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What is the Role of the Pharmacist in Obesity Management?

Katherine S. O'Neal · Kimberly M. Crosby

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Abstract Obesity rates have increased over the last two decades. Based on NHANES data, 68.8 % of US adults are classified as overweight or obese. Obesity increases the risk of diseases and can contribute to increased morbidity and mortality. This review examines studies published in which pharmacists have provided weight management services alone or in a team. The electronic databases OVID Medline, International Pharmaceutical Abstracts and EMBASE (1946–2014) were searched. Nine articles were identified in which pharmacists delivered a weight management service either alone or in a team, and eight studies collected outcomes. Six studies evaluated the participant's weight loss or satisfaction with the service, and two studies evaluated weight loss associated with a meal-replacement program. The outcomes from these studies are limited and while positive, have failed to provide significant evidence of the impact of pharmacists providing these services. More randomized, controlled trials are needed to document weight management services.

Keywords Weight management · Pharmacists · Collaborative practice · Community pharmacy · Roles · Obesity

Introduction

The rates of obesity have increased steadily over the last 20 years. A report from the most recent National Health and Nutrition Examination Survey (NHANES 2009–2010) estimated that 68.8 % of US adults are considered overweight or obese [1, 2•]. Furthermore, extrapolation of this NHANES data suggests that by the year 2030 more than one-half of the US population will be obese [3•]. Obesity rates in children and

adolescents are concerning as well. The prevalence of obesity in children and adolescents during 2009–10 was 16.9 % [1]. The costs associated with diabetes as a disease are staggering. The direct medical costs associated with obesity are estimated in the billions for the US and account for 5–10 % of all medical spending. Worldwide, in countries outside the US, medical costs related to obesity may account for up to 3 % of total medical spending for the country [4•, 5•]. Obesity is associated with substantial increases in risk of diseases such as diabetes and coronary heart disease among others [6]. Obese patients with chronic medical conditions (diabetes, hypertension, hyperlipidemia) had lower scores when measuring health-related quality of life. Despite these poor health outcomes seen in overweight or obese patients, only one-half of patients with diabetes, hypertension or hyperlipidemia receive counseling on diet and/or exercise by their primary care provider [7, 8]. There is a specific need for patient education and counseling on diet and exercise. Average weight losses of 2.5 to 5.5 kg in overweight and obese adults can decrease the risk of developing type 2 diabetes. Modest weight loss can improve dyslipidemia by decreasing LDL-C and triglycerides and increasing HDL-C. The US Department of Health and Human Services recognized obesity as an important risk factor for development of disease and co-morbidities by extending coverage to Medicare patients for intensive behavioral therapy (IBT) for obesity [9, 10].

When Hepler and Stranded defined the term “pharmaceutical care” they described an expanded role of the pharmacist as an overseer of medication therapy and disease outcomes to improve the patients' quality of life. The numbers and types of pharmaceutical care services provided by pharmacists have grown since this first definition of the term in the 1990s [11]. Medication management and education programs studied have documented that pharmacists can play an integral role (independently or as part of a care team) in improving disease outcomes [12]. The evolution of pharmaceutical care services has called for the expansion of the pharmacists role to include prevention of disease and public health concerns [13, 14•]. In a policy statement the American Public Health Association

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endorsed the role of the pharmacist in promoting and advancing public health through improving pharmacotherapy, improving access to care and health education, and provision of preventative health services [15]. Medication therapy management programs in which pharmacists have provided care in diabetes, hyperlipidemia and hypertension involve educating patients on diet and lifestyle changes to maintain a healthy weight. Thus, obesity services are a logical extension for these pharmaceutical care services. Weight management services present a potential opportunity for pharmacists to impact public health [16].

