

Best Practices in the Veterans Health Administration's MOVE! Weight Management Program

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Background: Obesity is a substantial problem in the Veterans Health Administration (VHA). VHA developed and disseminated the MOVE! Weight Management Program for Veterans to its medical facilities but implementation of the program has been variable.

Purpose: The objective was to explore variation in MOVE! program implementation to identify facility structure, policies, and processes associated with larger patient weight-loss outcomes.

Methods: Qualitative comparative analysis (QCA) was used to identify facility conditions or combinations of conditions associated with larger 6-month patient weight-loss outcomes. QCA is a method that allows for systematic cross-case comparison to better understand causal complexity. Eleven sites with larger outcomes and 11 sites with smaller outcomes were identified and data were collected with site interviews, facility-completed program summary forms, and medical record abstraction in 2009 and 2010. Conditions were selected based on theory and experience implementing MOVE! and were calibrated using QCA methods. Configuration patterns were examined to identify necessary conditions (i.e., always present when outcome present, but alone do not guarantee outcome) and sufficient conditions (i.e., presence guarantees outcome) at sites with larger and smaller outcomes. A thematic analysis of site interview data supplemented QCA findings.

Results: No two sites shared the same condition pattern. Necessary conditions included the use of a standard curriculum and group care-delivery format, and they were present at all sites with larger outcomes but at only six sites with smaller outcomes. At the 17 sites with both necessary conditions, four combinations of conditions were identified that accounted for all sites with larger outcomes. These included high program complexity combined with high staff involvement; group care-delivery format combined with low accountability to facility leadership; an active physician champion combined with low accountability to facility leadership; and the use of quality-improvement strategies combined with not using a waiting list.

Conclusions: The use of a standard curriculum delivered with a group care-delivery format is an essential feature of successful VHA facility MOVE! Weight Management Programs, but alone does not guarantee success. Program development and policy will be used to ensure dissemination of the best practices identified in this evaluation.

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Introduction

Obesity prevalence among national samples of patients receiving care within the Veterans Health Administration (VHA) has ranged from 25% to 35% over the last decade.^{1–5} Current VHA data suggest that the prevalence of obesity among VHA primary care-enrolled patients, which include about 90% of all patients treated in the VHA, is 35%.⁶ The current obesity epidemic poses a serious challenge for the VHA given the well-documented association between obesity and the development of other health problems, including diabetes, heart disease, sleep apnea, hypertension, osteoarthritis, gallbladder disease, and selected cancers.⁷

Effective interventions for treating obesity are available. The VHA developed and disseminated the MOVE! Weight Management Program for Veterans (MOVE!) in 2006 to address the need for evidence-based weight management treatment.^{8,9} MOVE! uses a comprehensive, evidence-based, tiered approach that provides diet and physical activity counseling combined with behavioral modification strategies. The approach is based on the NIH Identification of Overweight and Obesity in Adults Evidence Report,¹⁰ recommendations of the U.S. Preventive Services Task Force,^{11,12} the joint Department of Veterans Affairs/Department of Defense Clinical Practice Guideline for Screening and Management of Overweight and Obesity,¹³ and supplemented by more recent literature (e.g., Diabetes Prevention Program tools).¹⁴

In 2009, the VHA provided care to almost 6 million Veterans through a nationwide network of 153 hospitals and 956 outpatient clinics.¹⁵ Although policy, tools, and a basic framework for the delivery of MOVE! care was developed and disseminated centrally, the implementation of MOVE! at the facility level has been variable because of local tailoring and variability in resources, strengths, and constraints. Although variation in practice generally is not favored within healthcare settings, in the case of MOVE!, it offered the opportunity to identify best practices for achieving better patient outcomes in real-world clinical settings. The primary objective of this evaluation was to identify MOVE! structure, policies, and processes associated consistently with larger patient weight-loss outcomes. The inclusion of which program structures, policies, processes to examine were derived from implementation science conceptual models and clinical program features consistently identified as effective in research studies.^{10,11,16} The purpose for identifying best practices is to improve MOVE! care by informing the development of future national policy, tools, and resources.

