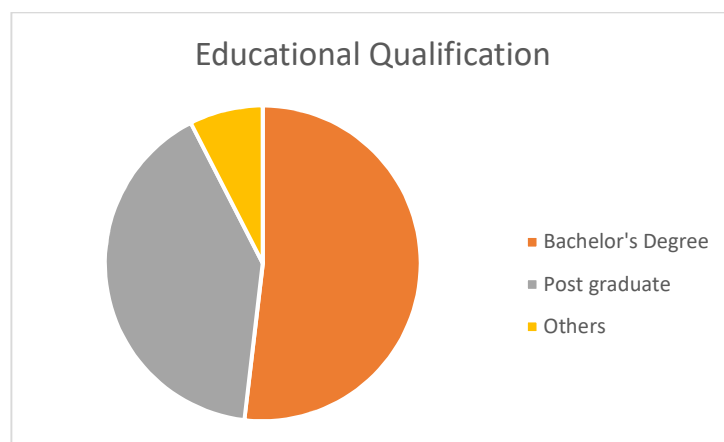
Source: Researcher's compilation

Table 4.3 Educational qualifications of the respondents

| <b>Educational Qualification</b> | <b>N</b> | <b>%</b> |
|----------------------------------|----------|----------|
| Bachelor's Degree                | 351      | 51.80%   |
| Post-graduate                    | 275      | 40.60%   |
| Others                           | 51       | 7.50%    |

Source: Researcher's compilation

Figure 4.3: Educational qualifications of the respondents



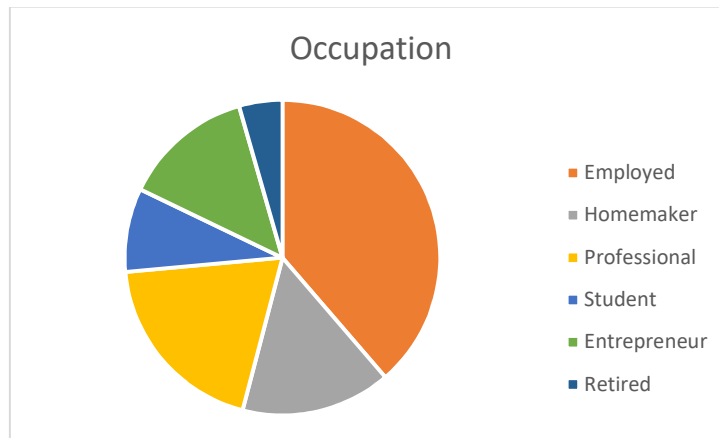
Source: Researcher's compilation

Table 4.4 Occupation of the respondents

| <b>Occupation</b> | <b>N</b> | <b>%</b> |
|-------------------|----------|----------|
| Employed          | 262      | 38.70%   |
| Homemaker         | 104      | 15.40%   |
| Professional      | 132      | 19.50%   |
| Student           | 58       | 8.60%    |
| Entrepreneur      | 91       | 13.40%   |
| Retired           | 30       | 4.40%    |

Source: Researcher's compilation

Figure 4.4: Occupation of the respondents



Source: Researcher's compilation

#### 4.1.1 Sample Description and Interpretation

The sample of 677 respondents had 39% males and 61% females. 44% of respondents were 18 to 40, 46% aged 41 to 59 , and 10% were aged above 70.

52 % of respondents had a bachelor's degree, 41% were post-graduates, and 7 % had educational qualifications below graduate level. 86% had a bachelor's degree or higher, whereas 14% had completed high school education. 39% of participants in the research were employed, 33% were professionals and self-employed, 20% were homemakers and retired, and 9% were students.

## 4.2 Descriptive Statistics

Chi-square analysis is used as a technique for descriptive analysis. Though the analysis was conducted with all the demographic variables, the study has explained those results, which were found to be significant.



### 4.2.1 Chi-square Statistics

Table 4.5 Chi-square associations between Gender and Eating regulation

| Particulars |        |                 | Eating regulation |        | Total | Chi-Square Tests |         |
|-------------|--------|-----------------|-------------------|--------|-------|------------------|---------|
|             |        |                 | LOW               | HIGH   |       | Value            | p-Value |
| Gender      | Male   | % within Gender | 32.20%            | 67.80% | 100%  | 5.718            | 0.01*** |
|             | Female | % within Gender | 23.80%            | 76.20% | 100%  |                  |         |
|             | Total  | % within Gender | 27.00%            | 73.00% | 100%  |                  |         |

\*\*\*significant at 99% level of confidence

Source: Researcher's compilation

Table 4. 6 Chi-square associations between Family type and Lifestyle habits

| Particulars |         |                      | Lifestyle habits |        | Total | Chi-Square Tests |         |
|-------------|---------|----------------------|------------------|--------|-------|------------------|---------|
|             |         |                      | LOW              | HIGH   |       | Value            | p-Value |
| Family type | Nuclear | % within family type | 44.50%           | 55.50% | 100%  | 6.081            | 0.04**  |
|             | Joint   | % within family type | 52.90%           | 47.10% | 100%  |                  |         |
|             | Total   | % within family type | 46.20%           | 53.80% | 100%  |                  |         |

\*\* significant at 95% level of confidence

Source: Researcher's compilation

Table 4.7 Chi-square associations between age groups and lifestyle habits

| Particulars |                  |                     | Lifestyle habits |        | Total | Chi-Square Tests |         |
|-------------|------------------|---------------------|------------------|--------|-------|------------------|---------|
|             |                  |                     | LOW              | HIGH   |       | Value            | P-Value |
| Age groups  | Young (18 to 40) | % within age groups | 56.00%           | 44.00% | 100%  | 7.273            | 0.02**  |
|             | Middle aged      | % within age groups | 46.00%           | 54.00% | 100%  |                  |         |

\*\* significant at 95% level of confidence

Source: Researcher's compilation

Table 4.8 Chi-square associations between age groups and mindfulness

| Particulars |                           |                     | Mindfulness |        | Total | Chi-Square Tests |         |
|-------------|---------------------------|---------------------|-------------|--------|-------|------------------|---------|
|             |                           |                     | LOW         | HIGH   |       | Value            | p-Value |
| Age groups  | Young (18 to 40)          | % within age groups | 56.70%      | 43.30% | 100%  | 14.75            | 0.01*** |
|             | Middle aged (41 to 59)    | % within age groups | 46.90%      | 53.10% | 100%  |                  |         |
|             | Senior Citizen (Above 60) | % within age groups | 32.90%      | 67.10% | 100%  |                  |         |

\*\*\*significant at 99% level of confidence

Source: Researcher's compilation

## 4.2.2 Chi-square Statistics Interpretation

The chi-square tests revealed significant associations between:

Gender & eating regulation: Within females, 76% reported higher levels of eating regulation when compared to males, where 68% of men had high levels of eating regulation.

Family type (nuclear/joint family) & lifestyle habits: 55% of respondents from a nuclear family reported good lifestyle habits as compared to 47% who belonged to a joint family.

Age group & lifestyle habits: 56 % senior citizens surveyed had good levels of lifestyle habits as compared to 44% of young people who reported good levels of lifestyle habits.

Age group & mindfulness: A significantly higher percentage(67%) from the senior citizens' group reported higher levels of mindfulness compared to their younger counterparts who had 43 % of respondents who had high mindfulness.

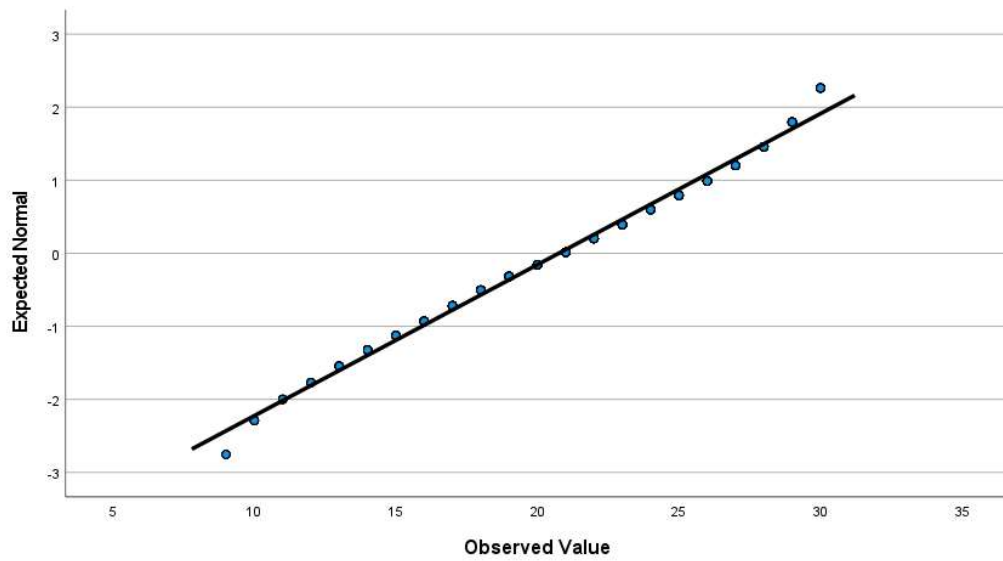
### **4.3 Regression Assumption Testing**

Prior to regression analysis, the data must meet the regression assumptions, namely normality, linearity, multi-collinearity, and homoskedasticity. These tests were first conducted on the data before proceeding with regression analysis.

#### **4.3.1 Normality Test**

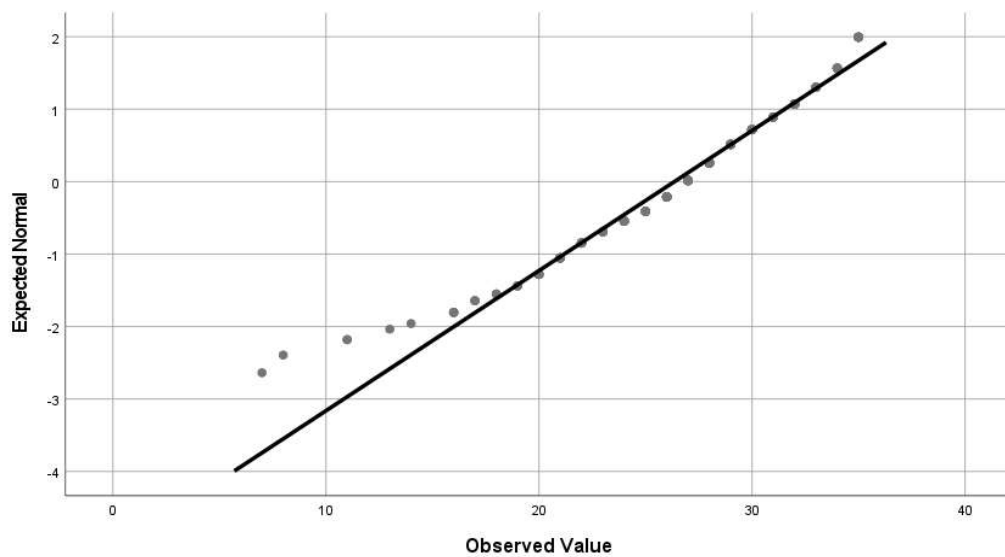
The study used a normal probability plot to assess normality. The data are plotted against a theoretical normal distribution so that the points should form an approximate straight line. Departures from this straight line indicate departures from normality. In the normal Predicted Probability (P-P) plot, the residuals are said to be normally distributed if they conform to the diagonal normality line. Osborne and Waters (2002) state that regression assumes the variables to have normal distributions. However, it has been emphasised that only the assumption of normally distributed errors is relevant to regression (Williams et al., 2013). The distributions were generated for each of the constructs. The vertical axis represents the expected normal order statistic medians, whereas the horizontal axis represents the observed values of the dataset.

Figure 4.5: Normality plot for eating regulation



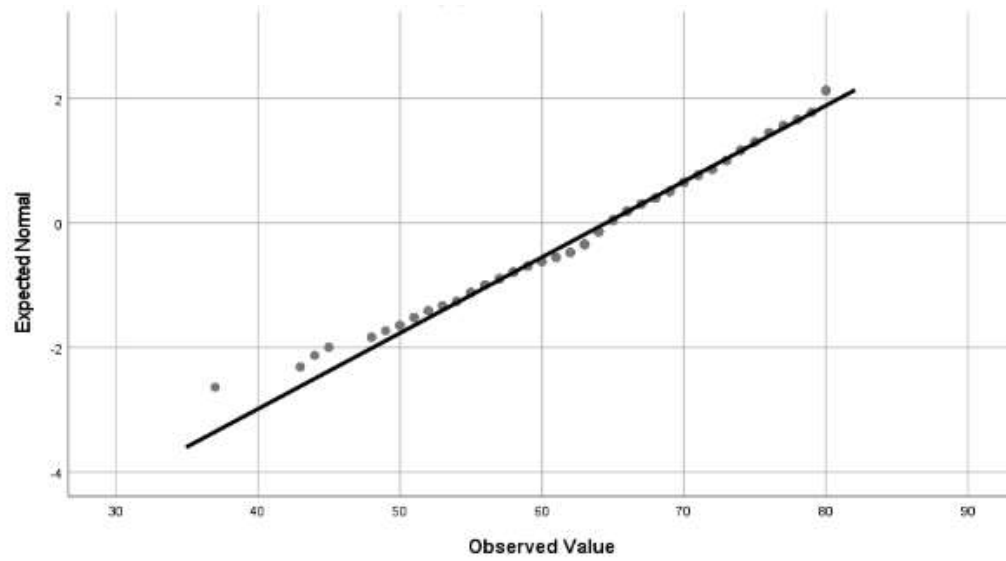
Source: Researcher's compilation

Figure 4.6: Normality plot for mindfulness



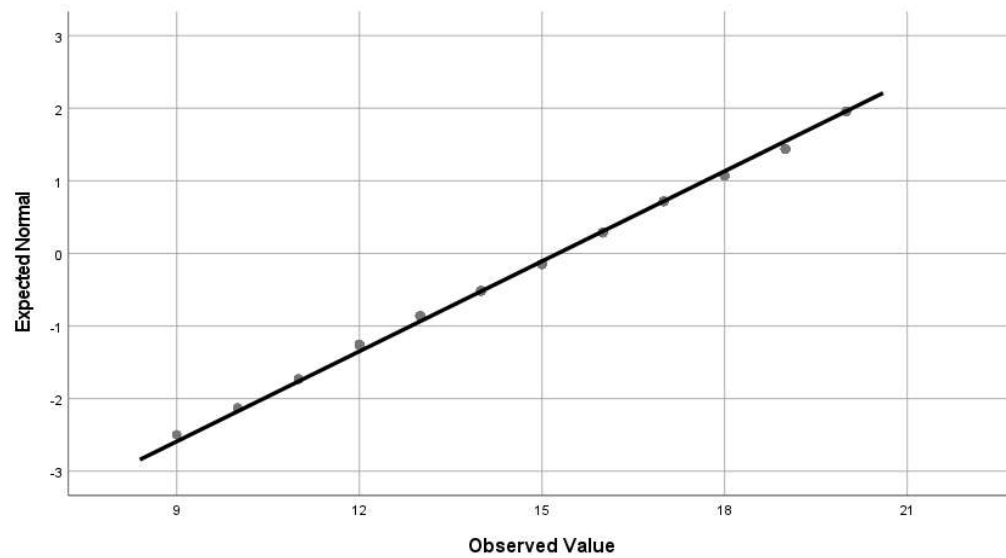
Source: Researcher's compilation

Figure 4.7: Normality plot for hardness



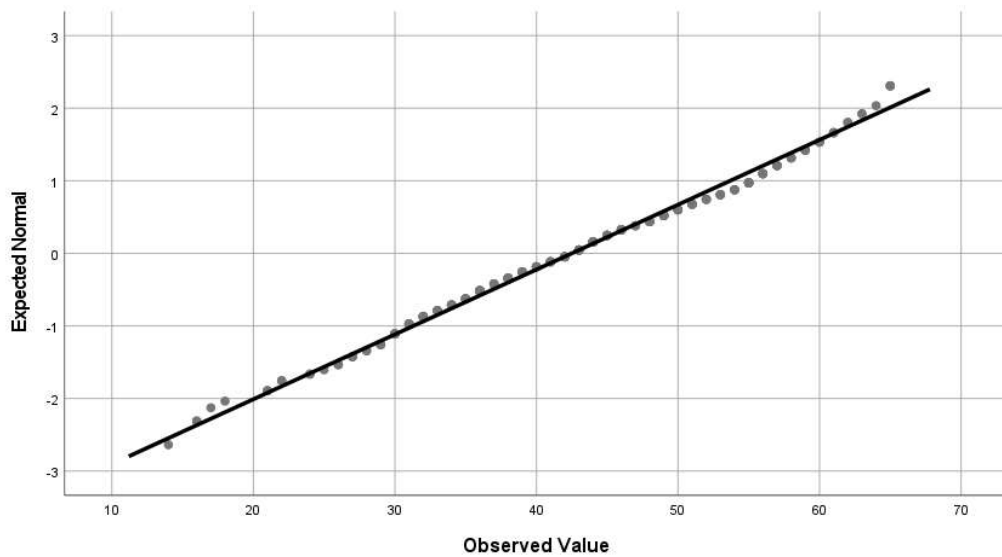
Source: Researcher's compilation

Figure 4.8: Normality plot for food cultural practices



Source: Researcher's compilation

Figure 4.9: Normality plot for lifestyle habits



Source: Researcher's compilation

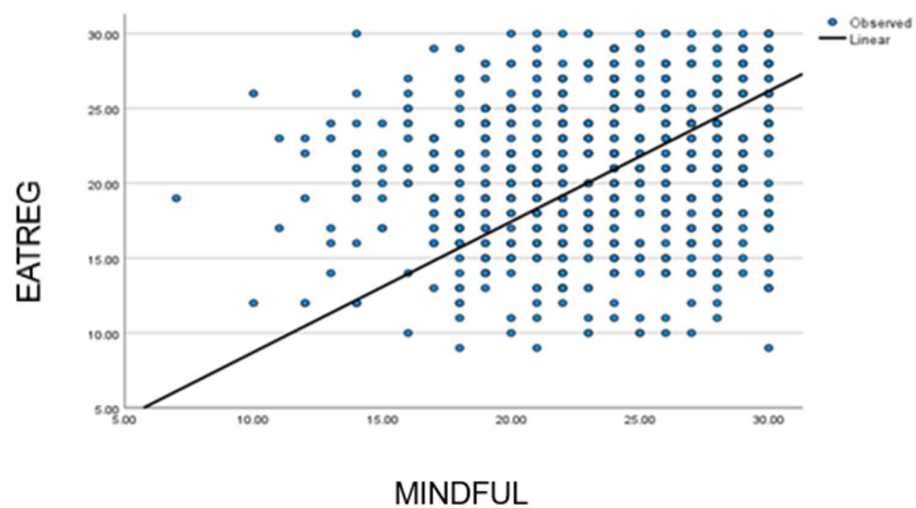
### **Interpretation:**

The probability plots in the figures above, show that the residuals follow a normal distribution. Hence, it is concluded that the assumption of normality is met since there are no drastic deviations.