The 2013 Obesity Guideline developed by the American College of Cardiology, American Heart Association and The Obesity Society stresses that more research is needed to determine the optimal types of lifestyle interventions for treatment of obesity and the locations for these interventions. Pharmacists, specifically in community pharmacy settings, can demonstrate an important role in providing this care. The factors and considerations influencing pharmacists in providing weight management services and several studies in which pharmacists have provided weight management services are discussed in this review article.

Overview: Considerations and Barriers to Implementation of Service

There are several factors to consider when exploring the potential opportunities for pharmacist involvement with weight management services. These factors include 1) level of involvement or role with a service; 2) basic background knowledge of obesity both as a disease state and the health risks associated with it; 3) additional training that may be required to provide the service; and 4) legal considerations or scope of practice agreements that may or may not be required by the individual states. While these considerations are necessary for background preparation in developing the service, they can also serve as barriers, in addition to many other barriers that may exist, to implementing the weight management service.

Pharmacists' Role

In addition to the extensive training in pharmacotherapy, pharmacists, as previously discussed, are becoming more integrated into a variety of pharmaceutical care services and in providing point-of-care testing. Pharmacists are in a unique position, specifically, to provide weight management services [17–19, 20••, 21]. While working with patients with type 2 diabetes, for example, pharmacists most likely integrate, directly or indirectly, discussions on physical activity and weight loss. These discussions can be complimented with common point-of-care devices such as weight scales, height

measures, measuring tape, body composition analyzers, pedometers, blood pressure/heart rate monitors, and calorie counters. In addition, patients often perceive pharmacists as the 'medication experts' and may ask for assistance with over-the-counter products such as vitamins, herbals, supplements, or nonprescription drug options specifically marketed for weight loss such as Alli (orlistat). Lastly, as highlighted in a recent Gallup poll, pharmacists are more accessible than most healthcare providers and highly trusted by patients, second only to nurses [22].

Regardless of the practice setting, there are several different roles pharmacists can take in providing weight management services [21]. At the lowest level of commitment, pharmacists can provide information and recommendations on both over-the-counter products as well as prescription medications. At a higher level of commitment, pharmacists can utilize point-of-care devices and provide more direct weight management services separately or in conjunction with other disease state management programs. These types of services can include collaborations with physicians and dietitians in which patients are referred from one provider to the other or a partnership in which all are directly involved with the service. Either approach can be provided via individual sessions or through group sessions and can be offered as a 1-time session or, of more likely a benefit, over several sessions. Examples of potential service offerings include patient weigh-ins, blood pressure monitoring, motivational behavioral counseling, education sessions on various topics (e.g., reading nutrition labels, health risks associated with obesity), nutrition and exercise support, and medication monitoring.

Knowledge and Training

Despite the awareness of obesity as a health epidemic and desire to expand clinical services, attitudes vary in regards to provision of weight management services [19, 23, 24••, 25, 26••, 27]. Baseline knowledge regarding obesity management, including nutrition, physical activity, and pharmacotherapy, and health risks associated with obesity should be an expectation for anyone providing weight management services [10]. Studies vary in their findings on the training pharmacists received while in pharmacy school. Most pharmacists surveyed agree that little training was received while in pharmacy school on weight management services [26••]. The limited studies that are available involving pharmacists in weight management have found conflicting data on pharmacists' perceptions of their knowledge or medical expertise and the training needed to appropriately counsel and give patients advice on weight management [19, 23, 24••, 25, 26••, 27]. A survey of Texas community pharmacists found that while most felt comfortable counseling patients on weight management, they did not feel confident in their ability to achieve positive outcomes for the patient [25]. This perception was

