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Pattern of consumption of fruits and vegetables by people with and without noncommunicable diseases

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Pattern of consumption of fruits and vegetables by people with and without noncommunicable diseases

Patrón de consumo de frutas y hortalizas por personas con y sin enfermedades no transmisibles

Padrão do consumo de frutas, legumes e verduras de pessoas com e sem doenças não transmissíveis

ABSTRACT

Objective: to compare the consumption of fruits and vegetables among users of health services with and without noncommunicable disease. Method: quantitative and cross-sectional study, assessed the consumption of fruits and vegetables, through an interview, the questionnaire contained sociodemographic and food consumption variables. To analyze the data, we used descriptive statistics and Pearson's chi-square test between groups with and without noncommunicable diseases. Results: the sample contained 719 participants, the value of $p \leq 0.005$ was observed in the variables of age, marital status, economic class, occupation, consumption of raw salad and fruits. We found no differences between the consumption of fruits and vegetables between groups. Conclusion: the consumption of healthy foods is a protective and treatment factor for non-communicable diseases, it is still necessary to update public health policies for the population with non-communicable diseases already installed.

DESCRIPTORS: Food Consumption; Noncommunicable diseases; Health Promotion.

RESUMEN

Objetivo: comparar el consumo de frutas y hortalizas entre usuarios de servicios de salud con y sin enfermedades no transmisibles. Método: estudio cuantitativo y transversal, evaluando el consumo de frutas y verduras, a través de una entrevista, el cuestionario contenía variables sociodemográficas y de consumo de alimentos. Para analizar los datos se utilizó estadística descriptiva y la prueba de chi-cuadrado de Pearson entre grupos con y sin enfermedades no transmisibles. Resultados: la muestra estuvo conformada por 719 participantes, se observó el valor de $p \leq 0,005$ en las variables de edad, estado civil, clase económica, ocupación, consumo de ensalada cruda y frutas. No encontramos diferencias entre el consumo de frutas y verduras entre grupos. Conclusión: el consumo de alimentos saludables es un factor protector y de tratamiento de las enfermedades no transmisibles, aún es necesario actualizar las políticas de salud pública para la población con enfermedades no transmisibles ya instaladas.

DESCRIPTORES: Consumo de alimentos; Enfermedades no Transmisibles; Promoción de la Salud.

RESUMO

Objetivo: comparar o consumo de frutas, legumes e verduras em usuários dos serviços de saúde com e sem doença não transmissível. Método: estudo quantitativo e transversal, avaliou consumo de frutas, legumes e verduras, por meio de entrevista, o questionário continha variáveis sociodemográficas e referentes ao consumo alimentar. Para analisar os dados utilizamos a estatística descritiva e teste de qui-quadrado de Pearson entre os grupos com e sem doenças não transmissíveis. Resultados: a amostra continha 719 participantes, o valor de $p \leq 0,005$ foi observado nas variáveis de idade, estado civil, classe econômica, ocupação, consumo de salada crua e frutas. Não encontramos diferenças entre o consumo de frutas, legumes e verduras entre os grupos. Conclusão: o consumo de alimentos saudáveis é um fator protetor e de tratamento para as doenças não transmissíveis, ainda é necessário a atualização das políticas públicas de saúde para a população com doenças não transmissíveis já instaladas.

DESCRIPTORES: Consumo de Alimentos; Doenças não Transmissíveis; Promoção da Saúde.

