

ANTHROPOMETRIC INDICATORS AND HYPERTENSION IN ITALIAN YOUNG ADULTS FROM THE WORD KIDNEY DAYS 2010-2011

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INTRODUCTION AND AIMS

Overweight has been associated with higher prevalence of masked hypertension (HTN) in the adult general population. Epidemiological studies have found a progressive increase in prevalence of elevated blood pressure with increasing body fatness.

Gold standard for assessing fat distribution are computed tomography or magnetic resonance; however high costs of these methods limit their application in clinical practice. The "traditional" methods are still widely used. Among these the estimate of BMI is the most common, but its reliability is matter of debated as it gives few information on abdominal fat mass. Conicity index (Ci), that includes weight, height and waist circumference (WC) has been proposed as useful index of abdominal adiposity as WC alone and weight/height ratio (Wht-ratio).

Aim of this study was to investigate whether BMI, Ci, WC, Wht-ratio alone or in combination may be related to the presence of HTN in a large cohort of healthy young people.

METHODS

Study population is represented by students of Italian high school participating to a "school project" promoted by Italian National Kidney Foundation for the World Kidney Days. We screened for HTN and urinary abnormalities healthy students attending the last and last-to-next year of high Italian school. Trained personnel (nephrologists and nurses) assessed systolic and diastolic BP (SBP; DBP). Weight, height and WC were measured. BMI, Ci and Wht-ratio were calculated. HTN was defined as SBP \geq 140 mmHg and/or DBP \geq 90 mmHg, pre-hypertension as SBP 120 - 140 mmHg or DBP 80 - 90 mmHg. Stage-1 HTN was defined as SBP of 140 mmHg - 160 mmHg or DBP 90 - 100 mmHg, and Stage-2 HTN as SBP \geq 160 mmHg or DBP \geq 100 mmHg. According to the BMI, normal weight was considered from 18.5 to 24.9 kg/m², overweight from 25 to 29.9 kg/m², class-I obesity from 30,0 to 34.9 kg/m², class-II from 35 to 39.9 kg/m², class-III \geq 40 kg/m². Normal WC was <88 cm in female and <102cm in male. Linear regression analysis was applied to assess whether BMI, Ci, WC, Wht-ratio could be independent predictor of HTN.

Tab.I Clinical Characteristics

	Female (N. 2,486)	Male (N. 2,046)	P value
Age (Year)	18 \pm 1	18 \pm 1	NS
SBP mmHg	113,2 \pm 13,1	120,7 \pm 14,1	0,01
DBP mmHg	69,5 \pm 9,1	71,1 \pm 8,9	0,01
Smokers (%)	25	31	NS
Coffee drinkers (%)	49	74	0,01
Weight (kg)	58,9 \pm 11,6	72,4 \pm 9,9	0,01
Height (m)	1,6 \pm 0,1	1,7 \pm 0,1	0,01
BMI (kg/m ²)	21,8 \pm 3,3	23,1 \pm 3,3	0,01
WhtRatio	0,4 \pm 0,05	0,4 \pm 0,06	0,01
WC (cm)	79,8 \pm 10,7	84,9 \pm 10,5	0,01
C index	1,2 \pm 0,1	1,2 \pm 0,1	NS

Data are expressed as means \pm SD, or percentage.
SBP: Systolic Blood Pressure
DBP: Diastolic Blood Pressure

RESULTS

4479 students (median age: 18 years; IQR: 18-19) were analyzed (Tab.I). Incident HTN was found in n. 71 (1.6%) participants (n.31 female; n.39 male). In hypertensive participants (HP) median SBP and DBP were 144 mmHg (IQR: 140-150) and 90 mmHg (IQR: 90-94), respectively. Stage-1 HTN and Stage-2 HTN was present in 94.3% and 5.7% of HP, respectively.

Overweight, class-I,II,III obesity percentage was 21.1, 10.1, 7.1, 1.4 in HP, respectively. Compared to participants without HTN, HP had median: BMI=23.7(IQR:21.9-27.8) Vs 21.8 (IQR:20.0-24.1), p=0.001; Ci=1.22 (IQR:1.16-1.31) Vs 1.21(IQR:1.14-1.29), p=0.527; WC= 88.0 (IQR:80.0-98.5) Vs 81.0 (IQR:74-89), p=0.001; Wht-ratio:0.50 (IQR:0.46-0.59) Vs 0.47 (IQR:0.44-0.52), p=0.001) (Fig 1,2,3,4).