### **4.3.2 Linearity Test**

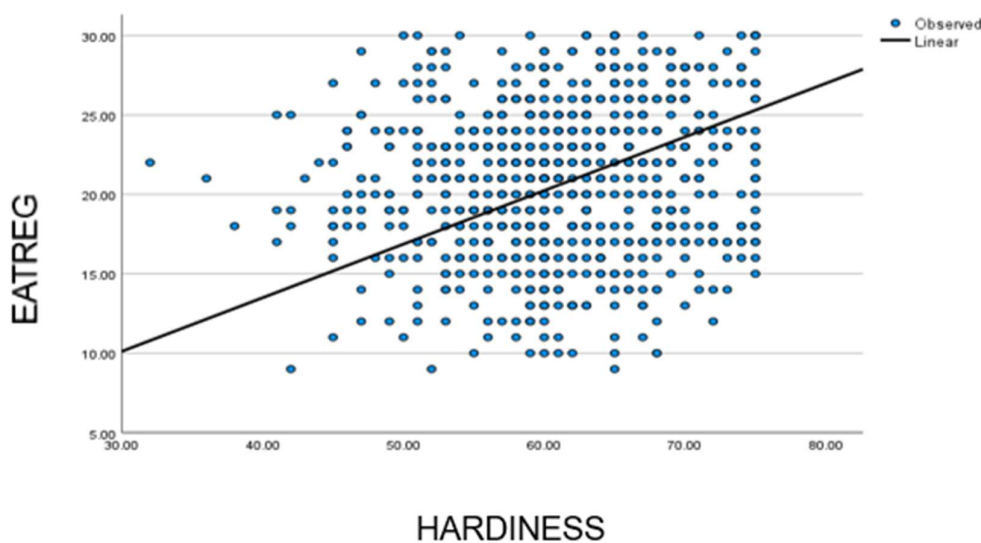
A Linearity test aims to determine whether the relationship between independent variables and the dependent variable is linear or not. The linearity test is a requirement in the correlation and linear regression analysis. In a regression model, there should be a linear relationship between the independent variable and the dependent variable. The following are the results of testing linearity between the dependent variable, Eating regulation, and the independent variables: Mindfulness, Hardiness, Food culture, and Lifestyle habits.

Figure 4.10: Linearity test for mindfulness



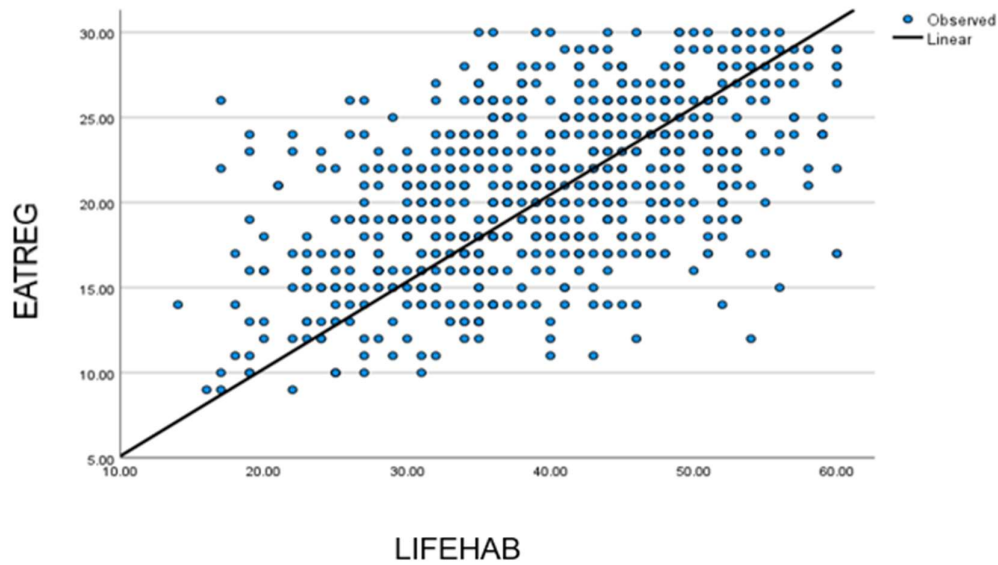
Source: Researcher’s compilation

Figure 4.11: Linearity test for hardiness



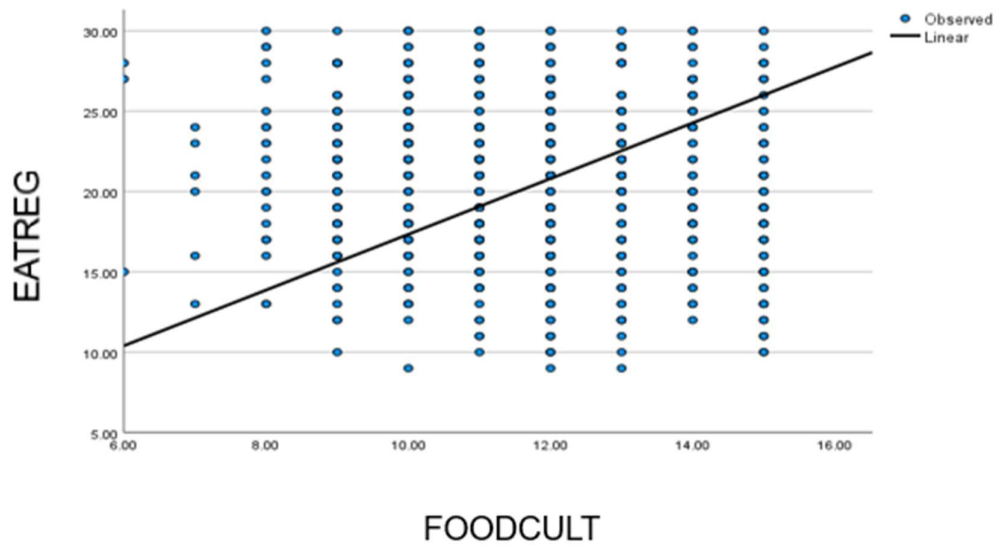
Source: Researcher’s compilation

Figure 4.12: Linearity test for lifestyle habits



Source: Researcher's compilation

Figure 4.13: Linearity test for food cultural practices



Source: Researcher's compilation

### Interpretation:

The study concluded that predictor variables (mindfulness, hardiness, food culture and lifestyle habits) in the regression have a straight-line relationship with the outcome variable (eating regulation), thereby fulfilling the second assumption of linear regression.



### 4.3.3 Absence of Multi-collinearity

Multi-collinearity refers to when the predictor variables are highly correlated with each other. In severe cases (such as a perfect correlation between two or more predictors), multi-collinearity can mean that no unique least squares solution to a regression analysis can be computed (Williams et al., 2013). This assumption of linear regression must be met before proceeding with further analysis. To confirm the absence of multi-collinearity, the Variance Inflation Factor (VIF) should be  $<10$ , indicating that there is no multi-collinearity between the variables. To test for multi-collinearity, each independent variable is replaced as a dependent variable and tested against other variables individually. Given below are the results of the testing for multi-collinearity. The constructs tested as dependent variables in order were mindfulness, hardiness, lifestyle habits, and food cultural practices.

Table 4.9 Collinearity statistics for mindfulness

| Coefficients |          |                         |       |
|--------------|----------|-------------------------|-------|
| Model        |          | Collinearity Statistics |       |
|              |          | Tolerance               | VIF   |
| 1            | Hard     | 0.972                   | 1.029 |
|              | Life     | 0.852                   | 1.173 |
|              | Foodcult | 0.87                    | 1.149 |

Dependent Variable: Mindfulness

| Collinearity Diagnostics |           |            |                 |                      |      |      |          |
|--------------------------|-----------|------------|-----------------|----------------------|------|------|----------|
| Model                    | Dimension | Eigenvalue | Condition Index | Variance Proportions |      |      |          |
|                          |           |            |                 | (Constant)           | Hard | Life | Foodcult |
| 1                        | 1         | 3.859      | 1.000           | 0.00                 | 0.00 | 0.00 | 0.01     |
|                          | 2         | 0.107      | 6.014           | 0.01                 | 0.02 | 0.01 | 0.92     |
|                          | 3         | 0.027      | 12.026          | 0.04                 | 0.11 | 0.96 | 0.07     |
|                          | 4         | 0.008      | 22.097          | 0.94                 | 0.87 | 0.03 | 0.00     |

Dependent Variable: Mindfulness

Source: Researcher's compilation

Table 4.10 Collinearity statistics for hardiness

| Coefficients |          |                         |       |
|--------------|----------|-------------------------|-------|
| Model        |          | Collinearity Statistics |       |
|              |          | Tolerance               | VIF   |
| 1            | Life     | .822                    | 1.217 |
|              | Foodcult | .871                    | 1.149 |
|              | Mind     | .938                    | 1.066 |

Dependent Variable: Hardiness

Collinearity Diagnostics

| Model | Dimension | Eigenvalue | Condition | Variance Proportions |      |          |      |
|-------|-----------|------------|-----------|----------------------|------|----------|------|
|       |           |            | Index     | (Constant)           | Life | Foodcult | Mind |
| 1     | 1         | 3.831      | 1.000     | 0.00                 | 0.00 | 0.01     | 0.00 |
|       | 2         | 0.115      | 5.763     | 0.01                 | 0.00 | 0.79     | 0.07 |
|       | 3         | 0.044      | 9.374     | 0.00                 | 0.47 | 0.20     | 0.28 |
|       | 4         | 0.010      | 19.387    | 0.99                 | 0.53 | 0.00     | 0.65 |

Dependent Variable: Hardiness

Source: Researcher's compilation

Table 4.11 Collinearity statistics for lifestyle habits

| Coefficients |          |                         |       |
|--------------|----------|-------------------------|-------|
| Model        |          | Collinearity Statistics |       |
|              |          | Tolerance               | VIF   |
| 1            | Foodcult | 0.989                   | 1.011 |
|              | Mind     | 0.986                   | 1.015 |
|              | Hard     | 0.984                   | 1.016 |

Dependent Variable: Lifestyle

Collinearity Diagnostics

| Model | Dimension | Eigenvalue | Condition | Variance Proportions |          |      |      |
|-------|-----------|------------|-----------|----------------------|----------|------|------|
|       |           |            | Index     | (Constant)           | Foodcult | Mind | Hard |
| 1     | 1         | 3.842      | 1.000     | 0.00                 | 0.01     | 0.00 | 0.00 |
|       | 2         | 0.122      | 5.613     | 0.00                 | 0.92     | 0.04 | 0.01 |
|       | 3         | 0.03       | 11.324    | 0.02                 | 0.06     | 0.70 | 0.20 |
|       | 4         | 0.006      | 24.411    | 0.98                 | 0.01     | 0.25 | 0.79 |

Dependent Variable: Lifestyle habits

Source: Researcher's compilation

Table 4.12 Collinearity statistics for food cultural practices

| Coefficients |      |                         |       |
|--------------|------|-------------------------|-------|
| Model        |      | Collinearity Statistics |       |
|              |      | Tolerance               | VIF   |
| 1            | Mind | 0.935                   | 1.070 |
|              | Hard | 0.969                   | 1.032 |
|              | Life | 0.919                   | 1.088 |

Dependent Variable: Food cultural Practices

| Collinearity Diagnostics |           |            |           |                      |      |      |      |
|--------------------------|-----------|------------|-----------|----------------------|------|------|------|
| Model                    | Dimension | Eigenvalue | Condition | Variance Proportions |      |      |      |
|                          |           |            | Index     | (Constant)           | Mind | Hard | Life |
| 1                        | 1         | 3.924      | 1.000     | 0.00                 | 0.00 | 0.00 | 0.00 |
|                          | 2         | 0.05       | 8.84      | 0.00                 | 0.37 | 0.00 | 0.36 |
|                          | 3         | 0.02       | 13.923    | 0.02                 | 0.30 | 0.40 | 0.51 |
|                          | 4         | 0.006      | 25.821    | 0.98                 | 0.32 | 0.60 | 0.13 |

Dependent Variable: Food Cultural Practices

Source: Researcher's compilation

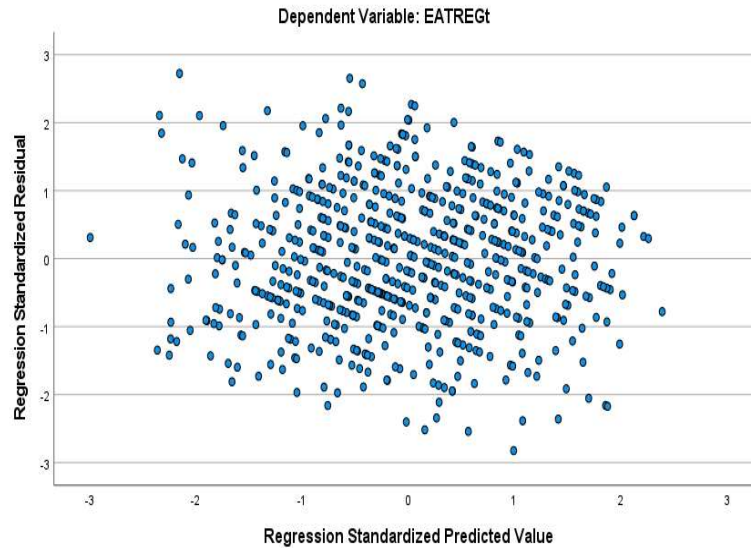
### Interpretation

It is observed from the above data that the Variance Inflation Factor (VIF) is  $<10$ , indicating no multi-collinearity between the variables for all the constructs.

### 4.3.4 Test for Homoskedasticity

Homoskedasticity, also known as homogeneity of variance, is a statistical assumption commonly used in research, particularly in regression analysis. Tests for homoskedasticity checked whether the variances of the errors or residuals in a statistical model are consistent across all levels of the predictor variables. For data to be called homoscedastic, the plotted points must be equally distributed above and below zero on the X-axis and to the left and right of zero on the Y-axis. Scatterplots of the residuals against the predicted values of the independent variables were checked to indicate the presence of heteroskedasticity. The homoscedastic nature of the data is presented in the figure below.

Figure 4.14: Scatterplot for homoscedasticity



Source: Researcher's compilation

#### **Interpretation:**

The scatter plots of the residuals against the predictor variables indicated the homogeneity of variance across the variables.

After meeting the assumptions of regression, the study proceeded to test the hypotheses using linear regression.

## **4.4 Hypothesis Testing**

The independent variables were tested as single predictors to meet the first study objective. A univariate regression model was used to test the independent relationship between the single predictors of mindfulness, hardiness, food cultural practices, and lifestyle habits with eating regulation. It was followed by a multi-variate regression, which comprehensively tested all predictor variables.

To meet the second study objective, lifestyle habits was tested as a mediator variable, and mindfulness, hardiness and food cultural practices were the predictors. Multiple regression was used to test for mediation (Baron & Kenny, 1986). The study estimated the direct effect between the predictor mindfulness and the mediator, followed by the mediator as a predictor with eating regulation. It was followed by testing the indirect effect for statistical significance to interpret mediation.

The third study objective was met by testing moderation. Food cultural practice was tested as a moderator: first between mindfulness and eating regulation, then between hardiness and eating regulation. To test moderation, standardised scores for the independent variables were computed. The standardised scores were multiplied to create interaction terms. The interaction terms were then regressed with the dependent variable.

