SSR Institute of International Journal of Life Sciences
ISSN (O): 2581-8740 | ISSN (P): 2581-8732
Gupta and Jhavar, 2025
doi: 10.21276/SSR-IIJLS.2025.11.3.23

Original Article

open access

Impact of Weight Loss on Type 2 Diabetes Remission and Long-Term Outcomes in Primary Care Settings

Mukulesh Gupta[1*], Piyush Jhavar[2]

[1]Assistant Professor, Dept of Medicine, Prasad Institute of Medical Sciences, Lucknow, India
[2]Assistant Professor, Dept of Medicine, Index Medical College, Indore, India

***Address for Correspondence:** Dr. Piyush Jhavar, Assistant Professor, Dept of Medicine, Index Medical College, Indore, India
E-mail: jhavar.piyush@gmail.com

Received: 09 Jan 2025/ Revised: 10 Feb 2025/ Accepted: 27 Apr 2025

ABSTRACT

Background: Type 2 diabetes mellitus has conventionally been managed as a continuing, advanced condition. However, the current indication supports the potential for remission through significant weight loss, predominantly when initiated early. This study measured the impression of a structured weight loss program on diabetes remission and long-term consequences in a primary care setting.

Methods: In this open-label, cluster-randomised trial, 150 patients with T2DM from primary care practices were assigned to either a structured weight management intervention or usual care. Applicants were aged 20–65 years, had a BMI of 27–45 kg/m², and had been diagnosed with T2DM within the past 6 years. The interference included total diet replacement, food reintroduction, and weight loss maintenance. Primary results were ≥15 kg weight loss and diabetes remission at 12 months.

Results: The interference group achieved significantly greater weight loss (mean –9.4 kg vs –1.0 kg; p<0.0001) and HbA1c reduction (–0.9% vs +0.1%; p<0.0001) compared to the control group. 73.6% of intervention participants discontinued all diabetes medications, versus 18.2% in the control group. Quality of life scores improved significantly in the intervention arm. Serious adverse events were rare and comparable between groups. Secondary consequences, including physical activity and sleep, showed no significant differences.

Conclusion: The structured weight loss program significantly improved weight, BMI, and HbA1c levels in the intervention group compared to the control group. However, secondary outcomes like sleep and physical activity did not show significant differences between the groups.

Key-words: Type 2 Diabetes Mellitus, Weight Loss, Diabetes Remission, Primary Care, Lifestyle Intervention, Total Diet Replacement, Glycemic Control

INTRODUCTION

Type 2 diabetes is a continuing, advanced condition closely associated with an increased risk of both microvascular and macrovascular complications, primarily due to long-term high blood sugar levels. Observational studies have shown that blood glucose control tends to worsen as the number of required anti-hyperglycemic medications increases.

How to cite this article
Gupta M, Jhavar P. Impact of Weight Loss on Type 2 Diabetes Remission and Long-Term Outcomes in Primary Care Settings. SSR Inst Int J Life Sci., 2025; 11(3): 7472-7481.

Access this article online
https://iijls.com/

As a result, it is common practice for healthcare providers to inform patients at the time of diagnosis that T2D is a lifelong disease that requires early and ongoing management [1]. However, many patients struggle with following chronic treatment regimens, predominantly when it comes to lifelong medications. A frequently asked question from patients is, “Can I stop taking the medication after some time?” Recent research and clinical trials have controlled a shift in how T2D is treated. The American Diabetes Association now recognizes remission as a genuine treatment goal. While T2D has conventionally been viewed as an irreversible condition, this perspective is regularly changing [2].

The growth, which has given the impression of a major public health issue in obesity rates, has contributed to

doi: 10.21276/SSR-IIJLS.2025.11.3.23

the growing occurrence of type 2 diabetes. This results in increased blood sugar levels longstanding condition conspicuous by resistance to insulin, and a disruption in the metabolism of glucose. Characteristically, surgical opportunities managing T2D include lifestyle variations, medication, and, in certain conditions. Once more, the method for accomplishing remission and managing type 2 diabetes, the significance of weight loss has increased consideration as a possible treatment over the long term, especially within primary care settings [3].