related to the years in practice. The longer they were in practice, the more they felt they could achieve positive outcomes for the patient without medication involvement. Overall, however, they felt more confident in achieving outcomes for patients when medications were directly involved. Similarly, Dastani et al. [27] found that pharmacists were more likely to counsel patients on disease states if it involved medication-related information (e.g., use, adverse effects) vs. use of supplements or lifestyle related concerns that were more in the patient's control. Overall confidence in providing the service varies. While the pharmacists surveyed in the Texas study were more confident the longer they were in practice with their ability to counsel patients about obesity, the pharmacists surveyed in Scotland were less confident the longer they had been in practice [25, 26••]. The authors concluded that this could be due to general comfort level in counseling patients on obesity or lack of training or formal education in providing clinical pharmacy services [26••]. Other areas of perceived training needs identified by pharmacists include physical assessment skills (estimation of body fat, measurement of cholesterol), consultation skills, and advice on weight-loss drugs [26••]. Those studies identifying perceived lack of expertise as a barrier also acknowledged that training would help improve this perception as well as their self-confidence [24••, 25, 26••, 27].

There are several resources for pharmacists to receive additional training in weight management. There are also several published studies that can be used as templates for what has been successfully implemented, national obesity guidelines to provide guidance on evidence-based services, textbooks or 'how-to' books on developing and marketing a service, certification programs for additional credentialing, and continuing pharmaceutical education (CPE) programs available to provide additional focused training on obesity as a disease state or weight management services [23, 24••, 25, 26••, 27–31]. Sarayani and colleagues evaluated three different approaches to providing continuing pharmaceutical education programs in regards to program efficacy and pharmacists' satisfaction [24••]. The study concluded that lecture-based education programs including small group training sessions improved pharmacists knowledge retention and competence. The sessions that were case discussions improved competence only in weight management. Regardless of approach, the study demonstrated that CPE programs are effective approaches to further knowledge.

Legal Considerations

Pharmacists are currently not recognized as providers in most states within the US; hence, pharmacists may or may not be able to bill third party payers directly for a weight management service. Depending on the level of commitment desired for the service, pharmacists may structure the service as a

stand-alone service or work collaboratively with other healthcare providers. In many clinical scenarios, pharmacists are working collaboratively with a healthcare team and operating under a scope of practice agreement. Pharmacists are encouraged to review their individual state laws regarding pharmacist managed services, scope of practice agreements and potential billing opportunities.

Recognizing obesity as not only a disease but a health epidemic, effective in 2011, the US Department of Health and Human Services Centers for Medicare & Medicaid introduced a new policy allowing for more opportunities in the treatment of obesity for Medicare beneficiaries [16, 32]. With this policy, Medicare covers intensive behavioral therapy for obese patients defined as BMI > 30 kg/m². The covered therapy includes screening for obesity, nutritional assessment, and counseling. While pharmacists are not recognized as providers at the time of this writing, it could be an opportunity that occurs in the future with the achievement of provider status by CMS for pharmacists.

Other Barriers

The survey of Texas community pharmacists identified several perceived barriers to achieving positive outcomes with a weight management service [25]. The top three barriers were lack of time (77 %), lack of patient demand/expectations (56 %), and lack of reimbursement (49 %). The study also found that some barriers were related to the confidence of the pharmacist in achieving positive outcomes. For example, those pharmacists that identified lack of privacy as a barrier (42 %) also were less confident in delivering the service. On the other hand, pharmacists that perceived lack of time and lack of reimbursement as barriers were also the ones that had higher confidence in counseling patients on obesity. The study by Newlands and colleagues also identified lack of reimbursement (76 %) as a top three barrier in addition to workload concerns (93 %) and need for additional staff (60 %) [26••].

Workflow, staffing requirements, and time management can be classified as pharmacy operational concerns that upper management can choose to address and make a priority. The other top barriers, lack of patient demand/expectations and lack of reimbursement, are addressed next. The available studies are conflicting on patient perceptions and expectations of pharmacists. Some studies support the conclusion that patients, as well as pharmacists, view pharmacists as 'medication experts' and not as experts in chronic health conditions such as obesity and that there was a lack of awareness from patients on what pharmacists could provide [23, 25, 26••, 33, 34••]. However, another study that surveyed of 181 community pharmacy patients found that 13 % of the patients were willing to utilize pharmacists for weight management services and pay out-of-pocket for the services [35•]. The top strategies pharmacists found to be critical in overcoming service

implementation barriers were creating patient awareness of pharmacist provided weight management services and increasing knowledge about obesity [25, 34••].

