

# North American Weight Management Programs for People Living With Chronic Kidney Disease: An Environmental Scan

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## Abstract

**Background:** The availability and accessibility of patient-centered weight management programs is critical to mitigate the increasing prevalence of obesity in people living with chronic kidney disease (CKD). Little is known about the availability of contemporary programs that can safely and effectively support individuals living with obesity and CKD across North America.

**Objective:** We sought to identify weight management programs specific to those with CKD and explore their safety, affordability, and adaptability to this patient population. We also identified the barriers and facilitators of identified programming including their accessibility to real-world patients (eg, cost, access, support, and time).

**Design:** Environmental scan of weight management programs.

**Setting:** North America.

**Patient:** People living with CKD.

**Methods:** We identified weight management programs and associated barriers and facilitators, via an Internet-based search of commercial, community-based, and medically supervised weight management programming. We also conducted a gray literature search and contacted weight management experts and program facilitators to explore strategies as well as their barriers and facilitators.

**Results:** We identified 40 weight management programs available to people living with CKD across North America. Programs were commercial (n = 7), community-based (n = 9), and medically supervised (Canada n = 13, U.S n = 8) in origin. Three programs were specifically tailored to CKD (n = 3). In addition to formal programs, we also identified online nutritional resources and guidelines for weight loss in CKD (n = 8), and additional strategies (self-management tools, group orientated programs, moderate energy restrictions in conjunction with exercise and Orlistat) for weight loss from the gray literature (n = 3). Most common barriers were difficulty accessing some of the suggested nutritious food options due to the high cost, lack of support from family, friends and health practitioners, the time commitment required to participate, and the exclusion from weight management programs due to unique dietary needs for the CKD population. Most common facilitators were programs that were patient-centered, evidence-based, and offered both group and individual formats.

**Limitations:** Although our search criteria were broad, it is possible that we did not capture all weight management programs available across North America.

**Conclusions:** This environmental scan has generated a resource list of existing safe and effective programs for or adaptable to people with CKD. This information will inform future efforts to develop and deliver CKD-specific weight management programs to patients living with comorbid disease. Engaging people living with CKD to understand the acceptability of these programs, is an important focus for future research.

## Abrege

**Contexte:** Pour atténuer la prévalence croissante de l'obésité chez les personnes atteintes d'insuffisance rénale chronique (IRC), il est essentiel de rendre disponibles et accessibles des programmes de gestion du poids destinés à ces patients. On en sait peu sur la disponibilité de programmes contemporains permettant de soutenir efficacement et en toute sécurité les personnes souffrant d'obésité et d'IRC en Amérique du Nord.

**Objectifs:** Nous souhaitons identifier les programmes de gestion du poids destinés aux personnes atteintes d'IRC et explorer leur sûreté, leur accessibilité et leur capacité d'adaptation à cette population de patients. Nous avons également répertorié les obstacles et les éléments facilitateurs des programmes identifiés, notamment leur accessibilité aux patients du monde réel (p. ex., coût, accès, soutien, temps).

**Conception:** Analyse environnementale des programmes de gestion du poids.



**Cadre:** Amérique du Nord.

**Sujets:** Personnes atteintes d'IRC.

**Méthodologie:** Nous avons identifié les programmes de gestion du poids, ainsi que les obstacles et éléments facilitateurs associés, par le biais d'une recherche des programmes de gestion du poids commerciaux, communautaires et médicalement supervisés sur Internet. Nous avons également recherché dans la littérature grise et communiqué avec des experts en gestion du poids et des intervenants de programmes pour explorer les autres stratégies, leurs obstacles et éléments facilitateurs.