#### 4.4.1 Testing of Hypotheses H1 to H4:

The following hypotheses were tested using a single predictor linear regression :

**H1:** There is a significant relationship between mindfulness and eating regulation.

**H2:** There is a significant relationship between hardiness and eating regulation.

**H3:** There is a significant relationship between food cultural practices and eating regulation.

**H4:** There is a significant relationship between lifestyle habits and eating regulation.

Table 4.13 Models including single predictors of eating regulation

|                         | Standardised<br>coefficient ( $\beta$ ) | <i>p</i> -value | R <sup>2</sup> | <i>p</i> -value |
|-------------------------|-----------------------------------------|-----------------|----------------|-----------------|
| Mindfulness             | 0.187                                   | <0.001          | 0.04           | <.001***        |
| Hardiness               | 0.115                                   | 0.003           | 0.01           | .003***         |
| Food cultural practices | -0.057                                  | 0.136           | 0.00           | 0.136           |
| Lifestyle habits        | 0.545                                   | 0.001           | 0.30           | <.001***        |

\*Significant at 90%, \*\* significant at 95%, \*\*\*significant at 99% level of confidence

Source: Researcher's compilation

#### Interpretation:

As seen in Table 4.13, mindfulness has a coefficient of 0.187, with *p*-value =.000. Therefore, the null hypothesis stating “mindfulness has no relationship with eating regulation” is rejected, confirming a statistically significant relationship between mindfulness and eating regulation.

The table shows that hardiness has a coefficient of 0.115, with *p*-value =.003. Therefore, the hypothesis stating “hardiness has no relationship with eating regulation” is rejected, confirming a statistically significant relationship between hardiness and eating regulation.

Food cultural practices had a coefficient of -0.057 with a  $p$ -value of 0.136. Therefore, the study fails to reject the null hypothesis, stating that “there is no relationship between food cultural practices and eating regulation”. Hence, the hypothesised relationship between food cultural practices and eating regulation is not supported.

The table shows that lifestyle habits had a coefficient of 0.545, with  $p$ -value =.000. Therefore, the hypothesis stating “lifestyle habits have no relationship with eating regulation” is rejected, confirming a statistically significant relationship between lifestyle habits and eating regulation.

#### 4.4.2 Testing of Hypotheses H5 and H6:

The following hypotheses were tested using multiple linear regression:

**H5:** Lifestyle habits mediate the relationship between mindfulness and eating regulation.

**H6:** Lifestyle habits mediate the relationship between hardiness and eating regulation.

Table 4.14 Predictors of lifestyle habits

|                         | Standardised coefficient ( $\beta$ ) | $p$ -value | $R^2$ | $p$ -value |
|-------------------------|--------------------------------------|------------|-------|------------|
| Mindfulness             | 0.228                                | <0.001     | 0.052 | <.001***   |
| Hardiness               | 0.190                                | <0.001     | 0.036 | <.001***   |
| Food cultural practices | 0.029                                | 0.449      | 0.001 | .449       |

Source: Researcher’s compilation

Table 4. 15 Path analyses of predictor variables in the study

| Path                                          | B      | $p$ -value |
|-----------------------------------------------|--------|------------|
| Mindfulness ---> Eating regulation            | 0.187  | 0.001***   |
| Hardiness ---> Eating regulation              | 0.115  | 0.003***   |
| Food cultural practices---> Eating regulation | -0.057 | 0.136      |
| Lifestyle habits ---> Eating regulation       | 0.545  | 0.001***   |
| Mindfulness---> Lifestyle habits              | 0.228  | 0.001***   |
| Hardiness---> Lifestyle habits                | 0.19   | 0.001***   |
| Food cultural practices--->Lifestyle habits   | 0.029  | 0.449      |

\*Significant at 90%, \*\* significant at 95%, \*\*\*significant at 99% level of confidence

Source: Researcher’s compilation

Table 4.16 Models including multiple predictors of eating regulation

| Model Including multiple predictors of eating regulation ( $R^2 = 0.306$ )<br>$p$ -value of the composite model=0.001 *** |                                      |
|---------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
|                                                                                                                           | Standardised coefficient ( $\beta$ ) |
| Mindfulness                                                                                                               | 0.06                                 |
| Hardiness                                                                                                                 | 0.015                                |
| Food cultural practices                                                                                                   | -0.074                               |
| Lifestyle habits                                                                                                          | 0.530                                |

\*Significant at 90%, \*\* significant at 95%, \*\*\*significant at 99% level of confidence

Source: Researcher's compilation

Table 4.17 Lifestyle habits as mediator  
(comparison of beta coefficients before and after introduction of lifestyle habits)

| Variables               | Single predictor Model               |            | Beta coefficients after introducing lifestyle habits as a mediator |            | Mediation |
|-------------------------|--------------------------------------|------------|--------------------------------------------------------------------|------------|-----------|
|                         | Standardised coefficient ( $\beta$ ) | $p$ -value | Standardised coefficient ( $\beta$ )                               | $p$ -value |           |
| Mindfulness             | 0.187                                | 0.001***   | 0.060                                                              | 0.075*     | Partial   |
| Hardiness               | 0.115                                | 0.003***   | 0.015                                                              | 0.655      | Total     |
| Food cultural practices | -0.057                               | 0.136      | -0.074                                                             | 0.025**    | Total     |
| Lifestyle habits        | 0.545                                | 0.001***   | 0.530                                                              | 0.001***   | Mediator  |

\*Significant at 90%, \*\* significant at 95%, \*\*\*significant at 99% level of confidence

Source: Researcher's compilation

**Interpretation:**

With reference to Table 4.13, mindfulness, hardiness, and lifestyle habits were significant as single predictors of eating regulation. Food cultural practices was not a significant predictor. A regression was performed with mindfulness, hardiness, food cultural practices as predictors and lifestyle habits as the dependent variable to test mediation. As seen in Table 4.14, mindfulness and hardiness had a significant relationship with lifestyle habits. However, food cultural practices had an insignificant relationship. These relationships can be seen in Table 4.15 (Path analyses).

Then, a multi-variate regression was performed with mindfulness, hardiness, food cultural practices, and lifestyle habits as predictor variables and eating regulation as the dependent variable. Table 4.16 shows that the model, which included multiple predictors (mindfulness, hardiness, food cultural practices, and lifestyle habits), had an  $R^2$  of 0.306. Mindfulness had a coefficient of 0.060 with a  $p$ -value=0.075 and was significant at 90% confidence level. Hence the null hypothesis stating that “lifestyle habits do not mediate the relationship between mindfulness and eating regulation.” is rejected, confirming that lifestyle habits is a statistically significant mediator between mindfulness and eating regulation. The results, therefore support partial mediation of lifestyle habits between the predictor variable mindfulness and eating regulation.

Hardiness in the multiple predictor model had a coefficient of 0.015 with a  $p$ -value=0.655, which was insignificant. Hardiness, which was earlier a significant predictor of eating regulation, was rendered insignificant in the multiple predictor model after the introduction of lifestyle habits. The results, therefore, support full mediation of lifestyle habits between the predictor variable hardiness and eating regulation. Hence, the study fails to reject the null hypothesis, stating “lifestyle habits do not mediate the relationship between hardiness and eating regulation.” The study confirms that lifestyle habits is a statistically significant mediator between hardiness and eating regulation.

Food cultural practices had a coefficient of -0.074 with  $p$ -value=0.025. Food cultural practices, which were earlier not a significant predictor of eating regulation, became significant with the introduction of lifestyle habits in the multiple predictor model. The study fails to reject the null hypothesis, stating “lifestyle habits do not mediate the relationship between food cultural practices and eating regulation”. The results support full mediation of lifestyle habits between the predictor variable food cultural practices and eating regulation. In Table 4.17, the comparison of beta coefficients and significance levels of the predictors before and after the introduction of lifestyle habits in the model shows that:



- a. Lifestyle habits partially mediate the relationship between mindfulness and eating regulation. While mindfulness was significant as a single predictor, the significance level dropped after adding lifestyle habits to the multiple-predictor model.
- b. Lifestyle habits fully mediated the relationship between hardiness and eating regulation. Hardiness, which was significant in the single predictor model, was rendered non-significant in the multiple predictor model.
- c. Lifestyle habits fully mediated the relationship between food cultural practices and eating regulation. Food cultural practices, which was insignificant as a single predictor, became significant in the multiple predictor model.

It must be noted that all models with lifestyle habits as a predictor showed a coefficient of above .530 at statistically significant levels.

Literature requires the predictor variable to have a significant relationship between a dependent variable and the mediating variable to test mediation. However, a notion exists that when two independent variables are combined, they may show a significant relationship with the dependent variable due to multi-collinearity. Since the relationship changes diametrically from non-significant to significant at 95% confidence level (Table 4.16), the study inferred that lifestyle habits fully mediates between food cultural practices and eating regulation. Though there is conflicting research in this regard, the literature recommends the researcher to fall back upon conceptual clarity and literature to take a final call. Considering the existing research in the literature review chapter and conceptual understanding, it is explained that food cultural practices in a culture-driven country like India is an important variable mediated by lifestyle habits while explaining the variance in eating regulation.

#### **4.4.3 Testing of Hypotheses H7 and H8:**

The following hypotheses were tested using multiple linear regression:

**H7:** Food cultural practice moderates the relationship between mindfulness and eating regulation

**H8:** Food cultural practice moderates the relationship between hardiness and eating regulation.

Table 4.18 Moderation of food cultural practices between

a)mindfulness and eating regulation (int fc\*min)

b)hardiness and eating regulation (int fc\*hard)

| Interaction term                       | Standardised coefficient ( $\beta$ ) | <i>p-value</i> | R square | <i>p-value</i> |
|----------------------------------------|--------------------------------------|----------------|----------|----------------|
| a)Food culture*Mindfulness(int fc*min) | -0.032                               | 0.493          | 0.001    | 0.401          |
| b)Food culture*Hardiness (int fc*hard) | -0.026                               | 0.493          | -0.001   | 0.493          |

Source: Researcher's compilation

### Interpretation

The interaction term of food cultural practices and mindfulness had a coefficient of -.032 with a  $p$ -value=.401. Therefore, the study fails to reject the null hypothesis, stating, “Food cultural practices do not moderate the relationship between mindfulness and eating regulation”. Hence, the hypothesised moderating relationship of food cultural practices between mindfulness and eating regulation is not supported.

The interaction term of food cultural practices and hardiness had a coefficient of -.026 with a  $p$ -value=.493. Therefore, the study fails to reject the null hypothesis stating that “Food cultural practice does not moderate the relationship between hardiness and eating regulation.” Hence, the hypothesised moderation of food cultural practices between hardiness and eating regulation is not supported.

### 4.4.4 Hypothesis Testing Summary

Below is a summary of the hypothesis testing:

Table 4.19 Results of hypotheses testing

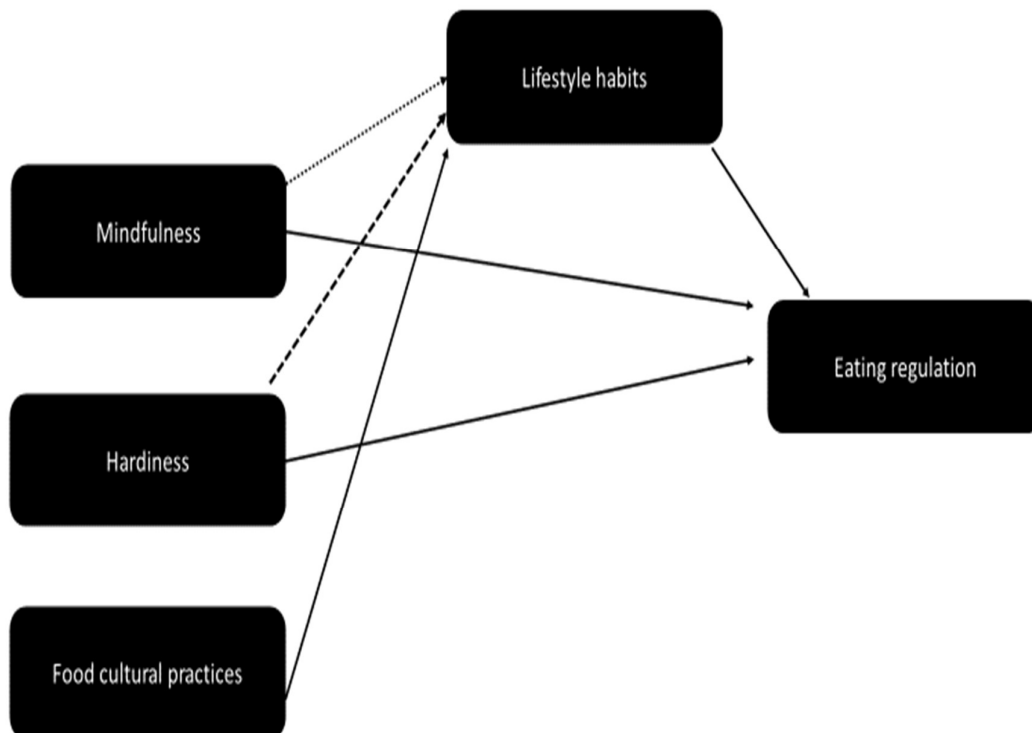
| Proposed hypotheses                                                                                   | Supported/ Not supported |
|-------------------------------------------------------------------------------------------------------|--------------------------|
| <b>H1:</b> There is a significant relationship between mindfulness and eating regulation.             | Supported                |
| <b>H2:</b> There is a significant relationship between hardiness and eating regulation.               | Supported                |
| <b>H3:</b> There is a significant relationship between food cultural practices and eating regulation. | Not supported            |

|                                                                                                        |               |
|--------------------------------------------------------------------------------------------------------|---------------|
| <b>H4:</b> There is a significant relationship between lifestyle habits and eating regulation.         | Supported     |
| <b>H5:</b> Lifestyle habits mediate the relationship between mindfulness and eating regulation         | Supported     |
| <b>H6:</b> Lifestyle habits mediate the relationship between hardiness and eating regulation           | Supported     |
| <b>H7:</b> Food cultural practice moderates the relationship between mindfulness and eating regulation | Not supported |
| <b>H8:</b> Food cultural practice moderates the relationship between hardiness and eating regulation.  | Not supported |

Source: Researcher's compilation

## 4.5 Final Model

Figure 4.15: Final tested model for the antecedents of eating regulation



Source: Researcher's compilation

Table 4.20 Model fit

| <b>Model Summary</b>                                          |                   |                |                   |                            |        |                   |
|---------------------------------------------------------------|-------------------|----------------|-------------------|----------------------------|--------|-------------------|
| Model                                                         | R                 | R Square       | Adjusted R Square | Std. Error of the Estimate |        |                   |
| 1                                                             | .553 <sup>a</sup> | 0.306          | 0.302             | 4.040                      |        |                   |
| a. Predictors: (Constant), LIFEST, FOODCUL, MINDFUL, HARDNESS |                   |                |                   |                            |        |                   |
| <b>ANOVA<sup>a</sup></b>                                      |                   |                |                   |                            |        |                   |
| Model                                                         |                   | Sum of Squares | Df                | Mean Square                | F      | Sig.              |
| 1                                                             | Regression        | 4839.296       | 4                 | 1209.824                   | 74.105 | .000 <sup>b</sup> |
|                                                               | Residual          | 10971.014      | 672               | 16.326                     |        |                   |
|                                                               | Total             | 15810.310      | 676               |                            |        |                   |
| a. Dependent Variable: EATREGt                                |                   |                |                   |                            |        |                   |
| b. Predictors: (Constant), LIFEST, FOODCUL, MINDFUL, HARDNESS |                   |                |                   |                            |        |                   |

Source: Researcher's compilation

### Interpretation

As can be seen from Table 4.20, the final model has a significant explanatory power ( $R^2 = .306$ ) of the dependent variable eating regulation as predicted by mindfulness, hardiness and food cultural practices and mediated by lifestyle habits.

As seen in Table 4.17, the coefficient of mindfulness changed from 0.187 to 0.06. This means that mindfulness was significant at 99% confidence level before including lifestyle habits as a mediator variable. Whereas, after adding lifestyle habits as a mediator, it was significant at 90% confidence level. It shows the significance of mindfulness upon eating regulation is mediated by the lifestyle habits of a person. The same has been discussed and theorised in Chapter 5. The dotted line in Figure 4.15 has depicted the relationship.

As seen in Table 4.17, the coefficient of hardiness changed from 0.115 to 0.015. The result means hardiness was significant at 99% confidence level before adding lifestyle habits as a mediator variable. Whereas, after adding lifestyle habits as a mediator, it was not significant. It shows that the significance of hardiness upon eating regulation is mediated by the lifestyle

habits of a person. The theorisation has been elaborated in Chapter 5. The relationship has been depicted by the rectangular dotted line.

Table 4.17 also shows the change in the relationship of food cultural practices with eating regulation. Before the introduction of lifestyle habits, the relationship was not significant. However, the relationship of food cultural practices with eating regulation becomes significant with a coefficient of -0.074 at 99% level of confidence with the introduction of lifestyle habits as a mediator. Though small, the change suggests that food cultural practices diminish eating regulation in the presence of lifestyle habits.

Lifestyle habits were significant as a single predictor of eating regulation with a coefficient of 0.545 at 99% confidence level. After introduction of predictor variables, it had a coefficient of 0.530 and remained significant at 99% confidence level. The finding underscores lifestyle habits as an important predictor of eating regulation. The research proceeds to elaborate the interpretation of these findings in the theoretical contribution.