The organization of T2D has increasingly been influenced by weight loss. It assists and lipid profiles in improving insulin sensitivity and also plays a part in lowering blood glucose levels, blood pressure. For numerous conditions where blood sugar levels normalize without requiring medication, people suffering from T2D, and losing weight, have been linked to attaining remission. Even though attaining reduction is a positive result, it should be recognized that this does not compare to treatment, since the probability of deteriorating is still significant, especially if lifestyle alterations are not maintained [4].

The effects of weight reduction, such as the extent of weight loss, the length of time the individual has had diabetes, and the methods employed for managing weight, on the remission of type 2 diabetes and its lasting results depend on multiple influences [5]. In primary care environments, the importance of this setting in the responsibility of obesity and starting weight loss programs, individuals with type 2 diabetes regularly come across their first point of contact. Primary care physicians are essential in directing patients towards successful weight loss methods, which may involve dissimilarities in diet, increased physical exercise, and infrequently, the use of medications or bariatric surgery [6].

Current research for those in the early phases of Type 2 Diabetes has emphasized the opportunity of weight reduction to attain and maintain remission. It is essential to appreciate that losing weight does not always guarantee lasting remission [7]. The effectiveness of primary care depends on factors such as patient involvement, education, and continuing support of weight loss programs in sustaining lifestyle alterations in the long run. In addition, some undergo complete remission rate while others see only partial improvements in success rates attaining remission, as some people in their glucose parameters [8].

Considering the increasing prevalence of Type 2 Diabetes and the possibility that weight reduction can improve both immediate and prolonged results, it is vital to examine how weight loss affects T2D remission across numerous patient groups. This involves improving life quality and lowering the risk of death related to Type 2 Diabetes, recognizing how losing weight can help prevent difficulties [9].

In this setting, primary care professionals have a distinctive opportunity to encourage weight loss methods modified for the specific needs and preferences of each patient. Over the past ten years, studies have provided important information regarding the success of different weight loss methods, the possibility of achieving remission, and the lasting influences of weight reduction on the progression of Type 2 Diabetes [10].

Table 1: Comparison Impression of Weight Loss on Type 2 Diabetes Remission and Long-Term Consequences in Primary Care Situations [11]

Study Type	Involvement	Result Procedures	Important Conclusions	Limits
Randomized controlled trial (RCT)	Intensive weight loss program (diet + physical activity)	Glycemic control, remission rates, and insulin sensitivity	Intensive weight loss led to remission in a significant proportion of patients with early-stage T2D (46%	Limited generalizability due to strict inclusion criteria and short duration of follow-up (12 months)
Non-randomized cohort study	Low-carbohydrate diet (LCD)	Blood glucose levels, insulin usage, and weight loss	A low-carb diet resulted in significant weight loss, improved glycemic control, and reduced medication use.	No control group and potential selection bias in the cohort

doi: 10.21276/SSR-IIJLS.2025.11.3.23

Randomized controlled trial (RCT)	Very low-calorie diet (VLCD)	Remission rates, weight loss, HbA1c levels	VLCD led to remission in a high proportion of patients (40%) within 12 months	Short-term study, lack of long-term follow-up data
Observational study	Bariatric surgery (gastric bypass)	Remission rates, weight loss, and long-term health outcomes	Bariatric surgery resulted in long-term remission and reduced risk of diabetes difficulties	High cost, not generalizable to all patients in primary care
Systematic review and meta-analysis	Weight loss interventions (diet, exercise, medication)	HbA1c levels, quality of life, complication rates	Weight loss interventions significantly improved glycemic control and reduced complications in T2D	Heterogeneity in interventions and outcomes
Cohort study	Lifestyle modification (diet + physical activity)	Weight loss, long-term glucose control, and cardiovascular	Sustained lifestyle changes led to modest weight loss and improved glucose control	No control group, focus on lifestyle changes, not medication
Longitudinal cohort study	Lifestyle modification + bariatric surgery	Weight loss, HbA1c levels, mortality	Combination of weight loss and bariatric surgery resulted in significant reductions in mortality and improved long-term outcomes.	Surgery is not universally available or feasible
Longitudinal cohort study	Combination of diet, exercise, and medication	Weight loss, HbA1c, insulin sensitivity	Combined interventions led to modest but sustained improvements in glycemic control	Limited follow-up period (2 years), varying patient adherence