**See
Commentary
by Green
in this issue.**

Methods

Qualitative comparative analysis (QCA) was selected to evaluate potential MOVE! best practices, and a glossary of terms associated with QCA is provided in Appendix A (available online at www.ajpmonline.org). QCA is a comparative analytic method informed by set-theoretic assumptions that allows for systematic cross-case comparisons across a small to intermediate number of cases and is a bridge between quantitative and qualitative techniques.^{17–19} QCA differs from purely qualitative case-oriented methods, which generally focus on each individual case at the expense of cross-case comparison. QCA also differs from purely quantitative or variable-oriented research by requiring familiarity and in-depth knowledge of each case, which naturally limits its application to a small to intermediate number of cases where probabilistic methods cannot be used and is a good method for analyzing small to medium N data sets.

In QCA, cross-case comparisons are performed systematically to examine configurations of conditions (i.e., variables or determinants) while respecting the diversity and heterogeneity of cases. It is useful for studying causal complexity—when outcomes may be explained by multiple conditions and combinations of conditions.^{17–19} QCA has been used profitably to study other organizational contexts. Recent studies have examined complex processes like the role of critical pathways in reducing length of stay following surgery, strike occurrence in workplaces, and the spiritual dimensions of nursing in a research hospital.^{20–22} The QCA was supplemented with a thematic qualitative analysis that came from site interviews. These themes provide examples for the configurations of conditions that emerged from the QCA.

Facility Selection

Twenty-two facilities were used in this analysis conducted in 2009 and 2010. The number was due to practical constraints related to project resources. In QCA, cases are selected based on a predefined outcome and selection is nonrandom and iterative; that is to say, it is not a mechanical process based on strict inclusion and exclusion criteria.^{17,18} Full sample-selection methods are detailed in Appendix B (available online at www.ajpmonline.org) and are summarized briefly here. Facilities were selected into one of two groups based on facility-aggregated patient weight-loss outcomes. Patient weight data were obtained from the VA Corporate Data Warehouse, which receives regular electronic extracts of vital signs recorded in the VHA's electronic medical record, and the percentage of MOVE!-treated patients achieving a 5% or more body weight loss and mean percentage body weight change at 6 months were calculated for each of 239 facilities eligible for selection.

Facilities were rank-ordered from highest to lowest on both measures, and the sum of facility rankings on each metric was used to create an overall facility ranking. Starting from the top of the overall rankings, facilities were evaluated one by one for selection into the group with the largest patient weight-loss outcomes and starting from the bottom of the overall rankings, facilities were evaluated one by one for selection into the group with the smallest patient weight-loss outcomes. In addition to overall rank, the facility's size, complexity, and geography were considered when making selections to ensure a broad representation. The highest-ranked facility had 54.3% of its MOVE!-treated patients achieving a 5% or more body weight loss at 6 months, whereas the lowest one

had 4.3% achieving this threshold. The highest-ranked facility had a mean percentage body weight change of -7.1% at 6 months, whereas the lowest one had a mean body weight change of 0.5% .

Data Collection

A number of domains and potential causal conditions were identified based on evaluation priorities, experience with implementing MOVE!, evidence-based recommendations for weight management, and implementation science theory.^{16,23} These domains formed the framework for subsequent data collection. Data were collected from each facility using a program summary form (PSF); in-depth telephone interviews; and a medical record abstraction of patients treated with MOVE! at the facility. On the PSF, each facility described the specific level of effort (full-time employee equivalent, FTEE) by discipline providing MOVE!-related care (e.g., dietitian, nurse, physician or midlevel provider, physical activity specialist, psychologist, other); staff reporting structure (i.e., supervisory and functional organization charts and relationships); and program organization (i.e., patient flow through the program).

