









# Potential barriers to the use of anti-obesity medications in persons with spinal cord injuries and disorders

Sherri L. LaVela<sup>1,2</sup>  | Kelsey Berryman<sup>1</sup>  | Ibuola Kale<sup>1</sup>  | Gary J. Farkas<sup>3,4</sup>  |  
Geoffrey V. Henderson<sup>5</sup>  | Vanessa Rosales<sup>1</sup>  | Dan Eisenberg<sup>6,7</sup>  |  
Lorena Reyes<sup>1,8</sup> 

<sup>1</sup>Department of Veterans Affairs, Center of Innovation for Complex Chronic Healthcare (CINCCCH), Edward Hines Jr. VA Hospital, Hines, Illinois, USA

<sup>2</sup>Department of Physical Medicine and Rehabilitation, Feinberg School of Medicine, Northwestern University, Chicago, Illinois, USA

<sup>3</sup>Department of Physical Medicine and Rehabilitation, University of Miami Miller School of Medicine, Miami, Florida, USA

<sup>4</sup>Miami Project to Cure Paralysis, University of Miami Miller School of Medicine, Miami, Florida, USA

<sup>5</sup>Department of Physical Medicine and Rehabilitation, SUNY Upstate Medical University, Syracuse, New York, USA

<sup>6</sup>Center for Innovation to Implementation, VA Palo Alto Health Care System, Palo Alto, California, USA

<sup>7</sup>Stanford-Surgery Policy Improvement Research & Education Center, Stanford University School of Medicine, Stanford, California, USA

<sup>8</sup>Nutrition and Food Services, VA Edward Hines, Jr., Hines, Illinois, USA

## Correspondence

Sherri L. LaVela, Department of Veterans Affairs Edward Hines, Jr. VA Hospital, 151-H, Building 1, Office D-312, 5th Avenue & Roosevelt Road, Hines, IL 60141, USA.  
Email: [Sherri.LaVela@va.gov](mailto:Sherri.LaVela@va.gov)

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## Abstract

**Background:** Anti-obesity medications (AOMs) may provide a viable option for obesity management. However, little is known about the use of AOMs in persons with SCI/D.

**Objective:** Describe health care providers' (HCPs) views about barriers to AOM use in persons living with SCI/D.

**Methods:** Descriptive qualitative design using in-depth interviews. Descriptive statistics were used to calculate demographic and employment characteristics. Interviews were audio-recorded and transcribed verbatim. Transcripts were coded and analyzed using Braun and Clarke's (2006) six thematic analysis phases.

**Results:** HCPs (n = 12) were from 11 different nationwide facilities. Most HCPs were male (75%), a large majority were white (67%), and most were 26–49 years of age. Participants were dietitians (75%), physicians (17%), and psychologists (8%). HCPs ranged from 1.5 to 15 years of providing SCI/D care. HCPs described four main thematic barriers to AOM use in persons with SCI/D: (1) AOM side effects that are especially concerning in persons with SCI/D; (2) AOMs contribute to poor eating habits; (3) availability, accessibility, and administration; and (4) lack of evidence, clinical agreement, and knowledge about AOM use in the SCI/D population.

**Conclusions:** There are several potential barriers to AOM use in the SCI/D population. Barriers include AOM side effects which may cause or exacerbate conditions

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that are already concerns in persons with SCI/D, such as bowel and skin problems, and muscle loss. SCI/D HCPs reported a lack of evidence about AOM use in persons with SCI/D, but interest in obtaining more knowledge.

**KEYWORDS**

anti-obesity medication, hcp, obesity, pharmacotherapy, qualitative, spinal cord injury

## 1 | INTRODUCTION

Among the 255,000–383,000 individuals living with spinal cord injuries and disorders (SCI/D) in the United States (US),<sup>1</sup> an estimated three quarters meet criteria for overweight or obesity.<sup>2–6</sup> This marked prevalence of overweight or obesity is due to pathophysiologic changes that occur post-injury, such as decreased muscle activation in affected myotomes, loss of lean muscle mass from disuse, and an overall decline in energy expenditure.<sup>7</sup> Weight gain ensues, characterized by increased adiposity and cardiometabolic dysfunction, including chronic inflammation,<sup>8</sup> insulin resistance,<sup>9</sup> dyslipidemia, and hypertension.<sup>10</sup> In this high-risk population, excess weight adversely impacts health, function, and quality of life.<sup>10–12</sup>

