

Diet, Obesity, & Sarcopenia

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Objectives

Explore Relationships

- Understand how diet, obesity, and sarcopenia are connected.
- Examine the impact of sarcopenic obesity on health.

Review Prevalence

- Analyze prevalence estimates of sarcopenia and sarcopenic obesity.
- Highlight the importance of standardized diagnostic criteria.

Identify Health Risks

- Recognize major health risks of sarcopenic obesity.
- Assess impacts on quality of life, cognitive function, and mortality.

Evaluate Interventions

- Discuss dietary and lifestyle interventions.
- Consider the role of early life factors and long-term data.

Future Research

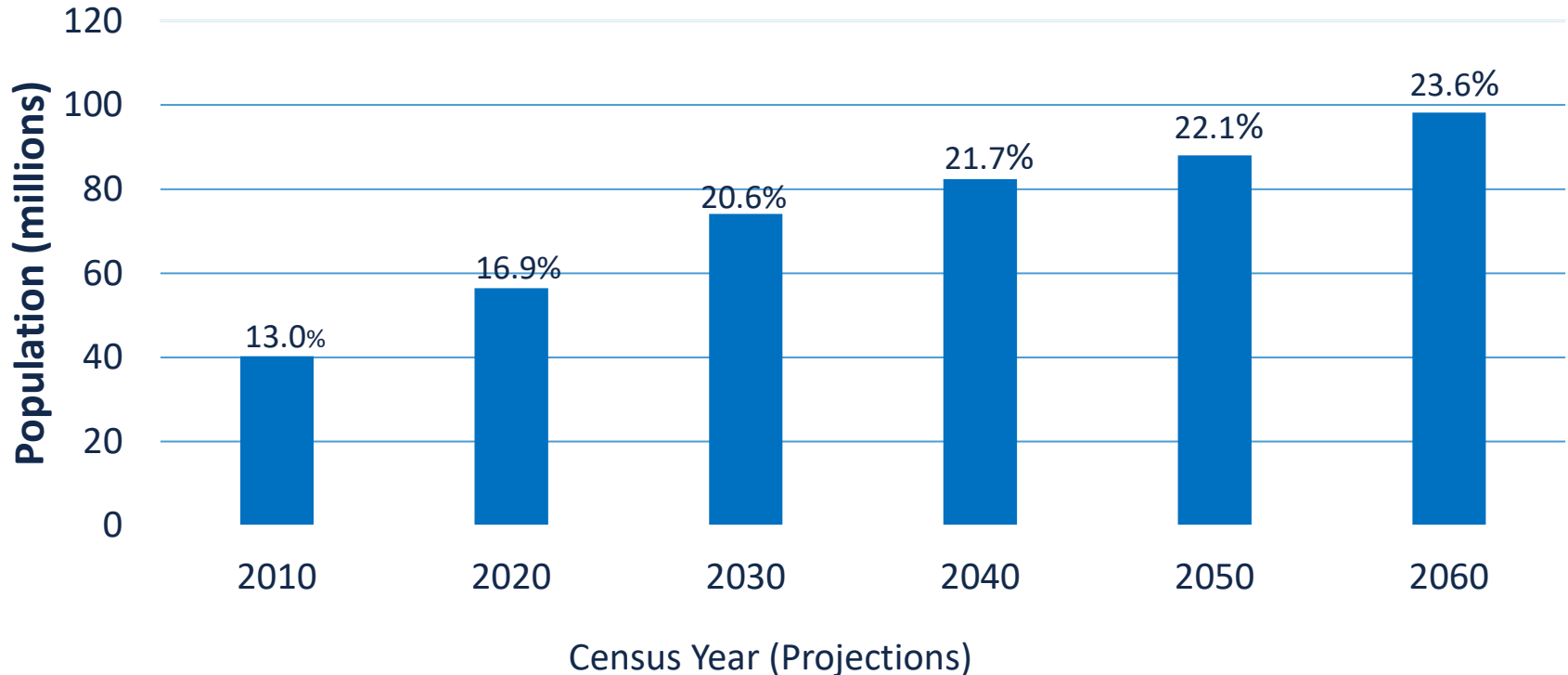
- Identify gaps and propose future research directions.
- Explore advanced methods for prediction and management.



