Seasonal Association Of Abdominal Fat Indices And Blood Pressure Variables Among The Ellisras Population Aged 4−18 Years Overtime: Data From Ellisras Longitudinal Study

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PHASA 2023
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BACKGROUND

Obesity and hypertension have been declared a global pandemic, and both have been reported to be affected by seasonal variation as a risk factor. Many studies on literature reported the prevalence of obesity and blood pressure (BP) at different seasons (Visscher and Seidell, 2004; Van Anders *et al*., 2006; , Goyal *et al*., 2018, Nika *et al*., 2019). However, seasonal association in abdominal fat indices and blood pressure received little attention on the literature.

OBJECTIVES

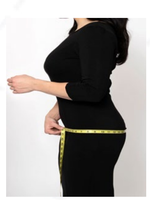
This study investigated the association of obesity indices and BP variable in different seasons (autumn and spring) among the Ellisras population aged 4−18 years overtime.

METHODOLOGY

This study forms part of the Ellisras Longitudinal Study. At baseline, measurements were collected in autumn 1999 with 1 974 (1033 boys and 941 girls) participants. The same participants were followed repeatedly overtime (autumn and spring 2000, 2001, 2003). In spring 2003, a total of 1 701 (873 boys and 828 girls) participants were still present in the study. Anthropometric measurements (Height Waist Circumference(WC), and hip circumference (HC)) were measured following the procedure by the International Society for the Advancement of Kinanthropometry (ISAK) (Norton, 2018). Blood pressure was measured following the procedure documented by the National High Blood Pressure Education Program (NHBPEP) Working Group on Hypertension Control in Children and Adolescents (1996). Data was analysed using STATA (version 12), with the significant level set at P≤0.05.


Height


WC


HC


BP

RESULTS

The results showed that all obesity indices and BP measurements in autumn 1999 were significantly (P≤0.05) associated with subsequent spring (1999−2003) measurements when adjusted for age and gender.

Table 1: Regression coefficient, 95% CI, and P value for the association of obesity and blood pressure variables between autumn and spring among Ellisras population aged 4−18 years.

Year	Variables	Unadjusted			Adjusted for age and gender		
		B	P	95% CI	B	P	95% CI
Autumn 1999	WC	0.006	0.000*	0.003−0.016	0.008	0.001*	0.003−0.012
	WHtR	0.025	0.000*	0.167−0.337	0.016	0.000*	0.008−0.025
	WHR	0.588	0.000*	0.552−0.624	0.096	0.000*	0.077−0.116
	DBP	0.001	0.267	-0.001−0.003	0.007	0.028*	0.000−0.012
	SBP	0.003	0.055	0.000−0.007	0.007	0.009*	0.002−0.012
Autumn 2000	WC	0.010	0.000*	0.005−0.014	0.009	0.001*	0.004−0.014
	WHtR	-0.001	0.936	-0.267−0.246	-0.002	0.884	-0.028−0.024
	WHR	-	-	-	-	-	-
	DBP	0.000	0.975	-0.004−0.004	0.000	0.952	-0.004−0.004
	SBP	0.000	0.747	-0.002−0.002	0.000	0.666	-0.002−0.003
Autumn 2001	WC	0.000	0.873	-0.004−0.005	0.002	0.535	-0.004−0.008
	WHtR	0.011	0.499	-0.021−0.042	0.011	0.499	-0.207−0.042
	WHR	0.001	0.565	-0.003−0.005	0.001	0.646	0.003−0.005
	DBP	0.002	0.131	-0.001−0.005	0.003	0.136	-0.001−0.006
	SBP	0.005	0.027*	0.000−0.009	0.006	0.020*	0.001−0.010
Autumn 2003	WC	0.006	0.006*	0.002−0.011	0.075	0.000*	0.056−0.094
	WHtR	-	-	-	-	-	-
	WHR	-	-	-	-	-	-
	DBP	0.002	0.292	-0.001−0.005	0.002	0.291	-0.001−0.005
	SBP	0.010	0.002*	0.004−0.016	0.009	0.003*	0.003−0.016

WC-waist circumference; WHtR-waist-to-height ratio; WHR- waist-to-hip ratio; DBP- diastolic blood pressure, SBP- systolic blood pressure

CONCLUSIONS

An association between autumn and spring measurements for obesity and BP variables was evident in this study overtime. Obesity and BP are associated with seasons. Furthermore, the development of obesity and BP in autumn can result in the development of obesity in spring.

ADVOCACY MESSAGE

The development of obesity and BP can be observed overtime and is associated with seasons. Therefore, people should maintain a healthy lifestyle across seasons such that obesity and BP prevalence cannot be maintained overtime.

ACKNOWLEDGEMENTS

UNIVERSITY OF LIMPOPO
School of Molecular and Life Sciences
Ellisras Longitudinal Study
"Veni vidi vici"
NRF National Research Foundation

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