Information from the PSF was used to tailor the interview guide for each site. Each facility participated in a 90-minute telephone interview with two evaluation team members. Participants from the facility included the MOVE! Facility Coordinator plus other key program staff. Facilities were asked to provide detailed information about MOVE! with respect to clinical components and strategies used; program structure, policies, and processes; oversight and accountability; quality-improvement efforts; use of data and technology for tracking and monitoring outcomes; resource availability (particularly staffing resources); and challenges.

After the interview was completed, a two-page summary was sent to each facility that highlighted the key information obtained and probed for any areas needing additional clarification. To validate information provided during interviews about clinical components and behavioral strategies used within MOVE!, data were abstracted from electronic medical records of approximately 50 randomly selected patients with at least 2 MOVE! visits during the evaluation period at each facility. The data from the medical record abstraction were used to inform condition calibration described in the next section. Methods used for medical record abstraction are described in Appendix C (available online at www.ajpmoline.org).

Data Coding

After data collection, decision rules for the 17 potential causal conditions were defined for use in the QCA; these are listed in Table 1. A code book was established detailing conditions, decision rules, and data sources to be used for each condition. Two project team members independently coded data collected from each site. A third team member assessed coding quality across the data sources and resolved conflicts.

Data Analysis

Crisp-set QCA (csQCA) was chosen for this evaluation. Crisp-set refers to a QCA analysis with conditions that are calibrated dichotomously. csQCA yields results that are interpreted more easily and are more actionable because they provide a holistic understanding of the multiple causal conditions related to an outcome in a form that is easier to understand than other QCA methods.¹⁹ Using the coded data, each site was calibrated dichotomously as either “having” or “not having” each condition. Calibration involves consid-

Table 1. Seventeen conditions included in the qualitative comparative analysis evaluating the MOVE! Weight Management Program for Veterans

Condition ^a
1. High interface between screening and treatment—use of an orientation session or class between identification of eligibility within primary care clinics and treatment start with the MOVE! program
2. Use of a standard program curriculum with defined length, structure, and content for program delivery
3. Use of a multidisciplinary team approach for providing care that involved a dietitian and staff from at least one other discipline (e.g., psychology, physical activity, medical, nursing, or other)
4. High program complexity—use of a group orientation or some other initial screening and an active treatment phase including a minimum of 8-week group sessions plus a maintenance component or a longer-than-8-week active treatment component
5. Use of a weight-loss maintenance component in the treatment program
6. Use of group care-delivery format; this includes facilities that used predominately group care delivery or a combination of group and individual care-delivery formats
7. High use of structured dietary plans with patients, including feedback on food logs, and specific diet plans for creating calorie deficits
8. High use of structured physical activity plans with patients, including feedback on physical activity logs, assistance with physical activity planning, or a separate physical activity component to the program
9. High use of multiple behavioral strategies, including at least four of the following: skills training, goal setting, problem solving, self-monitoring, stimulus control/cue reduction, positive behavioral reinforcement, relapse prevention, and social support
10. High staff involvement in MOVE! as evidenced by the facility being above the median full-time equivalent MOVE! staff-to-patient ratio over the evaluation period
11. No use of a wait list, as a measure of how facilities managed their supply/demand of resources for providing MOVE! care
12. High Facility complexity—VA Medical Centers and Hospitals were considered high complexity relative to VA community-based outpatient clinics
13. High data tracking and analysis capacity for tracking patient progress and monitoring program outcomes as evidenced by use of MOVE data cube or data extracted from the VHA's electronic medical record
14. Active physician champion involvement in MOVE! program
15. Use of quality improvement (e.g., Plan, Do, Study Act/Lean/Six Sigma/Systems Redesign) for enhancing program and resolving challenges
16. High program accountability to facility leadership and regular internal reporting requirements
17. High program accountability to regional leadership and regular external reporting requirements

^aFurther definition and decision rules for each condition are in Appendix D (available online at www.ajpmonline.org).

