

Selection of processed and packaged potato-based snacks among university students: a cross-sectional study regarding food environment and dietary behavior

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Abstract

Purpose – Potato-based snacks (PBS) are widely popular among people of all age groups despite known negative health aspects. University students, due to their busy routines and less familiarity with diets are more prone to selecting unhealthy meals and snacks. The study aims to explore the outlook of university students regarding their consumption of processed and packaged PBS in their daily lives and compares gender's PBS choices with dietary habits and food environment.

Design/methodology/approach – A total of 122 students from various universities across Pakistan were included in this study. The data were collected using a structured questionnaire and distributed using the snowball method.

Findings – The university students showed a significant difference in their living habits ($p = 0.016$), where 25.4% of enrolled male students were hostellers as compared to females (14.8%). Significant differences were noticed in choosing PBS that further depends on the familiarity of the product, ($p = 0.030$), where 9.0% of female students rated familiarity with the product as being important while 20.5% of males responded familiarity as a critical factor. Studying the usual location/point of purchase for a PBS, a significant difference was observed ($p = 0.008$) where more male students (27.9%) choose to buy their PBS from a local convenience store as compared to female students (18.9%). Female students (13.1%) would rather choose to buy their PBS on their weekly grocery runs.

Originality/value – This study concluded that female and male students' attitudes regarding the consumption of PBS were almost the same regardless of environment and brand repute.

Highlights

- (1) Dietary behavioral studies of consumption of PBS
- (2) The environment and brand reputation have no impact on the consumption of PBS
- (3) Gender differences have no impact on the selection of PBS
- (4) Awareness and healthy selection of PBS are critical factors that need to be focused

Keywords Potato-based snacks, Dietary habits, Food environment, Brand reputation, Health benefits

Paper type Research paper



1. Introduction

In the United States of America, potato snack is the number one food with yearly sales of around 69,273.1 million (Hernandez-Brenes, Ramos-Parra, & Serna-Saldivar, 2022). Potato-based snacks (PBS) are among the most popular snacks for all ages. These PBS are known to be unhealthy for a long. PBS is enjoyed throughout the years and in all seasons, as there are countless brands and flavors to choose from. These snacks also include the fried variety which is the most famous and ordinally consumed. Various research studies showed ample quantities of acrylamides in PBS, and these acrylamides produce numerous carcinogens and neurotoxins (El-Sayyad *et al.*, 2011).

PBS is associated with weight gain among men and women of all ages, Mozaffarian, Hao, Rimm, Willett, and Hu (2011), accessed the diet change and lifestyle of men and women for 4 years and concluded an average gain of 3.3lbs in both genders. This gained weight mostly contributed to the ingestion of potato chips (1.69 lb.) and other kinds of cooked potatoes (1.28 lb.). Chacar and Salameh (2011), observed obesity prevalence among adolescents in Lebanon with increased consumption of processed foods and suggested that 20.5% of students are at risk of developing obesity. Tam, Yassa, Parker, O'Connor, and Allman-Farinelli (2017) assessed variations in the dietary behavior of university students, due to their independence and awareness in making their own dietary choices. University campuses like any other institution have many food choices, which are usually based on convenience for the students and sometimes may compromise nutrition.

The food environment at university premises leaves students with a vast variety of food choices which are usually unhealthy and mostly ready-to-eat processed foods. Students who consume snacks throughout their day while going or coming back from campus or even while studying around night were more likely to skip meals (Savige, MacFarlane, Ball, Worsley, & Crawford, 2007). Meal skipping, specifically skipping breakfast, is recorded with increased obesity and with a BMI (body mass index) ≥ 27 . The finding added more support to the role of consuming breakfast in the prevention of obesity (Huang, Hu, Fan, Liao, & Tsai, 2010).

Reading food labels is also one of the important parameters in deciding on healthy snacks; recently Cambridge University research showed that females would read labels on their foods more frequently than males (Smith & Rogers, 2014). Raspberry, Chaney, Housman, Misra, and Miller (2007) showed the determinants of nutrition label use among university students and found that the students who studied nutrition labels had greater knowledge and had a more accurate view of diet-disease associations. The study also concluded that the students who read labels have better information about weight management.

