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Cardiovascular disease risk in Irish adults

M. Buffini[1], C.B. O'Donovan[1], A.P. Nugent[1], J. Walton[2], A. Flynn[2] and B.A. McNulty[1]
[1]*Institute of Food and Health, University College Dublin, Ireland and* [2]*School of Food and Nutritional Sciences, University College Cork, Ireland*

Cardiovascular disease (CVD) accounts for 36 % of all deaths per year in Ireland, making it the most common cause of death[(1)]. The association between certain nutrients and CVD is well established, however recent research suggests that an overall dietary pattern may be a better predictor of CVD risk[(2)]. The aim of the current study was to identify CVD risk within a sub cohort (n = 754) of the National Adult Nutrition Survey (NANS) (www.iuna.net). The NANS was a cross-sectional food consumption survey carried out between 2008 and 2010 in an Irish adult population (n = 1500), a four day semi-weighed food diary was used to collect habitual food and beverage intakes, and 79 % of participants provided blood samples. Stepwise regression analysis was used to identify certain markers of metabolic health as having a significant effect on the SCORE risk factors, total cholesterol, HDL cholesterol and systemic blood pressure. SCORE is a commonly used tool for identifying those at risk of CVD[(3)]. These markers were used to perform cluster analysis of NANS participants split by gender.

	Males				Females					
	Cluster 1 (n = 172)		Cluster 2 (n = 204)		Cluster 1 (n = 101)		Cluster 2 (n = 90)		Cluster 3 (n = 187)	
Clustering Variable	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Age (yrs)	**48·47**	15·25	34·58*	16·00	52·08^{a}	14·00	**54·77**^{a}	14·54	33·39^{b}	12·08
BM I (kg/m^2)	**29·56**	4·31	25·54*	3·58	**31·60**^{a}	4·55	24·78^{b}	3·19	24·35^{b}	3·31
Weight (kg)	**91·24**	15·36	80·68*	12·10	**81·73**^{a}	12·10	64·70^{b}	9.08	65·48^{b}	9·04
Total Cholesterol (mmol/L)	**5·50**	0·88	4·28*	0·74	5·31^{a}	0·91	**5·74**^{b}	0·97	4·58^{c}	0·75
HDL Cholesterol (mmol/L)	1·34	0·31	**1·45***	0·33	1·47^{a}	0·30	**2·19**^{b}	0·42	1·64^{c}	0·35
ApoA1 (mg/dl)	147·46	29·30	**148·50**	31·86	157·28^{a}	31·30	**199·73**^{b}	30·68	154·43^{a}	41·72
ApoB (mg/dl)	**127·17**	23·86	85·67*	22·30	**123·27**^{a}	26·76	113·71^{b}	25·82	89·51^{c}	21·81
ApoC2 (mg/dl)	**6·60**	2·78	3·55*	1·63	5·37^{a}	2·27	**5·35**^{a}	2·10	3·11^{b}	1·54
ApoC3 (mg/dl)	**11·71**	3·77	7·44*	2·56	10·52^{a}	2·98	**11·29**^{a}	4·03	7·19^{b}	2·59
ApoE (mg/dl)	**3·27**	1·13	2·46*	0·94	3·18^{a}	1·17	**3·96**^{b}	1·44	2·50^{c}	0·94
Adiponectin (µg/ml)	4·38	2·10	**5·06***	1·91	5·09^{a}	1·89	**10·97**^{b}	4·68	6·89^{c}	2·38
Glucose (mmol/L)	**5·55**	0·85	5·07*	0·56	**5·62**^{a}	0·93	5·01^{b}	0·56	4·86^{b}	0·51
TNF-α (pg/ml)	**7·17**	2·11	6·83	1·78	**7·08**^{a}	1·79	5·99^{b}	1·71	6·19^{b}	2·00
Systolic BP (mmHg)	**135·44**	16·51	125·17*	13·47	**127·24**^{a}	15·80	123·47^{a}	20·06	110·65^{b}	12·44

Significant differences between male clusters were analysed with an unpaired t-test ($p < 0·05$). *Denotes statistical significance between male clusters. Significant differences between female clusters were analysed with a one-way ANOVA. ^{abc}Denotes statistical significance between female clusters ($p < 0·05$). Bolded text represents highest values. Underlined text represents lowest values. BMI body mass index, Apo apolipoprotein, HDL high density lipoprotein, BP blood pressure, TNF-α tumour necrosis factor alpha.

Two clusters were identified in the male cohort. Cluster 1 were older and had significantly higher BMIs, weight, systolic blood pressure, and blood lipids ($p \leqslant 0·001$). Cluster 2 members had higher levels of adiponectin and HDL cholesterol. In the female cohort three clusters were identified. Cluster 3 were the youngest ($p < 0·001$), however they did not differ from cluster 2 in terms of BMI, weight, blood glucose or TNF-α. Females in clusters 1 & 2 were similar in age, however those in cluster one had significantly higher BMIs, weight, blood glucose, systolic BP and TNF-α ($p < 0·001$). Cluster 2 members had the overall highest total cholesterol ($p < 0·001$) which corresponded with the overall highest HDL cholesterol levels ($p < 0·001$). There was no difference in smoking status between cluster for males ($p = 0·36$) or females ($p = 0·10$). Further analysis will determine differences in the dietary patterns of cluster members by examining food group and nutrient intakes and to establish if the dietary patterns of those at greater risk can explain greater susceptibility to CVD.

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