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INTRODUCTION

Non-Communicable Diseases (NCDs) portray the largest share of global mortality, accounting for 71% of deaths, with four being the main ones, circulatory diseases, diabetes, cancer and respiratory tract diseases. (1) Public health problems are related to globalization, population aging and accelerated urbanization, a scenario that favors the increase of risk factors that contribute to the emergence and worsening of NCDs, such as unhealthy lifestyle habits, inadequate nutrition, smoking, physical inactivity and increased alcohol consumption. (1,2,3)

The Strategy Plan for combating NCDs, prepared by the Brazilian Ministry of Health, based on the strategies proposed by the United Nations, which has as one of the goals to reduce the premature mortality rate (<70 years) from NCDs by 1/3 by the year 2030, however, one of the goals is to increase the recommended consumption of fruits and vegetables by 20%. (2,3)

It is recognized that poor diet is a risk factor for the emergence and worsening of NCDs. (1,3,4,5) Healthy eating is the intake of foods that promote well-being through nutritional balance, contemporary food consumption is one of the risk factors with the greatest association in the development, treatment and prevention of NCDs. (4,5)

The consumption of raw or cooked

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Fruits, Leafy greens and Vegetables (FLV) is a structural part of a healthy diet, the intake and diversity of these foods contribute to providing basic and adequate nutrition, resulting in beneficial effects in the treatment of NCDs. (6) A systematic review showed that the increase in the daily portion of FLV decreases on average 12,3% the risk of mortality from all causes and when associated with other healthy foods this index increases to 56,0%. (7)

Given the above, this study aimed to compare the habit of consuming FV in health service users with and without NCDs.

METHOD

Quantitative and cross-sectional study carried out with users of health services with and without NCDs in Ribeirão Preto, São Paulo, Brazil, from 2017 to 2018. Ribeirão Preto-SP consists of a population of 604.682 inhabitants and a network of care services in five health districts (North, South, East, West and Central). (8)

The sampling plan was by Stratified Random Sampling with proportional allocation by strata, where each stratum is formed by the health districts of Ribeirão Preto - SP, adopting the parameters of relative sampling error of 10%, significance level of 5% of according to the total number of monthly average visits to pharmacies in the five districts,

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in 2016. The eligible population for this study were people aged 18 years or over, of both sexes, assisted in one of the five districts of health of Ribeirão Preto – SP, who reported having NCDs or not.

For this study, a four-part questionnaire called Characterization of health service users with and without NCD was used. The first refers to identification, the second to sociodemographic variables, the third to clinical variables and finally, food consumption. The answers were self-reported through individual interviews, with an average time of 20 minutes in which, after identifying the interviewer and informing the research objective, the interviewee was invited, and after acceptance, reading was performed in a loud and clear voice, the Informed Consent Form was then collected and the respondent's signature was collected. A pilot study was carried out, in which 50 users of health services participated, which were included in the final sample.

For this study, the four main NCDs were considered, cardiovascular diseases, Systemic Arterial Hypertension, Stroke and heart disease, Diabetes Mellitus (DM), type 1 DM and type 2 DM, chronic respiratory diseases included Rhinitis, Sinusitis, Chronic Obstructive

Pulmonary Disease, Asthma and Bronchitis, and Cancer and other self-reported diseases.^(3,9)

Variables related to FLV consumption were classified according to the frequency of consumption in the last seven days. The investigated foods were raw salad, cooked vegetables, fresh fruits or fruit salad.

Users of health services were categorized into good consumption as those who reported having consumed the investigated foods at least three times a week, according to the 10 steps of healthy eating for adults recommended in the protocols of the Food and Nutritional Surveillance System.^(10,11)

Data were organized and double-validated in Microsoft Excel, version XP (Microsoft Co, USA). Subsequently, data was imported into the Statistical Package for Social Sciences (SSPS) for Windows base module and exact test version 22 for statistical analysis. Descriptive statistics were used with presentation of results in absolute and percentage frequency in the form of tables. Subsequently, data were categorized into healthy and unhealthy consumption and for users of health services with and without DNT, Pearson's chi-square test was used. In all tests, a

significance level of 5% was adopted. The project was approved by the Research Ethics Committee of the Nursing School of Ribeirão Preto-USP, under opinion number 1.875.599 and authorized by the Municipal Health Department of Ribeirão Preto – SP.