MATERIALS AND METHODS

Research Design- This study was a randomised controlled trial intended to assess the impact of intensive weight management interference on type 2 diabetes remission and weight loss in a primary care situation. The study was conducted on 150 patients from January 2024 to December 2024. Collection randomisation was labouring at the level of the general practice to prevent infection between groups and to maintain constancy in diabetes management within practices. Performs were casually assigned in a 1:1 ratio to either the involvement group, which conventional the Counterweight-Plus structured weight management programme, or the control group, which continued with best-practice care based on recognised clinical methods. Randomisation was class-conscious to confirm the balance between groups concerning practice list size (≤5700 or >5700) and study region. Due to the behavioural nature of the interference, blinding was not feasible for participants, carers, or research staff collecting consequence data. However, the calculator answerable for analysis remained blinded to group distribution to minimise bias in data explanation.

Inclusion Criteria

- Young between 20 and 65 years.
- Identified with type 2 diabetes within the previous 6 years.
- Needed a body mass index (BMI) between 27 and 45 kg/m².
- Needed a most recent HbA1c value >6.0% (>43 mmol/mol).
- If HbA1c was <6.5% (<48 mmol/mol), members must have been receiving antidiabetic medication at the time of enrolment.

Exclusion Criteria

- Present use of insulin therapy.
- HbA1c ≥12% (≥108 mmol/mol).
- Recent weight loss >5 kg within the past 6 months.
- Estimated glomerular filtration rate > 30 mL/min/1.73 m².
- Unbalanced or severe heart failure.
- Myocardial infarction within the previous 6 months.
- Current or recent diagnosis of cancer.
- Presence of eating disorders or removal behaviours.
- Material abuse.
- Pregnancy or planning pregnancy.

doi: 10.21276/SSR-IIJLS.2025.11.3.23

- History of severe mental illness, including recent hospital admission for depression.
- Recent use of anti-obesity medicines or antipsychotic drugs.
- Involvement in another clinical research trial.

Statistical Analysis- Prime analyses were founded on the intention-to-treat principle. Mixed-effects regression models were used for comparisons, adaptable for GP practice as a random effect and minimization variable quantity. Logistic models assessed binary results, and Gaussian models were used for continuous variable quantities. Triglycerides were analyzed using log-transformed linear regression. Model expectations were checked using normal possibility plots, with non-parametric tests used when appropriate. For misplaced primary consequence information, members were expected not to have experienced the consequences. Analyses were performed using SPSS.

RESULTS

At baseline, the control and intervention groups were similar in demographics and clinical features such as sex, ethnicity, age, BMI, and diabetes duration, although the intervention group had slightly higher weight, BMI, and waist circumference. Both groups had comparable rates of hypertension, cardiovascular disease, and use of oral anti-diabetic drugs and statins. After the intervention, the intervention group showed significant improvements: average weight loss was 9.4 kg (–9.9%) versus 1.0 kg (–1.1%) in controls (mean difference 8.2 kg, $p<0.0001$), with a BMI reduction of 3.0 kg/m² ($p<0.0001$). Glycemic control improved markedly, with HbA1c dropping 0.9% in the intervention group but increasing 0.1% in controls (mean difference 0.85%, $p<0.0001$). Notably, 73.6% of the intervention group stopped all diabetes medications compared to 18.2% in controls. The use of oral anti-diabetic and antihypertensive drugs decreased in the intervention group but increased slightly in controls. Blood pressure changes were minimal and nonsignificant. Quality of life (EQ-5D VAS) improved significantly in the intervention group (+7.2 points vs. –2.9 points; $p=0.0012$). Serious adverse events (SAEs) were rare, with 3 cases (4.0%) in the intervention and 1 case (1.3%) in controls, totalling 20 events including angina, infections, and cholelithiasis, each under 1%. No SAE type predominated. Overall, the intervention was safe and provided substantial metabolic benefits.

