



Title: Risk factors for stroke in young adults

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Introduction

Cerebrovascular disease (CVD) is a complex disease related to age, with high mortality and long-term disability; can occur in any age group, although its incidence has decreased in older adults.

However, globally, there has been an increasing trend in the hospitalization rate among the age groups 18 to 34 and 35 to 44 years, with an increase of 27.3% and 35.6%, respectively.

Nawaz, B., Eide, G. E., Fromm, A., Øygarden, H., Sand, K. M., Thomassen, L., Næss, H., & Waje-Andreassen, U. (2019). Young ischaemic stroke incidence and demographic characteristics – The Norwegian stroke in the young study – A three-generation research program. *European Stroke Journal*, 4(4), 347–354. <https://doi.org/10.1177/2396987319863601>

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Introduction

Several studies have documented an alarming increase in cardiovascular risk factors in young adults, at least two-thirds have at least one, such as smoking, high blood pressure, dyslipidemia, obesity and stress; the prevalence of three or more factors has doubled compared to the older population.

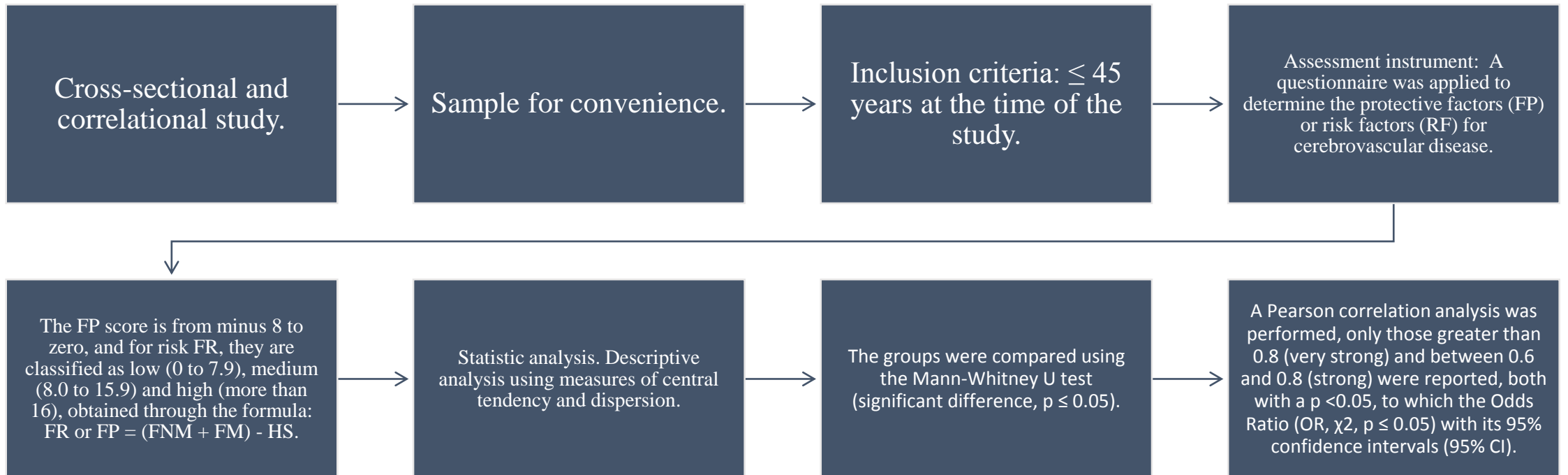
León Cejas, L., Mazziotti, J., Zimmerman, A., Nofal, P., Fernández Pardal, M., Bonardo, P., & Reisin, R. (2019). Misdiagnosis of acute ischemic stroke in young patients. *Medicina*, 79(2), 90–94.

González-Gómez, F. J., Pérez-Torre, P., DeFelipe, A., Vera, R., Matute, C., Cruz-Culebras, A., Álvarez-Velasco, R., & Masjuan, J. (2016). Ictus en adultos jóvenes: Incidencia, factores de riesgo, tratamiento y pronóstico. *Revista Clínica Española*, 216(7), 345–351. <https://doi.org/10.1016/j.rce.2016.05.008>

Objective.

