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RESEARCH

Estratificação do risco cardiovascular em adultos jovens: relação com pressão arterial, antropometria e achados bioquímicos

Cardiovascular risk stratification in young adults: relation to blood pressure, and found anthropometry biochemical

Estratificación del riesgo cardiovascular en adultos jóvenes: relacionados con la presión arterial, antropometria y resultados bioquímicos

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ABSTRACT

Objective: to stratify the cardiovascular risk of young adults by the Framingham Risk Score (FRS) and relate it to blood pressure, anthropometric and biochemical data. **Method:** this study was quantitative, it conducted with 351 young adults from 12 schools in Juazeiro - Ceará, at random selected, stratified by school and shift. Sociodemographic data collected by questionnaire followed by the objective verification of blood pressure and abdominal circumference (AC). The material collection and biochemical analysis, measured weight and height carried out in the contract laboratory. **Results:** in the results, was established a female majority, mixed-race, combining study and work. It was little risk of young adults by FRS, however, statistically significant between ERF and diastolic blood pressure, CA, body mass index and HDL cholesterol, LDL and triglycerides. **Conclusion:** quantifying cardiovascular risk in young adults can support relevant nursing actions in promoting cardiovascular health. **Descriptors:** cardiovascular diseases, risk, nursing, young adult, students.

RESUMO

Objetivo: estratificar o risco cardiovascular de adultos jovens pelo Escore de Risco Framingham (ERF) e relacioná-lo à pressão arterial, dados antropométricos e bioquímicos. **Método:** estudo quantitativo, realizado com 351 escolares adultos jovens de 12 escolas públicas em Juazeiro do Norte - Ceará, selecionados aleatoriamente, estratificados por escola e turno. Os dados sociodemográficos foram coletados por questionário, seguido da verificação objetiva da pressão arterial e circunferência abdominal (CA). A coleta de material e análise bioquímica, medida de peso e altura, foram realizadas em laboratório contratado. **Resultados:** foi constatado ter maioria feminina, mestiça, conciliando estudo e trabalho. Foi pequeno o risco dos adultos jovens pelo ERF, porém, estatisticamente significativo, entre ERF e pressão arterial diastólica, CA, índice de massa corporal e colesterol HDL, LDL e triglicéridos. **Conclusão:** quantificar riscos cardiovasculares em adultos jovens pode subsidiar ações de enfermagem relevantes na promoção da saúde cardiovascular. **Descritores:** Doenças cardiovasculares, Risco, Enfermagem, Adulto jovem, estudantes.

RESUMEN

Objetivo: estratificar el riesgo cardiovascular de adultos jóvenes através de la escala del riesgo Framingham (ERF) y relacionarlo a la presión arterial, datos antropométricos y bioquímicos. **Método:** estudio cuantitativo, realizado con 351, escolares adultos jóvenes de 12 escuelas públicas en la ciudad de Juazeiro do Norte -Ceará, seleccionadas de forma aleatoria estratificados por escuela y turno. Los datos sociodemográficos, fueron recogidos por preguntas seguidas de su verificación objetiva de la presión arterial y la circunferencia abdominal (CA). La colecta de material, analisis bioquímico, medida de peso y altura se realizaron en un laboratorio contratado anticipadamente. **Resultados:** se comprobó que se tiene la mayoría femenina, mestiza, conciliando estudio y trabajo. Fue mínimo el riesgo de los adultos jóvenes por el ERF, sin embargo fue estadísticamente significativo, entre ERF, presión arterial diastólica, CA, índice de masa corporal y colesterol HDL, LDL y triglicéridos. **Conclusión:** cuantificar los riesgos cardiovasculares en adultos jóvenes puede subsidiar acciones relevantes de enfermería en la promoción de la salud cardiovascular. **Descriptor:** enfermedades cardiovasculares, riesgo, enfermería, adulto joven, estudiantes.

From Dissertation study "analysis of cardiovascular risk factors in young adult School of Juazeiro do Norte-Ceará", 2010. Universidade Estadual do Ceará.

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INTRODUCTION

The last decades have brought major changes in the health of the world's population, especially with regard to the epidemiological impact of chronic non-communicable diseases (NCD). In this group, cardiovascular diseases (CVD) and its risk factors are the most representative and responsible for the higher rates of morbidity and mortality in the population in Brazil and around the world, generating significant losses in individual and collective field, financial and social cost.^{1,2}

The DCV share with the NCD several risk factors, including smoking, dyslipidemias, hypertension, diabetes *mellitus*, obesity, overweight, sedentary lifestyle, poor diet in vegetables and fruits, alcohol use and psychosocial stress, age over 45 years for men and 55 years for women.¹⁻³

The aggregation of cardiovascular risk factors (FRCV) over time leads to the development of cardiovascular changes in young adult population; proven fact in⁴⁻⁵ studies that demonstrate evidence of atherosclerosis in this phase, and contrasts the culturally ingrained idea in young people of the existence of CVD only at more advanced ages.