Projected Population of Adults ≥ 65 years United States, 2010-2060



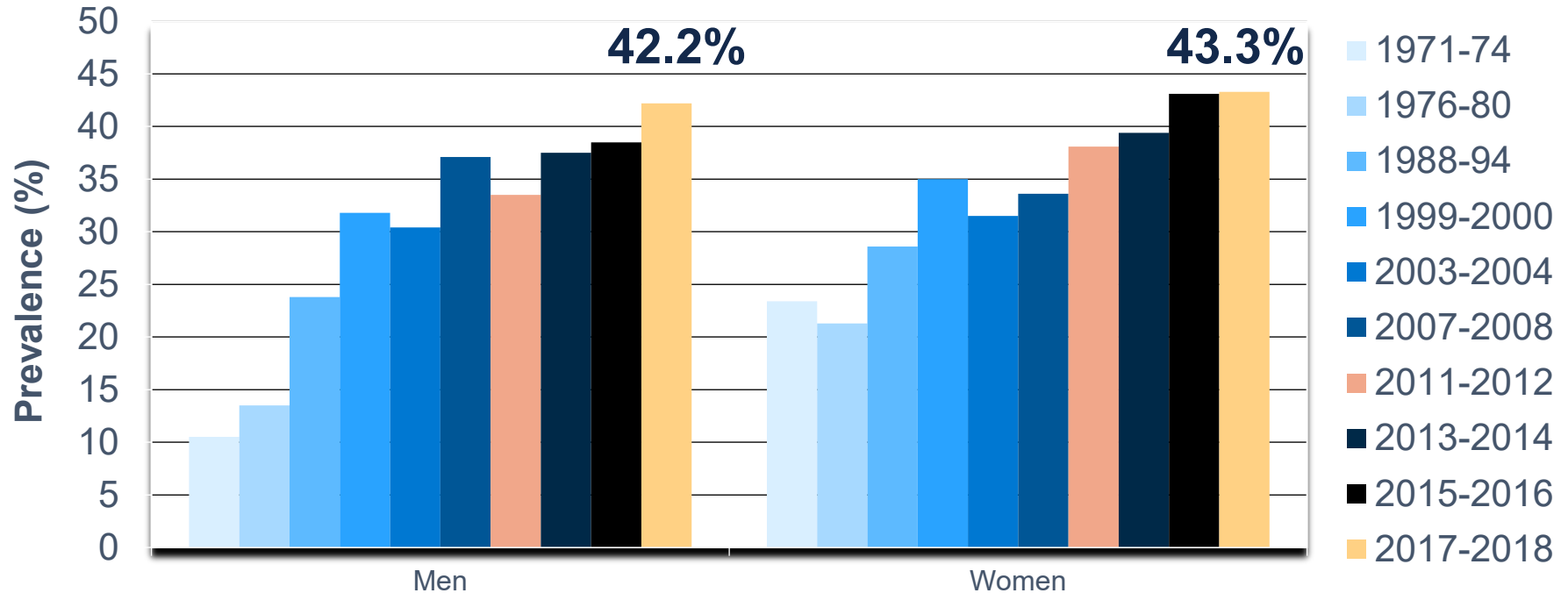
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Prevalence of BMI-defined Obesity in Ages 60+ NHANES 1971-2018