Determine risk factors for stroke in young people under 45 years of age in the Toluca Valley.

Methodology



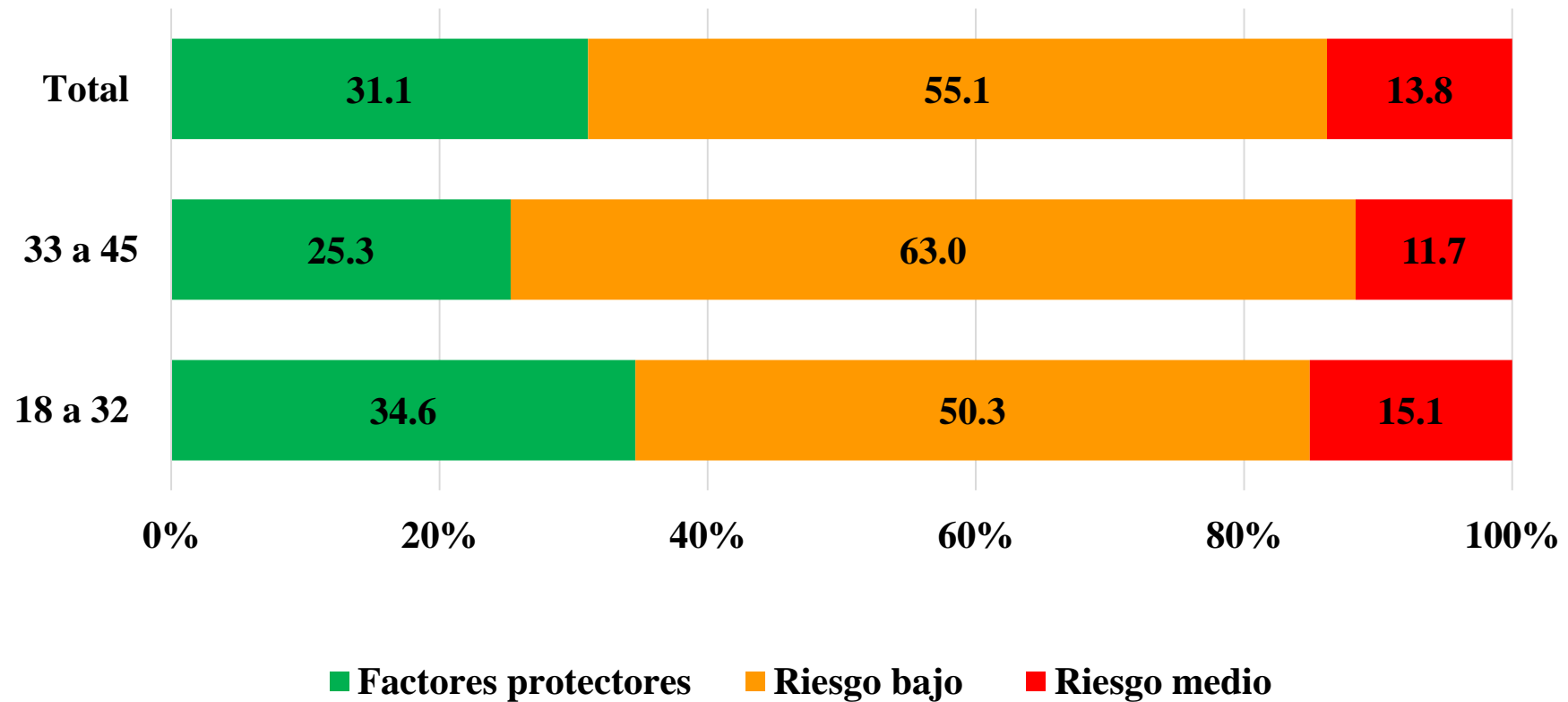
Results

Table. 1 Sociodemographic characteristics for ischemic stroke of the people under 45 years of age in the Toluca Valley.