VA, Veterans Affairs; VHA, Veterans Health Administration

ering how a site is related to a clearly defined concept defined by specific decision rules.¹⁹

When conflicts between data sources arose (e.g., staff-reported program components versus what was seen in the medical record abstractions), the team discussed which data source would represent more reliably the site's actual practice. This happened in only ten of 440 possible comparisons. Project team members responsible for data collection, data coding, and condition calibration were blinded to the facility selection process and to outcome group assignment in order to minimize bias. See Appendix D (available online at www.ajpmonline.org) for more information on condition calibration.

Once sites were calibrated, a truth table was constructed using Stata, version 11.1. The truth table is used to analyze logical combinations of conditions to determine if specific combinations share the same outcome.¹⁹ Configuration patterns across sites were examined to assess the diversity of sites and determine necessary and sufficient conditions for larger patient weight-loss outcomes. In csQCA, a condition is considered necessary for an outcome if it is always present when the outcome occurs. In other words, the outcome cannot occur in the absence of the condition, but its presence does not guarantee the outcome. A condition or combination of conditions is sufficient for an outcome if the outcome always occurs when the condition or combination is present. The presence of a sufficient condition or combination of conditions guarantees the outcome when the necessary conditions are present. Further explanation of necessary and sufficient conditions is provided in Appendix D (available online at www.ajpmonline.org).

Sites were first examined to identify necessary conditions for larger or smaller patient weight-loss outcomes; then a bottom-up approach was used to identify conditions sufficient for larger patient weight-loss outcomes. When single conditions could not predict the outcome, combinations of conditions were examined two at a time, retaining combinations able to predict the outcome perfectly and preferring those combinations that were able to explain the largest number of sites. When two combinations of conditions both covered the same number of sites, the combination that did not introduce a new condition to the solution was selected (if possible). This ensured the minimum number of solutions possible to describe the sites with larger patient weight-loss outcomes. Combinations were added one by one until all 11 sites with larger patient weight-loss outcomes were accounted for.

The qualitative data captured during site interviews were also examined to identify themes and better understand how sites exemplified the best practices identified with the QCA. To do this, qualitative data from each site were compiled and the commonalities and differences across sites were examined using standard qualitative analytic techniques, such as reviewing data to identify common themes, matching themes to conditions, and examining themes across cases.²⁴

Results

The truth table (Appendix E, available online at www.ajpmonline.org) generated after calibration revealed maximum diversity in that no two sites shared the same pattern of conditions. No single conditions or combinations of conditions were identified as both necessary and sufficient. Two conditions were identified as necessary for larger patient weight-loss outcomes: the use of a stan-

dard curriculum for program delivery and the use of a group care-delivery format. That is to say, facilities that did not use a standard curriculum or used only an individual care-delivery format were guaranteed to have smaller patient weight-loss outcomes ($n=5$).

Among the 17 sites (11 with larger weight-loss outcomes and six with smaller outcomes) with both necessary conditions, no single conditions were sufficient to predict larger patient weight-loss outcomes. However, four combinations of conditions or "solutions" were identified that accounted for or "covered" all 11 sites with larger patient weight-loss outcomes. Figure 1 depicts how the four solutions covered all 11 sites with some sites covered by more than one solution. Nine of the 11 sites were covered by three solutions, which covered five sites each. The fourth solution covered three sites, including the two sites not covered by the first three solutions. Table 2 provides the raw and unique coverage for each sufficient solution. These coverage estimates suggest that the solution of high program complexity and high staff involvement has the most empirical relevance. Table 3 provides a summary of the necessary and sufficient conditions for larger and smaller patient weight-loss outcomes.

The qualitative data captured during site interviews were examined to understand further how sites that fell into each of the four solutions exemplified those conditions. Sites covered by the high program complexity and high program staff involvement solution had programs with prolonged and multiple contacts with patients. All sites either offered programs that were longer than 8 weeks in duration or offered monthly support group or maintenance sessions. In addition to an increased number of staff providing MOVE! care, staff members had detailed roles that were well defined and coordinated with other staff roles.

