

Improving Healthcare Worker Wellness Through a Workplace Weight Loss Challenge: A Quality Improvement Initiative

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Abstract

Background

Overweight and obesity are important health concerns among healthcare providers. Work-related factors, including prolonged sedentary behavior, occupational stress, long working hours, and irregular meal patterns, may contribute to weight gain, highlighting the need for workplace wellness programs that promote healthy eating and physical activity.

Methods

To address this issue, the Department of Nutrition and Dietetics at King Fahad Armed Forces Hospital (KFAFH), Jeddah, designed a comprehensive weight loss program specifically for KFAFH staff, ensuring that they had the resources and guidance needed to achieve and maintain optimal health and well-being. The program aimed to achieve 10% weight loss while increasing awareness of a healthy lifestyle. The very-low-calorie diet (VLCD) with total meal replacement (TMR) program consisted of four phases and lasted 12 weeks. Adherence to the program was monitored, and educational workshops and structured workout programs were provided to participants. To incentivize engagement, participants competed for valuable prizes throughout all phases. The Standards for Quality Improvement Reporting Excellence (SQUIRE) 2.0 guidelines were used to guide the planning and evaluation of this quality improvement initiative.

Interventions

The intervention is designed to provide participants with practical tools and resources, including workshops on nutrition, exercise routines, and meal planning guidance. By fostering a sense of community and encouraging peer support, the project aims to empower individuals to take charge of their health and make lasting lifestyle changes. Ultimately, the “Challenge your weight” project aspires to promote not only weight loss but also improve quality of life and increase physical fitness.

Results

The “Challenge Your Weight” program at KFAFH achieved substantial improvements, surpassing the initial weight loss targets and achieving a significant reduction in the percentage of weight loss among participants. Participants adhered well to the dietary and workout program, resulting in notable improvements in their body measurements and substantial reductions in body composition measures. Additionally, there were marked improvements in lipid profiles and hemoglobin A1C levels. Positive participant feedback underscored the program’s success in enhancing health awareness and promoting a commitment to wellness, with a high percentage of participants reporting increased awareness of healthy lifestyles and eating habits. These findings highlight the program’s effectiveness in fostering long-term health improvements and encouraging sustainable healthy behaviors.

Conclusions

The implementation of a structured weight loss program among healthcare providers demonstrated marked effectiveness in achieving substantial weight reduction, with participants losing over 10% of their body weight, accompanied by notable improvements in metabolic health markers. The program not only emphasized dietary modifications and physical activity but also incorporated behavioral strategies to foster long-term lifestyle changes.

How to cite this article

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Introduction

Problem description

The prevalence of obesity and overweight among healthcare providers has reached alarming levels. Recent epidemiological studies indicate that a significant proportion of healthcare professionals, including doctors, nurses, and allied health staff, struggle with weight management issues. For instance, a study conducted in Saudi Arabia revealed that nearly 40% of healthcare workers are classified as overweight or obese, a concerning statistic given that these individuals are expected to model healthy behaviors for their patients [1]. This paradox not only raises questions about the personal health of these professionals but also highlights a potential disconnect between their lifestyles and the health messages they convey to the community. The sedentary nature of many healthcare roles, coupled with high-stress environments, long working hours, and irregular meal patterns, contributes to this growing issue. As the healthcare workforce grapples with its own weight management challenges, it becomes increasingly difficult for healthcare professionals to advocate effectively for healthy living among the populations they serve.

Available knowledge

The available knowledge surrounding this issue is expanding. A recent systematic review reported an estimated obesity prevalence of 37.8% among healthcare workers in Saudi Arabia [2]. The demanding nature of healthcare jobs can lead to stress and burnout, which are associated with unhealthy eating habits and sedentary lifestyles. Physical inactivity, long working hours, and work-related stress are important factors contributing to the high prevalence of obesity and obesity-related morbidity among healthcare workers. Addressing physical inactivity and obesity is crucial for improving the health of healthcare providers [3].

A number of studies conducted in various healthcare settings have evaluated the impact of obesity on employees' health and work performance. Elabd et al. compared the number of diagnosed obesity-related medical conditions among employees with obesity and those with normal weight, the number of medications prescribed for obesity-related medical conditions, and the number of sick leaves taken per employee between January 1, 2021, and January 1, 2022 [4]. The rate of sick leave was higher among overweight or obese employees. In addition, the authors found a correlation between obesity and the number of sick leaves. Malkin et al. estimated the costs of overweight and obesity-related conditions from a societal perspective [5]. These conditions were estimated to cost a total of \$3.8 billion, equivalent to 4.3% of total healthcare expenditures in Saudi Arabia in 2019. The estimated costs of absenteeism and presenteeism associated with overweight and obesity totaled \$15.5 billion, equivalent to 0.9% of GDP in 2019.

Healthcare organizations play a central role in helping employees adopt healthier lifestyles and maintain a healthy body weight by implementing practices that promote healthy workplace environments. Elabd et al. suggested several approaches, including introducing workplace weight management initiatives to encourage employees to adopt healthier diets and engage in regular exercise, as well as providing healthy food options in hospital cafeterias and on-site vending machines [4]. Additionally, studies indicate that traditional weight loss interventions, which often emphasize individual responsibility and lifestyle changes, may not be sufficiently tailored to the unique challenges faced by healthcare professionals. Instead, there is a growing consensus that comprehensive and supportive weight loss programs incorporating group dynamics, peer support, and workplace wellness initiatives are more likely to yield positive outcomes. This evolving body of knowledge underscores the need for targeted interventions that address not only the physical aspects of weight loss but also the contextual factors that influence the health behaviors of healthcare workers.

Rationale

The rationale for focusing on weight loss challenges among healthcare providers is further strengthened by the goals outlined in Saudi Arabia's Vision 2030 initiative. This ambitious plan seeks to enhance the quality of life for citizens and residents by promoting healthier lifestyles and improving public health outcomes. Engaging healthcare staff in effective weight loss programs aligns with these national objectives, as healthier providers are better equipped to deliver high-quality care and serve as role models for their patients. By fostering a culture of health and wellness within healthcare organizations, such programs can enhance staff engagement, morale, and productivity, ultimately contributing to improved patient care and community health. Furthermore, addressing the weight loss challenges faced by healthcare providers not only supports their personal health journeys but also contributes to the broader goal of reducing the prevalence of chronic diseases linked to obesity within the population.

This study aims to evaluate a structured workplace weight loss program among healthcare workers at KFAFH, with a primary clinical target of approximately 10% body weight reduction over 12 weeks and an educational target of improved healthy eating and meal-planning skills. Secondary assessments include body composition, metabolic markers, adherence and process measures, and participant satisfaction. Additionally, this weight loss challenge program aims to improve wellness and maintain optimal health

among healthcare professionals at King Fahad Armed Forces Hospital (KFAFH) by identifying the root causes of weight gain using quality improvement tools such as fishbone diagrams and 5 Whys analyses.

Materials And Methods

Demographic data

We initially screened 124 participants, of whom 53 were confirmed eligible. The participants had a mean age of 31 ± 9 years, and the majority were male (62.3%). Approximately 19% had prediabetes or diabetes, 5.6% were receiving treatment for hypertension, and 16.9% were receiving treatment for dyslipidemia (Table 1).

