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Perception of the Hospital Nutrition Service by Internal Clients: Example of the Results Obtained in the Area of Production of Pediatric Formulas and Enteral Diets

Nancy Yukie Yamamoto Tanaka[1*], Edgard Monforte Merlo[2], Carolina Ferreira Nicoletti[3], Carla Barbosa Nonino[3], Wilson Moraes Góes[4], Roberta Novaes[4], Fernando Fávero[4], Júlio Sérgio Marchini[3]

[1]Division of Nutrition and Dietetics, Hospital das Clínicas, Faculty of Medicine of Ribeirão Preto, University of São Paulo, São Paulo, Brasil
[2]Faculty of Economia e Administração of Ribeirão Preto, University of São Paulo, São Paulo, Brasil
[3]Department of Internal Medicine, Faculty of Medicine of Ribeirão Preto, University of São Paulo, São Paulo, Brasil
[4]Center of Information and Analysis, Hospital das Clínicas, Faculty of Medicine of Ribeirão Preto, University of São Paulo, São Paulo, Brasil
Email: *nancyyyt@hotmail.com

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Abstract

***Aim*: Client perception was important to indicate points requiring interventions or adjustments and to permit refinement of the services offered. This study aimed to determine the perception of internal clients regarding the quality of the service after integrating these items into the system of electronic prescription. *Methods*: We applied a questionnaire elaborated based on the SERVQUAL about the five dimensions of service quality (tangibility, reliability, responsiveness, safety, and empathy) with adaptation of the four-point Likert scale, ranging from "I fully disagree" to "I fully agree". *Results*: The instrument was applied to 138 professionals, with a 56% return. Analysis revealed that the strong points were related to tangibility, safety and empathy, while the aspects related to reliability showed a lower score regarding time of delivery, occurrences and waste, and those related to responsiveness showed a lower score regarding service to be provided in a timely manner. The Cronbach Alpha Coefficient indicated that the investigation had a high degree of consistency and that the results could be considered reliable. *Conclusion*: Application of the adapted SERVQUAL questionnaire revealed that the perception of internal clients about the five quality**

*Corresponding author.

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dimensions after the changes made and provided valuable information for the scoring of aspects that still needed adjustment to improve interventions.

Keywords

Nutrition Hospital Service, Electronic Prescription, Internal Clients, Quality of Service, Patient Care

1. Introduction

The technological advances and the advent of scientific medicine have revolutionized the role and functions of the hospital. The intervening changes have led to the need to look for new models of health management in order to permit the qualification of services by means of planning, execution and control, creating a new organizational architecture seeking competitive advantages [1].

The concept of quality is being widely disseminated, reaching sectors such as the Food and Nutrition Units (FNUs), mainly due to the considerably increased level of consumer demand and to the change in the paradigm that quality generates costs [2]. Quality fundamentally indicates the level of excellence of what is produced (product or services) and implies the search for constant improvements that should be introduced in a parcimonious manner, permitting their incorporation.

In view of the need to incorporate quality into the service provided, a very important focal point is the determination of the satisfaction of the client/patient, which requires the creation of a continuous system of verification in order to maintain updated the quality characteristics required by the client [3]. In the management of FNUs, the development of tools for the evaluation of food quality, including flavor, temperature and presentation, should be the starting point for the development of strategies aiming at the maximization of satisfaction with hospital food [4].

The survey of satisfaction helps to insure the process of continuous improvement, permitting the monitoring of areas that require changes and the control of the effects of the changes made [5]. Within this context, the level of client/patient satisfaction serves as a thermometer for actions directed at rescuing the association of pleasure with food consumption [6].

In large institutions providing tertiary level care, patient care has a dynamic characteristic that requires constant attention on the part of the multidisciplinary team. In order to insure the quality of the care provided, support services must carry out their activities without compromising the work of other professionals who, as internal clients, on many occasions act as intermediate agents between the FNU and the external clients, *i.e.*, the patients.

Satisfaction with the quality of service can be defined by the comparison between perception of the service provided and the expectation of the service desired. Service can be perceived as being of exceptional quality when it exceeds expectations, as being of unacceptable quality when it does not satisfy expectations, and as being of satisfactory quality when expectations are confirmed by means of service perception [7].