Creating a financially viable, cost-effective service is critical for long-term sustainability. Several different approaches have been described in the studies outlined in this review [18, 21]. The approaches range from a one-time registration fee, charging a fee for each session, providing the service free of charge, and grant funding. Additional studies should be conducted to evaluate the cost-effectiveness of pharmacists managed weight management services especially in the event pharmacists receive provider status recognition.

Review of Practice Models Provided by Pharmacists

There is limited data regarding the role of pharmacists in weight management clinics as well as the effectiveness, clinical outcomes and financial viability, of these services. A comprehensive literature search identified two major themes: pharmacists-managed community based-services and collaborative practice clinics. Most services had the pharmacist involved in nutrition counseling, physical activity recommendations, motivational/behavioral counseling, goal setting and monitoring, blood pressure and cholesterol screening, or medication/supplement use recommendations and/or monitoring. Most of the programs incorporated a lengthier initial consultation visit and then multiple follow-up visits, shorter in duration, until patients met their goals. Additionally, almost all pharmacists self-trained by independently reading literature on weight management. These studies demonstrate that pharmacists can successfully implement a weight management service and that there are several different approaches, with positive patient outcomes, that can be used. The pharmacist's role in the approaches described below range from behavioral counseling with lifestyle education to medication/supplement monitoring. Table 1 summarizes the roles and outcomes achieved by the services described below.

Community Pharmacy Based Services

As far back as the late 1990s and coinciding with the paradigm shift in pharmaceutical care, there is documentation of community pharmacists and weight management services [44, 45]. An independent pharmacy owner developed a weight management service after realizing many patients were asking for weight loss advice [44]. Participants paid a fee upfront for each individual visit. An initial consult was done to provide a diet assessment and plan. Participants were also screened prior to being 'admitted' into the full service to assess motivation and, essentially, stage of change. Follow-up 5-minute visits took place weekly until the participant's target weight was

achieved. Using the guidelines developed from the American Dietitians Associations and a contracted dietitian for assistance, the weekly sessions included a weigh-in, food diary review and counseling on behavioral modifications for diet and exercise. The pharmacist only enrolled 12 participants at one time to keep the service manageable.

A community pharmacy in Iowa evaluated the outcomes achieved for two different approaches to weight loss, meal replacement vs. a reduced calorie diet, to determine if a pharmacist could be successful in providing the service and if one method was better than the other [37]. The meal replacement (MR) required patients to substitute two of three meals with the MR product. Participants enrolled in the weight management program were randomized into one of the two approaches. Participants were recruited through in-store advertising and radio/print advertising. Ninety-five participants were recruited and 88 completed the program. The study evaluated an active 12-week weight-loss phase and a 10-week weight-maintenance phase. During the weight-maintenance phase, participants were given flexibility to construct their own plan based on what they learned in the program, which the study concluded was effective. The initial pharmacist-led visit was 45-minutes in duration and included a physical assessment (e.g., blood pressure, weight, lipid panel, blood glucose, and waist circumference), self-assessment questionnaire, including detail on history of weight loss, current diet, current level of physical activity, and, finally, plan of action for dietary intake, physical activity, and behavior modifications. Follow-up visits were 15-minutes in length and took place every two weeks for a total of 13 visits. At these visits, weight and waist circumference were measured along with blood pressure. The pharmacists also reviewed adherence, food and activity diaries, and other challenges and provided recommendations. A repeat lipid panel was obtained at the 12 and 22-week marks. The study demonstrated that both methods were effective and could be successfully managed by pharmacists.