In persons with SCI/D, unique challenges may stymie healthy behaviors such as exercise and healthy eating.<sup>13,14</sup> For example, multiple factors curtail exercise engagement and benefits, including neurologic factors (e.g., paralysis), musculoskeletal factors (e.g., overuse injuries), and SCI/D secondary complications (e.g., chronic pain). Individuals with SCI/D have reported difficulty participating in physical activity<sup>14</sup> that is sufficiently strenuous to impact weight.<sup>13,15</sup> This has led exercise proponents – like the authors of the review *Exercise Interventions Targeting Obesity in Persons with Spinal Cord Injury* – to conclude that “a negative calorie balance is most readily achieved through reducing calorie intake” and to emphasize diet to manage obesity in this population.<sup>16</sup> However, dietary changes present their own unique challenges. Individuals with SCI/D report several barriers to healthy eating, such as overeating due to impaired hunger and satiety cues, unhealthy food choices due to access issues, and dependence on others for meals.<sup>13,17</sup>

Recent drug advances suggest that anti-obesity medications (AOMs) may provide a viable option for obesity management. Commonly prescribed FDA-approved AOMs fall into the following general categories: 1) lipase inhibitor, 2) sympathomimetic amine, 3) antidepressant-opioid receptor antagonist, and 4) GLP-1 agonist.<sup>18</sup> AOMs have varying mechanisms of action, adverse effects, and benefits. However, they all promote weight loss by decreasing hunger and appetite while simultaneously increasing feelings of satiety, leading to reduced ingestion and absorption of calories.<sup>19</sup> Some medications approved for diabetes alone are used off-label to treat obesity; however, some GLP-1 agonists, such as liraglutide and semaglutide, are approved specifically for obesity treatment.<sup>20</sup> Mechanistically, GLP-1 agonists work by increasing the effects of GLP-1, a hormone secreted by the gut that stimulates insulin secretion via the incretin effect. While these medications are used to treat obesity, the literature

suggests that they may also redistribute adipose (decrease in visceral fat deposition with a relative increase in lower-body subcutaneous fat deposition), decrease inflammation, inhibit glucagon production, and delay gastric emptying.<sup>20</sup> The newer AOMs have shown greater efficacy and safety compared with older drug treatments, but there is tremendous variability in response for individual patients. For example, semaglutide combined with behavioral therapy resulted in a 16% mean weight reduction (vs. 5.7% in placebo plus therapy) in a 68-week clinical trial of more than 600 participants<sup>21</sup>

Current unknowns include long-term use of these medications in able-bodied populations, and short- and long-term use in the SCI/D population. The only AOM SCI/D study, to date, was a controlled case series of five participants, in which three were on treatment with a GLP-1 agonist, for example, semaglutide administered subcutaneously once per week. Results demonstrated decreased body weight, fat tissue mass, body fat percent, and visceral adipose tissue volume as well as reduced fasting plasma glucose and HbA1c levels after 26 weeks of semaglutide administration.<sup>22</sup> While suggestive of cardiometabolic benefit in persons with SCI/D and obesity, the sample size was small and there remains a dearth of data applicable to the SCI/D population.

Despite the excitement this new class of drugs has generated, health care providers (health care providers' (HCPs)) must continue to individualize drug therapy based on mechanism of action, side effect profile, and knowledge that individuals vary in response to AOMs. Side effect profiles of these new medications appear favorable, though post-marketing vigilance continues to be warranted given notable AOM failures of the past, such as fenfluramine and phenylpropanolamine, withdrawn due to cardiac risks, pulmonary hypertension, and strokes, respectively.<sup>23</sup> HCPs must grapple with the risks and benefits of AOM use while working in a collaborative therapeutic relationship with patients. Therefore, this study was designed to determine the views of HCPs who provide nutrition and obesity management care to persons with SCI/D about barriers to using AOMs in this population.

## 2 | METHODS

### 2.1 | Design and framework

A descriptive qualitative design was used that included semi-structured interviews to address the research question: *What are HCPs' views about AOM use in persons with SCI/D?* The Edward Hines

Jr. Veterans Health Administration (VHA) Institutional Review Board approved this study.