RESULTS

The study sample showed that of the 719 participants, 504 (70,1%) reported at least one CNCD and 215 (29,9%) did not, and the prevalence of females was 512 (71,2%). Statistical significance was evidenced ($p \leq 0,005$) in the variables related to age, participants reported being between 35 and 59 years old, marital status where they reported being married or in a stable union, economic class, classified as C and occupation prevailed over those who reported being employed. In the variable referring to education, 293 (40,8%) reported having incomplete primary education (Table 1).

The distribution of responses regarding FLV food consumption among participants with and without NCDs was similar, evidencing healthy FLV consumption.

For the consumption of foods: raw sa-

Table 1 - Distribution of the absolute number (n) and percentage (%) of food consumption according to sociodemographic variables, in the period from 2016 to 2018 – Ribeirão Preto, SP, 2021.

SOCIODEMOGRAPHIC VARIABLES	FOOD CONSUMPTION						P-VALUE
	NOT HEALTHY		HEALTHY		TOTAL		
	N	%	N	%	N	%	
Sex							<0,902
Male	189	28,9	18	28,1	207	28,8	
Female	466	71,1	46	71,9	512	71,2	
Age							<0,001*
18 to 34 years	236	36	6	9,4	242	33,7	
35 to 59 years	263	40,2	30	46,9	293	40,7	
60 years or more	156	23,8	28	43,8	184	25,6	
Marital Status							<0,001*
Single	263	40,2	9	14,1	272	37,8	
Married/ Stable union	294	44,9	45	70,3	339	47,2	
Widow(er)	37	5,6	5	7,8	42	5,8	

Divorced/ Separated	61	9,3	5	7,8	66	9,2	
Education							<0,426
< Elementary School	266	40,6	27	42,2	293	40,8	
Elementary School	53	8,1	3	4,7	56	7,8	
High School	244	37,3	21	32,8	265	36,8	
≥ Higher Education	92	14	13	20,3	105	14,6	
Economic class							<0,027*
A+B	218	33,3	32	50	250	34,8	
C	347	53	26	40,6	373	51,8	
D+E	90	13,7	6	9,4	96	13,4	
Occupation							<0,005*
Employed	287	43,8	25	39,1	312	43,4	
Retired/Pensioner	142	21,7	25	39,1	167	23,2	
Unemployed	226	34,5	14	21,9	240	33,4	
NCD							<0,142
Yes	454	69,3	50	78,1	504	70,1	
No	201	30,7	14	21,9	215	29,9	

Source: Pereira, 2021. *Pearson's chi-square test

lad, vegetables and fruits, there was little variation in the data reported by participants who reported some NCD when compared to those who did not. Taking as relevance the consumption of raw salad and fruit, variables that showed statistical significance ($P \leq 0,005$) (Table 2).

DISCUSSION

When exploring the sociodemographic variables, it was evidenced that the users of health services with and without NCDs were female, young adults, married, with elementary education, with low income and workers. This corroborates

other studies. ^(12,13) A study carried out in Mississippi, in the United States of America, with data from the Behavioral Risk Factor Surveillance System, showed a predominance of married couples in relation to marital status. ⁽¹²⁾

Similar data regarding economic class were pointed out by different stu-

Table 2: Numerical and percentage distribution of health service users with and without NCDs according to the consumption of fruits, vegetables and salad, raw healthy and unhealthy, in the period 2017 to 2018 – Ribeirão Preto, SP, 2021.

FOOD	FOOD CONSUMPTION						P-VALUE
	WITH CND (N= 504)		WITHOUT CND (N= 215)		TOTAL (N= 719)		
	N	%	N	%	N	%	
RAW SALAD							<0,006*
Healthy Consumption	367	72,9	145	67,4	512	71,2	
Unhealthy Consumption	137	27,1	70	32,6	207	28,8	
VEGETABLES AND LEAFY GREENS							<0,070
Healthy Consumption	355	70,4	132	61,4	487	67,7	
Unhealthy Consumption	149	29,6	83	38,6	232	32,3	
FRUITS							<0,047*
Healthy Consumption	335	66,5	125	58,1	460	64	
Unhealthy Consumption	169	33,5	90	41,9	259	36	