Consuming healthy snacks like fruits was associated with less depression, anxiety and emotional distress as compared to the consumption of chips/crisps and chocolates as snacking options. Cognitive problems, exhaustion and somatic symptoms are studied to be greater in those who snack on potato chips and chocolates as compared to fruit snacks (Smith & Rogers, 2014). Increased intake of fruits and vegetables showed a positive association with improved mental health and self-satisfaction (Mujcic & J. Oswald, 2016). Cambridge university press also supports the overall theories on the consumption of a healthy and high-quality diet with low levels of depression, whereas an unhealthy diet is associated with mood changes, un-satisfaction with self, and depression (Khalid, Williams, & Reynolds, 2016).

The food environment accessible to students plays a vital role in their snack selection. Factors like the availability of kind of foods and snacks, their cost and the policies of the school are all part of the food environment. It was observed that the students' food environment was not conducive to healthy meals or snacking behaviors. Unhealthy foods were mostly available at ease, and foods, in general, have high costs making it difficult to make choices (Carter & Swinburn, 2004). Keeping the above discussion, the current research was conducted to evaluate the selection of processed and packaged PBS among university students currently enrolled in different universities in Pakistan and to examine the effect of the food environment on the selection of PBS by university students.

2. Materials and methods

The cross-sectional study was used to collect the data from October 2021 to April 2022. The study focused on the selection of processed and packaged PBS among university students, regarding food environment and dietary behavior. A self-designed questionnaire was used to access the goals of the study.

2.1 Sample size and selection

A simple random sampling method was used to collect the data. The target population was university students across Pakistan. The questionnaire responses were collected using an online platform and later using snowball sampling. A total of 122 samples were collected keeping a 5% margin of error.

2.2 Research instrument

A self-designed questionnaire was used as an instrument/tool to assemble the required data for the study analysis. The designed questionnaire was based on 22 questions including multiple choices and as well a Likert scale. The set questionnaire helped to evaluate, the living style of the students, i.e. day scholar or hosteller, the highest level of education completed, frequency consumption of PBS, choices among available PBS in Pakistan, preference of flavor and how the university students like to consume PBS, (e.g. with tea or juice, in between the meals, while studying, while watching entertainment [Television (TV)/Netflix/YouTube, etc.], out of straight boredom), why do the students prefer to consume the PBS [e.g. quick grab-and-go, convenience, easily available, etc.], how important are the factors like price, packaging, quantity, quality (brand name), familiarity with the product when purchasing the potato-based snack, where do the students usually get their PBS from (e.g. vending machine, tuck-shop, etc.), in general how a student's dietary behavior is, do the students read the food labels, nutrition facts and calories, on the PBS. Are the students aware of the negative health effects of the consumption of PBS; weight gain, obesity, coronary heart disease, mood changes/depression and risk of cancer? Do the students skip meals if they consume PBS? Do the students see any noticeable weight gain based on the potato-chip consumption, and if they will go for alternative healthy snacks if available? Do the students find the tempting PBS hard to resist or are they focused on their intentions to resist, how are the students influenced to buy PBS (influenced by the available choices, peer pressure, sponsored advertisements, international brands, looking for healthy ingredients and fewer additives, labels of organic). And how often do the students dispose of the packaging after consuming the PBS?

2.3 Statistical analysis

A non-parametric test was used to analyze the data regarding the effect of the selection of processed and packaged PBS among university students. The chi-squared test was used to evaluate the impact of healthy and unhealthy snack consumption and to evaluate the effect of dietary behaviors of the university students on point of selection of their PBS. Later, hypothesis testing was performed to evaluate the impact of gender in the selection of PBS and dietary choices.

2.4 Ethical approval

The research instrument and confidentiality of data were well maintained as per guidelines of the ethical review committee of the University of Management and Technology Lahore, Pakistan [approval number UMT (University of Management and Technology Lahore)/IRB/PostGrad/Res/2021-03-R006].

