Applied nutritional investigation

Diet quality of patients with acute coronary syndrome receiving public and private health care

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ABSTRACT

Objective: The aim of this study was to investigate the quality of the diets consumed by patients with acute coronary syndrome (ACS) who received public and private health care.

Methods: This observational, prospective, longitudinal cohort study evaluated patients with ACS who attended three private and one public cardiology reference hospitals. Information about dietary parameters during the 6 mo before the acute ACS event was collected at admission and 180 d later using a semiquantitative food frequency questionnaire. Diet quality was assessed using the Alternative Healthy Eating Index (2010), and a multilinear regression model was developed to evaluate the associated variables.

Results: The 581 volunteers included in this study comprised 325 (55.9%) and 256 (44.1%) patients treated at private and public hospitals, respectively. Although the dietary index increased significantly after ACS ($P < 0001$), diet quality remained unsatisfactory, particularly in terms of reductions in the consumption of cardioprotective components (vegetables, fruits, and eicosapentaenoic and docosahexaenoic fatty acids). Compared with patients receiving private health care, those attending a public hospital reported lower dietary quality ($P < 0.001$). The best diet quality was found to correlate with female sex ($P < 0.001$), receipt of dietary guidance at hospital discharge ($P < 0.001$), private health care ($P < 0.001$), a stable relationship status (P, 0.016), and older age ($P < 0.001$).

Conclusion: The overall post-ACS diet quality remained unsatisfactory, especially in terms of cardioprotective components and among patients receiving public health care. Sociodemographic factors and the assistance model/quality were determinants of the observed differences in dietary quality.

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Introduction

Acute coronary syndrome (ACS) is a primary cause of premature morbidity and mortality in Brazil and worldwide. Because ACS is closely related with dietary intake [1,2], changes to a patient's diet may help control classic cardiovascular risk factors such as hypercholesterolemia, systemic arterial hypertension (SAH), and diabetes mellitus (DM), and might affect prognosis after an ACS event [3]. Accordingly, guidelines have been developed to help patients with ACS establish healthy dietary pattern at the time of hospital discharge. These guidelines promote the intake of cardioprotective foods (e.g., vegetables, fruits, olive oil, whole grains) [2,4−6] and discourage the consumption of components considered predictive of cardiovascular risk, such as sweet drinks, red and processed meats, alcohol, trans fats, and sodium [6].

Despite the development of these secondary prevention guidelines [3], however, previous studies have reported poor adherence because patients tend to maintain their pre-acute dietary profiles, particularly in low-income countries [7]. There is ample evidence that social determinants of health (SDH) [8,9] and deficiencies in health systems [10,11] may influence adherence to treatment and are negatively associated with cardiovascular effects and mortality [5,10].

In Brazil, >75% of the population is covered by the Brazilian Unified Health System, whereas a relatively small proportion of the population is covered by private health insurance. Although health has been established as a universal and equitable right of all Brazilians [12], evidence suggests that access to and quality of health services varies within the population [13]. In addition, little evidence is available regarding the role of diet quality in the context of secondary prevention, particularly in terms of possible disparities between public and private services.

Against this background, we aimed to investigate the quality of the diets consumed by patients with ACS who received treatment in public and private health care settings. We believe that this information will serve as a basis for confirming possible disparities in dietary guidance provided at hospital discharge and for designing public health policy strategies to minimize such distortions.

Materials and methods

Study design and location

This observational, prospective, longitudinal cohort study included patients who had received a diagnosis of ACS at one of four cardiology reference hospitals located in Aracaju City, Sergipe, Brazil. One hospital provided care to patients insured by the public health care program; because this hospital did not include an open emergency service, referrals from other health units were required. The three remaining hospitals provided care to patients with private health insurance; accordingly, patients at these facilities either directly accessed care or were referred from other health institutions.

Study sample

This study included 581 patients of both sexes. All patients were >18 y of age and had been admitted to hospitals with clinical statuses compatible with ACS.

Patients were considered eligible for the study based on the following symptoms: unstable angina and acute myocardial infarction (AMI) with ST-segment elevation (STEMI) or non−ST-segment elevation (NSTEMI). These entities were diagnosed according to the clinical history (i.e., onset of symptoms consistent with acute ischemia in the preceding 24 h) and a serial increase in cardiac necrosis, and were confirmed by electrocardiography, echocardiography, or coronary angiography [3].