Source: Pereira, 2021 *Pearson's chi-square test

dies. ^(13, 14) According to data from the Family Budget Survey, carried out by the Brazilian Institute of Geography in 2017/2018, it showed a similar level of monthly income in the population analyzed. ⁽¹⁵⁾

By analyzing the results of a longitudinal study carried out in Indonesia, it was pointed out that the population's food consumption had a high prevalence of NCDs, in addition to being associated with weight gain, resulting from poor diet. ⁽¹⁶⁾

Em relação ao orçamento familiar da população brasileira, os gastos aumentaram em 0,6% na aquisição de legumes e verduras e 1,0% em relação às frutas ⁽¹⁵⁾ However, a study carried out in Belo Horizonte pointed out the adequate consumption of fruits and vegetables, suggesting improvement in educational activities and the need to act on the consumer's environment, ⁽¹⁷⁾ according to the Brazilian healthy eating guidelines, ^(4,9,10,13) habits are protective measures for NCDs. ^(1,2,3,4,5,8,9,10) On the other hand, socioeconomic factors can make it difficult to purchase these foods. ^(4,5,10,17)

A recent literature review pointed out that the habitual consumption of FLV contributes to health promotion, in addition to helping to provide essential nutrients in the population with NCDs. ⁽¹⁸⁾ In contrast, studies show that the unhealthy eating pattern among adults remains high, ^(2,8,13) varying according to region and social class. ^(4,19) National and international studies indicate that efforts to reduce rates of obesity, DM and risk factors for CNCDs are needed so that they have a positive impact on reducing

morbidity and mortality and improving quality of life. ^(10,11,19,20)

A cross-sectional study carried out in Rio Grande do Norte, aimed to identify the most frequent food consumption patterns and the association of socioeconomic and demographic factors in a municipality, showed the relationship between FLV consumption and national recommendations, ⁽¹⁹⁾ since it is similar to the present study.

In contrast, studies show that the unhealthy eating pattern among adults remains high

Habitual consumption of FLV is a protective and treatment factor for NCDs, reducing mortality rates and less impact on public health expenditures. ^(1,2,3,4,5,21,22,23,24)

Our results are better and more consistent with the expectations of public health policies. On the other hand, fur-

ther studies are needed to confirm data from other studies showing that people with NCDs have a consistent eating pattern, in accordance with national protocols that indicate healthy eating habits. ^(10,11,13,19)

Given the above, there are changes in food consumption in the city of Ribeirão Preto - SP in relation to national and international literature, as adequate food consumption was found, in accordance with the recommendations of the health protocols. ^(10,11,19) Thus, it was found that people with one or more NCDs reported adequate consumption of FV, which can lead to some bias in the results obtained, constituting a limitation of the study, in addition to obtaining self-reported data by the participants, which may underestimate the results found in the present study.

When comparing the FV consumption of health service users with and without DNT, a difference in consumption was expected, as the rates of DNT are increasing worldwide, however, it is understood that the consumption of these foods is a protective factor for the onset and treatment of NCDs. In this regard, we conclude that the results can contribute to the updating and improvement of public health policies in the general context and especially for people living with some NCD, emphasizing nutritional guidelines in the family context so that it can stimulate the consumption of FV in a healthy way, in order to minimize the appearance of NCDs, number of deaths and hospital admissions related to lack of adequate control of the disease and consequently provide a better quality of life to the population. ■

REFERENCES

1. World Health Organization [Internet]. Noncommunicable diseases 2018. [atualizado 2018; citado 2021 jan 28]. Disponível em: <https://www.who.int/news-room/fact-sheets/detail/non-communicable-diseases>
2. Malta DC, da Silva MMAD. As doenças e agravos não transmissíveis, o desafio contemporâneo na Saúde Pública. *Ciênc Saúde Colet.* 2018 [citado 2021 jan 29];23(5):1350-1352. <https://doi.org/10.1590/1413-81232018235.31552017>
3. Brasil. Ministério da Saúde. Secretaria de Vigilância em Saúde. Plano de ações estratégicas para o enfrentamento das doenças crônicas e agravos não transmissíveis no Brasil 2021-2030. Brasília; 2020. [citado 2021 jan 28]. Disponível em: [7793 saúdecoletiva ■ 2021; \(11\) N.68](https://an-