## 2.2 | Setting

The VHA SCI System of Care is comprised of 24 regional SCI centers and over one hundred outpatient clinics throughout the US. Within the system of care, interdisciplinary teams provide coordinated life-long care to veterans with SCI/D.

## 2.3 | Sample/Recruitment

The target sample included 12 SCI/D HCPs, a sample size deemed sufficient for thematic analysis,<sup>24,25</sup> large enough to unfold a rich understanding but small enough for in-depth analysis.<sup>24,26</sup> The convenience sample included individuals who delivered health care to veterans with SCI/D within the VHA SCI/D integrated service delivery network. HCPs were recruited through electronic mail invitations to national VHA SCI/D-HCP listservs. Interested HCPs contacted the research team and were screened for inclusion criteria to ensure they were (1) a HCP, (2) fluent in English, and (3) involved in nutrition and obesity management for individuals with SCI/D.

## 2.4 | Data collection

### 2.4.1 | Surveys

A brief survey was conducted to obtain basic demographic data and employment characteristics.

### 2.4.2 | Semi-structured interviews

Interviews were conducted using a semi-structured interview guide that was developed by the research team<sup>27</sup> based on literature, and professional experiences in SCI/D medicine, rehabilitation, nutrition, psychology, health services research, and public health. Field-testing of the interview guide was conducted with three SCI/D HCPs and edits were made based on their feedback. An excerpt of the interview guide is in Figure 1.

An experienced qualitative researcher (KB) conducted individual 60-min interviews using Microsoft Teams from May to July 2023. Field notes were taken, and interviews were audio-recorded and transcribed verbatim. To ensure accuracy, transcription was completed by one transcriptionist, followed by audio review verification by a secondary transcriptionist.

### 2.4.3 | Analysis

Demographic and employment characteristics were analyzed by calculating frequencies for categorical variables and mean, range, and standard deviation for continuous variables. Established thematic analysis methods were used,<sup>28</sup> which are recommended when research on a topic is limited and participant views are unknown.<sup>28</sup> NVivo software, designed to support layered qualitative analysis, concept building, and data organization (QSR International, version 12 NVivo, 2018, Doncaster, Victoria, Australia), was used to code and analyze transcripts. Thematic analysis allowed a focus on the interview narrative content and provided flexibility to facilitate an understanding of SCI/D HCPs' perspectives on AOM use.<sup>28</sup> The authors' philosophical assumptions were ontological (reflecting realities from both HCPs and researchers and driven by qualitative

What are evidence-based treatments for obesity in persons with SCI/D?

Do you recommend using anti-obesity medications in the SCI/D population?

-Why or why not?

What is the state of knowledge/agreement about use of anti-obesity medications in persons with SCI/D?

Under what circumstances would you consider using these medications with your patients with SCI/D?

-Why might your recommendations differ in persons with SCI/D vs. those without SCI/D?

Can you describe barriers to the use of anti-obesity medications in SCI/D?

What are some of the side effects of anti-obesity medications in general?

Can you describe any side effects that may be of greater concern to people with SCI/D?

*Wrap-up:* Is there anything else you would like to share as it relates to obesity management and anti-obesity medication use in persons with SCI/D?

FIGURE 1 Excerpt from interview guide: Use of anti-obesity medications in persons with spinal cord injuries and disorders.

data that reflected individuals' perspectives and experiences) as well as methodological (shaped by the researchers' experiences during data collection and analysis).<sup>29</sup>

Three experienced qualitative researchers (SL, KB, IK) with expertise in SCI/D research and collective backgrounds in public health, physical medicine and rehabilitation, disability studies, nutrition science, psychology, and health services research conducted the thematic analysis. The authors have research and personal experiences with nutrition and weight management but do not belong to the group of participants who provide firsthand clinical care to persons with SCI/D and therefore acknowledge that this creates the potential for preconceptions and a lack of understanding of the experiences of SCI/D HCPs. Thus, throughout data collection, thematic analysis, and interpretation, ongoing awareness, reflection, and critical self-evaluation were applied to consider our positionality and our similarities and differences with the participants.