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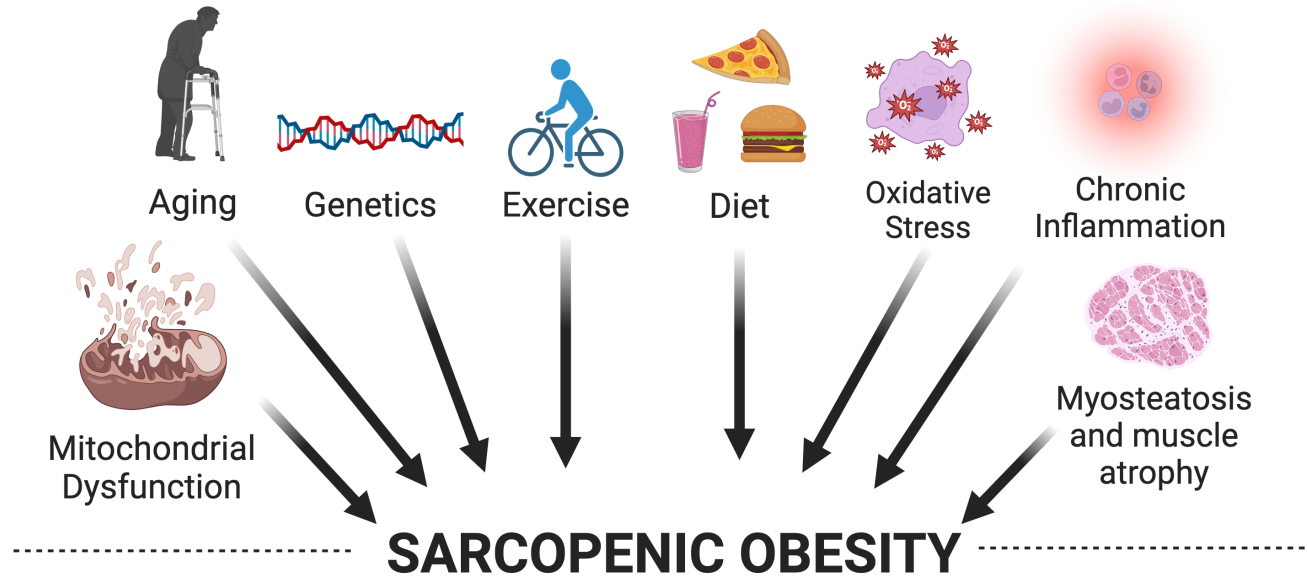
Prevalence of Sarcopenia



Definition	Number of studies	Participants (<i>n</i>)	Forest plot	Prevalence estimate (%)	95% CI	Heterogeneity
EWGSOP/AWGS	83	58283		12.9	9.9, 15.9	93% ($P < 0.001$)
IWGS	12	10381		9.9	3.2, 16.6	52% ($P = 0.100$)
FNIH	16	6467		18.6	11.8, 25.5	75% ($P = 0.003$)
ALM/height	68	39135		30.4	20.4, 40.3	87% ($P < 0.001$)
ALM/weight	27	18985		40.4	19.5, 61.2	100% ($P < 0.001$)
ALM regression	6	16899		30.4	20.4, 40.3	87% ($P < 0.001$)
ALM/BMI	8	4984		24.2	18.3, 30.1	92% ($P < 0.001$)
Other	6	9243		18.0	7.3, 28.8	100% ($P < 0.001$)