Within this context, the objective of the present study is to assess the perception of internal clients, *i.e.*, the health professionals are responsible for patient care, regarding the quality of the service provided by the area of pediatric formula and enteral diet production after integration of these items into the system of electronic prescription.

2. Methods

2.1. Participants

The study was conducted on 138 selected health professional of both sexes working in a public hospital, 10 of them clinical nutritionists and 128 nurses. All participants used the services provided by the areas of pediatric formula and enteral diet production of the University Hospital, Faculty of Medicine of Ribeirão Preto, University of São Paulo, with exclusion of the following areas: Psychiatry, Gynecology and Obstetrics, Renal Transplant Unit, Coronary Unit, Epilepsy Center, Bone Marrow Transplant Unit, Metabolic Unit, Obstetrical Center, and Hemodialysis Unit, because of their very limited use of the services provided by the areas under study.

The study was approved by the Research Ethics Committee of the institution and all subjects gave written in-

formed consent to participate.

2.2. Study Design

All clinical nutritionists and nurses were invited to participate in the study by direct approach and received a questionnaire elaborated by the research group based on the SERVQUAL [8] instrument. An explanation about how to fill out the questionnaire was provided and the participants were asked to return the filled out instrument to the principal investigator.

2.3. Questionnaire

The questionnaire consists of a multiple item scale for the recoding of client perception of the service offered, consisting of 22 statements (**Table 1**) about the five dimensions of service quality :1) tangibility (appearance of the physical premises, equipment, staff and material for communication); 2) Reliability (ability to provide the promised service with confidence and accuracy); 3) responsiveness (being available to help the clients and to provide the service in a prompt manner); 4) safety (knowledge and courtesy of the employees and their ability to transmit trust and confidentiality) and; 5) empathy (personalized patient care).

The 22 statements contained in the questionnaire for the assessment of the five quality dimensions were distributed as follows: Tangibility (questions 1 to 4), Reliability (questions 5 to 8), Responsiveness (questions 9 to 12), Safety (questions 13 to 16), Empathy (questions 17 to 21), and the last question (number 22) which concerns the general opinion about the work performed by the area and the degree of internal client satisfaction with the service provided (**Table 1**). The scoring used was an adaptation of the four-point Likert scale [9], ranging from "I fully disagree" to "I fully agree", with the final score corresponding to the client's perception of the quality of the service provided.

2.4. Statistical Analysis

The score for each question is reported as mean ± SD and range. Qualitative data were submitted to correspondence analysis which is directly related to the chi-square statistic, and a contingency table was applied. The Cronbach Alpha statistic was used to determine the internal consistency of the questionnaire. The level of significance was set at $p < 0.05$ in all analyses.

3. Results

Seventy-seven of the 138 questionnaires distributed were returned (56%). **Table 2** shows the degree of satisfaction of the internal clients regarding the quality of the service provided by the areas of pediatric and enteral diet production, using the descriptive statistics for the 22 questions contained in the questionnaire.

According to the perception of the persons interviewed, the strong points were those related to tangibility, safety and empathy. In the aspects related to reliability, a lower score was observed for the time of delivery, occurrences and waste, and regarding responsiveness there was a lower score for service performed in a timely manner, these being the aspects reported as points needing improvement.

Figure 1 shows the correspondence for the 22 questions contained in the questionnaire. Questions 5, 7, 8 and 9 were found to be associated with the response levels 1 and 2, indicating aspects that require greater investigation and appropriate interventions. The remaining questions were associated with responses 3 and 4, which indicate a positive perception on the part of the persons interviewed regarding the services provided.

The Cronbach Alpha coefficient was 0.91, showing the investigation presented a high degree of consistency and that the results can be considered reliable.

4. Discussion

The present study revealed a good degree of satisfaction on the part of internal clients regarding the service provided by the areas evaluated. The application of the adapted SERVQUAL questionnaire contributed to the indication of aspects that require attention in order to obtain better quality.

The hospital food services should be of good quality and satisfy the nutritional requirements of admitted patients [10]. Regarding the aspects ranging from diet prescription to diet distribution, the standardization of the service is of fundamental importance [11].

