THE RELATIONSHIP BETWEEN NUTRITIONAL KNOWLEDGE AND FOOD CHOICES AMONG STUDENTS AT THE UNIVERSITY OF JOHANNESBURG, SOUTH AFRICA

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ABSTRACT

Introduction: A balanced diet heavily influences a student's cognitive function and academic achievement. Evidence remains limited on the extent to which nutritional knowledge translates into healthier food choices among South African university students**.** This study evaluated the role of nutritional knowledge in the dietary decision-making of 600 students at the University of Johannesburg. **Methods:** An online survey was carried out from July to November 2022. The target population was registered undergraduate and postgraduate students in all faculties. **Results:** Nutritional literacy appeared to be high among participants (average score: 4 out of 5). High awareness of balanced diets and the risks of processed foods was observed, with no significant differences by age, gender, or accommodation status. Despite this, dietary behaviours did not consistently reflect this knowledge. More than half of the students (58%) rarely consumed the recommended fruit intake, while substantial proportions frequently consumed packaged white bread (47%), fried foods (36%), and sugar-sweetened beverages (28.5%). The primary drivers of the food selection were cost (83%), availability (64%), and convenience (58%). Nutritional awareness (40.5%) and social influences (41%) had a moderate impact. A weak but significant association between nutritional knowledge and healthier dietary behaviors was observed ($|r| = 0.09–0.17$; $p<0.05$), especially on increased consumption of wholegrains and vegetables, and reduced intake of fast foods and sugar-sweetened beverages. **Conclusion:** Nutritional knowledge accounted for only a limited proportion of dietary behaviour. Promotion of healthy eating on campus should therefore combine nutrition education with efforts to improve the affordability, availability, and convenience of healthy food.

Keywords: Nutritional knowledge, Food choices, University students, Dietary behavior, South Africa

INTRODUCTION

Adequate nutrition is a fundamental determinant of learners' health, cognitive function, and academic performance (Moral-Moreno et al., 2025; Solomou et al., 2023). As reported by UNESCO (2023), having a balanced diet enhances learning capacity and improves overall well-being. Poor dietary intake and food insecurity of students negatively affect their physical and mental health. This includes higher levels of stress and anxiety that influence their academic engagement and performance (Guiné et al., 2023; Buthelezi et al., 2025; Sultana et al., 2025). For many students, the transition to university marks the first time they assume responsibility for their own food purchasing and meal preparation, often without regular parental guidance. This occurs alongside the challenges of managing academic workloads, adjusting to new social settings, and operating within limited financial means (Mahmood et al., 2021). Especially in developing countries, students are often considered at nutritional risk due to compromised dietary quality and suboptimal food choices (Moral-Moreno et al., 2025; Sultana et al., 2025).

Structural inequalities, rising food costs, and limited access to nutritious foods have been described as factors contributing to the persistent challenges of achieving healthy diets in Sub-Saharan Africa. Food insecurity is a cause for concern in both rural and urban communities across the region (Wudil et al., 2022). In South Africa (SA), an emerging country, economic inequalities significantly shape the eating patterns of young adults. Nutritious foods are expensive for households with limited income. They therefore turn to cheaper options that are mostly energy-dense (Mgweba, 2024; Sahadeo et al., 2025a). Similar observations were made at universities, where financial and time pressures were reported to influence students' food choices, with students frequently opting for cheap, convenient foods rather than healthier options (Sahadeo et al., 2025a, 2025b; Kanosvamhira, 2025; Jonker & Walsh, 2025).

Nutritional knowledge is important for shaping food choices and dietary behaviours. It assumes an understanding of nutrients and food groups, as well as how diet impacts health (Scalvedi et al., 2021). Individuals with higher awareness have been reported to be more likely to make healthier food choices, even in resource-constrained settings (Guiné et al., 2023; Silva et al., 2023). However, knowledge alone does not guarantee healthy food choices. The university food environment may constrain students' ability to act on what they know through factors such as food affordability, availability, convenience, marketing practices, and time pressures. As a result, a disconnect may emerge between what students know about healthy eating and what they actually consume. Campus food is usually dominated by fast-food and convenience stores selling processed food (cheap snacks, etc). Healthier meals are either limited or perceived as expensive (Cooksey-Stowers et al., 2017; Racine et al., 2022).

