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Article

Psychological and Economic Factors in Relation to Poor Dietary Habits among Malaysian B40 Youths

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Abstract: One of the main concerns related to health for Malaysians is the widespread poor dietary habits. The underlying reasons could be attributed to economic and psychological factors. Based on past literature, it is found that low income, loneliness and distress could potentially collectively contribute to poor dietary choices. The present research aims to examine the potential associations between economic and psychological factors with poor dietary habits among B40 youths in Malaysia. The research successfully recruited 397 B40 Malaysian youths aged between 21 and 39 years to complete a cross-sectional survey. The results from mediation analysis confirmed our initial prediction, which is that higher income could lower chances of the consumption of unhealthy foods (B = −0.05, p = .03), but psychological insecurities, such as distress (B = 0.01, p = .02) and loneliness (B = 0.01, p = .03), would cause an opposing outcome. The findings of this research further contribute to the current understanding and common conception that the limitations of healthy diets among low-income groups may result from economic constraints and psychological limitations. However, the effect sizes are almost negligible, and the mediation analysis revealed that there are no significant interaction effects between income with psychological distress (B = −0.00, p = .54) and loneliness (B = −0.00, p = .0.98). It is recommended that future research explore the connection between income and psychological factors that precede poor dietary habits, utilising different measures and recruiting a larger sample to confirm the present research's findings.

Keywords: B40 youths; dietary habits; loneliness; Malaysian youths; low income; psychological distress; young adults.

Introduction

The B40 community, which is the lowest, is a categorisation set for individuals or families with monthly household earnings under RM 4850 and an average monthly income of RM 3,166 (Department of Statistics Malaysia [DOSM], 2020). The B40, i.e., the Bottom 40, roughly make up 40% of the Malaysian population. This information is based on the Household Income & Expenditure Amenities 2019 by the Department of Statistics Malaysia, published in July 2020. The B40 communities are at risk of poor dietary habits due to low purchasing power (Azizan et al., 2018; Daniel, 2020; Haws et al., 2017; Howse et al., 2018; Norddin et al., 2025; Shahar et al., 2019). There is yet research that explores how the risk could be severe among young adults from the B40 community when the COVID-19 rules began to relax in late 2021. According to the biopsychosocial model, economic and psychological factors are interconnected with physical health, and the choices that accompany these factors (Engel, 1977, 1981). Following the model, the present research assumes that the B40 communities may opt for poor dietary habits as a result of low income, alongside distress and

loneliness. Therefore, the present study aims to investigate the interrelations among financial abilities, loneliness, dietary habits, and psychological distress within the B40 youths. To pursue this, the data collection was conducted between November and December 2021 through online dissemination of a survey form.

Literature Review

1. Low Income and Poor Dietary Habits

Halleröd & Larsson (2007) outlined that low-income individuals suffer from the deprivation of access to essential livelihood resources, such as nutritious food (Christensen et al., 2021; Sulaiman et al., 2021). This creates a demarcation of healthy dietary habits between the two socioeconomic groups, low-income vs high-income (Drisdelle et al., 2020; Muhamad et al., 2020). However, this deprived access to nutritious food might be a combined factor of perceived or actual deprivation. Actual deprivation occurs when access is restricted, and perceived deprivation is the subjective perception that access to resources is limited.

Actual deprivation could be caused by low purchasing power, a heavy-duty job that hinders preparation time, or a lack of access to quality food due to a geographical location. Malaysian B40s reportedly struggle to afford nutritious food due to reported inflated costs (Eng et al., 2022; Teoh, 2024). They also often face greater difficulty preparing and consuming healthy meals, as their responsibilities limit the time available (Alim et al., 2021; Sanusi, 2020; Soraya et al., 2021).

Actual deprivation could also stem from geographical proximity to healthy food outlets (Badland & Pearce, 2019; Kee et al., 2019). Research in Malaysia has found that selected low-income communities have limited access to diverse, nutritious options, as supermarkets offering healthy food options are further in distance (Ibrahim, 2021; Norddin et al., 2025). In other regions, low-income areas have greater choices of fast-food outlets (Badland & Pearce, 2019), but the availability of fast-food outlets is not necessarily a strong influence in Malaysia. Fast food consumption is higher among Malaysian youths with hectic lifestyles and greater purchasing power, particularly university students aged 19–27 years (Habib et al., 2011), but the low-income group prefer not to purchase them as they are costly (Chee Cheong et al., 2019; Xiao et al., 2018). They may instead rely on cheaper, convenient, geographically nearer and widespread options within Malaysian culture, such as street stalls, night markets, or canteens (Arifen, 2022; Abd Hanan et al., 2021; Mazlan et al., 2017; Lim, 2014), which often have low nutritional value (Arifen et al., 2023, 2024, 2025).

