FOOD FOR
COLLECTIVES

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Characterization of attributes related to satisfaction with services provided by an institutional FNU: the Kano model

Caracterização dos atributos relacionados à satisfação com os serviços prestados por uma UAN institucional: modelo Kano

Abstract

The aim of this study was to characterize the main attributes related to the satisfaction of users from an Institutional Food and Nutrition Unit, based on the Kano model. A cross-sectional, descriptive study was carried out, applying a survey with socioeconomic questions and the Kano model, with a sample population of 330 regularly registered university students. The sample was homogeneous, and covered students from humanities, exact and biological science. It was noticed that the attributes evaluated within the kano model obtained "one- dimensional" result, bringing satisfaction to the interviewees in proportion to their performance. If not present, the results were classified as dissatisfaction, except the attribute "customer service", which was classified as "attractive", since the better the users were served, the greater the satisfaction. Thus, it is concluded that the kano model was efficient to evaluate the quality of an institutional non-profit service. In addition, it is possible to visualize the main attributes that impact on satisfaction, allowing us to prioritize adjustments for improvements.

Keywords: Institutional Feeding. Customer behavior. Quality management.

Resumo

Objetivou-se caracterizar os principais atributos ligados à satisfação dos usuários de uma Unidade de Alimentação e Nutrição institucional, com base no modelo Kano. Desenvolveu-se um estudo transversal, descritivo, aplicando questionário com questões socioeconômicas e o modelo Kano, com uma população amostral de 330 universitários regularmente matriculados. A amostra teve caráter homogêneo, sendo classificada nas áreas de Humanas, Exatas e Saúde. Percebeu-se que os atributos avaliados dentro do modelo Kano obtiveram resultados "unidimensionais", trazendo satisfação para os entrevistados em proporção ao seu desempenho. Caso não estivesse presente, resultaria em insatisfação, exceto o atributo "atendimento", que foi classificado como "atrativo", pois quanto melhor os usuários fossem atendidos, maior a satisfação. Assim, conclui-se que, o modelo Kano mostrou-se eficiente para avaliar a qualidade na prestação de serviços sem fins lucrativos. E ainda, é possível verificar os principais atributos que impactam na satisfação, priorizando-se assim os ajustes para suas melhorias.

Palavras-chave: Alimentação Institucional. Comportamento do consumidor. Gestão da qualidade.

INTRODUCTION

The globalization process has led to changes in lifestyle, eating habits and time available for meals. Individuals are increasingly encouraged to consume food away from home, a fact that has contributed to the growth and consolidation of collective eating.[1]

Collective feeding corresponds to the provision of ready-to-eat meals and / or food to the population in a Food and Nutrition Unit (FNU).[2] FNUs are spaces where nutritionally healthy meals are prepared and provided in a safe hygienic-sanitary point of view, which meet the needs of clients.[3] In addition, it must meet the individual's dietary preferences.[4]

In daily life of college students, there is an intense routine and distance from the family, so they are more subject to the search of practicality for meals preparation. Rosso & Silva[5] reinforce this fact, when they state that the less time available for food consumption leads to meals outside the home environment. In this sense, the university restaurant has the purpose of offering meals that meet basic nutritional needs, respecting the quantity, quality, harmony and adequacy.

However, the overall quality of any service is determined by the level of customer satisfaction. Thus, for food services, quality must be measured through the satisfaction provided by the final product. In most cases, the quality of a FNU is closely associated with food nutritional quality, hygienic safety, customer service, and ultimately, the price. São José[6] reinforces that the menu is the fundamental point within a FNU, being interconnected with purchase planning, customer satisfaction and cost composition.

According to Ramos et al.,[7] in order to obtain a realistic and up-to-date perception of the quality of products and / or services, it is necessary to periodically conduct satisfaction surveys with the users, assessing related attributes. Thus, the present study aimed to characterize the main attributes related to the satisfaction from users of a FNU, through the Kano model.

METHODOLOGY

Study design

This is a cross-sectional, descriptive, quantitative study conducted from February to June 2018 in a FNU from a higher education institution located in the city of Picos-PI, Brazil, which serves on average two thousand meals daily, of which 75% are made for students.

For sample definition, it was considered that users from the FNU, for daily food, are composed by students, public servants (technicians and teachers), other employees and visitors. However, the study was applied only to the student population, because, according to

the Student Assistance Center (SAC) form the institution, students are the main audience for the food and nutrition services provided by the institution.

In this sense, the study included students linked to the higher education institution where the research was conducted. Participants were 18 years of age or older, users of the FNU services for at least three meals a week, and agree to participate in the research by signing the Informed Consent Form (ICF).