Further testing of lifestyle habits due to the strong mediating role was done to examine which aspects of lifestyle habits were influencing eating regulation. The analysis helped to get a deeper understanding of the mechanism with which lifestyle habits impact eating regulation.

Table 4.21 Dimensions of lifestyle habits influencing eating regulation

| <b>Dimensions of lifestyle habits impacting eating regulation (<math>R^2 = 0.306</math>)</b> |                                      |                 |
|----------------------------------------------------------------------------------------------|--------------------------------------|-----------------|
| <i>p</i> -value of the composite model=0.001                                                 |                                      |                 |
|                                                                                              | Standardised coefficient ( $\beta$ ) | <i>p</i> -value |
| Physical activity                                                                            | 0.278                                | <.001***        |
| Daily routine                                                                                | 0.230                                | <.001***        |
| Social & Mental balance                                                                      | 0.184                                | <.001***        |

\*\*\*significant at 99% level of confidence

Source: Researcher's compilation

### Interpretation

All three dimensions of lifestyle habits in this study significantly predicted eating regulation at 99% confidence level, indicating that inclusion of all dimensions of lifestyle habits used in this study is necessary to impact eating regulation. Physical activity, daily routine and social & mental balance were further discussed in the findings to understand their implications in improving eating regulation.

# Chapter 5

## Findings and Theoretical Contributions

The study has significantly contributed to the literature in understanding the role of psychological and environmental factors impacting eating regulation. Further, the research explains some critical factors that can enhance or diminish eating regulation. By exploring the interplay between eating regulation, psychological factors, food culture, and lifestyle habits, the research provides a holistic understanding of factors that collectively contribute to eating regulation. A discussion pertaining to eating regulation and each of the antecedent factors with reference to the measures used in the study is presented below.

### 5.1 Eating Regulation

When attempting to change eating behaviour, an individual needs to take specific actions, including setting a goal, choosing the means to achieve it, planning for healthy eating habits, and identifying areas where changes may be necessary. Eating regulation encompasses these actions and assumes relevance in the context of healthy eating. In doing this, psychological and environmental factors can enable or impair eating regulation. The need for studying the antecedents of eating regulation has also been highlighted in prior research (Reed et al., 2016). Billore et al. (2023) call for consumers' understanding of how to resist temptations and practice control through self-regulation. The present research addresses these critical research gaps and explains how nurturing psychological resources like mindfulness and hardiness can enhance eating regulation.

Prior research has examined the impact of some psychological factors for their influence on eating regulation. A study found that working memory capacity, as a crucial factor in achieving eating regulation, selectively maintains goal-relevant information without getting distracted (Dohle et al., 2018). A cross-sectional study among obese individuals revealed that individuals with low self-efficacy tend to have difficulties with eating control and are susceptible to challenges in regulation and lack of the ability to resist eating (Oikarinen et

al., 2023). This research has added mindfulness and hardiness as psychological resources that impact eating regulation.

Among the sample, women had a higher percentage of respondents with high levels of eating regulation. It could mean that women have a higher inclination toward achieving eating regulation. A noteworthy feature of the present research is the study of factors influencing eating regulation among individuals not particularly reporting health disorders.

## **5.2 Mindfulness**

A growing body of research suggests that mindfulness can improve eating habits. For example, a study by Annameier et al. (2018) found that mindfulness training was associated with reduced emotional eating and improved self-regulation of food intake. In another research, people who could focus on their thoughts and feelings without judgment and mindfully react to them had better eating habits (Kerin et al., 2018).

As a component of mindfulness, awareness promotes the conscious choice of food while being alert to differences between physical hunger and hunger induced by emotions (Warren et al., 2017). Awareness can help notice satiety signs and signalling when to stop eating, preventing overconsumption of food. Recent research showed that mindfulness meditation was effectively used to focus attention towards low-energy-density foods (Hussain et al., 2022). This was evaluated using visual attention towards food cues in a laboratory setting. The present study concurs with these findings and confirms the relevance of mindfulness in enhancing eating regulation.

In the quantitative analysis, mindfulness was a significant predictor of eating regulation. The present study provides promising evidence that mindfulness can be a helpful tool for improving eating regulation. There are several ways in which mindfulness can improve eating regulation. First, mindfulness can help an individual to stay focussed on the present moment. This ability helps avoid getting distracted from how a person intends to eat. It is essential to be aware of what one is doing to curtail the triggers that lead a person to overeat or eat unhealthy foods. Being preoccupied with the future or the past can distract the person from the present moment and resist unhealthy foods. These and similar statements are included in the present study as the awareness dimension of mindfulness.

The statements in the present qualitative study identified situations where one is exposed to different types of food. Individuals who are aware would be able to distinguish between the types of food in terms of their health benefits and make appropriate food choice decisions. Awareness as a mindfulness component can help target eating habits to prevent weight loss or maintenance. Awareness can help a person eat less and choose healthier food items.

The second aspect of mindfulness, attention, provides an enhanced ability to enable or inhibit a behaviour (Chatzisarantis & Hagger, 2007). Paying attention to situations can help a person to stay on track with dietary goals. For people engaged in jobs, work schedules can get hectic, causing them to lose track of meal timings. This can disrupt eating patterns. The timeliness of meal consumption is important for regulating eating habits. Preventing situations where one is likely to eat foods that deviate from healthy eating can be helpful, as demonstrated in the statement where the respondent consciously tries to eat fruits instead of biscuits. Mindfulness may be effective in helping people to change their behaviour by increasing their ability to pay attention to temptation cues, direct their attention in ways that support self-control, and monitor their behaviour (Papies, 2017). The present study corroborates this finding where mindfulness was effective in paying attention to the content of meals. Individuals may often face stimuli that trigger the urge to engage in unhealthy eating behaviour. Attention training could help them resist the temptation for unhealthy foods and thus assume importance in observing and tracking one's behaviour.

Those individuals who get so focused on other tasks lose touch with present situations and cannot remember what they have eaten throughout the day. This could lead to overconsumption of high-calorie foods, leading to weight gain. Rushing through activities without being attentive can distract individuals from how they intend to eat. Paying attention to the present moment will help individuals to notice situations when they are full and prevent overeating. Being attentive can help identify the foods being eaten and control the quantity of food consumed. This can prevent excessive calorie consumption through sweets. Being attentive to the present moment will not distract individuals from how they intend to eat, and differentiate between those foods that are beneficial and those that are harmful to health. Such statements in the scale indicated that the attention dimension of mindfulness was necessary for eating regulation.

Mindfulness is a powerful tool to improve eating habits and promote overall health and well-being. The research introduces a novel theoretical perspective by emphasizing the



importance of taking proactive and preventive approaches to understanding the mechanisms through which mindfulness influences eating regulation. It is primarily seen in literature that mindfulness is used to intervene in disordered eating habits (Kerin et al., 2018). By shifting the focus from solely preventing disordered eating to addressing the root causes and mechanisms of eating regulation, it offers new insights into the potential of mindfulness in promoting healthy eating behaviours. This theoretical contribution provides a framework for intervention development and highlights the preventive nature of mindfulness-based approaches.

Applying the findings will protect individuals from giving in to temptations and stay on track for their dietary goals. The sample surveyed in this study indicated that the number of mindful individuals was higher among older age groups. Therefore, mindfulness makes older individuals more likely to achieve eating regulation.

### **5.3 Hardiness**

Previous research has emphasised the importance of hardiness in preventing maladaptive coping behaviours, including emotional eating (Bartone, 2008). It is widely established that stress leads to unhealthy eating practices. In other research, hardiness has been used as a personal resource in helping to cope with stress and adversity (Vagni et al, 2021). Psychological hardiness and mindfulness significantly impacted nurses' quality of professional life during the COVID-19 pandemic (Zakeri et al., 2022). The study enhances the findings of previous studies, which have found evidence of cultivating personal strengths to improve self-management of behaviours and health outcomes (Tai-Seale et al., 2019). Therefore, the present research included hardiness in studying eating regulation.

Reichenberger et al. (2021) conducted a study that evaluated food choice behaviour at different times during the day in response to stress and found that self-control was necessary in impacting food intake. Concurrent with the prior research, this research interprets the findings to say that strong self-control is required to ensure that an individual assumes responsibility, while commitment to following routines and taking on the challenge of turning around unhealthy habits were found to exert their influence on eating regulation. This research addresses critical gaps in the existing literature by explicitly investigating the relationship between hardiness and eating regulation. The study addresses another critical

gap in the literature, which calls for further research on the psychosocial facilitators that encourage healthy habits in the form of regulated eating (Walker-Clarke et al., 2022).

This research found that hardiness has a direct influence on eating regulation. In this research, the aspects of control, commitment, and challenge, which collectively represent the hardiness construct, help explain how they can impact eating regulation.

The control aspect of hardiness refers to the belief that one can influence the outcome of events. People high in the control aspect of hardiness believe that they can make choices and act to control their lives. This belief can help eat regulation in several ways.

Self-control as an aspect of hardiness can help people to resist unhealthy eating habits. Hardy individuals who do everything possible to ensure that they control the results of what they do will make changes when they feel that their diet needs improvement. When people believe that they can control their eating, they are less likely to get distracted from their eating patterns. They are also more likely to make healthy choices when eating out or at social events. The belief that one has control over their behaviours helps individuals to take personal responsibility for their actions healthily. The belief that they can control the results when they work seriously and thoroughly will help them to change their diet whenever the situation demands.

Overall, the control aspect of hardiness can be a helpful asset for people trying to improve their eating regulation. It can help them to resist unhealthy eating habits, cope with stress, and maintain healthy eating habits.

The commitment aspect of hardiness refers to a person's sense of purpose and dedication to their goals. People who are high in commitment are more likely to persevere in the face of challenges, and they are more likely to make healthy choices that support their goals. For example, a person committed to losing weight is more likely to resist temptation and choose healthy food.

There are a few ways in which commitment can improve eating regulation. First, commitment can help people to stay focused on their goals. When people are seriously involved in what they do, they are more likely to make choices aligned with their goals. For example, a person committed to losing weight is likelier to choose healthy foods over unhealthy foods.

Second, commitment can help people to put in all their efforts to make sure that they resist unhealthy food. Their enthusiasm helps to stay on track with their dietary goals and remember what they have eaten throughout the day. This positive resource will ensure they complete any activity and keep working hard on their eating intentions.

Third, commitment can help people maintain healthy eating habits over time. When people are committed to their goals, they are more likely to stick to their healthy eating habits even when faced with challenges.

The commitment aspect of hardiness is an essential factor in eating regulation. People who are high in commitment are more likely to persevere in the face of challenges, and they are more likely to make healthy choices that support their goals. As a result, commitment can play a significant role in improving eating regulation and promoting healthy weight management.

In addition to control and commitment, the challenge aspect of hardiness can help improve eating regulation. It can help people to view setbacks and challenges as opportunities to learn and grow. This can be helpful for people trying to change their eating habits, as it can help them stay motivated and persevere in the face of challenges. Even when a greater effort is required, individuals stay focused on their planned eating patterns. They feel attracted to a situation involving a personal challenge, including resisting unhealthy foods, remembering what they have eaten throughout the day, and making the necessary changes in their eating habits. Overall, the challenge aspect of hardiness can be a valuable asset for people trying to improve their eating regulation. It can help people view challenges as opportunities to develop a positive attitude toward eating healthily.

## **5.4 The Impact of Lifestyle Habits on Eating Regulation**

In prior research, lifestyle behaviour has included the aspects of dietary practices, physical activity, sleep patterns, and stress. Research suggests that both the quality and quantity of sleep can affect the risk of developing NCDs, such as cardiovascular diseases (Hall et al., 2018). The United States Physical Activity Guidelines Advisory Committee Scientific Report (2018) shows that regular physical activity has been shown to lower the risk of cardiovascular disease (CVD), type 2 diabetes, metabolic syndrome, obesity, and certain types of cancer. The present research provides evidence for factors among lifestyle habits

that positively impact eating regulation. Research shows that lifestyle behavioural interventions were significantly associated with reductions in binge eating symptoms among eaters, and interventions focused on increasing physical activity led to greater reductions in binge eating scale scores (Mama et al., 2015). While people primarily use physical activity targeted at weight loss, there are several benefits of engaging in physical activity in addition to weight loss itself (Janiszewski & Ross, 2007). Research on physical activity found that even where significant weight loss was not achieved, abdominal fat was reduced, resulting in health benefits. Physical activity has suppressed hunger cues and reduced food intake (Bilski et al., 2020). Time scarcity reduced physical activity and, in some cases, led people to consume less fruit and vegetables, eat out more, and eat more food high in salt, sugar, or fat (Venn & Strazdins, 2017).

While some studies suggest that acute exercise can lead to short-term appetite suppression, others point to compensatory overeating post-exercise (Höchsmann et al., 2023). These conflicting findings underscore the multifaceted interaction between physical activity and eating behaviours. While there are varying results on whether physical activity increases or diminishes eating behaviour, this study has found a positive influence of physical activity among lifestyle habits on eating regulation. Exercising in an organized manner, like going to a gym, and structured physical training positively impacted eating regulation. The importance of getting adequate physical exercise to improve eating regulation has been underlined by the results of this study.

In studies concerning lifestyle habits, sleep patterns have been widely associated with an impact on eating behaviour. Sleep patterns are strongly linked to circadian rhythms. The synchronization and proper timing of circadian rhythms play a crucial role in the overall health and well-being of various organisms, including humans. When an individual's sleep-wake cycle is not appropriately synchronized with their biological night, or when eating patterns deviate from other biological rhythms, or even when there is a misalignment between the central and peripheral rhythms (like organ or system rhythms), circadian misalignment can occur. This misalignment can have significant implications for a range of physiological processes. Circadian misalignment alter dietary behaviours, appetite regulation, glucose management, and mood. Research in experimental settings has demonstrated that such misalignment profoundly impacts processes that contribute to the risk of cardiovascular diseases, diabetes, obesity, and psychiatric disorders (Baron & Reid, 2014). The current study supports that sleep patterns, represented by daily routine in lifestyle

habits, positively influence eating regulation. The misalignment between the sleep-wake cycle and the biological night can disrupt the body's natural signals for hunger and satiety. For instance, individuals who stay awake during the biological night may experience altered appetite regulation, leading to increased snacking and potentially overeating, particularly during late hours. The current study reiterates that daily routine positively impacts eating regulation by observing regular sleep patterns and getting adequate sleep.

Moreover, irregular sleep patterns can disrupt the timing of meals, leading to inconsistent eating schedules. This misalignment between eating patterns and circadian rhythms can influence the body's ability to regulate glucose levels and manage energy expenditure effectively. Individuals with irregular sleep timings will likely have erratic eating habits, including skipping meals or consuming larger meals closer to bedtime. In the exploratory interview responses, respondents reported that time constraints make it difficult to follow a schedule. Such patterns can lead to difficulties in weight management and an increased risk of metabolic disorders. Research shows that late and variable sleep timings were associated with irregular eating patterns (Linnaranta et al., 2020). Disrupted sleep and eating patterns can lead to disturbances in the release of hormones, potentially leading to increased feelings of hunger and altered perceptions of fullness. Consequently, individuals might find it challenging to maintain a balanced and consistent diet.

The intricate connection between circadian misalignment, sleep timings, and eating habits has broader implications for health outcomes. The disrupted eating habits resulting from circadian misalignment can contribute to weight gain, impaired glucose regulation, and difficulties adhering to healthy dietary patterns. Respondents of this study reported sleeping at the same time each day, following scheduled programs for daily activities and getting a minimum of 6-7 hours of sound sleep every day. The results show that these activities are pivotal in influencing eating regulation.

Empirical research highlights the intricate relationship between mental balance and eating habits. Emotional states such as stress, anxiety, and depression have been shown to influence food choices considerably (O'Connor et al., 2008). The psychological mechanisms behind mental balance's influence on eating habits are multifaceted. Emotional eating, triggered by negative emotions and stress, can lead to consuming comfort foods high in sugar and unhealthy fats (Oliver et al., 2000). It is possible that positive psychological states can enhance self-regulation, self-efficacy, and goal-directed behaviour, promoting adherence to healthier dietary choices. Mental balance can influence cognitive processes, affecting how

food is perceived, recalling previous meals, and appraising available food options. Cognitive functions like focus, recollection, and decision-making are fundamental in shaping dietary choices. Cognitive distortions, evident in irregular eating behaviours, can accentuate the connection between psychological well-being and eating habits.

The results of this research used social and mental balance as an aspect of lifestyle habits. It included sharing personal problems and worries with others, and keeping in touch with significant others as indicators of social well-being. Mental balance was reflected by statements that indicated concentrating on positive thoughts, having a good work-life balance, being mentally relaxed, and taking time out for relaxation.

Lifestyle habits have emerged as pivotal determinants of eating regulation. Among the different age groups surveyed in this study, a higher number of senior citizens reported high levels of lifestyle habits. Older individuals tend to have stable routines that enable them to follow regular timings for daily activities and sleep. The younger respondents within the study sample had a higher percentage of respondents with low lifestyle habits. Younger individuals tend to have irregular routines and compromised sleep patterns, disturbing the body's mechanism to digest food at appropriate times. The finding that social and mental balance significantly impacts eating regulation underlines the importance of keeping good personal relationships to avoid stress-related eating. This study provides an in-depth exploration of how various aspects of lifestyle, including physical activity, daily routine, and social and mental balance, individually and collectively influence eating regulation.