Measure category	Outcome measure	Definition/calculation
Outcome measures	Percentage of participants achieving >10% weight loss	Calculated as follows: (Number of participants achieving more than 10% weight loss ÷ Total number of participants) × 100.
	Percentage of participants reporting positive lifestyle changes	Positive lifestyle changes include increased physical activity and healthier eating habits. Calculated as follows: (Number of participants reporting positive lifestyle changes ÷ Total number of participants) × 100.
Process measures	Percentage of weight loss per participant	Calculated as follows: ((Initial weight - Final weight) ÷ Initial weight) × 100.
	WHR	Calculated as follows: Waist circumference ÷ Hip circumference.
	Percentage change in WHR	Calculated as follows: ((WHR after intervention - WHR before intervention) ÷ WHR before intervention) × 100.
	Percentage change in fat mass	Calculated as follows: ((Average fat mass before intervention - Average fat mass after intervention) ÷ Average fat mass before intervention) × 100.
	Percentage of compliance with exercise	Calculated as follows: (Number of participants complying with the exercise program ÷ Total number of participants) × 100. Compliance is assessed based on adherence to the prescribed physical activity program and supported by changes in physical activity indicators, including muscle mass measurements and InBody assessments during each measurement period.
	Percentage of compliance with diet	Calculated as follows: (Number of participants adhering to the prescribed dietary program ÷ Total number of participants) × 100. Dietary compliance is evaluated based on adherence to the prescribed meal replacement protocol and supported by observed changes in weight, fat mass, and WHR during each measurement period.
	Percentage change in InBody score	Calculated as follows: ((Average InBody score after intervention - Average InBody score before intervention) ÷ Average InBody score before intervention) × 100.
Balancing measures	Percentage change in muscle mass	Calculated as follows: ((Average muscle mass after intervention - Average muscle mass before intervention) ÷ Average muscle mass before intervention) × 100.
Staff feedback and engagement	Percentage of participants reporting satisfaction	Satisfaction refers to participants who report that they successfully achieved their goal or express overall satisfaction with the program. Calculated as follows: (Number of participants reporting satisfaction ÷ Total number of participants) × 100.

TABLE 1: Outcome, process, balancing, and participant satisfaction measures of the program.

WHR, waist-to-hip ratio

The implementation of a weight loss program among healthcare workers is a crucial initiative aimed at enhancing both personal well-being and professional efficacy. Healthcare workers, often subjected to high-

stress environments and irregular working hours, may struggle to maintain a healthy lifestyle, leading to increased risks of obesity-related conditions. By integrating structured weight loss programs into the workplace, these professionals can benefit from tailored support that addresses their unique challenges, such as shift work and limited time for physical activity. Furthermore, promoting a culture of health within healthcare settings not only improves the overall wellness of the staff but also sets a positive example for patients, ultimately fostering an environment where health and wellness are prioritized and practiced consistently.

The project was carried out at KFAFH, Jeddah. To the best of our knowledge, this is the first challenge designed to promote a healthy lifestyle and reduce the prevalence of obesity among KFAFH staff. The mission of our organization is to promote a healthy lifestyle among Ministry of Defense personnel and foster a sustainable, healthy community for their associates and families, in alignment with the vision of KFAFH. In support of this mission, the Department of Nutrition and Dietetics designed a comprehensive weight loss program specifically for KFAFH staff, ensuring that they had the resources and guidance needed to achieve and maintain optimal health and well-being, based on the prioritization matrix used to identify gaps for improvement. Various quality improvement tools, such as fishbone diagrams and 5 Whys analyses, were used to identify the root causes of weight gain among KFAFH staff. The aim and drivers of this program are outlined in the driver diagram (Figure 1).

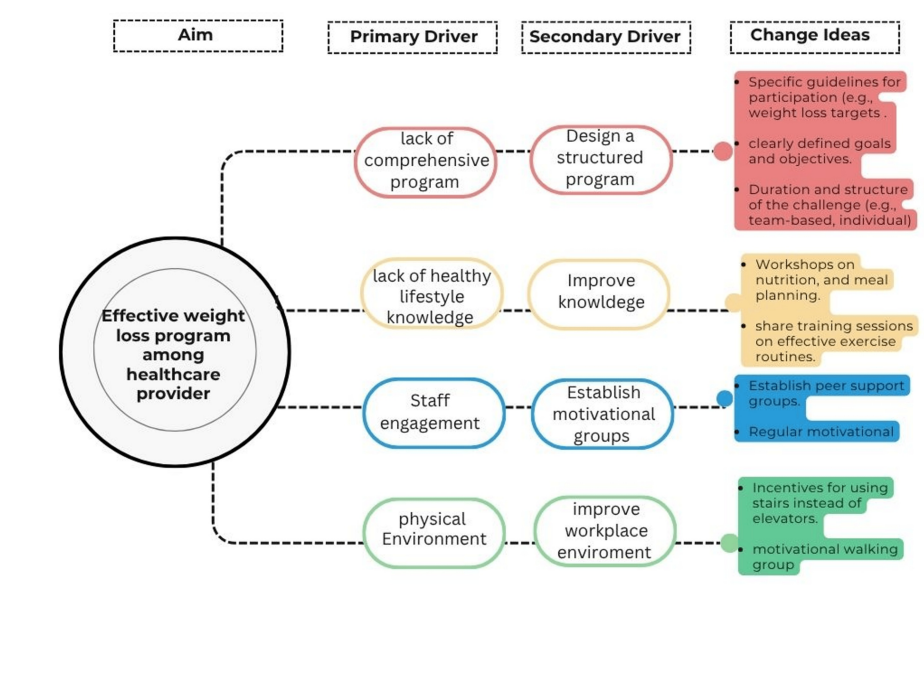


FIGURE 1: Driver diagram of the program.

Driver diagram of the “Challenge Your Weight” program showing the project aim, primary and secondary drivers, and change ideas.

This figure was created using Canva (Canva Pty Ltd., Sydney, Australia).

Study design

This quality improvement study was conducted in accordance with the Standards for Quality Improvement Reporting Excellence (SQUIRE) 2.0 guidelines for reporting healthcare improvement initiatives. The study used a pre-post intervention design to evaluate the impact of a weight loss challenge program on body weight and health outcomes among KFAFH staff. The project was conducted over 19 months, from May 2023 to July 2024. The Plan-Do-Study-Act (PDSA) cycle was used as a quality improvement method for this project.

The PDSA cycles were as follows: Cycle 1 - Plan/Design: formation of the program team; definition of goals and workflow; hospital approval; and determination of participant criteria, consent procedures, timeline, rules, resources, and budget. Cycle 2 - Implementation: participant enrollment, weekly measurements, nutrition education, coaching, physical activity support, online follow-up, and regular progress reviews. Cycle 3 - Sustainability: monthly maintenance follow-up, continued education, and development of a longer-term staff wellness model based on successful program elements.

Baseline data were collected during the preintervention phase. Quantitative and qualitative data were collected for the required measures. The project involved ongoing weekly monitoring of performance measures, followed by the implementation of interventions and action plans as appropriate. Outcomes before and after the program were compared to evaluate the effectiveness of the quality improvement initiative.

Participants and eligibility criteria

The inclusion criteria were employment at KFAFH, voluntary participation, and a BMI of ≥ 27 kg/m². Participants with a BMI of < 27 kg/m² and those with conditions for which a very-low-calorie diet (VLCD)/total meal replacement (TMR) program was considered inappropriate or unsafe, including pregnancy, significant renal or hepatic disease, eating disorders, and other medical contraindications identified during clinical screening, were excluded.

Before enrollment, participants underwent a clinical review that included relevant medical history and comorbidities, physical assessment, anthropometric measurements, body composition assessment using InBody, blood pressure measurement, and laboratory review. Laboratory measures included hemoglobin A1C (HbA1c) and lipid profiles, with available results reviewed through the hospital OASIS system. Participants with medical concerns were assessed and followed up by physicians at the Employee Health Clinic.

We initially screened 124 participants who were KFAFH staff members who had volunteered or registered for the program; they did not represent the entire KFAFH workforce. Of these, 53 were eligible and entered the program. Three participants withdrew early, leaving 50 active participants. Following planned phase-based elimination, 20 finalists remained for the final phase.

