

Tingkah Laku Pembelian Mahasiswa Institusi Pengajian Tinggi dalam Jualan Secara Langsung di Aplikasi Tiktok

Ezni Nazzira Azhar, Nur Ajera Najiha Rosli, Normarshitah Norshahidy dan Siti Yuliandi Ahmad

Emotional Eating, Emotional Food Choice and Its Associated Factors among Public University Students in Malaysia

Nur Shafiqah Azlan, Asma' Ali, Noor Salihah Zakaria, Wan Hafiz Wan Zainal Sukri, Mohamad Rahijan Abdul Wahab and Lee Yi Chen

Intertwined Vulnerabilities: A Conceptual Framework of Food Insecurity, Diet Quality, and Mental Distress among Socioeconomically Disadvantaged University Students in Malaysia

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INTERTWINED VULNERABILITIES: A CONCEPTUAL FRAMEWORK OF FOOD INSECURITY, DIET QUALITY, AND MENTAL DISTRESS AMONG SOCIOECONOMICALLY DISADVANTAGED UNIVERSITY STUDENTS IN MALAYSIA

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Abstract

In Malaysia's evolving higher education landscape, students from the B40 (bottom 40%) income group face multifaceted vulnerabilities that extend beyond academic demands. This conceptual paper proposes the Intertwined Vulnerabilities Model (IVM), a theoretical framework that synthesizes multidisciplinary literature, to explore the relationships among food insecurity, diet quality, and mental distress among socioeconomically disadvantaged university students. Drawing from Scarcity Theory, Maslow's Hierarchy of Needs, and the Nutrition Transition Model, this paper positions food insecurity as not merely a nutritional challenge but a systemic determinant of cognitive and psychosocial functioning. While poor diet quality frequently coexists with food insecurity, its impact may be moderated by behavioral, educational, and structural variables such as food literacy, social support, and campus food policy. Conversely, the link between food insecurity and mental distress is theorized as more direct and exacerbated by financial strain and social stigma. The IVM emphasizes a dynamic interaction of mediators and moderators, encouraging more precise delineation of the mechanisms at play. The model's conceptual boundaries and assumptions are clarified to provide a robust foundation for future empirical testing. This paper adopts a theory-building approach, synthesizing findings through a narrative literature review, and outlines the potential for qualitative and mixed-method validation. The proposed model contributes to policy discussions aligned with Malaysia's National Plan of Action for Nutrition (NPANM III) and Sustainable Development Goals (SDG 2 and SDG 3). The implications are twofold: (1) it offers a policy-relevant scaffold for developing multidimensional interventions in university settings, and (2) it stimulates further research across public health, psychology, and education disciplines.

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Keywords: Conceptual framework, Food insecurity, Diet quality, Mental distress, Malaysia

