

Development of an 'At Risk for Metabolic Syndrome' Score

Olfert, MD¹, Famodu OA¹, Clark RL¹, Holásková I¹, Murray PJ¹, Waanders T¹, Moina C¹, Morrell JS²

¹ West Virginia University, ² University of New Hampshire

Abstract

Objective: Develop a score that evaluates individuals 'at risk of metabolic syndrome (metS)' in college-age students using risk factors in addition to the five components of metS (abnormal waist circumference, dyslipidemia, elevated blood pressure, and insulin resistance). **Target Audience:** Epidemiological researchers require a tool that accurately assesses one's risk of developing metS because being diagnosed increases risk of other co-morbidities. **Rationale:** MetS affects more than 20% of U.S. adults and was reported in 10% of male and 3% of female college students. **Description:** Health and nutrition research professionals developed the scoring tool in September 2014. In addition to the five components, the tool considered nutritional status, physical inactivity, ethnicity, and family history. Thirty-seven young adults at West Virginia University (WVU) were evaluated using the 12 point scale. **Evaluation:** Correlations were assessed between our tool and two validated tools of disease severity: West Virginia University School of Public Health MetS Severity Score (Gurka et al 2014) and the American Heart Association Score (AHA My Life Check® 2016). Pearson's correlation showed a significant association between our score and WVU's Public Health Z-score (R = 0.049 CI (0.19, 0.70) p=0.0024) and the AHA Score (R = -0.35, CI (-0.60, -0.03) p=0.03). **Conclusions and Implications:** To our knowledge, no instrument has been developed to assess 'at risk of developing metS'. Our instrument strongly correlates to the most validated tools that currently assess disease severity. Future analysis is being undertaken to evaluate our tool using a larger sample size. Development of this tool helps improve primary prevention intervention strategies on individuals at risk of MetS.

Background

MetS encompasses five risk factors which increase a person's risk for chronic diseases such as cardiovascular disease, diabetes, and stroke. A person must have at least 3 of the 5 risk factors to be diagnosed with metS. Although the more risk factors a person presents with, the higher the risk for chronic diseases. Identifying someone with metS is viewed as a time to decrease the chances of morbidity and mortality from these chronic diseases.

Target Audience

Objective: Develop a score that evaluates individuals 'at risk of metS.'

Those 'at risk' of metS have fewer risk factors. 'At risk' of metS is commonly used clinically, but does not have an established definition. Developing a tool for epidemiological researchers to accurately assess a person's risk could identify a population that is:

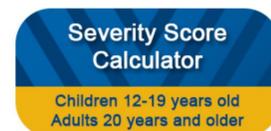
- Younger
- Less affected
- More amenable to behavior change
- More physiologically responsive to secondary prevention

Methods

Currently there are two tools that identify a person's risk for metS.

WVU School of Public Health (SPH) Severity Score

- Scale= z-score, with 0-value indicating 'average'



The American Heart Association (AHA) Life Check

- Scale= 0-10, with 10 indicating optimal health



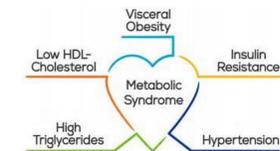
Risk Factor	WVU SPH Score	AHA Life Check Score	'At Risk of metS' Score
Weight/BMI	X	X	X
Waist Circumference	X		X
Fasting blood measures			
HDL	X		
Triglycerides	X		
Cholesterol		X	
Blood Glucose	X	X	X
Blood Pressure	X	X	X
Ethnicity	X		X
Physical Activity		X	X
Healthy Diet		X	X
Family/Personal History			X
Medications			X

'At risk' for metS score scale= 0-12

- <3= low risk, ≥3 and ≤5= medium risk, ≥6= high risk

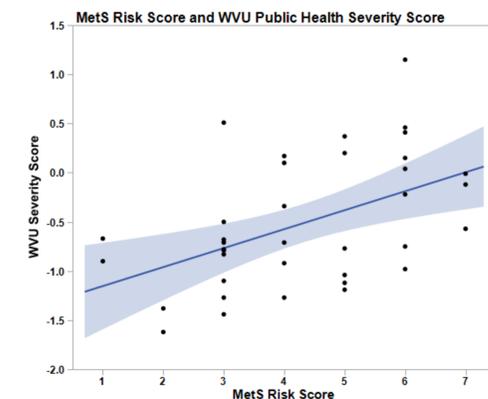
Evaluation

Thirty-seven young adults at West Virginia University (WVU) were evaluated using each of the scoring tools indicated above. Correlations were assessed between the newly developed 'at risk of metS' score and the two validated scores: AHA and WVU SPH score.

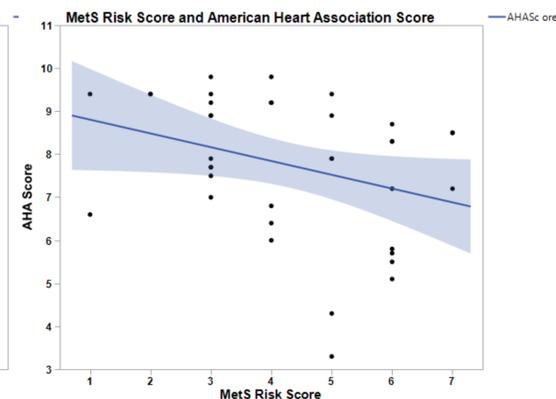


Results

A



B



Pearson's correlation showed a significant association between our score and (A) WVU's SPH Z-score (R = 0.49 CI (0.19, 0.70) p=0.0024) and the (B) AHA Score (R = -0.35, CI (-0.60, -0.001) p=0.05).

Conclusion

To our knowledge, no instrument has been developed to assess 'at risk of developing metS'. Our instrument strongly correlates to the most validated tools that currently assess disease severity.

- **Limitations:** This was a small test population, more research needs to be done on a larger scale to refine and validate the tool.
 - Future analysis is being undertaken to evaluate our tool using a larger sample size.
- **Implications:** Development of this tool will help improve primary prevention intervention strategies on individuals at risk of metS.