Intervention

The program used a VLCD with TMR, consisted of four phases, and lasted 12 weeks (Figure 2). Participants were divided into five groups, each supervised by two clinical dietitians. Online groups were available to participants 24/7 for consultation, motivation, and workout programs. Smartwatches were distributed to record daily step counts (target: approximately 10,000 steps) and sleep duration (measured twice a week). After each phase, educational workshops were conducted, body composition measurements were recorded using InBody, and motivational prizes were awarded (Figure 3). Participants with the lowest percentage of weight loss were eliminated after each phase. The finalist group comprised 20 participants who competed through the first three stages for valuable prizes.



FIGURE 2: Outline of the program and its phases.

Overview of the "Challenge Your Weight" program, illustrating participant selection, program structure, dietary and physical activity interventions, and the sequential phases of implementation.

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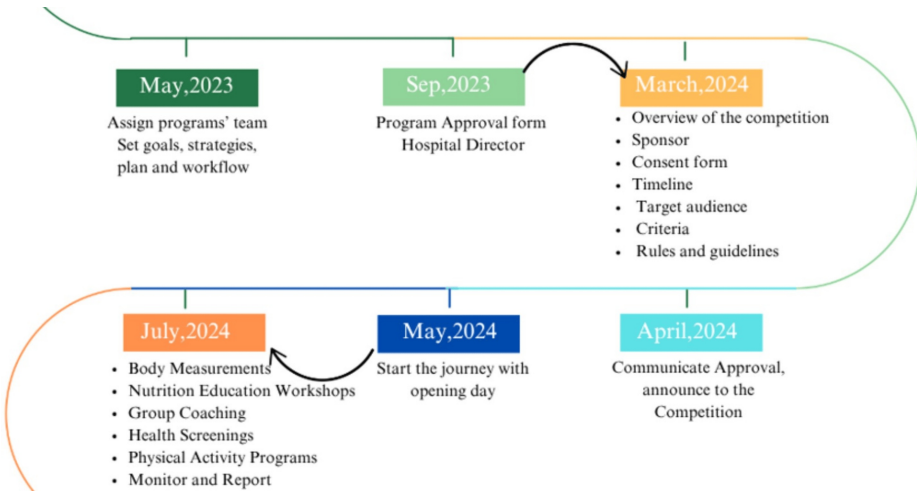


FIGURE 3: Project timeline.

Timeline of the planning, approval, implementation, and monitoring phases of the "Challenge Your Weight" program. The timeline illustrates the key milestones from program planning and administrative approval through participant recruitment, program implementation, and follow-up activities.

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The program used Nestlé Health Science OPTIFAST VLCD TMR products. Products used included strawberry, vanilla, and coffee shakes; high-protein chocolate shake; chocolate and cappuccino bars; and chicken soup. The standard shake and soup products supplied approximately 20 g protein per serving, the bars approximately 21 g protein per serving, and the high-protein chocolate shake 28 g protein per serving. The manufacturer describes OPTIFAST VLCD as a nutritionally complete meal-replacement system providing vitamins, minerals, trace elements, essential fatty acids, and protein. Exact product-specific micronutrient

composition is available in the manufacturer's product information.

No routine additional vitamin or mineral supplementation was prescribed as part of the program. The participants were advised to consume approximately 2 L of water daily. A marked water container indicating the 2-L target was distributed, and daily hydration reminders were provided.

The four phases of the transition protocol were as follows: Phase I - Intensive: approximately 600-800 kcal/day, using three TMR meals per day, with light exercise. Phase II - Transition: approximately 800-1,000 kcal/day, using two TMR meals plus one balanced meal, with exercise two to three days per week and a target of at least 10,000 steps per day. Phase III - Maintenance: approximately 1,000-1,200 kcal/day, using one TMR meal plus two balanced meals, with exercise four to five days per week, including resistance and cardiovascular activities, and at least 10,000 steps per day. Phase IV - Stabilization: approximately 1,200-1,500 kcal/day, using three balanced meals, with exercise four to five days per week and at least 10,000 steps per day.

Educational workshops were delivered before each program phase, with four sessions scheduled and additional sessions provided as needed, particularly during Phase III. Each workshop lasted approximately 30 minutes and was scheduled during staff break times to facilitate attendance. Workshop content included healthy eating, correct use of meal replacements, balanced-meal planning, portion control, calorie calculation, physical activity guidance, and long-term lifestyle strategies. Sessions were facilitated by the Challenge Your Weight clinical dietitian team, with support from the Academic Affairs and Training Center.

Study of the intervention

The intervention and its outcomes were assessed and monitored as follows. Leadership commitment was promoted by ensuring that leadership supported and promoted the weight loss program, demonstrating its importance to the organization's culture. Fostering a workplace culture that valued health and wellness was important for encouraging positive behavioral changes among employees. Weekly meetings were conducted to organize the competition and make the necessary arrangements. A platform was created for employees to track their progress and celebrate milestones together, fostering a sense of community. Success stories and testimonials from employees who participated in the program were shared to inspire others to join. Adherence was monitored through regular dietitian follow-up, weekly measurements, online group support, and program-specific indicators. Medication reviews and adjustments were led by physicians through the Employee Health Clinic.

Regular health screenings were also performed to help employees understand their baseline metrics, including BMI, blood pressure, HbA1c, and cholesterol levels. Body composition was assessed using an InBody analyzer. Anthropometric and InBody assessments were performed during a relatively consistent daytime period, generally during staff break times. Participants were instructed to avoid food and excessive fluid intake for approximately two to four hours before assessment, empty their bladders approximately 30 minutes before measurement, avoid strenuous exercise for at least 12 hours, and abstain from caffeine for approximately three hours. The same InBody device was used throughout the program, and routine calibration and quality checks were performed according to departmental practice. No separate formal clothing-standardization protocol was documented.

Participant feedback was used to continuously improve the program based on employee input and outcomes. Safety was managed as a balancing measure through medical follow-up by Employee Health Clinic physicians. Participants who developed clinically significant symptoms, poor tolerance, hypotension, hypoglycemia, dizziness, or other safety concerns underwent clinical review. Medication adjustments, intervention modifications, or discontinuation were determined by the medical team in collaboration with the clinical dietitians.

At the end of each phase, participants were ranked according to their percentage of weight loss. Those with the lowest weight-loss percentages were eliminated from the competition. No fixed numerical weight-loss cutoff was used. The process continued until 20 finalists remained for the final phase. Decisions were made by the program team according to the competition rules and participants' progress.

Measures

Primary Outcomes

The primary outcomes were to achieve a 10% reduction in body weight for each participant within the three-month program and to ensure that at least 80% of participants could identify healthy eating strategies and demonstrate improved meal-planning skills by the end of the program.

Secondary Outcomes

The secondary outcomes were to achieve an 80% satisfaction rating on post-program surveys assessing

participants' overall experience and perceived benefits; reduce body measurements, including weight, BMI, waist-to-hip ratio (WHR), and fat mass; and improve health metrics, such as lipid profiles and HbA1c levels, to support better overall health outcomes.

Data collection

Data collection encompassed both quantitative and qualitative measures to assess various health indicators. Quantitative data included physical measurements, namely height, weight, and waist, hip, and arm circumferences; laboratory results, such as lipid profiles and HbA1c levels; and body composition data from InBody analyzers, including fat mass, muscle mass, and BMI. BMI was calculated by dividing weight in kilograms by height in meters squared. Qualitative data comprised participant feedback, engagement, and challenges and were collected through comprehensive surveys administered to participants after program completion.

Analysis

Continuous variables are presented as mean $\pm$ SD, whereas categorical variables are presented as frequencies and percentages. Baseline and postintervention continuous variables were compared using a two-tailed paired-samples t-test. Test statistics (t values), degrees of freedom, and p-values are reported for each comparison. Statistical significance was defined as a two-sided p-value of <0.05 . Statistical analyses were performed using Microsoft Excel (Microsoft Corporation, Redmond, WA, USA).