## **5.5 Introduction of the New Construct of Food Cultural Practices, Scale Development, and Contribution to the Body of Knowledge**

Food culture can play a significant role in shaping individuals' eating habits and dietary choices. A major factor unearthed through this research is the introduction of food cultural practices as a factor that indirectly influences eating regulation.

Previous research on family meal culture indicated that the frequency of joint family meals on social occasions was positively associated with eating-related self-regulation (De Wit et al., 2015). The participants used effective cognitive, affective, and behavioural strategies to

mitigate the possible adverse effects of food abundance. It showed that social environments can support the development of critical self-regulation skills.

Cultural influences have an impact on food consumption practices. Students with a strong cultural background retained their nutritional and social values even during extended periods away from home (Nemeth et al., 2019). Studies have shown that food culture can influence food preferences, portion sizes, meal patterns, and the development of eating disorders. For example, Satija et al. (2016) found that individuals from cultures that prioritize a plant-based diet tend to have healthier eating patterns and lower rates of obesity and chronic diseases. Dillette et al. (2021) emphasized the need for studies that give due importance to cultural contexts in terms of wellness. This study has addressed this gap by using food cultural practices to boost eating regulation and potentially lead to wellness.

The qualitative study in this research explored the role of food culture in eating regulation. The study involved interviews with individuals from different cultural backgrounds. The interviews revealed that food culture could significantly shape individuals' eating habits, both positively and negatively. For example, some participants reported that their food culture encouraged them to eat healthy foods, while others reported that it led them to eat unhealthy foods. Participants reported adjusting to the family's needs rather than their own when choosing foods for meals. This may be particularly true in joint families where some family members may consider it more convenient to cook foods that would suit most family members rather than cook foods suited to individual needs.

Nepalese culture uses food to show affection and concern, negatively impacting dietary management (Sapkota et al., 2017). This study concurs with the findings, as in Indian culture, it is considered rude to refuse food served to you as a guest. Additionally, Indian culture includes many festivals and celebrations with abundant fried food and sweets. This aspect of culture negatively influences eating regulation through lifestyle habits. It contributes to the theoretical understanding of the role of culture in eating regulation by highlighting its impact on individuals' eating behaviours. Furthermore, the study provides a valid measure for food cultural practice by developing a food cultural practices scale.

The qualitative study findings were used to develop the Food Cultural Practices Scale (FCPS). The FCPS is a 3-item scale that reflects the food related practices followed in one's culture and was found to be reliable and valid. The scale development provides a framework for assessing and quantifying cultural influences on eating regulation, allowing for more

comprehensive investigations into the role of culture in eating regulation. The study has provided a foundation for examining food culture reflecting practices followed and can lead to unearthing complex and multidimensional aspects of food culture that influence eating regulation. The study found that food cultural practices impact eating regulation, along with other factors.

## **5.6 Mediation of lifestyle habits**

The research went a step further in establishing that despite being mindful, lifestyle habits must be given due attention to the goal of eating regulation. The study contributes to the effects of mindfulness through lifestyle habits on eating regulation and enriches the theoretical knowledge of mindfulness interventions in promoting healthy eating behaviours. This more profound understanding of the underlying mechanisms enhances the applicability and effectiveness of mindfulness-based approaches. The understanding of the combined effect of mindfulness and lifestyle habits in conjunction has been helpful in influencing eating regulation. It can prevent problematic eating behaviours and promote overall well-being.

The examination of the mediation paths revealed that hardiness individually predicted eating regulation. However, when used in a multiple predictor model, the non-significance of hardiness was supporting evidence for hardiness influencing lifestyle habits, ultimately leading to eating regulation. This finding is beneficial in contributing to the theory that psychological factors like hardiness can be first used to develop good lifestyle habits in order to enhance eating regulation. However, without good lifestyle habits, hardiness can be rendered ineffective. The relationship of hardiness with lifestyle habits in the path to eating regulation demonstrates that personal psychological resources can be used to improve lifestyle habits. This, in turn influences eating regulation. The mediation of lifestyle habits on the relationship between hardiness and eating regulation expands the theoretical knowledge of adaptive coping strategies in eating behaviour. Recent research on a women's sample has emphasized that a combination of factors, including mindfulness, hardiness, food culture, and lifestyle habits, influence eating regulation (Dsouza et al., 2023a). The significance of lifestyle habits in all the models using multiple predictors of eating regulation underlines the salience of improvements in physical activity, daily routines, and maintaining



good social and mental health, with the help of psychological resources and food cultural practices in the context of overall health and well-being.

Interestingly, food cultural practices were not a significant predictor in the direct relationship with eating regulation. However, it became a significant negative predictor of eating regulation in the presence of lifestyle habits. It means that individuals must be watchful of food cultural practices, as they can diminish eating regulation in the presence of lifestyle habits. Food cultural practices were not found to moderate the relationship between psychological factors like mindfulness and hardiness with eating regulation. This research has included the negative aspects of food cultural practices, as respondents in qualitative study reported. Future research could also include the positive aspects, such as fasting due to specific cultural practices, to test the moderating impact. Due to the vastly varying practices reported at the qualitative study stage, this research had not included the fasting aspect in the food cultural practices construct.

# Chapter 6

## Managerial Implications

The study provides practical suggestions on the mechanisms through which mindfulness influences eating regulation. Practitioners may use mindfulness by advising their clients to pay attention to the present moment and identify and avoid reacting to internal and external hunger cues. Mindfulness can help them to avoid getting distracted from eating regulation. Further, the clients may be advised to give due attention to lifestyle habits with the goal of eating regulation.

The study addresses the previous gap in literature (Ostendorf et al., 2021), by targeting individual psychology in the form of hardiness to contribute to weight loss management through eating regulation. More recent study has highlighted the importance of psychological resources like mindfulness and hardiness, which can enable and motivate women to focus on their weight-related goals through necessary lifestyle corrections (Dsouza et al., 2023b).

Findings from this study will be helpful to policymakers as well as the health and wellness industry. The finding that lifestyle habits are crucial in impacting eating regulation is significant. While physical activity and diet tend to be the focus of most interventions, this study also recommends giving due importance to following routines for daily activities. Keeping good social relationships would help to prevent stress, which is widely known to disrupt eating patterns. The study offers suggestions to include a holistic approach, explaining the boosting of eating regulation and cultural aspects of behaviour, which must be considered in preventive approaches to reducing obesity. Health interventions tend to target medicine as a remedy to disease. On the other hand, the cost of such interventions can be reduced and even prevented by maintaining good lifestyle habits with appropriate counseling. The study stresses that the economic burden highlighted by the World Obesity Laboratory can be contained with the help of public campaigns highlighting behavioural and lifestyle changes impacting eating regulation.

The study has shown that psychological and cultural factors influence either directly or through lifestyle habits. Wellness centres and service providers would benefit from advising their clients to develop mindfulness and hardiness as psychological resources. The study

interprets eating regulation to be a contributor to well-being. It is a dynamic concept that involves constant planning and monitoring with a futuristic connotation. Hence, the components of hardiness - commitment, control, and challenge can lead to the sustainability of eating behaviour, which is necessary for well-being and needs to be encouraged.

Mindfulness would help individuals focus on their dietary goals, and hardiness would help them maintain personal control, stay committed to their eating regulation goals, and persist despite the challenges they face in ensuring that they achieve eating regulation. The validation of culture as a factor to be considered in eating regulation will guide healthcare providers to pay due attention to cultural aspects of food, which may hamper eating regulation. The holistic approach of developing psychological resources boosting eating regulation while considering culturally influenced behaviour that attenuates eating regulation, combined with lifestyle habits, can be adopted in impacting eating regulation.

The findings of this research have several practical implications for practitioners, policymakers, and the health and wellness industry, as well as for individuals seeking to improve their eating regulation and overall well-being.

## **6.1 Mindfulness as a Strategy:**

Practitioners and health professionals can leverage the mechanism of mindfulness to enhance eating regulation. By advising clients to be present in the moment and to recognize and manage internal and external hunger cues, practitioners can help them avoid distractions and mindless eating. Incorporating mindfulness techniques into daily routines can help individuals develop a heightened awareness of their eating behaviours, fostering more intentional and mindful choices.

## **6.2 Lifestyle Habits for Enhanced Eating Regulation:**

The study emphasizes the critical role of lifestyle habits in eating regulation. Practitioners can encourage clients to pay attention to their lifestyle habits, including physical activity, sleep patterns, and stress management. Educating clients about the mediating effect of lifestyle habits on the relationships between psychological attributes and eating behaviours

can empower them to make holistic lifestyle changes that positively impact their eating regulation.

### **6.3 Holistic Approach for Policy and the Wellness Industry:**

Policymakers can draw on the study's findings to craft comprehensive approaches to combat obesity and promote healthy eating. Policymakers can design interventions that address diverse aspects of individuals' lives, recognising the combined influence of psychological attributes, cultural practices, and lifestyle habits. The health and wellness industry can incorporate these insights into its offerings, providing guidance and support for clients to develop psychological resources, improve lifestyle habits, and navigate cultural influences on eating behaviour. Health and well-being are essential predictors of tourist behavioural intention (Saiprasert et al., 2021). The factors included in this study contribute to overall health and well-being. To the researcher's knowledge, though lifestyle habits are associated with eating behaviour (Hasan et al., 2023), they have not been tested for their mediating role between mindfulness and eating regulation. Thus, this research addresses this gap and shows that adherence to conducive lifestyle habits and psychological aspects like mindfulness and hardiness enhance eating regulation.

### **6.4 Economic Considerations and Public Campaigns**

The study findings have implications for potential economic benefits by focusing on lifestyle changes and behavioural interventions for eating regulation. Rather than relying solely on medical interventions, public health campaigns can emphasize the value of lifestyle modifications in reducing obesity-related health costs. Encouraging behavioural and lifestyle changes through public campaigns can contribute to the prevention and reduction of obesity-related diseases and their associated economic burdens. The World Obesity Federation (2023) has highlighted a significant economic burden due to the costs of obesity treatment. Prevention of obesity and lifestyle diseases can be done through eating regulation with the mechanism elaborated in this research.

## **6.5 Long-Term Sustainability**

For wellness centres and service providers, the study underscores the importance of developing psychological attributes like hardiness and mindfulness in clients. These attributes can contribute to sustainable eating regulation by promoting commitment, control, and resilience in the face of challenges. This long-term perspective aligns with the dynamic nature of eating behaviour and the need for ongoing planning and monitoring.

# **Chapter 7**

## **Limitations, Future Research and Conclusions**

### **7.1 Limitations**

Due to the lack of time, the study was cross-sectional. Though pioneering in introducing the concept of food cultural practices as an antecedent for eating regulation, this study has taken the scale for food cultural practices to be unidimensional. The scale can be expanded in further studies.

### **7.2 Recommendations for Future Research**

While this study found evidence of the attenuating influence of food cultural practices on eating regulation, it would be worth exploring the salutary effects of certain cultural practices that enhance eating regulation. Indian culture has a rich tradition in the use of Ayurveda. Future research may explore the adherence to Ayurvedic traditions and practices and its impact on health through food. The scale developed for food cultural practices is unidimensional. Further research may incorporate other aspects of culture that influence eating habits. Longitudinal studies may be conducted to study long-term adherence to lifestyle habits and enhance psychological resources in maintaining eating regulation. The study could be expanded to a larger geographical area, giving due attention to the cultural practices prevalent in the sample.

### **7.3 Conclusions**

The present study investigated the role of psychological and environmental factors in eating regulation. A mixed methods approach studied the influence of antecedents relevant to eating regulation. The qualitative study revealed insightful responses resulting in the emergence of

the construct of food cultural practices. The quantitative study examined the individual and combined influences of the antecedents influencing eating regulation.

Results showed that mindfulness and hardiness as psychological factors directly influenced eating regulation. Among environmental factors, lifestyle habits were a significant predictor of eating regulation, whereas food cultural practices were not. Testing the antecedents in combination revealed the importance of lifestyle habits as a critical factor in influencing eating regulation. Psychological factors and food cultural practices influence eating regulation through lifestyle habits.

The findings of this study make several theoretical contributions. To the researcher's knowledge, it is the first study to comprehensively test the antecedents of eating regulation. First, the study has justified using multiple factors in the studies on eating regulation. The study tested the holistic use of psychological and environmental factors in influencing eating regulation. Second, the different mechanisms by which mindfulness, hardiness, and food cultural practices influence eating regulation through lifestyle habits have added to the understanding of strategies in obesity prevention. The third contribution is the development of a scale to measure food cultural practices. Additionally, the study was conducted on a sample of individuals with no reported health disorders. The findings suggest that a preventive approach to improving eating regulation can be effective, in individuals not experiencing health problems.

The findings of this study have several implications for practice. The study suggests that practitioners can use mindfulness techniques to improve eating regulation by advising clients to pay attention to the present moment and manage hunger cues, thus preventing distractions and staying on track for their dietary goals. Practitioners can encourage clients to focus on lifestyle factors such as physical activity, sleep patterns, and social and mental well-being. Understanding the connection between lifestyle factors and psychological attributes can help individuals make holistic lifestyle changes that positively affect their eating behaviour. Policymakers can use the study's findings to develop comprehensive strategies to combat obesity and promote healthy eating. The health and wellness industry can incorporate these insights into their services, offering guidance and support for clients to develop psychological resources, improve lifestyle habits, and navigate cultural influences on eating behaviour.

The present study has some limitations. The study's cross-sectional nature limits the findings related to the sustainability of eating regulation. Being unidimensional, the scale developed for food cultural practices reflected only the aspects that diminished eating regulation.

Future studies could build on the foundation laid by this study. The study recommends a holistic approach to studies influencing eating behaviour, adding other relevant constructs to prevent obesity and improve health. Future research could use a more comprehensive sample with diverse cultural backgrounds to elicit varied responses on food cultural practices and positive influences on eating behaviour.

The research has expanded the knowledge of the multifaceted determinants of eating regulation, paving the way for future research to unravel the complexities of how individuals navigate their dietary choices within the broader context of their lifestyles, psychological attributes, and cultural practices.



# References

Ahirwar, R., & Mondal, P. R. (2019). Prevalence of obesity in India: A systematic review. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*, 13(1), 318-321.

Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes*, 50(2), 179-211.

Annameier, Shelly K., Nichole R. Kelly, Amber B. Courville, Marian Tanofsky-Kraff, Jack A. Yanovski, and Lauren B. Shomaker. Mindfulness and laboratory eating behavior in adolescent girls at risk for type 2 diabetes. *Appetite* 125 (2018): 48-56.

Annesi, J. (2011). Self-Regulatory Skills Usage Strengthens the Relations of Self-Efficacy for Improved Eating, Exercise, and Weight in the Severely Obese: Toward an Explanatory Model. *Behavioral Medicine*. <https://doi.org/10.1080/08964289.2011.579643>.

Avenell A, Aucott L, Broom I, Brown T and Poobalan A. Systematic review of the longterm effects and economic consequences of treatments for obesity and implications for health improvement. *Health Technology Assessment* 2004; 8/21.

Baillet, A., Romain, A. J., Boisvert-Vigneault, K., Audet, M., Baillargeon, J. P., Dionne, I. J. & Langlois, M. F. (2015). Effects of lifestyle interventions that include a physical activity component in class II and III obese individuals: a systematic review and meta-analysis. *PLoS One*, 10(4), e0119017.

Bandura A. Social cognitive theory of self-regulation. *Organisational behaviour and human decision processes*. 1991 Dec 1;50(2):248-87.

Barberis, N., Gugliandolo, M. C., Costa, S., & Cannavò, M. (2022). Healthy and binge eating behaviours: The motivational processes underlying peer pressure. *Psychology, Health & Medicine*, 27(5), 1144-1153.

Baron, K. G., & Reid, K. J. (2014). Circadian misalignment and health. *International review of psychiatry*, 26(2), 139-154.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of personality and social psychology*, 51(6), 1173.

Bartone, P. T. (2006). Resilience under military operational stress: can leaders influence hardiness?. *Military psychology*, 18(sup1), S131-S148.

Bartone, P. T., Roland, R. R., Picano, J. J., & Williams, T. J. (2008). Psychological hardiness predicts success in US Army Special Forces candidates. *International Journal of Selection and Assessment*, 16(1), 78-81.

Beavers, A. S., Lounsbury, J. W., Richards, J. K., Huck, S. W., Skolits, G. J., & Esquivel, S. L. (2013). Practical considerations for using exploratory factor analysis in educational research. *Practical Assessment, Research, and Evaluation*, 18(1), 6.

Bennie, J. A., Pedisic, Z., Sunjic, D., & et al. (2019). Associations between Healthy Lifestyle Behaviors and Eating Patterns in Young Adults: A Cross-Sectional Study. *Nutrients*, 11(4), 835.

Bento, S., Ferreira, C., Mendes, A. L., & Marta-Simões, J. (2017). Emotion regulation and disordered eating: The distinct effects of body image-related cognitive fusion and body appreciation. *Psychologica*, 60(2), 11-25.

Billore, S., Anisimova, T., & Vrontis, D. (2023). Self-regulation and goal-directed behavior: A systematic literature review, public policy recommendations, and research agenda. *Journal of Business Research*, 156, 113435.

Bilski, J., Mazur-Bialy, A. I., Surmiak, M., Hubalewska-Mazgaj, M., Pokorski, J., Nitecki, J., & Brzozowski, T. (2020). Effect of acute sprint exercise on myokines and food intake hormones in young healthy men. *International journal of molecular sciences*, 21(22), 8848.

