Seven years of nutritionDay in Brazil: Are we improving the nutritional care of hospitalized patients?

Siete años de nutritionDay en Brasil: ¿estamos mejorando el cuidado nutricional de los pacientes hospitalizados?
Sete anos de nutritionDay no Brasil: Estamos melhorando o atendimento nutricional de pacientes internados?

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Summary

Introduction: Due to the high prevalence of hospital malnutrition, the nutritionDay worldwide project (nutriDia Brasil) aims to evaluate the nutritional care provided to inpatients.

Objective: To verify the evolution of nutritional care provided by hospitals that participated in nutriDia Brasil between 2009 and 2015.

Methods: nutriDia is an audit that takes place simultaneously in all participating hospitals in a single day, using standard questionnaires from which a national report is generated. A temporal analysis of the descriptive data obtained through the reports from 2009 to 2015 was conducted.

Results: During this period, 5581 patients from 265 hospital units were evaluated. The prevalence of weight loss in the last three months was consistently reported by almost half of the sample, ranging from 47.2% in 2009 to 53.7% in 2015. There was a significant increase in the use of oral supplementation offered to patients from 2009 to 2015 (11.8% to 18.2%). However, enteral and parenteral nutrition therapy remained practically unchanged in all these years (approximately 10% and less than 1%, respectively). From 2012 to 2015, an average of 8% of the units reported not

Resumen

Introducción: debido a la alta prevalencia de la malnutrición intrahospitalaria, el proyecto mundial *nutritionDay* (nutriDia Brasil) busca evaluar la atención nutricional brindada a los pacientes hospitalizados.

Objetivo: verificar la evolución de la atención nutricional brindada por los hospitales que participaron en nutriDia Brasil entre 2009 y 2015.

Métodos: nutriDia es una auditoría que se realiza simultáneamente en todos los hospitales participantes en un solo día mediante cuestionarios estandarizados a partir de los cuales se generan informes nacionales. Se realizó un análisis temporal de los datos descriptivos obtenidos a través de los informes desde 2009 hasta 2015.

Resultados: durante este período se evaluaron 5581 pacientes de 265 unidades hospitalarias. Cerca de la mitad de la muestra informó consistentemente una prevalencia de pérdida de peso durante los últimos 3 meses, con valores que oscilaron entre 47,2 % en 2009 y 53,7 % en 2015. Hubo un aumento significativo del uso de suplementos orales ofrecidos a los pacientes entre 2009 y 2015 (de 11,8 % a 18,2 %). Sin embargo, no hubo prácticamente ningún cambio en la terapia de nutrición parenteral y enteral en todos

Resumo

Introdução: Devido à alta prevalência de desnutrição hospitalar, o projeto nutritionDay worldwide (nutriDia Brasil) tem como objetivo avaliar os cuidados nutricionais despendidos pelas unidades hospitalares aos seus pacientes.

Objetivo: Verificar a evolução da assistência nutricional prestada pelos hospitais que participaram do nutriDia Brasil entre 2009 e 2015.

Métodos: nutriDia é uma auditoria que ocorre simultaneamente em todos os países participantes em um único dia, utilizando questionários padronizados que geram um relatório nacional. Foi realizada uma análise temporal dos dados descritivos obtidos por meio dos relatórios de 2009 a 2015.

Resultados: Nesse período, foram avaliados 5.581 pacientes de 265 unidades hospitalares. A prevalência de perda de peso nos últimos três meses foi consistentemente relatada por quase metade da amostra, variando de 47,2% em 2009 a 53,7% em 2015. Observou-se um aumento significativo no uso de suplementação oral oferecida aos pacientes de 2009 a 2015 (11,8% para 18,2%). No entanto, a terapia nutricional enteral e parenteral permaneceu praticamente inalterada em todos es-

having a Nutritional Support Team. On the other hand, there was a significant increase in the use of national protocols for nutritional assessment, from only one-third in 2009 to 92% in 2015. Regarding hospital diets, less than 40% of the patients reported accepting the hospital diet in its entirety, throughout the editions, with patient-related causes (anorexia, nausea, and vomiting) being the main reason.

Conclusions: Important advances were observed concerning hospital routines that allow early identification of malnutrition. However, little progress has been made in implementing nutritional therapy, whether oral, enteral, or parenteral.