Multivariate linear regression analysis showed that Wht-ratio was predictor of HTN (p=0.02) while WC was predictor of SBP (p=0.001).

CONCLUSIONS

These results suggest that in healthy young people Wht-ratio is significantly associated with hypertension while WC is associated with SBP levels. BMI and Ci appear weak predictor of HTN.

Fig.1 : Association between SBP and BMI in total cohort of students

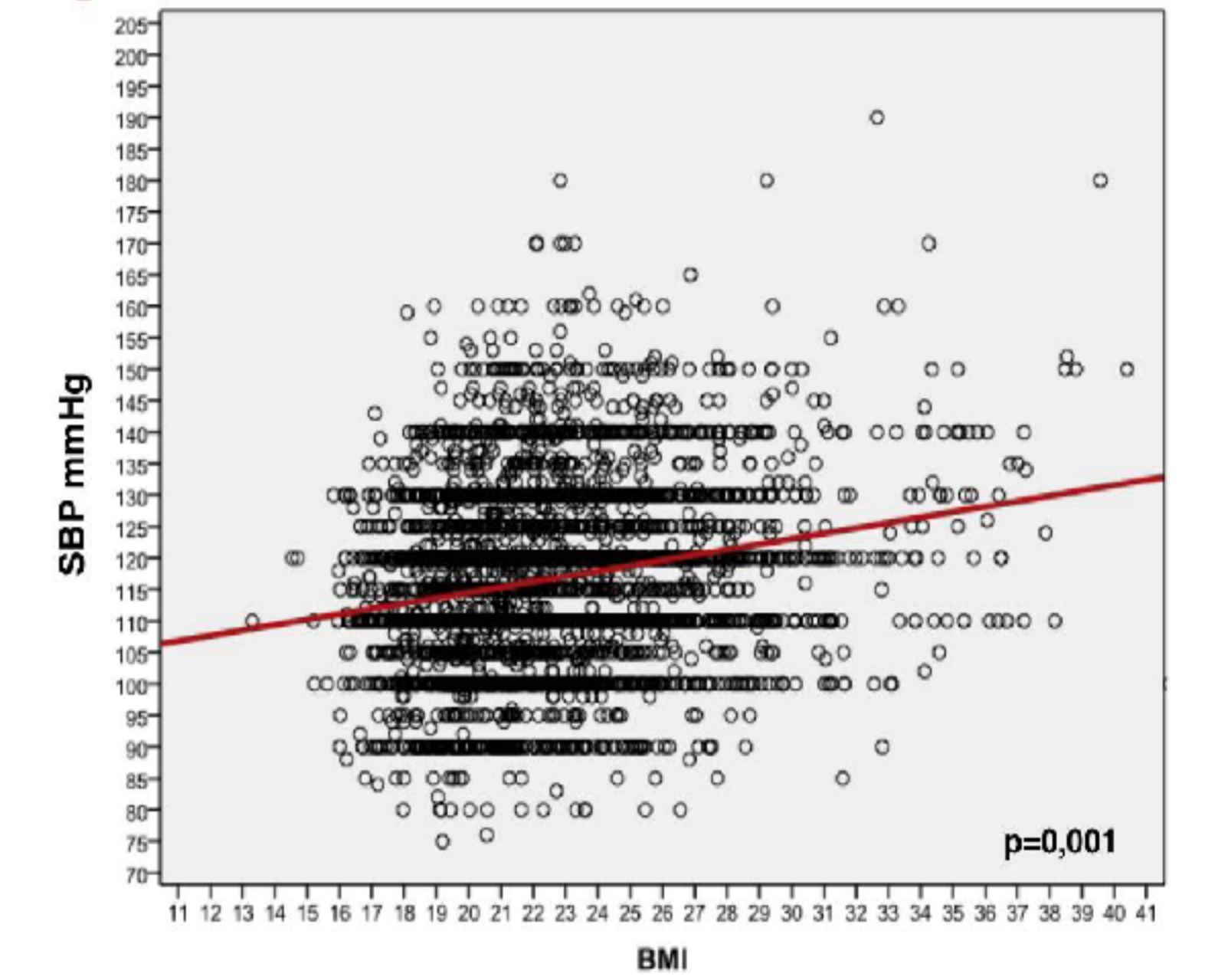


Fig.2 : Association between SBP and WC in total cohort of students

