

MONITORING RISK FACTORS FOR NONCOMMUNICABLE DISEASES: A POPULATION-BASED STUDY

Monitoramento de fatores de risco para doenças crônicas não transmissíveis: um estudo de base populacional

Monitorización de factores de riesgo para enfermedades crónicas no transmisibles: un estudio de base poblacional

Original Article

ABSTRACT

Objective: To monitor the prevalence of risk factors for the onset of noncommunicable diseases in adults from a municipality in Northern Parana, Brazil. **Methods:** This is a cross-sectional population-based study conducted in 2013 through home interviews with 453 adults selected according to the demographic extension areas of the municipality. The variables studied were those related to sociodemographic conditions and main risk factors associated with chronic diseases such as smoking, physical activity, alcohol consumption and nutritional status. Bivariate analysis of variables was performed at each level of measurement using P-value <0.05. **Results:** There was an association between risk factors for noncommunicable diseases and sociodemographic characteristics such as gender, education and marital status ($p < 0.05$). The proportion of physical inactivity was found in women, individuals with low education and widowed people. Regarding the abusive consumption of alcohol, men, individuals with low education and single people presented statistical significance. Smoking was prevalent among men and single individuals and excessive weight was prevalent among men, individuals with low education and married people, with statistical significance for these variables. **Conclusion:** The sociodemographic characteristics showed an association between the main risk factors for NCDs, corroborating the hypothesis that these diseases may also have their origin in the social determinants.

Descriptors: Chronic Disease; Risk Factors; Epidemiology; Disease Prevention.

RESUMO

Objetivo: Monitorar a prevalência dos fatores de risco à ocorrência das doenças crônicas não transmissíveis em adultos de um município do norte do Paraná, Brasil. **Métodos:** Trata-se de um estudo transversal de base populacional, realizado em 2013 e operacionalizado por meio de uma entrevista domiciliar com 453 adultos selecionados conforme as áreas de extensão demográficas do município. As variáveis estudadas foram aquelas relacionadas às condições sociodemográficas e aos principais fatores de risco associados às doenças crônicas como tabagismo, atividade física, ingestão de bebida alcoólica e estado nutricional. Realizou-se análise bivariada das variáveis em cada nível de determinação utilizando P-valor < 0,05. **Resultados:** Houve associação entre os fatores de risco para as doenças crônicas não transmissíveis e as características sociodemográficas para sexo, escolaridade e situação conjugal ($p < 0,05$). A proporção da inatividade física ocorreu nos indivíduos do sexo feminino, com baixa escolaridade e entre os viúvos (as). Quanto ao consumo abusivo de álcool, os indivíduos do sexo masculino, com baixa escolaridade e entre os solteiros (as) tiveram significância estatística. O cigarro foi prevalente entre os homens e os solteiros (as) e o excesso de peso entre os indivíduos do sexo masculino, baixa escolaridade e casados (as), com significância estatística para essas variáveis. **Conclusão:** As características sociodemográficas mostraram associação entre os principais fatores de risco para as DCNT corroborando com a hipótese de que tais doenças também podem ter sua origem nos determinantes sociais.

Descritores: Doença Crônica; Fatores de Risco; Epidemiologia; Prevenção de Doenças.

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RESUMEN

Objetivo: *Monitorear la prevalencia de los factores de riesgo para la ocurrencia de enfermedades crónicas no transmisibles (ECNT) en adultos de un municipio del norte de Paraná, Brasil.*

Métodos: *Se trata de un estudio transversal de base poblacional realizado en 2013 a través de una entrevista en el domicilio de 453 adultos elegidos según las aéreas de extensión demográfica del municipio. Las variables estudiadas fueron aquellas relacionadas con las condiciones socio demográficas y los principales factores de riesgo asociados con las enfermedades crónicas como el tabaquismo, la actividad física, la ingesta de bebida alcohólica y el estado nutricional. Se realizó un análisis bivariado de las variables de cada nivel de determinación utilizando el $p < 0,05$.*