Keywords: Malnutrition, nutritional assessment, nutritional therapy, nutritional status, hospital malnutrition.

estos años (aproximadamente 10 % y 1 %, respectivamente). Entre 2012 y 2015, un promedio de 8 % de las unidades informaron no contar con un grupo de soporte nutricional. Por su parte, hubo un aumento significativo en el uso de protocolos nacionales para la valoración nutricional, desde solamente un tercio en 2009 hasta el 92 % en 2015. Con respecto a las dietas hospitalarias, menos del 40 % de los pacientes reportó haber aceptado la totalidad de la dieta durante todas las ediciones, y las causas relacionadas con el paciente (anorexia, náuseas, y vómito) fueron la razón principal.

Conclusiones: se observaron avances importantes con respecto a las rutinas hospitalarias que permiten la identificación temprana de la malnutrición. Sin embargo, es poco lo que se ha avanzado en la implementación de la terapia nutricional, ya sea oral, enteral o parenteral.

Palabras clave: malnutrición, valoración nutricional, terapia nutricional, estado nutricional, malnutrición hospitalaria.

ses anos (aproximadamente 10% e menos de 1%, respectivamente). De 2012 a 2015, uma média de 8% das unidades relataram não ter uma Equipe Multidisciplinar de Terapia Nutricional. Por outro lado, houve aumento significativo do uso de protocolos nacionais para avaliação nutricional, de apenas um terço em 2009 para 92% em 2015. Em relação à dieta hospitalar, menos de 40% dos pacientes relataram aceitar a dieta hospitalar em sua totalidade, ao longo das edições, sendo as causas referentes ao paciente (anorexia, náusea e vômito) relatadas como principal motivo.

Conclusões: Foram observados avanços importantes em relação às rotinas hospitalares que permitem a identificação precoce da desnutrição. No entanto, pouco progresso tem sido feito na implementação da terapia nutricional, seja oral, enteral ou parenteral.

Palavras-chave: Desnutrição, avaliação nutricional, terapia nutricional, estado nutricional, desnutrição hospitalar.

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INTRODUCTION

Malnutrition is a clinical condition resulting from a deficiency of one or more essential nutrients, leading to a series of changes in body composition and physiological functions. Hospital malnutrition has been under the spotlight since the 1970s[1]. Since then, it has been a concern for health professionals due to the great importance that nutritional status has on the treatment of patients, as it is a risk factor for worsening clinical evolution, as it impairs immune function, interfering with susceptibility to infections, healing, and inflammatory response[2,3]. Consequently, hospital malnutrition has been associated with increased length of hospital stay, higher mortality rates, and increased health care costs[4].

In Brazil and the world, important studies have shown that hospital malnutrition is highly prevalent. One of these studies, the Brazilian Hospital Nutritional Assessment Survey (IBRANUTRI), found 48.1% of malnutrition in the 4,000 patients hospitalized by the Unified Health System (UHS), with 12.6% having severe malnutrition and 35.5% moderate[5]. Another large study, the Latin American Nutrition Study (ELAN), evaluated 9,233 patients of the Unified Health Information Systems (HIS) in 12 countries and showed that 50.2% of these patients had some degree of malnutrition. More precisely, 12.6% and 37.6% had severe and moderate malnutrition, respectively[6].

The literature points out that, with standardized protocols for assessing the patient's nutritional status at the time of admission to the hospital, it is possible to prevent the risk of malnutrition and improve the prognosis of hospitalized patients[7]. In a recent study carried out in an extensive Swiss database showed that patients identified as malnourished and who received nutritional therapy had shorter hospital stays and lower 30-day readmission rates[4].

In addition to the use of standardized protocols, another important factor when talking about care for malnutrition at the hospital level is the performance of the Nutritional Support Teams (NSTs). These NSTs are interdisciplinary teams that have been built to ensure and improve the quality and safety of nutritional treatments. NSTs continuously check and optimize the quality of procedures in the core areas of nutritional management by implementing nutritional screening processes using a validated tool, nutritional status assessment, an adequate nutritional care plan development, prompt and targeted nutritional treatment delivery, and provision of accurate monitoring to oversee all aspects of care, from catering to artificial nutrition[8].

