Health Smart : Jurnal Kesehatan Masyarakat
https://fikesunras.ac.id/index.php/HealtSmart
HealthSmart Vol 2(2) August Edition 2026 Pages 152-169

Academic Background and the Selection of Menu Items Without Calorie Labels on ShopeeFood and GoFood in Bengkulu City

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Abstract
Online food delivery applications such as ShopeeFood and GoFood have become a primary food environment for students, yet most menu items lack calorie information. This study examined the effect of academic background on the selection of unlabelled menu items and the mediating role of nutrition literacy. An analytical cross-sectional design involved 80 students in Bengkulu City (40 health-cluster, 40 non-health-cluster) recruited by stratified random sampling. A validated questionnaire measured nutrition literacy, label attention, convenience orientation, and frequency of application use; menu selection was captured through a standardised ordering scenario. Data were analysed using chi-square tests, t-tests, analysis of variance, binary logistic regression, and mediation testing. Unlabelled items were selected by 40.0% of health-cluster students versus 65.0% of non-health-cluster students (chi-square = 5.013; p = 0.025). Nutrition literacy was higher in the health cluster (t = 3.309; Cohen's d = 0.740) and was the strongest predictor (odds ratio = 0.340), fully mediating the effect of academic background (indirect effect = −0.752; Sobel z = −2.111; p = 0.035; 79.6% mediated). Model discrimination was adequate (Nagelkerke R square = 0.477; accuracy = 78.8%; area under the curve = 0.851). Strengthening nutrition literacy and mandating digital calorie labelling are priority interventions.

Keywords: Calorie labelling, nutrition literacy, digital consumer behaviour, online food delivery, university students

History Article	: Submit : 9 August @026 Accepted : 29 August 2026 Publish : 31 August 2026
Doi	: https://doi.org/10.64146/66fkmr34

How to cite this article:
Elvina, W. (2026). Academic Background and the Selection of Menu Items Without Calorie Labels on ShopeeFood and GoFood in Bengkulu City. Health Smart : Jurnal Kesehatan Masyarakat, 2(2). https://doi.org/10.64146/66fkmr34

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e-ISSN: 3111-2131

INTRODUCTION

Digital transformation in the food sector has reshaped the way students obtain their daily meals. Online food delivery applications such as ShopeeFood and GoFood gather thousands of outlets into a single interface that is accessible at any hour and unconstrained by distance. These services have expanded rapidly and now position digital platforms as a new food environment that helps shape the daily energy intake of their users (Bennett et al., 2024; Jia et al., 2024). The digital food environment differs from physical outlets because purchase decisions are driven by visual cues, price discounts, and popularity rankings. Those cues reduce the visibility of nutrition information whenever a platform does not require calorie details for every menu item.

Calorie information on online menus remains scarce in many national settings. A mapping of popular menu items in Bangkok showed a predominance of energy-dense dishes high in sodium and lacking adequate nutrition information (Jindarattanaporn et al., 2023; Bennett et al., 2024). An audit of outlet compliance in Saudi Arabia found that only a limited share of restaurants displayed complete calorie information in the applications even though a national labelling policy was already in force (Alangari, 2023; Alkhunein et al., 2024). Southeast Asian markets still impose no labelling obligation on digital channels. Consumers therefore face a choice architecture that obscures the energy content of most ordering decisions.

Experimental evidence indicates that calorie labelling can lower the energy content of online orders. A randomised controlled trial using a virtual delivery application in the United Kingdom reported fewer ordered calories when labels appeared alongside proportional pricing (Finlay et al., 2023; Luick et al., 2024). Menu-based choice experiments among online consumers reinforce that finding through a shift in preference towards lower-energy dishes (Tanasache et al., 2025; Luick et al., 2024). Repositioning outlets and reordering menu lists has likewise been shown to change the composition of user baskets (Bianchi et al., 2023; Finlay et al., 2023). This evidence underlines the role of information architecture in online ordering.

Students are among the heaviest users of delivery services. A survey of university students in the United Arab Emirates recorded frequent weekly ordering accompanied by limited perceptions of the availability of healthy options (Cheikh Ismail & Al Dhaheri, 2024; Saleh & Osaili, 2024). Studies on the determinants of food choice among campus users reveal that price and delivery speed consistently outweigh nutritional considerations, although visual presentation moderates this pattern by increasing impulsive selection and promotional discounts amplify the effect of price sensitivity (Alshahry & Alhazmi, 2026; Cheikh Ismail & Al Dhaheri, 2024). These patterns emerge during a formative stage of eating habits that tends to persist into adulthood. Fast-food consumption among young people is associated with weight gain and digestive complaints (Harjadinta & Susanty, 2025; Cahyani, 2025). The risk of excess energy intake in this group therefore deserves serious scientific attention.