Data collection

Patients were evaluated at two time points: at hospital admission and 180 d after the acute event. Hospital data were collected consecutively from October 2013 to September 2015 by a dietitian and nutrition students. The second data collection period occurred from April 2014 to March 2016.

At the first time point, patient characterization data were collected using a semistructured interview questionnaire comprising open and closed questions to solicit information about the socioeconomic status and clinical status at admission, history, cardiovascular risk factors, and anthropometric measures and guidelines, provided at hospital discharge. The research team participated in periodic training and meetings to evaluate the progress of the investigation and verify the quality of data collection.

Evaluation of dietary intake

Dietary intake was evaluated using the semiquantitative food frequency questionnaire (FFQ) [14], which comprised 116 food items. Some small adaptations were made to include regional foods. The FFQ was used to assess food consumption during the previous 6 mo and was administered during hospital admission through personal contact with the patient and 180 d after the acute event via telephone.

During the first FFQ administration, an album comprising photos of food, utensils, and standard measures was used to help the interviewees remember the consumed portions of foods and minimize possible causes of error, thus increasing the reliability of information [15].

The consumption frequencies of the food portions were transformed into daily quantities (g) using national nutritional composition tables [16] and information from food labels.

Studies of dietary patterns have been used to identify the most frequently consumed dietary components and determine protectors or predictors of cardiovascular disease (CVD) [5,6]. Dietary indexes based on the available scientific evidence regarding the relationship between various foods/nutrients and health outcomes can be used for this purpose [6]. In this study, we used the Alternative Healthy Eating Index (AHEI-2010) [6] to evaluate the quality of the diets consumed by the participants. This index, which was shown to correlate closely with CVD, comprises 11 components scored on a scale of 0 (*worst*) to 10 (*best*), with total scores ranging

Table 1
Components of AHEI-2010 and adapted AHEI

Components	AHEI-2010		AHEI adapted	
	Criterion for minimum score (0)	Criterion for maximum score (10)	Criterion for minimum score (0)	Criterion for maximum score (10)
Vegetables (servings/d)*	0	≥5	0	≥3 (45 kcal)
Fruits (servings/d)*	0	≥4	0	≥3 (210 kcal)
Whole grains (g/d)†				
Women	0	75	0	75
Men	0	90	0	90
Sugar sweetened beverages and fruit juice (servings/d)†	≥1	0	≥1	0
Nuts and legumes (servings/d)†	0	≥1	0	≥1 (55 kcal)
Red and processed meat (servings/d)*	≥1.5	0	≥1 (190 kcal)	0
Trans fats (% of energy)†	≥4	≤0.5	≥4	≤0.5
Long-chain fatty acids (ω-3) (EPA/DHA) (mg/d)†	0	250	0	250
Polyunsaturated fatty acids (% of energy)†	≤2	10	≤2	10
Sodium (mg/d)‡	Largest decile	Smallest decile	Largest decile	Smallest decile
Women	>3337	<1112	>7178	<2580
Men	>5271	<1612	>8585	<3079
Alcohol (dose/d)§				
Women	≥2.5	0.5−1.5	≥2.5	0.5−1.5
Men	≥3.5	0.5−2	≥3.5	0.5−2
Total	0	110	0	110