- Black, D. S. (2011). A brief definition of mindfulness. *Behavioral Neuroscience*, 7(2), 109.
- Brown, K. W., & Ryan, R. M. (2003). Mindful attention awareness scale. *Journal of personality and social psychology*.
- Carver, C.S. & Scheier, M.F. (1998). *On the Self-regulation of Behavior*. New York: Cambridge University Press.
- Chatzisarantis NL and Hagger MS (2007) Mindfulness and the intention-behavior relationship within the theory of planned behavior. *Personality and Social Psychology Bulletin* 33(5): 663–676.
- Cresswell, C., Watson, H. J., Jones, E., Howell, J. A., & Egan, S. J. (2022). The role of compulsive exercise in the relationship between perfectionism and eating disorder pathology in underweight adolescents with eating disorders. *Eating Behaviors*, 47, 101683.
- Creswell, J.W. (1998), *Qualitative Inquiry and Research Design: Choosing Among Five Traditions*, Sage, Thousand Oaks, CA.
- Dakanalis, A., Mentzelou, M., Papadopoulou, S. K., Papandreou, D., Spanoudaki, M., Vasios, G. K., & Giaginis, C. (2023). The association of emotional eating with overweight/obesity, depression, anxiety/stress, and dietary patterns: a review of the current clinical evidence. *Nutrients*, 15(5), 1173.
- Dao, M. C., Thiron, S., Messer, E., Sergeant, C., Sévigné, A., Huart, C., & Roberts, S. B. (2021). Cultural influences on the regulation of energy intake and obesity: A qualitative study comparing food customs and attitudes to eating in adults from France and the United States. *Nutrients*, 13(1), 63. <http://dx.doi.org/10.3390/nu13010063>
- Darviri, C., Alexopoulos, E. C., Artemiadis, A. K., Tigani, X., Kraniotou, C., Darviri, P., & Chrousos, G. P. (2014). The Healthy Lifestyle and Personal Control Questionnaire (HLPCQ): a novel tool for assessing self-empowerment through a constellation of daily activities. *BMC public health*, 14(1), 1-10.

Daubenmier, J., Kristeller, J., Hecht, F. M., Maninger, N., Kuwata, M., Jhaveri, K., ... & Epel, E. (2016). Mindfulness intervention for stress eating to reduce cortisol and abdominal fat among overweight and obese women: An exploratory randomized controlled study. *Journal of Obesity*, 2016, 1-13.

De Wit, J. B., Stok, F. M., Smolenski, D. J., de Ridder, D. D., de Vet, E., Gaspar, T., ... & Luszczynska, A. (2015). Food culture in the home environment: Family meal practices and values can support healthy eating and self-regulation in young people in four European countries. *Applied Psychology: Health and Well-Being*, 7(1), 22-40.

Devonport, T. J., Nicholls, W., & Fullerton, C. (2019). A systematic review of the association between emotions and eating behaviour in normal and overweight adult populations. *Journal of health psychology*, 24(1), 3-24.

Di Maio, S., Keller, J., Kwasnicka, D., Knoll, N., Sichert, L., & Fleig, L. (2022). What helps to form a healthy nutrition habit? Daily associations of intrinsic reward, anticipated regret, and self-efficacy with automaticity. *Appetite*, 175, 106083.

Dillette, A. K., Douglas, A. C., & Andrzejewski, C. (2021). Dimensions of holistic wellness as a result of international wellness tourism experiences. *Current Issues in Tourism*, 24(6), 794-810.

Dohle, S., Diel, K., & Hofmann, W. (2018). Executive functions and the self-regulation of eating behavior: A review. *Appetite*, 124, 4-9.

DSouza K.S., Desai, P.H., & Borde, N., (2023). Women's lifestyle habits boost psychological resources in achieving eating regulation. *The Indian Journal of Home Science*, 35(2), 253-262.

DSouza, K. S., Desai, P. H., Borde, N., & DSouza, E. (2023). The impact of mindfulness and food culture on eating regulation and the mediating role of lifestyle habits. *Revista de turism-studii si cercetari in turism*, (35).

Farstad, S. M., McGeown, L. M., & von Ranson, K. M. (2016). Eating disorders and personality, 2004–2016: A systematic review and meta-analysis. *Clinical Psychology Review*, 46, 91-105.

Fishbach, A., & Dhar, R. (2005). Goals as excuses or guides: The liberating effect of perceived goal progress on choice. *Journal of Consumer Research*, 32(3), 370-377.

Foresight (2007) *Tackling Obesities: Future Choices Project Report*. London: HMSO

Fulkerson, J. A., Larson, N., Horning, M., & et al. (2008). A Review of Associations Between Family or Shared Meal Frequency and Dietary and Weight Status Outcomes Across the Lifespan. *Journal of Nutrition Education and Behavior*, 40(5), 314-320.

Garg, N., Wansink, B., & Inman, J. J. (2007). The influence of incidental affect on consumers' food intake. *Journal of Marketing*, 71(1), 194-206.

Godsey, J. (2013). The role of mindfulness-based interventions in the treatment of obesity and eating disorders: An integrative review. *Complementary Therapies in Medicine*, 21(4), 430-439.

Groesz, L. M., McCoy, S., Carl, J., & et al. (2012). What Is Eating You? Stress and the Drive to Eat. *Appetite*, 58(2), 717-721.

Grosso, G., Marventano, S., D'Urso, M., & et al. (2017). Mistakes in Nutrition and Food Labeling: Consequences on Obesity and Chronic Diseases. *International Journal of Food Sciences and Nutrition*, 68(7), 898-903.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2014). Pearson new international edition. *Multivariate data analysis, Seventh Edition*. Pearson Education Limited Harlow, Essex.

Hasan, H., Shihab, K. A., Mohammad, Z., Jahan, H., Coussa, A., & Faris, M. E. (2023). Associations of smartphone addiction, chronotype, sleep quality, and risk of eating disorders

among university students: A cross-sectional study from Sharjah/United Arab Emirates. *Heliyon*, e12882.

Hall, M. H., Brindle, R. C., & Buysse, D. J. (2018). Sleep and cardiovascular disease: emerging opportunities for psychology. *American Psychologist*, 73(8), 994.

Higgins, E. T. (1997). Beyond pleasure and pain. *American psychologist*, 52(12), 1280.

Higgs S & Thomas J (2016) Social influences on eating. *Current Opinion in Behavioral Sciences* 9: 1–6.

Höchsmann, Christoph, Safiya E. Beckford, Jeffrey A. French, Julie B. Boron, Jeffrey R. Stevens, and Karsten Koehler. Biological and behavioral predictors of relative energy intake after acute exercise. *Appetite* 184 (2023): 106520.

Hoek, H. W. (2006). Incidence, Prevalence and Mortality of Anorexia Nervosa and Other Eating Disorders. *Current Opinion in Psychiatry*, 19(4), 389-394.

Hoenink, J. C., Burgoine, T., Brage, S., Forouhi, N., Griffin, S. J., Monsivais, P. & Adams, J. (2023). The moderating role of eating behaviour traits in the association between exposure to hot food takeaway outlets and body fatness. *International Journal of Obesity*, 47(6), 496-504.

Holloway, I. (2008). *A-Z of qualitative research in healthcare and nursing* (Vol. 1). Oxford, UK: Blackwell.

Hummel, A. C., & Smith, A. R. (2015). Ask and you shall receive: Desire and receipt of feedback via Facebook predicts disordered eating concerns. *International Journal of Eating Disorders*, 48(4), 436-442.

Hussain, M., Unchiasu, M., Wood, J., Samways, N., Keyte, R., Egan, H., & Mantzios, M. (2022). Exploring Mindfulness and Mindful Eating and Visual Attention Towards Food Cues: Preliminary Findings. *Journal of Cognitive Enhancement*, 6(3), 402-416.

James, G., Witten, D., Hastie, T., & Tibshirani, R. (2013). *An introduction to statistical learning*. Springer.

Janiszewski, P. M., & Ross, R. (2007). Physical activity in the treatment of obesity: beyond body weight reduction. *Applied Physiology, Nutrition, and Metabolism*, 32(3), 512-522.

Juarascio, A., Manasse, S. M., Goldstein, S. P., & et al. (2018). Mindfulness Training for Adults with Binge Eating Disorder: A Review of the Literature and Discussion of Study Findings. *Journal of Eating Disorders*, 6, 16.

Karoly, P. (1993). Goal systems: An organizing framework for clinical assessment and treatment planning. *Psychological Assessment*, 5(3), 273.

Karoly, P. (1999). A goal systems–self-regulatory perspective on personality, psychopathology, and change. *Review of General Psychology*, 3(4), 264-291.

Keel, P. K., Klump, K. L., Leon, G. R., & et al. (2007). Age of Onset of Eating Disorders: Prevalence, Course, and Outcome. *International Journal of Eating Disorders*, 40(Suppl), S87-S90.

Kerin, J. L., Webb, H. J., & Zimmer-Gembeck, M. J. (2018). Resisting the temptation of food: Regulating overeating and associations with emotion regulation, mindfulness, and eating pathology. *Australian Journal of Psychology*, 70(2), 167-178.

Khare, A., & Chowdhury, T. G. (2015). Food categorization flexibility increases the preference for indulgent foods. *Journal of Consumer Psychology*, 25(4), 546-560.

Kliemann, N., Beeken, R. J., Wardle, J., & Johnson, F. (2016). Development and validation of the self-regulation of eating behaviour questionnaire for adults. *International Journal of Behavioral Nutrition and Physical Activity*, 13(1), 1-11.

Kopp, W. (2019). How western diet and lifestyle drive the pandemic of obesity and civilization diseases. *Diabetes, metabolic syndrome and obesity: targets and therapy*, 2221-2236.

Kristeller, J. L., & Wolever, R. Q. (2014). Mindfulness-based eating awareness training for treating binge eating disorder: the conceptual foundation. *Eating Disorders and Mindfulness*, 93-105.

Kruglanski, A. W., Szumowska, E. (2020). Habitual Behavior Is Goal-Driven. *Perspectives on Psychological Science*, 15(5), 1256–1271. <https://doi.org/10.1177/1745691620917676>

Lambert, V. A., Lambert, C. E., & Yamase, H. (2003). Psychological hardiness, workplace stress and related stress reduction strategies. *Nursing & Health Sciences*, 5(2), 181-184.

Landis, J. R., & Koch, G. G. (1977). An application of hierarchical kappa-type statistics in the assessment of majority agreement among multiple observers. *Biometrics*, 363-374.

Latham, G. P., & Locke, E. A. (1991). Self-regulation through goal setting. *Organizational behavior and human decision processes*, 50(2), 212-247.

Linnaranta, O., Bourguignon, C., Crescenzi, O., Sibthorpe, D., Buyukkurt, A., Steiger, H., & Storch, K. F. (2020). Late and instable sleep phasing is associated with irregular eating patterns in eating disorders. *Annals of Behavioral Medicine*, 54(9), 680-690.

Ludy, M. J., Mattes, R. D., & Montenegro-Bethancourt, G. (2019). The Effects of Aerobic Exercise on Energy Intake, Appetite, and Eating Behavior in Individuals with Compensatory Behaviors. *Appetite*, 136, 40-48.

Lv, N., Azar, K. M., Rosas, L. G., Wulfovich, S., Xiao, L., & Ma, J. (2017). Behavioral lifestyle interventions for moderate and severe obesity: a systematic review. *Preventive medicine*, 100, 180-193.

Lwin, M. O., Malik, S., & Lau, J. (2020). Association between food availability and young people's fruits and vegetables consumption: understanding the mediation role of the theory of planned behaviour. *Public Health Nutrition*, 23(12), 2155-2164.



- Mama, S. K., Schembre, S. M., O'Connor, D. P., Kaplan, C. D., Bode, S., & Lee, R. E. (2015). Effectiveness of lifestyle interventions to reduce binge eating symptoms in African American and Hispanic women. *Appetite*, 95, 269-274.
- Mantzios, M., Wilson, J. C., & Giannou, K. (2015). Psychosocial influences on mindful eating: A qualitative exploration of the experiences of individuals who participated in a mindfulness-based intervention. *Journal of Health Psychology*, 20(7), 1002-1013.
- Markwald, R. R., Melanson, E. L., Smith, M. R., & et al. (2013). Impact of Insufficient Sleep on Total Daily Energy Expenditure, Food Intake, and Weight Gain. *Proceedings of the National Academy of Sciences*, 110(14), 5695-5700. Mela, D. J. (2016).
- Mason, A. E., Epel, E. S., Kristeller, J., Moran, P. J., Dallman, M., Lustig, R. H., ... & Daubenmier, J. (2015). Effects of a mindfulness-based intervention on mindful eating, sweets consumption, and fasting glucose levels in obese adults: Data from the SHINE randomized controlled trial. *Journal of Behavioral Medicine*, 38(4), 201-213.
- Mason, A. E., Jhaveri, K., Cohn, M., Brewer, J. A., Johnson, S. L., & Epel, E. S. (2018). Testing a mobile mindful eating intervention targeting craving-related eating: Feasibility and proof of concept. *Journal of Behavioral Medicine*, 41(2), 160-173.
- Mason, M. (2010). Sample size and saturation in PhD studies using qualitative interviews. *Forum qualitative Sozialforschung/Forum: qualitative social research* (Vol. 11, No. 3).
- Masterson, T. D., Brand, J., Lowe, M. R., Metcalf, S. A., Eisenberg, I. W., Emond, J. A., & Marsch, L. A. (2019). Relationships among dietary cognitive restraint, food preferences, and reaction times. *Frontiers in psychology*, 10, 2256.
- McClelland, M., Geldhof, J., Morrison, F., Gestsdóttir, S., Cameron, C., Bowers, E., ... & Grammer, J. (2018). Self-regulation. *Handbook of life course health development*, 275-298.

Milyavskaya, M., Inzlicht, M., Hope, N., & Koestner, R. (2015). Saying “no” to temptation: Want-to motivation improves self-regulation by reducing temptation rather than by increasing self-control. *Journal of Personality and Social Psychology*, 109(4), 677.

Moreno Jiménez, B., Rodríguez Muñoz, A., Garrosa Hernández, E., & Blanco Donoso, L. M. (2014). Development and validation of the Occupational Hardiness Questionnaire. *Psicothema*.

Muraven, M., & Baumeister, R. F. (2000). Self-regulation and depletion of limited resources: Does self-control resemble a muscle? *Psychological bulletin*, 126(2), 247.

National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases, and Stroke  
<https://nhm.gov.in/index1.php?lang=1&level=2&sublinkid=1048&lid=604>. Accessed on 10 June 2023

Naughton, P., McCarthy, M., & McCarthy, S. (2015). Acting to self-regulate unhealthy eating habits. An investigation into the effects of habit, hedonic hunger and self-regulation on sugar consumption from confectionery foods. *Food Quality and Preference*, 46, 173-183.

Nemeth, N., Rudnak, I., Ymeri, P., & Fogarassy, C. (2019). The role of cultural factors in sustainable food consumption—An investigation of the consumption habits among international students in Hungary. *Sustainability*, 11(11), 3052.

O'Brien, L. M., & Palfai, T. P. (2016). Efficacy of a brief web-based intervention with and without SMS to enhance healthy eating behaviors among university students. *Eating behaviors*, 23, 104-109.

O'Connor DB, Jones F, Conner M, McMillan B, Ferguson E. (2008). Effects of daily hassles and eating style on eating behavior. *Health Psychology*, 27(1S), S20-S31.

Oikarinen, N., Jokelainen, T., Heikkilä, L., Nurkkala, M., Hukkanen, J., Salonurmi, T., ... & Teeriniemi, A. M. (2023). Low eating self-efficacy is associated with unfavorable eating

behavior tendencies among individuals with overweight and obesity. *Scientific Reports*, 13(1), 7730.

Oliver G, Wardle J, Gibson EL. (2000). Stress and food choice: A laboratory study. *Psychosomatic Medicine*, 62(6), 853-865.

Olson, K. L., Emery, C. F., & Mindfulness and Weight Loss Study (2017). Mindfulness and weight loss: A systematic review. *Psychosomatic Medicine*, 79(1), 59-67.

Osborne, E., Ainsworth, B., Chadwick, P., & Atkinson, M. (2022). The role of emotion regulation in the relationship between mindfulness and risk factors for disordered eating: A longitudinal mediation analysis. *The International journal of eating disorders*. <https://doi.org/10.1002/eat.23849>.

Osborne, J. W., & Waters, E. (2002). *Multiple Regression Assumptions*. ERIC Digest.

Ostendorf, D. M., Blankenship, J. M., Grau, L., Arbet, J., Mitchell, N. S., Creasy, S. A., & Catenacci, V. A. (2021). Predictors of long-term weight loss trajectories during a behavioral weight loss intervention: An exploratory analysis. *Obesity Science & Practice*, 7(5), 569-582.

Papies, E. K. (2017). Mindfulness and health behaviour: Examining the roles of attention regulation and decentering. *Mindfulness in social psychology*, 94-108.

Pervan, S. J., Bove, L. L., & Johnson, L. W. (2009). Reciprocity as a key stabilising norm of interpersonal marketing relationships: Scale development and validation. *Industrial Marketing Management*, 38(1), 60-70.