The quantification of risk factors in the population of young adults identifying the level of susceptibility of these and contribute to nursing strategies focused on prevention of diseases and the promotion of cardiovascular health in the groups most likely to develop them, influencing for healthy living behaviors and minimize the incidence of cardiovascular disease, with contribution to the goals of the World Health Organization (who) and with attention to the priorities of the Ministry of health of Brazil in the confrontation of the NCD in the perspective of change in the supremacy of morbidity and mortality for these causes.^{1-2,4-5}

By implementing preventive and characteristic in populations without disease installed *a priori*, is that the Framingham risk score is configured as valid instrument in promoting cardiovascular health in primary care to adults, in particular, in this study - that of young adults, the demotic Assembly, actions that may delay or prevent cardiovascular damage.^{6,7}

Meet the own risk factors, however, is not enough for a change of conduct. Are common situations where, even on access to health services, the poor quality in the provision of service and/or the difficulty of infrastructure lead to negligence in the investigation and evaluation of cardiovascular risk in user, which returns without the diagnosis of FRCV, many times, even though they may be evident; which certainly points to a professional look focused on disease installed.⁸

A Swedish study⁹ held on primary health care, with intervention programs in the lifestyle of people with cardiovascular risk, showed its efficiency and impact, including in

those individuals with high risk for CVD. In Brazil, a study¹⁰ held also in primary health care, in the family health strategy, agrees with the need for prevention activities based on the identification of cardiovascular risk, suggesting that measures such as these are widely prescribed because they corroborate with the Ministry of Health's proposals on guidelines and recommendations for comprehensive care in the NCD.¹

Unravel the FRCV to which they are exposed to certain populations is a long task embraced by nursing, although considered incipient, still with regard to the production of knowledge specific to cardiovascular health⁸. So the question arises: what would be (m) (s) (s) stratum of cardiovascular risk among young adults, since scientific evidence demonstrating your home in childhood, with consolidation in youth? So, and stratification the cardiovascular risk of young adults by the Framingham risk score and relate the strata found with blood pressure, biochemical and anthropometric data, it seemed one step being considered in valuing the practice of nursing in public health, with appreciation of the use of social tools, like the school, the establishment of feasible strategies to the local reality.

GOAL

And stratification the cardiovascular risk of young adults by the Framingham risk score and relate the strata found with blood pressure, biochemical and anthropometric data.

METHOD

It is a quantitative study, conducted between March 2009 and December 2010 at 12 public schools state average level regular and adult and youth education - EJA, located in town of Juazeiro do Norte, interior of the State of Ceará.

Taken as a young adult phase comprised between 20 to 24 years, the Brazilian legal framework contextualizes the Statute of the child and adolescent (ECA) in the field of health of the adolescent and the young.¹¹

Counting on the finite population of 845 students young adults enrolled in 12 schools, the sample was calculated considering the prevalence of 50% for the occurrence of cardiovascular risk factors, in view of the lack of studies of prevalence in the city with the population concerned, and 4% error¹², which resulted in a sample of 351 students.

The sample of 351 young adults stratified according to the breakdown by school and shifts. The selection of subjects made from random drawing, based on the list of registered. The non-acceptance in participating and/or abandonment, followed with replacement of student in new lottery, using the same criteria. Exclusion criteria were limited in the absence of these at the time of data collection.

Data collection, after consent, included the completion of a questionnaire with items concerning sociodemographic characteristics (age, sex, date of birth, school, class, race, marital status, occupation, monthly income, public place). Following the objective

measurement of blood pressure, waist circumference and invitation blood collection-oriented.

The participants' blood pressure was recorded by two collectors, researcher and a nurse asked, both with professional record of attendance in hypertension program by the family health strategy, with assimilation of the technique by the Brazilian Cardiology Society recommendations³ and verification by the Pearson correlation test positive ($p < 0.005$). Checking of blood pressure occurred in three consecutive times in the same day by the indirect method with auscultator technique and use of calibrated sphygmomanometers, observing the proper cuff size and width in relation to the arm.