Meanwhile, perceived deprivation may originate from the layman's belief that "healthy is expensive" (Daniel, 2020; Haws et al., 2017; Howse et al., 2018). This could be attributed to limited educational access to information about healthy lifestyle practices (Di Benedetto, 2015; Li et al., 2019; Muhamad et al., 2020). Several studies in Malaysia have presented that the understanding of healthy diets is poor within the urban population of Malaysia, though public awareness of the need for healthy diets at least is rising (Arifen et al., 2022; Lim, 2014; Abd Hanan et al., 2021). The trend is still concerning, as most recent research has demonstrated, a high percentage of Malaysians do not know the government recommendations for healthy eating habits, and the number is staggeringly high for the B40 communities and those with a lack of quality educational resources (Rahim et al., 2022). Overall, low income could increase the risk of poor dietary habits among youth due to combined financial and psychological factors. The present study intends to examine the correlations between income and psychological factors, including loneliness and distress, and dietary habits, to provide support to this conclusion.

2. How Low-Income, Psychological Distress and Loneliness Influence Dietary Habits

Emerging adulthood is often characterised by instability and uncertainty, because during this period, young adults are expected to complete their education, prepare for future careers, and establish meaningful and stable relationships (Arnett et al., 2014; Hang et al., 2024; Lee et al., 2018). However, high societal expectations combined with still-developing cognitive functioning may hinder effective emotional regulation, leading to distress when stability in employment, friendships, or romantic relationships is not achieved. Such distress may manifest as perceived loneliness—an emotional state arising from poor-quality or absent social connections (Hawkley & Cacioppo, 2010).

Menec et al. (2020) illustrated that the highest proportion of reported socially isolated and lonely groups is among individuals with low income. They are at greater risk of exclusion from the social system due to the inability to access economic resources, becoming economically inactive, or fearing stigmatisation by society (Ab Malik et al., 2020; Fong et al., 2019; Halleröd & Larsson, 2007; Horesh et al., 2020; Megalakaki & Kokou-Kpolou, 2021; Richard et al., 2017). Loneliness, an intense emotional response to perceived social isolation (Killeen, 1998), may later cause individuals to disregard the benefits of the food they consume to overcome the emotional turmoil (De Pasquale et al., 2021), risking the development of poor eating habits (Cortés-García et al., 2022; Doan et al., 2022; Grenard et al., 2013; Latikka et al, 2022; Mason, 2020; Salari-Moghaddam et al., 2019; Spence, 2017).

Distress among youths could also increase risk of unhealthy dietary habits, including consuming processed foods, sugary products, and saturated fats (Amatori et al., 2020; Jacob et al., 2020; Pengpid & Peltzer, 2019; Terada et al., 2019; Sangsefidi et al., 2020), skipping breakfast and maintaining a less balanced diet (Sangsefidi et al., 2020), as well as increased intake of junk food such as fast food, sweets, snacks, and caffeine (Hong & Peltzer, 2017). During economic uncertainty, for example COVID-19 pandemic, political instability, and climate change, psychological distress severely affects dietary habits among those from lower income as they are more likely to engage in emotional eating and unhealthy dietary habits (excessive calorie consumption) to cope with negative emotions (Bemanian et al., 2020; Frayn et al., 2018).

In conclusion, young adults with lower socioeconomic status are faced with a greater risk of experiencing loneliness and distress due to the high expectations placed upon them to search and establish themselves with a stable relationship, quality friendships, and employment (Ducharme et al., 2014; Hang et al., 2024; Pozzi et al., 2021). This could subsequently increase the risk of poor dietary habits. However, this situation remains under-examined, especially in Malaysia. Therefore, the present research aims to further investigate this matter among the Malaysian B40 youths.