Resultados: *Hubo asociación entre los factores de riesgo para las enfermedades crónicas no transmisibles y las características socio demográficas para el sexo, la escolaridad y la situación conyugal ($p < 0,05$). La proporción de la inactividad física se dio en los individuos del sexo femenino, de baja escolaridad y entre los viudos (as). Sobre el consumo abusivo del alcohol los individuos del sexo masculino, de baja escolaridad y entre los solteros (as) tuvieron estadística significativa. El tabaco fue prevalente entre los hombres y los solteros (as) y el exceso de peso entre los individuos del sexo masculino, baja escolaridad y casados (as) con significancia estadística para esas variables. **Conclusión:** *Las características socio demográficas señalaron la asociación entre los principales factores de riesgo para las ECNT apoyando la hipótesis de que tales enfermedades también pueden tener su origen en los determinantes sociales.**

Descriptor: *Enfermedad Crónica; Factores de Riesgo; Epidemiología; Prevención de Enfermedades*

INTRODUCTION

The demographic transition experienced in Brazil reflects the paradigm shift regarding recurrent diseases in the population. These changes can be attributed to social and economic changes that have influenced the way people live, work and eat in society, which have cooperated in increasing the prevalence of Noncommunicable Diseases (NCDs) in the country⁽¹⁾.

NCDs are defined as a set of multifactorial diseases of uncertain etiology, long latency periods and different risk factors that occur throughout life⁽²⁾. The most common diseases in this group are diabetes, cancer, cardiovascular diseases and chronic respiratory diseases⁽³⁾. Currently, they are considered a serious public health problem responsible for 63% of deaths worldwide⁽²⁾. Following the global trend, NCDs constitute the leading cause of death in adults and older people in Brazil and are responsible for increased spending on services, medications and hospitalizations – a cost of R\$ 4.18 million per year for the public system^(4,5).

These diseases threaten human health and development as they have an impact on the quality of life of individuals, increasing the chances of a premature death and also increasing the adverse economic costs for families, communities and society in general^(6,7). Such diseases are the result of many social determinants and conditioning factors as well as individual risk factors such as smoking, harmful use of alcohol, physical inactivity and unhealthy diet⁽⁸⁾.

The current health care policy in the country has prioritized investment and reorganization of services for the control of NCDs through the development of strategies and guidelines for surveillance, reporting, assessment, monitoring, health promotion and comprehensive care⁽²⁾. Since then, studies have been conducted in order to assess the risk factors associated with these diseases, portraying - although indirectly - the quality of life of this population^(3,9).

The sharing of these factors added to the urgency to stop the growing threat of NCDs justify the adoption of integrated and sustainable strategies through the surveillance and monitoring of the profile of these diseases and their determinants and conditioning factors as well as through the detection of changes in geographical and time trends across population groups, thus contributing to the planning of health care actions^(10,11).

Therefore, knowing the most prevalent risk factors in a population allows the development of health actions focused on prevention, with a consequent decrease in the incidence and mortality rates and an improvement in the quality of life of a population, which justifies the need to conduct the present research. Furthermore, the analysis of the relationship between risk factors for the development of NCDs can generate important information that could foster and support the development and strengthening of integrated surveillance of these diseases by improving instruments used to monitor these factors. Given that, there is an evident need for further analysis of NCDs and associated factors. The identification of these factors can lead to improvements in this area and allows healthcare professionals to develop new practices and routines to meet this population in order to trigger interventions and coordinated actions to promote and encourage the adoption of healthy behaviors and lifestyle. Despite being fairly explored in the literature, there is a need for studies that present results regarding the risk factors associated with the occurrence of chronic diseases. The Ministry of Health (MOH) fosters and encourages the development of research on the integrated control of NCDs and their risk factors in line with the National Policy for Health Promotion and points out that there are still many challenges towards the qualification of actions and responses to people with NCDs⁽²⁾.

Thus, the present study assumes that NCDs may also have their origin in the social determinants such as income, education and housing conditions since the health-disease process can be socially determined⁽¹²⁾. Given that, it aimed to monitor the prevalence of risk factors for the onset of noncommunicable diseases in adults from a municipality in Northern Parana, Brazil.