Variable	18 a 32		33 a 45		Total	
	N	%	N	%	n	%
N	1609	62.1	984	37.9	2593	100
Education						
Básic	478	29.7	607	61.7	1085	41.8
Medium	640	39.8	203	20.6	843	32.5
High	491	30.5	174	17.7	665	25.6
Occupation						
Employee	552	34.3	403	41.0	955	36.8
Estudent	592	36.8	27	2.7	619	23.9
Housewife	198	12.3	239	24.3	437	16.9
Others	267	16.6	315	32.0	582	22.4
Civil Estatus						
Married	472	29.3	745	75.7	1217	46.9
Unmarried	972	60.4	150	15.2	1122	43.3
Other	165	10.3	89	9.0	254	9.8

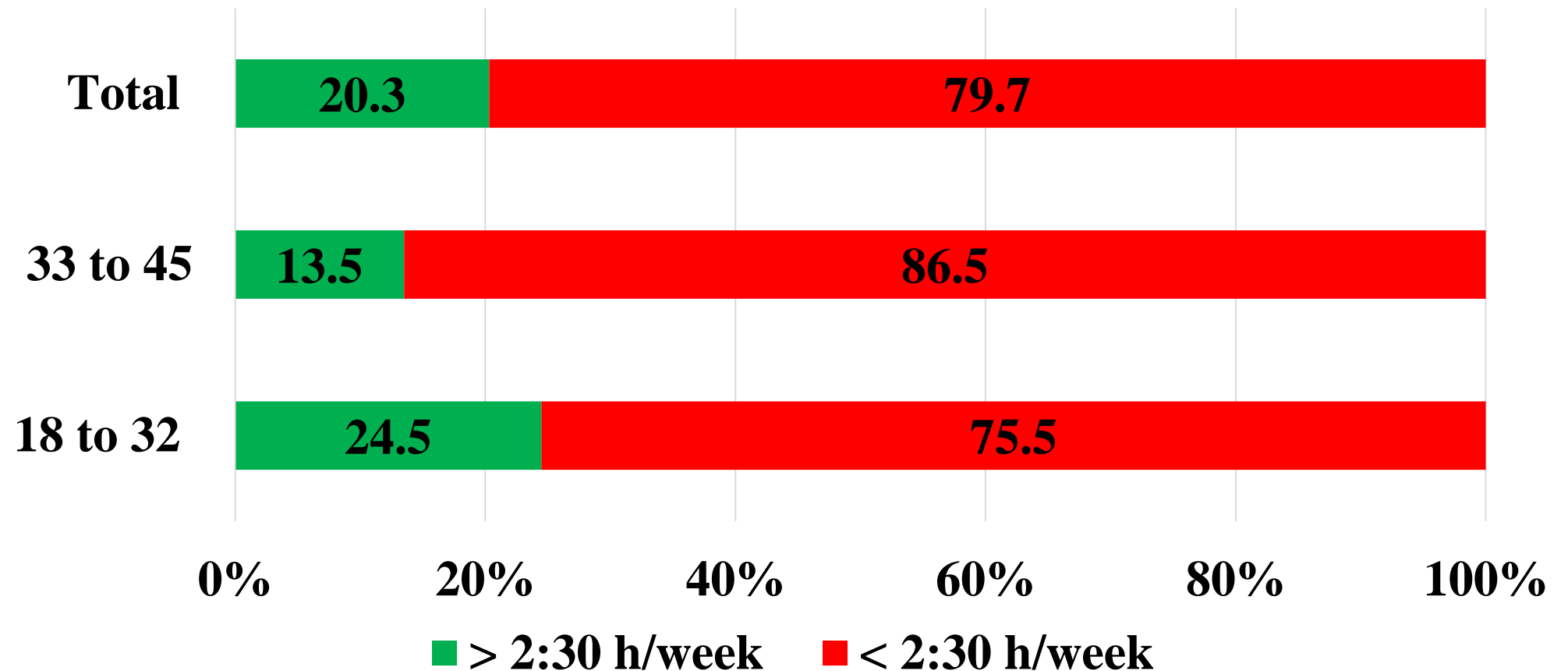
Results

Graph 1. Percentage of Protective and Risk Factors for Cerebrovascular Event in children under 45 years of age in the Toluca Valley.