When a participant missed a scheduled assessment, the team attempted to reschedule the measurement at another suitable time. If the rescheduled assessment was not completed, the measurement was left missing; no imputation, substitution of previous values, or last-observation-carried-forward method was used. Withdrawal and planned phase-based elimination were reported as attrition rather than treated as ordinary missing measurements. Analyses used the available observations for each time point and outcome.

Regarding the staff composition of the participants, physicians and administrative staff each accounted for approximately 18.87%, followed by nurses (15.09%), information and communications technology staff (11.32%), support services staff (13.21%), pharmacists (7.55%), specialists (9.43%), and technicians (5.66%). Regarding nationality, 87.0% of the participants were Saudi nationals, while 13.0% were non-Saudi nationals (Figure 4).

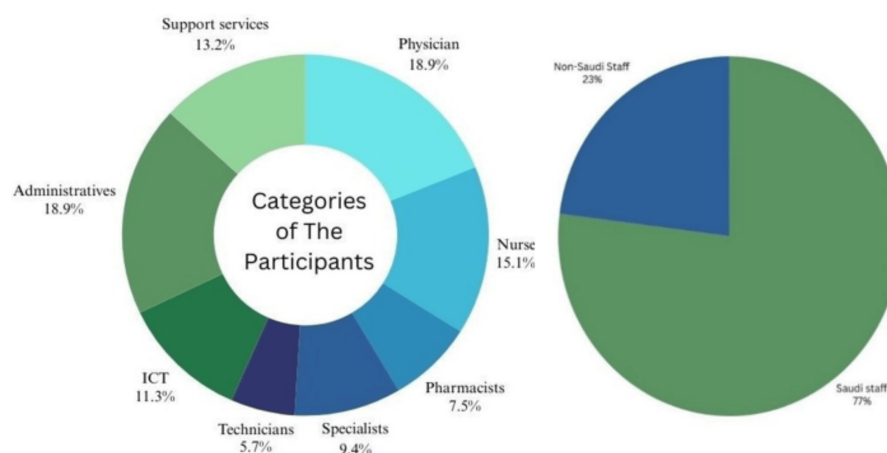


FIGURE 4: Staff composition of the program participants.

ICT, information and communications technology

Ethical considerations

This project was initiated by the Department of Nutrition and Dietetics and was approved by the hospital director and the Institutional Review Board (IRB) at KFAFH on December 9, 2025 (approval no. REC 875). All data collection and analysis procedures were conducted in accordance with the principles of the Declaration of Helsinki and the ethical standards of the IRB to ensure data integrity. All participants signed a consent form before data collection.

Results

Weight-loss outcomes

As shown in Figure 5A, the average percentage of weight loss among all participants increased progressively throughout the program, reaching approximately 13%, which exceeded the program's initial target. A marked increase in weight loss was observed after Phase 3, suggesting improved participant outcomes during the final stage of the intervention. This improvement may be attributed to increased motivation and the program's competitive nature as participants progressed toward the final phase. Additionally, peer support and encouragement within the competitive environment may have helped maintain high levels of engagement and adherence.

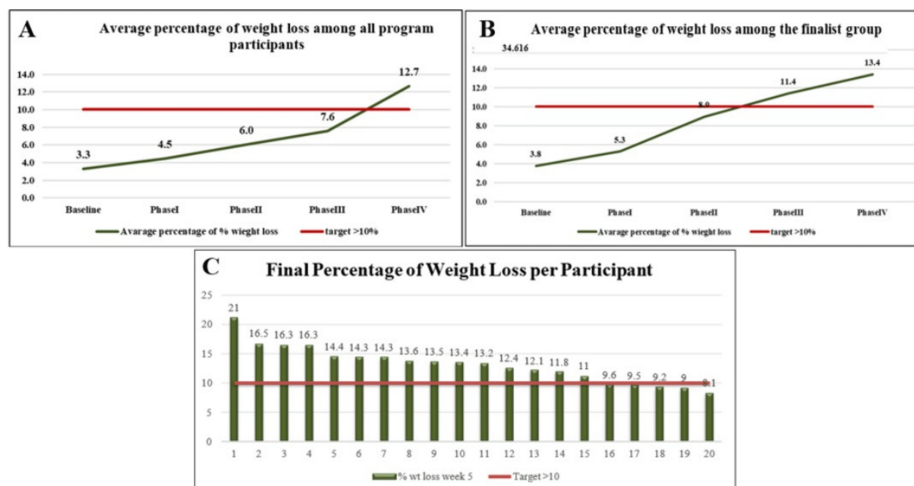


FIGURE 5: Weight-loss outcomes of participants in the “Challenge Your Weight” program.

(A) Average percentage of weight loss among all program participants across the three program phases. (B) Average percentage of weight loss among the finalist group across the three program phases. (C) Final percentage of weight loss achieved by each participant who completed the program.

Among the finalists (Figure 5B), the average weight loss reached 13.4%, surpassing the predefined target of 10%. Notably, the finalists had already achieved the target weight loss by the end of Phase 2, indicating earlier success than that observed in the overall participant group. This early achievement may reflect higher baseline motivation, better adherence to the intervention, or greater engagement with program activities. These findings are consistent with previous studies, including those by Bellanti et al. [6] and Johnson [7], which demonstrated that structured weight-loss interventions incorporating behavioral strategies, regular follow-up, and participant support are effective in achieving clinically meaningful reductions in body weight.

The individual weight-loss outcomes of participants who completed the program are presented in Figure 5C. Considerable variability was observed across participants; however, all completers demonstrated weight reduction. The three highest-performing participants achieved weight-loss percentages of 21.0%, 16.5%, and 16.3%, respectively, reflecting substantial improvements by the end of the intervention.

As shown in Figure 6A, the mean BMI decreased from 34.6 kg/m² at baseline to 29.6 kg/m² after completion of the program, representing a reduction of 4.9 BMI units (approximately 14.2%). This decrease reflects an improvement in participants' weight status and may suggest a reduced risk of obesity-related health complications.

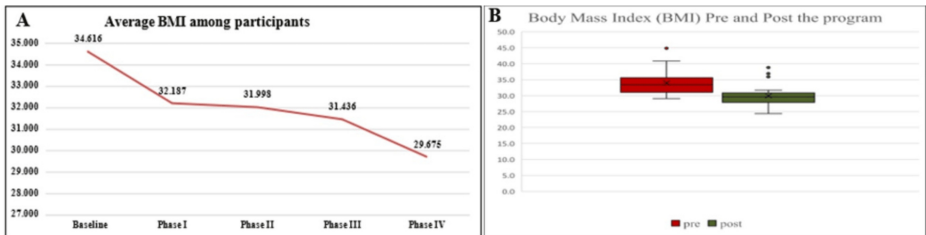


FIGURE 6: Changes in BMI among participants in the “Challenge Your Weight” program.

(A) Mean BMI of participants before and after completion of the 12-week weight-loss program. (B) Distribution of BMI values before and after the intervention, presented as box plots.

Values are presented as mean $\pm$ SD. Comparisons between baseline and post-intervention measurements were performed using a two-tailed paired-samples t-test. A two-sided $p < 0.05$ was considered statistically significant.

The box plot in Figure 6B further demonstrates a downward shift in BMI values following the intervention, with a lower median BMI and an overall reduction in the distribution of BMI values compared with baseline. These findings indicate an improvement in BMI across the participant group following the weight-loss program.

These results are consistent with previous studies. Deshmukh et al. reported a mean BMI reduction of 4.1 points among obese patients participating in a structured weight-loss intervention [8]. Similarly, Bellant et al. observed a 16% reduction in BMI among participants enrolled in an 11-week, multiphase very-low-calorie ketogenic diet program [6]. Collectively, these findings support the effectiveness of structured, multidisciplinary weight-loss interventions in achieving substantial reductions in BMI and potentially improving obesity-related health outcomes.