Academic background is thought to differentiate the way students handle nutrition information. A comparison of medical and non-medical students in Islamabad revealed higher nutrition knowledge

https://doi.org/10.64146/66fkmr34

scores in the health group even though the eating habits of both groups were broadly similar (Farrukh, 2026; Alqahtani et al., 2024). That finding raises questions about the distance between knowledge and actual behaviour in concrete menu-selection situations. A study of health literacy among health-cluster students in Saudi Arabia reported that half of the respondents fell into the limited category (Alqahtani et al., 2024; Shudayfat et al., 2023). Such a gap calls for testing within specific decision contexts.

Nutrition literacy and food literacy have developed into constructs that explain eating behaviour. Research among adults in Saudi Arabia found a positive association between food literacy and the prioritisation of healthy food choices (Alhudhaif et al., 2026; Consavage Stanley et al., 2022). The digital food and nutrition literacy model treats the ability to appraise online information as a distinct skill (Consavage Stanley et al., 2022; Bennett et al., 2024). Electronic health literacy among university students is likewise related to healthier lifestyle behaviour (Shudayfat et al., 2023; Alhudhaif et al., 2026). Smartphone-based nutrition education media have been shown to improve knowledge and healthy food consumption behaviour (Pratama & Saputra, 2025; Daryati et al., 2026). Academic background thus serves as an upstream determinant, while nutrition literacy functions as the intervening explanation.

The theoretical framework of this study combines the Health Belief Model with a choice architecture perspective. The Health Belief Model explains consumption decisions through perceived susceptibility, perceived benefits, barriers, and self-efficacy, which have been shown to predict the tendency to consume nutrient-dense foods (Winham et al., 2024; Jung et al., 2023). The choice architecture perspective explains how the presentation of information steers rapid decisions on digital interfaces (Lemken et al., 2023; Bianchi et al., 2023). Public acceptance of default nudges that favour healthier options is high across a range of cultural settings (Lemken et al., 2023; Jung et al., 2023). Combining the two frameworks captures internal individual factors alongside external interface factors.

Empirical evidence from the Indonesian context remains scarce despite the high penetration of food delivery services. Previous studies have predominantly focused on usage intention, service satisfaction, and menu nutritional quality without examining users' academic disciplines (Jia et al., 2024; Alshahry & Alhazmi, 2026), while research treating the selection of unlabelled menu items as a behavioural outcome is also rare (Tanasache et al., 2025; Alkhunein et al., 2024). Indonesia's digital labelling policy therefore lacks local empirical support. The value of online food delivery transactions continues to rise (Katadata, 2026), confirming these platforms as a primary channel for digital food distribution. In Bengkulu City, online food delivery services are well established with intense inter-platform competition (Candra & Hayadi, 2025), yet existing local studies have only linked online ordering frequency to student nutritional status without examining how calorie labels on digital menus influence food selection decisions (Shovianti et al., 2024), a gap that the present study addresses by

https://doi.org/10.64146/66fkmr34

testing whether academic background predicts the selection of menu items without calorie labels among university students. Testing a multidisciplinary student population allows comparison of groups with different exposure to nutrition curricula within a single campus.

The novelty of this study rests on three main aspects. The first is a standardised ordering scenario that mimics the application interface so that respondent decisions are captured under conditions resembling actual practice (Bianchi et al., 2023; Luick et al., 2024). The second is the examination of academic background as the primary variable, with nutrition literacy modelled as the mediator and label attention, frequency of application use, sex, and monthly allowance as covariates (Farrukh, 2026; Alhudhaif et al., 2026). The third is the reporting of effect sizes and model discrimination, which are rarely presented in comparable Indonesian studies (Hair et al., 2022; Field, 2024). These aspects distinguish the present study from prior work.

This study aims to examine the effect of academic background on the decision to select menu items without calorie labels on the ShopeeFood and GoFood applications among students in Bengkulu City. Subsidiary aims include comparing nutrition literacy across academic clusters, identifying predictors of the decision, and assessing the classification accuracy of the model. The first hypothesis posits that students in the health cluster exhibit statistically significantly lower adjusted odds ratios of selecting unlabelled menu items compared with students in the non-health cluster, as estimated through binary logistic regression controlling for sex, monthly allowance, and platform usage frequency. The second hypothesis states that nutrition literacy is consistently and negatively associated with that decision. The third hypothesis states that frequency of application use is positively associated with that decision. The findings are expected to inform digital calorie labelling policy while strengthening nutrition literacy curricula across study programmes (OECD, 2023; FAO, 2024).