As exclusion criteria, individuals who follow different academic calendars were disregarded, such as those belonging to the Nature science course (PROCAMPO) and the National Plan for the Training of Teachers of Basic Education (PARFOR), since its frequency was not assiduous, occurring only a few months per year.

For sample calculation, a frequency of two thousand consumers was considered daily and a maximum representation of 75% of students. The Gauss formula described below was used for confidence interval of 95% (p = 0.05).

$$n = \frac{N.Z^2.p.(1-p)}{Z^2.p.(1-p) + e^2.(N-1)}$$

Where: n - sample calculation; N – population; Z - standardized normal variable associated with confidence level; p - true probability of the event; e - sampling error.

Based on the calculation, it was determined a sample population of 252 students, which was stratified by course proportionally to the number of students regularly registered. This stratification was equally subdivided by the number of periods / semesters of each course, rounding up the numbers when necessary.

After stratification, the sample consisted of 330 students, according to the quantities described in table 1.

For data collection, a survey was conducted covering socioeconomic questions (10 questions). The variables used in the analysis included income (minimum wage = R$ 954.00); household income; place of residence; housing form; time at university (years); meals at the university restaurant (UR); and frequency of UR use (per week) and the Kano model (28 questions).

Suitability and application of the Kano model

According to the Kano diagram, the requirements of a customer-specified product or service can be classified in three ways: expected, explicit, and sudden. Expected or manda-

Table 1. Description of the sample stratification according to the university courses at UFPI / CSHNB, Picos-PI, 2017.

Course	Population	Sample by course	Nº of periods	Sample by period	Final sample by course	Proportion of participants
Nursing school	399	36	9	4	36	10.9%
Nutrition	380	35	9	4	36	10.9%
Medical school	60	6	2	3	6	1.8%
Biology science	330	30	9	4	36	10.9%
Bussiness school	384	35	9	4	36	10.9%
Mathematics	304	38	8	5	40	12.1%
Information system	301	27	8	4	32	9.7%
History	347	32	9	4	36	10.9%
Pedagogy	399	36	9	4	36	10.9%
Language school	399	36	9	4	36	10.9%
Total	**3303**	**311**	-	-	**330**	**100%**

tory requirements are those that the costumer expects to meet in such a product or service. Explicit requirements are those that the customer says they want in the product or service. And sudden requirements are those the customer doesn't expect, which is something that might surprise him. Thus, the survey considered as the most relevant attributes related to the satisfaction of the services offered at the FNU, cleaning of utensils (CU); environmental cleanliness (EC); customer service (CS); amount paid (AP); quality of seats (QS); quality of meals (QM); quality of drink (QD); variety of menu (VM); number of tables (NT); ventilation (VT); lighting (LI); sound (SD); relationship between employees and customers (RL) and reliability (RE).

For each attribute, two questions were presented, the first was related to customer reaction when the attribute was present or its performance was higher (functional question).

The second question was concerned with customer reaction when the attribute is missing or had poor performance (dysfunctional issue). The customer can respond in five different ways: "I like it this way"; "I hope it is this way"; "I stay neutral"; "I can accept it this way"; and "I don't like it this way."

This theoretical model is based on the relationship between the degree of performance (horizontal axis) and degree of satisfaction (vertical axis), and each attribute resulting from the different relationships between degrees is described in sequence (except for the questionable attribute, which is not represented in the theoretical model).

a) Attractive attribute (A): is the key point for customer satisfaction; if it is high performing, it will bring full satisfaction, but it will not bring customer dissatisfaction if not served.

b) Mandatory attribute (M): If it is not present or if the performance is insufficient, the customer will be dissatisfied; conversely, if it is present or has sufficient performance, it will not bring satisfaction.

c) One-dimensional attribute (OD): satisfaction is proportional to the degree of performance: the higher the degree of performance, the higher the customer satisfaction and vice versa.

d) Neutral attribute (N): refers to aspects that are neither good nor bad; consequently, they do not result in any customer satisfaction or dissatisfaction.

e) Reverse attribute (R): refers to the high degree of performance resulting in dissatisfaction (and vice versa, the low degree of performance resulting in satisfaction) and the fact that it is not similar for all customers.

f) Questionable attribute (Q): Indicates that the question was asked incorrectly, or the customer did not understand the question correctly, or the answer was inconsistent.