Respected the five of the participant, this was placed in a sitting position, with legs uncross, questioned the emptying of the bladder and the bombing range of at least 30 minutes for food intake, smoking or alcohol, according to the Protocol recommended by the *American Heart Association*®¹³ and Brazilian society of Cardiology in the VI Brazilian guidelines of hypertension.³ For the statistical analysis and classification of blood pressure values in normal ($\leq 139 \times 89$ mmHg) and changed ($\geq 140 \times 90$ mmHg) was used the value resulting from the average of the last two measurements.³

The measurement of waist circumference it was conducted by researcher com the student standing and clothes away, with measuring tape unextensive, located at the midpoint between the anterior superior iliac Crest and the last rib, being considered normal values ≤ 88 cm for women and 102 cm for men only.^{3,14}

As a result, participants received an invitation letter for biochemical analysis and were instructed on the need for fasting, of the 12 2:0 pm, as determinations of the IV Brazilian guidelines on Dyslipidemias and Atherosclerosis prevention,¹⁴ in addition to enhanced service gratuity and the need to copy the results to attach to the questionnaire of the study.

The weight and height, as well as biochemical indicators: blood glucose, total cholesterol, HDL, LDL and triglycerides were carried out in the private lab hired for this purpose, by biosecurity issues, guarantees of a collection and analysis of appropriate material and the availability of anthropometric scale adult mechanics with scale ruler 2 m and capacity for 150 kg and precision of 100 g. For checking the weight and height this examined remained standing with feet together, arms outstretched for body-worn operation, without shoes and with the lowest weight of clothing possible. The values allowed calculating body mass index (BMI), which classified in normal (< 25 kg/m²) and changed (≥ 25 kg/m²).¹⁴

The height and weight checks, young adults sent to room for venous blood collection in Vacutainer system, with immediate forwarding of material for analysis. The absentees to collecting blood for biochemical analysis reconvened and rescheduled via telephone contact for up to three times. After this period considered as a quitter and replaced in new lottery, according to the aforementioned criteria. The absence of some, to the end of the study, generated a *missing* of 54 subjects with regard to biochemical data and measures of weight and height, influencing consequently their dependent variables: body mass index (BMI), cholesterol and the Framingham risk score (ERF).

Of possession of information followed by the Framingham, risk score calculation, which analyzes, from the sum of values assigned to the variables: age, total cholesterol, HDL cholesterol, blood pressure and smoking, scores of global cardiovascular risk for the next ten years. Done calculating the scores found were classification as low risk ($\leq 10\%$), medium risk ($> 10\%$ and 20%) and $<$ high risk ($\geq 20\%$).¹⁴

Statistical Package statistically analyzed the data for *Social Sciences* (SPSS version 15.0) with description of absolute and relative frequencies, with determination of mean values and standard deviation for continuous variables. The tests were used *Chi-square*, *Fisher exact test* and *Odds Ratio* at the intersection between the variables, whereas their application criteria. The statistical significance regarded as p-value < 0.005 .

This study integrates the dissertation "analysis of cardiovascular risk factors in young adult School of Juazeiro do Norte, Ceará" approved by the Research Ethics Committee (CEP) of the Universidade Estadual do Ceará under Protocol 10030228-9 in April 27, 2010, out of respect for ethical principles advocated in resolution No. 196 of 1996 in force during the evaluation by that ZIP CODE, befitting the current resolution No. 466 of 2012.

RESULTS AND DISCUSSION

The preset age group of young adults (20-24 years) not considered as a situation of increased risk for CVD, but demonstrating growing trend of morbidity and mortality for these causes. Young adults in the study had an average of 21.55 years (± 1.387).

Table 1- Sociodemographic characteristics of young adult school. Juazeiro do Norte-Ceará-Brazil, 2010.

Sociodemographic characteristics		f (%)	
Age			
	20	109	31.1
	21	80	22.8
	22	66	18.8
	23	52	14.8
	24	44	12.6
Sex			
	Male	135	38.5
	Female	216	61.5
Ethnicity			

	White	106	30.2
	Black	30	8.5
	Mestizo	215	61.3
Income			
	≤ 2 minimum wages	280	79.8
	2 > minimum wages	71	20.2
Marital status			
	Without partner (a)	280	80
	With partner (a)	71	20
You live with			
	Parents	284	80.9
	Partner (a)	53	15.1
	Other	14	4.0
Profession/occupation as student			
	Yes	222	63.2
	No	129	36.8
Total		51	100.0

Note: minimum wage in effect in 2010: R \$ = 510.00;

The results (table 1) showed a majority of female young adults (61.5%) and mixed auto refer (61.3%), combining school and work (63.2%), without partner (80%), still in his parents ' House (80.9%). The most familiar remuneration (78.8%) did not exceed two minimum wages.