METHODS

This study applied a quantitative approach with an analytical cross-sectional design because the relationships between variables were measured at a single point in time (Creswell & Creswell, 2023). Data collection ran for eight weeks during the even semester of the 2025/2026 academic year at a comprehensive university in Bengkulu City that hosts both health and non-health faculties (ethical clearance No. [nomor diisi penulis], issued by [nama komite etik diisi penulis] on [tanggal diisi penulis]).

The population comprised actively enrolled undergraduate students who had ordered food through ShopeeFood or GoFood at least once during the previous month. Respondents were drawn by *stratified random sampling* with a balanced allocation of twenty respondents in each academic cluster. The sample size was calculated with the two-proportion comparison formula at a 95% confidence level, 80% statistical power, and a 10% allowance for data loss, which yielded 40 respondents per group; the

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valid data analysed therefore comprised 80 respondents, consisting of 40 health-cluster students and 40 non-health-cluster students (Hair et al., 2022).

The instrument was a five-section online questionnaire covering respondent characteristics, twelve nutrition literacy items adapted from the digital food and nutrition literacy model (Consavage Stanley et al., 2022), eight label attention items grounded in the Health Belief Model (Jung et al., 2023), six convenience orientation items, and the frequency of ordering through ShopeeFood and GoFood during the previous month. All attitudinal items used a five-point Likert scale.

The instrument trial involved thirty students outside the main sample. Content validity was appraised by three public health nutrition experts with an index of 0.89, item validity used corrected item-total correlations with a threshold of 0.30, and reliability used Cronbach's alpha with a threshold of 0.70 (Field, 2024).

The dependent variable was the decision to select menu items without calorie labels, recorded through a standardised ordering scenario styled after the ShopeeFood and GoFood interfaces and containing six menu pairs matched on price, dish category, and estimated delivery time. Each pair contained one item with calorie information and one item without it. Respondents were classified as selecting unlabelled menu items when they chose the unlabelled option in four or more pairs (Bianchi et al., 2023).

Analyses were performed in IBM SPSS Statistics version 27 using descriptive statistics, chi-square tests, independent samples t-tests, one-way analysis of variance, and binary logistic regression with the *enter* method, reporting odds ratios and 95% confidence intervals. Normality was examined with the Kolmogorov-Smirnov test and homogeneity of variance with the Levene test, while model fit was judged through the Hosmer and Lemeshow test, Nagelkerke R square, the classification table, and the ROC curve. Mediation by nutrition literacy was tested within the PROCESS Model 4 framework for binary outcomes (Hayes, 2022). Path a is expressed in standard deviations, while path b is expressed as the logit coefficient of the second block. The indirect effect was tested with the Sobel test, and a Monte Carlo confidence interval based on 5,000 resamples (Preacher & Selig, 2012), while the mediated proportion used the Karlson Holm Breen approach (Kohler et al., 2011). The significance threshold was set at $p < 0.05$.

RESULTS AND DISCUSSION

Eighty students met the analysis criteria, comprising 40 health-cluster students and 40 non-health-cluster students. The distribution of sex did not differ significantly between the two clusters, with a chi-square value of 0.833 and $p = 0.361$. Monthly allowance and semester level likewise showed no significant differences, so the two groups were comparable on all of these characteristics. Detailed respondent characteristics are presented in Table 1.

Table 1. Respondent characteristics by academic cluster (n = 80)

Characteristic	Health n (%)	Non-health n (%)	Chi-square	p
Sex			0.833	0.361
Male	14 (35.0)	18 (45.0)		
Female	26 (65.0)	22 (55.0)		
Monthly allowance			0.087	0.957
Low	14 (35.0)	15 (37.5)		
Medium	16 (40.0)	16 (40.0)		
High	10 (25.0)	9 (22.5)		
Semester			0.499	0.919
Semesters 1 and 2	11 (27.5)	12 (30.0)		
Semesters 3 and 4	13 (32.5)	11 (27.5)		
Semesters 5 and 6	8 (20.0)	10 (25.0)		
Semester 7 and above	8 (20.0)	7 (17.5)		

Internal consistency testing showed that every construct exceeded the 0.70 threshold. Cronbach's alpha reached 0.879 for nutrition literacy, 0.866 for label attention, and 0.812 for convenience orientation. All corrected item-total correlations exceeded 0.40, so no item was removed from the analysis. The Kolmogorov-Smirnov test indicated that the distributions of nutrition literacy, label attention, convenience orientation, and frequency of application use did not depart from normality, with p values of 0.826, 0.199, 0.571, and 0.093 respectively, so the assumptions for parametric testing were satisfied. Reliability results appear in Table 2, while the descriptive profile of the numerical variables appears in Table 3.