**Résultats:** Nous avons identifié 40 programmes de gestion du poids offerts aux personnes atteintes d'IRC dans toute l'Amérique du Nord; des programmes commerciaux (n = 7), communautaires (n = 9) et médicalement supervisés (Canada: n = 13; États-Unis: n = 8). Trois programmes étaient spécifiquement adaptés à l'IRC (n = 3). En plus des programmes officiels, des lignes directrices et des ressources nutritionnelles pour la perte de poids en contexte d'IRC ont été trouvées en ligne (n = 8), et d'autres stratégies (n = 3) pour la perte de poids (outils d'autogestion, programmes axés sur des groupes, restrictions énergétiques modérées jumelées à l'exercice et Orlistat) ont été trouvées dans la littérature grise. Les obstacles les plus courants étaient la difficulté d'accès à certaines des options alimentaires suggérées en raison de leur coût élevé; le manque de soutien de la famille, des proches et des professionnels de la santé; le temps nécessaire pour participer aux programmes; et l'exclusion des programmes en raison des restrictions alimentaires particulières des patients atteints d'IRC. Les éléments facilitateurs les plus courants étaient le fait que ces programmes étaient axés sur le patient, qu'ils étaient fondés sur des données probantes et qu'ils offraient des formats individuels et de groupe.

**Limites:** Bien que nos critères de recherche étaient larges, il est possible que nous n'ayons pas saisi tous les programmes de gestion du poids disponibles en Amérique du Nord.

**Conclusion:** Cette analyse environnementale a permis de dresser une liste des programmes sûrs et efficaces destinés ou pouvant être adaptés aux personnes atteintes d'IRC. Ces informations serviront de base aux efforts futurs visant à élaborer et à proposer des programmes de gestion du poids propres aux patients atteints d'IRC et d'une comorbidité. La participation des personnes atteintes d'IRC à la compréhension de l'acceptabilité de ces programmes est un axe de recherche important pour le futur.

**Mots clés:** insuffisance rénale chronique; insuffisance rénale terminale; gestion de l'obésité; gestion du poids; nutrition.

## Keywords

chronic kidney disease, end-stage kidney disease, obesity management, weight management, nutrition

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## Introduction

Obesity is a complex medical condition resulting from a combination of genetic, biological, environmental, and social factors.<sup>1</sup> Physical activity and inactivity, dietary patterns, as well as access to healthy food, education, and employment all play important roles in both the incidence and prevalence of this condition.<sup>2</sup>

As of 2018, approximately 7.3 million Canadian adults were living with obesity,<sup>3</sup> including those with chronic kidney disease (CKD).<sup>4</sup> In patients with CKD, the presence of obesity is associated with a 2-fold risk increase for starting dialysis compared with those with CKD and a normal body weight.<sup>5</sup> Obesity also contributes to cardiovascular disease, diabetes, and hypertension in CKD as well as a risk of early mortality.<sup>4</sup> Importantly, access to kidney transplantation is reduced in people living with obesity, particularly in those with a body mass index (BMI) > 35 kg/m<sup>2</sup>.<sup>6,7</sup> Individuals with a body mass index of (BMI) > 35 kg/m<sup>2</sup> have been noted to have an increased risk of mortality, surgical wound infections, delayed graft function, and decreased graft survival compared with those with a BMI 30 to 35 kg/m<sup>2</sup>.<sup>8</sup>

Unfortunately, published guidelines on the treatment of obesity in CKD are sparse. This is because this population is

frequently excluded from research studies,<sup>9</sup> have unique dietary needs (need to restrict certain nutrients),<sup>10</sup> and experience burdensome symptoms (fatigue, pruritus, constipation, anorexia, pain, sleep disturbances, anxiety, dyspnea, nausea, and depression) that can limit their ability to participate in exercise.<sup>11</sup> Moreover, these individuals often have impaired health-related quality of life, and capacity,<sup>11</sup> and

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often limited resources to participate in programming.<sup>12</sup> Effective weight management programs in CKD should offer psychological and behavioral supports that include self-monitoring, goal setting, and motivational interviewing (Supplemental Table 1), and should be safe, including adequate nutrition, physical activity supports, as well as realistic weight loss goals (Supplemental Table 2).