Polit, D. F., & Beck, C. T. (2006). The Content Validity Index: Are you Sure You Know What's Being Reported? Critique and Recommendations. *Research in Nursing and Health*, 489-497

Popkin, B. M. (2015). Nutrition Transition and the Global Diabetes Epidemic. *Current Diabetes Reports*, 15(9), 64.

Prabhakaran, D., Jeemon, P., & Roy, A. (2016). *Cardiovascular diseases in India: current epidemiology and future directions*. *Circulation*, 133(16), 1605-1620.

Reed, J., Yates, B., Houfek, J., Pullen, C., Briner, W., & Schmid, K. (2016). Eating Self-Regulation in Overweight and Obese Adults: A Concept Analysis.. *Nursing forum*. <https://doi.org/10.1111/nuf.12125>.

Reichenberger, J., Pannicke, B., Arend, A. K., Petrowski, K., & Blechert, J. (2021). Does stress eat away at you or make you eat? EMA measures of stress predict day to day food craving and perceived food intake as a function of trait stress-eating. *Psychology & health*, 36(2), 129-147.

Rios, J. M., Berg, M. K., & Gearhardt, A. N. (2023). Evaluating Bidirectional Predictive Pathways between Dietary Restraint and Food Addiction in Adolescents. *Nutrients*, 15(13), 2977. MDPI AG. Retrieved from <http://dx.doi.org/10.3390/nu15132977>

Rolls, B. J., Roe, L. S., & Meengs, J. S. (2002). Portion Size Can Be Used Strategically to Increase Vegetable Consumption in Adults. *American Journal of Clinical Nutrition*, 76(1), 120-124.

Rossi, A. A., Pietrabissa, G., Tagliagambe, A., Scuderi, A., Montecchiani, L., Castelnuovo, G., Mannarini, S., & Dalla Ragione, L. (2023). Many Facets of Eating Disorders: Profiling Key Psychological Features of Anorexia Nervosa and Binge Eating Disorder. *Behavioral Sciences*, 13, 276. <https://doi.org/10.3390/bs13030276>

Rozin, P., Kabnick, K., Pete, E., Fischler, C., & Shields, C. (2003). The ecology of eating: smaller portion sizes in France than in the United States help explain the French paradox. *Psychological science*, 14(5), 450-454.

Ruíz-Roso, M., Knott-Torcal, C., Matilla-Escalante, D., Garcimartín, A., Sampedro-Núñez, M., Dávalos, A., & Marazuela, M. (2020). COVID-19 Lockdown and Changes of the Dietary Pattern and Physical Activity Habits in a Cohort of Patients with Type 2 Diabetes Mellitus. *Nutrients*. <https://doi.org/10.3390/nu12082327>.

Ryan, R. M., & Deci, E. L. (2017). Self-determination theory: Basic psychological needs in motivation, development, and wellness. Guilford publications. Higgs, S., & Thomas, J.M. (2016). Social influences on eating. *Current Opinion in Behavioral Sciences*, 9, 1-6.

Saiprasert, W., Xu, B. & Tavitiyaman, P. (2021), "The relationship among perceived medical quality, well-being perception and behavioral intention: a comparison between domestic and overseas medical destinations", *Journal of Quality Assurance in Hospitality and Tourism*, pp. 1-26, doi: 10.1080/1528008X.2021.1943598.

Sapkota, S., Jo-anne, E. B., Gwynn, J., Flood, V., & Aslani, P. (2017). Perceived impact of Nepalese food and food culture in diabetes. *Appetite*, 113, 376-386.

Satija, A., Bhupathiraju, S. N., Rimm, E. B., Spiegelman, D., Chiuve, S. E., Borgi, L. & Hu, F. B. (2016). Plant-based dietary patterns and incidence of type 2 diabetes in US men and women: results from three prospective cohort studies. *PLoS medicine*, 13(6), e1002039.

Schlesinger, S., Neuenschwander, M., Ballon, A., Nöthlings, U., & Barbaresko, J. (2020). Adherence to healthy lifestyles and incidence of diabetes and mortality among individuals with diabetes: a systematic review and meta-analysis of prospective studies. *J Epidemiol Community Health*, 74(5), 481-487.

Scholz, U., Nagy, G., Göhner, W., Luszczynska, A., & Kliegel, M. (2009). Changes in self-regulatory cognitions as predictors of changes in smoking and nutrition behaviour. *Psychology and Health*, 24(5), 545-561.

Schüz, B., Schüz, N., & Ferguson, S. G. (2017). It's self-defense: How perceived knowledge and self-efficacy beliefs influence smokers' self-exempting cognitions. *Journal of Health Psychology*, 22(6), 727-737

Sharps, M. A., Hetherington, M. M., Blundell-Birtill, P., Rolls, B. J., & Evans, C. E. (2019). The effectiveness of a social media intervention for reducing portion sizes in young adults and adolescents. *Digital Health*, 5, 2055207619878076.

Smallwood, J., McSpadden, M., & Schooler, J. W. (2007). The lights are on but no one's home: Meta-awareness and the decoupling of attention when the mind wanders. *Psychonomic bulletin & review*, 14, 527-533.

Sniehotta, F. F., Scholz, U., & Schwarzer, R. (2005). Bridging the intention-behaviour gap: Planning, self-efficacy, and action control in the adoption and maintenance of physical exercise. *Psychology & health*, 20(2), 143-160.

Spaeth, A. M., Dinges, D. F., & Goel, N. (2013). Effects of experimental sleep restriction on weight gain, caloric intake, and meal timing in healthy adults. *Sleep*, 36(7), 981-990.

Sussman, A. B., Paley, A., & Alter, A. L. (2021). How and why our eating decisions neglect infrequently consumed foods. *Journal of Consumer Research*, 48(2), 251-269.

Tabriz, E. R., Ramezani, M., Heydari, A., & Aledavood, S. A. (2023). Health-Promoting Lifestyle among the Survivors of Colorectal Cancer: An Integrative Review. *Journal of Caring Sciences*, 12(2), 2.

Tai-Seale, M., Downing, N. L., Jones, V. G., Milani, R. V., Zhao, B., Clay, B., ... & Longhurst, C. A. (2019). Technology-enabled consumer engagement: promising practices at four health care delivery organizations. *Health Affairs*, 38(3), 383-390.

Tangney, J. P., Baumeister, R. F., & Boone, A. L. (2004). High Self-Control Predicts Good Adjustment, Less Pathology, Better Grades, and Interpersonal Success. *Journal of Personality*.

Tapper, K., Murphy, S., Lynch, R., & et al. (2018). The Development of a Multidimensional Measure of Disordered Eating in Early Adolescence: The Adolescent Eating Disorder Examination (A-DEE). *International Journal of Behavioral Nutrition and Physical Activity*, 15(1).

United Nations. (2015). Transforming our world: The 2030 Agenda for Sustainable Development. Retrieved from <https://sdgs.un.org/goals/goal3>

US Department of Health and Human Services. (2018). *2018 Physical activity guidelines advisory committee scientific report*.

Vagni, M., Maiorano, T., Giostra, V., & Pajardi, D. (2021). Hardiness, stress and secondary trauma in Italian healthcare and emergency workers during the COVID-19 pandemic. Sustainability. *Journal of Nursing Management*, 12 (14): 5592.

Van Dam, N. T., Earleywine, M., & Borders, A. (2010). Measuring mindfulness? An item response theory analysis of the Mindful Attention Awareness Scale. *Personality and individual differences*, 49(7), 805-810.

Venn, D., & Strazdins, L. (2017). Your money or your time? How both types of scarcity matter to physical activity and healthy eating. *Social science & medicine*, 172, 98-106.

Walker-Clarke, A., Walasek, L., & Meyer, C. (2022). Psychosocial factors influencing the eating behaviours of older adults: A systematic review. *Ageing Research Reviews*, 77, 101597.

Warren, J. M., Smith, N., & Ashwell, M. (2017). A structured literature review on the role of mindfulness, mindful eating and intuitive eating in changing eating behaviours: effectiveness and associated potential mechanisms. *Nutrition research reviews*, 30(2), 272-283.

Williams, M. N., Grajales, C. A. G., & Kurkiewicz, D. (2013). Assumptions of multiple regression: Correcting two misconceptions. *Practical Assessment, Research, and Evaluation*, 18(1), 11.

Wiss, D. A., & Avena, N. M. (2020). Food addiction, binge eating, and the role of dietary restraint: Converging evidence from animal and human studies. *Binge Eating: A Transdiagnostic Psychopathology*, 193-209.

World Obesity Federation Global Obesity Observatory 2022. [https://data.worldobesity.org/country/india-95/#data\\_economic-impact](https://data.worldobesity.org/country/india-95/#data_economic-impact), accessed on 8 May 2023.

World Obesity Federation. (2023, March 8). Prevalence of obesity. Retrieved from <https://www.worldobesity.org/about/about-obesity/prevalence-of-obesity>

Yang, C. L., Schnepf, J., & Tucker, R. M. (2019). Increased hunger, food cravings, food reward, and portion size selection after sleep curtailment in women without obesity. *Nutrients*, 11(3), 663.

Yayan, E. H., & Çelebioğlu, A. (2017) Effect of an obesogenic environment and health behaviour-related social support on body mass index and body image of adolescents. *Global Health Promotion*, 75797591667512. doi:10.1177/1757975916675125

Zakeri MA, Ghaedi-Heidari F, Khaloobagheri E, Hossini Rafsanjanipoor SM, Ganjeh H, Pakdaman H, Abbasifard M, Mehdizadeh M, Zakeri Bazmandeh A and Dehghan M (2022) The Relationship Between Nurse's Professional Quality of Life, Mindfulness, and Hardiness: A Cross-Sectional Study During the COVID-19 Outbreak. *Front. Psychol.* 13:866038. doi: 10.3389/fpsyg.2022.866038

Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In *Handbook of self-regulation* (pp. 13-39). Academic press.



# Annexures

## Annexure 1

### Questionnaire for the Exploratory Study

1. Describe your eating habits. How do you obtain your food?  
*Cue: meal setting, timing, perception of current eating habits, resources, eat at home? eat out?*
2. According to you, what is healthy eating?  
*Cue: perception of healthy eating, examples of foods*
3. Is eating healthy important to you? why?  
*Cue: perceived importance*
4. What kind of foods do you eat frequently? What makes you feel that these foods are healthy/ not healthy?  
*Cue: frequency of foods eaten, perceived relation to healthy eating*
5. Would you want to change the current eating habits that you follow? How? and why?  
*Cue: perception of current state, need for change, reasons*
6. What kind of foods would you like to eat more frequently ? How would you do that?  
*Cue: perceived ideal state, plan of action*
7. Why do you feel/not feel confident about sustaining/changing healthy eating habits?  
*Cue: perceived self-efficacy*
8. What helps/hinders you to maintain/follow/avoid a healthy eating pattern?  
*Cue: enablers/ barriers to healthy eating*
9. If you want to eat healthy, would you depend on someone to provide you healthy food? Why?  
*Cue: support, resources for plan of action*
10. What do you enjoy / not enjoy about eating healthy food?  
*Cue: attitude towards healthy food*

## Annexure 2

### Questionnaire Used for Quantitative Data Collection

The objective of this questionnaire is to identify factors leading to eating behaviour. All the information provided by you will be kept strictly confidential, and used for academic purposes only. Please proceed to answer the questionnaire only if you agree to provide the information.

Please answer the following questions about yourself, and your health-related habits.

|                                                                                                     |              |               |                  |              |                     |
|-----------------------------------------------------------------------------------------------------|--------------|---------------|------------------|--------------|---------------------|
| Age                                                                                                 |              | Height in cm  |                  |              |                     |
| Marital status                                                                                      |              | Weight in Kg  |                  |              |                     |
| Educational Qualification                                                                           |              | Gender        |                  |              |                     |
| Occupation                                                                                          |              |               |                  |              |                     |
| Do you live in a nuclear/joint family?                                                              |              |               |                  |              |                     |
|                                                                                                     | <b>never</b> | <b>rarely</b> | <b>sometimes</b> | <b>often</b> | <b>always</b>       |
| How often do you eat home cooked food?                                                              |              |               |                  |              |                     |
| How often do you eat out/ ready-made meals?                                                         |              |               |                  |              |                     |
| Do you suffer from any chronic illness? If yes, please specify:                                     |              |               |                  |              |                     |
| Do you have a family history of chronic illness that you may be at risk of? If yes, please specify: |              |               |                  |              |                     |
| How often do you consume alcohol?                                                                   | Never        | Rarely        | Sometimes        | Often        | Always              |
| How much alcohol do you consume at a time?                                                          | None         | One glass     | 2 glasses        | 3 glasses    | More than 3 glasses |

## EATING REGULATION

The following questions reflect your opinion about your eating habits.

| <b>Please read the following statements and tick the boxes most appropriate to you:</b> | <b>Never</b> | <b>Rarely</b> | <b>Sometimes</b> | <b>Often</b> | <b>Always</b> |
|-----------------------------------------------------------------------------------------|--------------|---------------|------------------|--------------|---------------|
| I get easily distracted from the way I intend to eat.                                   |              |               |                  |              |               |
| Whenever I feel that my diet needs to improve, I make changes.                          |              |               |                  |              |               |
| I can remember what I have eaten throughout the day.                                    |              |               |                  |              |               |
| I can resist the foods that I find unhealthy.                                           |              |               |                  |              |               |
| I give up too easily on my eating intentions.                                           |              |               |                  |              |               |

## MINDFULNESS

Below is a collection of statements about your everyday experiences. Using the scale below, please indicate how often you currently have each experience.

| <b>Please indicate what really reflects your experience rather than what you think your experience should be.</b> | <b>Never</b> | <b>Rarely</b> | <b>Sometimes</b> | <b>Often</b> | <b>Always</b> |
|-------------------------------------------------------------------------------------------------------------------|--------------|---------------|------------------|--------------|---------------|
| I find it difficult to stay focused on what's happening in the present.                                           |              |               |                  |              |               |
| It seems like I am running on automatic without much awareness of what I am doing.                                |              |               |                  |              |               |
| I rush through activities without being really attentive to them.                                                 |              |               |                  |              |               |
| I get so focused on the goal I want to achieve, that I lose touch with what I am doing right now to get there.    |              |               |                  |              |               |
| I do Jobs or tasks automatically without taking notice of what I'm doing.                                         |              |               |                  |              |               |
| I find myself preoccupied with the future or the past.                                                            |              |               |                  |              |               |
| I find myself doing things without paying attention.                                                              |              |               |                  |              |               |

## HARDINESS

Given below, are statements about life, that people feel differently about. Please indicate how much you agree with each statement.

|                                                                                                     | <b>Strongly agree</b> | <b>Agree</b> | <b>Neither agree nor disagree</b> | <b>Disagree</b> | <b>Strongly disagree</b> |
|-----------------------------------------------------------------------------------------------------|-----------------------|--------------|-----------------------------------|-----------------|--------------------------|
| I involve myself seriously in what I do.                                                            |                       |              |                                   |                 |                          |
| I consider the work that I do is of value to society                                                |                       |              |                                   |                 |                          |
| I identify myself with my work.                                                                     |                       |              |                                   |                 |                          |
| I do not mind putting all my efforts in the work that I do.                                         |                       |              |                                   |                 |                          |
| My daily work satisfies me.                                                                         |                       |              |                                   |                 |                          |
| My own enthusiasm makes me go ahead with the completion of any activity.                            |                       |              |                                   |                 |                          |
| I do everything I can to make sure I control the results of my work.                                |                       |              |                                   |                 |                          |
| Things are only obtained from personal effort.                                                      |                       |              |                                   |                 |                          |
| The control of situations is the only thing that ensures success.                                   |                       |              |                                   |                 |                          |
| Things go well when you prepare for them thoroughly.                                                |                       |              |                                   |                 |                          |
| When you work seriously and thoroughly, you control the results.                                    |                       |              |                                   |                 |                          |
| Even when it requires greater effort, I choose to do things that represent a new experience for me. |                       |              |                                   |                 |                          |
| I am mainly attracted to innovations and novelties in procedures.                                   |                       |              |                                   |                 |                          |
| I feel attracted to tasks and situations involving a personal challenge.                            |                       |              |                                   |                 |                          |
| To the extent I can, I try to have new experiences in my daily activities.                          |                       |              |                                   |                 |                          |
| When possible, I look for new and different situations in my daily life.                            |                       |              |                                   |                 |                          |

## LIFESTYLE HABITS

You are requested to answer the following questions pertaining to your current lifestyle.

| <b>Physical well being</b>                                                         | <b>Never</b> | <b>Rarely</b> | <b>Sometimes</b> | <b>Often</b> | <b>Always</b> |
|------------------------------------------------------------------------------------|--------------|---------------|------------------|--------------|---------------|
| I exercise continuously for 20 minutes at least 3 times per week.                  |              |               |                  |              |               |
| I exercise in an organised manner.                                                 |              |               |                  |              |               |
| (e.g., I go to a gym/yoga session / structured physical training)                  |              |               |                  |              |               |
| I get adequate physical exercise for my body.                                      |              |               |                  |              |               |
| I make sure that I sleep at the same time each day.                                |              |               |                  |              |               |
| I follow a scheduled program for my daily activities.                              |              |               |                  |              |               |
| I get at least 6-7 hours of sound sleep every day.                                 |              |               |                  |              |               |
|                                                                                    |              |               |                  |              |               |
| <b>Mental well being</b>                                                           | <b>Never</b> | <b>Rarely</b> | <b>Sometimes</b> | <b>Often</b> | <b>Always</b> |
| I concentrate on positive thoughts during difficulties.                            |              |               |                  |              |               |
| I express my feelings freely.                                                      |              |               |                  |              |               |
| I feel that I have a good balance of time between work, personal life and leisure. |              |               |                  |              |               |
| I feel that I am mentally relaxed.                                                 |              |               |                  |              |               |
| I take time out for relaxation.                                                    |              |               |                  |              |               |
|                                                                                    |              |               |                  |              |               |
| <b>Social well being</b>                                                           | <b>Never</b> | <b>Rarely</b> | <b>Sometimes</b> | <b>Often</b> | <b>Always</b> |
| I share my personal problems and worries with others.                              |              |               |                  |              |               |
| I ensure that I keep in touch and have regular contact with my relatives /friends. |              |               |                  |              |               |

## FOOD CULTURAL PRACTICES

Please give your responses, based on your agreement with the following statements.

|                                                                                                       | <b>Strongly<br/>agree</b> | <b>Agree</b> | <b>Neither<br/>agree<br/>nor<br/>disagree</b> | <b>Disagree</b> | <b>Strongly<br/>disagree</b> |
|-------------------------------------------------------------------------------------------------------|---------------------------|--------------|-----------------------------------------------|-----------------|------------------------------|
| A wide variety of food is served during festivals and celebrations in my culture.                     |                           |              |                                               |                 |                              |
| In my culture, it is considered as rude when you refuse to eat food that is served to you as a guest. |                           |              |                                               |                 |                              |
| A lot of sweets and fried foods are served during festivals and celebrations in my culture.           |                           |              |                                               |                 |                              |

# Annexure 3

## Inter-Rater Reliability Rating Form for the Questionnaire

Dear Expert,

I would like to introduce myself as a Research scholar at Goa University, studying the factors affecting Eating Regulation for my PhD thesis. The research explores the different mechanisms through which individuals regulate their eating habits.