3. Present Study

In summary, the reality of low income and a busy lifestyle at a young age could limit access to healthy foods, likely because of low purchasing power and time availability to prepare nutritious food, thus perceiving living healthily as not a priority. The risk of poor dietary habits may also stem from distress and loneliness due to being young and poor. There is yet research exploring the severity of the risk when COVID-19 rules began to relax in late 2021. The present study examines the relationships among income level, psychological distress, loneliness and dietary habits among B40 youths in late 2021. The results of the present research could further add to the current literature on the consequences of low income for health outcomes among B40 youths.

4. Theoretical Framework and Predictions

The framework of the present research is dependent on the Biopsychosocial Model, which identifies biological, psychological, and socio-environmental factors as influential to health outcomes, and in the present research, the focus is on the influence of income, distress, and loneliness on dietary habits (Engel, 1977, 1981; Taylor & Stanton, 2015). The present study hypothesised that low income may reduce the likelihood of consuming healthy food and beverage options (breakfast, water, fruits, vegetables, and fish), while increasing the intake of unhealthy alternatives (sugary drinks, processed meats, fried fish, crisps, chocolate, and fast food) among B40 youths in Malaysia. It is also predicted that high psychological distress and loneliness would lead to similar dietary outcomes, and there will be a positive interaction effect between them and low income. However, there may be a bidirectional relationship between diet and mental health, in which case a poor diet quality may, in turn, exacerbate psychological distress and negative mood.

Methodology

1. Research Design

This is a cross-sectional survey study with four variables examining income level, loneliness, psychological distress, and dietary habits among B40 youths.

2. Samples

The inclusion criteria are (1) any Malaysians who come from a household income below RM 4,850 (B40 communities); (2) fall within the age range between 21 and 39 years old, as this stage is a critical stage for intimacy (Maree, 2021) and follows the current age limit of youth categorisation in Malaysia (Dewan Negeri Selangor, 2019). The chosen sampling method was convenience sampling due to time and accessibility constraints.

A total of 406 responses were successfully collected. However, nine responses were excluded from the descriptive analysis in IBM SPSS due to missing or inaccurate data. After data cleaning, a total of 397 responses were obtained, comprising 279 females (70.2%) from various states across Malaysia. The recruited participants were between the ages of 21 and 39 (mean age was not available because participants' ages were collected as categorical, with options a, '21-29 years old', and b, '30-39 years old'). Table 1 provides further details on participants' demographic variations.

Table 1. Participants' Demographics Variations According to Percentage (N = 397)

		Number (%)
Age Group	21 to 29 years old	340 (85.6)
	30 to 39 years old	57 (14.4)
Race	Malay	353 (88.9)
	Chinese	19 (4.8)
	Indian	7 (1.8)
	Others	18 (4.5)
Employment Status	Employed	235 (59.5)
	Unemployed	40 (10.1)
	Student	122 (30.9)
Marital Status	Single	315 (79.3)
	Married	77 (19.4)
	Divorce	5 (1.3)
Education Level	PMR	1 (0.3)
	Sijil Pelajaran Malaysia	27 (6.8)
	Sijil Tinggi Pelajaran Malaysia	4 (1)
	Diploma	70 (17.9)
	Degree	276 (69.5)
	Advanced Degrees (master's and PhD)	16 (4)
	Certificates (e.g., SKM)	3 (5.8)
Reported Household Income	< 1000	148 (37.2)
	RM 1 001 – RM 2 000	84 (21.1)
	RM 2 001 – RM 3000	87 (21.9)
	RM 3 001 – RM 4 850	78 (19.6)

3. Materials

The study utilised an online survey form categorised into five sections: informed consent, demographic information, and the three psychological scales listed below. The survey was available in both English and Malay, so participants could answer in the language that was most comfortable to them, without risking the potential bias and misrepresentation that can result from a language barrier. The scales for dietary habits and loneliness (see below) were translated and adapted for the Malay language with permission from the original developers, as no current Malay-language scales are available to measure these factors. The translated scales were checked by 11 reviewers who are native Malay speakers and fluent in both spoken and written English. They checked whether the translated items retain the same meaning and understanding as the original items and provided suggestions for improvement. The reviewed and edited items were then used in the survey.