Estimates range 9.9% to 40.4%

ETIOLOGICAL FACTORS



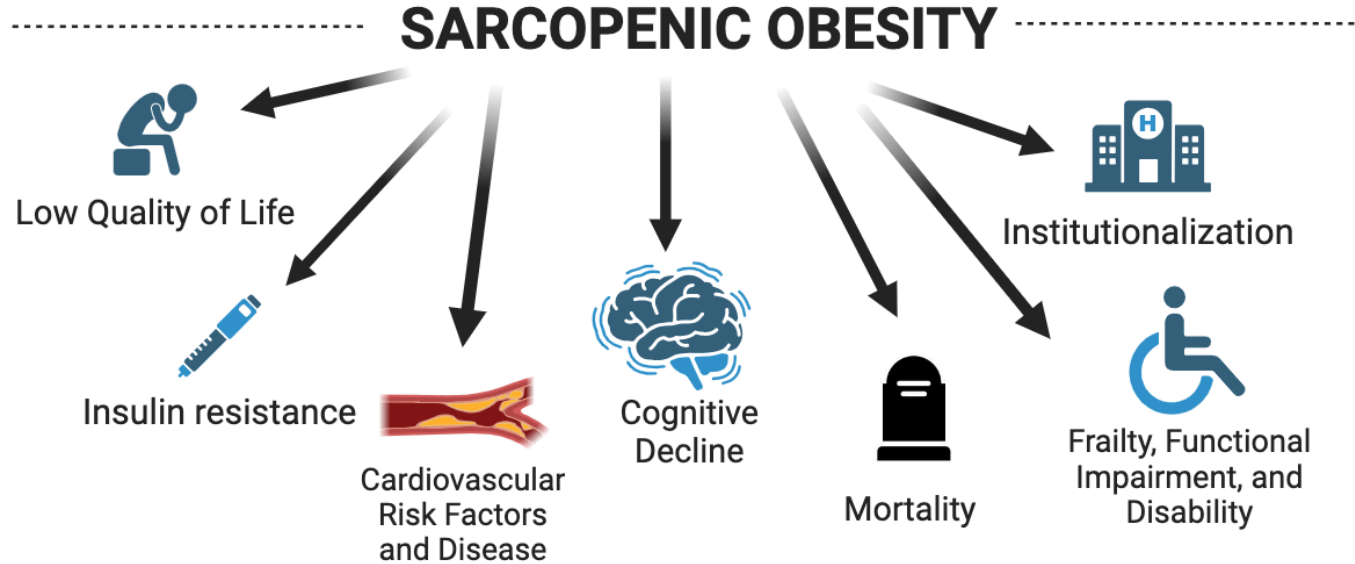
Prevalence of Sarcopenic Obesity



Table 2. Baseline prevalence of sarcopenia, obesity and sarcopenic obesity—NHANES III

Classification	Overall (>60)	60–70 years	Age group (years)	
			70–80 years	80+ years
<i>Females</i>				
Any sarcopenia	845 (35.4)	538 (17.6)	297 (39.4)	239 (52.5)
Class I sarcopenia	670 (28.1)	470 (15.4)	236 (31.0)	170 (38.1)
Class II sarcopenia	175 (7.3)	68 (2.1)	61 (8.4)	69 (14.3)
Any obesity	1538 (60.8)	2226 (62.4)	493 (58.3)	217 (49.1)
Any sarcopenic obesity	455 (18.1)	289 (8.4)	169 (20.5)	111 (24.5)
Any class I sarcopenic obese	370 (14.5)	257 (7.4)	137 (16.1)	81 (18.5)
Any class II sarcopenic obese	85 (3.7)	32 (0.1)	32 (4.3)	30 (6.1)
<i>Males</i>				
Any sarcopenia	1797 (75.5)	1816 (58.1)	607 (78.7)	371 (88.1)
Class I sarcopenia	1491 (66.3)	1671 (54.9)	496 (68.0)	266 (66.3)
Class II sarcopenia	306 (9.3)	145 (3.2)	111 (10.8)	105 (21.8)
Any obesity	1264 (54.4)	1658 (51.4)	408 (51.1)	185 (39.8)
Sarcopenic obesity	1045 (42.9)	1061 (30.5)	353 (43.0)	178 (39.8)
Any class I sarcopenic obese	857 (37.0)	974 (28.6)	276 (35.2)	118 (27.2)
Any class II sarcopenic obese	188 (5.9)	87 (1.9)	76 (7.8)	60 (12.6)

Data displayed are counts (prevalence rates), after weighting and accounting for strata and primary sampling units. Owing to a small sample size in the referent category (18–40 years of age) for sarcopenic obesity, weighted prevalence estimates cannot be obtained.