Significant disparities in students' access to nutritious food and healthy eating opportunities have been reported in South African Universities, particularly among those from historically disadvantaged backgrounds (Adeniyi & Durojaye, 2020; Council on Higher Education, 2024). These differences

contribute to unhealthy dietary patterns, among which are meal skipping, low dietary diversity, and high consumption of ultra-processed foods (Sahadeo et al., 2025a). While existing studies have explored the causes individually, there remains a limited understanding of how they interact to influence students' dietary choices (Jonker & Walsh, 2025). This represents an important gap in the literature, notably within the country's higher education context.

The University of Johannesburg (UJ) is characterized by its large, socioeconomically diverse student population, which serves as a microcosm of broader South African disparities. This study aims at understanding its students' levels of nutritional knowledge and how this knowledge translates into food choices within this university food environment. By focusing on UJ, this study might provide context-specific evidence to guide SA campus nutrition policy and interventions for students from varied socio-economic backgrounds.

METHODS

Study design

This study employed a quantitative cross-sectional survey design with a primarily descriptive and partially explanatory approach.

Study population and sampling

The target population was registered undergraduate and postgraduate students across all eight faculties of the University of Johannesburg (UJ). These include the College of Business and Economics; the Faculty of Art, Design and Architecture; the Faculty of Education; the Faculty of Engineering and the Built Environment; the Faculty of Health Sciences; the Faculty of Humanities; the Faculty of Law; and the Faculty of Science. The participants had to be aged 18 years or older and residing either on campus or off campus. A non-probability convenience sampling method was used.

The minimum sample size was estimated at 382 respondents. This calculation was made using the Raosoft sample size calculator for a population of approximately 50,000 UJ students, with a 95% confidence level and a 5% margin of error. A total of 600 valid responses were finally collected.

Data collection instrument and ethical considerations

Data were collected using a self-administered online questionnaire developed based on existing literature and validated tools. The survey was carried out using Microsoft Forms. It consisted of multiple-choice questions organized into four sections: Section A: Socio-demographic characteristics (age, gender, accommodation status); Section B: Nutritional knowledge; Section C: Food choices; and Section D: Factors influencing food choices. General Nutrition Knowledge Questionnaire (GNKQ), already validated across diverse populations (Kliemann et al., 2016), was exploited to define nutrition-related awareness items. Dietary behavior was evaluated through questions examining the frequency of intake of selected food groups and specific products. Respondents also had to select the main factor determining their food choices.

Cost, availability, convenience, nutritional knowledge, social influences, and religious reasons were the possibilities. The study employed five-point Likert-style options measuring levels of agreement, frequency, and influence for sections B, C, and D, respectively.

The questionnaire was piloted with 20 students who were not considered in the main study sample. Feedback indicated that the instrument was clear enough and not time-consuming to complete. Content validity was strengthened by adapting previously validated instruments. The nutritional knowledge scale demonstrated good reliability ($\alpha = 0.818$). Sections C and D consisted of discrete behavioural and contextual items rather than a single latent construct; their reliability measures were therefore not considered appropriate.

The online survey link was shared from July to November 2022 via the official student communication platform (uLink, now Moodle), which is accessible to all UJ students.

This research was conducted under the ethics clearance 21STH43 issued by the School of Tourism and Hospitality Research Ethics Committee at the University of Johannesburg in December 2021. Authorization to conduct the study and to disseminate the questionnaire through uLink was obtained from the UJ Registrar's Office. Participation was voluntary and anonymous, and informed consent was secured electronically from all participants before completion of the questionnaire.

Data analysis

Data were analyzed using SPSS Statistics software version 26.0. Responses to the GNKQ were coded numerically on a five-point scale (1–5), with higher scores indicating greater nutritional knowledge. One-way analysis of variance (ANOVA-Fisher LSD) was then conducted to examine differences in mean nutritional knowledge scores across socio-demographic groups. Associations between nutritional knowledge scores and food choices were primarily assessed using non-parametric correlation analysis (Spearman's rho). Parametric correlations (Pearson's r) were also done for comparison purposes. Statistical significance was set at $p < 0.05$.