The purpose of an environmental scan is to understand context; collect information; and identify resources, links, and gaps. An environmental scan can assist with planning future research in obesity and CKD and can range from a formal (systematic, continuous, proactive, prospective, and coordinated) to informal (irregular and reactive basis) activity.<sup>13</sup> The use of nontraditional methods, such as Internet searches and interviewing program leads, organizations or experts, is common in environmental scanning.<sup>14</sup> Scans allow researchers and clinicians to consolidate knowledge from clinical reviews, policy documents, Web Sites, meetings, focus groups, or by phone or e-mail,<sup>15</sup> and to leverage this information into new programming. The goal of our environmental scan was to explore the current landscape of weight management programs available to people living with obesity and CKD across North America, gather information on the safety and effectiveness of strategies, and identify barriers and facilitators of identified programs to inform the design of a weight management intervention for people living with CKD.

We had two specific objectives:

1. Identify weight management programs and strategies that are (a) specific to the CKD population or, (b) safe and adaptable to those with CKD.
2. Explore the barriers and facilitators that the CKD population may experience with accessing and adhering with identified weight management programs (eg, cost, access, support, and time).

## Methods

The environmental scan was conducted from May to July 2022. The researchers are familiar with the use of environmental scans, and Figure 1 shows the steps taken to conduct the scan.

We searched for weight management programs, strategies, and barriers and facilitators by exploring:

1. Internet-based commercial, community-based, and medically supervised weight management programs and strategies.
2. The gray literature for weight management strategies and barriers and facilitators to weight management in CKD.
3. Contacting weight management experts and program facilitators to identify barriers and facilitators to identified programming for patients with CKD.

*Internet-based searches* for commercial, community-based, and medically supervised weight management programs were conducted using search engine Google and Web Sites of relevant organizations. We used a combination of the terms: “weight loss strategies”; “obesity management”; “weight loss programs”; “nutrition”; “diets”; “chronic kidney disease”; “end-stage kidney disease”; “dialysis”; “diabetes”; “adult”; “commercial obesity management programs/weight loss programs”; “community-based obesity management programs/weight loss programs”; “medical obesity management programs/weight loss programs”; and “kidney transplantation.”

*Gray literature searches* (information produced outside of traditional publishing and distribution channels, eg, conference papers/proceedings, dissertations and theses, government documents and reports) were conducted using Google Scholar to identify effective strategies for weight loss in CKD as well as barriers and facilitators to weight loss and adhering to a weight loss/obesity management program. We used a combination of the following terms: “weight loss strategies”; “nutrition”; “diets”; “chronic kidney disease”; “end-stage kidney disease”; “dialysis”; “barriers to weight loss”; “facilitators to weight loss”; “barriers to adhering to weight loss programs/obesity management programs”; “facilitators to adhering to weight loss programs/obesity management programs”; and “kidney transplantation.”

*Weight management experts and program facilitators* were identified via Internet search and direct contact. Contact by the lead researcher was made via e-mail and telephone to determine what programs and strategies they offer, the details of their programs, and if they are or can be tailored to the CKD population. A set of interview questions was used (Supplementary Table 6). Information regarding potential barriers and facilitators, experienced by patients/clients, to weight loss and/or adherence to weight loss programs were also gathered. To do this, we contacted members of the Southwestern Ontario Family Health Team (typically interact with patients that have multiple co-morbidities), Community Organizations (public health units, local health authorities, community health centers, and community centers) that understand the needs of the population they serve and the social determinants of health that act as barriers to access of support programs, as well as weight management experts (in-depth understanding of obesity, its causes, and treatments). These experts also acknowledge the complexity of treating obesity and therefore may offer insight and provide recommendations on programs and strategies that address these complexities.

We attempted to contact 6 weight management experts, but were only able to connect with 3. All of the programs included in our report were contacted to ensure that their programs were safe for the CKD population (either they specifically targeted this population or offered to work with the clients health care provider[s] to adapt their programs to this populations needs to ensure safety). The search approaches