Demographics.
The demographic data collected for this research include age group, race, employment status, education level, and reported household income. All the inputs were categorical variables, and the participants were tasked to click from a list of options generated on the online form. For the age group, participants may choose from two options: 21–29 years or 30–39 years. The race has three main options —Malay, Chinese, and Indian —and one additional option for participants to write their race, e.g., "Bumiputera Sabah". Participants may indicate whether they are currently employed full-time, unemployed or an active student. Lastly, for the income, the participants were requested to choose from four options: (1) < 1000; (2) RM 1 001 – RM 2 000; (3) RM 2 001 – RM 3000; (4) RM 3 001 – RM 4 850. It is expected that students would choose income based on reported household income.

Kessler Psychological Distress Scale (K10) – Malay Version.
This scale was used to measure psychological distress. It is a 10-item scale for assessing a person's emotional state, originally developed by Kessler et al. (2002) and later adapted and translated by Tiong et al. (2018). K10 is an Ordinal 5-Likert scale from 1 = 'none of the time' to 5 = 'all of the time'. High scores suggest high levels of psychological distress, while low scores suggest low levels (Kessler et al., 2002). K10 show high values of internal consistency, α=.94. The study also included the Malay Version by Tiong et al. (2018).

Diet and Behaviour Scale (DABS) (Richards et al., 2015).
Sixteen items from the original scales were extracted, and they were selected due to cultural importance, for example, Item 12, "How often did you eat an Indian or Chinese takeaway?" and Item 13, "How often did you eat pies or pasties?", and Item 18, "How often did you eat beans or peas?". Items 1 to 11 (Breakfast, Chocolate, Crisps, Fruits and Vegetables, Soft Drinks, Energy Drinks, Sweets, Fast Food, Processed Meats, Fried Fish, High Protein Fish), the scale is a 5-point scale from 1 = Never to 5 = Every day. Items 12 to 16 (Canned Drinks, Canned Cokes, Chocolate Bars, Crisp Packets, Water Pints Per day) are subjective questions used to determine consumption amounts. The scale overall showcased a low internal reliability (α = .63), and further analysis of each categorised and grouped item revealed values ranging from .37 to .66.

UCLA Loneliness scale (ULS8) (Hays and Dimatteo, 1987).
The scale, originally developed by Hays and Dimatteo (1987), consists of 8 items that assess feelings of loneliness and social isolation. It uses a four-point rating scale, 1 = 'Never' to 4 = 'Often', and a high score between 26 and 32 indicates severe loneliness. In contrast, a lower score indicates a low level of loneliness (Hays & Dimatteo, 1987). Reliability analysis revealed α = .71.

4. Data Collection

Online recruitment messages were spread via social media platforms, including LinkedIn, Facebook, Instagram, and WhatsApp. Any interested participants would click on the link to the form. Once they clicked the form, they were directed to the online Google Survey Form, in which they must read through the informed consent section, indicate their consent, and fill in the demographic information section. Subsequently, they were tasked to read the items on the three scales and fill them in accordingly. A debriefing message was provided on the last page of the survey form, and they must click submit the form to end the survey. All of the data was automatically computed into Google Sheets, which was later downloaded for further analysis at the end of the data collection process.

5. Ethical Consideration

Before the data collection, the researcher had submitted the Ethical Review Form for approval for this study, which acts in accordance with the IIUM Research Ethics Committees (IREC), the ethics approval number: S7/01-2021-007. The participation was entirely voluntary, and an informed consent form was given along with the survey form. All information provided was kept private and confidential, as in the Personal Data Protection Act 2010. Only the two researchers and authors of this paper have access to the data. The research

did not collect personal information such as name, email address, or other information that could cause the data to be traced back to the participant.

The Findings

1. Descriptive Analysis

To illustrate the patterns of responses for each key variable, except income (already available in Table 1), Table 2 summarises the descriptive analyses for dietary habits, loneliness, and distress. Dietary indicators were computed using an equal-weighted scoring approach. This equal-weighting approach was adopted to maintain conceptual consistency and interpretability, as each item represents a comparable dimension of dietary habit. There is a total of seven categories/types of dietary habits listed for the present research: (1) Frequency or regularity of taking breakfast; (2) intake of water calculated by the estimated number of pints per day reported by the participants; (3) the mean value for the reported frequency of drinking different types of sugary drinks; (4) the total sum of number of cans different types of sugary drinks consumed per week; (5) total sum of number of packets or bars of crisps/chocolates consumed per week; (6) the mean value for the reported frequency of consuming different types of unhealthy food including processed meats, fried fish, crisps, chocolate and fast food; (7) the mean value for the reported frequency of consuming different types of healthy food including high protein fish, fruits and vegetables.