Considering the high prevalence of in-hospital malnutrition, and the fact that it is observed in both developing as well as first world countries[9-11], a nutritionDay project was developed, which began in 2006 and now covers 71 countries. It is a multi-center project that aims to evaluate, through annual audits, the nutritional care provided by hospitals to their patients, in addition to making health professionals and medical institutions aware of the importance of adequate nutritional care for the best recovery of the patient, as well as of the use of institutional resources.

Through standardized questionnaires, information is obtained from the patient and the institution on the application of nutritional care. The project was called nutriDia Brasil in Brazil and had its first edition in 2009.

The objective of this study was to perform a temporal analysis of the evolution of nutritional care provided by the hospitals that participated in nutritionDay in Brazil between 2009 and 2015.

METHODS

This study addressed data obtained from seven editions of nutriDia Brasil through reports covering the period between 2009 and 2015. Over these years, 265 medical units in hospitals in 20 Brazilian states were evaluated.

Data collected up to the year 2015 were considered, given that changes to the study protocols were introduced starting in 2016, leading to changes in the questionnaires used and, consequently, in the presentation of results, hindering comparison with previous years of some research parameters.

The Ethics Committee approved all editions of the host country of the project and, in Brazil, the Ethics Committee approved the project of the National Coordination Hospital, and all patients received the Free and Informed Consent Form that was sent to the hospitals requesting consent for voluntary participate in the study. Each patient received a code to maintain the confidentiality of the information and ensure non-identification of patients and units alike.

The yearly sample consisted of all patients hospitalized in the registered units on the audit day who consented to participate in the study. Thus, there was no sample size calculation, as it depended on the size of the units of each participating hospital.

Data collection was carried out by the staff of each Institution using standardized questionnaires made available by the Vienna Coordinating Center. The first questionnaire describes unit structure and resources, while the second questionnaire concerns patient information. The third questionnaire gathers information about the patient's previous nutritional history and intake on that day.

In this study, data related to hospital units were analyzed, such as the presence of NST, evolution of protocols and guidelines used in each Unit, and nutritional screening at the time of admission of the patient to the hospital. In addition, patient-related data such as nutritional diagnosis, as well as demographic and anthropometric data, unintentional weight loss in the last three months, use of nutritional therapy, and causes of non-intake of total hospital meals were analyzed.

Data were analyzed using the Stata statistical program (version 16.0). Descriptive analyses of the variables studied were performed using relative and absolute frequencies for categorical variables and means and standard/median deviation and interquartile range for continuous variables. The Chi-squared test was used to test the variation of frequencies of the nutritional parameters assessed across the years and p-values <0.05 were considered significant.

RESULTS

A total of 5581 patients hospitalized in 265 hospitals across the country were evaluated between 2009 and 2015. In the seven editions of nutritionDay in Brazil, more than half of the sample was male, aged between 5 and 106 years. Regarding Body Mass Index (BMI), this was similar over the years, ranging from 24.2 ± 5.0kg/m^2 to 25.2 ± 58kg/m^2, and the average weight ranged from 65.5 ± 16.3 to 67.9 ± 17.4 kg), also for both genders (**Table 1**).

The prevalence of weight loss in the last three months was consistently reported by almost half of the sample, ranging from 47.2% in 2009 to 53.7% in 2015, consid-

Table 1. Demographic and anthropometric data of patients participating in nutriDia Brasil (2009-2015)

Year	Units (n)	Patients (n)	Male (%)	Age (years) Median [IQR]	Weight (kg) Mean ± SD	BMI (kg/m²) Mean ± SD
2009	39	718	54.9	57 (10-104)	66.5 ± 16.5	24.6 ± 5.6
2010	37	847	60.4	54 (14-93)	65.5 ± 16.3	24.4 ± 5.6
2011	13	432	55.8	61 (17-97)	65.7 ± 15.5	24.2 ± 5.0
2012	41	785	55.2	58 (14-94)	66.3 ± 16.1	24.6 ± 5.4
2013	61	1350	55.4	59 (5-101)	66.6 ± 16.3	24.9 ± 5.7
2014	36	700	55.1	59 (13-104)	67.7 ± 16.5	25.1 ± 5.2
2015	38	749	52.6	60 (11-106)	67.9 ± 17.4	25.2 ± 5.8

ering all editions (p <0.001). Data showed a significant increase in the Oral Supplementation (SO) offered to patients from 2009 to 2015. Its use varied from 11.8% in the first year to 18.2% in 2015 (p = 0.003). However, the use of Enteral Nutritional Therapy (ENT) and Parenteral Nutritional Therapy (PNT) remained practically unchanged over all these years, with around 10% for ENT and less than 1% for the use of PNT (**Table 2**).