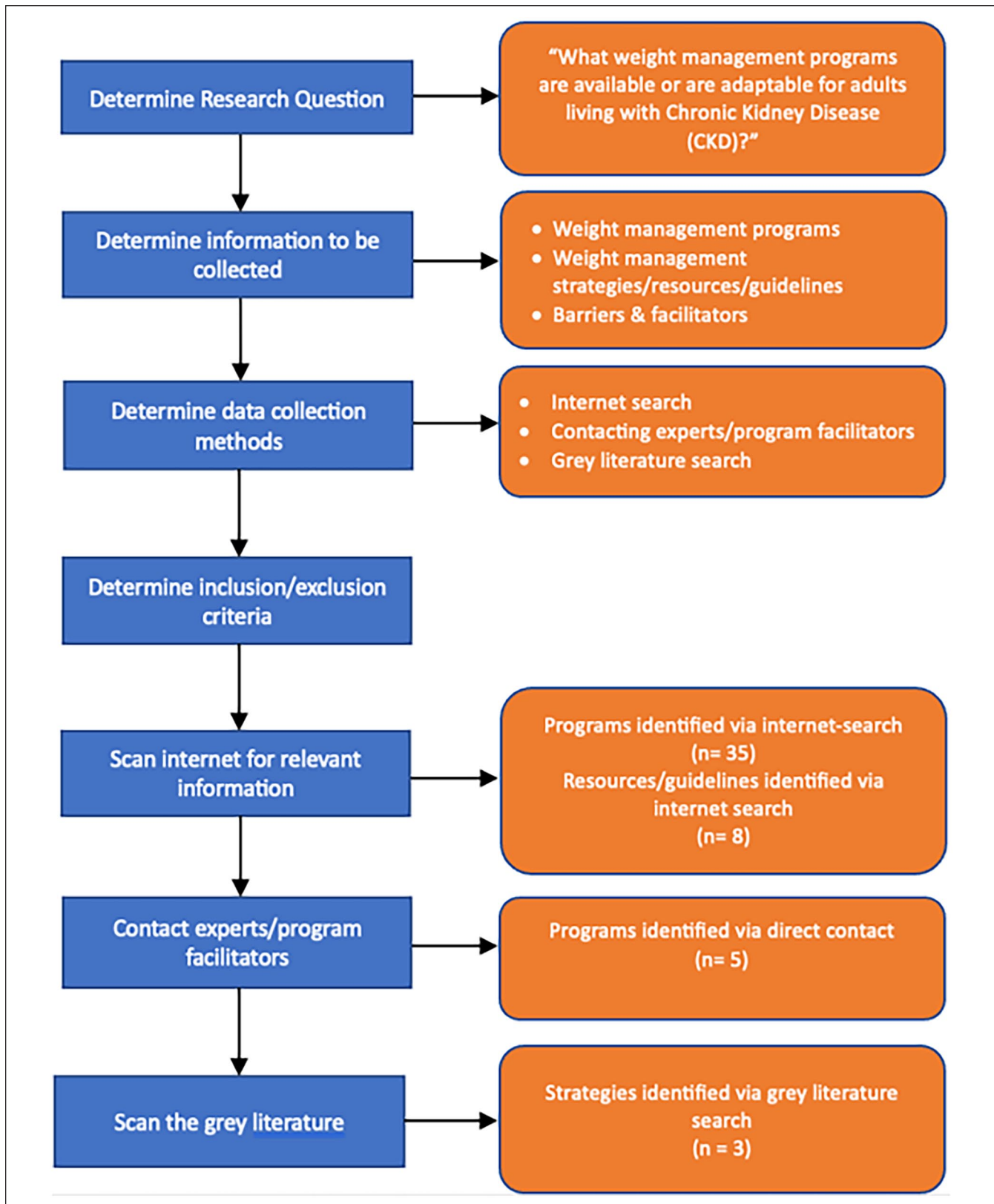


Figure 1. Environmental scan process.