METHODS

This is a cross-sectional population-based study conducted in 2013 through home interviews in the municipality of Maringá, located in Northern Paraná, Brazil, with a population estimated for that year of 397,437 inhabitants⁽¹³⁾. Sample calculation was used to ensure the representativeness of the event. The sample was determined by using data from a census of the adult population (age \geq 18 years) in the year before data collection (2012 census) - 346,744 people⁽¹⁴⁾. In addition, the sample selection was carried out based on the 21 Demographic Extension Areas (*Áreas de Extensão Demográfica - AED*) in the municipality⁽¹³⁾.

Thus, the sample size calculated using Epi-Info version 3.5.1 included the proportion of the adult population of the municipality with a 5% error estimation and 95% reliability plus 20% for possible losses. After the proportional stratification by the number of individuals of each AED the final sample included 453 participants.

The selection for the sample representativeness occurred by spontaneous demand of the first household and only one person was interviewed. In order to provide a better distribution, one household was selected and three others were excluded, always starting on the right side of the street. In case the adult person was not at home, the next household was chosen restarting the process at each interview. When there was more than one person at home a simple draw was held for the selection of the respondent who should meet the inclusion criteria - being over 18 years old. Those who refused to participate in the study were excluded.

Home visits included the application of a face-to-face questionnaire proposed by the Ministry of Health⁽²⁾. The variables analyzed in the present study included: sociodemographic characteristics such as age; skin color (white, black, *pardo* or tanned, yellow); marital status (single, married/united, widowed, separated); education level (never studied, primary education, secondary education, higher education); and the main characteristics associated with the onset of NCDs, such as: 1) smoking (active smoker, regardless of the number of cigarettes, non-smokers and ex-smokers); 2) physical activity (leisure-time physical activity: mild or moderate intensity activity (walking,

walking on a treadmill, weight training, hydrogymnastics, gymnastics in general, swimming, martial arts and fighting, cycling, volleyball or other) for at least 30 minutes a day for 5 or more days a week or vigorous intensity activities (running, treadmill running, aerobics, soccer, basketball or tennis) for at least 20 minutes a day for 3 or more days a week; occupational physical activity - intense physical efforts at work; transport-related physical activity - walking or cycling to work; and physical inactivity - no regular physical activity, that is, less than three times a week and duration of less than 30 minutes, regardless of the type of exercise); 3) alcohol use (abuse - more than five (men) or four (woman) drinks on a single occasion at least once in the last 30 days (one alcoholic beverage corresponds to a can of beer, a glass of wine or a shot of any distilled beverage); 4) nutritional status (assessed using the body mass index (BMI) formula: weight (kg)/height (m)² and classified into overweight (when BMI \geq 25 kg/m²) and obesity (BMI \geq 30 kg/m²) - height and weight were self-reported⁽²⁾.

Data were collected using a semi-structured questionnaire printed by the researchers (a total of 5), who asked and wrote down the answers. No time was previously set to complete the questionnaire. The interviewee should choose a place in the house for the interview. After the explanation of the research objectives, the Free Informed Consent Form was read and signed and the person was invited to participate in the study. In case of refusal, a new person was invited and another household was selected. A pilot study was conducted for the previous training of the researchers.

Data analysis was performed using the SPSS software version 20.0. To check for association between independent variables and the occurrence or not of the outcome, we performed bivariate analysis of the variables at each level of determination using Pearson's Chi-squared tests for variables with normal distribution and Fisher's Exact test for non-parametric data. All inferential statistical tests were performed with a significance level set at $p < 0.05$. The quality of the adjustment consisted in the application of the Hosmer-Lemeshow test.

The study was approved by the Human Research Ethics Committee of the State University of Maringá (Opinion No. 30564/012).

RESULTS

The study included 453 adults, 77.5% (n=351) of whom were women. The mean age was 52.0 ± 16.23 years. The percentage distribution of the adult population according to sociodemographic characteristics is shown in Table I. In addition, 49.7% (n=225) had low education.

Table I - Percentage distribution of the adult population according to sociodemographic characteristics. Maringá, Paraná, 2013 (n=453).