RESULTS

Socio-demographic characteristics of the studied population

Table 1 shows the socio-demographic characteristics of the study participants. A considerable diversity could be noticed. Nearly half of them were aged 18–20 years (49.2%). For the rest, 34.0% fell within the 21–25-year age group, and 16.8% were older. Female students represented a larger proportion of the sample (64.3%) than males (35.7%). Less than one-third of participants (26.3%) resided on campus. The majority were non-residential students. Indeed, 44.5% lived in student housing or nearby rentals, and 29.2% lived off campus with family or independently.

Table 1: Socio-demographic characteristics of the study participants (N=600)

Demographic variable		N	%
Age	18-20	295	49.2%
	21-25	204	34.0%
	Older than 25	101	16.8%
Gender	Female	386	64.3%
	Male	214	35.7%
Accommodation	Resident on Campus	158	26.3%
	Non-residential, staying at a student accommodation or a private room nearby	267	44.5%
	Non-residential residential (stay with parents, guardians, family members or partners or alone)	175	29.2%

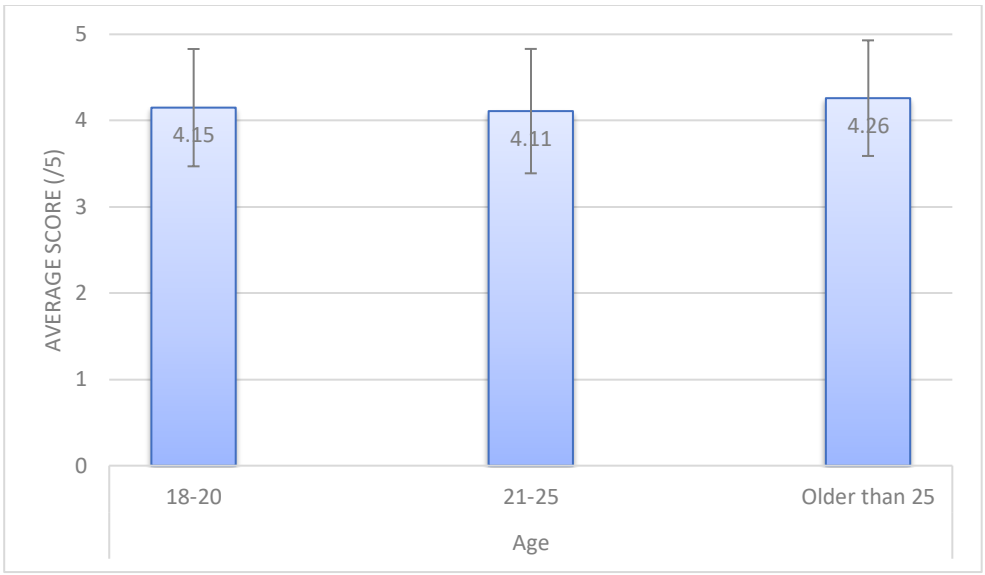
Nutritional knowledge of the study participants

The distribution of responses to the nutritional knowledge items among the 600 participants is presented in Table 2. This knowledge was relatively high across most domains, with mean scores ranging from 3.58 to 4.49 out of 5. The highest levels of agreement were observed for statements related to the health risks associated with excessive consumption of junk or processed foods (93%) and the components of a balanced diet (90%). Knowledge regarding processed foods and the importance of nutrition information when purchasing food was also high (>80%). The belief that breakfast is the "most important" meal, or that three balanced meals are essential, saw lower, though still significant, consensus support at 77% and 75%, respectively. Acceptance of the importance of including all food groups daily was reported by 72.5% of participants. The lesser-known areas were about white packaged bread containing highly processed flour and additives, and its association with obesity (61%), as well as the importance of calorie intake when buying and consuming food (55%).

High levels of nutritional knowledge were maintained irrespective of demographic background. Whether categorized by age, gender, or accommodation status, participants consistently averaged scores of 4 out of 5, indicating no statistically significant correlation between these factors and their level of insight (Figure 1).