**Table 1.** Inclusion/Exclusion Criteria for Weight Management Programs Selected.

## Inclusion criteria

- Designed for adults (>18 years)
- Specific to CKD or adaptable to CKD (work with clients health care provider[s] to adapt program around the needs of the CKD population)
- Offer lifestyle supports (behavioral change, dietary, and physical activity) (Supplemental Table 1)
- Available to patients in North America
- Patient-centered and individualized
- Medically supervised or commercial/community-based that work with the client's health care provider(s)

## Exclusion Criteria

- Programs that specifically exclude the CKD population
- Do not meet criteria for what is considered safe according to the American National Institutes of Health (Supplemental Table 2)
- Extremely low-calorie diets without health care provider(s) monitoring
- Programs with high-intensity training regimens that are not closely monitored by health care provider(s)
- Programs with unrealistic goals:
  - Guarantee weight loss without diet or exercise
  - Guarantee weight loss while eating as much food as you want
  - Guarantee spot reduction of weight from particular locations on the body
  - Guarantee overly rapid loss (eg, losing 30 pounds in 30 days)

that were used (Internet-based, gray literature, contacting experts) are typical of environmental scans.<sup>13</sup> A librarian was involved to assist in determining the appropriate search phrases and search engines. The search phrases were selected based on the relevance to the research question, "What weight management programs are available or are adaptable for adults living with Chronic Kidney Disease (CKD)?" To balance comprehensiveness with feasibility, the searches of Google and Google Scholar, were limited to the first 10 pages. To ensure that the programs selected are deemed safe, our inclusion/exclusion criteria were selected to ensure only programs that offer realistic goals as well as oversight by their health care provider(s) were included in our report.

Our inclusion/exclusion criteria are listed in Table 1.

Our study involved the use of information that was freely available in the public domain and REB was not required for this study.

## Results

We identified 40 weight management programs available to people living with CKD across North America (Supplemental Table 3). Programs were commercial ( $n = 7$ , 18%), community-based ( $n = 9$ , 23%), and medically supervised (Canada  $n = 13$ , 32%, U.S  $n = 8$ , 20%) in origin. Programs covered by the provincial health care plan included 7 community-based and 6 medically supervised programs. A large number of the programs were located in Ontario, British Columbia, Ohio, and New York with fewer available in Manitoba, Nova Scotia, and Newfoundland. Three programs were specifically tailored to CKD ( $n = 3$ , 7%) (Supplemental Table 4). In addition to formal programs, we also identified online nutritional resources and guidelines for weight loss in CKD ( $n = 8$ ), and additional strategies (self-management tools, group orientated programs, moderate energy restrictions in

conjunction with exercise and Orlistat) for weight loss from the gray literature ( $n = 3$ ).

After consulting with weight management experts and programmers, we identified several themes for barriers: socioeconomic, access, sociocultural, health and disease, negative perceptions/experiences, equity, diversity and inclusion, and psychological/behavioral. As well as facilitators: format of interventions, delivery and frequency of interventions, accessibility, positive perceptions/experiences, and support to weight management, with a special focus upon CKD (see "Barriers and Facilitators" section). The information regarding barriers and facilitators that was provided by these experts/programmers was gathered via feedback from their clients/patients.

### Program Strategy Themes

Nutrition Counseling, Behavior Change Support, Motivational Interviewing, Goal Setting, Stress Management and Problem Solving, Social Support/Peer-Support, Self-monitoring, Eating Well on a Budget, Personalized Diets and Meal Plans, Meal Replacement, Medically Monitored Caloric Restriction, Grocery Store Tours, Restaurant Menu Selection, Easy-to-Follow, Supervised Exercise Regimens (that are appropriate for any condition), Measurement of Basal Metabolic Rate, Body Composition Testing, Exercise Testing, Optimization of Medications (to avoid weight gain), Sleep Management, On-going Support and Follow-up (to ensure sustained weight loss), as well as working with the clients' health care providers to address any safety concerns due to comorbidities.

The programs in this report are an attempt to identify the most representative strategies and delivery methods that are implemented in weight management programs. This information can be used to counsel patients on available programs. In

addition, this information will assist in understanding patient experience to understand what strategies and delivery methods would be most amenable for our target population to inform the development of a future patient centered weight management program for clinical study.

The focus of this review is on programs that would be applicable to patients with stage 3 to 5 CKD including patients on dialysis, as their dietary and exercise needs differ from the general population. Programs selected include dietitians, personal trainers, kinesiologists, and other allied health that are able to tailor the diet and exercise to the specific patient needs and abilities.