Variables	n	%
Gender		
Men	102	22.5
Women	351	77.5
Education		
Never studied	21	4.6
Primary education	225	49.7
Secondary education	123	27.2
Higher education	84	18.5
Marital status		
Single	69	15.2
Married/united	296	65.3
Widowed	57	12.6
Separated/divorced	31	6.8
Skin color		
White	316	66.5
Black	16	3.5
<i>Pardo</i>	117	25.8
Yellow	4	4.2

Table II - Prevalence of risk factors for the onset of Noncommunicable Diseases (NCDs). Maringá, Paraná, 2013.

Variables	n	%
Physical activity		
Active	117	25.8
Inactive	336	74.2
Alcohol use		
Abuse	53	11.7
No abuse	400	88.3
Smoking		
Smokers	45	9.9
Ex-smokers	87	19.2
Non-smokers	321	70.9
Nutritional status*		
Normal	160	43.4
Excessive weight	209	56.6

* n=369 adults assessed

Regarding the risk factors for the onset of NCDs, it was observed that 74.2% (n=336) of the interviewees did not do physical activity and 56.6% (n=209) presented excessive weight - 35.4% (n=160) of whom were obese (Table II).

Alcohol abuse rate was not high in the study population and the number of people who smoked and are now ex-smokers accounted for 9.3% (n=44) of the sample.

Table III shows the results of the bivariate analyses between the study variables and the main risk factors for NCDs. Statistical significance was found for the prevalence of physical inactivity among women, people with low education, and widowed individuals.

As for alcohol abuse, statistical significance was found for men, people with low education and single people.

Table III - Frequency of risk factors for Noncommunicable Diseases (NCDs) in the adult population according to sociodemographic variables. Maringá, Paraná, 2013.

Variables	Physical activity Inactive		Abusive drinking		Smokers		Excessive weight	
	%	p-value	%	p-value	%	p-value	%	p-value
Gender		0.04		<0.01		<0.01		<0.01
Men	66.7		22.5		15.7		58.8	
Women	76.4		7.7		8.3		42.5	
Education		<0.01		<0.01		0.79		<0.01
Never studied	90.5		-		14.3		28.6	
Primary education	77.8		8.4		9.8		49.8	
Secondary education	73.2		11.4		11.4		44.7	
Higher education	61.9		20.2		7.1		42.9	
Marital status		<0.04		<0.03		<0.01		<0.04
Single	63.8		20.3		17.4		43.5	
Married/united	74.3		10.5		7.8		48.0	
Widowed	86.0		5.3		7.0		40.4	
Separated/divorced	74.2		6.5		19.4		45.2	
Skin color		0.86		0.76		0.40		0.06
White	75.3		11.3		9.0		48.7	
Black	68.8		18.8		6.3		37.5	
<i>Pardo</i>	72.6		10.3		12.8		42.7	
Yellow	68.4		5.3		10.5		31.6	

There was a prevalence of smoking among men and single people and excessive weight among men, people with low education and married individuals - all these variables presented statistical significance.

No statistical significance was found regarding the association between risk factors race/skin color (p value>0.05).

DISCUSSION

The sociodemographic characteristics were associated with the main risk factors for NCDs, confirming the initial hypothesis of the present study that such diseases can also have their origin in the social determinants. The results revealed statistical significance for the association between risk factors such as physical inactivity, alcohol abuse, smoking and excessive weight and sociodemographic characteristics such as age, gender and education, as in other studies^(8,10,11). This may be related to the living conditions of a new profile of the population that is more independent and exposed to sedentary behaviors and lifestyle habits that are harmful to health. This set of modifiable risk factors

is responsible for the vast majority of deaths and major fractions of the burden of diseases related to NCDs⁽⁸⁾.

Regarding the non-adherence to regular physical activity in the present study, it was statistically significantly associated with women, people with low education and widowed individuals. The rate found (76.4%) was similar to that found in Pelotas, Rio Grande do Sul, where physical inactivity was the most prevalent risk factor found (75.6%), particularly among women⁽⁸⁾. It is noteworthy that low education may have contributed to the higher rates found in the present study as the lack of physical activity was more prevalent among people who had never studied (90.5%).

Another epidemiological study of physically inactive adults demonstrated in its analyses that sedentary behavior, especially the amount of time spent watching television, was more prevalent among women⁽¹¹⁾. There is a growing global trend that points out people are increasingly becoming less active due to technological advances and passive recreational activities⁽¹⁵⁾. Among women, these findings may be related to their inclusion in the labor market - and also their exclusion of the labor market, when they are assigned to do housework only⁽¹⁶⁾.