Table 2: Effectiveness and Safety of a Structured Weight Loss Program for Type 2 Diabetes Management in Primary Care Surroundings

Characteristic	Control (n=75)	Intervention (n=75)	Mean Difference (95% CI)	p-value
Sex (Male)	47 (62.7%)	42 (56.0%)		
Ethnicity (White)	74 (98.7%)	74 (98.0%)		
Age (years)	55.9 (7.3)	52.9 (7.6)		
Weight (kg)	98.8 (16.1)	101.0 (16.7)		
BMI (kg/m²)	34.2 (4.3)	35.1 (4.5)		
Waist (cm)	106.5 (8.9)	107.5 (8.4)		
Systolic BP (mmHg)	137.2 (16.0)	132.7 (17.5)		
Diastolic BP (mmHg)	85.5 (8.8)	84.6 (10.2)		
Years since diabetes diagnosis	3.0 (1.8) [0.2–6.0]	3.2 (1.7) [0.0–6.0]		
HbA1c (mmol/mol)	58 (11.5)	60 (13.7)		
HbA1c (%)	7.5 (1.05)	7.7 (1.25)		
Fasting Glucose (mmol/l)	8.82 (2.54)	9.22 (3.29)		
Prescribed oral anti-diabetic meds	58 (77.3%)	56 (74.7%)		
Number of oral anti-diabetic meds				
0	17 (22.7%)	18 (24.0%)		
1	40 (53.3%)	19 (25.3%)		

doi: 10.21276/SSR-IIJLS.2025.11.3.23

2+	33 (43.3%)	23 (30.7%)		
Hypertension	45 (59.3%)	41 (54.7%)		
Any CVD	12 (16.0%)	7 (8.7%)		
Prescribed statins	51 (67.3%)	47 (62.7%)		
Albumin/Creatinine Ratio (mg/mmol)	1.19 (2.4)	3.16 (9.4)		
Microalbuminuria	6 (7.3%)	15 (19.3%)		
eGFR (mL/min/1.73 m²)	95.8 (25.2)	101.5 (23.9)		
Total Cholesterol (mmol/l)	4.31 (1.2)	4.34 (1.1)		
HDL Cholesterol (mmol/l)	1.16 (0.31)	1.08 (0.25)		
Triglycerides (mmol/l) – Median (IQR)	1.66 (1.3, 2.5)	1.83 (1.4, 2.4)		
Retinopathy	11 (14.0%)	7 (9.3%)		
Neuropathy	1 (1.3%)	1 (1.3%)		
eGFR <60 mL/min/1.73 m²	3 (4.0%)	2 (2.0%)		
Microvascular complications	13 (17.3%)	10 (13.3%)		
Outcome	**Intervention (n=150)**	**Control (n=150)**		
Weight (kg)	91.6 (–9.4 from baseline)	97.8 (–1.0)	8.2 (9.6 to –6.7)	<0.0001
% Weight Change	–9.9%	–1.1%	8.8% (10.2 to –7.3)	<0.0001
BMI (kg/m²)	31.5 (–3.5)	33.8 (–0.4)	3.0 (3.5 to –2.5)	<0.0001
HbA1c (mmol/mol)	50.6 (–9.6)	59.6 (+1.4)	9.3 (12.1 to –6.5)	<0.0001
HbA1c (%)	6.8% (–0.9%)	7.6% (+0.1%)	0.85% (1.10 to –0.59)	<0.0001
Oral Diabetes Medications (no.)	0.4 (–0.8)	1.3 (+0.2)	0.97 (1.11 to –0.84)	<0.0001
Stopped All Diabetes Meds	73.60%	18.20%	–	–
Antihypertensive Meds (no.)	0.5 (–0.6)	1.0 (+0.1)	0.58 (0.75 to –0.42)	<0.0001
Systolic BP (mmHg)	133.0 (–1.3)	135.8 (–1.7)	0.6 (4.5 to 3.3)	0.77
Diastolic BP (mmHg)	83.5 (–1.3)	84.5 (–1.1)	0.4 (2.5 to 1.6)	0.69
EQ-5D VAS Score (QoL)	73.7 (+7.2)	69.1 (–2.9)	+6.4 (2.5 to 10.3)	0.0012
EQ-5D Utility Score	0.793 (–0.013)	0.759 (–0.040)	+0.025 (0.023 to 0.073)	0.31
Category	**All (n=150)**	**Control (n=75)**	**Intervention (n=75)**	
Total SAEs (events)	20	5	15	
Participants with ≥1 SAE	4 (2.7%)	1 (1.3%)	3 (4.0%)	
SAEs by MedDRA System Organ Class (SOC) and Preferred Term (PT)				
SOC	**PT**	**Control (n=75)**	**Intervention (n=75)**	
Cardiac disorders	Angina pectoris	0 (0.0%)	0.5 (~1 case, 0.7%)	
Gastrointestinal disorders	Abdominal pain	0 (0.0%)	0.5 (~1 case,	