Table 2. Descriptive analysis for dietary habits, loneliness and distress

		Minimum	Maximum	Mode	Mean	Standard Deviation
1.	Breakfast (Frequency)	1	5	5	3.68	1.19
2.	Water (Pints Per Day)	0.0	10.0	1	2.11	1.47
3.	Sugary Drinks (Avg. Freq)	1	4	-	1.80	0.68
4.	Sugary Drinks (No. of Cans)	0	12	0	0.79	1.62
5.	Crisps and Chocolate (No. of Packets)	0	34	2	2.04	2.50
6.	Unhealthy Food (Avg. Freq)	1	4.5	-	2.82	0.55
7.	Healthy Food (Avg. Freq)	1	5	-	2.98	0.81
8.	Loneliness	8	32	-	18.98	4.49
9.	Distress	10	50	-	26.39	10.14

2. Bivariate Correlations

Pearson's and Spearman's correlation analyses were computed to provide a preliminary view of how the variables are related to one another. The categorical data were analysed using Spearman correlation (Frequency of Breakfast intake and Income level). The continuous data were analysed using Pearson correlation (Water (Pints Per Day); Sugary Drinks (Avg. Freq); Sugary Drinks (No. of Cans); Crisps and Chocolate (No. of Packets); Unhealthy Food (Avg. Freq); Healthy Food (Avg. Freq); Loneliness; Distress). The results of the analysis are summarised in Table 3. Seven dietary habits extracted from the participants' responses in the DABS were used to assess their relations with loneliness, distress and income.

The paper initially predicted that poor dietary habits are likely associated with loneliness, distress, and lower income. After controlling for false discovery rate using the Benjamini–Hochberg correction (FDR = .05), several significant relationships remained. Higher psychological distress was associated with lower frequency of breakfast consumption ($r_s = -.18$, $p_{adj} = .024$) and greater intake of unhealthy foods ($r = .22$, $p_{adj} = .017$). Similarly, loneliness was positively related to unhealthy food intake ($r = .21$, $p_{adj} = .020$). Income level showed inverse associations with both loneliness ($r_s = -.28$, $p_{adj} = .008$) and distress ($r_s = -.29$, $p_{adj} = .007$), as well as with unhealthy food intake ($r_s = -.17$, $p_{adj} = .013$). Finally, loneliness and psychological distress were strongly and positively correlated ($r = .48$, $p_{adj} = .010$).

Table 3. Pearson (r) and Spearman's (r_s) correlation for different dietary habits with loneliness, psychological distress and income level. (N = 397)

	Loneliness		**Distress**		**Income**	
Breakfast (Frequency)	$r_s = -.10$*	$p = .08$	$r_s = -.18$**	$p < .001$[a]	$r_s = .07$	$p = 0.16$
Water (Pints Per Day)	$r = .02$	$p = 0.66$	$r = .02$	$p = 0.64$	$r_s = .11$*	$p = 0.04$
Sugary Drinks (Avg. Freq)	$r = .10$*	$p = 0.04$	$r = .11$*	$p = 0.03$	$r_s = -.10$*	$p = 0.04$
Sugary Drinks (No. of Cans)	$r = -.06$	$p = 0.25$	$r = -.03$	$p = 0.57$	$r_s = -.03$	$p = 0.59$
Crisps and Chocolate (No. of Packets)	$r = .01$	$p = 0.78$	$r = .06$	$p = 0.25$	$r_s = -.10$*	$p = 0.04$
Unhealthy Food (Avg. Freq)	$r = .21$**	$p < .001$[a]	$r = .22$**	$p < .001$[a]	$r_s = -.17$**	$p < 0.001$
Healthy Food (Avg. Freq)	$r = .06$	$p = .24$	$r = -.00$	$p = .96$	$r_s = -.09$	$p = .09$
Loneliness			$r = .48$**	$p < .001$[a]	$r_s = -.28$**	$p < 0.001$[a]
Distress					$r_s = -.29$**	$p < 0.001$

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
[a]. Remained significant after Benjamini–Hochberg correction (FDR = .05)

3. Moderation Analysis

A series of multiple moderation analyses using PROCESS Model 2 (Hayes, 2022) were conducted to examine whether psychological distress and loneliness moderated the relationship between income and six dietary outcomes: (1) average frequency of sugary drink consumption, (2) number of sugary drinks consumed per week, (3) number of crisps and chocolate packets consumed per week, (4) average frequency of unhealthy food intake, (5) average frequency of healthy food intake, and (6) daily water consumption (pints). Across all models, salary was entered as the independent variable, while distress and loneliness were tested as moderators. Results summarised in Table 4.