3. Results and discussion

In the current study, the results were compiled and divided into three categories: sociodemographic data, food environment, and food behavior. [Table 1](#) showed the sociodemographic features

Table 1. Comparison between female and male students regarding sociodemographic features

	Females <i>n</i> = 61	Males <i>n</i> = 61	Mean	<i>p</i> value	Chi-square value
<i>Age</i>			25 years	0.59	1.890
18 – 21 years	25.4%	20.5%			
22 – 25 years	13.9%	13.9%			
26 – 29 years	7.4%	9.8%			
>30 years	3.3%	7.7%			
<i>Total</i>	50%	50%			
<i>Hosteller or day scholar</i>				0.016	5.764
Hosteller	14.8%	25.4%			
Day-Scholar	35.2%	24.6%			
<i>Level of education</i>				0.447	1.612
High-School	21.3%	27.0%			
Bachelors	19.7%	15.6%			
MS/M.Phil	9.0%	7.4%			

Source(s): Author's Work

of the study, 50% of male students and 50% of female students responded regarding PBS consumption and dietary behavior changes. The results showed more males (25.4%) were hostellers ($p = 0.016$) in comparison to females (14.8%). According to the culture of Pakistan, males are more likely to live in hostels and dormitories, and females are preferred to live in their homes, rather than travel long distances to other cities. Moreover, most males (27%) have a high school as their highest degree of education in comparison to females (10.3%).

3.1 PBS consumption trends and preferences

When studying trends of consumption of PBS, consumption frequency, the ideal choice of company, choice of flavor, why and how do male and female like to consume their PBS, the data showed a nonsignificant difference in food consuming behavior for gender. The data showed female students (18.9%) consume PBS more often than male (15.6%) students. While most students, regardless of gender only consume PBS once a week, 14.8% of females responded with a higher score for twice-a-week consumption as compared to male students (9.0%). In total 47.54% of students responded by choosing “Lays”, as their ideal PBS brand, out of which 25.4% were females and 22.1% were male students. Snackers (1.63%) was the least preferred PBS brand among both genders combined. The results also showed that female students (13.1%), as well as male students (13.1%), showed the highest and most common preference for spicy flavored PBS, while vegetable was the least preferred flavor among both genders, respectively.

Pakistani cuisine is known to be full of aromatic spices and flavors. “Spicy”, flavored foods and snacks are most commonly available and enjoyed as compared to other flavors. Qidwai, Saleheen, Saleem, Andrades, and Azam (2003) studied food preferences among Pakistani adults and reported 22% of individuals preferred spicy-flavored foods. 45% of students (Table 2) responded to consuming PBS while watching entertainment (TV, Netflix, YouTube, etc.), out of which 25.4% were female and 19.7% were males.

3.2 Attitudes towards the selection of PBS among university students

Evaluation of male and female students’ attitudes regarding the purchase of PBS, there was no significant difference noted in attributes such as price, packaging, quality (brand name), quantity and flavor. However, the attribute of familiarity, ($p = 0.030$) showed that only 9% of female students responded that the flavor attribute is important while 20.5% of male students