Audio-recorded interviews were listened to and read transcripts to glean a broad sense of the data meaning. An inductive approach was used to identify constructs directly from the data to generate preliminary codes and an initial codebook. In vivo and descriptive open coding were used to identify codes based on data interpretation to make sense of meanings and experiences across the data set, emphasizing content meaning and quality over quantity.<sup>30,31</sup> Coded data were reviewed to find themes that represented patterns of meaning and explore relationships among themes. Themes were then checked against data excerpts and against all transcripts. Fit was assessed and modifications were made by either relocating or discarding codes. Themes were fine-tuned until reaching saturation,<sup>28,30,32</sup> defined as the point when no further novel information on concepts was identified in the data.<sup>24</sup> Confirmability and dependability were maintained by keeping an audit trail of the themes and the rationale for decisions using field notes, a codebook, coding rules, and analytic memos.<sup>33</sup> Final themes were established, named, and defined and any discrepancies were resolved through discussion until full agreement was achieved.<sup>30,34</sup>

### 3 | RESULTS

#### 3.1 | Sample characteristics

HCPs (n = 12) were from 11 different VHA facilities. Most were male (75%), white (67%), and 26–49 years of age (83%). Participants were dietitians (75%), physicians (17%), and psychologists (8%). HCPs had 1.5–15 years of experience providing SCI/D care and, on average, spent over half of their workweek providing SCI/D care. Characteristics are summarized in Table 1.

#### 3.2 | Themes

HCPs described four main thematic barriers to AOM use in persons with SCI/D: (1) AOM side effects that are especially concerning in

TABLE 1 Health care provider demographic and employment characteristics (n = 12).

	N (%) or mean (SD) range
Demographic characteristics	
Sex	
Male	9 (75%)
Female	3 (25%)
Race	
White	8 (67%)
Black/African American	2 (17%)
Asian	1 (8%)
Other, not reported	1 (8%)
Age range	
26–49	10 (83%)
50–64	2 (17%)
Employment characteristics	
Position type	
Dietitian	9 (75%)
Physician	2 (17%)
Psychologist	1 (8%)
Years of work providing SCI/D care	6.7 (6.1) 1.5–15
Percent of workweek spent with individuals with SCI/D	53.5 (31.4) 13–100

persons with SCI/D; (2) AOMs contribute to poor eating habits; (3) availability, accessibility, and administration of AOMs; and (4) lack of evidence, clinical agreement, and knowledge about AOM use in the SCI/D population. Theme descriptions and representative quotations from HCPs are below. HCP characteristics by ID are shown in Table 2.

**Theme 1. AOM side effects that are especially concerning in persons with SCI/D.** One of the barriers identified by HCPs was AOM side effects, including bowel problems, gastrointestinal distress, skin breakdown, nutritional deficiency, weight-loss induced muscle loss, medical complications (e.g., decreased ability to combat infections) that may develop or be exacerbated by AOM use, and interactions with other medications commonly used in persons with SCI/D.

##### 3.2.1 | Bowel/gastrointestinal distress and skin integrity concerns

HCPs described many gastrointestinal side effects as barriers to using AOMs in persons with SCI/D. They considered symptoms such as gas, bloating, abdominal discomfort, nausea, and possible constipation (that could lead to GI blockage) as barriers to use of AOMs

TABLE 2 Health care provider characteristics by ID (n = 12).

ID	Sex	Ethnicity	Age range	Position type	Percent of workweek with SCI/D patients	Years working in SCI/D care
HP01	Female	Caucasian	26–49	Dietitian	50%	3
HP02	Male	Black/African American	26–49	Psychologist	38%	3
HP03	Male	Caucasian	50–64	Dietitian	33%	15
HP04	Male	Caucasian	26–49	Dietitian	70%	6
HP05	Female	Caucasian	26–49	Dietitian	13%	3
HP06	Male	Caucasian	26–49	Dietitian	18%	1.5
HP07	Male	Caucasian	26–49	Dietitian	45%	2
HP08	Male	Caucasian	26–49	Dietitian	65%	2
HP09	Male	Other, unspecified	26–49	Dietitian	90%	1
HP10	Male	Caucasian	26–49	Dietitian	20%	15
HP11	Male	Black/African American	50–64	Physician	100%	15
HP12	Female	Asian	26–49	Physician	100%	14

in individuals with SCI/D. HCPs also expressed hesitancy with using AOMs due to concerns about pancreatitis, gallbladder issues, and renal failure.