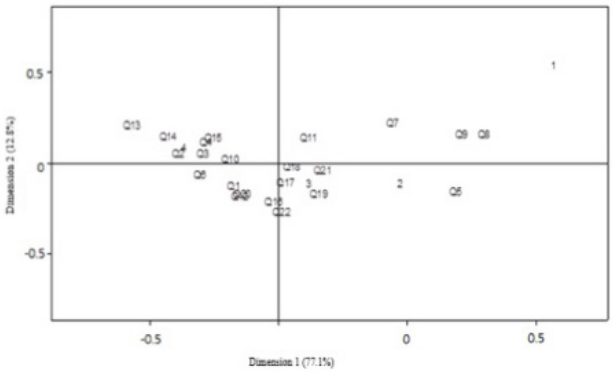

Figure 1. Correspondence graph for the questionnaire applied in the study. Q: question.

Table 1. Questionnaire for the evaluation of the quality of the service provided by the areas of pediatric formula and enteral diet production.

Questions	Aspects Evaluated
Q1	The presentation of the bottles used for the delivery of pediatric milk and non-milk formulas satisfies the needs to which they are destined.
Q2	The presentation and quality of the disposable flasks used for the delivery of enteral diets are adequate.
Q3	The boxes used to package the pediatric formulas and enteral diets have a good presentation and satisfy the requirement of a safe and effective transport.
Q4	The presentation of the final product to be delivered is clean and pleasant, demonstrating good hygiene.
Q5	The pediatric formulas and the enteral diets are delivered according to the prescribed times.
Q6	The service provided by the Milk Section is reliable
Q7	The number of occurrences involving pediatric formulas and enteral diets is sporadic.
Q8	The service provided by the Milk Section does not generate observable waste.
Q9	The requests sent to the Milk Section are satisfied in a timely manner.
Q10	The pediatric formulas and the enteral diets delivered always agree with the medical prescriptions.
Q11	The service provided by the Milk Section demonstrates concern about the clientele, with an attempt to collaborate as much as possible with the other teams providing care for the patient.
Q12	The system involving the collection of medical prescriptions, the production of pediatric formulas and enteral diets and their delivery is safe and efficient.
Q13	The service provided by Milk Section transmits safety regarding the nutritional quality of the final products delivered.
Q14	The service provided by the Milk Section transmit safety about the microbiological control of the final products delivered.
Q15	The technical information contained on the labels of the pediatric formulas and enteral diets is sufficient and adequate.
Q16	The Nutrition Team provides a specialized service capable of transmitting safety and tranquility to the patients and their relatives.
Q17	The work carried out by the Nutrition team, in addition to providing appropriate nutritional care, intends to be cordial and respectful towards the patients/clients.
Q18	Individualized nutritional care is always provided when requested or when necessary by the nutritionists, the health agents and the nutrition workers.
Q19	There is an established partnership between the Milk Section and the Multidisciplinary Team that acts directly on the wards, with positive reflexes on hospitalized patients.
Q20	The Milk Section, by supplying the pediatric formulas and enteral diets, fulfills its role of action on the clinical course of hospitalized patients, satisfying their individual necessities.
Q21	In the presence of occurrences or complaints, the Nutrition team always demonstrates concern about verifying and analyzing the problem, looking for solutions in order to correct or avoid it.
Q22	In general, the Milk Section cares for its patients/clients with promptness and efficacy, making them feel satisfied with the care provided by the Nutrition Team.

Table 2. Descriptive statistics for the 22 questions of the questionnaire.

Question	n	Mean	Standard deviation	Minimum	Median	Maximum
Q1	72	3.35	0.67	2.00	3.00	4.00
Q2	77	3.52	0.64	2.00	4.00	4.00
Q3	76	3.45	0.70	1.00	4.00	4.00
Q4	77	3.44	0.73	1.00	4.00	4.00
Q5	77	2.66	0.79	1.00	3.00	4.00
Q6	77	3.47	0.58	2.00	4.00	4.00
Q7	75	2.87	0.98	1.00	3.00	4.00
Q8	77	2.56	0.94	1.00	3.00	4.00
Q9	74	2.66	0.91	1.00	3.00	4.00
Q10	76	3.37	0.73	1.00	3.00	4.00
Q11	77	3.14	0.87	1.00	3.00	4.00
Q12	77	3.34	0.62	2.00	3.00	4.00
Q13	77	3.66	0.58	2.00	4.00	4.00
Q14	77	3.56	0.64	1.00	4.00	4.00
Q15	77	3.43	0.73	1.00	4.00	4.00
Q16	77	3.23	0.67	1.00	3.00	4.00
Q17	77	3.18	0.79	1.00	3.00	4.00
Q18	76	3.16	0.85	1.00	3.00	4.00
Q19	77	3.09	0.76	1.00	3.00	4.00
Q20	77	3.32	0.66	2.00	3.00	4.00
Q21	77	3.06	0.86	1.00	3.00	4.00
Q22	77	3.19	0.69	2.00	3.00	4.00