	Female (n = 61)	Male (n = 61)	p value	Chi-square value		
<i>Consumption of PBS</i>						
Almost always	13.1%	9.8%	4.259	0.372		
Often	18.9%	15.6%				
Sometime	13.9%	19.7%				
Seldom	4.1%	3.3%				
Never	0.0%	1.6%				
<i>Consumption frequency of PBS</i>						
Once a week	18.0%	21.3%	0.425	2.794		
Twice a week	14.8%	9.0%				
Thrice a week	7.4%	3.7%				
4 or more times a week	9.8%	9.0%				
<i>Ideal brands</i>						
Lays	25.4%	22.1%	0.282	10.914		
Oye Hoye	0.8%	4.1%				
Pringles	6.6%	4.9%				
Cheetos	7.4%	4.9%				
Knock Out	0.0%	2.5%				
Super Crisp	0.8%	3.3%				
Kurleez	3.3%	3.3%				
Potato Sticks - Kalsou	0.8%	2.5%				
Slanty	4.1%	1.6%				
Snackers	0.8%	0.8%				
<i>PBS – flavor preference</i>						
Salty	6.6%	9.8%			0.372	7.570
Spicy	13.1%	13.1%				
Sweet	2.5%	5.7%				
BBQ	10.7%	9.8%				
Vegetable	1.6%	0.0%				
Cheese	12.3%	6.6%				
Sour	2.5%	2.5%				
Plain	0.8%	2.5%				
<i>How do you prefer to consume your PBS?</i>						
With tea or juice	7.4%	8.2%	0.625	2.610		
In between the meals	3.3%	6.6%				
While studying	9.8%	9.8%				
While watching entertainment (TV, Netflix, YouTube, etc.)	25.4%	19.7%				
Out of straight boredom	4.1%	5.7%				
<i>Why do you prefer to consume PBS?</i>						
Quick grab-and-go	9.0%	7.4%	0.432	3.816		
Quick energy	7.4%	6.6%				
Convenience in carrying around	3.3%	4.1%				
Easily available	11.5%	18.9%				
You just like it for the sake of it	18.9%	13.1%				

Table 2.
Comparison between
female and male
student's PBS choice
and consumption
behaviors

Source(s): Author's Work

considered flavor to be a more important attribute when buying PBS. It was observed that 18.9% of female and 27.9% of male students would consider their local convenience store for the purchase of PBS. 13.1% of females preferred to buy their PBS from weekly grocery runs while 2.5% of male students would buy from a weekly grocery run ($p = 0.008$). It is more opportune for males in Pakistan to visit the local store as compared to females. Females in society generally try to get all their needs in their usual weekly grocery runs. It's casual for

men in Pakistan to buy from their local convenience store, while most women do not feel as comfortable when visiting a store frequently. Women in Pakistan are more comfortable when buying from weekly, less frequent grocery runs.

Roomi and Parrott (2008) evaluated the cultural boundaries that play role in women's freedom in Pakistan and reported that Pakistani women are not allowed to move freely in society, and such restrictions apply from early childhood when going out of the house and mixing with the opposite gender is strictly prohibited. The aspect of familiarity and point-of-purchase is found to be significantly different amongst male and female students. These findings (Table 3) reject our alternative hypothesis (H1), "Female and male consumption of processed and packaged PBS are not the same".

PBS attributes	Female, <i>n</i> = 61	Male, <i>n</i> = 61	<i>p</i> -value	Chi-square value
<i>Price</i>			0.530	3.171
Not Important	4.9%	5.7%		
Less Important	7.4%	11.5%		
So-So	12.4%	13.9%		
Important	17.2%	10.7%		
Very Important	8.2%	8.2%		
<i>Packaging</i>			0.570	2.929
Not Important	5.7%	3.3%		
Less Important	5.7%	4.1%		
So-So	9.8%	13.9%		
Important	13.1%	16.4%		
Very Important	15.6%	12.4%		
<i>Quality [Brand Name]</i>			5.323	0.256
Not Important	5.7%	1.6%		
Less Important	4.1%	3.3%		
So-So	4.9%	9.8%		
Important	15.6%	13.1%		
Very Important	19.7%	22.1%		
<i>Quantity</i>			0.755	1.896
Not Important	5.7%	6.6%		
Less Important	6.6%	8.2%		
So-So	8.2%	11.5%		
Important	10.7%	9.8%		
Very Important	18.9%	13.9%		
<i>Flavor</i>			0.481	3.482
Not Important	4.9%	1.6%		
Less Important	2.5%	2.5%		
So-So	4.9%	6.6%		
Important	13.9%	18.9%		
Very Important	23.8%	20.5%		
<i>Familiarity</i>			0.030	10.703
Not Important	6.6%	2.5%		
Less Important	6.6%	2.5%		
So-So	10.7%	11.5%		
Important	9.0%	20.5%		
Very Important	17.2%	13.1%		
<i>The usual location for PBS purchase</i>			0.008	11.864
Tuck Shop	14.8%	13.9%		
Local Convenience Store	18.9%	27.9%		
Weekly Grocery Run	13.1%	2.5%		
Vending Machines	3.3%	5.7%		