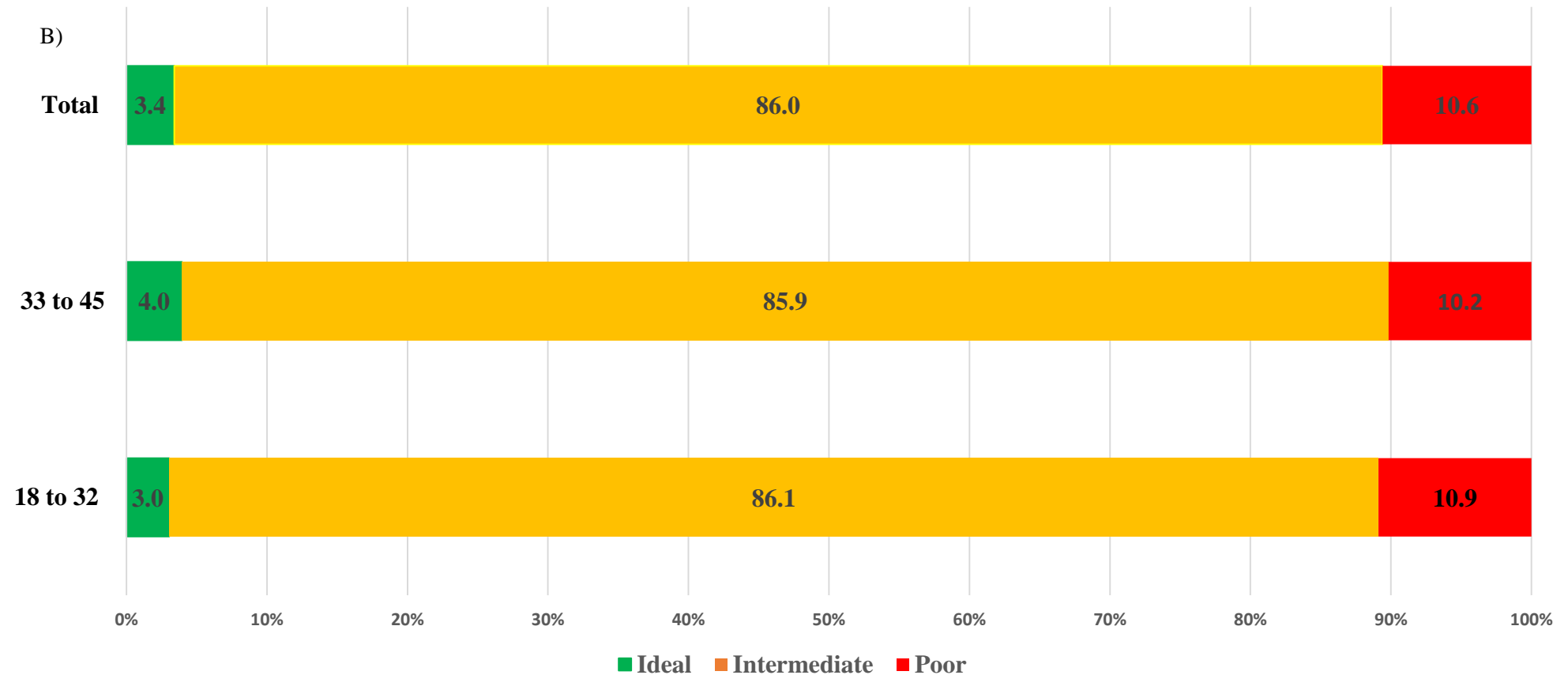
Results

Graph 2. Percentage of healthy habits present for an Ischemic Cerebrovascular Event of the population under 45 years of age in the Toluca Valley. A) Exercise.



