



# Obesity with Comorbid Stress Urinary Incontinence in Women: A Narrative Review to Inform Dietetics Practice



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## ABSTRACT

Stress urinary incontinence (SUI) is a common problem among women; clinical treatment guidelines include weight reduction as a strategy for controlling urinary leakage. The purpose of this review was to gather evidence on the association between obesity and SUI and to ascertain whether there are any special considerations for implementing medical nutrition therapy with community-dwelling, obese, adult females with comorbid SUI. Five key findings emerged: epidemiologic studies consistently report statistically significant associations between obesity and SUI, randomized control trials found that weight loss appears to ameliorate SUI symptoms, the SUI–activity link may affect weight management, there is a potential interplay between SUI and the obesity–sleep connection, and dietary components are associated with the exacerbation of urinary symptoms. The pathogenesis of SUI and obesity-related contributions to urinary leakage is included in the introductory discussion. Lastly, insights on special considerations for implementing nutrition interventions with this population are offered.

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**S**TRESS URINARY INCONTINENCE (SUI; URINARY leakage associated with physical activities that increase intra-abdominal pressure—for example, laughing, coughing, sneezing, and rigorous exercise), affects 20% to 40% of American women.<sup>1</sup> There are disparate results regarding the prevalence of SUI among different races of women; some research suggests that the condition is more common among those of European descent.<sup>2</sup> In a large study conducted in the United States, researchers found that compared with non-Hispanic white women, prevalence rates are reported to be lower among Chinese, Japanese, and Hispanic females living in the United States.<sup>2</sup> For younger women, initial onset is typically associated with involvement in high-impact sports/exercise or pregnancy.<sup>3,4</sup> Statistics vary regarding the prevalence of SUI during pregnancy; the reported range is from 18.6% to 75%.<sup>5</sup> Studies suggest that women who experienced SUI during pregnancy are more likely to require surgery for urinary incontinence as they age.<sup>4</sup> SUI affects more middle-aged women than older women; perimenopausal women (aged 45 to 49 years) are at highest risk.<sup>6,7</sup>

The International Consultation on Incontinence endorses the value of weight loss for obese women with concomitant SUI.<sup>8</sup> Clinical treatment guidelines include weight reduction as a strategy for controlling urinary leakage.<sup>9,10</sup> Indeed, there are reports that substantial weight loss after bariatric surgery may palliate urinary symptoms.<sup>11,12</sup> For individuals with body mass index (BMI) >35, severe urinary incontinence is included as an obesity-related comorbidity for offering a patient the option of bariatric surgery.<sup>13</sup>

## Pathogenesis of SUI

SUI is associated with compromised functioning of the bladder sphincter and/or pelvic floor muscles. Thus, pressure placed on the abdomen leads to an accidental opening of the urethra, and thereby leakage of urine.<sup>8,14</sup> The underlying mechanisms of SUI are complex and multifactorial. Analysis of a subset the Swedish Twin Register (N=14,094) highlighted genetics as a factor in the risk of urinary leakage.<sup>15</sup> Other research supports a genetic predisposition to SUI.<sup>16</sup> SUI may also be a symptom or a side effect of a gynecologic condition such as the hormonal and physiological changes associated with menopause (eg, lowered estrogen and weakening of pelvic floor muscles).<sup>14</sup> In addition, straining and pelvic floor stress associated with constipation may promote urinary leakage.<sup>10</sup> Also, chronic cough related to smoking and certain health conditions (eg, asthma) may lead to SUI, as well as high-impact activities over an extended period of time (eg, extreme weight lifting).<sup>3</sup>

**Weight: A Mechanical Stressor.** Excess weight can exert considerable pressure on a women's bladder, thereby

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resulting in unintentional leakage of urine.<sup>17</sup> Surplus weight may also increase intra-abdominal pressure, weakening the pelvic floor muscles and urethral support structures; over time, a compromised pelvic region may allow urine to leak.<sup>18</sup> Both rapid accumulation ( $\geq 20$  kg across 4 years) and long-term carrying (period of 26 to 54 years) of excess weight increase a woman's risk for developing urinary symptoms.<sup>17</sup> Recent animal studies suggest a potential connection between urinary leakage and ghrelin, a 28–amino acid peptide hormone that helps to maintain a healthy pelvic floor.<sup>19</sup> Body weight above normal limits can result in decreased levels of circulating ghrelin; thereby, obesity may result in weakened pelvic floor muscles and increase a woman's risk for SUI.<sup>19</sup>

Gravidity may also compromise the pelvic floor, resulting in onset of SUI during pregnancy, after delivery, or even during later life.<sup>4,20,21</sup> Multiple births increased risk twofold for severe SUI (odds ratio [OR] 2.95, 95% CI 0.6 to 6.4).<sup>20</sup> Wesnes<sup>17</sup> suggests high body fat stores rather than merely baby weight (placenta, amniotic fluid, fetus, increased blood volume, and body fluids) correlates with the onset of urinary leakage. Also of note, additional weight gain recommended for underweight pregnant women often increases their risk for incontinence compared with those who had been at normal weight or were overweight before pregnancy.<sup>17</sup> This raises the question about the effect of a more rapid accumulation of pounds advised for this group of women to reach an optimal pregnancy weight compared with their normal/overweight counterparts.