Ethical Aspects and Statistical Analysis

The project was submitted and approved by the Research Ethics Committee of the Federal University of Piauí (UFPI), registered under CAAE No. 85053718.7.0000.5214, thus complying with the requirements of Resolution No. 466/2012 of the National Health Council. After signing the informed consent, the survey was applied to the sample population. It is noteworthy that for the survey application, the students were recruited and sent to an exclusive room for data collection, thus ensuring a favorable environment for the resolution of the questions.

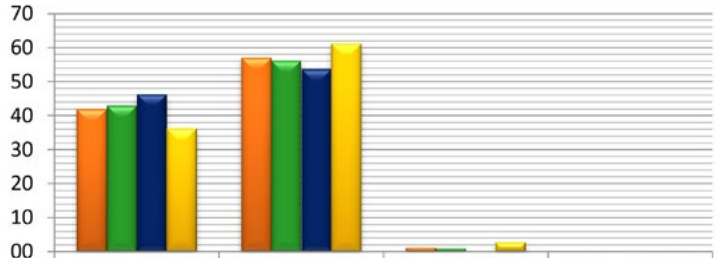
The quantitative data obtained were tabulated and analyzed with Microsoft Excel 2013 software for descriptive analysis (mean and percentage).

RESULTS

In order to maintain the homogeneity among the courses offered by the institution, the collection was based on the proportion of students properly registered in each course. Table 1 shows the homogeneity of the collection, highlighting Mathematics and Medical courses, with higher (12.1%) and lower (1.8%) representation, respectively. Despite the variation between these two courses, when grouped by concentration areas (Human, Exact and biological science), the representation percentages did not show discrepancies, being 34.6% (n = 114), 32.7% (n = 108) and 32.7% (n = 108), respectively (Table 1).

Figure 1 shows the distribution of participants by age, where the majority was between 18 to 30 years, representing 98.8% of the cases (18 to 20 years: 41.8% ; 21 to 30 years: 57%). When this variable was evaluated by concentration area there were no significant changes. Ages between 31 and 40 years were found only in humanities courses, representing 2.8% of the population from the respective area. There was no evidence of individuals equal or over 41 years old.

Figure 1. Age distribution of total population and concentration area of UFPI, Picos-PI, 2018



	18 - 20	21 a 30	31 a 40	> 41
% GENERAL	42	57	01	00
% BOLOGICAL SCIENCE	43	56	01	00
% EXACT SCIENCE	46	54	00	00
% HUMAN SCIENCE	36	61	03	00

*BIOLOGICAL SCIENCE: Nutrition, Nursing school, biology and medical school; EXACT SCIENCE: bussiness, Information systems ans Mathematics; HUMAN SCIENCE: History, Language and Pedagogy.

As for gender of the population, the largest representation was for females, with 60.6%. Based on the distribution by areas, it is clear that in Biological and Human science, there is a prevalence of females, however, the Exact science is mainly represented by male (62%).

Information on the socioeconomic profile is shown in Table 2. It was found greater representation for family income of 1-2 minimum wages (53.4%), mainly in Biological and Exact science. For Human science, although there was a good representation of family income of 1-2 minimum wages, there was higher prevalence of income below one minimum wage. The highest concentration of income, between 3 and >6 minimum wages, was among participants in the biological science area (16.7%). Conversely, the Human area had the lowest percentage of participants at higher income range (4.7%), significantly different from the other areas (10.9%). Such discrepancy between economic profiles by area may directly reflect the results regarding satisfaction of the users.

Another variable investigated was the participation in family income, and both in general and between areas, there were little or no participation. However, it was found participation in family income for the area of Humanities (27.8%).

The analysis of residence profile has shown that most participants (72.1%) lived in the study city itself (Picos-PI), and the others (27.9%) use daily transfers from the surrounding cities. Regarding the form of housing, it is noted that 45.2% and 42.4% live either with parents or friends, respectively, especially in biological and Exact science.

In the variable related to time attending the university, there was homogeneity between the points, except for times of 4-5 years and above five years, which have lower proportion (10.6% and 2.1%, respectively).

Having the university restaurant (UR) as a service provided by the institution, we can understand the behavior of these students. Overall, there is a comparable ratio between those who eat two meals per day (lunch and dinner) and those who eat only one meal per day (or lunch or dinner). However, when stratified by area, it is clear that the courses associated to biological and Exact science have higher prevalence for consumption of two meals, with 63.2% and 60.2%, respectively. The courses in the area of Humanities have almost total consumption between lunch and dinner (43.5%) or just dinner (50.9%).

Regarding the UR frequency of use per week, the results are variable (Table 1), and only the biological and Human science had more defined frequency: the former with 41.2% using between 5-7 times a week and the latter with 52.8% using 3-4 times a week.