The five sites in this solution had multiple points of involvement with patients, which often included an orientation session, reviewing of food or activity logs with patients, and group sessions led by a rotating team of multidisciplinary staff. The three sites in the solution that included a combination of quality-improvement strategies and absence of a waiting list appeared to monitor patient volume and adjust the program accordingly to either increase the number of patients receiving treatment or to add additional treatment service options to meet increased demand. Overall, relatively few sites had experience applying quality-improvement strategies specifically to MOVE!.

Twelve sites had an active champion, but as the QCA demonstrated, the presence of an active champion alone was not the single critical factor for achieving better outcomes. The solution that included a combination of an active physician champion and low accountability to fa-

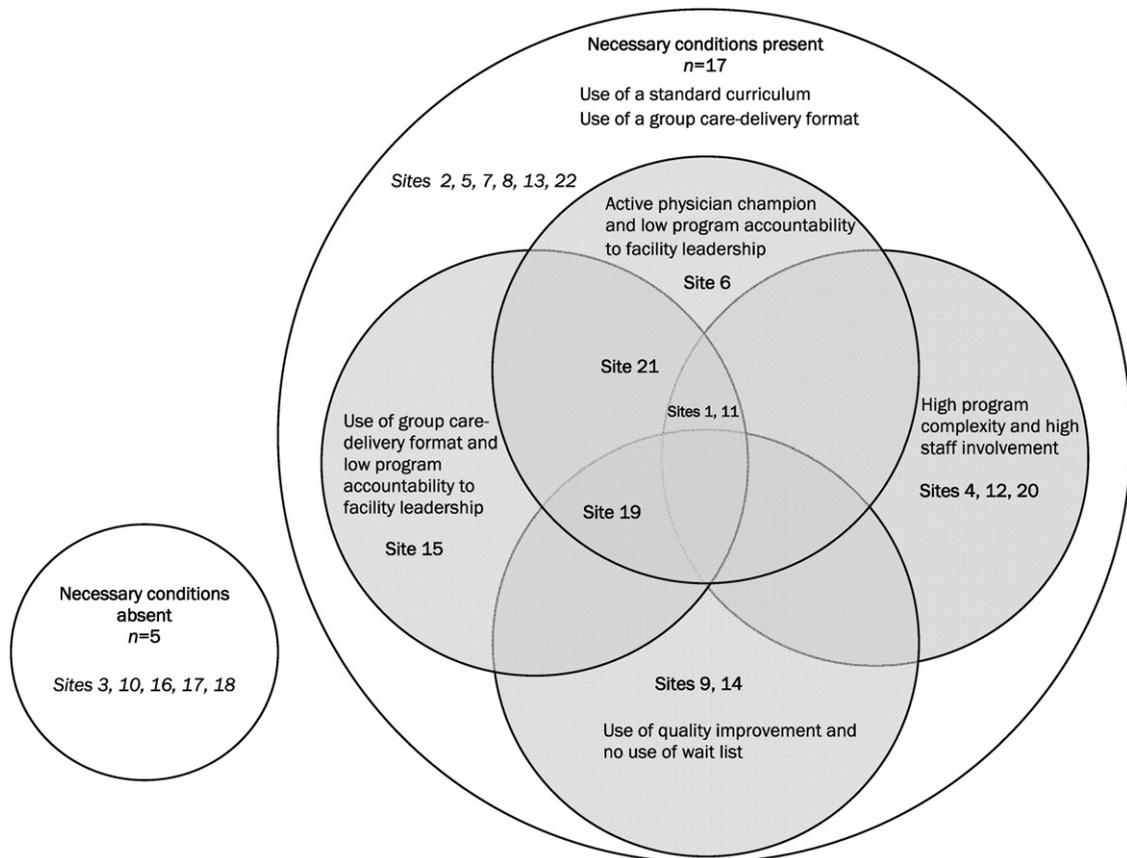


Figure 1. Site distribution results among the two necessary conditions and four sufficient combinations of conditions
Note: Sites with larger patient weight-loss outcomes are identified with bold type; sites with smaller patient weight-loss outcomes are identified with italic type.

cility leadership was exemplified by sites that reported having physician champions that were knowledgeable about MOVE!, actively shared information with supervisors and other departments, sought resources, and helped develop local program policy and procedures. Many champions were also engaged in MOVE! patient care; they taught group sessions and/or counseled individual patients.