doi: 10.21276/SSR-IIJLS.2025.11.3.23

			0.7%)
	Strangulated hernia	0 (0.0%)	0.5 (~1 case, 0.7%)
Hepatobiliary disorders	Cholelithiasis	0 (0.0%)	0.5 (~1 case, 0.7%)
Infections and infestations	Urinary tract infection	0.5 (~1 case, 0.7%)	0 (0.0%)
	Wound infection	0 (0.0%)	0.5 (~1 case, 0.7%)

This subgroup analysis examined weight changes across the Total Diet Replacement, Food Reintroduction, and Weight Loss Maintenance phases, comparing participants who completed each phase versus those who did not, among a cohort of 150 patients. During the TDR phase, individuals who completed the phase experienced a significantly greater mean weight reduction (–14.5 kg) compared to those who did not (–3.0 kg), with a between-group difference of –11.5 kg (95% CI: –14.5 to –8.6, p<0.0001). In the FR phase, while both groups showed a slight weight gain, the increase was significantly lower among completers (+1.0 kg vs +3.2 kg), with a between-group difference of –2.7 kg (95% CI: –4.3 to –1.1, p=0.0010). In the WLM phase, although weight gain continued, the difference between completers and non-completers was minimal and not statistically significant (–0.6 kg, p=0.3809) (Table 3).

Table 3: Impact of Phase Completion on Weight Trajectory in a Controlled Weight Management Program for Type 2 Diabetes

Phase	Group	N	Baseline / Start (Mean±SD)	End (Mean±SD)	Change (Mean±SD)	Difference (95% CI), p-value
TDR	Completed	128	100.9±16.7	86.4±15.6	14.5±6.0 (-15.5, –13.4)	11.5 (–14.5, –8.6), p<0.0001
	Not Completed	22	101.6±18.4	98.6±17.9	3.0±3.6 (–5.0, –1.0)	0.7 (–9.7, 8.3), p=0.8797
FR	Completed	107	85.2±15.0	86.2±15.4	1.0±3.2 (0.3, 1.6)	2.7 (–4.3, –1.1), p=0.0010
	Not Completed	20	92.0±17.7	95.2±17.1	3.2±2.3 (2.1, 4.3)	5.5 (–13.4, 2.5), p=0.1779
WLM	Completed	78	85.1±14.6	87.0±15.1	1.9±2.9 (1.2, 2.5)	0.6 (–1.8, 0.7), p=0.3809
	Not Completed	30	89.5±17.0	92.0±17.2	2.4±3.0 (1.3, 3.5)	5.0 (–11.6, 1.7), p=0.1424

The secondary outcomes of the study assessed the impact of the intervention on sleep and physical activity over 12 months. Sleep duration showed a modest increase in the intervention group (+2 minutes/day) compared to a reduction in the control group (–14 minutes/day), but the difference was not statistically significant (p=0.45). Similarly, sleep efficiency somewhat declined in both groups, with no significant between-group difference (p=0.50). Sedentary time decreased by 8 minutes/day in the intervention group, while it increased by 3 minutes/day in the control group, though this was also not significant (p=0.55). Light and moderate activity levels remained nearly unchanged in both groups, and no significant improvement in physical activity was observed. Vigorous activity remained very low in both groups throughout the study (Table 4).

doi: 10.21276/SSR-IIJLS.2025.11.3.23

Table 4: Effect of a Weight Loss Intervention on Sleep and Physical Activity in Patients with Type 2 Diabetes