The Framingham risk score calculation (ERF) for young adults has resulted in only a couple of stratified scores in less than 1% (97.6%) and equal to 1% (2.4%), both in the range of low overall risk of developing CVD in 10 years (ERF ≤ 10%). Although small the difference between the totals for the scores, we consider that there is importance to differentiate them from the point of view of existence and aggregation of cardiovascular risk factors, so that follows in table 2 its relations with data referring to the variables: systolic and diastolic blood pressure, waist circumference, body mass index, total cholesterol, HDL cholesterol, LDL cholesterol, triglycerides and glucose.

Table 2 - Relationship between the ERF of low risk blood pressure, waist circumference, body mass index and cholesterol in young adults. Juazeiro do Norte-Ceará-Brazil, 2010.

	ERF low risk (≤ 10%)									Value of p
	1 < % score			Score = 1%			Total			
	n	%	X ± SD	n	%	X ± SD	n	%	X ± SD	
PAS	290		108.26	7		117	297		108.5	p > 0.05
Normal	288	99.3	± 10.477	7	100	± 7.274	295	99.3	± 10.666	
Changed	2	0.7		-	-		2	0.7		
PAD	290		71.53	7		76.29	297		71.89	

	Normal	287	99	± 7.86	6	85.7	± 10.193	293	98.7	± 8.023	p < 0.005
	Changed	3	1		1	14.3		4	1.3		
CA		290		75.92	7		89.57	297		76.09	
	Normal	275	94.8	8.47 ±	4	57.1	± 17.681	279	93.9	± 9.128	p < 0.001
	Changed	15	5.2		3	42.9		18	6.1		
IMC		290		22.921	7		28.083	297		23.043	
	Normal	228	78.6	± 3.571	2	28.6	± 8.995	230	77.4	± 3.835	p < 0.005
	Changed	62	21.3		5	71.4		67	22.6		
CT		290		146.02	7		175	297		146.70	
	Normal	284	97.9	± 22.067	5	71.4	± 42.856	289	97.3	± 23.066	p < 0.001
	Changed	6	2.1		2	28.6		8	2.7		
HDL		290		45.97	7		39	297		45.80	
	Normal	172	59.3	± 8.315	1	14.3	± 13.038	173	58.2	± 8.489	p = 0.017
	Changed	118	40.7		6	85.7		52°	41.8		
LDL		290		82.790	7		114.60	297		83.540	
	Normal	288	99.3	± 20.697	6	85.7	± 35.172	294	99	± 21.602	p < 0.001
	Changed	2	0.7		1	14.3		3	1		
TG		290		85.47	7		149.71	297		86.98	
	Normal	279	96.2	± 22.561	5	71.4	± 100.292	284	95.6	± 28.216	p < 0.005
	Changed	11	3.8		2	28.6		13	4.4		
GL		290		75.031	7		75.657	297		75.045	
	Normal	290	100	± 2.970	7	100	± 2.989	297	100	± 2.967	

Note 1: *Missing* of 54 young adults (n = 297)

Note 2: average (X); Standard Deviation (SD); Systolic blood pressure (SBP); Diastolic blood pressure (DBP); Abdominal circumference (CA); Body mass index (BMI); Total cholesterol (TC); HDL cholesterol (HDL); LDL cholesterol (LDL); Triglycerides (TG); Blood Glucose (GL).

When compared to the ERF strata found in low-risk rating among young adults systolic and diastolic blood pressure were not large with respect to quantitative values changed. The measurement of waist circumference and BMI were altered considerably, with 42.9% and 71.4% respectively, on students with stratum ERF = 1%, which suggests association between the change of body weight and the highest stratum found.

The average total cholesterol, LDL cholesterol and Triglycerides were within normal limits and minor changes in the strata. HDL presented average below the recommended values (39 mg/dl) and significant changes (41.8%) in relation to other variables. None of the blood glucose values presented amendment. The significance found in the *p* value for the trends of normality of variables arranged in table 2 corroborating with the fact that the young adults demonstrate low risk by the ERF.

The prevalence of CVD and its early emergence trends makes the young adult population, addressed in this study, focus to research and nursing care demands.¹⁵ studies claim that exposure to cardiovascular risk factors already begin at birth, reflecting in adulthood, and that the determination of the global cardiovascular risk in young adults may reveal, even in low-risk, important forecasts in emergence of CVD, with implications for the detection of Subclinical Atherosclerosis,⁴ and potentially conduct preventive demotic Assembly.