Source(s): Author's Work

Table 3. Comparison between female and male student's attitudes regarding PBS purchasing

Studying meal-skipping patterns among female and male students showed 9.8% of males were skipping breakfast in comparison to female students (4.9%). Male students (7.4%) however, responded to skipping dinner more than female students (3.3%). Noticeable weight gain was noted high in male students (16.4%) for female students (10.7%). Willingness to consider healthier options if available over PBS were more in male than female participants. Overall, in the current study, the null hypothesis (Ho), the effect of dietary behaviors of the university students on point of selection of their PBS is the same and was accepted, since there was no significant difference found in this parameter.

3.3 Effect of the food environment on the selection of PBS among university students

Other comparisons (Table 4) evaluated between female and male students' PBS choices were regarding their food environment influences. According to the responses received more female students (14.8%) than male students (1.8%) were influenced by the available PBS

	Female, n = 61	Male, n = 61	p-value	Chi-square value
<i>Dietary behavior</i>			0.316	4.730
Poor	8.2%	12.3%		
Fair	15.6%	18.0%		
Good	16.4%	15.6%		
Very Good	5.7%	3.3%		
Excellent	4.1%	0.8%		
<i>Reading Labels</i>			0.422	3.884
Almost always	6.6%	4.9%		
Often	9.0%	9.0%		
Sometime	22.1%	16.4%		
Seldom	6.6%	8.2%		
Never	5.7%	11.5%		
<i>Consider calories</i>			0.118	7.354
Almost always	7.4%	6.6%		
Often	11.5%	9.8%		
Sometime	18.0%	9.8%		
Seldom	4.9%	11.5%		
Never	8.2%	12.3%		
<i>Opinion – Consuming PBS contributes negatively to health</i>			9.349	0.053
Strongly agree	8.2%	16.4%		
Agree	17.2%	19.7%		
Neutral	17.2%	10.7%		
Disagree	6.6%	1.6%		
Strongly disagree	0.8%	1.6%		
<i>Awareness – Weight-gain</i>			0.564	2.964
Extremely	13.9%	15.6%		
Very	13.1%	18.0%		
Moderately	11.5%	7.4%		
Slightly	5.7%	5.7%		
Not at all	5.7%	3.3%		
<i>Awareness – Obesity</i>			0.568	2.937
Extremely	9.8%	10.7%		
Very	13.1%	14.8%		
Moderately	12.3%	12.3%		

Table 4. Comparison between female and male students' dietary behavior and knowledge regarding PBS

(continued)