Results

Percentage of healthy habits present for an Ischemic Cerebrovascular Event of the population under 45 years of age in the Toluca Valley. B) Diet.



Results

Table. 2 Modifiable and non-modifiable factors for Ischemic Cerebrovascular Event in the population under 45 years of age in the Toluca Valley (* p U de Mann-Whitney).

Factors	18 a 32		33 a 45		p*	Total	
	N	%	N	%		N	%
<i>Not modifiable</i>							
Age (m ± SD)	24.36 ± 4.21		38.17 ± 3.87			29.6 ± 7.9	
Male	762	47.36	494	50.2	0.16	1256	48.4
Family background	115	7.15	53	5.39	0.07	168	6.5
<i>Modifiable</i>							
<i>Hábits y drug addiction</i>							
Moderate – high stress	793	49.3	462	47	0.21	1255	48.4
Contraceptive (Woman)	221	13.7	131	13.3	0.76	352	13.6
Smoking	586	36.4	328	33.3	0.06	914	35.2
Alcoholismo	348	21.6	198	20.1	0.02	546	21.1
Drug addiction	35	2.2	12	1.2	0.07	47	1.8
<i>Comorbidity</i>							
Hypertensión	29	1.8	37	3.8	0.002	66	2.5
Diabetes type II	22	1.4	35	3.6	0.001	57	2.2
Heart disease	25	1.6	16	1.6	0.886	41	1.6
Severe headache	114	7.1	78	7.9	0.427	192	7.4
High triglycerides	69	4.3	65	6.6	0.01	134	5.2
High cholesterol	54	3.4	63	6.4	0.001	117	4.5
Transient ischemic attack	0	0	4	0.4	0.011	4	0.2
Overweight/obesity	789	49.04	591	60.1	0.001	1380	53.2

Results

Table. 3 Pearson's correlation between the protective and risk factors for Ischemic Cerebrovascular Event in the population under 45 years of age in the Toluca Valley.

	18 a 33	34 a 45	Total	18 a 33	34 a 45	Total
<i>Healthy habits (Protective factors)</i>						
Exercise	0.85	0.767	0.824			
	0	3.66E-191	0			
<i>Risk factor's</i>						
				Non- modifiable factors		
Gender (Man)					0.911	0.705
					0	0
				Modifiable factors		
Modifiable factors	0.938	0.949	0.934			
	0	0	0			
Drug addiction	0.899	0.902	0.874		0.95	0.949
	0	0	0		0	0
Smoking				0.957	0.952	0.953
				0	0	0
				Comorbidity		
Overweight- obesity				0.746	0.659	0.683
				7.55E-286	1.69E-123	0

Results

Table. 4 Odds Ratio and Relative Risk.

	Odds Ratio	IC 95%	χ^2	RR	IC 95%	χ^2
18 a 32 vs 33 a 45	0.62	0.52 - 0.75	< 0.001	0.89	0.85 - 0.93	< 0.001
33 a 45 vs 18 a 32	1.610	1.34 - 1.94	< 0.001	1.13	1.08 - 1.18	< 0.001
Man vs Woman	3.29	2.72 - 3.98	< 0.001	1.35	1.29 - 1.42	< 0.001
Exercise < 2:30 h/week vs > de 2:30 h/week	1.22	1.00 - 1.48	0.054	1.1	1.00 - 1.21	0.054
Exposed /factive smoker vs non smoker	33.47	20.78 - 53.90	< 0.001	1.64	1.58 - 1.71	<0.001
overweight/obesity vs normal weight	3.89	3.23 - 4.67	< 0.001	1.43	1.36 - 1.50	<0.001
overweight/ obesity vs normal weight	1.91	1.55 - 2.36	< 0.001	1.15	1.1 - 1.2	< 0.001
overweight/ obesity vs normal weight	5.43	3.16 - 9.33	< 0.001	1.29	1.22 - 1.36	< 0.001



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