Table 2: Levels of nutritional knowledge among the respondents (N=600)

Item description	Percentage			Mean knowledge score (/5)	SD
	Strongly disagree/ Disagree	Neutral	Strongly agree/ Agree		
Junk or processed foods contain saturated fats, added sugar, and salt and if consumed in excess it can be harmful.	3%	4%	93%	4.49	0.88
A nutritious and balanced diet contains foods from the following food groups: fruit, vegetables, dairy, grains, and protein.	5%	5%	90%	4.38	0.93
Cakes, hot chips, burgers, pizza, chip snacks, sugary drinks (such as energy- and soft drinks) are all considered as processed food.	7%	11%	82%	4.16	0.98
Nutritional information is important when buying and consuming food.	6%	13%	81%	4.14	0.99
Breakfast is the most important meal of the day.	11%	12%	77%	4.13	1.15
It is important to consume at least 03 balanced meals a day.	14%	11%	75%	4	1.15
It is important to include all food groups in your diet on a daily basis.	10.5%	17%	72.5%	3.96	1.05
White packaged bread contains highly processed flour and additives, and an excess can cause obesity.	7%	32%	61%	3.81	0.99
Calorie intake is important when buying and consuming food.	11%	34%	55%	3.58	0.97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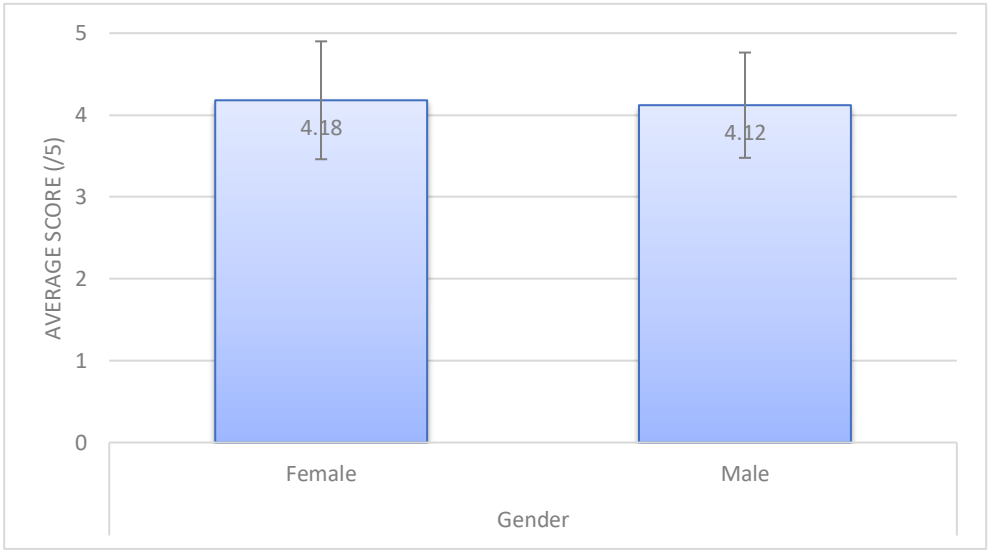
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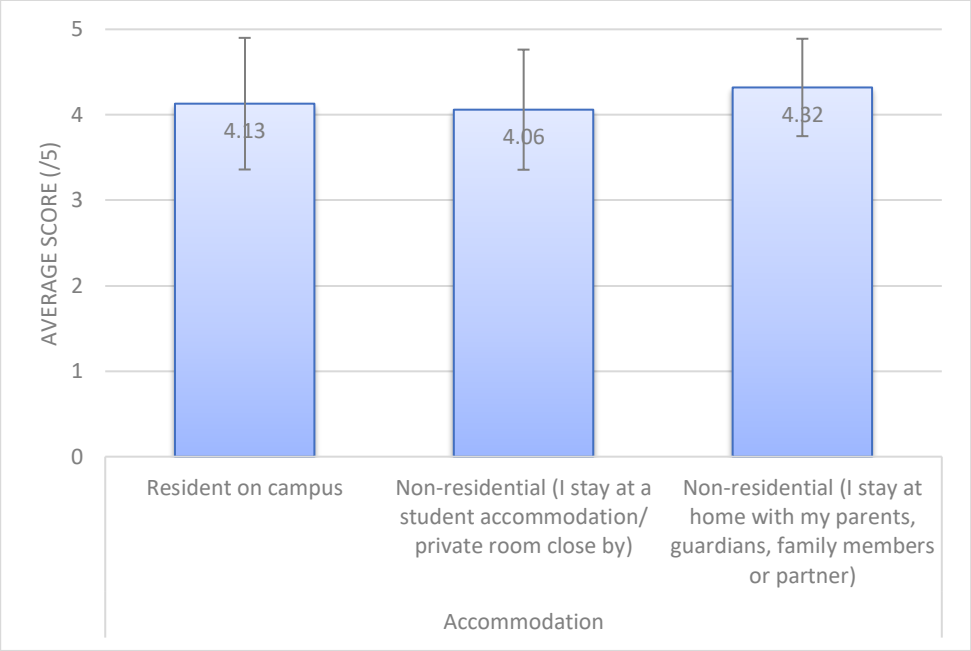