Changes in body composition

WHR

A reduction in the average WHR among participants was observed after the three-month program (Figure 7). Specifically, the ratio decreased from 0.944 to 0.903, representing a reduction of approximately 4.34%. This change was statistically significant ($p = 0.007$; Table 2).

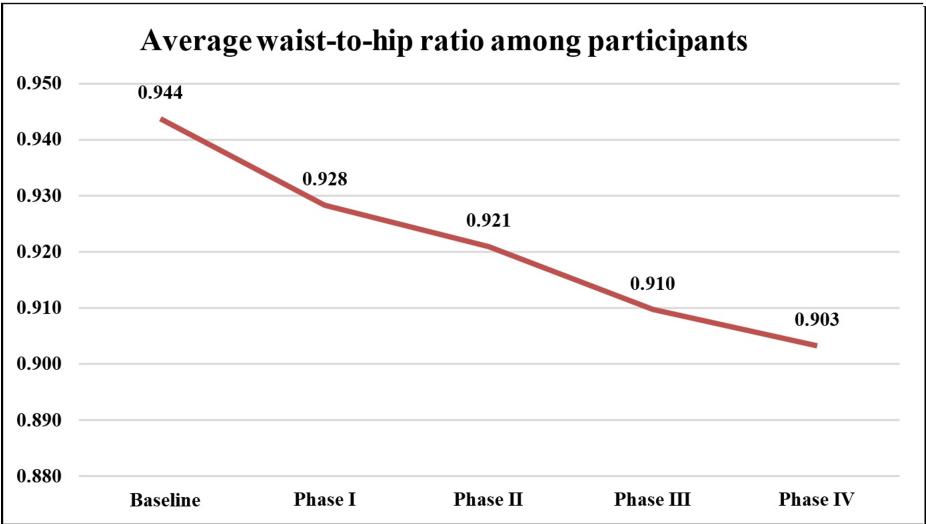


FIGURE 7: Average WHR among program participants.

Values are presented as mean $\pm$ SD. Comparisons between baseline and post-intervention measurements were performed using a two-tailed paired-samples t-test. A two-sided $p < 0.05$ was considered statistically significant.

WHR, waist-to-hip ratio

Table with 6 columns: Variable, Baseline, mean (SD), After six weeks, mean (SD), After 12 weeks, mean (SD), t (df)^a, p-value^a. Rows include WHR, Total body fat mass (kg), and Total body lean mass (kg).

TABLE 2: Changes in body composition throughout the program.

Data are presented as mean (SD).
a p-values and t-statistics represent comparisons between baseline and 12 weeks using a two-tailed paired-samples t-test. Statistical significance was defined as p < 0.05.
WHR, waist-to-hip ratio

These findings are consistent with existing research, which further supports the effectiveness of such interventions in reducing central obesity and improving health markers. Lee et al. demonstrated that reductions in WHR are associated with lower risks of metabolic syndrome and cardiovascular events in adults participating in structured weight-loss programs [9]. Additionally, Park et al. found that lifestyle interventions focusing on diet and exercise significantly decreased WHR, improving insulin sensitivity and metabolic health [10]. Even modest reductions in WHR may provide health benefits, supporting the possibility that the weight-loss program contributed positively to participants' health outcomes.

Body Fat Mass

Mean body fat mass decreased from 40.7 kg at baseline to 30.5 kg after the 12-week program, representing a reduction of approximately 25% (p = 0.007; Figure 8). This finding highlights the potential effectiveness of the intervention in promoting fat loss and improving participants' overall health and well-being.

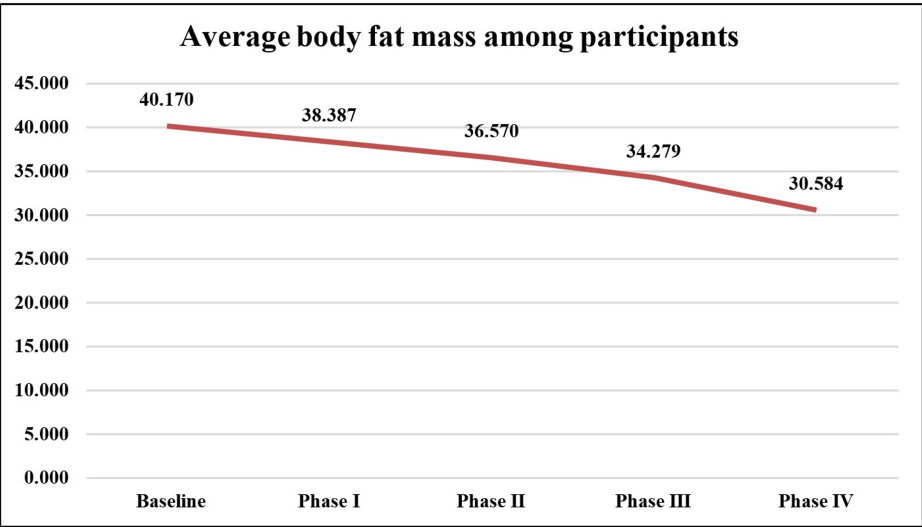


FIGURE 8: Average body fat mass (kg) among program participants.

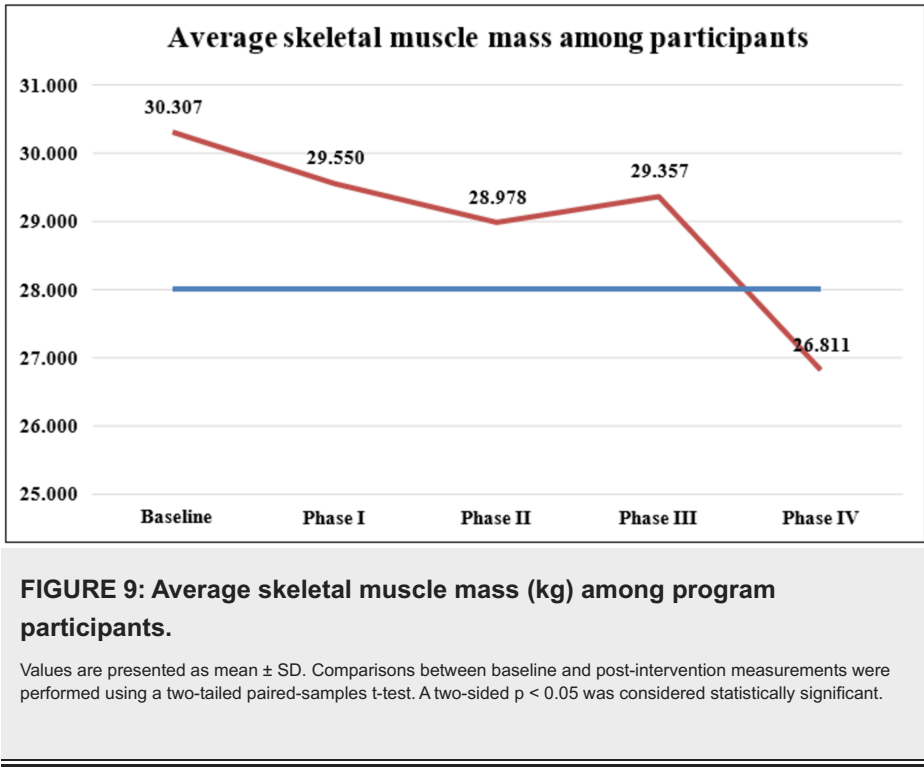
Values are presented as mean ± SD. Comparisons between baseline and post-intervention measurements were performed using a two-tailed paired-samples t-test. A two-sided p < 0.05 was considered statistically significant.