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REFERENCES

- tigo.saude.gov.br/images/pdf/2020/October/01/Plano-DANT-vers--o-Consulta-p--blica.pdf
- Brasil. Ministério da Saúde. Guia alimentar para a população brasileira. 2. ed. Brasília/DF: Ministério da Saúde; 2014. [citado 2020 mar 18]. Disponível em: https://bvsmms.saude.gov.br/bvs/publicacoes/guia_alimentar_populacao_brasileira_2ed.pdf
 - Nicola DD. The role of preventive nutrition on chronic non-communicable diseases. *Nutrients*. 2019 [citado 2021 fev 05];11:1074. doi: 10.3390/nu11051074
 - Wallace TC, Bailey RL, Blumberg JB, Burton-Freeman B, Chen CO, Crowe-White KM, et al. Fruits, vegetables, and health: A comprehensive narrative, umbrella review of the science and recommendations for enhanced public policy to improve intake. *Crit Rev Food Sci Nutr*. 2020 [citado 2021 fev 10];60(13):2174-2211. <https://doi.org/10.1080/10408398.2019.1632258>
 - Schwingshackl L, Schwedhelm C, Hoffmann G, Lampousi AM, Knüppel S, Iqbal K, et al. Food groups and risk of all-cause mortality: a systematic review and meta-analysis of prospective studies. *Am J Clin Nutr*. 2017 [citado 2021 fev 10];105(6):1462-1473. doi: 10.3945/ajcn.117.153148
 - Ribeirão Preto (Cidade). Prefeitura Municipal. Plano municipal de saúde de Ribeirão Preto 2018-2021. Ribeirão Preto: Prefeitura Municipal [Internet]. 2017 [citado 2021 jan 28]. Disponível em: <https://www.ribeiraopreto.sp.gov.br/ssaude/rede/i16distritos.php>
 - Brasil. Ministério da Saúde. Secretaria de Atenção à Saúde. Departamento de Atenção Básica. Estratégias para o cuidado da pessoa com doença crônica. Brasília, DF: Ministério da Saúde [Internet]. 2014 [citado 2021 jan 30]. Disponível em: https://bvsmms.saude.gov.br/bvs/publicacoes/estrategias_cuidado_pessoa_doenca_cronica_cab35.pdf
 - Nascimento FA, Silva SA, Jaime PC. Cobertura da avaliação do estado nutricional no Sistema de Vigilância Alimentar e Nutricional brasileiro: 2008 a 2013. *Revista bras. epidemiol.* [Internet]. 2019 [citado 2021 jan 20];22:e190028. <https://doi.org/10.1590/1980-549720190028>
 - Silveira FC, Susin LRO, Meucci RD. Marcadores de consumo alimentar em mulheres da zona rural de Rio Grande, Rio Grande do Sul, 2017. *Epidemiol. Serv. Saúde* [Internet]. 2020 [citado 2021 jan 30];29(1):e2018381. <https://doi.org/10.5123/s1679-49742020000100023>
 - Mendy VL, Vargas R, Cannon-Smit G, Payton M, Enkhmaa B, Zhang L. Food insecurity and cardiovascular disease risk factors among mississippi adults. *Int J Environ Res Public Health* [Internet]. 2018 [citado 2021 fev 04];15(9). <https://doi.org/10.3390/ijerph15092016>
 - Mendonça RD, Lopes MS, Freitas PP, Campos SF, Menezes MC, Lopes ACS. Monotonia no consumo de frutas e hortaliças e características do ambiente alimentar. *Rev. Saúde Pública* [Internet]. 2019 [citado 2021 fev 01];53:63. <https://doi.org/10.11606/S1518-8787.2019053000705>