In this study, we sought to characterize the quality of attributes that impacted the overall quality of service provided by the UR, including cleaning of utensils, environment cleanliness, customer service, amount paid, quality of seats, quality of meal, quality of drink, variety of menu, number of tables, ventilation, lighting, sound, relationship between employees and customers and reliability.

Table 2. Socioeconomic profile of the sample of the UFPI, Picos-PI 2018.

Variables	General (N=330)	Biological (N=114)	Exact (N=108)	Human (N=108)
Income (minimum wage)				
< 1	35.2%	27.2%	27.8%	50.9%
1 – 2	53.9%	56.1%	61.1%	44.4%
3 – 4	7.9%	13.2%	8.3%	1.9%
5 – 6	1.2%	0.9%	1.9%	0.9%
> 6	1.8%	2.6%	0.9%	1.9%
Participation in the family income				
Yes	13.9%	6.1%	8.3%	27.8%
No	86.1%	93.9%	91.7%	72.2%
Place of residence				
Picos-PI	72.1%	77.2%	77.8%	61.1%
Other	27.9%	22.8%	22.2%	38.9%
Form of residence				
With parents	45.2%	34.2%	51.9%	50.0%
Alone	11.5%	16.7%	9.3%	8.3%
With friends	42.4%	49.1%	37.0%	40.7%
University residence	0.9%	0.0%	1.9%	0.9%
Time at the university (years)				
< 1	22.7%	23.7%	24.1%	20.4%
1 - 2	22.4%	25.4%	21.3%	20.4%
2 - 3	23.0%	19.3%	23.1%	26.9%
3 - 4	19.1%	15.8%	23.1%	18.5%
4 - 5	10.6%	10.5%	7.4%	13.9%
> 5	2.1%	5.3%	0.9%	0.0%
*Meals in the UR***				
Lunch	23.6%	35.1%	29.6%	5.6%
Dinner	20.6%	1.8%	10.2%	50.9%
Lunch + Dinner	55.8%	63.2%	60.2%	43.5%
Frequency of UR use (weekly)				
3 - 4 times	38.2%	29.8%	32.4%	52.8%
5 - 7 times	31.5%	41.2%	36.1%	16.7%
8 – 10 times	30.3%	28.9%	31.5%	30.6%

*BIOLOGICAL SCIENCE: Nutrition. Nursing school, biology and medical school; EXACT SCIENCE: bussiness, Information systems ans Mathematics; HUMAN SCIENCE: History, Language and Pedagogy.

** University restaurant

Analyzing Table 2, one-dimensional quality was the most prevalent in the classification of attributes related to the UR, reaching maximum percentages of 59.1% (cleanliness of the environment). It is also noticed that only the attribute "customer service" was not classified as one-dimensional, and, in turn, it was qualified as attractive. For the other qualities taken as basis, there were no representative percentages for any attribute.

Table 3. Description of qualities conferred to attributes analyzed by users of a Institutional Restaurant of UFPI, Picos-PI 2018.

