

Medically Tailored Meals Cut HbA1c More Than Subsidies in Type 2 Diabetes

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Managing type 2 diabetes in patients facing food insecurity presents a persistent clinical challenge, often complicated by limited access to nutritious options and the high cost of diabetes-friendly foods.¹ Clinicians frequently grapple with how best to support these patients beyond pharmacotherapy, knowing that dietary adherence is paramount for glycemic control. A recent intervention trial addressed this directly, showing that medically tailored meals delivered a superior reduction in HbA1c compared to food subsidies alone.

KEY TAKEAWAYS

- ° The Pivot: Direct provision of medically tailored meals offers a more effective intervention for glycemic control than financial food subsidies in food-insecure adults with type 2 diabetes.
- ° The Data: Medically tailored meals reduced HbA1c by an additional 0.59% (95% CI, -0.91 to -0.27; P<0.001).
The Action: For food-insecure patients with type 2 diabetes, consider advocating for or prescribing medically tailored meal programs where available, as they appear to offer a more direct and impactful pathway to improved glycemic outcomes than simply providing funds for food.

Type 2 diabetes, a chronic metabolic disorder affecting millions globally, demands rigorous dietary management alongside pharmacological interventions to prevent complications. For patients experiencing food insecurity, this management becomes exponentially more difficult. These individuals often reside in food deserts, lack reliable transportation to grocery stores, or face financial constraints that force them to prioritize calorie intake over nutritional quality. The resulting diet, typically high in processed foods and refined carbohydrates, exacerbates hyperglycemia and undermines efforts to achieve target HbA1c levels. The medical community has long debated the most effective non-pharmacological interventions for this vulnerable population: is it better to empower patients with financial resources to purchase healthier food, or to directly provide them with meals designed by nutritionists?

A recent randomized controlled trial sought to answer this question, enrolling 1,000 adults with type 2 diabetes who also screened positive for food insecurity. The participants, predominantly from low-income urban and rural areas, had a baseline HbA1c greater than 7.5% despite receiving standard diabetes care. Investigators randomized patients 1:1 to either a medically tailored meal program or a food subsidy program for a 12-week intervention period. The primary endpoint was the change in HbA1c from baseline to 12 weeks, with secondary endpoints including changes in blood pressure, lipid profiles, body weight, and self-reported quality of life measures. The trial was conducted across 10 community health centers in three different regions, aiming for a diverse representation of food-insecure populations.

What the trial actually measured

Patients in the medically tailored meal (MTM) arm received three prepared meals per day, seven days a week, for 12 weeks. These meals were designed by registered dietitians to meet specific nutritional guidelines for type 2 diabetes, emphasizing whole grains, lean proteins, fruits, and vegetables, while strictly limiting added sugars, unhealthy fats, and sodium. The meals were delivered directly to participants' homes, removing barriers related to transportation and food preparation. Each meal package included detailed nutritional information and heating instructions. The average caloric intake for the MTM participants was approximately 1,800 calories per day, adjusted for individual needs where possible, with a focus on consistent carbohydrate counts to aid glycemic management. The program also included weekly check-ins with a nutritionist to address any dietary concerns or preferences, although adherence to these check-ins varied.

The food subsidy (FS) arm received a weekly stipend of €75, provided via a debit card, specifically earmarked for purchasing groceries. Participants in this arm also received educational materials on healthy eating for diabetes and a list of local grocery stores that accepted the debit card. The stipend amount was determined based on an average estimate of the additional cost of purchasing diabetes-friendly foods for one person for a week in the study regions. The intent was to remove the financial barrier to healthy eating, allowing patients autonomy in their food choices. However, there was no direct oversight of how the funds were spent, relying instead on self-reported dietary changes, which are notoriously unreliable. Both groups continued to receive their usual medical care from their primary care physicians, including diabetes medications and regular monitoring.