AHEI, Alternative Healthy Eating Index; DHA, docosahexaenoic acid; EPA, eicosapentaenoic acid; FFQ, food frequency questionnaire.
*Recommendation of the Food Guide for the Brazilian Population [17].
†Recommendation of the AHEI-2010 [6].
‡Principle of AHEI-2010 [6] was considered to calculate the cutoff points for sodium based on sample distribution deciles. The intake of sodium was considered intrinsic to the food of the FFQ and sodium from the addition of salt by the individuals.
§Recommendation of the AHEI-2010 [6]. The dosage amounts of each beverage were established according to the Food Guide for the Brazilian Population [17].
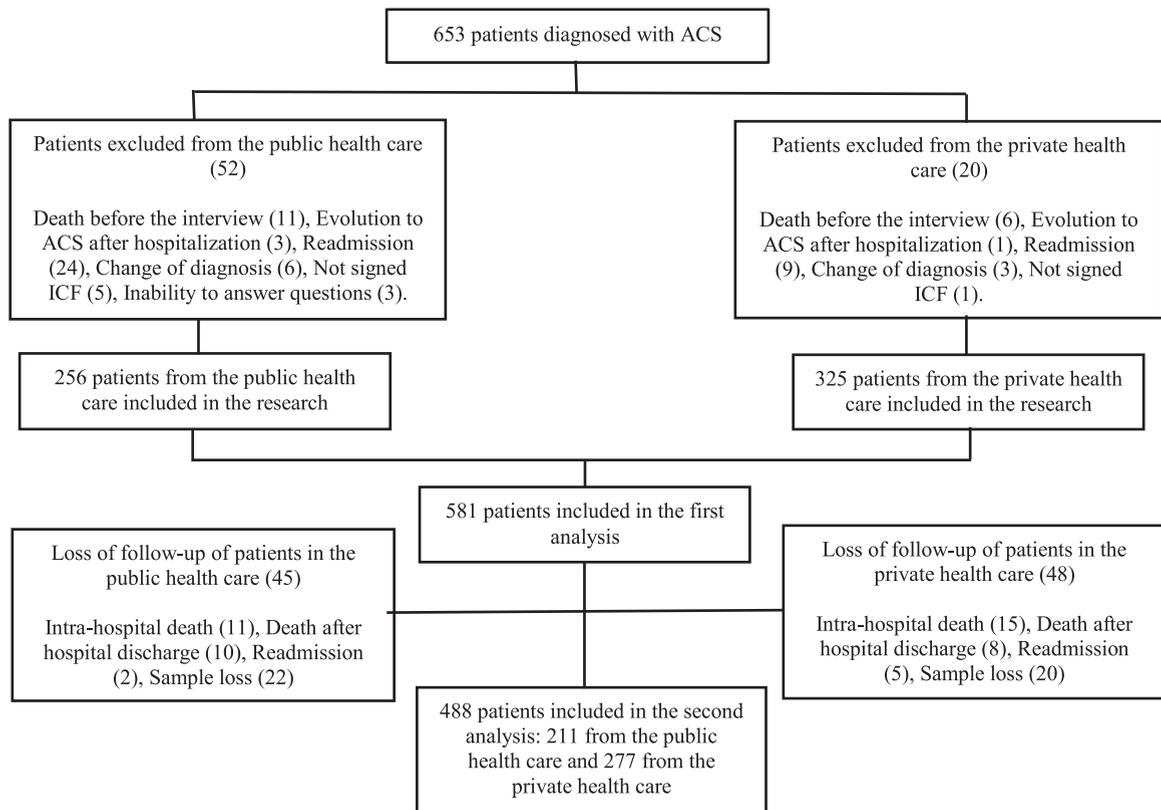
Fig. 1. Organogram representative of the process of inclusion, exclusion and loss of follow-up of patients in the research.

from 0 (*lower dietary quality*) to 110 (*higher dietary quality*) [6]. Higher scores are strongly associated with a lower cardiovascular risk and can thus be used to measure diet quality [6]. In this study, the scores for the components of vegetables, fruits, and red and processed meats were calculated according to the numbers of portions recommended in the Food Guide for the Brazilian Population [17], as shown in Table 1.

Anthropometric evaluation

The following parameters were evaluated in all participants. Body weight was measured using a scale with a capacity of 150 kg at 100-g intervals (Filizola, São Paulo, SP, Brazil). Height was measured using a stadiometer (Seca, Chino, CA, USA). Waist circumference was measured using a flexible, inelastic tape (Seca). Anthropometric measurements were performed according to the basic guidelines for anthropometric evaluation published by the World Health Organization (WHO) [18].

Excess weight was evaluated using the body mass index according to the WHO classification [18], and central adiposity was evaluated using the waist circumference classification proposed by the International Diabetes Federation [19].