Looking specifically at patients who have been prescribed drug therapy, orlistat, for weight loss, Malone and colleagues [38] evaluated the pharmacists' impact on providing support for these patients. Pharmacists were provided a 1-day training seminar in obesity management. The 30 participants in the study were recruited through an outpatient nutrition clinic associated with a teaching hospital and divided evenly into either a control group or intervention group. All participants received clinical assessments and their prescription from the nutrition clinic; however, the participants in the intervention group received additional 'focused' counseling from the pharmacist with each monthly refill, through a scheduled appointment, about orlistat, about any adverse effects that were experienced, and counseling on dietary information. The participants that had the help of a pharmacist stayed on drug therapy longer and were more successful with weight loss. Also using

Table 1 Descriptive summary of studies integrating pharmacists in weight management

Author	Design	Intervention	Total participants (n) enrolled	Patient outcomes
Community pharmacy based weight management pharmaceutical care services				
Bescoby [36]	6 month, pre/post study	Weight management pharmaceutical care program	21	Participant satisfaction with the program
Ahrens [37]	12 week, randomized, controlled, open-label study	Meal-replacement program with a conventional weight loss diet comparing outcomes for participants on a reduced calorie diet to those on a meal replacement product	88	Phase 1: Meal replacement: avg 4.90 kg avg weight loss; reduced calorie diet: 4.30 kg avg weight loss Phase 2: Meal replacement: additional 0.7 kg, total 5.2 kg weight loss (6.36 % decrease from baseline); reduced calorie diet: additional 0.9 kg, total 4.3 kg weight loss(5.63 % from baseline)
Malone [38]	Pre/post study	Pharmaceutical care services provided for patients on orlistat therapy	30	Control group: 0.5 kg avg weight loss Intervention group: 2.5 kg avg weight loss Participants in the intervention group stayed on therapy on average 18.5 weeks vs. 7.8 for the control group
Botomino [39]	1 year ,stratified, randomized pre/post study	Weight management counseling (standard, intensive, high risk) provided to patients in a nationwide diabetes screening campaign	3,800	≥5 % initial body weight lost in: 16.7 % standard counseling pts; 24.5 % intensive counseling pts; 24.5 % high-risk counseling pts (p<0.05 High risk vs intensive and standard groups)
Morrison [40•]	12 month, pre/post study	Weight management pharmaceutical care program	458	10.2 % of participants enrolled for 12 months (n=314) achieved ≥5 % weight loss from baseline.
Winter [41]	24 week, pre/post study	Weight management pharmaceutical care program	60	18 participants completed 24 weeks in the program. 1.82 kg avg weight loss per patient
Weight management programs involving pharmacists				
Lloyd [18]	Pre/post retrospective study	Pharmacist-led weight management program provided to university employees	289	3.6 kg avg weight loss/participant 1 % change in BMI averaged
Malone [42]	20 week, pre/post study	Multidisciplinary, weight management program	90	After 20 weeks, average participant weight loss was 17.1 %
Milton-Brown [43•]	6 month, pre/post study	Meal-replacement program provided to patients through a hospital outpatient pharmacy	37	Average weight loss 10.2 lbs at 3 months and 14.17 lbs at 6 months

orlistat for drug therapy, Schwartz and colleagues [46] evaluated the role of pharmacists simply providing a focused educational packet with the purchase of orlistat. The packet included information on dietary planning, a fat counter, fat wheel, more detailed instructions on using orlistat (including multivitamin use) and a food diary. Follow-up telephone interviews took place at 14, 30, 60, and 90 days after enrollment. A majority of participants (79 %) used the information packet and 83 % (based on pharmacy weigh-ins) lost weight. The study demonstrated that simply providing additional supplementary material to patients, who are motivated, can be successful.