Abstrak

Dalam landskap pendidikan tinggi Malaysia yang semakin mencabar, pelajar daripada kumpulan pendapatan B40 (40% terbawah) berdepan dengan kerentanan pelbagai dimensi yang melangkaui tuntutan akademik semata-mata. Kertas konsep ini memperkenalkan Model Kerentanan Jalinan (Intertwined Vulnerabilities Model, IVM), sebuah rangka kerja teori yang mensintesis kesusasteraan pelbagai disiplin, untuk meneroka hubungan antara ketidakjaminan makanan, kualiti diet, dan tekanan mental dalam kalangan pelajar universiti yang kurang bernasib baik dari segi sosioekonomi. Berteraskan Teori Kekurangan (Scarcity Theory), Hierarki Keperluan Maslow, dan Model Peralihan Pemakanan (Nutrition Transition Model), makalah ini mengangkat ketidakterjaminan makanan bukan sekadar isu pemakanan, tetapi sebagai penentu sistemik kepada fungsi psikososial dan kognitif. Walaupun kualiti diet yang rendah lazimnya wujud seiring dengan ketidakterjaminan makanan, kesannya dipercayai dipengaruhi oleh pembolehubah perantara dan penyederhana seperti celik ilmu pemakanan, sokongan sosial, dan dasar institusi universiti. Sebaliknya, hubungan antara ketidakterjaminan makanan dan tekanan mental dilihat lebih langsung dan bertambah buruk akibat tekanan kewangan dan stigma sosial. Model ini menekankan interaksi dinamik antara mediator dan moderator, dan memperincikan sempadan konsep serta andaian teori dengan lebih jelas sebagai asas kepada pengujian empirikal pada masa akan datang. Kaedah pendekatan adalah melalui pembinaan teori berdasarkan tinjauan literatur naratif, melalui pendekatan kualitatif atau kaedah campuran. Implikasinya adalah secara dua hala: (1) menyediakan kerangka dasar yang relevan untuk intervensi multidimensi di institusi pengajian tinggi, dan (2) merangsang kajian lanjutan dalam bidang kesihatan awam, psikologi, dan dasar pemakanan. Sumbangan konsep ini juga selaras dengan Pelan Tindakan Pemakanan Kebangsaan Malaysia (NPANM III) dan Matlamat Pembangunan Mampan (SDG 2 dan SDG 3), yang menyeru pembaharuan institusi dalam menyokong pelajar yang terkesan.

Kata kunci: Kerangka konseptual, Ketidakamanan makanan, Kualiti diet, Tekanan mental, Malaysia

Introduction

In recent years, the issue of food insecurity among university students has emerged as a pressing concern globally, with evidence indicating that students from low-income backgrounds are disproportionately affected (Ellison et al., 2021; Ahmad et al., 2021). In Malaysia, the B40 population (households earning below RM4,850 monthly) faces particular challenges that transcend academic demands. University

students from this group often struggle with erratic access to nutritious food, suboptimal dietary patterns, and mounting mental health concerns, forming a complex triad of vulnerabilities that undermines both their health and academic potential. Despite growing awareness, these interconnected issues remain underexplored through a unified theoretical lens, particularly in the context of Malaysian higher education.

Food insecurity in this demographic is more than a nutritional deficit; it is deeply embedded in broader socioeconomic stressors, including inadequate financial resources, lack of institutional support, and limited food literacy (Ramlee et al., 2019; Bakar et al., 2019). Poor diet quality is frequently a byproduct of this insecurity, as students resort to energy-dense, nutrient-poor meals due to financial and time constraints (Yap et al., 2019). These dietary compromises have cascading effects on physical and psychological health, with numerous studies linking poor diet to fatigue, anxiety, and depression (Demilew et al., 2023; Ramón-Arbués et al., 2021). Simultaneously, mental distress is exacerbated by feelings of isolation, stigma, and academic pressures, which are often intensified in food-insecure environments (Barry et al., 2021; Ibrahim et al., 2019).

Given the multifactorial nature of these challenges, there is a pressing need to conceptualize the interconnections between food insecurity, diet quality, and mental distress within a unified model. This paper aims to fill that gap by developing a conceptual framework tailored to the Malaysian university context, particularly focusing on B40 students. Drawing from multidisciplinary literature in public health, nutrition, and psychology, the framework integrates moderating and institutional factors to explain how these vulnerabilities intersect and influence one another. Rather than presenting new empirical findings, this paper synthesizes existing evidence to propose a model that can guide future research, inform institutional interventions, and support the national goals outlined in the National Plan of Action for Nutrition of Malaysia III (NPANM III) and the Sustainable Development Goals (SDG 2 and SDG 3). This paper thus sets out to propose a unified theoretical model—the Intertwined Vulnerabilities Model—highlighting the multidimensional pathways between food insecurity, diet quality, and mental distress in the Malaysian B40 student context. The sections that follow elaborate on theoretical foundations, a literature synthesis, and implications for future empirical validation and policymaking.