Table 2. Reliability results and corrected item-total correlations

Construct	Number of items	Cronbach's alpha	Range of corrected item-total correlations
Nutrition literacy	12	0.879	0.424–0.659
Label attention	8	0.866	0.517–0.714
Convenience orientation	6	0.812	0.499–0.625

Table 3. Descriptive statistics of the numerical variables (N = 80)

Variable	N	Mean	Standard deviation	Standard error of the mean
Nutrition literacy	80	72.73	12.32	1.378
Label attention	80	3.311	0.722	0.081
Frequency of application use	80	6.575	1.621	0.181
Convenience orientation	80	3.585	0.664	0.074

https://doi.org/10.64146/66fkmr34

The cross-tabulation revealed a marked difference in menu selection. Sixteen health-cluster students, or 40.0%, selected menu items without calorie labels, compared with 26 non-health-cluster students, or 65.0%. The Pearson chi-square value was 5.013 with one degree of freedom and p = 0.025. A phi coefficient of 0.250 indicates an association of moderate strength. The crude odds ratio was 2.786 with a 95% confidence interval of 1.125–6.899. Complete results are presented in Table 4 and Table 5 and visualised in Figure 1.

Table 4. Cross-tabulation of academic background and menu selection

Academic background	Menu selection				Total		p
	Without calorie label		With calorie label				
	n	%	n	%	n	%	
Health	16	40.0	24	60.0	40	100	0.025
Non-health	26	65.0	14	35.0	40	100	
Total	42	52.5	38	47.5	80	100	

Table 5. Chi-square test results and measures of association

Test or measure	Value	df	Asymptotic p
Pearson Chi-Square	5.013	1	0.025
Continuity Correction	4.060	1	0.044
Phi and Cramer's V	0.250		0.025
Odds ratio (95% CI)	2.786 (1.125–6.899)		
N of Valid Cases	80		

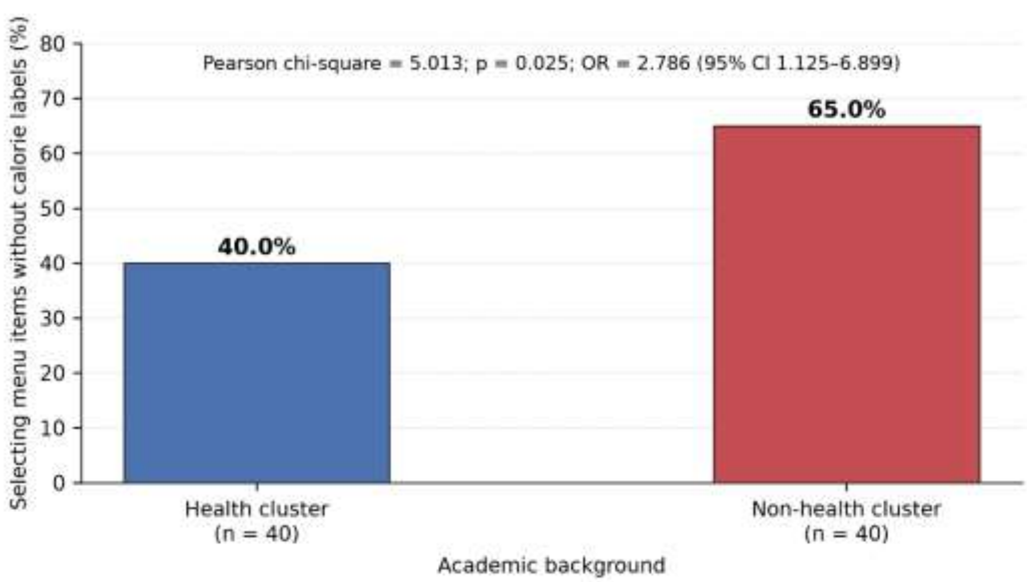

Figure 1. Percentage selecting menu items without calorie labels by academic cluster

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Independent samples t-tests showed an advantage for health-cluster students in nutrition literacy and label attention. The Levene test produced an F value of 0.010 with p = 0.920 for nutrition literacy, so the assumption of homogeneity of variance held. Mean nutrition literacy reached 77.03 among health-cluster students compared with 68.44 in the non-health cluster, with t = 3.309 and a Cohen's d effect size of 0.740. Label attention was also higher in the health cluster, with means of 3.516 versus 3.106, t = 2.630, and p = 0.010. Frequency of application use was instead higher among non-health-cluster students, with a mean difference of 0.750 orders per month. Convenience orientation did not differ significantly between the two groups, with t = −1.039 and p = 0.302, so the preference for convenience appeared equivalent across clusters. A summary of the tests is presented in Table 6.