They also discussed concerns about AOM side effects that might impact neurogenic bowel in persons with SCI/D, describing that people with SCI/D often already struggle with bowel incontinence and that giving them AOMs will likely make this worse and would be alarming in patients with SCI/D. HCPs stressed that AOMs may result in bowel accidents, diarrhea, and anal leakage and that these are issues alone but are especially problematic in persons with SCI/D because many cannot get up and out of their wheelchair, are unable to quickly get to the bathroom to take care of it, do not always have help to do so, and it can be time-consuming and laborious every time they go to the bathroom (e.g., getting to a sling for transfers). Additionally, HCPs expressed concerns that the moisture from leakage and/or diarrhea caused by AOMs impacts skin integrity and puts people with SCI/D at increased risk for pressure injuries. They also indicated that AOMs likely prolong wound healing.

HCPs described concerns about electrolyte loss and dehydration due to diarrhea. Finally, HCPs talked about the risk of side effects from AOMs being exacerbated in individuals with SCI/D because of loss of sensation, describing lack of visceral sensation causing delays in potential diagnosis (such as pancreatitis) and the inability to feel moisture from leakage (and sitting in it while they wait for assistance) leading to pressure injuries and possibly urinary tract infections.

My understanding is there is just a lot of gastrointestinal side effects, potentially nausea. It causes diarrhea, you know that is going to be hard on patients with spinal cord injury, because they can't get up out of that chair. The diarrhea is also a problem because of skin integrity. [HP03]

The number one side effect is GI stuff, that's not something you really wanna have being a problem in SCI patients, especially those with risk for pressure wounds. Patients with spinal cord injury have multiple complications from just having a neurogenic bowel and bladder. So, to consider anti-obesity medications, I would take more caution and make sure they didn't have a risk factor that would cause them to have higher complications [such as]... pancreatitis, gallbladder. [HP10]

### 3.2.2 | Other complications/symptoms of AOM use in SCI/D

HCPs indicated that significant and/or rapid weight loss due to AOM use could lead to additional side effects in persons with SCI/D. They expressed concerns that losing weight with AOMs could cause muscle loss, which they described as a serious side effect for patients with SCI/D. HCPs described that in addition to weight loss, AOM use could lead to nutritional deficiencies (e.g., deficiency in vitamins and minerals) that could lead to decreased bone density and loss of calcification in bones.

In general, HCPs believed that AOM use might influence other existing chronic conditions or comorbidities (e.g., blood pressure and heart conditions) negatively or may exacerbate medical complications, for example, depleting the body of needed resources to fight infections or manage neurogenic bladder. HCPs also noted that rapid weight loss associated with AOMs could put someone with SCI/D in autonomic dysreflexia, which could lead to death. Brain fog, low energy, lightheadedness, or dermatitis from the injection are other side effects mentioned by HCPs as barriers to AOM use.

Rapid changes in weight, could possibly put someone in autonomic dysreflexia which could lead to death. Weight loss could actually be a negative concern; muscle loss is a serious side effect for spinal cord patients. When you lose weight or have a calorie deficit, you will lose muscle and you don't want that with spinal cord patients, they're already losing enough. [HP01]

There is such a high risk of losing calcification in your bones if weight loss [while on AOMs], happens too quickly and that would be especially important with spinal cord. As far as other symptoms, maybe brain fog or just, lower energy. [HP06]

Side effects from AOM use in SCI, you know, becoming deficient in vitamins and minerals, loss in muscle mass, sometimes even bone density. [HP07]

### 3.2.3 | Interactions with other commonly used medications in persons with SCI/D

HCPs were concerned that because individuals with SCI/D are usually already taking many medications related to their injury, AOMs might have interaction side effects. HCPs had concerns about AOM interactions with mental health medications as well as those commonly used for pain in this population.