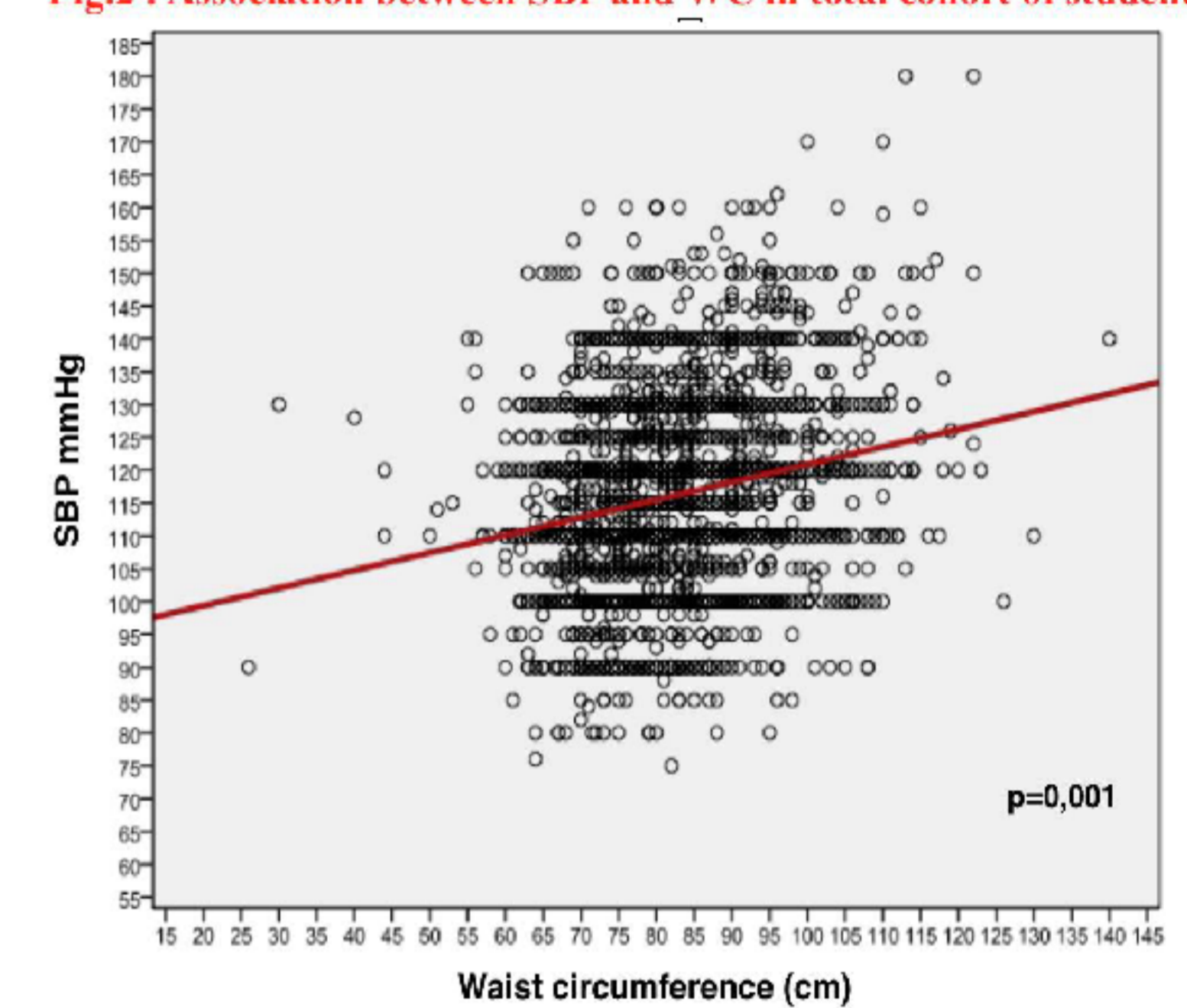


Fig.3 : Association between SBP and Wht-Ratio in total cohort of students

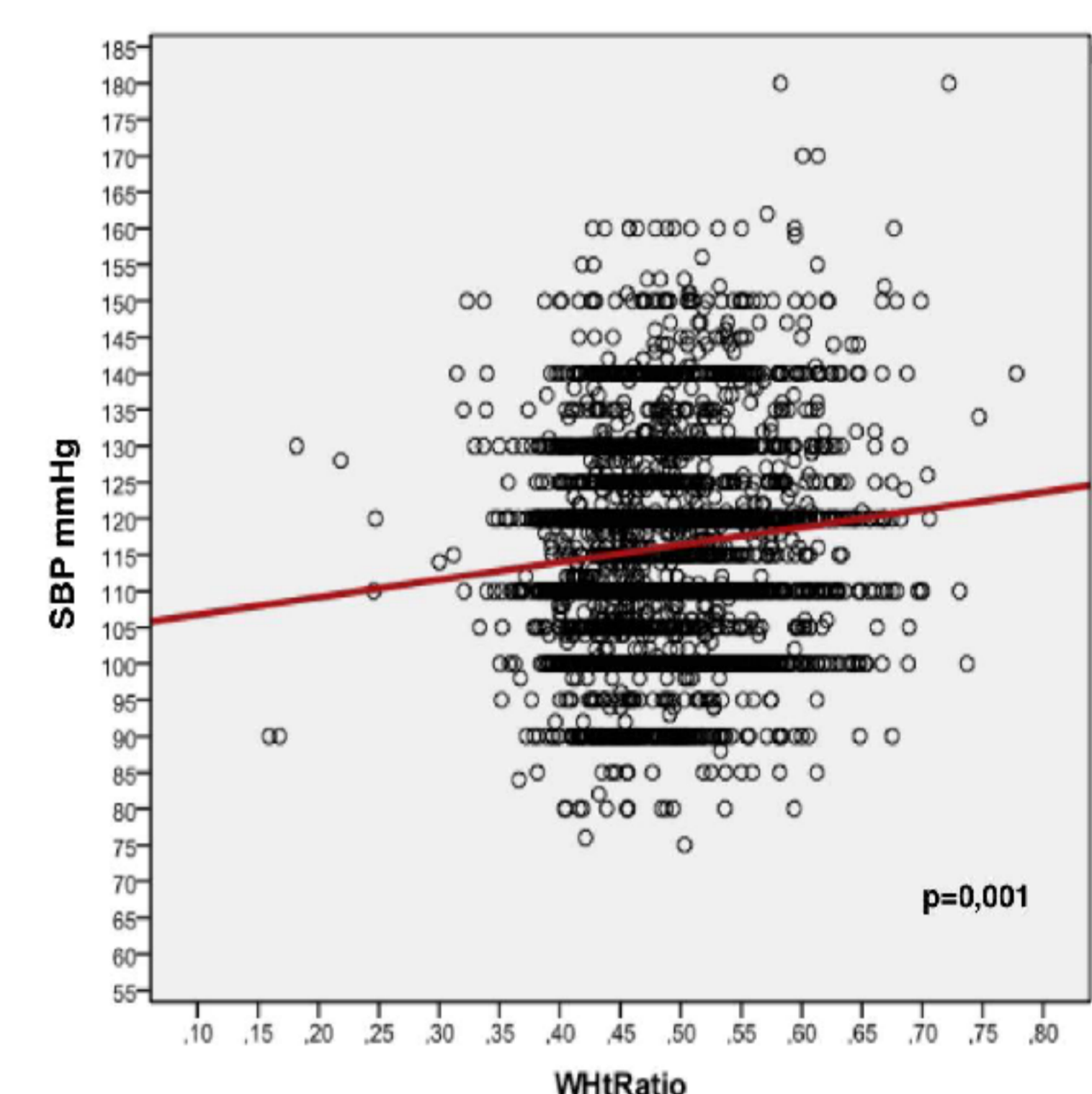


Fig.4 : Association between SBP and C-index in total cohort of students