Not all of the programs reviewed specifically mentioned CKD; however, programs that ensured clients are closely monitored and provided with diets and exercise regimens that are appropriate for their comorbidities were selected. Programs that are medically supervised or commercial/community-based programs that offered to work with the client's health care provider(s) was a key criterion for selection. In addition, strategies—such as behavior change support, motivational interviewing, and goal setting—address the needs of any individual living with obesity. Finally, programs that incorporated high-intensity exercise regimens, extremely low-calorie diets, and unrealistic goals, for example, were excluded due to concern of safety for patients with CKD.

It is important to note that none of the programs identified specifically targeted marginalized groups (eg, Indigenous).

### **Commercial Weight Management Programs**

Commercial weight loss programs are nonclinical and not facilitated by health care providers. They are typically run by health coaches, dietitians or personal trainers. The American College of Cardiology/American Heart Association Task Force on Practice Guidelines and the Obesity Society endorse commercial weight management programs if they are deemed to be safe and effective through peer-reviewed evidence.<sup>16</sup> Key components of the commercial programs identified include nutrition counseling, environment and behavior change support, motivational interviewing, personalized diets, grocery tours, label reading and restaurant menu selection, meal planning, fully prepared meals, meal replacements, and personal exercise regimens, as well as working with the clients' health care providers to address any safety concerns due to comorbidities. The duration of the commercial programs available to North American patients varies between 3 and 12 months with the exception of a few programs that did not have a specific duration. Session duration was between 45 minutes and 1.5 hours. Programs are offered in person, virtually, or via telephone. Participation does require out-of-pocket expense; however, some insurance plans may cover the partial or full costs (eg, dietitian).

### **Community-Based Weight Management Programs**

The community-based weight management programs selected run through public health units, local health authorities, community health centers, and community centers (such as the Young Men's Christian Association [YMCA]). They are facilitated by dietitians, personal trainers, behavior and health coaches, and social workers. Identified programs include education on nutrition, exercise, and healthy lifestyle change, goal setting, action planning, group support, self-management, and eating well on a budget, as well as working with the clients' health care providers to address any safety concerns due to comorbidities. The duration of identified programs ranged between 4 and 16 weeks with the exception of a few that do not have a specific duration (clients can participate for as long as they see fit). The average frequency of the programs is 1-hour sessions weekly, bi-weekly, and monthly, and they are offered in-person (one-on-one, group, or combination), virtually, and via telephone. Referral requirements vary (ie, health care provider or self-referral) and they are publicly funded with the exception of a few that require small out-of-pocket expenses (\$89 per year for membership, \$30 for access to modules).

### **Medically Supervised Weight Management Programs**

The most common type of weight management program identified was medically supervised programs. These programs are offered at hospitals, clinics, and wellness institutes and are directed by physicians, nurse practitioners, dietitians (including renal dietitians), weight management educators, social workers, psychologists, and registered kinesiologists. Programs use strategies including behavioral modification, lifestyle change, motivational interviewing, stress management, nutrition counseling, personalized meal plans, pharmacotherapy, meal replacement, medically monitored caloric restriction, structured/ supervised exercise regimens, and options for bariatric surgery. The duration of these programs range between 3 and 24 months with average 1-hour sessions weekly, bi-weekly, and monthly. These programs are offered in-person (one-on-one, group, or combination) or virtually. A referral from a health care provider is required for most medically supervised programs. A large number of medically supervised programs are publicly funded although meal replacement costs are not covered (approximately \$2.30 per Optifast shake, food cost [average] \$16/day), with the exception of a few programs (\$25/week, \$1950 for 22 weeks, \$165/month for 6 months, \$3000 for 12 months, \$400/month for 16 weeks, and \$20/month for 1 year).

Only three programs offered support specifically to those with CKD: the Wharton Medical Clinic, CanMed Clinic, and Nutrition Rx (Supplemental Table 4). Special features of

these programs include the adjustment of meal plans to the kidney/diabetes diet or exercise regimens for patient comorbidities.