The primary outcome analysis showed a clear advantage for the medically tailored meal intervention. Patients in the MTM group experienced a mean reduction in HbA1c of 1.23% (95% CI, -1.45 to -1.01) from baseline, compared to a mean reduction of 0.64% (95% CI, -0.82 to -0.46) in the FS group. This translated to a statistically significant difference of 0.59% (95% CI, -0.91 to -0.27; $P=0.003$). Secondary endpoints also largely favored the MTM group. Participants receiving medically tailored meals showed a greater reduction in systolic blood pressure, averaging 5.8 mmHg (95% CI, -7.1 to -4.5; $P=0.003$) compared to 2.1 mmHg in the food subsidy group. Diastolic blood pressure reductions were also more pronounced in the MTM arm. Total cholesterol and LDL-cholesterol levels saw modest, but statistically significant, improvements in the MTM group, while the FS group showed no significant changes. Body weight decreased by an average of 2.5 kg (95% CI, -3.1 to -1.9; $P=0.003$). The open-label design is the obvious caveat. Participants knew which intervention they were receiving, which could introduce bias in self-reported outcomes and adherence. However, HbA1c, the primary endpoint, is an objective biochemical marker, less susceptible to such biases. The 12-week duration, while sufficient to observe changes in HbA1c, is relatively short for a chronic condition like type 2 diabetes. Whether these benefits are sustained long-term, or if patients can maintain these dietary habits once the meal program concludes, remains an unanswered question. The cost-effectiveness of medically tailored meal programs, which are inherently more expensive to administer than food subsidies, was not a primary focus of this trial, but it is a critical consideration for broader implementation. The logistical challenges of delivering thousands of tailored meals daily across diverse geographic regions are substantial, requiring robust infrastructure and coordination. The trial also did not account for potential differences in baseline dietary habits or cooking skills within the food subsidy group, which could influence how effectively participants utilized their stipends. Some participants in the FS group might have already possessed strong culinary skills and nutritional knowledge, while others might have struggled to translate the educational materials into practical, healthy meal preparation. This variability could have diluted the overall effect in the FS arm.

Another limitation involves the generalizability of the findings. The study population was primarily composed of individuals from low-income backgrounds experiencing food insecurity, which is appropriate for the research question. But whether these results extend to other populations with type 2 diabetes who do not face food insecurity, but still struggle with dietary adherence, is unclear. The specific composition of the medically tailored meals, while dietitian-designed, might not be universally appealing or culturally appropriate for all patient groups, potentially affecting long-term adherence outside of a trial setting. The trial also did not explore the potential for a hybrid model, where patients receive a combination of tailored meals and subsidies, or where subsidies are paired with more intensive dietary counseling and cooking classes. Such an approach might offer a more sustainable and cost-effective solution in the long run. The mechanism by which the MTM program achieved superior results likely involves a combination of factors: guaranteed access to appropriate food, removal of decision fatigue, and potentially improved medication adherence due to a more stable daily routine. The food subsidy, while providing financial relief, did not address the knowledge gaps, time constraints, or psychological burdens associated with healthy eating in challenging circumstances. The trial was not powered to detect differences in hard clinical outcomes such as cardiovascular events or renal failure, which would require a much larger sample size and longer follow-up. But the significant improvements in surrogate markers like HbA1c, blood pressure, and weight suggest a positive trajectory for these outcomes. The investigators did not collect detailed data on the specific types of foods purchased by the food subsidy group, making it difficult to ascertain if the funds were indeed used for healthier options or if other household needs took precedence. This lack of granular data on food choices in the control arm represents a missed opportunity to understand the real-world challenges faced by patients given financial support without direct dietary intervention. The study also did not explore the impact of social determinants of health beyond food insecurity, such as housing stability or access to transportation, which could independently influence health outcomes and adherence to dietary interventions. The MTM program, by delivering meals directly, implicitly mitigated some of these external factors, but the underlying issues persist. The next trial needs to show if these benefits translate into reduced hospitalizations or improved survival over several years.

CLINICAL IMPLICATIONS

The data unequivocally shows that simply giving patients money for food is not enough to move the needle on glycemic control in type 2 diabetes. Clinicians should recognize that the complexity of food insecurity extends beyond mere financial constraint; it involves time, knowledge, and the mental load of daily decision-making. Prescribing a medically tailored meal program, where available, offers a direct and effective pathway to improved HbA1c, blood pressure, and weight.

For healthcare systems and policymakers, this trial presents a clear argument for investing in structured meal delivery programs as a legitimate medical intervention, not just a social service. While the upfront cost is higher than food subsidies, the long-term savings from reduced diabetes complications and hospitalizations could be substantial. The challenge lies in scaling these programs to meet demand and integrating them seamlessly into existing healthcare infrastructure.

Patients, particularly those struggling with food access and diabetes management, stand to benefit significantly. The removal of the daily burden of sourcing and preparing diabetes-appropriate meals can free up mental and physical resources, potentially improving adherence to other aspects of their care. This approach acknowledges the profound impact of social determinants on health outcomes and offers a tangible solution.

But the short duration of the trial means we still lack evidence on sustained benefits. We need to understand if patients can maintain these gains once the meal program ends, or if these programs become a permanent, and costly, fixture of diabetes management. The next step must involve longer-term studies and robust cost-effectiveness analyses to justify widespread adoption.

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