Five-Year Clinical and Economic Impact of 20% Weight Loss in Adults with Obesity in Saudi Arabia: A Public Healthcare Perspective

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INTRODUCTION

- In Saudi Arabia, obesity and its associated 'obesity-related complications' (ORCs) contribute significantly to illness, premature death, and substantial healthcare costs. [1]
- Quantifying these burdens at the population level, along with the potential advantages of weight reduction, is essential to inform and support policy strategies aimed at reducing disease risk.[2]
- While prior studies have assessed obesity burden, the impact of major weight reduction remains underexplored at the national level.[3]
- Aligned with this need, Saudi Vision 2030, the Kingdom's national transformation strategy, places strong emphasis on combating obesity and its complications.[4]
- As part of its broader healthcare reform agenda, the Vision outlines strategic initiatives aimed at reducing the burden of chronic diseases by targeting key modifiable risk factors such as obesity. [5]

AIM

To evaluate the five-year clinical and economic impact of achieving a 20% weight reduction in adults with obesity in Saudi Arabia, from a public healthcare system perspective.

METHODS

- Model Framework:
  - Adapted Value of Weight Loss model
- Population:
  - Simulated cohort of 100,000 Saudi adults aged 20–69 years
  - Body mass index 30–50 kg/m², including both males and females
- Perspective & Time Horizon:
  - Public healthcare system perspective
  - Five-year time horizon
- Model Calibration:
  - Population-specific parameters were obtained from a systematic literature review reflecting obesity prevalence and incidence of ORCs in Saudi Arabia
- Included ORCs:
  - Type 2 diabetes (T2D)
  - Obstructive sleep apnoea
  - Hip and knee osteoarthritis
  - Chronic kidney disease (CKD)
  - Asthma, and
  - Cardiovascular disease (CVD)—including
    - hypertension, dyslipidemia, atrial fibrillation, heart failure, and unstable angina/myocardial infarction
- Cost Inputs:
  - Derived using a micro-costing approach Diagnostics
    - Treatment
    - Follow-up
    - Hospitalization
  - Sourced from public Saudi healthcare system data
  - Validated through expert consultation with key opinion leaders including policy-makers, physicians, and healthcare administrators
- Primary Outcomes:
  - Reduction in relative risk (RR) of developing each ORC with 20% weight loss
  - Associated healthcare cost savings over five years

RESULTS

- Over a five-year time horizon, achieving a 20% weight reduction in Saudi adults with obesity resulted in an estimated USD 88 million in cumulative healthcare cost savings.
- Most of these savings were driven by CVD, which accounted for **USD 47** million, underscoring the significant clinical and economic burden of CVD in the context of obesity.
- Substantial cost savings were also observed for other ORCs, including
  - T2D (USD 23.9 million)
  - Sleep apnoea (USD 6.6 million)
  - Hip/knee osteoarthritis (USD 4.1 million)
  - CKD (USD 3.3 million) and
  - Asthma (USD 1.9 million)
- In addition to economic benefits, clinical outcomes improved markedly.
- The greatest RR reductions were seen in
  - Sleep apnoea (–66.6%)
  - T2D (–49.1%)
  - Hypertension (–27.6%)
  - Asthma (–25.9%) and
  - Osteoarthritis (–24%)
- Other notable reductions included
  - Dyslipidemia (–19.7%)
  - CKD (–8.2%)
  - Atrial fibrillation (–10.1%)
  - Heart failure (–6.6%) and
  - Unstable angina/myocardial infarction (–0.8%).

Table 1. Five-Year Cost Savings and RR Reductions with 20% weight Reduction in Saudi Adults with Obesity

Complication	Cost Savings (USD, 5 years)	RR Reduction (%)
Hypertension	19.4 million	27.6%
Dyslipidaemia	26.4 million	19.7%
Atrial fibrillation	927 K	10.1%
Heart failure	1.22 million	6.6%
Unstable angina/MI	95 K	0.8%
Type 2 diabetes	23.9 million	49.1%
Sleep apnoea	6.6 million	66.6%
Hip/knee osteoarthritis	4.1 million	24.0%
Chronic kidney disease	3.3 million	8.2%
Asthma	1.9 million	25.9%
Total	88 million	—

MI, myocardial infarction; USD; United State dollars; RR, Risk Reduction

CONCLUSIONS

- A 20% weight reduction in Saudi adults with obesity could significantly reduce ORC incidence and associated costs.
- Over five years, projected cumulative savings of USD 88 million were primarily driven by reductions in CVD and T2D.
- These results highlight the dual advantage of weight management in enhancing population health outcomes while generating significant cost savings for Saudi Arabia's public healthcare system.
- The findings reinforce the importance of incorporating effective weight management strategies into national public health policies, in alignment with the goals of Saudi Vision 2030.

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