After your review, the revised questionnaire will be used for further testing. The table in the attachment contains questions that need to be assigned to one of the constructs in the questionnaire. **Please indicate whether you feel that the statements belong to any one construct, by typing “Y” in any one box.**

**The operational definitions of the constructs used in this study are as follows:**

**Eating regulation** is defined as a system of conscious personal management that guides one's thoughts, behaviour, and attention toward healthy eating. The regulation process comprises self-observation, judgment and reaction.

**Mindfulness** is the degree to which one has a clear awareness, including thoughts, emotions, sensations, actions, of surroundings and complete attention to the experiences occurring in the present moment.

**Hardiness** is a personality trait comprising 3 attitudes: commitment, control, and challenge.

**Lifestyle habits** are a set of routine activities consisting of physical activity, daily routine, and mental and social balance of an individual.

**Food cultural practices** represent food-related practices followed, owing to belonging to a culture/community.

Thanking you in anticipation,

Kevin D'Souza

Research scholar

Goa University.

[A] Please mark “Y” in any one box, indicating your choice of the construct for the items (Statements) given below after referring to the definitions of the 5 constructs.

**1. Eating Regulation (ER)**

**2. Hardiness (HAR)**

**3. Mindfulness (MIN)**

**4. Food Culture (FC)**

**5. Lifestyle (LIF)**

| Sr. no. | Scale item                                                                                            | MIN | HAR | FC | LS | ER |
|---------|-------------------------------------------------------------------------------------------------------|-----|-----|----|----|----|
| 1       | Whenever I feel that my diet needs to improve, I make changes.                                        |     |     |    |    |    |
| 2       | When you work seriously and thoroughly, you control the results.                                      |     |     |    |    |    |
| 3       | When possible, I look for new and different situations in my daily life.                              |     |     |    |    |    |
| 4       | To the extent I can, I try to have new experiences in my daily activities.                            |     |     |    |    |    |
| 5       | Things go well when you prepare for them thoroughly.                                                  |     |     |    |    |    |
| 6       | Things are only obtained from personal effort.                                                        |     |     |    |    |    |
| 7       | The control of situations is the only thing that ensures success.                                     |     |     |    |    |    |
| 8       | My own enthusiasm makes me go ahead with the completion of any activity.                              |     |     |    |    |    |
| 9       | It seems like I am running on automatic without much awareness of what I am doing.                    |     |     |    |    |    |
| 10      | In my culture, it is considered as rude when you refuse to eat food that is served to you as a guest. |     |     |    |    |    |
| 11      | I take time out for relaxation.                                                                       |     |     |    |    |    |
| 12      | I share my personal problems and worries with others.                                                 |     |     |    |    |    |



| <b>Sr.<br/>no.</b> | <b>Scale item</b>                                                                                              | <b>MIN</b> | <b>HAR</b> | <b>FC</b> | <b>LS</b> | <b>ER</b> |
|--------------------|----------------------------------------------------------------------------------------------------------------|------------|------------|-----------|-----------|-----------|
| 13                 | I rush through activities without being really attentive to them.                                              |            |            |           |           |           |
| 14                 | I make sure that I sleep at the same time each day.                                                            |            |            |           |           |           |
| 15                 | I give up too easily on my eating intentions.                                                                  |            |            |           |           |           |
| 16                 | I get so focused on the goal I want to achieve, that I lose touch with what I am doing right now to get there. |            |            |           |           |           |
| 17                 | I get easily distracted from the way I intend to eat.                                                          |            |            |           |           |           |
| 18                 | I get at least 6-7 hours of sound sleep everyday                                                               |            |            |           |           |           |
| 19                 | Fasting is one of the observances in my culture.                                                               |            |            |           |           |           |
| 20                 | I get adequate physical exercise for my body.                                                                  |            |            |           |           |           |
| 21                 | I follow a scheduled program for my daily activities.                                                          |            |            |           |           |           |
| 22                 | I find myself preoccupied with the future or the past.                                                         |            |            |           |           |           |
| 23                 | I find myself doing things without paying attention.                                                           |            |            |           |           |           |
| 24                 | I find it difficult to stay focused on what's happening in the present.                                        |            |            |           |           |           |
| 25                 | I feel that I have a good balance of time between work, personal life and leisure.                             |            |            |           |           |           |
| 26                 | I feel that I am mentally relaxed.                                                                             |            |            |           |           |           |
| 27                 | I express my feelings freely                                                                                   |            |            |           |           |           |
| 28                 | I exercise in an organised manner.                                                                             |            |            |           |           |           |
| 29                 | I exercise continuously for 20 minutes at least 3 times per week.                                              |            |            |           |           |           |
| 30                 | I ensure that I keep in touch and have regular contact with my relatives /friends.                             |            |            |           |           |           |
| 31                 | I do not mind putting all my efforts in the work that I do.                                                    |            |            |           |           |           |

| <b>Sr.<br/>no.</b> | <b>Scale item</b>                                                                                   | <b>MIN</b> | <b>HAR</b> | <b>FC</b> | <b>LS</b> | <b>ER</b> |
|--------------------|-----------------------------------------------------------------------------------------------------|------------|------------|-----------|-----------|-----------|
| 32                 | I do Jobs or tasks automatically without taking notice of what I'm doing.                           |            |            |           |           |           |
| 33                 | I concentrate on positive thoughts during difficulties.                                             |            |            |           |           |           |
| 34                 | I can resist the foods that I find unhealthy.                                                       |            |            |           |           |           |
| 35                 | I can remember what I have eaten throughout the day.                                                |            |            |           |           |           |
| 36                 | Even when it requires greater effort, I choose to do things that represent a new experience for me. |            |            |           |           |           |
| 37                 | A wide variety of food is served during festivals and celebrations in my culture.                   |            |            |           |           |           |
| 38                 | A lot of sweets and fried foods are served during festivals and celebrations in my culture.         |            |            |           |           |           |
| 39                 | I go to a gym/yoga session / structured physical training.                                          |            |            |           |           |           |
| 40                 | My daily work satisfies me.                                                                         |            |            |           |           |           |
| 41                 | I involve myself seriously in what I do.                                                            |            |            |           |           |           |
| 42                 | I identify myself with my work.                                                                     |            |            |           |           |           |
| 43                 | I feel attracted to tasks and situations involving a personal challenge.                            |            |            |           |           |           |
| 44                 | I do everything I can to make sure I control the results of my work.                                |            |            |           |           |           |
| 45                 | I consider the work that I do is of value to society.                                               |            |            |           |           |           |
| 46                 | I am mainly attracted to innovations and novelties in procedures.                                   |            |            |           |           |           |

**Please save the completed questionnaire and email it to  
kevin@unigoa.ac.in**

**Thank you.**

# Annexure 4

## Content Validity Rating Form for The Questionnaire

Dear Expert,

Kindly refer to the description of the scale items and give your score/rating based on the details given below.

### Constructs and operational Definitions for study:

**Eating regulation** is defined as a system of conscious personal management that guides one's thoughts, behaviour, and attention toward healthy eating. The regulation process comprises self-observation, judgment and reaction.

**Mindfulness** is the degree to which one has a clear awareness, including thoughts, emotions, sensations, actions, of surroundings and complete attention to the experiences occurring in the present moment.

**Hardiness** is a personality trait comprising 3 attitudes: commitment, control, and challenge.

**Lifestyle habits** are a set of routine activities consisting of physical activity, daily routine, and mental and social balance of an individual.

**Food cultural practices** represent food-related practices followed, owing to belonging to a culture/community.

### Rating Guidelines:

The rater is required to review the statements (test items) based on Relevance, Clarity and Simplicity of the content in each of the dimensions. In the rating sheet the rater is required to indicate the following for all the scale dimensions.

#### 1. Relevance:

Indicate on a scale of 1-4 whether the specified item is relevant as a measure for which it is intended. The ratings are given as follows:

1. not relevant,
2. item needs some revision,
3. relevant but needs minor revision,
4. very relevant

## 2. Clarity:

Indicate on a scale of 1-4 whether the specified item has clarity in understanding. The ratings are given as follows:

- 1- not clear,
- 2- item needs some revision,
- 3- clear but needs minor revision,
- 4- very clear.

## 3. Simplicity:

Indicate on a scale of 1-4 whether the specified item is simple to understand. The ratings are given as follows:

- 1- not simple,
- 2- item needs some revision,
- 3- simple but needs minor revision,
- 4- very simple.

Thank you,

Kevin D'souza,

Assistant Professor, Goa University.

## EATING REGULATION

Kindly rate the following statements/ items for the construct “**Eating Regulation**” with the score of 1- 4 for Relevance, Clarity and Simplicity based on the following statements.

| <b>Expert Rating for statements</b>                            | <b>Relevance<br/>(1-4)</b> | <b>Clarity<br/>(1-4)</b> | <b>Simplicity<br/>(1-4)</b> |
|----------------------------------------------------------------|----------------------------|--------------------------|-----------------------------|
| I get easily distracted from the way I intend to eat.          |                            |                          |                             |
| Whenever I feel that my diet needs to improve, I make changes. |                            |                          |                             |
| I can remember what I have eaten throughout the day.           |                            |                          |                             |
| I can resist the foods that I find unhealthy.                  |                            |                          |                             |
| I give up too easily on my eating intentions.                  |                            |                          |                             |

## MINDFULNESS

Kindly rate the following statements/ items for the construct “**Mindfulness**” with the score of 1- 4 for Relevance, Clarity and Simplicity based on the following statements.

| <b>Expert Rating for statements</b>                                                                            | <b>Relevance<br/>(1-4)</b> | <b>Clarity<br/>(1-4)</b> | <b>Simplicity<br/>(1-4)</b> |
|----------------------------------------------------------------------------------------------------------------|----------------------------|--------------------------|-----------------------------|
| I find it difficult to stay focused on what's happening in the present.                                        |                            |                          |                             |
| It seems like I am running on automatic without much awareness of what I am doing.                             |                            |                          |                             |
| I rush through activities without being really attentive to them.                                              |                            |                          |                             |
| I get so focused on the goal I want to achieve, that I lose touch with what I am doing right now to get there. |                            |                          |                             |
| I do Jobs or tasks automatically without taking notice of what I'm doing.                                      |                            |                          |                             |
| I find myself preoccupied with the future or the past.                                                         |                            |                          |                             |
| I find myself doing things without paying attention.                                                           |                            |                          |                             |

## HARDINESS

Kindly rate the following statements/ items for the construct “**Hardiness**” with the score of 1- 4 for Relevance, Clarity and Simplicity based on the following statements.

| Expert Rating for statements                                                                        | Relevance (1-4) | Clarity (1-4) | Simplicity (1-4) |
|-----------------------------------------------------------------------------------------------------|-----------------|---------------|------------------|
| I involve myself seriously in what I do.                                                            |                 |               |                  |
| I consider the work that I do is of value to society                                                |                 |               |                  |
| I identify myself with my work.                                                                     |                 |               |                  |
| I do not mind putting all my efforts in the work that I do.                                         |                 |               |                  |
| My daily work satisfies me.                                                                         |                 |               |                  |
| My own enthusiasm makes me go ahead with the completion of any activity.                            |                 |               |                  |
| I do everything I can to make sure I control the results of my work.                                |                 |               |                  |
| Things are only obtained from personal effort.                                                      |                 |               |                  |
| The control of situations is the only thing that ensures success.                                   |                 |               |                  |
| Things go well when you prepare for them thoroughly.                                                |                 |               |                  |
| When you work seriously and thoroughly, you control the results.                                    |                 |               |                  |
| Even when it requires greater effort, I choose to do things that represent a new experience for me. |                 |               |                  |
| I am mainly attracted to innovations and novelties in procedures.                                   |                 |               |                  |
| I feel attracted to tasks and situations involving a personal challenge.                            |                 |               |                  |
| To the extent I can, I try to have new experiences in my daily activities.                          |                 |               |                  |
| When possible, I look for new and different situations in my daily life.                            |                 |               |                  |

## LIFESTYLE HABITS

Kindly rate the following statements/ items for the construct “**Lifestyle habits**” with the score of 1- 4 for Relevance, Clarity and Simplicity based on the following statements.

| <b>Expert Rating for statements</b>                                                | <b>Relevance (1-4)</b> | <b>Clarity (1-4)</b> | <b>Simplicity (1-4)</b> |
|------------------------------------------------------------------------------------|------------------------|----------------------|-------------------------|
| I exercise continuously for 20 minutes at least 3 times per week.                  |                        |                      |                         |
| I exercise in an organised manner.                                                 |                        |                      |                         |
| I go to a gym/yoga session / structured physical training                          |                        |                      |                         |
| I get adequate physical exercise for my body.                                      |                        |                      |                         |
| I make sure that I sleep at the same time each day.                                |                        |                      |                         |
| I follow a scheduled program for my daily activities.                              |                        |                      |                         |
| I get at least 6-7 hours of sound sleep everyday                                   |                        |                      |                         |
| I concentrate on positive thoughts during difficulties.                            |                        |                      |                         |
| I express my feelings freely                                                       |                        |                      |                         |
| I have a good balance of time between work, personal life and leisure.             |                        |                      |                         |
| I am mentally relaxed.                                                             |                        |                      |                         |
| I take time out for relaxation.                                                    |                        |                      |                         |
| I share my personal problems and worries with others.                              |                        |                      |                         |
| I ensure that I keep in touch and have regular contact with my relatives /friends. |                        |                      |                         |

## FOOD CULTURAL PRACTICES

Kindly rate the following statements/ items for the construct “**Food cultural practices**” with the score of 1- 4 for Relevance, Clarity and Simplicity based on the following statements.

| Expert Rating for statements                                                                          | Relevance (1-4) | Clarity (1-4) | Simplicity (1-4) |
|-------------------------------------------------------------------------------------------------------|-----------------|---------------|------------------|
| Fasting is one of the observances in my culture.                                                      |                 |               |                  |
| A wide variety of food is served during festivals and celebrations in my culture.                     |                 |               |                  |
| In my culture, it is considered as rude when you refuse to eat food that is served to you as a guest. |                 |               |                  |
| A lot of sweets and fried foods are served during festivals and celebrations in my culture.           |                 |               |                  |

**Reviewer’s remarks:**



# Annexure 5

## Conference Presentations

1. Date: November 11 2017

Conference: International conference on advancements and challenges in Social Sciences and Business Management Inter- disciplinary research and practice.

Organiser: Research Development Association in collaboration with Rajasthan Chamber of commerce and Industry & Jaipur Management Association.

Venue: International Centre Goa.

**Paper title: Antecedents of self-regulation with respect to eating behaviour**

2. Date: April 29 2021

Conference: International conference on research and practices in Humanities, Social sciences, Education, Commerce and Business management.

Organiser: Inspira Research Association Jaipur & Lal Bahadur Shastri PG College Jaipur.

Venue: Online mode (Zoom)

**Paper title: The role of hardiness and lifestyle habits in the relationship with eating regulation.**

# Annexure 6

## Research Publications

1. Publication date: 1 June 2023

UGC CARE LISTED JOURNAL: Revista de Turism-Studii si Cercetari in Turism: No 35 (2023)

Article title: **“The impact of mindfulness and food culture on eating regulation and the mediating role of lifestyle habits”**

2. Publication date: 1 August 2023

UGC CARE LISTED JOURNAL: The Indian Journal of Home Science, No. 35 Issue (2)

Article title: **"Women's lifestyle habits boost psychological resources in achieving eating regulation"**