	Female, <i>n</i> = 61	Male, <i>n</i> = 61	<i>p</i> -value	Chi-square value
Slightly	5.7%	8.2%		
Not at all	9.0%	4.1%		
<i>Awareness – CHD</i>			0.349	4.446
Extremely	10.7%	11.5%		
Very	12.3%	19.7%		
Moderately	10.7%	5.7%		
Slightly	7.4%	6.6%		
Not at all	9.0%	6.6%		
<i>Awareness – Mood swing/Depression</i>			0.298	4.896
Extremely	5.7%	5.7%		
Very	8.2%	14.8%		
Moderately	14.8%	11.5%		
Slightly	5.7%	8.2%		
Not at all	15.6%	9.8%		
<i>Awareness – Cancer</i>			0.745	1.949
Extremely	4.9%	4.9%		
Very	9.0%	7.4%		
Moderately	9.0%	13.1%		
Slightly	9.8%	6.6%		
Not at all	17.2%	18.0%		
<i>Meal Skipping – Breakfast</i>			0.277	5.106
Extremely	6.6%	6.6%		
Very	4.9%	9.8%		
Moderately	4.9%	4.1%		
Slightly	7.4%	32.5%		
Not at all	26.2%	27.0%		
<i>Meal Skipping – Lunch</i>			0.957	0.656
Extremely	4.9%	5.7%		
Very	9.0%	9.8%		
Moderately	10.7%	9.0%		
Slightly	4.9%	6.6%		
Not at all	20.5%	18.9%		
<i>Meal Skipping – Dinner</i>			0.682	2.291
Extremely	4.1%	3.3%		
Very	3.3%	7.4%		
Moderately	9.8%	8.2%		
Slightly	7.4%	6.6%		
Not at all	25.4%	24.6%		
<i>Noticeable weight-gain</i>			0.225	5.667
Extremely	4.1%	2.5%		
Very	10.7%	16.4%		
Moderately	11.5%	10.7%		
Slightly	6.6%	10.7%		
Not at all	17.2%	9.8%		
<i>Consider healthier options if available</i>			0.658	2.425
Extremely	13.9%	14.8%		
Very	18.9%	22.1%		
Moderately	9.8%	4.9%		
Slightly	4.9%	5.7%		
Not at all	2.5%	2.5%		
<i>Give-up too easily on eating intentions</i>			0.367	4.297
Extremely	7.4%	5.7%		
Very	8.2%	7.4%		

(continued)

Table 4.

	Female, n = 61	Male, n = 61	p-value	Chi-square value
Moderately	19.7%	16.4%		
Slightly	13.1%	13.9%		
Not at all	1.6%	6.6%		
<i>Good at resisting tempting foods</i>			0.936	0.819
Extremely	6.6%	8.2%		
Very	13.1%	11.5%		
Moderately	14.8%	13.9%		
Slightly	12.3%	11.5%		
Not at all	3.3%	4.9%		
<i>Easily get distracted from the way I intend to eat</i>			0.846	1.392
Extremely	6.6%	5.7%		
Very	9.0%	10.7%		
Moderately	16.4%	12.3%		
Slightly	13.9%	15.6%		
Not at all	4.1%	5.7%		
<i>If I am not eating in the way I intend, I make changes</i>			0.255	5.336
Extremely	4.9%	9.0%		
Very	10.7%	14.8%		
Moderately	13.1%	13.1%		
Slightly	16.4%	11.5%		
Not at all	4.9%	1.6%		
<i>I find it hard to remember, What I have eaten throughout the day</i>			0.329	4.618
Extremely	14.8%	7.4%		
Very	10.7%	16.4%		
Moderately	11.5%	13.1%		
Slightly	8.2%	8.2%		
Not at all	4.9%	4.9%		

Table 4. Source(s): Author's Work

choices. 13.9% of female and 6.6% of male students sometimes felt influenced by peer pressure, while 13.9% of female and 6.6% of male students never did. More female participants (11.5%) never felt influenced by sponsored advertisements as compared to male participants (7.4%). 9.0% of females and 5.7% of male students answered to never determine the quality of their PBS by looking at electronic advertisements (Ferguson, Muñoz, & Medrano, 2012), research shows the major effect of food advertisements on desire and influence of selection of snacks and other foods. More male students (9.8%) always felt influenced by different overseas PBS brands, than female responses (4.9%). Looking for healthy ingredients and fewer additives or preservatives was responded to more often by male students (13.1%), than female students (6.6%); while 17.2% of females would sometimes look for these characteristics on the label as related to male students, 7.4%. Females (3.3%) would always look for the word organic, as compared to male students (0.8%). 16.4% of females and 19.7% of males answered to never look for the word “organic” while buying their PBS. 22.1% of females and 16.4% of males would always the packaging after eating PBS, 13.9% of females and 9.0% of males would sometimes dispose of the packaging; while 6.6% of females and 7.4% of male students responded to never dispose of the packaging after eating their PBS.