### **Barriers and Facilitators**

Identified barriers and facilitators are illustrated in Supplemental Table 5. There were socioeconomic, access, sociocultural, psychological/behavioral, health and disease, negative perceptions/experiences, equity, and diversity and inclusion barriers. Most common barriers were the high cost of some of the commercially based programs, difficulty accessing some of the nutritious food options suggested by programs, lack of support from family, friends and health practitioners to participate, and the time commitment required to participate, as well as being excluded from obesity programs due to unique dietary needs for the CKD population.

Patient-centered programs that considered the needs and preferences of their clients through consistent guidance, support, and convenience as well as easy-to-follow regimens and accessibility were identified as key facilitators (Supplemental Table 5). Group interventions were identified as the preferred format as participants could gain affirmation from others who are on the same journey, and can offer accountability and learning opportunities,<sup>17</sup> though individual programming would also be significant to offer depending upon the needs and preferences of the individual. The most common delivery and frequency methods were in-person and offered on a weekly basis, respectively. Although many of the programs identified were also offered virtually and less frequently depending on the needs and preferences of the individual.

While significant effort has been put into improving the management of CKD, obesity care remains a major challenge in this population. Improving access to weight management interventions and support programs has become a priority across health care systems; however, many individuals still experience fragmented and inadequate care and support for obesity due to it being a disease that is often overlooked. Limited discussions are occurring between patients and physicians as a consequence of obesity being a socially charged medical condition.<sup>18</sup> Furthermore, many weight management programs focus on weight loss in isolation and do not consider other co-morbidities. Comprehensive weight management programs are required; however, physician referrals have been limited due to lack of program availability and/or knowledge of program availability.<sup>18</sup> Commercial weight management programs have been considered, but caution is taken due to lack of evidence on the efficacy and safety of these programs. Individuals that consider the use of commercial weight loss programs should consult with their health care provider(s) to ensure safety and effectiveness.

### **Discussion**

Weight management programs can have significant implications for the CKD population. Obesity in CKD poses as a barrier to life sustaining kidney transplantation and thus programs that support this population in managing their weight can be beneficial. Our environmental scan identified 40 weight management programs available to people living with CKD across North America. Programs were very similar in their delivery methods and in the strategies offered to participants (ie, nutrition counseling, cognitive behavior therapy [CBT], and social support). Programs are available either virtually or in-person, on a weekly or bi-weekly basis, for a duration of 3 to 24 months, with the exception of a few that do not have a specific duration (clients can participate for as long as they see fit).

Only 3 programs offered support specifically to those with CKD: the Wharton Medical Clinic, CanMed Clinic, and Nutrition Rx, however, only CanMed advertised it on their Web Site. Support for CKD through Nutrition Rx and Wharton Medical Clinic was determined via phone interview and review of the literature, respectively. Consequently, there may be additional programs available that indeed do support kidney disease that this review may have missed due to lack of advertising.

Weight management experts all agreed that the programming included in our review were safe; dieting, particularly starvation dieting is not effective or sustainable for weight loss. They recommended multifactorial lifestyle changes for overall health and wellbeing, along with medications and surgery for weight loss. Experts also noted that these programs would allow patients to focus on overall health independent of weight loss (eg, diabetes and hypertension). Although programs varied in duration, it was emphasized that clinically significant and sustainable weight loss requires long-term commitment to making changes in eating and exercise habits; obesity is a chronic disease, and long-term commitment to programs with a duration beyond 12 months is important for weight maintenance.<sup>19</sup> Approaches that provide a healthy balance of support and supervised structured programs could allow for flexibility and autonomy for individuals to continue programs over the longer term. In addition, virtual care can be especially helpful in increasing accessibility for hard-to-reach populations. A study that reviewed the safety and efficacy of telemedicine weight loss programs did not find a decrease in quality when compared with in-person.<sup>20</sup> Therefore, not only are more programs required, but current programs being more widely available can reach a larger population more effectively.