Methodology

Although this paper is conceptual in nature, a structured approach was adopted to ensure the rigor and transparency of the proposed framework development. This study employed a narrative literature synthesis, combining insights from multidisciplinary sources including public health, behavioral sciences, psychology, and food policy. Key databases such as Scopus, PubMed, Google Scholar, and

ScienceDirect were used to identify relevant peer-reviewed articles published between 2010 and 2024. The search terms included combinations of “food insecurity,” “mental health,” “diet quality,” “B40 students,” “university students Malaysia,” “nutrition transition,” and “student well-being.” The inclusion criteria focused on empirical or review articles that examined structural, behavioral, and psychological dimensions of student food insecurity and mental health. A total of 87 articles were reviewed, and thematic patterns were mapped into three primary vulnerability domains: food insecurity, diet quality, and mental distress. Constructs were organized according to their theoretical relevance (e.g., Scarcity Theory, Maslow’s Hierarchy of Needs) and empirical support. The Intertwined Vulnerabilities Model (IVM) was then developed through iterative synthesis, critically informed by national strategies (e.g., NPANM III), and Sustainable Development Goals (SDG 2 and 3). Although no empirical data were collected at this stage, this conceptual groundwork sets the stage for future validation studies. The anticipated research design includes a cross-sectional survey among B40 university students using validated instruments for food insecurity (e.g., FIES), mental distress (e.g., DASS-21), and dietary quality (e.g., DDS or MDD-W), alongside structural equation modeling (SEM) for pathway testing.

Theoretical Foundations of the Framework

Scarcity Theory

Mullainathan and Shafir’s (2013) Scarcity Theory posits that resource scarcity, whether financial, temporal, or material, consumes cognitive bandwidth, leading to reduced mental capacity for long-term planning and optimal decision-making. In the context of food insecurity, this theory explains why students facing chronic hunger or food uncertainty may prioritize immediate caloric needs over nutritional quality. The narrowing of focus, or “tunneling,” often results in reactive rather than strategic food choices, which may undermine both physical health and psychological well-being. This theoretical lens also supports the direct link in the model between food insecurity and mental distress, emphasizing the cognitive toll imposed by poverty-related stressors.

Maslow’s Hierarchy of Needs

Maslow’s well-established theory of motivation identifies physiological needs, such as food, shelter, and safety, as the foundational tier in the human needs hierarchy. When such basic needs are unmet, individuals struggle to pursue higher-order goals such as academic achievement, social belonging, or self-actualization (Maslow, 1943). For B40 students, persistent food insecurity disrupts the foundation upon which academic and psychosocial development depend. Within the framework, this theory justifies the positioning of food insecurity as a root determinant that impairs

not only diet quality but also mental health, ultimately hindering students' educational engagement and personal growth.

Nutrition Transition Model

The Nutrition Transition Model explains the global shift from traditional, minimally processed diets to energy-dense, nutrient-poor food consumption patterns, particularly among urban and low-income populations (Popkin, 2006). In the Malaysian context, this transition disproportionately affects B40 students, who may rely on inexpensive, heavily marketed ultra-processed foods due to financial limitations and limited access to healthier alternatives. This theory supports the framework's focus on diet quality as a mediating factor influenced by socioeconomic status and environmental constraints, helping to contextualize dietary inadequacies as systemic rather than purely individual choices.

Behavioral Health Theories

Behavioral models such as the Theory of Planned Behavior (Ajzen, 1991) and Social Cognitive Theory (Bandura, 1986) provide additional insights into how students' food-related decisions and coping mechanisms are shaped by internal beliefs, social norms, and perceived control. These theories underpin the inclusion of food literacy, social support, and personal coping strategies as moderating variables in the framework. For instance, students with higher food literacy may be better equipped to navigate limited food environments and maintain healthier diets, while those with strong social networks may experience buffered psychological impacts from food-related stress.

Theoretical Background and Literature Review

The intertwined challenges of food insecurity, poor diet quality, and mental distress among university students, particularly those from socioeconomically disadvantaged backgrounds such as the B40 group in Malaysia, demand a nuanced conceptual analysis. This section synthesizes existing literature and theoretical perspectives that underpin the development of the proposed framework, highlighting gaps and limitations in current research while justifying the relevance of the conceptual contribution.