**SUI Provocation vis-à-vis Dietary Components.** Terauchi and colleagues<sup>22</sup> concluded that visceral fat level was a predictor for SUI among women (N=351, age=40 to 76 years). Visceral adipose tissue (VAT) collects within the abdominal

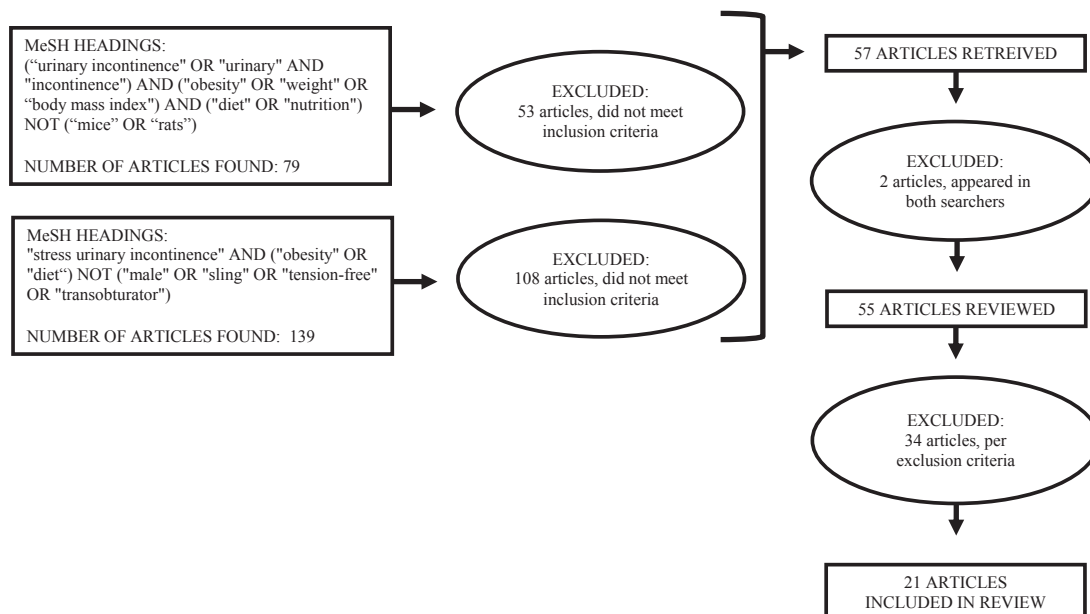
cavity and surrounds internal organs; it is associated with a number of health conditions such as cardiovascular diseases and insulin resistance.<sup>23</sup> Excessive VAT has also been implicated in bladder inflammation possibly due to alterations in neuroendocrine processes, which may present as urinary frequency and urgency. High stores of VAT are thus thought to be predictive of SUI.<sup>24,25</sup> Furthermore, consumption of specific foodstuffs (sugar-sweetened beverages and excessive amounts of saturated fat) also promote VAT accumulation and, thereby, may potentially contribute to the onset of urinary symptoms.<sup>23,26-28</sup>

### Purpose of the Review

Health care providers of various disciplines are advised to counsel women on the importance of weight loss as a potential strategy for helping to alleviate SUI symptoms.<sup>8-13</sup> In addition, the underlying pathological mechanisms of SUI highlight weight as a potential contributor and suggest that specific dietary components may play a role in the onset of urinary symptoms.<sup>17-19,22-28</sup> The purpose of this review was to gather evidence on the association between obesity and SUI and to ascertain the special considerations for implementing medical nutrition therapy (MNT) with community-dwelling, obese, adult women with comorbid SUI.

### METHODS

Using medical subject headings terms, searches of the Ebsco, ProQuest, and MEDLINE (via PubMed) databases were conducted March 2016 through May 2016 (see Figure 1). Inclusion criteria specified human studies of community-dwelling adult women, aged 18 years and older, published in English. Animal studies, commentaries, case studies, review articles,



**Figure 1.** Flow diagram of literature review process to gather evidence on the association between obesity and stress urinary incontinence. Inclusion criteria: Published in English language during the time frame 2003 to 2016, human studies, community-dwelling adult women, aged 18 years and older. Exclusion criteria: Published before 2003, animal studies, related conditions (eg, overactive bladder or urge incontinence), studies not differentiating specific findings for stress urinary incontinence, commentaries, case studies, review articles, and assessments of screening tools. MeSH=medical subject headings.

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