Regarding the nutritional care structure of the hospital units, 100% of the participating hospitals in the first three years of the study reported the presence of NST, with a significant decrease of the number of hospitals with NST in the last years (p = 0.047). As of 2012, there was participation of hospitals that reported not having NSTs (8% on average) but were nonetheless interested in participating in the study. On the other hand, we noticed a significant increase in the use of national protocols for nutritional assessment, with only one-third of hospitals referring to their use in 2009, and this figure rising to 92% in 2015 (p <0.001). It is worth noting that there is still considerable variation regarding the routine implementation of body weight measurement at admission, ranging from 26% to 77% of patients over the years (p = 0.001) (**Table 3**).

The results of hospital diet acceptance over the study period are shown in **Table 4**. It is observed that less than 40% of patients reported accepting the hospital diet in its entirety throughout the editions. **Figure 1** presents the main patient-reported reasons for not eating the meals offered by the hospital. Over the years, the main reasons for not eating were patient-related (anorexia, nausea, and vomiting), followed by diagnostic/therapeutic causes and hospital diet presentation (46.6%, 14.7%, and 14.1%, respectively).

DISCUSSION

This study sought to highlight the changes, at a national level, in the nutritional care provided to patients by hospital units of institutions in 20 Brazilian states that participated in the nutritionDay between 2009 and 2015.

Regarding hospital unit structures, we observed progress in the practice of routines that advocate the early and effective detection of malnutrition, such as national protocols whose use increased from 33% to 92% between 2009 and 2015. This finding is significantly appropriate, as the approach to malnutrition in hospitalized patients does not only depend on the nutritional therapy selected but also on the application at the right and appropriate time of guidelines and protocols by professionals dedicated to caring for malnourished patients[12].

All the participating units in the first three years had NSTs. However, from 2012 to 2015, an average of 8% of the units reported not having the presence of an established team. Several studies show significant improvements in patients nutritional status and better clinical outcomes, as well as cost reductions when patients are adequately followed by an NST[8,13,14].

The report of unintentional weight loss in the last three months was evaluated as one of the predictive variables of malnutrition, and the percentage found was high, totaling an average in seven years of 53.6% of the total population studied. This high prevalence

Table 2. Weight loss in the last three months and implemented nutritional therapy in patients participating in nutriDia Brasil (2009-2015)

Year	2009 (n = 718)	2010 (n = 847)	2011 (n = 432)	2012 (n = 785)	2013 (n = 1350)	2014 (n = 700)	2015 (n = 749)
Weight loss (three months) (p <0.001)[a]							
	n (%)	**n (%)**	**n (%)**	**n (%)**	**n (%)**	**n (%)**	**n (%)**
Yes	339 (47.2)	424 (50.1)	255 (59.0)	467 (59.5)	741 (54.9)	355 (50.7)	402 (53.7)
No or increased	239 (33.3)	251 (29.6)	108 (25.0)	235 (29.9)	438 (32.4)	263 (37.6)	284 (37.9)
Don't know	50 (7.0)	32 (3.8)	11 (2.6)	41(5.2)	93 (6.9)	45 (6.4)	49 (6.5)
Missing	90 (12.5)	140 (16.5)	58 (13.4)	42 (5.4)	78 (5.8)	37 (5.3)	14 (1.9)
Nutritional therapy (p = 0.003)[a]							
	n (%)	**n (%)**	**n (%)**	**n (%)**	**n (%)**	**n (%)**	**n (%)**
OS	85 (11.8)	92 (10.9)	64 (14.8)	100 (12.7)	217 (16.1)	126 (18.0)	136 (18.2)
EN	68 (9.5)	74 (8.7)	50 (11.6)	89 (11.3)	144 (10.7)	62 (8.9)	74 (9.9)
PN	7 (1.0)	5 (0.6)	4 (0.9)	7 (0.9)	8 (0.6)	7 (1.0)	5 (0.7)
EN + PN	4 (0.6)	1 (0.1)	0 (0.0)	1 (0.1)	3 (0.2)	2 (0.3)	1 (0.1)

[a]Chi-square test.