ADVERSE HEALTH OUTCOMES

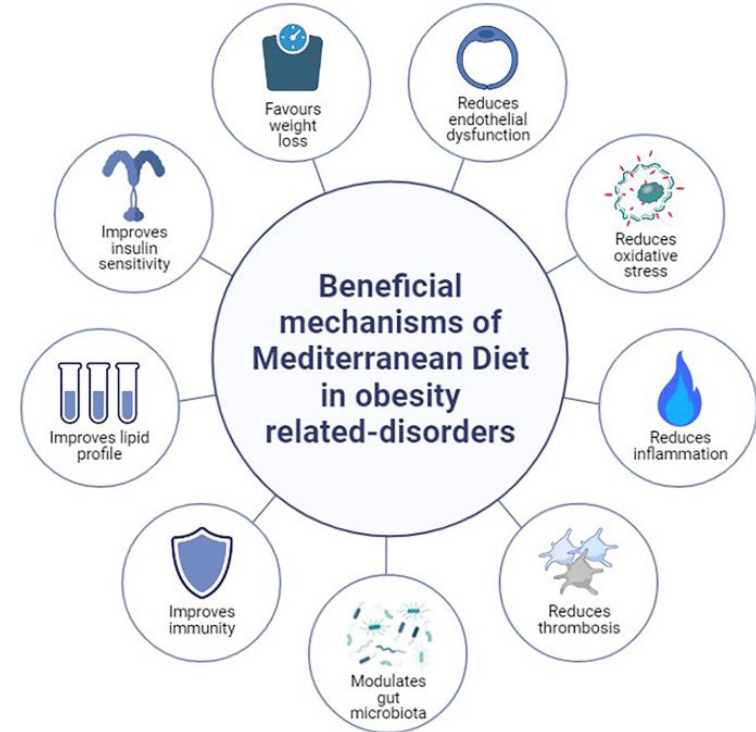
Dietary Solution? Mediterranean Diet!



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- PREDIMED study is a large, 5-year RCT consisting of a Mediterranean diet pattern supplemented with nuts or EVOO
- PREDIMED-Plus is 8 year follow-up study (55-75 years, BMI 27 – 40 kg/m²)
 - ER MED and PA promotion compared to ad libitum MED
- Interim analysis at 3 year follow-up of 1,521 individuals revealed improvements ER MED with PA promotion:
 - Total lean mass 0.47% (0.29%, 0.65%)
 - Total fat mass -0.52% (-0.71%, -0.33%)



What is NHANES?

- National Health and Nutrition Examination Survey
- Conducted by the CDC
- Focuses on health and nutritional status of U.S. adults and children
- Uses a complex, multistage, stratified sampling design for a comprehensive and representative dataset

Why NHANES?

- Provides valuable data for examining various health outcomes
- Allows for detailed secondary analysis

Mediterranean Diet - NHANES



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Exposures:

Mediterranean Diet (MED):

- Adherence score based on median intake (except alcohol) using 24-hour diet recall: whole grains, legumes, fruits, vegetables, nut/seeds, seafood, red meat, alcohol, MFA/SFA

Outcomes:

Frailty (n = 7,300, 2007 - 2017):

- Modified Fried Frailty Phenotype: weakness, low physical activity, exhaustion, difficulty walking, unintentional weight loss (Frail n = 610)

Cognitive Function (n = 2,240, 2011 - 2014):

- Consortium to Establish a Registry for Alzheimer's Disease-Word Learning Immediate Recall (CERAD-IR) and Delayed Recall (CERAD-DR), Animal Fluency Test (AFT), and Digit Symbol Substitution Test (DSST).

Physical Limitations (n = 10,427, 2005 - 2017):

- Limitations in: IADLs (n = 6,850), ADLs (n = 4,331), IADL & ADL (n = 4,010)
-



High MED adherence is associated with:

Lower Frailty - OR (95%CI):

- 0.52 (0.36, 0.75)

Lower Physical Limitations - OR (95%CI):

- IADL: 0.64 (0.54, 0.76)
- ADL: 0.75 (0.63, 0.88)
- ADL & IADL: 0.67 (0.56, 0.80)

Improved Cognition Scores - β (SE):

- CERAD-IR: 0.81 ± 0.33 *
- CERAD-DR: 0.16 ± 0.18
- AFT: 1.05 ± 0.44 *
- DSST: 3.17 ± 1.13 *



Research Gaps:

- Impact of diet exposures and other early life predictors on sarcopenic obesity.
- Changes in myosteatorsis and muscle mass over time.

Early Life Predictors:

- Identify early dietary patterns and lifestyle factors influencing sarcopenic obesity risk.
- Examine the role of early nutritional status, physical activity, and socio-economic factors.

Trajectory Analysis:

- Track changes in diet, myosteatorsis, and muscle mass across the lifespan.
- Use advanced methods like machine learning to predict sarcopenic obesity outcomes.

Integrated Health Outcomes:

- Assess how diet and other early life predictors influence physical function, frailty, and cognitive health in later life
- Utilize biomarkers and metabolomics data to understand the biological mechanisms.

Thank You!

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