Table 6. Independent samples t-test results by academic background

Variable	Health M (SD)	Non-health M (SD)	t	df	p	Cohen's d	Mean difference (95% CI)
Nutrition literacy	77.03 (11.51)	68.44 (11.71)	3.309	78	0.001	0.740	8.594 (3.424–13.764)
Label attention	3.516 (0.752)	3.106 (0.635)	2.630	78	0.010	0.588	0.409 (0.100–0.719)
Frequency of application use	6.200 (1.605)	6.950 (1.568)	−2.114	78	0.038	−0.473	−0.750 (−1.456 to −0.044)
Convenience orientation	3.508 (0.600)	3.663 (0.722)	−1.039	78	0.302	−0.232	−0.154 (−0.450 to 0.141)

One-way analysis of variance examined differences in nutrition literacy across the four academic clusters. The F value was 4.321 with 3 and 76 degrees of freedom and p = 0.007. An eta squared of 0.146 indicates an effect of moderate magnitude. Bonferroni post hoc tests showed that the Medicine and Nutrition cluster differed significantly from the Science and Engineering cluster with p = 0.030 and from the Social Sciences and Humanities cluster with p = 0.013, while the remaining pairwise comparisons did not reach significance. The results are presented in Table 7 and Table 8.

Table 7. Descriptive statistics of nutrition literacy by academic cluster

Academic cluster	n	Mean	Standard deviation	Selecting unlabelled menu (%)
Medicine and Nutrition	20	79.58	10.40	30.00

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Academic cluster	n	Mean	Standard deviation	Selecting unlabelled menu (%)
Nursing and Public Health	20	74.48	12.26	50.00
Science and Engineering	20	68.96	12.03	55.00
Social Sciences and Humanities	20	67.92	11.68	75.00
Total	80	72.73	12.32	52.50

Table 8. One-way analysis of variance of nutrition literacy scores by academic cluster

Source of variance	Sum of squares	df	Mean square	F	Sig.
Between Groups	1,748.427	3	582.809	4.321	0.007
Within Groups	10,249.783	76	134.866		
Total	11,998.210	79			

Binary logistic regression was run in two blocks. The first block contained only academic background, with B = −1.025 and Exp(B) = 0.359. The second block introduced nutrition literacy, label attention, frequency of application use, sex, and monthly allowance. The omnibus chi-square of the second block was 35.358 with six degrees of freedom and $p < 0.001$. Nagelkerke R square rose from 0.082 to 0.477, while the Hosmer and Lemeshow test produced $p = 0.420$, indicating adequate model fit. A summary of model fit is presented in Table 9.

Table 9. Summary of fit for the binary logistic regression model

Indicator	Block 1	Block 2
−2 Log likelihood	105.637	75.345
Omnibus chi-square (df)	5.067 (1)	35.358 (6)
Omnibus significance	0.024	< 0.001
Cox and Snell R Square	0.061	0.357
Nagelkerke R Square	0.082	0.477
Hosmer and Lemeshow chi-square (df)	12.486 (8)	8.140 (8)
Hosmer and Lemeshow significance	0.131	0.420

Coefficients in the second block show that the direct effect of a health-related academic background was no longer significant, with Exp(B) = 0.824 and a 95% confidence interval of 0.252–2.696. Nutrition literacy emerged as the strongest predictor, with Exp(B) = 0.340 for each one standard deviation increase. Label attention tended to lower the odds, with Exp(B) = 0.588 at a near-significant level of 0.100, whereas frequency of application use significantly raised the odds, with Exp(B) = 1.935. Sex and monthly allowance were not significant at the 0.05 level. Full coefficients are presented in Table 10 and the predicted probability pattern is displayed in Figure 2.

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Table 10. Binary logistic regression coefficients in the second block

Variable	B	Standard error	Wald	df	Sig.	Exp(B)	95% CI for Exp(B)
Health academic background (1)	−0.193	0.605	0.102	1	0.749	0.824	0.252–2.696
Nutrition literacy (z score)	−1.079	0.394	7.509	1	0.006	0.340	0.157–0.736
Label attention (z score)	−0.531	0.322	2.712	1	0.100	0.588	0.313–1.106
Frequency of application use (z score)	0.660	0.329	4.029	1	0.045	1.935	1.016–3.687
Female sex (1)	0.258	0.640	0.162	1	0.687	1.294	0.369–4.536
High monthly allowance (1)	0.616	0.796	0.599	1	0.439	1.851	0.389–8.800
Constant	−0.067	0.509	0.017	1	0.895	0.935	0.345–2.534