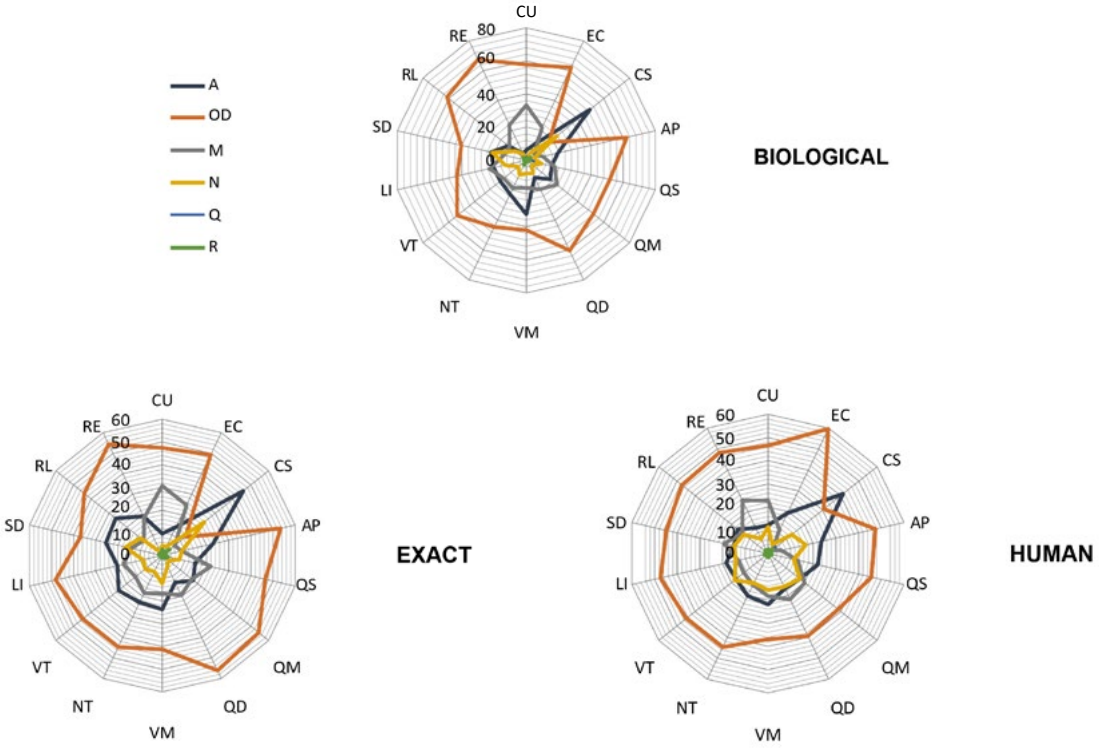
QUALITIES/ ATTRIBUTES	A	OD	M	N	Q	R
			(%)			
CU	9,7	52,4	30,0	5,8	0,6	1,5
EC	15,2	59,1	20,0	4,8	0,6	0,3
CS	47,0	21,2	5,5	20,9	2,1	3,3
AP	22,7	56,4	8,8	10,3	0,9	0,9
QS	18,2	49,7	18,2	10,0	2,1	1,8
QM	18,5	50,0	20,9	8,8	0,3	1,5
QR	14,2	53,9	20,9	10,3	0,0	0,6
VM	27,0	41,5	17,9	12,4	0,0	1,2
NT	22,7	46,4	17,9	10,9	0,3	1,8
VT	21,5	49,4	15,8	11,8	0,3	1,2
LI	20,3	47,9	18,5	12,4	0,0	0,9
SD	21,5	42,1	16,4	18,2	0,3	1,5
RL	19,7	52,7	13,0	11,8	0,9	1,8
RE	12,4	58,8	23,3	4,5	0,3	0,6

*CU: cleaning of utensils; EC: environmental cleanliness; CS: customer service; AP: amount paid; QS: quality of seats; QM: quality of meals; QD: quality of drink; VM: variety of menu; NT: number of tables; VT: ventilation; LI: Lighting; SD: sound; RL: relationship; RE: reliability. A: attractive: OD: one-dimensional. M: mandatory. N: neutral. R: reverse. Q: questionable.

The classification of attributes according to the qualities of the Kano model was stratified by areas. Analyzing by area (figure 2), the three concentration areas evaluated presented similar

profile, showing higher index for one-dimensional quality, and the attractive quality was evidenced only for the attribute "customer service". The mandatory quality, although not representative for any attribute, were more representative in biological and Exact science for the attribute "cleaning of utensils". For the Humanities area the attribute "reliability" was more representative. In the general analysis, no relevant values were observed for other qualities evaluated by the Kano model.

Figure 2. Description, by area, of the qualities conferred to the attributes analyzed by users of the university restaurant of UFPI, Picos-PI, 2018.



*CU: cleaning of utensils; EC: environmental cleanliness; CS: customer service; AP: amount paid; QS: quality of seats; QM: quality of meals; QD: quality of drink; VM: variety of menu; NT: number of tables; VT: ventilation; LI: Lighting; SD: sound; RL: relationship; RE: reliability. A: attractive: OD: one-dimensional. M: mandatory. N: neutral. R: reverse. Q: questionable.

DISCUSSION

Since the aim was to evaluate the opinion of College students on the variables that could be related to satisfaction with the services provided by an institutional FNU, during recruitment, we took care to maintain proportionality between the students from the different

courses. Thus, based on data collection, it was observed that homogeneity was preserved, allowing reduction of possible bias, especially when the courses were grouped by area (biological, Exact and Human science). Moreover, the smaller number of participants associated to the medical course is because it is a newly implemented course, which has only two classes.

In general, the sample is comprised of young adults, predominantly between 18-30 years, but also with a small percentage (1.2%) of students aged between 31-40 years, which were represented by students from the humanities area. These data are in agreement with the study conducted by Graça & Setton,[8] who reflected on the social origin of students based on social, cultural and choice of courses in order to understand the specificities of the participants.