Table 4. Analysis of the influence of Income on Dietary Habits and Assessing the influence of Loneliness and Distress as Moderators (N = 397)

	Sugary Drinks (Avg. Freq)		**Sugary Drinks (No. of Cans)**		**Crisps and Chocolate (No. of Packets)**		**Unhealthy Food (Avg. Freq)**		**Healthy Food (Avg. Freq)**		**Water (Pints Per Day)**	
	B (SE) [CI]	**p**	**B (SE) [CI]**	**p**	**B (SE) [CI]**	**p**	**B (SE) [CI]**	**p**	**B (SE) [CI]**	**p**	**B (SE) [CI]**	**p**
Income	−0.03 (0.03) [−0.09, 0.03]	0.38	−0.02 (0.07) [−0.17, 0.13]	0.78	−0.16 (0.12) [−0.39, 0.06]	0.16	−0.05 (0.02) [−0.10, −0.00]	0.03*	−0.07 (0.04) [−0.15, 0.00]	0.05*	0.14 (0.07) [0.01, 0.28]	0.04*
Distress	0.00 (0.00) [−0.00, 0.01]	0.22	−0.00 (0.01) [−0.02, 0.02]	0.93	0.01 (0.01) [−0.02, 0.04]	0.37	0.01 (0.00) [0.00, 0.01]	0.02*	−0.00 (0.00) [−0.01, 0.00]	0.3	0.01 (0.01) [−0.01, 0.02]	0.51
Loneliness	0.01 (0.01) [−0.01, 0.03]	0.31	−0.02 (0.02) [−0.06, 0.02]	0.33	−0.02 (0.03) [−0.08, 0.05]	0.61	0.01 (0.01) [0.00, 0.03]	0.03*	0.01 (0.01) [−0.01, 0.03]	0.31	0.01 (0.02) [−0.03, 0.05]	0.55
Income x Distress	0.00 (0.00)	0.72	0.02 (0.01)	0.06	−0.00 (0.01)	0.88	−0.00 (0.00)	0.54	−0.01 (0.00)	0.2	0.01 (0.01)	0.4

Income x Loneliness	[−0.01, 0.01] 0.01 (0.01)	0.21	[−0.00, 0.03] −0.00 (0.02)	0.90	[−0.03, 0.02] 0.01 (0.03)	0.73	[−0.01, 0.00] −0.00 (0.01)	0.98	[−0.01, 0.00] −0.00 (0.01)	0.83	[−0.01, 0.02] 0.00 (0.02)	0.92
	[−0.01, 0.02]		[−0.04, 0.03]		[−0.05, 0.07]		[−0.01, 0.01]		[−0.02, 0.02]		[−0.03, 0.03]	
R	0.15		.12		0.1		0.27		0.14		0.12	
R squared	0.02		.01		0.01		0.08		0.02		0.01	
F-statistics	1.92		1.17		0.71		6.34		1.53		1.09	
p-value	0.09		.33		0.61		< .001**		0.18		0.37	

**. Significant at the 0.01 level (2-tailed).

*. Significant is significant at the 0.05 level (2-tailed).

Initial analyses (without covariates) revealed significant associations for unhealthy food frequency, healthy food frequency, and daily water consumption. Specifically, higher income was associated with less frequent consumption of unhealthy foods ($B = -0.05$, $p = .03$) and slightly lower intake of healthy foods ($B = -0.07$, $p = .05$), but greater water intake per day ($B = 0.14$, $p = .04$). In addition, psychological distress ($B = 0.01$, $p = .02$) and loneliness ($B = 0.01$, $p = .03$) each positively predicted the frequency of unhealthy food consumption, suggesting that individuals experiencing greater emotional strain tended to consume unhealthy foods more frequently. No significant moderation effects were found, indicating that the influence of income on dietary habits did not vary according to levels of distress or loneliness.