Recent studies, such as that by Park et al., emphasized that combined aerobic and resistance exercise can improve body composition [10]. Furthermore, Apolzan et al. demonstrated the importance of structured weight-loss programs incorporating behavioral strategies to achieve sustainable results [11]. Reducing body fat, particularly visceral fat, may have beneficial effects on lipid profiles and cardiovascular health markers.
A comparison of fat mass loss and average laboratory results suggested that greater fat mass loss was associated with larger reductions in laboratory values. A fat mass loss percentage above 25% was associated with reductions in HbA1c of 0.5 percentage points and low-density lipoprotein (LDL) cholesterol of 0.4

units, whereas a fat mass loss percentage below 25% was associated with smaller reductions in HbA1c (0.3 percentage points) and LDL cholesterol (0.2 units). These findings suggest that greater fat mass loss may be associated with more substantial improvements in laboratory results.

Body Lean Mass

The results showed a reduction in skeletal muscle mass during the initial three phases of the program, from an average of 30.3 kg to 29.3 kg, representing a decrease of approximately 1 kg (Figure 9). These findings suggest that the weight-loss program among healthcare providers reduced body fat while largely preserving skeletal muscle mass.



These findings are consistent with previous research. Buchanan and Villani demonstrated that higher protein intake during caloric restriction can help preserve skeletal muscle [12]. Furthermore, Davidović Cvetko et al. emphasized the importance of resistance training in mitigating muscle loss during weight reduction [13]. Collectively, these studies highlight the potential effectiveness of a structured program that integrates dietary and exercise strategies to achieve weight loss while minimizing the loss of skeletal muscle.

However, a decrease in skeletal muscle mass to 26 kg was observed during the final phase. This change may reflect differences in participants' efforts to achieve the rewards and win the challenge. Increased exercise beyond the prescribed program may have contributed to the additional muscle loss. To address this issue in future challenges, collaboration with the Department of Physical Therapy may help emphasize muscle mass preservation and enhancement. This approach could support more consistent improvements in muscle mass throughout the program.

Compliance with the intervention

As shown in Figure 10A, compliance with the exercise program increased from 70% during Phase I to 86% in Phase II, followed by a slight decline to 84% in Phase III and 82% in Phase IV. Overall, average exercise compliance throughout the program was 80.5%, exceeding the predefined target of 80%. The exercise program was designed to progressively increase the frequency and intensity of exercise, beginning with two sessions per week and gradually increasing to five sessions per week. Exercise modalities also evolved from walking to aerobic and resistance exercises. In addition, participants were encouraged to participate in group walking activities around the hospital, which may have fostered social support and motivation and contributed to the high level of adherence observed throughout the intervention.

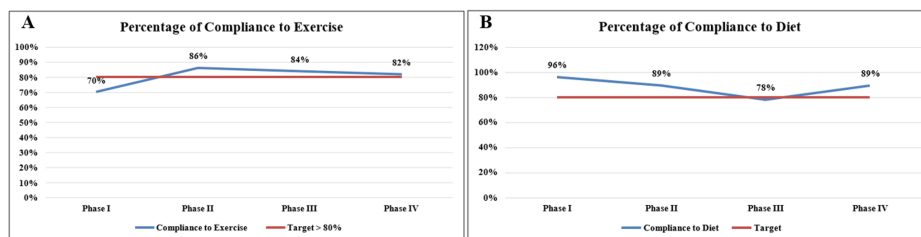


FIGURE 10: Compliance with the lifestyle intervention among participants in the “Challenge Your Weight” program.

(A) Percentage of compliance with the prescribed exercise program across the four intervention phases. (B) Percentage of compliance with the prescribed dietary program across the four intervention phases. The red horizontal line represents the target compliance of 80%.

Values are presented as mean $\pm$ SD. Comparisons between baseline and post-intervention measurements were performed using a two-tailed paired-samples t-test. A two-sided $p < 0.05$ was considered statistically significant.

As illustrated in Figure 10B, dietary compliance remained relatively high throughout the program, with compliance rates of 96%, 89%, 78%, and 89% during Phases I, II, III, and IV, respectively. Overall, average dietary compliance was 88%, exceeding the predefined target of 80%. A decline in compliance was observed during Phase III, which may be attributed to the reduced use of TMR and the introduction of calorie-based meal planning. This transition required participants to calculate the caloric content of their meals and may initially have posed challenges in adapting to the new dietary approach. Following educational workshops on meal calorie calculation, dietary compliance increased to 89% in the final phase, suggesting that these educational interventions may have helped improve participants' adherence to the revised dietary regimen.

Health outcomes

InBody Score

The average InBody score among participants increased from 54.5 to 62.5 (Figure 11). This increase suggests an improvement in participants' body composition scores. The InBody score assesses parameters such as muscle mass, body fat percentage, and overall body composition and serves as an indicator of body composition status.

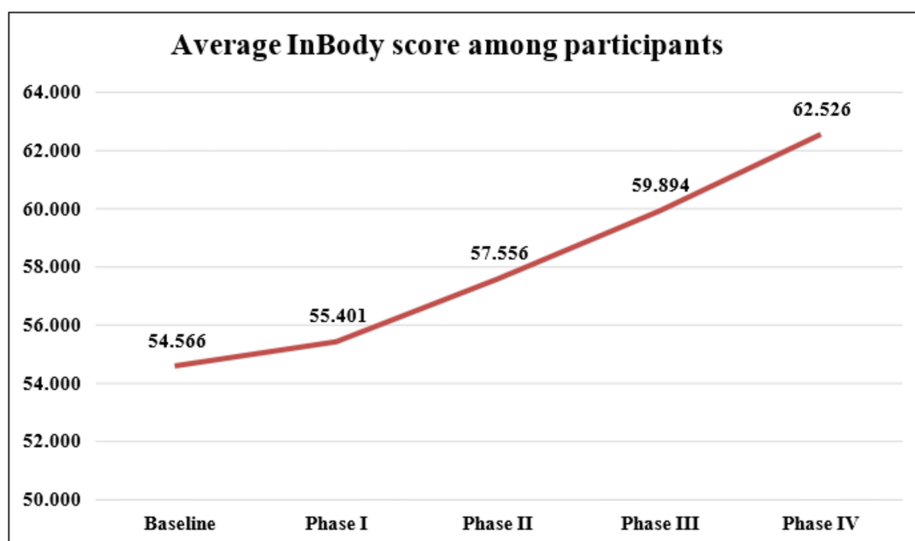


FIGURE 11: Average InBody score among program participants.

Values are presented as mean $\pm$ SD. Comparisons between baseline and post-intervention measurements were performed using a two-tailed paired-samples t-test. A two-sided $p < 0.05$ was considered statistically significant.

This increase in scores suggests that participants may have reduced body fat and improved their overall fitness. Such improvements may reflect sustained physical activity, better nutrition, and a more health-conscious lifestyle. These findings are consistent with recent research. For instance, Bellanti et al. reported

similar improvements in body composition following a structured exercise and nutrition program; participants also exhibited reduced body fat and improved metabolic health, consistent with the findings of the present study [6].

Lipid Profile Levels

As shown in Figure 12A, the mean total cholesterol (TC) level decreased from 5.3 mmol/L before the intervention to 4.2 mmol/L after the 12-week program, representing a 20% reduction. This decline indicates that the intervention was associated with improved TC levels, potentially reflecting positive changes in dietary habits and physical activity throughout the program.