Data analysis

All statistical analyses were performed using the R Core Team 2016 Program, version 3.3.2 (R Program for Statistical Computing, Vienna, Austria). $P < 0.05$ was considered statistically significant. Quantitative variables are described as means and SDs. The Kolmogorov–Smirnov test was applied to evaluate the assumption of sample normality, and the results determined the subsequent use of Student's t test or the Mann–Whitney test for independent groups. The Wilcoxon test was used to evaluate data from different time points. Categorical variables are described as absolute frequencies and percentages, and Pearson's χ^2 test or Fisher's exact test was used as appropriate to compare these variables between two groups (public versus private service).

To evaluate overall diet quality, a multilinear regression model was applied in which the AHEI-2010 score after ACS was set as the dependent variable and the following parameters were set as independent variables: age, sex, care model (public versus private service), relationship status (without [single, divorced, widower] versus with a stable relationship ([married, living with a partner]), education level, and receipt of dietary guidance at hospital discharge. We also calculated a 95% confidence interval (CI) for each independent variable associated with the AHEI-2010 score.

Ethical aspects

The study was submitted to the Research Ethics Committee of the Federal University of Sergipe and approved. All participants freely provided signed informed consent before participating in the study.

Results

Of the 581 patients included in the study, 325 (55.9%) and 256 (44.1%) were treated at the private and public hospitals, respectively. However, only 488 participated until the end of the investigation. Figure 1 provides an assessment of all patients included in the study, as well as the follow-up losses with their respective causes.

Table 2 presents the patients' characteristics according to health care type. Notably, public health care users were significantly more likely to be men (P, 0.002) and younger (P < 0.001) and to have a lower education level (P < 0.001), lower income per capita (P < 0.001), and less likely to have SAH (P, 0.037), DM (P, 0.008), dyslipidemia (P < 0.001), excess weight (P, 0.001), and central adiposity (P < 0.001). Public health care users also were more likely to report alcoholism (P, 0.049) and smoking (P < 0.001) and to exhibit STEMI, whereas private care users included more cases of NSTEMI (P < 0.001).

Furthermore, <50% of the patients in the public health care group had received dietary guidance at hospital discharge compared with the private health care users (P, 0.002). In both groups, dietary guidance was predominantly provided by physicians, especially in the public health care setting (P, 0.035; Table 2).

Table 2
Characteristics of patients with ACS, according to the type of health care, Aracaju, Sergipe, Brazil

| Variables | n | Type of health care | | P-value |
		Public n (%)	Private n (%)	
Age (y)	581			
18–49		51 (19.9)	24 (7.4)	
50–59		68 (26.6)	76 (23.4)	
60–69		88 (34.4)	109 (33.5)	
70–79		38 (14.8)	70 (21.5)	<0.001*
≥80		11 (4.3)	46 (14.2)	
Sex	581			
Male		181 (70.7)	189 (58.2)	0.002†
Marital status	580			
Stable relationship		166 (64.8)	210 (64.6)	1.000†
Education level (y)	581			
No education or <1 y		32 (12.5)	12 (3.7)	
1–3		64 (25.0)	20 (6.1)	<0.001*
4–8		99 (38.7)	79 (24.3)	
≥9		61 (23.8)	214 (65.9)	
Family income per capita (MS)	576			
≤1		196 (76.9)	52 (16.2)	
>1 to ≤3		54 (21.1)	162 (50.5)	<0.001*
>3 to ≤5		3 (1.2)	47 (14.6)	
>5		2 (0.8)	60 (18.7)	
Classification of ACS	581			
UA		20 (7.8)	81 (24.9)	
NSTEMI		47 (18.4)	166 (51.1)	<0.001*
STEMI		189 (73.8)	78 (24.0)	
Systemic arterial hypertension	581	194 (75.8)	270 (83.1)	0.037†
Diabetes mellitus	581	76 (29.7)	132 (40.6)	0.008†
Dyslipidemia	581	104 (40.6)	218 (67.1)	<0.001†
Excess weight	576	153 (60.5)	237 (73.4)	0.001†
Central adiposity	568	171 (68.1)	257 (81.1)	<0.001†
Alcoholism	581	39 (15.2)	31 (9.5)	0.049†
Smoking	581			
No		100 (39.1)	168 (51.7)	
Yes		63 (24.6)	36 (11.1)	<0.001*
Ex-smoker		93 (36.3)	121 (37.2)	
Received dietary guidance at hospital discharge	555‡			
No		146 (59.6)	142 (45.8)	0.002†
Yes		99 (40.4)	168 (54.2)	
Professional who performed the dietary guidance	267§			
Dietitian		2 (2)	15 (8.9)	0.035†
Physicians		97 (98)	153 (91.1)	