Socioeconomic Vulnerabilities Among B40 Students

In Malaysia, the B40 group refers to the bottom 40% of the population by household income, generally earning RM3,900 or less monthly (Nohuddin et al., 2021; Sakarji et al., 2021). These students often face multifaceted challenges that impede their academic progression, including financial strain, lack of educational resources, and

emotional stress. Sani et al. (2020) identified that part-time B40 students in public universities exhibit high dropout rates due to debt obligations, while Sulaiman et al. (2020) reported that 36.6% of final-year students acknowledged the negative academic impact of their parents' low socioeconomic status.

Beyond financial limitations, these students often lack financial literacy, exacerbating their vulnerability (Munisamy et al., 2022). Ibrahim et al. (2019) highlighted that only one-third of students experiencing mental health issues receive adequate treatment. These socioeconomic strains were further intensified during the COVID-19 pandemic, where technological barriers and remote learning disproportionately affected low-income students (Rudenstine et al., 2021). As McKay et al. (2016) demonstrated in the Australian context, students from low-income households often face discrimination, lack of support, and low self-esteem, all of which further compound their disadvantage.

Food Insecurity in Higher Education

Food insecurity is widely defined as the lack of consistent access to enough food for an active, healthy life (Ellison et al., 2021; Owens et al., 2020). Among university students, particularly those in the B40 group, this phenomenon is both widespread and understudied in Southeast Asia. For instance, in Malaysia, food insecurity among students ranges from 22% to 69.4%, significantly higher than the national average of 11.4% (Ahmad et al., 2021). Bakar et al. (2019) reported that 77% of students in Kuantan faced some form of food insecurity. Contributing factors include financial hardship, lack of meal preparation facilities, and rising tuition and living costs (Ramlee et al., 2019).

Globally, studies from the United States (Martinez et al., 2019), the United Kingdom (Thomas et al., 2019), and Australia (Wolfson et al., 2022) indicate similar patterns, highlighting how students often skip meals or rely on energy-dense, low-nutrient foods. Azmi et al. (2022) found that UiTM students experiencing food insecurity also faced psychological consequences such as guilt, loneliness, and suicidal ideation.

Diet Quality and Nutritional Disparities

Poor diet quality among university students is another prevalent concern, especially among those from low-income households. Diets are typically characterized by low intake of fruits and vegetables and high consumption of ultra-processed foods (Demilew et al., 2023; Yap et al., 2019). Transitioning to university life, time constraints, poor cooking skills, and limited resources often lead students to adopt suboptimal dietary practices (Ramón-Arbués et al., 2021). Suliga et al. (2020) and Quehl et al. (2017) note that lifestyle changes, such as moving away from family and increased academic workload, further exacerbate these issues.

Fokeena et al. (2016) reported that Malaysian students experience stress related to food preparation due to economic hardship, lack of facilities, and time limitations. Despite existing assessment tools like 24-hour recalls and FFQs, issues like recall bias and imprecise food categorization limit the accuracy of diet quality assessment (Pondor et al., 2017). Nevertheless, the evidence underscores a clear link between socioeconomic status and nutritional inadequacy, with implications for physical health and academic performance (Whatnall et al., 2019).

Mental Distress in University Students

Mental distress, encompassing anxiety, depression, and other emotional disorders, is an increasingly prominent issue among university students (Hersi et al., 2017). Abuhamdah et al. (2021) and Ibrahim et al. (2019) identified financial burden, academic pressure, and lack of social support as major contributors. Cultural and familial support systems have been shown to mitigate distress, whereas a lack thereof contributes to deteriorating mental well-being (Parker et al., 2023).

Malaysian studies show high prevalence rates of psychological distress, with Che Rahimi et al. (2021) reporting up to 56% of students affected. Hasan et al. (2020) and Tesfahunegn et al. (2019) linked mental distress to technological disparities, poor sleep, and academic overload. These factors are intensified among students from disadvantaged backgrounds, who may lack the coping mechanisms or resources to manage stress effectively.