Concerned about would it [AOMs] be something that could lead to medical complications because veterans are usually already on a lot of medications related to spinal cord injury, like a lot of pain medications. I would be curious if there any concerns with other medications in combination with an obesity medication intervention. [HP01]

For Qsymia, it does interact with some of the mental health medications. [HP10]

A big barrier to use of these [anti]obesity medications is that we already have such polypharmacy, our patients with SCI/D are really on so many medications. [HP12]

#### Theme 2. AOMs contribute to poor eating habits.

SCI/D HCPs identified contributing to poor eating habits as a barrier to AOM use. They indicated that some individuals with SCI/D develop a dependency on quick-fix interventions, such as dietary pills, and are therefore hesitant to use AOMs for fear that individuals would rely solely upon them and neglect making healthy dietary choices. HCPs fear that individuals believe they can eat anything

because they are taking these medications and that AOMs could become an excuse to eat poorly.

HCPs also had concerns that the medications decrease hunger to a degree that leads to skipping multiple meals and not eating. They suggested that lack of hunger leads to eating habits in which nutritional needs, including fluid and protein needs, are neglected. HCPs had concerns that AOM use could result in disordered eating or eating disorders, emphasizing that the risk of this is high in persons with SCI/D because of body dysmorphia.

The first thing that stands out is dependency on interventions, like I know some people tried diet pills before and found those beneficial and then they kind of get hooked or dependent on it. So, with AOMs are they relying on that solely for their maintenance of their weight or health? [HP02]

So unfortunately, I come across people who are like, oh, 'I can eat this because I'm on medication to help with that.' Even though you know they can prevent that [obesity] by choosing healthier choices with their diets. So, I feel like it [AOMs] could become a crutch or just another excuse of why 'I can eat this because I have that [AOM] to prevent issues.' That would be the biggest barrier. [HP05]

In considering anti-obesity drugs, I would be very cautious about the risk of eating disorders. The risk of eating disorders with spinal cord is really high because they're already suffering from some body dysmorphia. [HP06]

#### Theme 3. Accessibility, availability, and administration challenges.

HCPs discussed the limited availability of AOMs as a barrier. They explained that the shortages created a need to prioritize who might benefit most from AOMs (e.g., individuals who need it for glucose control). HCPs also described the costs of AOMs as a potential barrier for some patients with SCI/D.

Because since there's a shortage of it and they have to prioritize... maybe someone really needs it for glucose control. [HP03]

For us a barrier to using it [AOM] is availability and that's not just us. And as far as weight loss drugs, I think a large part of it is gonna depend on if the insurance companies are gonna pay and if the person with SCI can afford to pay for it. [HP11]

A different, but related, aspect was described as the inability of individuals with SCI/D to administer the medication to themselves and to monitor its effects. HCPs specifically discussed limited hand



dexterity to enable giving themselves a shot and not always having the help of an aide to do so.

One barrier is, you know, 'will they have difficulty giving it to themselves?' So, if it is a shot, do they have the hand dexterity to do that? Do they have a nursing aide to help them with that? So, there could be a few additional barriers to just providing the medication... There are more barriers to why it [AOMs] might not be the best choice in SCI. [HP06]

**Theme 4.** *Lack of evidence, clinical agreement, and knowledge about AOM use in the SCI/D population.*

The shared sentiment of SCI/D HCPs was that research and evidence on the use of AOMs in individuals with SCI/D is lacking. HCPs are unaware of any clinical agreement on the use of these medications in persons with SCI/D. As such, there is a general lack of knowledge on the feasibility of using AOMs in this population. However, SCI/D HCPs are highly interested in having clinical discussions as well as seeing evidence and research on AOM use in persons with SCI/D.

I'm not sure what evidence is available about [the use of AOMs in SCI/D]. Honestly, it has not been shared, at least with me in my area, I don't know that it's really been discussed much. [HP04]

I would say that agreement about use of AOMs in spinal cord injury is lacking. Just in general, the nutrition research in the SCI/D population is lacking overall, so definitely it is lacking in the area of AOMs. [HP09]

## 4 | DISCUSSION

In this study, HCPs' beliefs about barriers to AOM use in persons with SCI/D were presented. This previously unexplored topic offers a novel contribution to the literature and may provide guidance on the use of AOMs in this population.