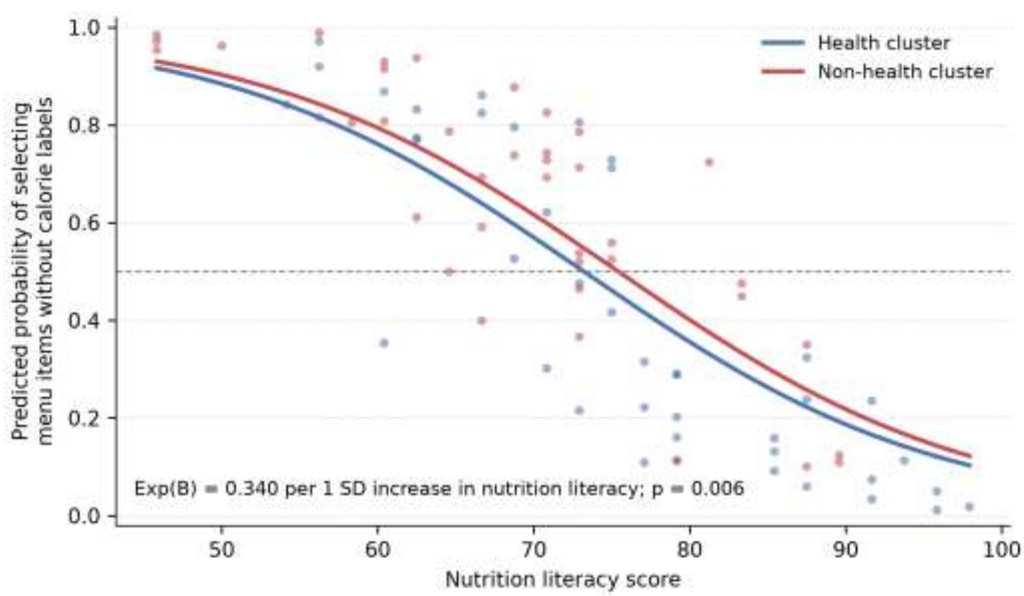

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Figure 2. Predicted probability of selecting menu items without calorie labels by nutrition literacy score

The classification table shows overall accuracy of 78.8% with specificity of 76.3% and sensitivity of 81.0%. The area under the ROC curve was 0.851 with a standard error of 0.043 and a 95% confidence interval of 0.767–0.935. These values place the discriminative ability of the model in the good category. Classification results are presented in Table 11 and the ROC curve is displayed in Figure 3.

Table 11. Classification table and model discrimination

Observed	Predicted labelled menu	Predicted unlabelled menu	Percentage correct
Selected labelled menu	29	9	76.3
Selected unlabelled menu	8	34	81.0
Overall percentage			78.8
Area under the ROC curve (95% CI)	0.851		0.767–0.935

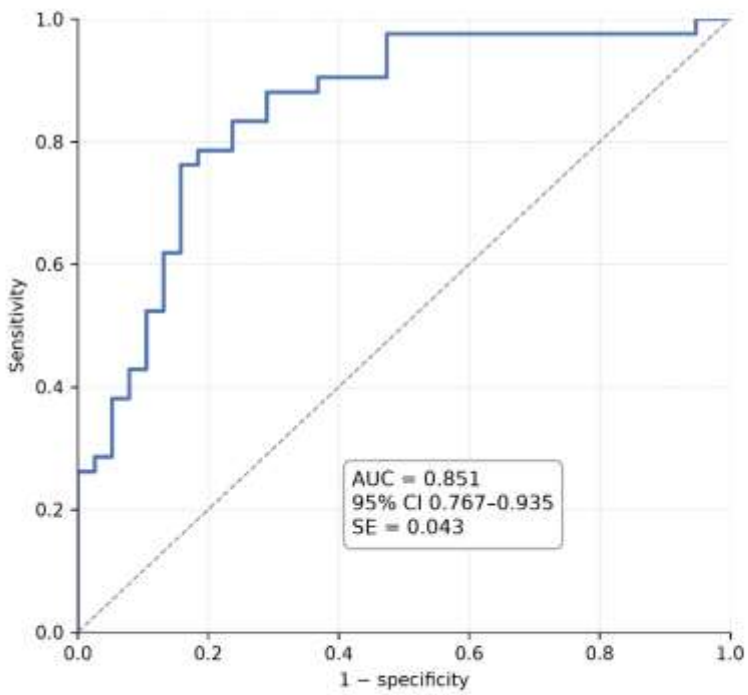

Figure 3. ROC curve of the second-block logistic regression model

The mediation analysis confirms nutrition literacy as the pathway explaining the relationship between academic background and menu selection. Path a was significant, with a coefficient of 0.697 standard deviation units, a standard error of 0.211, and p = 0.001. Path b was also significant, with a coefficient of −1.079, a standard error of 0.394, and p = 0.006. The indirect effect was −0.752 with a standard error of 0.357, so the Sobel test produced z = −2.111 and p = 0.035. The Monte Carlo

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confidence interval based on 5,000 resamples ranged from −1.605 to −0.154 and excluded zero, so the indirect effect remained consistent. The odds ratio of the indirect effect was 0.471 with a 95% confidence interval of 0.234 to 0.948. The direct effect shrank to −0.193 and lost significance with p = 0.749, so the pattern qualifies as full mediation. The mediated proportion reached 79.6%, while the total effect under the Karlson Holm Breen approach was −0.946, comparable to the first-block coefficient of −1.025. Mediation results are presented in Table 12.