Interrelationships: Food Insecurity, Diet Quality, and Mental Distress

Emerging literature increasingly supports a multidirectional relationship among food insecurity, diet quality, and mental distress. Ranjit et al. (2020) and Wolfson et al. (2022) found that food insecurity correlates with poor dietary intake, particularly of fruits and vegetables. In Malaysia, Ahmad et al. (2020) reported a 63.5% prevalence of food insecurity among IIUM students, linking it to stress and poor dietary habits.

The link between food insecurity and mental distress is equally well-established. Brownfield et al. (2023) and Rivan et al. (2021) showed that students experiencing food insecurity reported heightened levels of anxiety and depression. Mahrshahi et al. (2022) observed that international students, a similarly vulnerable group, experienced both elevated food insecurity and psychological distress. Despite the volume of research, few studies offer a unified model capturing the interplay between these variables, especially within the Malaysian B40 context.

Gaps and Conceptual Contribution

While the literature provides extensive insights into individual aspects of food insecurity, diet quality, and mental health, there remains a lack of integrated frameworks that explain how these dimensions interact, particularly among socioeconomically disadvantaged university students. Most studies rely on Western populations, self-reported data, or narrow scopes that limit generalizability (Martinez et al., 2019; Barry et al., 2021).

This paper addresses this gap by proposing a conceptual framework that synthesizes existing research into a coherent model, specifically contextualized for Malaysian B40 university students. The framework posits that food insecurity and socioeconomic hardship contribute to poor diet quality, which in turn mediates mental distress. This integrated perspective not only enhances theoretical understanding but also informs practical interventions and policy development aimed at supporting at-risk student populations.

Conceptual Framework

This paper proposes the “Intertwined Vulnerabilities Model”, a conceptual framework that explains the interconnected pathways between food insecurity, diet quality, and mental distress among socioeconomically disadvantaged university students in Malaysia. Grounded in public health, nutrition, and psychological literature, the model responds to an urgent gap in existing frameworks by offering a localized, multifactorial structure that reflects the lived experiences of B40 students.

As shown in Figure 1, food insecurity is positioned as a root determinant, influencing both diet quality and mental well-being. The model incorporates moderating variables such as food literacy and social support, along with institutional and policy-level factors, which interact with and shape student outcomes.

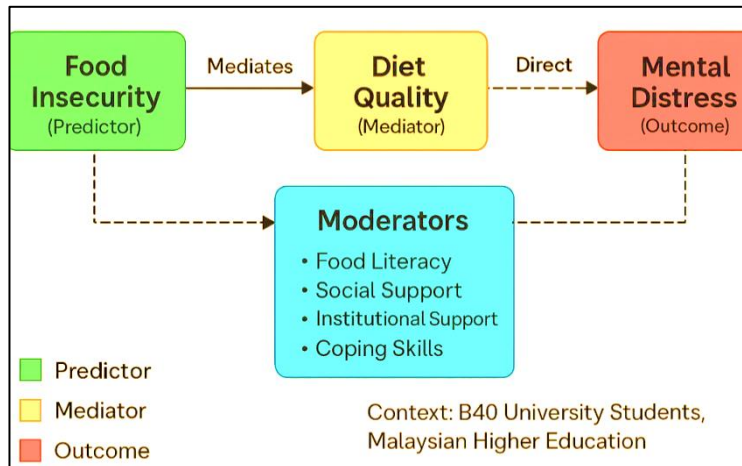


Figure 1: A Conceptual Framework Illustrating the Interrelationship Between Food Insecurity, Diet Quality, and Mental Distress Among B40 University Students in Malaysia

This conceptual framework illustrates the complex interplay between food insecurity, diet quality, and mental distress among B40 university students in Malaysia. At its core, the model positions food insecurity as a foundational challenge, directly influencing both diet quality and mental health outcomes. When students face financial limitations that restrict their access to sufficient and nutritious food, they are more likely to resort to inexpensive, energy-dense options that lack essential nutrients. This leads to poor diet quality, which can impair cognitive function, weaken immunity, and contribute to a general decline in well-being.