Figure 1: Average nutritional knowledge scores by Age (A), Gender (B), and Accommodation status (C)

Food choices of the study participants

Consumption patterns indicated a mixed dietary profile (Table 3). Student diets were most often dominated by unprocessed proteins (such as chicken, meat, or fish), with 66% of participants reporting regular consumption. Grains and vegetables followed a similar pattern of high adoption, with 57.5% consistently choosing whole grains and 52.5% opting always for vegetables "often or always". These previous food options are known as healthy. The least frequent healthy habit was fruit intake. Up to 58% of students "never or rarely" met the threshold of three to four fruits per day. Less favourable dietary behaviours were also evident. Fast food and snack habits were positioned in the middle of the spectrum. Indeed, regarding refined carbohydrates, nearly half of the students (47%) reported eating white bread or rolls frequently. Fried food intake was substantial, with 36% of students reporting frequent consumption of hot chips. Around one-quarter regularly consumed sugary snacks (26%) or energy drinks (28.5%).

Table 3: Food choices among respondents (N=600)

Item description	Frequency		
	Never/Rarely	Sometimes	Often/Always
A meal containing the following: unprocessed protein (chicken, meat, fish, etc.)	14%	20%	66%
A meal containing the following: wholegrains (wholewheat pasta, brown bread, baked potato etc.)	16.50%	26%	57.50%
A meal containing vegetables	17.50%	30%	52.50%
Packaged white bread or rolls	29%	24%	47%
Hot chips from fast food outlets	25%	39%	36%
Chip snacks, chocolates, ice cream	33%	41%	26%
Energy drinks and soft drinks	40.50%	31%	28.50%
Burgers from fast food outlets	39%	47%	14%
At least 3-4 fruits a day	58%	28%	14%

Factors determining the food choices of the study participants

As shown in Table 4, economic and environmental factors exerted a stronger influence on food choices than individual knowledge-related factors. Cost or budget was the main constraint for 83.0% of participants, with only 9.0% indicating a moderate effect and 8.0% reporting little or no influence. Availability of food was viewed as a major factor by 64.0% of students, moderately influential by 20.5%, and of limited effect by 15.5%. Convenience also affected food choices significantly for 58.0%, moderately for 27.5%, and had little influence for 14.5%. Friends or family were considered to have a significant influence by 41.0%, a moderate influence by 24.5%, and a limited/no influence by 34.5%. In contrast, nutritional knowledge was ranked fifth among the six factors assessed, with only 40.5% of respondents reporting a significant influence on their food choices, a moderate influence for 32.0%, and a limited effect for 27.5%. Religious reasons had a major/significant influence on just 21.0% of students, a moderate effect on 10.5%, and little or no influence on 68.5%.