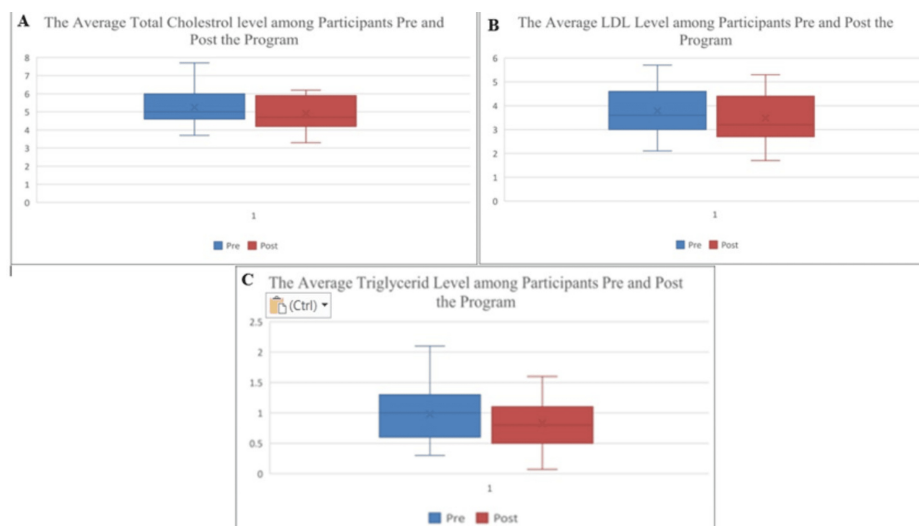


FIGURE 12: Changes in lipid profile parameters among participants before and after the “Challenge Your Weight” program.

(A) Mean TC levels before and after the 12-week intervention. (B) Mean LDL cholesterol levels before and after the intervention. (C) Mean TG levels before and after the intervention.

Values are presented as mean $\pm$ SD. Comparisons between baseline and post-intervention measurements were performed using a two-tailed paired-samples t-test. A two-sided $p < 0.05$ was considered statistically significant.

LDL, low-density lipoprotein; TC, total cholesterol; TG, triglyceride

The mean LDL cholesterol level also decreased (Figure 12B), from 3.9 mmol/L at baseline to 3.4 mmol/L after the intervention, corresponding to a reduction of approximately 12%. Because elevated LDL cholesterol is a major risk factor for cardiovascular disease, this improvement may indicate a beneficial change in cardiovascular risk.

Similarly, the mean triglyceride (TG) level decreased from 0.99 mmol/L to 0.83 mmol/L, representing a 16.2% reduction (Figure 12C). The mean TG levels remained below the recommended target threshold both before and after the intervention, indicating that participants maintained TG levels within the target range while achieving further improvement.

Overall, the reductions in TC, LDL cholesterol, and TG indicate improvements in lipid profiles during the intervention. These findings are consistent with previous studies. Mashnafi et al. reported that structured weight-loss interventions resulted in significant reductions in TC among Saudi participants [14]. Likewise, Bellanti et al. reported that targeted dietary interventions within comprehensive weight-management programs significantly improved lipid profile parameters [6]. Collectively, these findings support the potential role of structured lifestyle interventions in improving lipid profiles and reducing cardiovascular risk.

HbA1c Levels

As shown in Figure 13A, the mean HbA1c level decreased from 5.83% at baseline to 5.30% after the 12-week intervention, representing a relative reduction of approximately 9.1%. This decline indicates an improvement in mean HbA1c levels among participants following the weight-loss program.

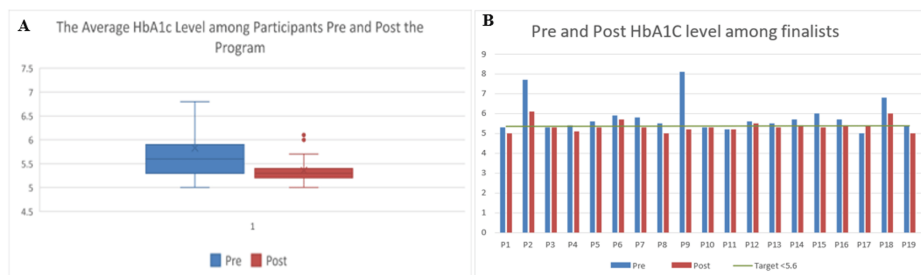


FIGURE 13: Changes in HbA1c levels among participants in the “Challenge Your Weight” program.

(A) Mean HbA1c levels of participants before and after the 12-week intervention. (B) HbA1c levels of each finalist participant before and after completion of the program.

Values are presented as mean $\pm$ SD. Comparisons between baseline and post-intervention measurements were performed using a two-tailed paired-samples t-test. A two-sided $p < 0.05$ was considered statistically significant.

HbA1c, hemoglobin A1c

At the individual level, Figure 13B shows changes in HbA1c values among the finalists. The highest baseline HbA1c value decreased from 8.1% before the intervention to 5.2% after program completion, reflecting a substantial reduction. Overall, the finalists showed consistent reductions in HbA1c levels, suggesting improved glycemic control and the potential for reducing the risk of type 2 diabetes (T2D) and its associated complications.

These findings are consistent with previous studies. Johnson reported an average HbA1c reduction of 0.5 percentage points among participants enrolled in a structured weight-loss program [7]. Similarly, Lee et al. observed a mean decrease of 0.6 percentage points in HbA1c among healthcare workers participating in lifestyle modification interventions, while Martín-Peláez et al. found that dietary modification combined with regular physical activity resulted in an average HbA1c reduction of 0.4 percentage points [9,15]. Collectively, these studies support the potential effectiveness of structured weight-loss and lifestyle intervention programs in improving glycemic control among healthcare professionals.

Staff feedback and engagement

Regarding the primary challenges participants faced at the beginning of the “Challenge Your Weight” program, 47% reported difficulty overcoming unhealthy eating habits, making this the most frequently reported challenge. Meanwhile, 27% identified commitment to regular exercise as their main challenge. Approximately 17% reported difficulty balancing the competition with daily life demands. Other challenges included maintaining motivation and encouragement throughout the competition (7%) and lack of sleep at the beginning of the competition (3%). The program therefore specifically addressed these issues by focusing on improving eating habits and increasing physical activity.

Participant feedback provided important evidence of the program’s impact, illustrating improvements in health awareness and participants’ interest in pursuing further wellness initiatives. Data indicated that 93% of participants reported increased awareness of healthy lifestyles and healthy eating habits following the program, exceeding the target of 80%. Other reported gains included increased awareness of the importance of physical fitness and physical activity (63%), the development of new social relationships and connections with others (47%), and improved time management and self-motivation (60%). These findings suggest that the program enhanced participants’ understanding of nutrition, physical activity, and overall well-being.

Additionally, 93% of participants expressed satisfaction with the program, considered it successful, and expressed a desire to implement further wellness initiatives. This positive reception highlights participants’ favorable perceptions of the program and its potential to foster a culture of well-being in the workplace.

Unintended outcomes

Some participants reported unintended positive outcomes during the program. Two participants reported discontinuing their antihypertensive medication after experiencing episodes of hypotension. These reports suggest that changes in blood pressure may have occurred during the weight-loss program and highlight the importance of regular blood pressure monitoring in future programs.

Additionally, one participant with diabetes reported discontinuing medication, while another reported reducing their insulin dosage after the program. These changes may reflect improvements in glycemic

control associated with lifestyle changes. Moreover, several participants who used smartwatches reported improved sleep quality. However, the data were incomplete because many participants could not use the smartwatches effectively to monitor sleep. This limitation highlights the need for reliable methods of tracking sleep patterns in future programs.

Furthermore, one participant reported discontinuing the use of a bilevel positive airway pressure device. This may indicate a perceived improvement in respiratory health or sleep quality, although the reason for discontinuation and any clinical confirmation should be clarified before drawing conclusions about health outcomes.