The most prevalent gender was female, and when evaluating by biological and Human areas, this index was in line with the overall result. However, for an Exact area there was divergence, with prevalence for males. Literature data confirm the findings by placing female gender associated with care and health, while the male gender are more related to logical aspects.[9,10]

Regarding socioeconomic profile of undergraduate students, the higher prevalence for family income lower than or equal to two minimum wages is evident, thus classifying them socially as class C.[11] This can be explained because, historically, the university mainly received young people from upper classes, but after transformations in politics, society, and institutions themselves, a larger contingent of lower-income social strata reached higher education.[12]

Despite the low family income, our data show that many students do not work and study concomitantly, which may be explained by several advantages that the university offers, such as scholarships to encourage research, extension and teaching, student aid and meals with affordable prices. It may also be related to intense academic routine of most courses, justified by the fact that most students who contribute to family income are part of night courses such as Human science, which facilitates getting a job during undergraduate period.

Ristoff[11] studied the history of socioeconomic profiles of Brazilian universities between 1991 and 2012, showing that students from biological sciences, especially from medical school, have family income higher than other courses. Humanities courses, especially Pedagogy and History, often have lower income families.

Form of housing was another variable analyzed, and it was observed that most students live in the city where they study; However, as we cross-check the data with form of housing, we noted that most students come from other cities and sought to reside in neighborhoods where the university is located.

By associating form of housing with family income, it is inferred that students are concerned about expenses, and some need to have extra income, facts that can make it more difficult

to stay at university. According to Almeida, Pinto & Lima,[12] the largest financial expenses for college students are related to rent, paper printing, photocopying, transportation and food.

The curriculum of the courses is composed of 8-10 modules, resulting in a maximum regular time of university stay between 4-5 years. In this regard, this study also sought to promote homogeneity in relation to college periods. Thus, it was possible to observe relative proportion between the analyzed period of time, except for the period greater than five years, which is composed by students with possible failing courses, registration locking or other administrative problems. This period of university stay, related to the age group found, allows students to have more autonomy, experience novel academic activities that produce personal growth, and is an important aspect in the transition from adolescence to adulthood.[13]

Given many difficulties students face, the government, through the Student Assistance Center, offers low-cost food at many public universities. As this service is object of study in this research, we tried to understand the usage profile of this service. Thus, it was found its full use (lunch and dinner) and considerable weekly frequency.

Regarding these variables, it is noteworthy that the courses of Humanities presented a different profile, with more frequent use for dinner and frequency between 3-4 times a week. This is due, in particular, to the fact that these courses are typically night courses, and there are considerable number of students in this area who do not live in the university city and thus have their meals in the UR.

The characterization of the attributes related to the services provided by FNU was based on the Kano model, which characterizes them into qualities that can be attractive, one-dimensional, mandatory, neutral, reverse or questionable. Among the 14 attributes evaluated, only "customer service" presented attractive quality. The others were characterized as one-dimensional. Attractive attributes are key to customer satisfaction, if the feature has high performance it will bring full satisfaction, but will not bring customer dissatisfaction if not attended. In one-dimensional attributes, satisfaction is proportional to the degree of performance: the higher the degree, the higher the customer satisfaction and vice versa.[14]

The "customer service" attribute is expressed as direct feedback, while the better the users are served, greater the satisfaction. Although the restaurant is a non-profit, customer service is a specific feature that enables user loyalty.[15]

"Cleanliness of utensils" and "environment cleanliness" cause satisfaction in proportion to their performance, and if not present, it will result in dissatisfaction. It is noteworthy that, although this attribute is characterized as one-dimensional, it was the one that obtained the highest representation for mandatory quality, especially in biological and Exact sciences.

The UR follows a Good Manufacturing Practice (GMP) manual for cleaning equipment, utensils, water tanks, sewers, filters, exhaust fans, etc. The UR also follow the recommendations of RDC No. 216/2004 of the National Health Surveillance Agency. As a result, there is periodic cleaning of the site, performed as often as necessary, as well as weekly cleaning with appropriate products for asepsis.[16,17]

Another attribute evaluated was the "amount paid", showing that if this rate increases, there will be dissatisfaction. Commonly in UR, the amount paid for the meal is considered symbolic, as it often does not meet the costs of the products used. Most of the meals are subsidized by the National Student Assistance Program (PNAES). This is because this type of non-profit FNU is only intended to provide the users access to quality meals at low cost.[18]

Aspects related to accommodation, such as "quality of seats" and "quantity of tables", were also evaluated, showing that the higher quality and quantity of accommodation generates greater satisfaction for users; By contrast, the reduction in number and quality will bring dissatisfaction. During the construction of this FNU, the physical and functional planning stage was contemplated, so as to enable the satisfactory distribution of approximately two thousand meals between lunch and dinner in a period of two hours for each moment.[19]