Lastly, the solution that included a combination of low program accountability to facility leadership and a group care-delivery format covered five sites, but uniquely covered only one site. This site reported being a highly self-motivated program with collective goals and a high degree of staff engagement and interaction with other departments. At this site, group care delivery was the main form of treatment, with individual care used to provide maintenance support after completion of the structured group curriculum.

Discussion

In this evaluation, an innovative technique to identify best practices associated with achieving larger patient weight-loss outcomes in the MOVE! Weight Management Program

for Veterans was used. Effective behavioral, medical, and surgical clinical interventions have been identified through clinical research and much is known about patient factors associated with successful weight loss by individuals, but less is known about the organization and delivery of obesity care within real-world clinical systems and their impact on overall program success. Thus, this evaluation represents a unique contribution. The use of a standard curriculum and providing care with a group-based component were essential features of successful MOVE! programs; however, they alone do not guarantee success. Additional sufficient features were identified, but the solution with the most empirical relevance was the one that included high program complexity and high staff involvement. Features of programs with high complexity exhibited a high level of contact with patients by multiple staff and at multiple points of care. Further, the staff-to-patient ratio providing MOVE!-related care at these sites was above the median for all sites evaluated.

A surprising result was that the condition of low program accountability to facility leadership was identified as part of the combination for two of the four sufficient solutions because formal accountability is part of VHA

Table 2. Raw and unique solution coverage of the four sufficient-condition combinations identified in the qualitative comparative analysis, n (%)

Solution	Raw coverage ^a	Unique coverage ^b
4. High program complexity and 10. High staff involvement	5 (45)	3 (27)
15. Use of quality improvement and 11. No wait list	3 (27)	2 (18)
14. Active physician champion and 16. Low program accountability to facility leadership	5 (45)	1 (9)
6. Use of group care-delivery format and 16. Low program accountability to facility leadership	5 (45)	1 (9)

^aRaw coverage indicates the proportion of facilities with larger patient weight-loss outcomes that were “fully in” the two conditions that made up the solution. All facilities with larger patient weight-loss outcomes were covered by one or more of the identified sufficient combinations of conditions, and this is referred to as 100% total solution coverage.

^bUnique coverage indicates the proportion of sites with larger patient weight-loss outcomes that are covered by only that particular solution.

culture. This finding may be an artifact of having an active physician champion and robust program where the need for formal reporting and accountability may be precluded; or the lack of accountability may free program staff of administrative tasks to attend to clinical care. One of two sites uniquely covered by this solution reported having highly motivated and informally accountable staff and the other site had an active physician champion.

Only three sites were covered by the solution that included the use of quality-improvement strategies and no waiting list, but two of these three sites were not covered by any other solution so the authors felt it was important to identify a possible path to success with MOVE!. Increasing the use of quality-improvement strategies is an area of opportunity for MOVE! and could be applied to either clinical or administrative challenges faced by programs.

Policy and Program Implications

Generally, necessary conditions identified from QCA can be used to prevent unintended outcomes. For example, if a condition is identified as necessary in leading to patient harm or medical error, then policy, system redesign, or other measures can be put into place to remove the condition. Removal of a necessary condition effectively guarantees that the bad outcome will not occur.¹⁷ However, for MOVE!, mandating the necessary conditions by policy alone will not guarantee better patient outcomes. Fo-

cus on both the necessary conditions and sufficient combinations of conditions should provide a more definitive roadmap to better patient outcomes. Over the next year, all VHA sites will be asked to incorporate a standardized, group-based curriculum (available at www.move.va.gov/GrpSessions.asp) if one is not already in place. Further, the use of a standard, group curriculum likely will become policy or a reporting metric in future years.