Outcome	Group	N	Baseline Mean (SD)	12-Month Mean (SD)	Change (SD)	Intervention Effect (95% CI)	p-value	Intra-class Correlation
Sleep Duration (min/day)	Intervention	75	421.4(77.1)	423.1 (74.8)	+2 (86)	+8.2(–13.2, 29.5)	0.45	0.02
	Control	75	441.7(64.5)	427.8 (61.8)	–14(63)			
Sleep Efficiency (%)	Intervention	75	72.7(10.7)	71.9 (11.9)	–0.8(13.8)	–1.21(–4.76, 2.35)	0.50	0.03
	Control	75	74.5(9.0)	74.1 (9.3)	–0.3(10.4)			
Sedentary Time (min/day)	Intervention	75	188.3(63.2)	180.6 (67.3)	–8 (71)	–5.9(–25.7, 13.9)	0.55	<0.01
	Control	75	177.5(65.2)	180.8 (69.9)	+3 (63)			
Light Activity (min/day)	Intervention	75	117.5(39.2)	117.9(42.9)	0 (42)	+3.0(–8.8, 14.8)	0.61	<0.01
	Control	75	109.6(46.6)	110.8(44.7)	+1 (37)			
Moderate Activity (min/day)	Intervention	75	51.0(21.3)	51.2(23.1)	+0.1 (22.3)	+0.81(–5.80, 7.42)	0.81	<0.01
	Control	75	48.1(26.5)	48.9(26.5)	+0.7(21.4)			
Vigorous Activity (min/day)	Intervention	75	0.9(0.7)	0.8(0.9)	–0.03(0.91)	+0.03(–0.23, 0.28)	0.84	0.05
	Control	75	0.7(0.6)	0.7(0.7)	+0.01(0.64)			

DISCUSSION

The organization of type 2 diabetes mellitus has conventionally emphasized glycemic control through pharmacotherapy, lifestyle alteration, and risk factor management. However, recent evidence has increasingly pointed toward the potential of significant weight loss as a powerful mechanism for inducing remission of T2DM, predominantly when introduced early in the disease course. This conversation discovers, especially in the background of primary care surroundings, the impression of weight loss on diabetes remission and lasting consequences, and compares discoveries from important studies [12].

Numerous breakthrough studies have established that projected weight loss can main to partial or complete remission of T2DM. The DiRECT study, conducted in the UK, is among the most mentioned in this regard. This cluster-randomized controlled trial enrolled patients from primary care practices and implemented a structured weight management program using a low-calorie diet, followed by gradual food reintroduction and long-term weight preservation. Unusually, 46% of members in the interference group achieved remission at one year, with 36% maintaining remission at 2 years. These results muscularly propose that significant weight loss, especially greater than 10 kg, is related to higher remission rates [13].

In difference, the Appearance AHEAD trial, showed in the United States, active an additional measured lifestyle intervention aimed at weight loss and cardiovascular risk reduction in overweight and obese individuals with T2DM. Even though the trial did not achieve its primary endpoint of reducing cardiovascular events, it did establish different rates of diabetes remission. The difference in remission consequences between Look AHEAD and DiRECT may be partly credited to differences in the intensity and structure of interferences, baseline duration of diabetes, and degree of weight loss accomplished. DiRECT's more destructive calorie restriction in the initial stage, directing rapid weight loss, appears to have been more effective in inducing remission [14].

Prominently, the part of primary care in transporting these involvements cannot be excessive. Primary care locations attend as the first point of communication for most patients and are if possible placed to deliver continuing lifestyle interferences. DiRECT's success in a real-world primary care circumstance offers a strong

doi: 10.21276/SSR-IIJLS.2025.11.3.23

model for contributing structured weight loss programs into routine diabetes care. However, it also raises questions about the feasibility, scalability, and lasting sustainability of such interventions within routine general practice, particularly given the time limitations and resource limits that many primary care practices face [15].

From an automatic position, weight loss mains to decreases in hepatic and pancreatic fat, which are dangerous to restoring beta-cell function and insulin sensitivity. Taylor's twin-cycle hypothesis posits that T2DM develops due to an unpleasant cycle of fat accumulation in the liver and pancreas, which impairs insulin secretion and action. This hypothesis is supported by imaging studies within DiRECT, where members who accomplished remission showed important decreases in intra-organ fat [16].

Longstanding consequences but introductory discoveries are auspicious of weight loss-induced remission are still under investigation. A follow-up of the DiRECT cohort found that those who maintained weight loss and remission had better quality of life, improved blood pressure and lipid profiles, and reduced need for diabetes medications. However, relapse is a recognized concept. Many individuals regain weight over time, and with it, glycemic control often deteriorates. Thus, weight maintenance approaches must be an important constituent of any intervention [17].