Table 12. Mediation by nutrition literacy of the relationship between academic background and menu selection

Mediation path or indicator	Value	Standard error	p or 95% CI
Path a: academic background → nutrition literacy (z score)	0.697	0.211	0.001
Path b: nutrition literacy (z score) → menu selection	−1.079	0.394	0.006
Direct effect (c′): academic background → decision	−0.193	0.605	0.749
Indirect effect (a × b)	−0.752	0.357	Sobel z = −2.111; p = 0.035
Monte Carlo 95% CI with 5,000 resamples for a × b	−1.605 to −0.154	–	does not include zero
Odds ratio of the indirect effect, Exp(a × b)	0.471	–	0.234–0.948
Total effect, Karlson Holm Breen approach (a × b + c′)	−0.946	–	odds ratio 0.388
Mediated proportion	79.6%	–	full mediation

DISCUSSION

The results show that academic background shapes the decision to select menu items without calorie labels. Health-cluster students had roughly 64% lower odds of choosing unlabelled items in the unadjusted model, although that direct effect lost significance once nutrition literacy and the remaining variables were controlled. The finding aligns with comparisons of medical and non-medical students that report superior nutrition knowledge in health groups (Farrukh, 2026; Alqahtani et al., 2024). Exposure to curricula covering energy metabolism, nutritional status assessment, and risk

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communication cultivates sensitivity to missing information on ordering interfaces. That sensitivity acts as an initial filter before price attributes enter consideration.

The substantial attenuation of the academic background coefficient after nutrition literacy entered the model carries an important message. The odds ratio moved from 0.359 in the first block to 0.824 in the second, signalling that most of the disciplinary effect operates through nutrition literacy. Formal mediation testing confirms this pattern statistically. The indirect effect of −0.752 was significant in the Sobel test with $z = -2.111$ and $p = 0.035$, and the Monte Carlo confidence interval excluded zero across the range −1.605 to −0.154. The mediated proportion reached 79.6% while the direct effect was no longer significant, so the relationship qualifies as full mediation (Hayes, 2022; Kohler et al., 2011). The pattern reinforces the idea that academic discipline is not a direct determinant but a provider of learning opportunities that generate skills for appraising food information (Consavage Stanley et al., 2022; Alhudhaif et al., 2026). Food literacy studies in adult populations report similar patterns (Alhudhaif et al., 2026; Shudayfat et al., 2023).

Nutrition literacy emerged as the strongest predictor, with an odds ratio of 0.340 for each one standard deviation increase. Its strength surpassed the contribution of the demographic variables usually reported in consumer behaviour research. This result is consistent with the digital food and nutrition literacy model, which places information appraisal at the core of healthy behaviour in online retail ecosystems (Consavage Stanley et al., 2022; Bennett et al., 2024). Such capability encompasses reading serving sizes, interpreting energy density, and recognising large-portion marketing strategies. Strengthening nutrition literacy therefore deserves to become an intervention target across study programmes.

Label attention contributed in the expected direction, although its magnitude was smaller than that of nutrition literacy and it only approached significance in the final model. The construct represents perceived benefits and self-efficacy within the Health Belief Model, which have been shown to predict the tendency to consume nutrient-dense foods (Winham et al., 2024; Jung et al., 2023). Respondents with high attention tend to seek additional information before pressing the order button. This searching behaviour creates a cognitive pause that restrains the dominance of fast thinking on digital interfaces (Lemken et al., 2023; Winham et al., 2024). That cognitive pause offers an entry point for nudge-based interventions.

Ordering frequency on ShopeeFood and GoFood was positively associated with selecting menu items without calorie labels. Each one standard deviation increase in frequency raised the odds by 93.5%. A study of students in Bengkulu City similarly found a link between the frequency of delivery application use and abnormal nutritional status (Shovianti et al., 2024). The finding is consistent with a survey of students in the United Arab Emirates in which intensive ordering accompanied limited

https://doi.org/10.64146/66fkmr34

perceptions of healthy options (Cheikh Ismail & Al Dhaheri, 2024; Saleh & Osaili, 2024). Frequent use builds automatic ordering routines driven by order history and algorithmic recommendations. Such routines shrink the space for nutritional appraisal and deepen reliance on cues of speed and price discounts (Alshahry & Alhazmi, 2026; Jia et al., 2024). Sustained consumption of ultra-processed and fast food is associated with metabolic syndrome and obesity in productive age groups (Ikhsan & Kurniawan, 2026; Harjadinta & Susanty, 2025).