Furthermore, food insecurity is shown to have a direct impact on mental distress. The chronic stress of not knowing when or how one will secure their next meal, combined with the social stigma of poverty, can heighten levels of anxiety, depression, and emotional exhaustion. This is compounded by the additional academic and social pressures faced by university students, making them particularly vulnerable. In turn, poor diet quality, often characterized by a lack of fresh fruits, vegetables, and essential micronutrients, further exacerbates mental health challenges. Nutritional deficiencies have been consistently linked to mood disorders, fatigue, and diminished psychological resilience.

The model also incorporates key moderating variables such as food literacy, social support networks, time management skills, and personal coping mechanisms. These factors can either buffer or intensify the effects of food insecurity and poor diet quality, depending on their presence or absence in a student's life. Finally, institutional and policy-level influences, such as campus food banks, mental health

programs, financial aid policies, and broader national nutrition plans like NPANM III, play a critical role in shaping the students' experiences. These systemic supports can help alleviate food insecurity, promote healthier dietary choices, and provide essential mental health resources, ultimately fostering a more supportive environment for Malaysia's B40 university students. Compared to existing linear or siloed models of nutritional vulnerability, the Intertwined Vulnerabilities Model incorporates psychological, behavioral, and institutional moderators, allowing for a more context-sensitive and holistic understanding of student well-being.

Anticipated Results

Although this paper is conceptual, we anticipate that future empirical validation of the Intertwined Vulnerabilities Model (IVM) will yield several key findings:

Food insecurity will show a direct positive association with mental distress, mediated by perceived stress and social stigma.

Diet quality is expected to partially mediate the relationship between food insecurity and mental distress, especially when moderated by factors such as food literacy and institutional food access.

Moderating variables like institutional infrastructure, social support, and coping mechanisms are anticipated to weaken the negative impact of food insecurity on psychological well-being.

Differences across subgroups (e.g., gender, year of study, campus location) may emerge, highlighting the need for tailored interventions.

These expected outcomes will help refine and validate the IVM using structural equation modeling in future empirical studies.

Discussion

The proposed Intertwined Vulnerabilities Model (IVM) offers a timely and policy-relevant framework that connects food insecurity, poor diet quality, and mental distress among B40 university students in Malaysia. Unlike fragmented approaches, IVM highlights the co-occurring nature of these vulnerabilities and illustrates how structural determinants (e.g., institutional support, economic access, food literacy) shape behavioral and psychosocial outcomes.

This model holds practical significance by informing institutional reforms, including subsidized meal plans, mental health integration in student affairs, and food pantry programs, as aligned with Malaysia's National Plan of Action for Nutrition (NPANM

III). It also provides a blueprint for tailored health promotion campaigns that combine behavioral change communication with structural interventions. Nevertheless, the model's purely conceptual basis limits immediate empirical generalizability. There are no statistical causal inferences at this stage. Moreover, its assumptions, such as the directionality between food insecurity and mental distress, require validation. Future studies must examine whether diet quality mediates or moderates these relationships, and whether coping mechanisms (e.g., time management, food literacy) buffer adverse effects as proposed.

Additionally, while the model advocates multidimensional interventions, practical implementation may face barriers including resource constraints, stigma in accessing aid, and institutional inertia. These unintended consequences must be critically monitored. Universities may inadvertently burden students by mandating program participation without addressing systemic causes. Despite these caveats, the IVM contributes meaningfully to scholarship and policy by offering a scaffold for hypothesis development, practice-informed strategies, and context-sensitive innovations.