The informatization of health services includes a series of interrelated components that collect, process, store and distribute information in order to help the decision-making process and the control of health organizations [12]. Thus, informatics aims to reduce human errors, especially those related to faulty communication, optimizing the time of the activities and the flow of information, causing these processes to be more agile and guaranteeing an appropriate supply of the prescribed diet [13] [14].

The areas of pediatric formula and enteral diet production of the Hospital Nutrition Service under study represent support places where the implantation of processes that obviate the need for intermediate agents to request formulas in cases of hospitalization, changes of bed, deviations or faults resulting from human failures permits an independent, functional and faster work flow, especially considering that the professionals involved provide direct care to hospitalized patients, an activity that requires time and concentration.

Informatics and automation of pharmaceutical services function as important tools for the optimization of activities, reducing the time of execution and improving quality. In addition, they contribute as important tools to the rationalization of work, the reduction of errors and a better cost control [15]. Several studies have reported the use of information technology as an effective mechanism for obtaining greater patient safety, with a reduction of errors of medication [16]-[18].

Regarding nutritional therapy, informatics and computer programs have been extensively used to facilitate the calculations of parenteral nutrition, with high practical applicability and a reduction of errors of calculation and of the time needed for prescription [19] [20].

A considerable difficulty faced by the hospital food service is to guarantee the execution of the various activities in the different production areas with proper care [14]. In the areas of enteral diet and milk formula production, the informatization of the service should permit the printing of labels for diet identification and should provide information for the preparing sector such as the quantity and type of diet and the order of production [21]. Thus, the integration of electronic prescription with the areas of pediatric formula and enteral diet production permits a better rationalization of work and a better control of the entire process from the collection of prescriptions to the dispensing of formulas ready for consumption.

For the elaboration of the Programa of Electronic Prescription of Nutritional Therapy we used the Standardization of Routine and Specialized Diets, of Pediatric Formulas and of Enteral Nutrition available in the service and established a single code for each type of diet or formula. The system permit to identify the pediatric formulas and enteral diets starting from the electronic prescription and to elaborate the order of production, in addition to identifying recently admitted patients and permitting immediate filling of the prescription.

This change eliminated errors due to human faults in the collection of prescriptions, in the request of formulas for the producing unit and in the delivery of these formulas to the wards, thus reducing waste. At the time of

electronic dispensing using a bar code, the system notifies patient discharges, fasting periods and deaths, avoiding the delivery of these formulas to the wards and thus reducing waste by permitting their reuse when possible.

The informatization of the sectors should reflect in a positive manner on the perception of the internal clients, who are the professionals responsible for the execution of the final step of the nutritional care process, which is the offer of pediatric formulas or the administration of enteral diets to the patients/clients. The perception of the informatized service is of fundamental importance for the diagnosis and assessment of the efficacy of the nutritional care process [22].

In the present study, the application of the adapted SERVQUAL tool permitted us to learn about the perception of internal clients regarding the five quality dimensions after the integration of the electronic prescription with the areas of pediatric formula and enteral diet production and provided valuable information about the aspects that still need intervention for improvement.

5. Conclusion

The perception of clients who receive the products and/or services is very important for the validation of the effectiveness of the changes or innovations introduced in order to adjust the final product to the set of practical needs of those who utilize these services, indicating the points that require interventions or adjustment that will permit an improvement of the services offered. Instruments evaluating the degree of satisfaction of internal or external clients regarding the service provided can contribute considerably to the promotion of continued quality.

Conflicts of Interest

The authors declare no conflicts of interest.

Authorship

Design and conduct of the study: NYYT, EMM, JSM; Data collection and analysis: NYYT, WMG, RN, FF; Data interpretation: NYYT, EMM, WMG, RN, FF; Manuscript writing: NYYT, EMM, CFN, CBN, JSM.

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