The menu offered at this FNU consists of salad, main course, garnish, accompaniment and dessert, being characterized as balanced and meeting the average nutritional needs of the academic community. Since the attributes "quality of meals" and "quality of drink" are classified as one-dimensional, they must have good sensory, nutritional and health aspects; otherwise, they will reduce the level of satisfaction and, proportionally, the user's demand.[20]

According to Almeida, Pinto & Lima,[12] a way to meet students' demands without losing their nutritional focus is to offer juice based on fruit concentrates weekly. Another strategy related to the attractiveness of the service refers to the "menu turnover", ranging from the main course to the accompaniment.

The environment of the UR was evaluated by the attributes "ventilation", "lighting" and "sound", and all were considered one-dimensional. In this FNU, ventilation is artificial, generated by air conditioning distributed throughout the room. It is emphasized that the temperature is pleasant, however there is a limitation on air circulation, a fact that may contribute to dissatisfaction, since it is linked to the maintenance and intensification of odors in the environment. Thus, it is suggested to install exhaust fans with the purpose of improving air circulation.[21]

Regarding "sound", Monteiro et al.[19] report that excessive noise directly affects the users health, increasing time of eating, making the moment unpleasant, stressful and hostile, and

may generate irritability, distraction, fatigue and reduced concentration. He also points out that this aspect can be improved, avoiding users crowding and offering alternative songs to reduce excessive noise.

As a requirement for visual satisfaction, "lighting" is fundamental during the eating process. In this sense, natural lighting should be used whenever possible through adequate window sizing. Otherwise, the installation of fluorescent lamps would be the first-hand alternative, as it maintains the natural color of the environment and food, and does not contribute to elevate the temperature of the place.[22]

Interpersonal "relationship" is fundamental in any social environment. So in a FNU, the welcoming process and the good treatment between users and staff proves to be a relevant attribute. The improvement of the UR operation comes mainly from suggestions and constructive criticism, provided through the relationship between the university community and those responsible for the FNU operation, including nutritionist, cooks and / or kitchen assistant.[23]

"Confidence" was an evaluated generalist attribute, involving every aspect of the service provided by fnu. Although many customers do not know the Good Manufacturing Practices manual, in which many units support their activities, confidence is evidenced by the visualization of personal protective equipment (PPE) used by the staff, especially during distribution, proper hygiene of trays and cutlery, and the constant presence of servers ensuring proper cleaning of the space.[24]

CONCLUSION

The Kano model proved to be an efficient method for assessing the quality of non-profit institutional service, allowing for comprehensive assessment of attributes, and thus demonstrating which can be improved for the proper satisfaction of the users.

It is noteworthy that although the main objective of a FNU is to provide adequate and safe food for maintenance of good development and health, other factors increase the overall satisfaction of the service. Thus, based on the evaluation, we were able to determine the main attributes that impact satisfaction, prioritizing adjustments according to the qualities evidenced in order to improve the quality of the service.

REFERENCES

1. Chamberlem SR, Kinasz TR, Campos MPFF. Resto de Ingestão e Sobra Descartada - Fonte de Geração de Resíduos Orgânicos em Unidades de Alimentação e Nutrição em Cuiabá - MT. Rev Alim Nutrição 2012; 23(2): 317-325.

2. Domingues CFS, Thomaz DPC, Simões DM, Weber ML. Geração de resíduos sólidos orgânicos em um restaurante universitário de São Paulo/S.P. Rev Meio Amb Sust 2016;10(5):58-73.

3. Cavalcante MJ, Antônio KLS, Barattol. Pesquisa de satisfação em um restaurante universitário no sudoeste do Paraná-PR. Rev Bras Obes, Nutrição e Emagrec 2017;11(68):661-666.

4. Ferreira MSB, Vieira RB, Fonseca KZ. Aspectos quantitativos e qualitativos das preparações de uma Unidade de Alimentação e Nutrição em Santo Antônio de Jesus, Bahia. Rer Nutr Vigil Saúde 2015; 2(1):22-27.

5. Rosso TDF, Silva MA. Avaliação da qualidade nutricional e sensorial de preparações servidas no almoço em um restaurante comercial da cidade de Criciúma. Anais do 1º Seminário de Pesquisa, Extensão e Inovação. Criciúma (SC). IF-SC; 2010. 1-3.

6. São José JFB. Avaliação qualitativa de cardápios em uma unidade de alimentação e nutrição localizada em Vitória - ES. Demetra 2014; 9(4):975-984.