Discussion

Summary

The “Challenge Your Weight” program is a comprehensive initiative that helps healthcare providers achieve and maintain a healthy weight through a supportive community. The program integrates education, motivation, and practical resources, offering participants workshops on nutrition, exercise routines, and behavior change strategies. This structured approach led to notable outcomes, with participants achieving an average weight loss of 13.4%, surpassing the initial goal of more than 10%. This finding is encouraging, as previous evidence shows that multicomponent lifestyle interventions combining dietary modification and physical activity can support meaningful weight reduction among healthcare professionals. Workplace interventions targeting both diet and physical activity are the most common approach studied in healthcare professional populations, with 75% of 51 reviewed studies employing this combined strategy [16]. Meta-analytic evidence from randomized controlled trials (RCTs) in healthcare settings shows that combined dietary and physical activity interventions produced the greatest weight reduction observed (-3.95 kg; 95% CI, -4.96 to -2.95) compared with controls at up to 12 months, significantly outperforming diet-only or physical activity-only approaches [17]. Participants also experienced substantial improvements in body measurements, body composition, and laboratory results, reflecting improvements in overall health. Even moderate weight loss has been associated with improvements in cardiometabolic risk factors, including blood glucose and lipid levels. Previous studies have reported that participants who lose 5-10% of their body weight consistently show clinically meaningful improvements in glycemia, TG, high-density lipoprotein cholesterol, and blood pressure, although changes in LDL cholesterol are less consistent [18-20]. Furthermore, the program successfully increased participants’ awareness of healthy lifestyles, underscoring its potential to promote comprehensive health improvements.

Impact of the project

This project demonstrated its potential to promote healthy lifestyles by providing nutrition counseling and fostering healthier eating habits among participants, which may help prevent or delay chronic diseases. Evidence from diabetes prevention programs has demonstrated that intensive lifestyle modification can substantially reduce the risk of developing T2D among individuals at high risk. Intensive lifestyle modification combining dietary counseling and physical activity reduces the incidence of T2D by 36-58% across landmark RCTs involving high-risk individuals with impaired glucose tolerance [21-23]. Evidence also shows that structured programs can improve critical health markers, such as HbA1c levels and lipid profiles, thereby enhancing overall patient care [24-26]. Moreover, participants often report benefits such as better sleep quality and increased energy levels, which can positively affect their overall well-being and quality of life. Additionally, group sessions create a sense of community and shared purpose among participants. These sessions promote teamwork, which may translate into improved morale and productivity in the workplace. Employees working together to achieve health goals can foster a culture of wellness and improve communication and interpersonal skills. However, some participants experienced a reduction in skeletal muscle mass, which may require adjustments to protein intake and resistance training, as well as collaboration with the physical therapy department to emphasize muscle mass preservation and enhancement.

Estimated cost savings

Implementing a weight-loss program among healthcare providers can lead to substantial cost savings and improved overall well-being. By promoting healthier lifestyles and reducing obesity rates, such programs can decrease the incidence of chronic diseases, such as diabetes, hypertension, and cardiovascular disease, which are costly to manage. Healthier employees may take fewer sick days and exhibit higher productivity, thereby reducing expenses related to absenteeism and lost work hours.

An estimation of the cost savings associated with weight-loss injections and bariatric surgery compared with a VLCD revealed potential financial benefits for participants (Figure 14). The weight-loss injection program (liraglutide/tirzepatide), which requires a commitment of at least six months to achieve a target weight loss of more than 10%, incurs an average cost of 6,447 SR per participant over six months.



FIGURE 14: Estimated cost savings associated with a VLCD compared with weight-loss injections and bariatric surgery.

KFAFH, King Fahad Armed Forces Hospital; VLCD, very-low-calorie diet

This figure was created using Canva (Canva Pty Ltd., Sydney, Australia).

In contrast, the VLCD supplementation program, designed to facilitate a similar weight-loss goal of more than 10% within 12 weeks, costs only 1,960 SR per participant, according to the Department of Revenue and Development at KFAFH.

For 16 participants with an initial BMI of >35 kg/m² who were eligible for weight-loss injections and achieved more than 10% weight loss, the costs were as follows: VLCD, 1,960 SR × 16 = 31,360 SR; injections, 6,447 SR × 16 = 103,152 SR; and cost savings, 103,152 - 31,360 = 71,792 SR.

For 10 participants eligible for bariatric surgery with a BMI of >35 kg/m² who achieved more than 10% weight loss over three months, the costs were as follows: VLCD, 1,960 SR × 10 = 19,600 SR; bariatric surgery, 16,654 SR × 10 = 166,540 SR; and cost savings, 166,540 - 19,600 = 146,940 SR.

When evaluating weight-loss interventions, it is essential to consider both short-term and long-term costs and benefits. The decision should not be based solely on the initial expenditure. For instance, bariatric surgery, despite its higher upfront cost, might incur additional expenses over time due to the need for medication, potential plastic surgery, and management of side effects associated with rapid weight loss. These long-term health and financial implications underscore the importance of a comprehensive evaluation. On the other hand, VLCD supplementation may appear more economical in the short term, but its sustainability and potential health impacts over time must also be considered. A thorough comparison of

both options should include their potential long-term health impacts and associated costs to ensure that the chosen intervention is both effective and sustainable.

Limitations

The present quality improvement project had several limitations. A major limitation was the absence of a control group. The study used a nonrandomized, uncontrolled design. Although preintervention and postintervention data were available, the lack of a control group limits the generalizability of the findings compared with what an RCT could provide. Moreover, the study had a small sample size. The number of registered participants was limited by staff shortages within the challenge team and limited access to clinic facilities at KFAFH for participants' InBody measurements. Stock issues were also identified during the program. Furthermore, there was a risk of self-selection bias because all participants were recruited from KFAFH, which may limit the representativeness of the sample. Additionally, excluding participants with the lowest percentage of weight loss after each phase may have introduced selection bias. This sequential elimination may have inflated the apparent effectiveness of the program. Therefore, the 13.4% weight loss reported among the finalists should be interpreted with caution, as it may not represent the weight loss achieved by the entire sample. There was also a risk of recall bias due to reliance on self-reported adherence. The short follow-up period was another limitation, as was the possibility of weight regain. Additionally, holidays and Eid made it challenging for participants to adhere to the program and attend workshops and measurement sessions. The reduction in skeletal muscle mass during the final phase suggests that the competitive incentive structure may have encouraged unsafe weight-loss behaviors, raising a potential safety concern. Furthermore, adverse events associated with the program were reported in limited detail, restricting the assessment of program safety. The findings reflect the combined effects of dietary modification, exercise, education, repeated measurement, social support, incentives, and competition. Therefore, it is difficult to identify which program components produced the observed effects. This underscores the importance of including a control group in future studies.

Lessons learned

Several lessons were learned during the implementation of the project. The project duration was considered short, and a longer intervention period may produce better and more sustained results. In addition, nutritional knowledge and healthy eating practices within the healthcare community were found to be limited. Furthermore, the elimination process appeared to affect participants' morale and commitment throughout the program. Future programs could therefore focus more on individual progress, continuous encouragement, and sustainable behavior change rather than elimination. Adequate staffing, access to measurement facilities, and consideration of holidays should also be incorporated into future planning to improve program implementation and participant adherence.

Conclusions

The implementation of a structured weight-loss program among healthcare providers demonstrated substantial weight reduction, with participants losing more than 10% of their body weight. This weight loss was associated with notable improvements in metabolic health markers, specifically HbA1c levels and lipid profiles. The program not only emphasized dietary modification and physical activity but also incorporated behavioral strategies intended to foster long-term lifestyle changes. These findings support the potential value of adopting similar programs to improve the health of healthcare professionals. Future wellness programs should focus on long-term sustainability and the potential to scale these interventions across diverse healthcare settings.

Additional Information

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All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

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Disclosures

Human subjects: Informed consent for treatment and open access publication was obtained or waived by all participants in this study. Research Ethics Committee, King Fahad Armed Forces Hospital issued approval REC 875. **Animal subjects:** All authors have confirmed that this study did not involve animal subjects or tissue. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

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