Table 4: Factors determining food choices of respondents (N=600)

Factor description	Prevalence		
	No influence/ Limited influence	Moderate influence	Significant influence/Very significant influence
Cost/ budget	8.0%	9.0%	83.0%
Availability of foods	15.5%	20.5%	64.0%
Convenience	14.5%	27.5%	58.0%
Friends/ family	34.5%	24.5%	41.0%
Nutritional knowledge	27.5%	32.0%	40.5%
Religious reasons	68.5%	10.5%	21.0%

The analysis of the correlation between nutritional knowledge and selected food choices (Table 5) gave more details. Several statistically significant relationships were identified ($p<0.05$), but the practical associations were weak, as the observed effect sizes were consistently small. Nonparametric tests indicated that higher knowledge levels significantly reduced the intake of hot chips from fast-food outlets ($r = -0.130$), packaged white bread or rolls ($r = -0.126$), and energy drinks or soft drinks ($r = -0.168$). Conversely, knowledge was positively linked to the consumption of whole grains, vegetables, and fruit. Parametric analysis largely mirrored these trends. Nevertheless, it is important to note that the link between nutritional awareness and daily fruit intake, as well as white bread or rolls consumption, became nonsignificant ($p=0.396$ and 0.105, respectively) using this model.

Table 5: Correlation between nutritional knowledge and food choices of the respondents

Correlation of nutritional knowledge with the choice of	Nonparametric		Parametric	
	p-value	Correlation coefficient (r)	p-value	Correlation coefficient (r)
Hot chips from fast food outlets	0.001	-0.130	0.026	0.091
Packaged white bread or rolls	0.002	-0.126	0.105	-0.066
A meal containing the following: wholegrains (wholewheat pasta, brown bread, baked potato, etc)	0.001	0.134	0.005	0.114
A meal containing vegetables	0.000	0.173	0.018	0.096
At least 3-4 fruits a day	0.019	0.096	0.396	0.035
Energy drinks and soft drinks	0.000	-0.168	0.001	-0.137

DISCUSSION

Nutritional knowledge

Although only 12.6% of participants were from the Faculty of Science and 9.8% from the Faculty of Health Sciences (data not shown), where nutrition-related topics are more likely to be taught, this study revealed a generally good understanding of core nutrition principles from UJ students, with mean knowledge scores ranging from 3.58 to 4.49 out of 5. Most of them recognized the health risks associated with excessive consumption of processed foods and demonstrated a good understanding of balanced diet composition and food group diversity. Comparable findings have been reported among university students globally, with awareness of dietary guidelines often being satisfactory (Scalvedi et al., 2021; Spronk et al., 2014). However, the respondents' actual food choices did not consistently reflect their awareness. This discrepancy supports prior evidence indicating that knowledge is only one component of dietary decision-making and often accounts for a relatively small proportion of healthier eating behaviors (McArthur et al., 2017; Thakur & Mathur, 2021; Khosa et al., 2025).

Previous research studies have described South African youth as typically having a fair understanding of nutrition while maintaining dietary patterns characterized by high-energy-dense but nutrient-poor food consumption (Mchiza et al., 2015; Okeyo et al., 2020). The observed nutrition transition in the country might be one reason for this gap between awareness and action. Although well-informed through academic or online channels, young people face a socio-economic reality in which convenience items are both omnipresent and intensively promoted. Under such conditions, nutritional awareness competes with powerful environmental influences that favour less healthy dietary choices (Steyn & Mchiza, 2014; Yamoah et al., 2021; Omoruyi & Durojaye, 2025).

The nutritional knowledge scores were high across age, gender, and accommodation status. This suggests that University settings may function as informational equalizers due to shared academic exposure and digital literacy (Sahadeo et al., 2025b). The non-significant difference observed does not imply equal living conditions. Recent national reports have shown that students from low-income households remain more likely to experience food insecurity, as they face markedly different economic realities that affect their ability to put that knowledge into practice (Council on Higher Education, 2024).

A lower level of consensus regarding calorie awareness and the health implications of refined white bread was observed in this study. White bread remains a widely consumed staple food in South Africa due to its affordability and cultural familiarity (Steyn & Mchiza, 2014). The routine consumption may therefore have diminished the critical reflection regarding that refined carbohydrate food. The low score also suggests that students focus more on broad concepts of healthy eating than on quantitative aspects of dietary assessment, such as energy balance and portion control.