7. Ramos AS, Souza FFR, Fernandes GCB, Xavier SKP. Avaliação qualitativa do cardápio e pesquisa de satisfação em uma unidade de alimentação e nutrição. Rev Alim Nutrição 2013; 24(1):1-7.

8. Graça M, Setton J. A divisão interna do campo universitário: uma tentativa de classificação. Rev Bras Est pedag 2000; 80(196):451-471.

9. Rennó N, Siqueira C, Leite C, Maria T. Representação social das advertências sanitárias entre alunos universitários fumantes e não fumantes. Rev da Rede de Enferm do Nordeste 2012; 13(4):909-918.

10. Malagris LEN, Florito, ACC. Avaliação do nível de stress de técnicos da área da saúde. Rev Estudos de Psicologia 2006; 23(4):391-398.

11. Risttoff D. O novo perfil do campus brasileiro: uma análise socioeconômica do estudante de graduação. Rev Avaliação 2014; 19(3):723-747.

12. Almeida AA, Pinto MN, Lima RA. Fatores que influenciam a permanência dos alunos ingressantes em cum curso superior no Alto Solimões, Amazonas, Brasil. Rev Educação, Cultura e Sociedade 2018; 8(1):250-266.

13. Teixeira MAP, Dias ACG, Wottrich SH, Oliveira AM. Adaptação à universidade em jovens calouros. Rev ABRAPEE 2008; 12(1):185-202.

14. Roos C, Sartori S, Godoy LP. Modelo de Kano para a identificação de atributos capazes de superar

as expectativas do cliente. Rev Produção Online 2009; 9(2):536-550.

15. Fofan AC. Utilização do modelo de Kano para identificação dos atributos que elevam a satisfação do cliente em uma empresa de serviço. [Dissertação]. Recife: Universidade Federal de Pernambuco, 2011.

16. BRASIL. Ministério da Saúde. Agência Nacional de Vigilância Sanitária. Resolução da Diretoria Colegiada (RDC) Nº 216 de 15 de setembro de 2004. Dispõe sobre Regulamento Técnico de Boas Práticas para Serviços de Alimentação. Diário Oficial da União, Brasília, 2004.

17. Lippi TAP, Amaral TG, Tabai KC, Nascimento MRF. Restaurante universitário: avaliação do serviço de alimentação da Universidade Federal Rural do Rio de Janeiro-UFRRJ. Rev Univ Rural 2004; 26(1-2):05-11.

18. Varela MCMS. O custo dos desperdícios: um estudo de caso no Restaurante Universitário da Universidade Federal do Rio Grande do Norte. [Trabalho de Conclusão de Curso]. Natal: Universidade Federal do Rio Grande do Norte, 2015.

19. Monteiro D, Verderose R, Bragagnolo S, Meneguetti R. Estudo sobre os fatores de influência na fila do restaurante universitário e sua otimização. Rev Ciências do Ambiente 2011; 7(1):42-45.

20. Fausto MA, Ansaloni JÁ, Silva ME, Garcia Junior J, Dehn, AA, César TB. Determinação do perfil dos usuários e da composição química e nutricional da alimentação oferecida do restaurante universitário da Universidade Estadual Paulista, Araraquara, Brasil. Rev Nutr 2001; 14(3):171-176.

21. Oliveira RC, Proença RPC, Salles RK. O direito à informação alimentar nutricional em restaurantes: uma revisão. Demetra 2012; 7(1):47-58.

22. Veiros MB. Analise das condições de trabalho do nutricionista na atuação como promotor de saúde em uma Unidade de Alimentação e Nutrição: um estudo de caso. [Dissertação]. Florianópolis: Universidade Federal de Santa Catarina, 2002.

23. Porfírio BA, Malizia DN, Telles EO, Guarnieli MCL, Abreu RAF, Batarquini RT et al. Programa Praticas Educativas em segurança dos alimentos na cidade universitária Armando de Salles Oliveira (CUASO-USP). Rev Cultura e Extensão 2012; 8(1):69-77.

24. Franklin TA, Sena AS, Santana ML, Matos TB, Milagres MP. Segurança Alimentar, Nutricional e Sustentabilidade do Restaurante Universitário. Rev Saúde Com 2016; 12(1):482-487.

Contributors

KS Feitosa, LS Luz and SA Teixeira worked at all stages from the study's conception to the revision of the final version of the manuscript; ES Oliveira and VA Oliveira participated in the analysis, interpretation of data and review of the manuscript; JPM Sampaio revised of the manuscript.

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