Table 3. Nutritional care routine in institutions participating in nutriDia Brasil (2009-2015)

Variable	2009 (n = 39)	2010 (n = 37)	2011 (n = 13)	2012 (n = 41)	2013 (n = 61)	2014 (n = 36)	2015 (n = 38)	p-value[a]
	n (%)	**n (%)**	**n (%)**	**n (%)**	**n (%)**	**n (%)**	**n (%)**	
Presence of NST	39 (100)	37 (100)	13 (100)	39 (95)	59 (97)	31 (86)	35 (92)	0.047
Use of national protocols	13 (33)	26 (70)	11 (85)	27 (66)	49 (80)	26 (72)	35 (92)	< 0.001
Weight on admission	10 (26)	16 (43)	10 (77)	23 (56)	36 (59)	26 (72)	16 (42)	0.001

[a]Chi-square test.

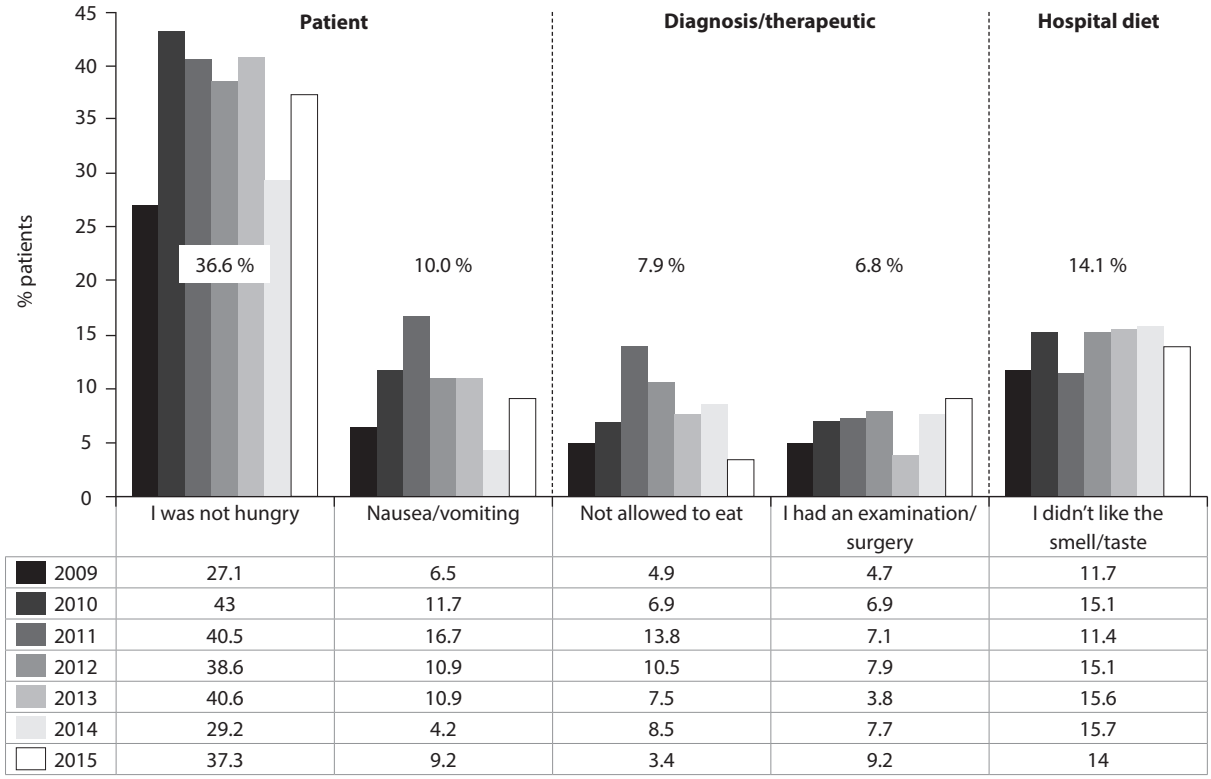
is a source of concern since weight loss compromises the improvement of the clinical picture in several situations. Unintentional weight loss remains an important parameter in nutritional assessment, being one of the three phenotypic criteria of the Global Leadership Initiative on Malnutrition (GLIM)[15].