The absence of effects for sex and monthly allowance strengthens the argument for the primacy of cognitive factors. Convenience orientation, which did not differ across academic clusters, points in the same direction because the preference for convenience appears evenly distributed among all student users of the applications. Demographic variables are often treated as the main determinants of consumption behaviour in the marketing literature. The present results show that the influence of both weakens once nutrition literacy and label attention enter the same model (Field, 2024; Hair et al., 2022). The methodological implication is the necessity of including cognitive constructs when modelling online ordering behaviour. The practical implication is an intervention that targets information appraisal skills rather than demographic segmentation.

Comparison with previous studies in Asia shows consistency in the direction of the relationship even though effect magnitudes vary. Studies among students in the United Arab Emirates and Saudi Arabia report similar menu selection patterns among users of delivery applications (Saleh & Osaili, 2024; Alshahry & Alhazmi, 2026). Differences in effect size may stem from variation in national labelling policy and in population nutrition literacy (Alangari, 2023; Jindarattanaporn et al., 2023). Situating the Indonesian findings within the regional evidence map strengthens the argument that digital labelling interventions require adaptation to cultural context and to the user characteristics of each food delivery platform.

The findings carry policy implications at platform level. Mandatory calorie labelling on digital channels has been shown to lower ordered energy across a range of randomised controlled trials (Finlay et al., 2023; Tanasache et al., 2025). Placing lower-energy dishes at the top of menu lists shifts basket composition without restricting freedom of choice (Bianchi et al., 2023; Luick et al., 2024). Outlet compliance with labelling regulation remains low, so periodic monitoring is required (Alangari, 2023; Alkhunein et al., 2024). International guidance on food label design provides a technical reference for national rules (OECD, 2023; FAO, 2024).

Implications for higher education concern the equitable distribution of nutrition literacy across academic clusters. Differences in nutrition literacy scores among the four academic clusters reached almost twelve points, with an eta squared effect size of 0.146. Students in science, engineering, social

https://doi.org/10.64146/66fkmr34

sciences, and humanities are the most vulnerable and therefore require micro-modules on practical nutrition. Such modules should emphasise skills for reading digital information rather than memorising nutrients (Alhudhaif et al., 2026; Jindarattanaporn et al., 2023). Delivering modules through smartphone applications and interactive media has proven effective in improving knowledge and healthy food consumption behaviour (Pratama & Saputra, 2025; Daryati et al., 2026; Cahyani, 2025). Collaboration with student services units can widen the reach of these programmes.

The limitations of the study should be acknowledged openly. The cross-sectional design restricts causal inference, so the observed relationships are associative (Creswell & Creswell, 2023; Hair et al., 2022). The sample of 80 respondents, comprising 40 health-cluster and 40 non-health-cluster students, is small, so statistical power is limited, confidence intervals are wide, and a model with six predictors must be interpreted cautiously as preliminary evidence. Collecting data at a single university in Bengkulu City and restricting the platforms to ShopeeFood and GoFood limits generalisation to other student populations. The standardised ordering scenario offers strong experimental control but does not yet represent real situations involving time pressure and budget constraints. Self-reported frequency of application use may also carry recall bias and social desirability bias. Future research should use actual transaction data and longitudinal multisite designs to test the robustness of these findings.

CONCLUSION

This study demonstrates that academic background influences the decision to select menu items without calorie labels on ShopeeFood and GoFood among students in Bengkulu City. Health-cluster students showed lower odds of choosing unlabelled items (crude odds ratio = 0.359), although this direct effect disappeared once nutrition literacy, label attention, frequency of application use, sex, and monthly allowance were controlled. Nutrition literacy was the strongest predictor and fully mediated the disciplinary effect (indirect effect = −0.752; Sobel z = −2.111; p = 0.035; 79.6% mediated).

These findings position nutrition literacy as the principal target of behavioural intervention in the digital food environment of Bengkulu City and comparable mid-sized Indonesian cities. Frequency of application use increased the odds of selecting unlabelled items, so ordering intensity warrants attention as a behavioural risk factor. The final model explained 47.7% of the variance with 78.8% classification accuracy and an area under the curve of 0.851. Policy implications point to mandatory calorie information for every outlet partnering with digital platforms, supported by periodic compliance monitoring, while educational implications point to nutrition literacy modules for all academic clusters, particularly the non-health cluster. Future studies should use actual transaction data, longitudinal designs, and multisite samples to test causality.

https://doi.org/10.64146/66fkmr34

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