ACS, acute coronary syndrome; MS, minimum salary; NSTEMI, acute myocardial infarction without ST elevation; STEMI, acute myocardial infarction with ST elevation; UA, unstable angina
*Pearson's χ^2 test.
†Fisher's exact test.
‡Number of patients who were discharged from hospital.
§Number of patients who received dietary guidance at hospital discharge.

After ACS, statistically significant increases were observed in both the AHEI-2010 total score and in the scores for components such as whole grains, sweet drinks and fruit juices, red and processed meats, polyunsaturated fatty acids (PUFAs), and sodium. However, the intakes of vegetables, fruits, trans fats, and eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) decreased after ACS. No changes in the intakes of nuts, legumes, or alcohol were observed (Table 3).

In a comparison stratified by the type of health system, discrete increases in AHEI-2010 total scores were observed among patients receiving both types of health care. Among public health care recipients, the intakes of vegetables, fruits, trans fats, and EPA/DHA fats decreased significantly; whereas those of whole grains, sweetened beverages and fruit juices, red and processed meats, PUFAs, and sodium increased significantly. Among private health care recipients, reduced intakes of vegetables, trans fats, and EPA/DHA and increased intakes of whole grains, sweetened drinks and fruit

Table 3
Averages (SD) of the AHEI-2010 patients' components, before and after ACS, Aracaju, Sergipe, Brazil

AHEI-2010 components	Before ACS	After ACS	P-value*
Vegetables	4.48 (2.74)	3.64 (2.17)	<0.001
Fruits	8.27 (2.55)	7.85 (2.41)	<0.001
Whole grains	2.68 (3.71)	3.48 (3.81)	<0.001
Sugar sweetened beverages and fruit juice	1.54 (2.74)	2.12 (2.64)	<0.001
Nuts and legumes	9.68 (1.39)	9.79 (1.13)	0.069
Red and processed meat	1.89 (2.71)	2.85 (2.66)	<0.001
Trans fats	8.13 (1.41)	7.82 (1.44)	<0.001
Long-chain fatty acids (ω-3) (EPA/DHA)	0.99 (1.96)	0.41 (1.14)	<0.001
Polyunsaturated fatty acids	5.13 (1.67)	5.40 (1.25)	<0.001
Sodium	3.92 (3.12)	4.81 (2.67)	<0.001
Alcohol	3.08 (2.02)	2.97 (1.84)	0.157
Total	49.78 (9.55)	51.15 (9.01)	<0.001

ACS, acute coronary syndrome; AHEI, Alternative Healthy Eating Index; DHA, docosahexaenoic acid; EPA, eicosapentaenoic acid
*Wilcoxon test.

Table 4
Averages (SD) of AHEI-2010 components, according to type of health care, before and after ACS, Aracaju, Sergipe, Brazil

AHEI-2010 components	Type of health care			
	Public		Private	
	Before ACS	After ACS	Before ACS	After ACS
Vegetables	4.70 (2.95)	3.23 (2.19)*	4.31 (2.57)	3.96 (2.10)[†,‖]
Fruits	8.22 (2.64)	7.34 (2.46)*	8.30 (2.47)	8.25 (2.30)[‖]
Whole grains	1.68 (3.09)	2.69 (3.60)*	3.44 (3.95)	4.09 (3.86)*[,‖]
Sugar sweetened beverages and fruit juice	1.18 (2.38)	2.01 (2.59)*	1.82 (2.97)	2.21 (2.69)*
Nuts and legumes	9.71 (1.40)	9.89 (0.67)	9.66 (1.39)	9.71 (1.38)
Red and processed meat	1.21 (2.17)	2.22 (2.45)*	2.40 (2.96)	3.33 (2.72)*[,‖]
Trans fats	8.08 (1.33)	7.59 (1.49)*	8.16 (1.47)	7.99 (1.38)[†,‖]
Long-chain fatty acids (n-3) (EPA/DHA)	1.03 (1.91)	0.32 (0.92)*	0.95 (1.99)	0.47 (1.28)*
Polyunsaturated fatty acids (PUFAs)	5.02 (1.74)	5.56 (1.33)*	5.22 (1.61)	5.29 (1.16)[§]
Sodium	2.92 (2.82)	4.16 (2.55)*	4.69 (3.13)	5.31 (2.65)*[,‖]
Alcohol	2.91 (1.75)	2.78 (1.44)	3.21 (2.19)	3.11 (2.08)
Total	46.66 (7.98)	47.79 (7.90)[‡]	52.15 (9.97)	53.71 (8.98)*[,‖]