In conjunction with a community pharmacy screening for type 2 diabetes, Botomino and colleagues [39] evaluated the effectiveness of providing weight-loss counseling immediately after the diabetes screening. The pharmacists received training over two evenings. Patients were either counseled on general lifestyle modifications or, in the more intensively counseled group, nutrition recommendations and goals to achieve target weight loss as well as physical activity recommendations. Those patients categorized at high risk for type 2 diabetes were counseled on general lifestyle modifications and also advised to follow-up with their physician. These counseling sessions were one-time sessions. Patients were followed-up afterwards through mail questionnaires. The high risk group achieved the highest amount of weight loss at each time interval questionnaires were mailed. The intensively counseled group only achieved greater weight loss than the general group at the first time interval. All three groups, however, achieved some weight loss. This study demonstrates that a pharmacist managed weight management service, albeit with limited involvement in this study, can complement existing clinical services for chronic diseases in which weight loss may have direct impact such as diabetes.

Yet another approach to providing services from the community pharmacy is to incorporate an existing, proven weight loss program such as the Counterweight Programme [40•]. Pharmacists in Scotland who participated in this study, which was part of a larger government funded study, received training in delivering the program from dietitians, as well as resources to deliver it and payment for providing it. The program consists of an initial visit and nine 10-30 minute follow-up visits within 12 months. The pharmacies extended their business hours to provide time for these appointments. The initial visit included height and weight measurements. For the follow-up visits, pharmacists provided counseling on nutrition and behavioral changes, established caloric goals and checked weight. Attendance at the pharmacy-based service was comparable to general practice based services and was successful in outcomes achieved.

The concept of a stand-alone pharmacist led weight management clinic was evaluated in a pilot study by Bescoby and colleagues [36]. In this study, the pharmacists provided intensive counseling on healthy eating, exercise, food labels, and energy

balance as well as guidance on weight loss targets. Participants were seen by individual appointments at weeks 1, 3, 5, 9, 13, 17, 21, and 25. Not only did the majority of participants (60 %) achieve weight loss of 5 % or greater, the patients reported that having the service at a pharmacy was a good idea.

Collaborative Practice Clinics

The available literature on collaborative practice clinics is even sparser than that on community pharmacy based services. However, the studies described demonstrate the feasibility and success that can be achieved. Utilizing existing resources and relationships, a pharmaceutical care center was established by the Auburn University Harrison School of Pharmacy and subsequently, implementation of a Healthy Habits Health and Wellness Program targeted towards campus employees and dependents [18, 47]. The service, during the study period, was free of charge but since completion in 2006, charges a fee. The participants were recruited through various direct marketing efforts (radio, newsletters) as well as physician referrals. The service is managed by pharmacy practice faculty, pharmacy residents and pharmacy students. Participants complete an intake form and medical release allowing the pharmacists to obtain medical and laboratory information from their physicians. The participants received an initial 1.5 hour session focused on collecting information that included a thorough medication review, social history, family history, health risks assessment and evaluation of current disease states or medications that may contribute to weight gain or challenges for weight loss as well as an assessment of readiness to change. A physical assessment (height, weight, BMI, body composition analysis, waist circumference, blood pressure, and heart rate) was also completed with the initial visit. A cholesterol panel was obtained at the second visit. Participants were seen every two weeks in 15-minute sessions until target weight was achieved and maintained for three months. The follow-up visits then changed to monthly. If a pharmaceutical intervention was needed, a progress note was forwarded to the patient's physician and followed up with a phone call from the pharmacist. From 1999 to 2006, a total of 289 participants were enrolled and 226 completed the program. The duration of the visits lasted a mean of 26 weeks which included 13 appointments.