HCPs identified side effects of AOMs, such as gastrointestinal distress, bowel issues, skin breakdown, nutritional deficiencies, muscle loss, and prescription drug interactions, as significant barriers to AOM use, since many of these common side effects could be especially problematic in persons with SCI/D. Depending on the type of AOM (detailed comparisons are outside the scope of this paper), the literature describes various side effects that align with those cited by SCI/D HCPs. For example, in GLP-1 agonist medications used for weight loss, gastrointestinal side effects have been reported, including constipation, nausea, vomiting, and diarrhea<sup>35,36</sup> as well as an increased risk of pancreatitis, bowel obstruction, and gastroparesis.<sup>37</sup> Most individuals with SCI/D have chronic gastrointestinal symptoms due to autonomic dysfunction, sensory deficits, paralysis

of motor function, immobility, and side effects of common medications.<sup>38</sup> In persons with SCI/D, neurogenic bowel dysfunction typically includes constipation, difficulty evacuating the rectum, fecal incontinence, and abdominal discomfort.<sup>38</sup> Gastrointestinal/bowel dysfunction is often a life-long challenge,<sup>39</sup> suggesting that at baseline persons with SCI/D already struggle with these problems that may be compounded by AOMs.

Loss of muscle mass is another documented concern with AOM use.<sup>40</sup> Individuals with SCI/D are already at risk of skeletal muscle atrophy, reduced muscle mass, and neurogenic obesity.<sup>41</sup> While muscle-mass loss due to AOMs may, in part, be offset by exercise,<sup>40</sup> many people with SCI/D have challenges participating in intense enough exercise to mitigate muscle loss.<sup>13,15</sup>

It is not surprising that HCPs emphasized side effects as barriers to AOM use in persons with SCI/D, as many of these side effects hinder AOM use in the population without SCI/D. However, individuals with SCI/D are at greater risk for some of these side effects and are less able to react to (e.g., bowel accidents or leakage due to impaired sensation and/or mobility issues) or counteract (unable to exercise to prevent muscle loss) some of the side effects. Also importantly, these factors may lead to or exacerbate other SCI/D secondary complications; for example, moisture from fecal incontinence is a risk factor for pressure injuries<sup>38</sup> and muscle loss contributes to obesity.<sup>41</sup>

SCI/D HCPs worried that AOM use could contribute to poor food choices and leave individuals relying on the medication as a "fix" in lieu of selecting nutritious food options. HCPs highlighted the importance of adequate nutrients to manage SCI/D secondary complications, for example, sufficient fluid intake to mitigate bowel and bladder dysfunction and adequate protein for pressure injury healing. Obesity treatment guidelines specify that pharmacotherapy should be used in conjunction with lifestyle modifications, including a healthy dietary pattern.<sup>42</sup> In fact, medications approved for chronic weight management are said to help individuals adhere to a healthy dietary plan, which may facilitate the sustainability of weight loss.<sup>43</sup> If AOMs are used in the SCI/D population, nutritional counseling should be offered.

HCPs were also concerned that individuals with SCI/D on AOMs would skip meals or stop eating to the extent that their nutritional needs would not be met. LaVela et al.<sup>17</sup> reported that individuals with SCI/D engaged in extreme fasting/caloric restriction and modified eating behaviors due to SCI/D-related symptoms, such as avoiding meals due to bowel dysfunction, not consuming fruits and vegetables because of fiber content, and fear of fecal incontinence. Farkas et al.<sup>44</sup> reported that compared to controls, persons with SCI/D more frequently reported decreased food appeal and decreased priority of eating.

HCPs had concerns that AOM use might lead to eating disorders; they noted that the risk of eating disorders is high in persons with SCI/D due to body dysmorphia and poor body image. There is limited research on weight-related body image in persons with SCI/D. One study reported that 42% of individuals with SCI/D had body image concerns due to excess weight<sup>11</sup> and in another study, individuals

with SCI/D identified their personal appearance as a motivating factor in managing their weight.<sup>15</sup> While there is also a lack of research on disordered eating in persons with SCI/D, it is possible that this population may be particularly vulnerable to eating disorders given the trauma of acquiring a SCI/D, along with post-injury body composition changes, symptoms/discomfort after eating, and body image concerns. Additional research is warranted to understand eating disorders in persons with SCI/D, and how this should be considered in AOM prescribing decisions.