 - Borges CA, Claro RM, Martins APB, Villar BS. Quanto cus-
 - ta para as famílias de baixa renda obterem uma dieta saudável no Brasil? *Cad Saúde Pública* [Internet]. 2015 [citado em 2021 jan 28];31(1): 137-148. <https://doi.org/10.1590/0102-311X00005114>.
 - Pesquisa de orçamentos familiares 2017-2018: primeiros resultados. IBGE, Coordenação de Trabalho e Rendimento. Rio de Janeiro: IBGE; 2019. 69 p. [citado 2021 fev 03]. Disponível em: <https://biblioteca.ibge.gov.br/visualizacao/livros/liv101670.pdf>
 - Oddo VM, Maehara M, Izwardy D, Sugihantono A, Ali PB, Rah JH. Risk factors for nutrition-related chronic disease among adults in Indonesia. *PLOS ONE* [Internet]. 2019 [citado 2021 fev 14];14(8). <https://doi.org/10.1371/journal.pone.0221927>.
 - Mendonça RD, Lopes MS, Freitas PP, Campos SF, Menezes MC, Lopes ACS. Monotonia no consumo de frutas e hortaliças e características do ambiente alimentar. *Rev. Saúde Pública* [Internet]. 2019 [citado 2021 mar 23];53:63. <http://dx.doi.org/10.11606/s1518-8787.2019053000705>
 - Reis BSMT, Machado IE, Freitas MIF, Jorge AO, Silva AG, Malta DC. Tendência temporal da prevalência dos fatores de risco e de proteção para doenças crônicas não transmissíveis em Belo Horizonte, MG. *REME: Rev Min Enferm.* [Internet]. 2020 [citado 2021 mar 10];24:e1307. <http://dx.doi.org/10.5935/1415-2762.20200044>
 - Freire MBB, Nascimento EGC, Cavalcanti MAF, Fernandes NCS, Júnior JMP. Padrão de consumo alimentar e fatores associados em adultos. *Rev Família, Ciclos de Vida e Saúde no Contexto Social* [Internet]. 2018 [citado 2021 mar 12];6(4). <https://doi.org/10.18554/refacs.v6i4.2982>
 - Silva DCGD, Seghetto W, Amaral FCDS, Reis NDA, Veloso GSS, Pessoa MC, et al. Consumo de bebidas açucaradas e fatores associados em adultos. *Ciênc Saúde Coletiva* [Internet]. 2019 [citado 2021 mar 11];24(3):899-906. <https://doi.org/10.1590/1413-81232018243.05432017>
 - Aune D. Plant Foods, Antioxidant Biomarkers, and the Risk of Cardiovascular Disease, Cancer, and Mortality: A Review of the Evidence. *Adv Nutr.* [Internet]. 2019 [citado 2021 18 mar];10(4):S404-S421. <https://doi.org/10.1093/advances/nmz042>
 - Du H, Li L, Bennett D, Yang L, Guo Y, Key TJ, et al. Fresh fruit consumption and all-cause and cause-specific mortality: findings from the China Kadoorie Biobank. *Int J Epidemiol.* [Internet]. 2017 [citado 2021 mar 17];46(5):1444-1455. <https://doi.org/10.1093/ije/dyx042>
 - Torres RC, Sousa PHSF, Silva LMM, Mota MM, Jesus AP, Silva AM. Perfil de idosos hipertensos e diabéticos de um município de Sergipe. *Saúde Coletiva.* [Internet]. 2020 [citado 2021 mar 18]; 10(59):4376-4381. <https://doi.org/10.36489/saudecoletiva.2020v10i59p4376-4387>
 - Pereira LFC. Hábitos e consumo alimentar de usuários de serviços de saúde com e sem doenças crônicas não transmissíveis [dissertação]. Ribeirão Preto: Escola de Enfermagem, Universidade de São Paulo; 2019.