The use of the Framingham risk score in determining the overall cardiovascular risk young adults studied is justified by its wide use in national and international research in this line and for your recommendation in the VI Brazilian guidelines of hypertension³ and IV Brazilian guidelines on Dyslipidemias and Atherosclerosis prevention,¹⁴ Although the age, an important variable in determining the ERF, by the fact of being smaller, bring less impact in the sum of scores for risk determination.³

The scores found in the calculation of the ERF of young adults revealed two types of results (ERF 1 ERF <%= 1%), and all contained in the classification of low risk for developing CARDIOVASCULAR DISEASE over the next 10 years. Other authors,⁷ while investigating the ERF in urban transport drivers in Teresina - Piauí, obtained a majority (85%), and located in the low-risk category. Diverse situation found another study⁽¹⁶⁾, which found, in the studied population of average age 51.91 years (\pm 13.25 years), cardiovascular risk by ERF between medium (46.5% and 32%) and high (33.9% and 60%) for minors and people over 60 years old, respectively. This panorama demonstrates trends of CVD in later stages of life³, although important in elderly not quantitative; suggest the development of CVD at ages smaller.

The relationship between the strata found, both within the same classification level, and the variables of systolic and diastolic blood pressure, waist circumference, BMI, cholesterol and glucose had a tendency to normality for the most part, however, the decision to treat them distinctly is the need to observe the existence or not of changes within a single classification level of risk and the power of the numeric value in the possible determination of risk aggregation.

Changes in waist circumference and BMI of the students, especially those with stratum ERF = 1%, predict the overweight as an important public health problem worldwide.² The Brazil, overweight has shown sustained growth for the period 2006-2009.¹⁷ In this context, the study of Rio de Janeiro⁵, in 17 years of tracking a group of children until young adulthood has shown the presence of cardiovascular risk important in weight change, with repercussions on blood pressure indices and dyslipidemias, evidence of CVD and metabolic syndrome.

The levels of total cholesterol, LDL cholesterol and triglycerides showed minor changes unlike HDL cholesterol that changed important way with an average below normal in young adults, similar to another study¹⁸, where there were minor changes of serum levels of triglycerides and low serum levels of HDL cholesterol, dyslipidemias with positive relationship for the overweight.¹⁹

The overweight and the dyslipidemias found in young adults support with global trends for overweight and obesity, certainly due to the interaction of cardiovascular risk factors like improper eating pattern, especially if we consider the income and cultural and media interference for fast and practical power of industrialized and *fast foods*, so widespread among the young and so affordable those who in their routine work and associate with minimal study time for food preparation or even making meals.²⁰⁻²

The low risk among young adults is not seen here merely as mathematical logic and proportionality, but rather as a point of reflection for nursing on the future behavior of the risks, their aggregations and relationships, which suggest great odds for developing CVD,

even in the short term. The evidence of increased exposure to cardiovascular risk factors in the population over time, brought by records from vigilance of risk and protection factors for chronic diseases¹⁷ confirms the demands for preventing, important field of nursing.

CONCLUSION

The implementation of the ERF in young adults this study demonstrated low risk of developing CVD in the next ten years, resulting in some way foreseen, given the young age of the participants and the importance of the age variable for determining the ERF. However, still, referred the chances of cardiovascular morbidity and aggravations for fleeing to points assessed by the ERF, as the determination of behavioral risks, as an example, the eating habits, considering many of them were overweight. Limitations of the study, questions answered in new research.

On the relationship between the ERF and the variable blood pressure what if found were significant trends to normality. The anthropometric data of waist circumference and body mass index brought the most important changes from the quantitative point of view, and when allied with the changed values of HDL cholesterol in their crosses with the strata of low risk to the ERF, presented the greatest slope stratum (ERF = 1%). Although no significance to abnormality, these results incite the possible associations with cardiovascular risk factors, in addition to the raised in this study: self-care, behavioral, economic factors, access to health and infrastructure.

It is understood that the little evidence of risk among young adults not minimize the concern of nursing, and the challenges to see the low risk as vast field for his role in promoting health and preventing cardiovascular diseases, especially given the trends and styles of contemporary life, the exposure to cardiovascular risk factors and character of multivariate CVD.

What fits is the determination of risk, their behaviors, realities and/or profiles with production continuing knowledge that subsidize daily practices possible, not only for nursing, but the various professionals who somehow can get involved and contribute to the theme, always with respect to the relevance of CVD in health promotion and disease prevention in various stages of human development. This study was a phase, in a way, considered poorly perceived by health services, a situation that is expected, could configure different, in the medium or long term.

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