ACS, acute coronary syndrome; AHEI, Alternative Healthy Eating Index; DHA, docosahexaenoic acid; EPA, eicosapentaenoic acid
*Wilcoxon test (comparison before and after ACS): $P < 0.001$.
[†] Wilcoxon test (comparison before and after ACS): $P < 0.01$.
[‡] Wilcoxon test (comparison before and after ACS): $P < 0.05$.
[§] Mann–Whitney test (comparison after ACS between groups): $P < 0.05$.
[‖] Mann–Whitney test (comparison after ACS between groups): $P < 0.001$.

Table 5
Multilinear regression model* of overall diet quality (AHEI-2010 score) of patients after ACS, Aracaju, Sergipe, Brazil

Variables	Coefficient (β)	95% CI	Standard error	P-value
Age (y)	0.132	0.067 to 0.198	0.033	<0.001
Male sex	−4.235	−5.845 to −2.645	0.819	<0.001
Private health care	3.541	1.782 to 5.300	0.895	<0.001
Stable relationship	1.988	0.380 to 3.597	0.819	0.016
Education level (y)	0.124	−0.050 to 0.317	0.093	0.152
Dietary guidance at hospital discharge	3.546	2.084 to 5.009	0.744	<0.001

ACS, acute coronary syndrome; AHEI, Alternative Healthy Eating Index.
N = 488; R^2; 0.184; $P < 0.001$.
*Multiple linear regression model was performed by age (y) in the interview; sex (0, female, 1, male); type of health care (0, public, 1, private); marital status (0, without stable relationship, 1, stable relationship); education level (y) in the interview; dietary guidance (0, no; 1, yes).

juices, red and processed meats, and sodium were observed (Table 4).

Comparatively, public service patients had a poorer nutritional intake, with lower AHEI-2010 total scores, as well as lower scores for the intakes of vegetables, fruits, whole grains, red and processed meats, trans fats, and sodium (Table 4).

Finally, a multilinear regression analysis of factors was conducted related to the overall diet quality after ACS. Accordingly, older age, female sex, private health care, a stable relationship, and dietary guidance received at hospital discharge were identified as independent predictors of the overall diet quality (Table 5).

Discussion

In the present study, we observed that despite the statistically significant increase in the AHEI-2010 score after an ACS event, the overall quality of the patients' diets remained unsatisfactory because both groups had low intakes of cardioprotective components. A better dietary quality after an acute event was associated with sociodemographic issues and the type and quality of health care. The relevance of these findings increases in the context of other studies that indicated that adherence-AHEI-2010 is inversely associated with CVD risk [6] and mortality [20].

Despite an increase in the patients' total AHEI-2010 scores after ACS, overall diet quality remained low, with scores not reaching

half of the possible maximum score (55 of 110 points). Secondary prevention is a fundamental component of a patient's clinical evolution after hospital discharge, particularly in terms of an understanding and adherence to a high-quality dietary pattern [7,21].

In the present sample, we identified increases in three individual AHEI-2010 component scores considered predictive of cardiovascular risk but only in two component scores considered cardioprotective. These data highlight the difficulties experienced by patients regarding adherence to the recommended intakes of higher quality foods; although they were able to modify and restrict their intakes of components that trigger CVD, this did not correspond to an increase in the intakes of cardioprotective foods.