Basic training and resources for providing MOVE! care are available to staff, but this may not be enough to provide the degree of program complexity and amount and type of staff involvement required for a successful program. A program development approach with facilities will be used to implement one or more of the sufficient solutions identified. This includes shoring up gaps in staffing, offering models for physician champion involvement, developing models for orientation and maintenance sessions, and providing education and training

Table 3. Combinations of necessary and sufficient conditions identified at sites with larger and smaller patient weight-loss outcomes

Sites with largest patient weight-loss outcomes	
Necessary conditions ^a	Sufficient conditions ^a
2. Use of a standard program curriculum 6. Use of a group care-delivery format	14. An active physician champion in combination with 16. Low program accountability to facility leadership 4. High program complexity in combination with 10. High staff involvement 6. Use of a group care-delivery format in combination with 16. Low facility accountability 15. Use of quality improvement in combination with 11. No use of a wait list
Sites with smallest patient weight-loss outcomes	
Necessary conditions ^a	Sufficient conditions ^a
14. Lack of an active physician champion or 16. High program accountability to facility leadership 4. Low program complexity or 10. Low staff involvement 6. Lack of a group care-delivery format or 16. High facility accountability 15. Quality improvement not used or 11. Wait list used	2. Lack of standard curriculum 6. Used individual care-delivery format

^aThe relationship between necessary and sufficient conditions for each outcome group is one that is provided by Boolean algebra; the inverse of necessary conditions for one outcome group describes the sufficient conditions for the other outcome group.

opportunities in quality-improvement and system redesign strategies. These have been ongoing areas of development but have never been among the highest development priorities.

This evaluation has several strengths. First, it was conducted using an established, clinical program where findings can be translated back directly to program policy and development. The sites included a mix of large, medium, and small medical centers as well as various-sized community-based outpatient clinics. The method used was ideal for studying complex phenomena and causal complexity, where it is very possible that multiple conditions and in certain combinations lead to certain outcomes, and that no single condition is causal. A robust number of sites were included in this analysis and maximum diversity in the condition configuration patterns was present, which enhances the generalizability of findings. Multiple data sources were used to calibrate conditions, and the team calibrating conditions was blinded to site outcome group assignment to minimize bias.

Several limitations of this evaluation are also noted. Because determining patient weight loss requires tracking patients for at least 6 months, facility outcomes established in the year before collecting data from sites were used. In most sites, the facility structure, process, and policies did not change appreciably between the year outcomes were measured and the year of data collection. In addition, crude patient weight-loss outcomes among MOVE!-treated patients were used for the purposes of facility sample selection. Case-mix adjustment on those outcomes was not performed, nor was a comparison group of nontreated patients at the same facility used to determine relative effectiveness of the program. Weight measurements used in the facility selection process were obtained via electronic extract from the electronic medical records, and facilities vary with respect to the degree to which weights are recorded in data fields amenable to electronic extract.

The QCA technique has been used most widely within the social sciences, with limited application to date within healthcare settings. Dichotomization of conditions required by csQCA may not be ideal for some of the conditions that were evaluated but provided more interpretable results. This was at the expense of being able to capture finer-grained variations in conditions that other QCA methods offer.

This evaluation demonstrates the value in taking a “deep dive” at a limited number of sites to complement existing national program monitoring, which because of the size of the VHA is sometimes superficial and less informative about certain aspects of programs. Best practices for implementing MOVE! were identified and can now be disseminated through VHA policy changes and

program development. Because these best practices were identified within existing clinical programs at VHA sites, use of these best practices throughout the VHA system can translate to better patient outcomes.

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Appendix

Supplementary data

Supplementary data associated with this article can be found, in the online version, at [doi:10.1016/j.amepre.2011.06.047](https://doi.org/10.1016/j.amepre.2011.06.047).

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