

Differences Between Older and Younger Adults with Diagnosed Cardiovascular Disease: An Analysis of Fels Study Data

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Background

- Most deaths in the United States (U.S.) result from complications of chronic diseases and at the heart of the matter is America's number one killer: cardiovascular disease (CVD). CVD is culpable for 33% of U.S. deaths, killing more people than all cancers and chronic lower respiratory diseases combined.¹
- Sequelae of CVD usually appear in older adults, but CVD is mirroring the trends of other chronic conditions and becoming increasingly common in younger adults. Roughly 10% of adult patients with myocardial infarction (MI) are under age 45.² Additionally, among young adults with MI, up to 80% failed to meet criteria for preventive treatment prior to their MI^{3,4} (see Figure 1).

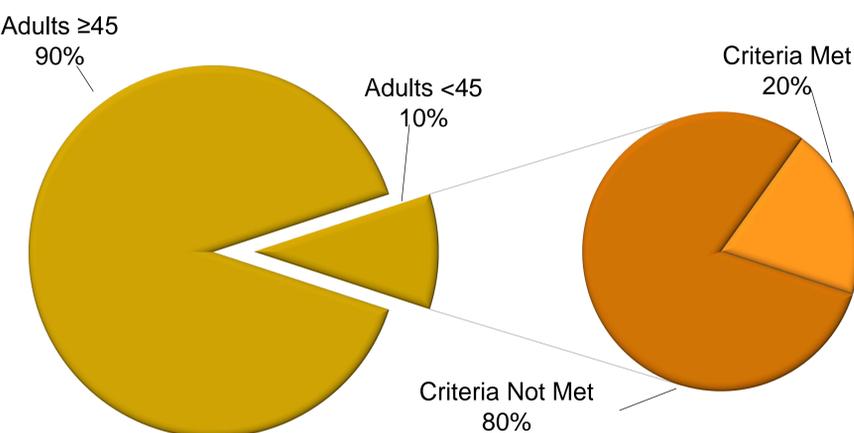


Figure 1. The proportion of all myocardial infarctions (MIs) occurring in older vs. younger adults (left) and the proportion of young adults with MI who met or failed to meet criteria for prophylactic statin therapy prior to their MI (right).

- Despite increasing prevalence and healthcare burden⁵, little research has focused on younger adults with CVD. Therefore, it is unknown whether younger adults with CVD share the same characteristics as older adults with the same diseases.
- This project examines adults 18 to 54 and adults 55 to 90 with diagnosed CVD. The purpose was to compare the two groups to assess for significant differences to inform public health and clinical interventions in younger adults. Increasing age is an independent risk factor for CVD development⁶, so it was originally hypothesized younger adults with CVD will have higher incidence of obesity and worse hyperlipidemia than their older counterparts.

Methods

- Secondary analysis of de-identified data from the Fels Longitudinal Study; therefore, exempt from Wright State University's Institutional Review Board evaluation.
- Data were analyzed for 317 participants with CVD of at least 18 years of age. Participants were divided into two age groups: 18 to 54 were considered 'younger' while 55 to 90 were considered 'older'.
- In addition to descriptive analyses, Chi-squared tests were performed on categorical variables while independent samples t-tests and Mann-Whitney U-tests were used on numerical data.

Results

- Younger adults with CVD had a higher BMI ($p = .007$), higher serum triglycerides ($p = .012$), higher income ($p = .001$), lower serum HDL ($p = .008$), and were more likely to be a current drinker ($p = .033$) than older adults with CVD.
- Table 1 shows the results for Chi-squared analyses of categorical variables such as sex and race.
- Table 2 shows the results for independent samples t-test and Mann-Whitney U-test analyses of continuous variables such as serum LDL and serum triglycerides.

Table 1. Frequencies and Analyses of Categorical Variables

	Younger Adults	Older Adults	χ^2 statistic	p-value
Sex			3.06	.08
Male	49 (59.0)	112 (47.9)		
Female	34 (41.0)	122 (52.1)		
Race			0.29	.59
White	82 (98.8)	229 (97.9)		
POC	1 (1.2)	5 (2.1)		
BMI			27.68	<.001*
<18.5	2 (2.4)	0 (0)		
18.5-24.9	14 (16.9)	44 (18.8)		
25.0-29.9	17 (20.5)	97 (41.5)		
30-39.9	40 (48.2)	88 (37.6)		
≥40.0	10 (12.0)	5 (2.1)		
Drinking Status			6.839	.03*
Never Drinker	9 (10.8)	37 (15.8)		
Former Drinker	7 (8.4)	43 (18.4)		
Current Drinker	67 (80.7)	154 (65.8)		
Smoking Status			0.15	.70
Non-smoker	37 (44.6)	110 (47.0)		
Smoker	46 (55.4)	124 (53.0)		

Note: Frequencies reported as n(%); asterisk designates significant p-value; POC=people of color; BMI=body mass index

Table 2. Mean ± SD and Analyses of Continuous Variables

	Younger Adults	Older Adults	t statistic	p-value
BMI	31.26 ± 7.35	29.26 ± 5.08	2.72	.007*
Serum Lipids				
LDL	109.34 ± 35.74	103.42 ± 32.07	1.40	.162
HDL	47.20 ± 12.19	52.12 ± 12.98	-3.01	.008*
Cholesterol	185.36 ± 42.05	179.28 ± 39.71	1.18	.239
Blood Pressure				
Systolic BP	123.83 ± 16.37	133.49 ± 19.21	-4.08	<.001*
Diastolic BP	80.53 ± 11.49	73.91 ± 10.86	4.70	<.001*

	Younger Adults	Older Adults	U statistic	p-value
Income	91236.72 ± 56380.76	79114.78 ± 65410.07	7425	.001*
Serum Triglycerides	199.60 ± 187.34	137.09 ± 77.24	7916	.012*

Note: Asterisk designates significant p-value; BMI=body mass index; LDL=low-density lipoprotein; HDL=high-density lipoprotein; BP=blood pressure

Discussion and Conclusion

- There were no statistically significant differences in sex, race, total cholesterol, serum LDL, or smoking status. Younger adults were more likely to be obese or morbidly obese, to have higher serum triglycerides, lower HDL, and higher income. Younger adults were more likely to have lower systolic BP and higher diastolic BP, consistent with typical age differences.⁷
- This study highlighted the importance of continued efforts addressing risk factors in young adulthood, an interventional 'sweet spot' because most young adults do not rely on their parents' health habits but have yet to cement their own.⁸
- Interventions advocating for delayed gratification, such as initiating and maintaining an active lifestyle to protect against CVD decades later, are difficult messages for young adults to accept⁹, and short-term or single-component interventions are likely to be unsuccessful. However, an ecological approach shows promising efficacy.
- Multifaceted interventions acting at interpersonal, organizational, and policy levels, such as those used to discourage tobacco usage and encourage tobacco cessation, tend to have a greater impact and are more likely to be sustained long-term. If these approaches encourage healthy lifestyle changes in adults at a young age, their risk for CVD is much decreased by middle age.¹⁰
- More research is needed regarding CVD in adults younger than 55 to increase the chance of identifying those with CVD and targeting them for intervention to curb the increasing disease burden and mortality of CVD in this age group.

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