According to the literature, several dietary patterns have beneficial effects on cardiovascular health [4,6,21]. However, these protective effects may be associated with the adequate intake of a set of food components, rather than improvements in selected individual components of these dietary patterns [21]. Similar to our findings, another study showed that individuals with AMI experienced greater difficulty increasing their intakes of components considered protective than with the restriction of foods predictive of cardiovascular risk [5].

In the present study, when evaluating the consumption of cardioprotective components, patients receiving public health care exhibited discrete increases in the scores for whole grains and PUFAs but reduced scores for vegetables, fruits, and EPA/DHA fats.

Among private service patients, an increased score was observed for whole grains as were reduced scores for vegetables and EPA/DHA fats.

Among cardiovascular risk–predictive components, both groups increased their scores for sweetened drinks and fruit juices, red and processed meats, and sodium but reduced their scores for trans fats.

Despite the protective role that vegetables and fruits play in the prevention of CVDs [6,21], there was a reduction in fruit consumption by public hospital patients, and in vegetable consumption by both groups of patients after the acute event. These results are consistent with a previous study that also observed poor compliance with the recommendations for vegetable intake [22].

After the ACS event, patients receiving private health care received higher index scores for three cardioprotective components (vegetables, fruits, and whole grains) and three cardiovascular risk predictors (red and processed meats, trans fat, and sodium) than patients receiving public health care, and these differences had a significant beneficial effect on the diet quality of patients in the former group.

The present study observed higher dietary quality among older patients, women, and those participating in stable relationships. Similarly, other studies have detected a higher prevalence of healthy diet consumption among women [7] and those in stable relationships [21] and have reported that the consumption of health-protective food components increases with age [23]. The superior dietary outcomes associated with these sociodemographic factors may be related to cultural issues; namely women are more concerned about their own health, and individuals in stable relationships rely on the support of their peers while administering self-care, especially as they grow older. Thus, sociodemographic factors may strongly affect the dietary pattern [22].

In addition, the present study data revealed that a reduced percentage of patients in both services received dietary guidance at hospital discharge from either a physician or nutritionist, suggesting that both types of service neglect this clinical practice. We further observed that the receipt of hospital discharge guidance was an independent predictor of higher post-ACS dietary quality. Receipt of hospital discharge guidance was significantly higher among patients in the private health care system suggests possible distortions in assistance among patients with ACS in Brazil. A study of the existing literature shows that social and environmental inequalities [8,24,25] and limited-access health services and programs that stimulate adherence to treatments [11,25] produce results similar to those observed in the present study, showing once again that socioeconomic factors and SDH may directly influence the behavior [8,11], clinical outcomes, and prognosis of the patient [10,24,25].

Some limitations should be considered when interpreting the present results. For instance, the comparison of study groups using a longitudinal design implied significant differences in the patients' baseline characteristics. However, we sought to control the effects of these differences by adjusting for these variables in the regression model of overall diet quality. Another limitation was the lack of previous validation of the adapted AHEI-2010. However, we selected this dietary index because it has been indicated for use in patients with heart disease and to facilitate comparisons with data in the literature. Finally, the Brazilian Health System experienced a 2-mo interruption of care provision, which may have reduced number of patients treated by this service (i.e., public health group).

Conclusion

The overall diet quality after ACS remained unsatisfactory, especially with regard to cardioprotective components. In addition,

greater dietary inadequacies were observed among patients receiving public health care. The sociodemographic condition and assistance model/quality were determinants of the differences in the patients' diet quality.

In view of the present findings, it is apparent that for treating patients with ACS, a continuous evaluation of not only the individuals' lifestyle, but also of the SDH, which greatly influences the prevention and treatment of chronic diseases, is essential. Within the SDH, it is necessary to evaluate the economic, social, and political instability in which individuals may be inserted because there is a need for interventions in these areas so as to align health-sector policies. Another problem concerns the health care fragmentation in the present day. In order to combat this, the development of actions in a multidisciplinary and comprehensive method is needed, with integrated and sustainable care focused on the prevention and on the needs of the population. These actions should not only be focused on the disease, but also on individuals at high risk and on the consequences of treatment.

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