Title:
Using Cluster Analysis to Identify Subgroups of College Students at Increased Risk for Cardiovascular Disease

Dieu-My T. Tran, PhD
School of Nursing, University of Nevada, Las Vegas, Las Vegas, NV, USA

Session Title:
Cardiovascular Risk Factors in Children and Young Adults
Slot:
E 19: Sunday, 29 October 2017: 4:15 PM-5:00 PM
Scheduled Time:
4:35 PM

Keywords:
cardiovascular risk factors, cluster analysis and college students

References:
Liu, K., Daviglus, M. L., Loria, C. M., Colangelo, L. A., Spring, B., Moller, A. C., & Lloyd-Jones, D. M. (2012). Healthy lifestyle through young adulthood and the presence of low cardiovascular disease risk profile in middle age the coronary artery risk development in (young) adults (CARDIA) study. *Circulation*,*125*(8), 996-1004.

Shah, A. S., Dolan, L. M., Gao, Z., Kimball, T. R., & Urbina, E. M. (2011). Clustering of risk factors: a simple method of detecting cardiovascular disease in youth. *Pediatrics*, *127*(2), e312-e318.

Zubair, N., Kuzawa, C. W., Lee, N. R., McDade, T. W., & Adair, L. S. (2014). Clustering and determinants of cardiometabolic risk factors among Filipino young adults. *Asia Pacific journal of clinical nutrition*, *23*(1), 148.

Abstract Summary:
Detecting high-risk groups through a clustering technique can be beneficial to identify groups of college students to target for interventions as this population is at risks for developing cardiovascular disease as they aged.
Learning Activity:

LEARNING OBJECTIVES	EXPANDED CONTENT OUTLINE
1. The learner will be able to evaluate college students who are at increased risk for cardiovascular disease.	The co-occurrence and cluster analysis results will accomplish this objective.
2. The learner will be able to identify college students who are at increased risk for a cardiovascular risk reduction intervention.	The hierarchical cluster analysis methodology and results will accomplish this objective.

Abstract Text:

Background: College students are considered a vulnerable population because they are exposed to many health issues such as sexually transmitted diseases, alcohol abuse, and chronic diseases. According to the 2008 National College Health Risk Behavior Survey, approximately 35% of college

students are overweight or obese; weight gain during college years was greater compared to weight gain among the general young adult population.

Purpose: To examine the co-occurrence of cardiovascular risk factors and cluster subgroups of college students, ages 19 to 39, for cardiovascular risks based on socio-demographics, non-modifiable and modifiable risk factors. The overall goal is to identify a target group of individuals at increased risk for cardiovascular disease.

Conceptual Framework: The conceptual models guiding this study were the Health Belief Model and the Information, Motivation and Behavior Skill Model.

Method: A cross-sectional, descriptive study was conducted using co-occurrence patterns and hierarchical clustering analysis. A total of 158 college students, who attended a Midwestern university, aged 19 to 39 years (M = 24.3, SD = 4.6) were in the final sample. The study variables included socio-demographics and health history, biometric measurements (height, weight, body mass index, blood pressure, blood glucose, lipid panel), and risk assessments (30-year cardiovascular disease risk and lifetime atherosclerotic cardiovascular disease risk).

Results: More than half of the participants were male (54.4%, n = 86) and White (63.1%, n = 99). Approximately 32.3% (n = 51) of the participants reported having a family history of heart disease. The average 30-year hard cardiovascular risk assessment was 2.3%, the 30-year full cardiovascular risk assessment was 4.8%, and the lifetime risk estimate was 31.4%. More than 50% of participants had one or more cardiovascular risk factors; the most commonly occurring cardiovascular risk factors were overweight/obese and hypertension (10.8%, n = 17). Of the total 34 risk factors that co-occurred, 30 of them involved being overweight/obese. Using hierarchical clustering analysis, seven-cluster-solution was obtained. Three clusters displayed significant relationships related to the lifetime and 30-year cardiovascular disease risks.

Conclusions: Detecting high-risk groups through a clustering technique can be used to identify groups of college students to target for interventions. The hierarchical cluster analysis identified White, single males with a family history of heart disease, overweight/obese, hypertensive, and occasionally (weekly) consumed red meat were considered the higher risk group to target for a cardiovascular risk reduction intervention compared to other subgroups. Health care providers such as nurses should use this information to initiate conversations regarding health promotion and intervention in the high-risk individuals.