Policies and actions are needed to encourage the adherence to regular physical activity, highlighting its benefits and ensuring financial support for the construction of places for this purpose^(8,15). In addition, it is estimated that 2.1 million dollars a year spent on health care could be saved through regular physical activity⁽¹⁷⁾. The prescription and practice of regular physical activity are effective in improving the clinical status of individuals – for instance, it can lower blood pressure and glycated hemoglobin levels, resulting in the prevention and control of hypertensive diseases and glucose metabolism disorders. Also, it has important positive effects on mental health, improving cognitive function and reducing the risks of depression, dementia and Alzheimer's disease⁽¹⁸⁾.

It is noteworthy that the non-adherence to regular physical activity and other factors such as smoking, altered sleep patterns and alcohol abuse also contribute to the emergence of excessive weight and worsen chronic diseases and dyslipidemias^(10,16).

As in other studies, excessive weight was the second most prevalent risk factor found in the present study and was significantly statistically associated with men, people with low education and married individuals^(10,18). In Brazil, the increase in excessive weight is increasingly common among men (54.7%) compared to women (47.4%), and among those with less than eight years of study (58.1%)⁽¹⁹⁾. It should be noted that obesity increases by 2.9 times the risk of developing hypertension and diabetes mellitus⁽¹⁵⁾.

Evidence shows that the main health risks related to lifestyle such as smoking, drinking, unhealthy diet, obesity and physical inactivity account for more than three million deaths worldwide each year among both men and women, with similar relative risks associated with overweight and obesity in both men and women. Smoking and alcohol are the main causes of global gender disparities in mortality⁽²⁰⁾.

Another relevant point highlighted by the present study revealed that alcohol abuse was more common among single men and those with more than 12 years of study, demonstrating rates that are similar to those found in other Brazilian states and capital cities^(21,22). Alcohol consumption accounts for 2.3 million deaths every year and has a negative impact on the health, social, political and economic scenarios⁽²³⁾. There is a global trend indicating that this consumption is more frequent among young people and tends to increase with the level of education⁽²¹⁾.

Just as alcohol consumption, smoking was also evident in the study population, especially among low-educated men and separated/widowed individuals; these findings are similar to those of other studies conducted in Brazilian capitals^(21,24). The literature shows that smoking is responsible for approximately 5.1 million deaths per year worldwide and 71% of lung cancers⁽²⁵⁾.

The present research could identify the prevalence of risk factors for the onset of NCDs at a local level, which can provide support for the planning, implementation and evaluation of public health interventions aimed at reducing these diseases. Other factors whose presence could affect the probability of accumulation of risk factors for NCDs were not assessed – for instance, the use of health services. The interpretation of the research results should take into account some methodological limitations. Monitoring systems that are based on reported data have certain limitations that should be considered when interpreting the data. The accuracy of self-reported information depends on respondents' knowledge of relevant information, the ability to remember them and the reliability of their memories. Therefore, the actual situation of the frequency of risk factors for NCDs could possibly be worse than that found, which represents a limitation of the present study. In this perspective, the main risk factors highlighted by the results of the present research could be prevented through social measures for the prevention and control of health, such as regular physical activity, balanced diet and the adoption of healthy habits. In addition, monitoring the most prevalent risk factors in the population can support and underlie the introduction of differentiated measures in the clinical practice by healthcare professionals in order to coordinate the management of care provided to the population aiming to trigger interventions and coordinated actions with an evidence-based treatment plan focused on the real needs of this population.

Thus, further studies on this issue should be carried out.

CONCLUSION

In the present study, most of the risk factors for the onset of noncommunicable diseases such as physical inactivity, alcohol abuse, smoking and excessive weight can be changed with the incorporation of healthy habits and changes in behavior and lifestyle. The prevalence of these factors in this study was significantly associated with gender, age, education and marital status.

Physical inactivity was the most prevalent risk factor and was associated with women, people with low education and widowed individuals. On the other hand, the male gender was associated with alcohol abuse, smoking and excessive weight.

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