A similar collaborative set-up, Winter and colleagues piloted a weight management clinic, 'Waist Management', placed out of a community pharmacy versus a university campus [41]. The clinic design was associated with 1-2 general practices. Patients were referred to the clinic either by the general practice or through self-referrals from advertising posted in the general practice clinics and pharmacies. Very similar to the clinic design at Auburn University [18], patients completed an intake form allowing the pharmacy to communicate and share medical information with the general

practice, and patients were screened for readiness to change to determine eligibility in the service. Over a 24-week period, patients were seen 12 times. The first 8 visits were weekly, and the pharmacists provided education on topics such as healthy eating, exercise and reading food labels. The other visits took place at week 12, 16, 20, and 24 in both group and individual settings. Pharmacists (or support staff) also took physical assessments including height, waist circumference and blood pressure at weeks 2 through 7, 12, and 16. Blood glucose was obtained at week 8 and both blood glucose and cholesterol at week 24. Pharmacists were paid for these sessions in three installments: first visit, week 8 and at the end of service at week 24. During this pilot study, 60 patients were enrolled and ten patients achieved the target weight loss of >5 % at week 12 and two patients achieved a weight loss of >10 % at week 24. Both of these studies demonstrate the successful collaboration with clinics and/or physicians for patient referrals and in achieving positive patient results [18, 41].

Malone and colleagues [42] evaluated a unique multidisciplinary program, the Lifestyle Challenge Program, delivered through an outpatient based hospital setting. The collaborators included a physician specializing in nutrition, a pharmacist, dietitian, exercise physiologist, and a behavioral psychologist. The physician and pharmacist attended a 3-day training session. The physician's responsibilities were patient recruitment, patient care, and physical assessments. The psychologist's responsibilities were patient screening and session facilitation. The pharmacist's responsibilities were patient screening, obtaining past medical and medication history, physical assessments (weight, height, and waist circumference), and patient education. The dietitian provided education topics on nutrition, and the exercise physiologist provided education on exercise. The program was 'educational' in nature and had an overall emphasis on diet, physical activity, and behavioral modifications. Specific topic example included portion sizes, nutrition labels, emotional eating, and drugs that can cause weight gain. Participants were seen in groups of 6-12 in 1-hour sessions over 20 weeks, and were charged a one-time fee of \$200. Each session started with a weigh-in. Participants could keep food and exercise diaries, but no prescribed dietary regimens were given. The unique design of this multidisciplinary program boasts that each health-care professional directly involved with a program can contribute their skill-set in optimizing patient results.

Similar to the approach that Malone and colleagues used with counseling on orlistat [38] and Ahrens and colleagues with the meal replacement product [37], pharmacists with the Harris County Hospital District incorporated both approaches into their design collaborating with the medicine department [43]. Patients that were receiving care from the physician in the institution's weight management clinic were given the authorization to receive meal replacement products from the outpatient pharmacy. The pharmacists were responsible for

verifying enrollment in the clinic before 'dispensing' and conducting a 6-month evaluation to assess weight loss. So, while a small role, this model shows how pharmacists can team up with an existing primary care clinic to help patients with their weight management goals.

Conclusion

With the increased focus on obesity as a health epidemic and the shift in primary care to a patient-centered medical home model, pharmacists are in an even better position to incorporate weight-management into the array of clinical services provided whether through community pharmacies or through collaborative practice clinic. There are a limited number of weight management studies involving pharmacists' services. Studies range from the pharmacist dispensing meal replacement products and monitoring weight loss to providing intensive or high-risk counseling on diet and lifestyle to support the participant in achieving significant and sustained weight loss. Results are varied and show modest weight loss for participants. Most of these studies were descriptive and utilized a pre-post design to analyze participant results. Only two studies utilized a randomized, controlled design with intervention and comparator groups. No studies have sought to show if this may reduce morbidity or mortality related to obesity. Nor have studies that document the economic impact of weight management services by pharmacists been done. Weight management/education is an area in which more studies are needed to demonstrate the role of the pharmacists in improving the health and quality of life for their patients.

Compliance with Ethics Guidelines

Conflict of Interest Katherine S. O'Neal has received grant support from Merck and Co.

Kimberly M. Crosby declares that she has no conflict of interest.

Human and Animal Rights and Informed Consent This article does not contain any studies with human or animal subjects performed by any of the authors.

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- Of importance
- Of major importance

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