Implications

Theoretical Implications

The "Intertwined Vulnerabilities Model" advances academic discourse by integrating nutritional science, public health, and psychological theory to offer a holistic perspective on student well-being. Unlike linear models that isolate food insecurity as a stand-alone issue, this framework emphasizes its systemic and multidirectional effects on both diet quality and mental health. It also enriches existing theories, such as Scarcity Theory and Maslow's Hierarchy of Needs, by contextualizing them within the lived experiences of B40 university students in Malaysia. Moreover, it bridges gaps in the literature by highlighting food literacy, social support, and institutional structures as crucial moderating variables, domains often overlooked in traditional models. This theoretical contribution invites scholars to reframe food insecurity not only as a nutritional or socioeconomic issue, but also as a psychosocial barrier to academic and personal development.

Practical Implications

For practitioners, policymakers, and educators, this framework underscores the need for cross-sectoral interventions that go beyond one-size-fits-all food assistance. Universities must adopt integrated approaches that link food access with mental health services, financial aid, and food literacy education. Student affairs departments, for instance, can collaborate with campus nutritionists to design workshops on affordable, healthy eating. Financial offices might reassess aid

disbursement cycles to prevent mid-semester food shortages. The model also supports the development of institutional policies aligned with NPANM III and SDG targets, particularly those addressing malnutrition (SDG 2) and mental well-being (SDG 3). For policymakers, the framework presents a case for embedding student food security and wellness into national higher education and public health agendas.

Malaysian universities can draw from global best practices such as integrated food literacy and wellness centers (e.g., University of California's Basic Needs Initiative) to build student-centered interventions. In conclusion, institutional strategies must not only address immediate needs like food assistance but also reshape policy structures that perpetuate nutritional and mental vulnerabilities. A unified approach is essential to ensure equity, retention, and long-term educational success.

Future Research Suggestions

To empirically validate the proposed model, future studies could employ mixed-methods or longitudinal designs across diverse Malaysian universities. Potential testable hypotheses include:

- H1: Food insecurity is a significant predictor of poor diet quality among B40 university students.
- H2: Poor diet quality mediates the relationship between food insecurity and mental distress.
- H3: Food literacy and social support moderate the relationship between food insecurity and mental distress.

Quantitative methods such as structural equation modeling (SEM) could test these relationships, while qualitative interviews may uncover nuanced student experiences. Future studies might also examine how specific policy interventions (e.g., on-campus food pantries, subsidies, or food literacy programs) affect academic retention, diet diversity, and psychological resilience. Comparative research between public and private universities or across urban and rural campuses would further enrich understanding of contextual differences and inform tailored interventions.

Conclusion

This conceptual paper has proposed the Intertwined Vulnerabilities Model, a multifaceted framework that captures the complex, bidirectional relationships between food insecurity, diet quality, and mental distress among socioeconomically disadvantaged (B40) university students in Malaysia. By synthesizing empirical insights and anchoring them in well-established theories, including Scarcity Theory, Maslow's Hierarchy of Needs, Nutrition Transition Models, and behavioral health

theories, this model moves beyond simplistic cause-and-effect paradigms to offer a more holistic understanding of student vulnerabilities.

The novelty of this framework lies in its contextual sensitivity and theoretical integration. It is one of the first conceptual models to explicitly position food insecurity as both a nutritional and psychosocial determinant in the Malaysian higher education setting. By incorporating moderating variables like food literacy, social support, and institutional infrastructure, the model highlights the interplay between personal, social, and structural dimensions of student well-being. This allows researchers, educators, and policymakers to see food insecurity not as an isolated issue, but as part of a systemic web that influences academic performance, mental resilience, and life trajectories.

Ultimately, the Intertwined Vulnerabilities Model lays the groundwork for empirical research, institutional policy formulation, and cross-disciplinary collaboration. It offers a strategic lens through which universities and public health systems can intervene more effectively, ensuring that no student's educational journey is undermined by hunger, anxiety, or the absence of supportive systems. As Malaysia continues to pursue the goals of NPANM III and the SDG 2030 agenda, this model provides a timely and actionable roadmap for enhancing equity, inclusion, and well-being in higher education.

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