After controlling for age, gender, race, employment status, education, and marital status, these previously significant effects were no longer observed, suggesting that the initial associations may have been confounded by demographic factors. For unhealthy food frequency, the overall model remained significant, $F(11, 385) = 3.51$, $p < .001$, $R^2 = .09$, but salary ($B = .02$, $p = .87$) and its interactions with loneliness ($B = .00$, $p = .93$) and distress ($B = .00$, $p = .39$) were non-significant. For healthy food frequency, the model was non-significant, $F(11, 385) = 0.87$, $p = .57$, $R^2 = .02$, with no significant effects of salary ($B = 0.10$, $p = .56$), loneliness ($B = 0.00$, $p = .82$), or distress ($B = -0.01$, $p = .16$). Similarly, for daily water consumption, the overall model was not significant, $F(11, 385) = 1.36$, $p = .19$, $R^2 = .04$, and neither salary ($B = -.06$, $p = .84$) nor its interactions with loneliness ($B = .00$, $p = .99$) or distress ($B = .01$, $p = .47$) significantly predicted water intake.

Finally, after applying the Benjamini–Hochberg correction (FDR = .05) for multiple comparisons across all dietary outcomes, none of the initially significant predictors remained statistically significant. Although uncorrected analyses suggested that higher income was linked to lower unhealthy food consumption and greater water intake, and that higher loneliness and distress predicted greater unhealthy food consumption, these effects did not survive correction for false discovery rate and should therefore be interpreted with caution.

4. Logistic Regression

Logistic regression was performed to estimate the effects of distress, loneliness, and income, along with their two-way interactions with demographic variables, on whether the participant takes breakfast or otherwise in their daily habits. To prepare the items for analysis, all raw participant data were recoded. For breakfast, if the subject had stated they "never" or "taken at least once or twice a month", they were coded as 1 to indicate a lower likelihood of having breakfast. Other responses were coded as 2 to indicate a greater likelihood of regular consumption of the food. The overall model was not statistically significant, $\chi^2(10) = 15.56$, $p = .113$, accounting for 3.8% (Cox & Snell R^2) to 6.0% (Nagelkerke R^2) of variance in breakfast consumption. Model fit was acceptable based on the Hosmer–Lemeshow goodness-of-fit test, $\chi^2(8) = 5.86$, $p = .663$. None of the predictors was significant. Additionally, including the demographic variables as controls revealed no further significant values. Bootstrapped logistic regression with 1,000 resamples confirmed these results, showing

similar coefficients and marginal significance levels. A robust logistic regression was performed with Huber–White standard errors to address potential concerns about influential cases or unequal variance that could bias standard error estimates. The robust analysis confirmed the stability of the near-significant effects involving Education × Salary and Marital Status × Salary, suggesting that these findings were not artefacts of data irregularities but rather consistent, modest trends.

Discussion

1. Income Interrelations with Loneliness and Distress

The results of the present research show that low income is associated with the experience of loneliness and psychological distress among B40 youths in Malaysia, which is consistent with past research stating that youths are at greater risk of experiencing loneliness because sociologically they transition from the comfort of their family home to the external world that requires them to seek a new social group (Arnett et al., 2014; Lee et al., 2018; Hang et al., 2024). However, low income could restrict or hinder these opportunities as much of social relationships and quality time may require capital, which they lack (Ab Malik et al., 2020; Halleröd & Larsson, 2007; Horesh et al., 2020; Megalakaki & Kokou-Kpolou, 2021; Menec et al., 2020; Richard et al., 2017). Moreover, the negative correlation between income and psychological distress is also consistent with multiple past studies. The cause of distress could be a result of financial restrictions in accessing various commodities (Ahmad and Khan, 2019; Menec et al., 2020). To conclude, the present research supports the consistent narrative of past research, presenting the consequential effects of low income on the mental health of young adults.