In terms of the frequency of nutritional therapy use, this study showed that oral supplementation was the most frequently used in all the years analyzed, with a significant increase from 11.8% to 18.2% between 2009 and 2015. This increase could attributed to the increased availability of commercial oral nutritional supplements in our country in the last decade. Oral nutritional supplementation is a well-established nutritional intervention tool that has been shown to improve patient prognosis in different clinical situations, improving nutritional status, immune function, strength, and tolerance to therapies imposed on the patient[16-18]. On the other hand, enteral and parenteral nutrition therapy remained practically unchanged in all these years (approximately 10% and less than 1%, respectively).

Table 4. Patient intake at lunch in nutriDia Brasil (2009-2015)[a]

	2009 n (%)	2010 n (%)	2011 n (%)	2012 n (%)	2013 n (%)	2014 n (%)	2015 n (%)
All	244 (40.2)	254 (36.8)	141 (40.2)	267 (36.8)	474 (40.1)	251 (38.5)	280 (40.2)
½	147 (24.3)	188 (27.2)	80 (22.8)	173 (23.9)	305 (25.8)	157 (24.1)	193 (27.8)
¼	83 (13.7)	129 (18.7)	54 (15.4)	133 (18.3)	252 (21.3)	131 (20.1)	125 (18.0)
Nothing	75 (12.4)	101 (14.6)	73 (20.8)	126 (17.4)	139 (11.8)	100 (15.3)	88 (12.7)
? No reply	57 (9.4)	19 (2.7)	3 (0.8)	26 (3.6)	11 (1.0)	13 (2.0)	9 (1.3)
Total (n)	606	691	351	725	1181	652	695

[a]Chi-square test: $p = 0.001$.



	I was not hungry	Nausea/vomiting	Not allowed to eat	I had an examination/ surgery	I didn't like the smell/taste
2009	27.1	6.5	4.9	4.7	11.7
2010	43	11.7	6.9	6.9	15.1
2011	40.5	16.7	13.8	7.1	11.4
2012	38.6	10.9	10.5	7.9	15.1
2013	40.6	10.9	7.5	3.8	15.6
2014	29.2	4.2	8.5	7.7	15.7
2015	37.3	9.2	3.4	9.2	14

Figure 1. Causes for not accepting all the meal in nutriDia Brasil (2009-2015).

Therefore, although significant advances have been observed concerning hospital routines that allow early identification of malnutrition, little progress has been made in implementing nutritional therapy, whether enteral, or parenteral. Further studies are needed to understand the barriers to nutritional prescribing in Brazilian hospitals.

Regarding hospital diet acceptance, patients were asked about the size of the lunch offered on the study day. The most frequently reported causes for not eating the full meal were patient-related, including anorexia and nausea/vomiting. Notwithstanding, some reported issues were related to the hospital unit organization or the surgical protocols, such as skipping a meal due to fasting for exams and surgeries. An issue that deserves attention is the non-acceptance of the meal offered due to organoleptic reasons, which refer to rejection due to smell and taste. This is something on which the Nutrition and Dietetic Services can work on in order to improve acceptance. In this sense, studies have suggested using the Mealtime Audit Tool that could be useful to identify and remove barriers to food intake for hospitalized patients, thus improving acceptance[19].

CONCLUSION

Between 2009 and 2015, nutritionDay in Brazil showed some improvement in Brazilian hospitals, such as adoption of national guidelines for nutritional care and increased use of oral nutritional supplements. However, there are still many hospitals without a Nutritional Support team to implement nutritional assessment and adequate nutritional therapy routinely. Some reported causes for non-acceptance of the hospital diet, such as rejection due to food smell or taste, could be managed to improve acceptance by the patients. The discussion of these results in national meetings could improve awareness among professionals and promote the implementation of new protocols with the aim of solving these problems.

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Authorship

SPO and MCG participated in the design, data analysis, writing and finalization of the work that resulted in the paper in question.

Conflicts of interest

No conflict of interest to declare.

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