A study from the United States, conducted within the Veterans Health Administration system, observed that even moderate weight loss (5-10%) achieved through intensive lifestyle intervention could reduce the need for diabetes medicines and improve metabolic parameters. This conclusion underscores that even if complete remission is not achieved, partial improvements can still translate into meaningful clinical benefits [18].

A supplementary remarkable study is the DIADEM-I trial, shown in the Middle East, which is intensive on a younger population with shorter diabetes duration. It also reported high remission rates (61% at 12 months), reinforcing the notion that early involvement is critical. Moderately, older individuals with longer-standing diabetes may require more destructive or multimodal methods, including bariatric surgery, to accomplish comparable consequences [19].

In quantity, while revisions differ in project, intensity, and consequences, a reliable theme emerges: intentional, structured weight loss can suggestively improve glycemic consequences, with the potential for decrease, especially when initiated early and sustained over time. DiRECT remains a standard for primary care-based interference, however, its generalisability to other healthcare systems and populations must be measured [20].

Weight loss is a foundation interference that offers not just metabolic development but potential remission of type 2 diabetes, predominantly in early-stage disease. Primary care the stage a fundamental role in delivering and sustaining these interferences, though systemic support, training, and organization are needed to approve success. The assessment of studies such as DiRECT, Look AHEAD, and DIADEM-I is the standing of modifying interferences to patient populations, available resources, and clinical surroundings. As healthcare systems increasingly emphasize preventative and value-based care, weight loss interferences for diabetes decrease in primary care should become a central calculated priority [21].

CONCLUSIONS

The study concluded the structured weight loss program demonstrated significant improvements in key health indicators for Type 2 diabetes management, particularly in weight loss, BMI reduction, and HbA1c levels, with the intervention group showing significant results compared to the control group. While secondary outcomes related to physical activity and sleep showed minor differences, they did not reach statistical significance. These findings suggest that the intervention can be an effective strategy for managing Type 2 diabetes in primary care settings, with further research needed to explore its broader impact on lifestyle factors.

This study proves that an organised weight management program in primary care can achieve significant weight loss, improve glycaemic control, and induce remission of type 2 diabetes in a substantial proportion of patients. The interference also reduced the need for diabetes and antihypertensive medications and improved quality of life, with minimal adverse events. These results support the feasibility and efficiency of applying remission-focused diabetes care in routine clinical practice.

CONTRIBUTION OF AUTHORS

Research concept- Mukulesh Gupta, Piyush Jhavar

doi: 10.21276/SSR-IIJLS.2025.11.3.23

Research design- Mukulesh Gupta
Supervision- Mukulesh Gupta
Materials- Mukulesh Gupta
Data collection- Mukulesh Gupta
Data analysis and Interpretation- Mukulesh Gupta
Literature search- Mukulesh Gupta, Piyush Jhavar
Writing article- Mukulesh Gupta, Piyush Jhavar
Critical review- Mukulesh Gupta
Article editing- Mukulesh Gupta
Final approval- Mukulesh Gupta

REFERENCES

[1] Ko JH, Kim TN. Type 2 diabetes remission with significant weight loss: Definition and evidence-based interventions. J Obes Metab Syndr., 2022; 31: 123–33. doi: 10.7570/jomes22001.

[2] Kvarnström K, Westerholm A, Airaksinen M, Liira H. Factors contributing to medication adherence in patients with a chronic condition: A scoping review of qualitative research. Pharmaceutics., 2021; 13: 1100. doi: 10.3390/pharmaceutics13071100.

[3] Jia W, Liu F, editors. Obesity: causes, consequences, treatments, and challenges. J Mol Cell Biol., 2021; 13: 463–65. doi: 10.1093/jmcb/mjab056.

[4] Wilding JPH. The importance of weight management in type 2 diabetes mellitus. Int J Clin Pract., 2014; 68: 682–91. doi: 10.1111/ijcp.12384.

[5] Stratton IM. Association of glycaemia with macrovascular and microvascular complications of type 2 diabetes (UKPDS 35): prospective observational study. BMJ, 2000; 321: 405–12. doi: 10.1136/bmj.321.7258.405.