2. Poor Dietary Habits Interrelations with Loneliness, Distress and Income

Firstly, low income is associated with increased unhealthy food consumption, as evidenced by both bivariate correlations and the moderation analysis. Lower income is also associated with greater loneliness and distress in the bivariate correlations, although moderation analysis revealed no significant interaction effects; the influence of each variable remains. Consistent with initial predictions and past literature, lower income increases the likelihood of poor dietary habits, in this case, more frequent consumption of unhealthy food. As explained initially, this could be a result of actual or perceived deprivation, including low purchasing power, a heavy-duty job hindering preparation time, or a lack of access to quality food due to geographical location, or a lack of awareness and poor motivation towards healthy eating habits (Alim et al., 2021; Di Benedetto, 2015; Li et al., 2019; Muhamad et al., 2020; Sanusi, 2020; Soraya et al., 2021; Teoh, 2024). However, moderation analysis and logistic regression revealed no significance when covariates were included, underscoring the confounding influence of other demographic variables. This suggests that demographic and structural factors may overshadow the direct effects of income or emotional distress on eating patterns.

Secondly, healthy choices appear to show an interesting pattern in the results, especially the fact that higher income is predictive of low consumption in the moderation analysis. The findings contradict the initial expectation. It might indicate that food consumption is low overall among youths, especially of B40 with higher income due to their workload, leaving a small window to prepare or identify healthy meals (Alim et al., 2021; Sanusi, 2020; Soraya et al., 2021), the poor attitude towards eating healthy (Mamun et al., 2020), or low awareness of the need to eat healthily (Arifen et al., 2022; Lim, 2014; Abd Hanan et al., 2021; Rahim et al., 2022). It is recommended that future research explore this further by probing B40 youths using either quantitative questionnaires or qualitative interviews to inquire whether time, attitude or overall awareness affects their ability to practice healthy dietary habits in Malaysia.

Meanwhile, the bivariate correlations revealed that greater distress and greater loneliness were associated with frequent consumption of unhealthy foods, and that greater distress was associated with a lower frequency of breakfast consumption. This confirms that the consumption of unhealthy foods may be fuelled by the need to remove psychological discomforts (Amatori et al., 2020; Bemanian et al., 2020; Frayn et al., 2018; Hong & Peltzer, 2017; Sangsefidi et al., 2020; Terada et al., 2019). Alternatively, psychological discomforts could increase the likelihood of poor dietary habits, which further worsens mental health (Caso

et al., 2022; Hyman, 2020). However, this association may not be confounded by income level as revealed in the moderation analysis, although the present study only included the B40 communities. Results may differ if higher income statuses are included in the research. Additionally, what the present research did not capture is the causal connection to determine which comes first, mental health or dietary choice. The Ecological-Momentary Assessment Design could provide a more valid method to test this. Doan et al. (2022) employed this method by asking the participants to report their feelings and cravings the moment they occurred. Their research presented not only causal connections between the emotion and food consumption but also greater ecological validity. It is recommended that future research attempt to replicate this among Malaysian B40 youths and include other youths with higher socioeconomic status to further confirm whether the influence of income also plays a role or otherwise.

Conclusion

This study examined whether income, psychological distress, and loneliness predicted dietary behaviours among Malaysian young adults. Initial analyses suggested that higher income was linked to lower unhealthy food consumption and greater water intake, while higher distress and loneliness were associated with more frequent unhealthy eating. However, these effects did not remain significant after controlling for demographic variables or adjusting for multiple comparisons, indicating that the observed relationships were likely confounded by factors such as age, gender, education, and employment. No significant moderation effects were found, suggesting that the influence of income on dietary habits does not vary by psychological influence. Policymakers focusing on physical and mental health may need to create assistance that caters to different demographics and cultures, besides accounting for financial and psychological factors alone. It is recommended that future research consider revisiting this topic by expanding the sample and contextualising it across different demographics and ensuring a more balanced sampling representation, especially by gender, income and employment status. Additionally, it is also recommended that future research consider conducting longitudinal and ecological momentary assessment as part of the research process.

Interpretation of the present findings should be made with caution. Although preliminary analyses suggested associations between income, psychological distress, loneliness, and certain dietary behaviours, all effects were small and lost significance after covariate adjustment and multiple-testing correction. Moreover, DABS demonstrated poor internal reliability, likely reflecting the heterogeneous nature of the behaviours assessed—spanning both healthy and unhealthy practices. The small number of items within subdomains and the conceptual overlap between domains, such as hydration and snacking frequency, may have reduced inter-item consistency. It is recommended to use alternative measures or make further refinements to the current tool. Finally, the use of online convenience sampling probably led to an over-representation of educated, urban youth, limiting generalisability and underscoring the need for more diverse and representative sampling in future research.

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