Food choices

The respondents' dietary behaviours showed weak adherence to guidelines despite their high nutritional knowledge. Even if 66% reported regularly consuming meals containing unprocessed protein sources and more than half frequently consumed whole grains (57.5%) and vegetables (52.5%), fruit consumption was particularly inadequate, with 58% rarely or never consuming the recommended three to four servings per day. This pattern is common among South African university students (Sahadeo et al., 2025a; Mushaphi et al., 2025). This awareness–action gap is likely driven by economic factors. In fact, fruit consumption is sensitive to cost, perishability, and accessibility for students on a budget (Sogari et al., 2018). They may prioritize satiety and affordability over nutritional quality when making purchasing decisions. Jonker & Walsh (2025) already reported that food insecurity significantly influenced dietary intake among South African university students during and after COVID-19. A decrease in fruit and vegetable consumption among financially constrained students was noticed. On the other hand, the frequent consumption of white bread (47%), fried foods (36%), sugary snacks (26%), and energy drinks (28.5%) noted reflects South Africa's national dietary shift toward ultra-processed foods mentioned above. A study conducted in Belgium by Deliens et al (2014) showed that students prioritize cost and convenience over nutritional value. This behaviour resulted in suboptimal diets in the South African context (Sahadeo et al., 2025a).

Determinants of food choices

In this study, cost was the primary determinant of food choice for 83% of participants. It was followed by food availability (64%) and convenience (58%). Nutritional knowledge ranked fifth (only 40.5%) among the six listed determinants. This aligns with the Social Ecological Model, in which structural factors often override cognitive factors (Story et al., 2008). Indeed, this model proposes that health behaviours are influenced by multiple interacting levels of factors, including individual, interpersonal, organizational, environmental, and policy-related determinants. Within this framework, knowledge represents only one individual-level factor and may be insufficient to overcome broader environmental barriers. Student food choices have been reported to be shaped by profound financial vulnerability (CHE, 2024). This food insecurity drives reduced dietary diversity and reliance on cheaper and energy-dense options (Jonker & Walsh, 2025). This is reinforced by campus environments where convenient foods are prioritized (Deliens et al., 2014). Thus, the lower ranking of knowledge does not diminish its importance but highlights how structural constraints (financial precarity and the food environment) override cognitive awareness (Adeniyi & Durojaye, 2020).

The knowledge–behaviour relationship

The correlation analysis showed significant but weak associations between nutritional knowledge and several dietary behaviours. This aligns with meta-analytic evidence demonstrating that nutrition knowledge exerts a small but positive effect on dietary behaviour (Spronk et al., 2014). Dietary behaviour is inherently multifactorial and influenced by numerous variables that were not directly measured in this study. They

include affordability, food availability, convenience, social influences, and food security. This might explain why nutritional knowledge alone did not exhibit a strong predictive relationship with food choices.

Fruit intake showed a weak association with knowledge, as food insecurity and affordability constrain South African students' diets more than awareness (Jonker & Walsh, 2025; CHE, 2024). As the Knowledge–Attitude–Practice and Social Ecological Models suggest, knowledge is necessary but not enough for lasting behaviour change (Story et al., 2008).

Study limitations

Reliance on this study on self-reporting introduces potential recall or social desirability bias. The convenience sampling approach and the single-institution design could also limit the generalizability of the results to the whole UJ student population and to the national level, respectively. Nevertheless, the robustness of the findings is enhanced by the relatively large sample size (N = 600). The study already provides important insights into the complex relationship between nutritional knowledge and food choices among university students.

CONCLUSION

Students at the University of Johannesburg commonly present good nutritional knowledge, but this awareness often fails to translate into healthy dietary practices. This awareness alone appeared insufficient to drive meaningful dietary behaviour change when students face structural barriers such as financial constraints, limited food availability, and the need for convenience. These factors emerged as stronger determinants of food choices than nutritional knowledge itself. Intervention strategies should go beyond nutrition education to enhance access to affordable, healthy food options within the university environment. Qualitative future research could provide a deeper understanding of the mechanisms students use to cope with food insecurity on campus.

Conflicts of Interest

The authors declare no conflicts of interest.

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