Keeping in view all the parameters of the food environment, choices do differ among males and females of PBS when it comes to familiarity aspect and point of purchase. So, this study rejected the alternate hypothesis (H₁), The effect of the food environment (Table 5) on the

	Female, <i>n</i> = 61	Male, <i>n</i> = 61	<i>p</i> -value	Chi-square value
<i>Influenced by available choices</i>				
Never	9.0%	5.7%	0.652	2.460
Rarely	5.7%	6.6%		
Sometimes	14.8%	1.6%		
Often	12.3%	3.7%		
Always	8.2%	6.6%		
<i>Influenced by peer-pressure</i>				
Never	13.9%	6.6%	0.71	8.628
Rarely	13.9%	12.3%		
Sometimes	8.2%	17.2%		
Often	11.5%	9.0%		
Always	2.5%	4.9%		
<i>Influenced by sponsored advertisements regarding brands</i>				
Never	11.5%	7.4%	0.509	3.297
Rarely	9.8%	11.5%		
Sometimes	13.1%	9.8%		
Often	10.7%	16.4%		
Always	4.9%	4.9%		
<i>I determine quality by looking at electronic advertisements</i>				
Never	9.0%	5.7%	0.664	2.391
Rarely	8.2%	11.5%		
Sometimes	12.3%	13.1%		
Often	13.9%	15.6%		
Always	6.6%	4.1%		
<i>Influenced by different over-seas PBS brands</i>				
Never	4.9%	6.6%	0.400	4.044
Rarely	12.3%	9.0%		
Sometimes	10.7%	12.3%		
Often	17.2%	12.3%		
Always	4.9%	9.8%		
<i>I look for biodegradable packaging</i>				
Never	13.1%	13.1%	0.350	4.436
Rarely	11.5%	16.4%		
Sometimes	11.5%	12.3%		
Often	11.5%	4.9%		
Always	2.5%	3.3%		
<i>I look for healthy ingredients and less additives or preservatives</i>				
Never	8.2%	11.5%	0.061	8.996
Rarely	9.8%	12.3%		
Sometimes	17.2%	7.4%		
Often	6.6%	13.1%		
Always	8.2%	5.7%		
<i>I look for the word "Organic" – potato snacks</i>				
Never	16.4%	19.7%	0.491	3.416
Rarely	10.7%	13.9%		
Sometimes	8.2%	7.4%		
Often	11.5%	8.2%		
Always	3.3%	0.8%		

(continued)

Table 5.
Comparison between female and male student's PBS choices based on their food environment influences

Table 5.

	Female, <i>n</i> = 61	Male, <i>n</i> = 61	<i>p</i> -value	Chi-square value
<i>How often do you dispose the packaging after eating PBS?</i>			0.389	4.131
Never	6.6%	7.4%		
Rarely	5.7%	4.9%		
Sometimes	13.9%	9.0%		
Often	5.7%	12.3%		
Always	22.1%	16.4%		

Source(s): Author's Work

selection of PBS is the same among students, as there was a significant difference estimated. Overall, the effect of influence from available choices, advertisements, peer pressure, overseas PBS brands, etc., was relatively insignificant amongst both genders. This could be because of the same environmental exposure of both genders; they are exposed to peer pressure and advertisements.

4. Conclusion

The current study was based on the students at universities across Pakistan, evaluating their PBS consumption, dietary behavior and food environment. The results found that familiarity with the brand as well as point-of-purchase was significantly different amongst male and female students. Female students choose to buy their PBS if they are readily familiar with the PBS brand. As for the point-of-purchase Pakistani male university students choose local convenience stores as their ideal location for PBS purchases, while female students would rather buy from weekly grocery runs. This difference could mainly be due to the cultural norm that males can easily go to local stores frequently, while females can go once in a few days. There was no significant difference in the factories of dietary behavior and the food environment influencing both genders. Moreover, the study has limitations since it does not involve students of lower education levels or schools. Future studies can further evaluate the effects of dietary behaviors and the food environment of all students on the consumption of other snacks and not just PBS. The finding will help to develop standards, rules and regulations for the betterment of the food environment and dietary behaviors of all students across Pakistan.

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