The decision to use AOMs in persons with SCI/D must consider risks alongside benefits as well as special considerations unique to this population. For example, HCPs in this study recognized polypharmacy as a problem in this population, indicating concerns about the use of AOMs in that this would add another medication. However, it is possible that the use of AOMs may lead to a reduction in weight and related secondary health conditions and consequently reduce the number of medications needed. As identified by HCPs in the current study, there is a lack of evidence and research on AOM use in persons with SCI/D. Considering the nuances of SCI/D, research is needed to understand if AOMs are a recommended approach to managing obesity in persons with SCI/D, as well as how food choices, eating behaviors, and medication requirements are ultimately affected.

Finally, HCPs in the current study identified AOM shortages and prioritization for specific diagnoses as barriers to AOM use. This concern is not limited to the population with SCI/D. The surge in popularity of AOMs for weight loss (indicated or off-label), particularly GLP-1 agonists (e.g., Ozempic, Wegovy) has caused widespread shortages.<sup>45</sup> Likewise, while costs associated with AOM use are not limited to individuals with SCI/D, this population may have a higher general financial burden.<sup>46</sup> Individuals with SCI/D often have many costs due to health care and rehabilitation service use, medical equipment and supplies, and personal assistance needs.<sup>47</sup> In addition, many face lost income due to difficulties finding or maintaining employment due to transportation barriers, fatigue, and lack of confidence in return to work.<sup>48-50</sup> Nonetheless, there are several AOMs that can be used to manage obesity; hence, availability of and access to the different medications is paramount to enabling shared decision-making to develop a treatment plan that considers multiple options, feasibility, and patient preferences.

Study limitations include the use of a convenience sample of only English-speaking HCPs, who were mostly dietitians. The study participants represent only a small proportion of SCI/D HCPs, which may impact the transferability of findings to other HCPs in other health care settings who may prescribe differently due to patient cost implications and organizational level pricing differences. Furthermore, this study did not present feedback directly from individuals with SCI/D, which may have revealed additional or different barriers to AOM use.

Conclusions. Obesity is a chronic disease; therefore, the approach to obesity management, including the use of AOMs in persons with SCI/D, is complex, individualized, and multimodal. There are several potential barriers to AOM use in the SCI/D population. AOMs may cause or exacerbate conditions that are already

concerns in persons with SCI/D, such as bowel dysfunction, skin integrity, muscle atrophy, bone loss, and eating disorders. However, AOMs are an evolving but promising addition to the armamentarium in the treatment of obesity; therefore, it is warranted to further investigate the interaction of AOMs with chronic and secondary conditions associated with SCI/D as well as other potentially addressable barriers. Research is needed to study AOMs in SCI/D to elucidate their clinical impact and safety and efforts are needed to build evidence and disseminate new findings to SCI/D HCPs once available.

## AUTHOR CONTRIBUTIONS

All authors listed have contributed sufficiently to the project and manuscript to be included as authors, and all those who are qualified to be authors are listed in the agreed upon order in the author byline.

- SL and LR acquired financial support for the project leading to this manuscript.
- SL, KB, GF, DE, and LR made substantial contributions to the conception and design of the study.
- SL, KB, IK, VR, and LR made contributions to the project administration and management.
- KB and SL made substantial contributions to the acquisition of data.
- SL, KB, IK, GF, and LR made substantial contributions to the coding and thematic analysis.
- All authors (SL, KB, IK, GF, GH, VR, DE, and LR) have been involved in analysis and interpretation of data, drafting the manuscript, have given final approval of the version submitted, and agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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## CONFLICT OF INTEREST STATEMENT

The authors do not have any conflicts of interest or commercial interests to disclose.

## ORCID

Sherril L. LaVela  <https://orcid.org/0000-0001-9900-0120>

Kelsey Berryman  <https://orcid.org/0000-0002-5553-067X>

Ibuola Kale  <https://orcid.org/0000-0002-0672-3328>



Gary J. Farkas  <https://orcid.org/0000-0002-5482-6049>  
 Geoffrey V. Henderson  <https://orcid.org/0000-0003-3596-3192>  
 Vanessa Rosales  <https://orcid.org/0009-0008-7305-8488>  
 Dan Eisenberg  <https://orcid.org/0000-0002-5908-3942>  
 Lorena Reyes  <https://orcid.org/0009-0004-1635-349X>

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