[6] Heath L, Stevens R, Nicholson BD, Wherton J, Gao M, et al. Strategies to improve the implementation of preventive care in primary care: a systematic review and meta-analysis. BMC Med., 2024; 22: 412. doi: 10.1186/s12916-024-03588-5.

[7] Misra S, Ke C, Srinivasan S, Goyal A, Nyriyenda MJ, et al. Current insights and emerging trends in early-onset type 2 diabetes. Lancet Diabetes Endocrinol., 2023; 11: 768–82. doi: 10.1016/S2213-8587(23)00225-5.

[8] Lukewich J, Martin-Misener R, Norful AA, Poitras M-E, Bryant-Lukosius D, et al. Effectiveness of registered nurses on patient outcomes in primary care: a systematic review. BMC Health Serv Res., 2022; 22. doi: 10.1186/s12913-022-07866-x.

[9] Wilding JPH. The importance of weight management in type 2 diabetes mellitus. Int J Clin Pract., 2014; 68: 682–91. doi: 10.1111/ijcp.12384.

[10] Perreault L, Kramer ES, Smith PC, Schmidt D, Argyropoulos C. A closer look at weight loss interventions in primary care: a systematic review and meta-analysis. Front Med (Lausanne)., 2023; 10. doi: 10.3389/fmed.2023.1204849.

[11] Williams LS. Chapter 1 randomized controlled trials: Methodology, outcomes, and interpretation. Clinical Trials in Neurologic Practice, Elsevier; 2001, p. 1–26.

[12] Bin Rakhis SA, AlDuwayhis NM, Aleid N, AlBarrak AN, Aloraini AA. Glycemic control for type 2 diabetes mellitus patients: A systematic review. Cureus, 2022. doi: 10.7759/cureus.26180.

[13] Hall KD, Kahan S. Maintenance of lost weight and long-term management of obesity. Med Clin North Am., 2018; 102: 183–97. doi: 10.1016/j.mcna.2017.08.012.

[14] Pi-Sunyer X. The look AHEAD trial: A review and discussion of its outcomes. Curr Nutr Rep., 2014; 3: 387–91. doi: 10.1007/s13668-014-0099-x.

[15] Allen LN, Pettigrew LM, Exley J, Nugent R, Balabanova D, et al. The role of Primary Health Care, primary care and hospitals in advancing Universal Health Coverage. BMJ Glob Health, 2023; 8: e014442. doi: 10.1136/bmjgh-2023-014442.

[16] Rossi AP, Fantin F, Zamboni GA, Mazzali G, Zoico E, et al. Effect of moderate weight loss on hepatic, pancreatic and visceral lipids in obese subjects. Nutr Diabetes., 2012; 2: e32–e32. doi: 10.1038/nutd.2012.5.

[17] van Baak MA, Mariman ECM. Obesity-induced and weight-loss-induced physiological factors affecting weight regain. Nat Rev Endocrinol., 2023; 19: 655–70. doi: 10.1038/s41574-023-00887-4.

[18] Kroll-Desrosiers A, Finley EP, Hamilton AB, Cabassa LJ. Evidence-based intervention adaptations within the veterans' health administration: A scoping review. J Gen Intern Med., 2023; 38: 2383–95. doi: 10.1007/s11606-023-08218-z.

[19] Taheri S, Zaghloul H, Chagoury O, Elhadad S, Ahmed SH, et al. Effect of intensive lifestyle intervention on bodyweight and glycaemia in early type 2 diabetes (DIADEM-I): an open-label, parallel-group, randomised controlled trial. Lancet Diabetes

doi: 10.21276/SSR-IIJLS.2025.11.3.23

Endocrinol., 2020; 8: 477–89. doi: 10.1016/s2213-8587(20)30117-0.

[20]Shouche S, Borthakur A, et al. Quantitative project management-use of metrics for effective project management. Paper presented at PMI® Global Congress. Asia Pacific, Bangkok, Thailand. Newtown Square, PA: Project Management Institute; 2006.

[21]Magkos F, Fraterrigo G, Yoshino J, Luecking C, Kirbach K, et al. Effects of moderate and subsequent progressive weight loss on metabolic function and adipose tissue biology in humans with obesity. Cell Metab., 2016; 23: 591–601. doi: 10.1016/j.cmet.2016.02.005.