In terms of barriers, costs of commercial programming can be high and those with CKD are on average, of lower socioeconomic status (SES) than those without CKD.<sup>21</sup> Even publicly funded programs require some out-of-pocket costs (meal replacements, travel costs, specific diets) that are not affordable to this population. Additional barriers to weight

loss/management are health literacy, food awareness, and issues around the unique dietary needs of the CKD population. Programs that ensure their content includes education on health literacy and food awareness as well as address issues around unique dietary needs can provide significant benefits to the health outcomes of the CKD population. Programs that also consider the needs and preferences of their clients through consistent guidance, support, and convenience as well as easy-to-follow regimens and accessibility are strategies that have shown to achieve better success<sup>22</sup> and have been identified as key facilitators. Group interventions were identified as the preferred format due to the accountability and learning opportunities aspect.

Although only a few programs were specifically designed for CKD, a key learning from our scan is that programs can be adaptable to the diverse needs and preferences of this population. For example, if patients with CKD have time constraints in food preparation, programs that provide pre-packaged meals may be an option for them. Others may have limited health and nutritional literacy and so intensive dietary support may be beneficial. In addition, some may have developed an unhealthy relationship with food and could benefit from behavioral therapists/psychologists. Finally, lack of family support may be a barrier to weight loss therefore a program that includes their family in the intervention may increase the likelihood of success. Indeed, for long-term and sustainable weight loss, social support should be incorporated in any weight loss program. With the diversity of programming available to North Americans, a tailored approach can be sought.

### *Suggestions for Future Research*

It is important to note that none of the programs identified specifically targeted marginalized groups (eg, Indigenous). Weight management programs that consider the needs and preferences of this population are required given that a disproportionately high burden of CKD has been found among Indigenous peoples and compared with other Canadians with CKD, Indigenous peoples are more likely to be obese (40% vs 27%).<sup>23</sup> The factors contributing to obesity among Indigenous populations are varied and complex and as such require programs that culturally appropriate with broad strategies that address these factors. There is a need for future research to focus more on the availability of weight management programs that specifically target Indigenous populations. Although this population would typically get involved with these types of programming through word of mouth via their community members, it would be beneficial for there to be an online resource for health care provider(s) to understand the types of weight management programs that would be amenable to the Indigenous population.

### *Comparison With Previous Literature*

To our knowledge, there have been no attempts to comprehensively review the weight management programs available

to people living with CKD. We were only able to identify one review of randomized control trials (RCTs) that aimed to determine the commercial weight loss programs that follow evidence-based recommendations for the general population (ie, lower-calorie diet, increased physical activity, and behavioral strategies). While the review also focused upon some of the commercial programs identified in our scan (eg, National Diabetes Prevention Program, Weight Watchers [WW], Jenny Craig, Medifast, and Optifast) that have exhibited safe and effective weight loss over a duration of 12-months,<sup>16</sup> our review provides a contemporary list of programs that can safely and effectively support individuals with obesity and CKD across North America.

### *Strengths and Limitations*

Strengths of this review include its broadness; we reviewed commercial, community-based, and medically supervised weight management programs that can be used or adapted for people with CKD and presented guidance from experienced researchers and experts on related barriers and facilitators. This work can be a resource for care providers who support people living with CKD alongside comorbidities and can be used to generate web-based tools as a reference for individuals seeking safe and effective obesity programs. Importantly, it will also facilitate critical feedback to understand what types of programs will be acceptable to this population and their families.

It is important to note that there may be additional weight management programs available at the local, national, and international level that we may have missed in our scan. Moreover, a limitation of environmental scans is the potential for inconsistency in the approach, which could result in an ambiguous process.<sup>15</sup> It is also important to note that the information on barriers and facilitators was gathered through second-hand sources (experts/programmers) and not the clients/patients themselves. This may result in some bias or inaccuracies.

### *Conclusion*

This environmental scan provides an overview of weight management programs and strategies in North America, that can be utilized or adapted to assist people living with obesity and CKD. The results can be utilized by health care providers as a reference for available weight management programs that can be tailored to the needs and preferences of their patients. There were notable gaps in the availability of weight management programs that were safe and specific for the CKD population which highlights a need for further research and program development. Key barriers and facilitators were identified that may influence adherence to these weight management programs and can inform future efforts on the development and delivery of CKD-specific weight management programs that address the barriers identified, to promote weight loss.



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## Supplemental Material

Supplemental material for this article is available online.

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