

INTRODUCTION AND OBJECTIVE

- Effective weight management and early metabolic control are important to prevent complications of hyperglycemia¹
- There is limited real-world data on glucose metrics stratified by BMI

Objectives:

This cross-sectional analysis evaluates the relationship between BMI and glucose control in FreeStyle Libre (FSL) participants enrolled in Weight Watchers (WW).

METHODS

- De-identified data from participants who connected FSL to WW were analyzed
- The diabetes diagnosis status, HbA1c, and medication usage of participants were unknown
- The updated Glucose Management Indicator (uGMI) was reported instead of GMI due to its improved alignment with laboratory A1c values²
- Mean glucose (mg/dL), uGMI (%), Time in Tight Range (70-140 mg/dL) (T1TR, %), Time in Range (70-180 mg/dL) (T1R, %), Time Above 120 mg/dL (TA120, %), Time Above 140 mg/dL (TA140, %), and Time Above 180 mg/dL (TA180, %) were calculated from the first 14 days of glucose data for each user
- Glucose metrics were stratified by BMI categories: Normal (18.5 - 24), Overweight (25 - 29), Obesity class 1 (30 - 34), class 2 (35 - 39), and class 3 (≥40)
- Group differences were evaluated by the Wilcoxon rank-sum test

RESULTS

- Participants (n = 3,019) from the United States were analyzed: 3.5% normal, 16.4% overweight, 27.6% obesity class 1, 24.5% class 2, and 28.1% class 3
- Compared to the normal BMI group, obesity classes 1-3 showed statistically significant differences in mean glucose, uGMI, T1TR, TA120, and TA140 (**Table 1**)

Table 1. Glucose metrics stratified by BMI category

BMI category	Number of users	Glucose metrics (n = 3,019)						
		Mean glucose (mg/dL)	uGMI (%)	T1R (%)	T1TR (%)	TA120 (%)	TA140 (%)	TA180 (%)
Normal (BMI ≥ 18.5 & < 25)	106 (3.5%)	125.4, [106.2, 149.2]	6.1, [5.3, 6.9]	92.8, [78.3, 98.6]	68.9, [46.6, 93.0]	50.8, [16.6, 75.9]	29.3, [4.9, 53.4]	4.8, [0.2, 18.3]
Overweight (BMI ≥ 25 & < 30)	495 (16.4%)	132.1, [114.8, 155.1] ns	6.3, [5.7, 7.1] ns	89.6, [73.8, 96.9] ns	63.7, [39.3, 83.0] ns	62.0, [34.6, 81.7] ns	33.9, [15.0, 60.9] ns	8.2, [1.5, 24.0] ns
Obesity class 1 (BMI ≥ 30 & < 35)	832 (27.6%)	134.7, [115.9, 159.5] *	6.4, [5.7, 7.2] *	89.2, [71.5, 97.3] ns	62.3, [35.3, 84.8] *	64.4, [35.7, 83.9] *	37.6, [13.7, 64.7] *	8.8, [1.6, 27.3] ns
Obesity class 2 (BMI ≥ 35 & < 40)	739 (24.5%)	136.0, [116.1, 160.3] *	6.4, [5.7, 7.2] *	88.7, [70.0, 96.8] ns	60.1, [33.4, 82.8] *	65.8, [38.2, 85.6] *	39.1, [14.5, 67.6] *	9.0, [1.5, 28.2] ns
Obesity class 3 (BMI ≥ 40)	847 (28.1%)	137.9, [119.3, 166.2] *	6.5, [5.8, 7.4] *	87.2, [65.4, 96.4] ns	57.3, [28.9, 79.3] *	68.4, [42.5, 88.9] *	42.8, [19.6, 71.8] *	10.5, [1.9, 33.7] *

Glucose metrics of FSL participants (n = 3,019) enrolled in WW, stratified by BMI categories. UGMI formula = $(15.36 / \text{mean glucose} + 0.0426)^{-1}$. Each glucose metric is represented by the median and IQR. P-value annotations denote significance from Wilcoxon rank-sum tests comparing each BMI category with the Normal BMI group (* = p < .005; ns = not significant).

References

- American Diabetes Association Professional Practice Committee for Diabetes*; 8. Obesity and Weight Management for the Prevention and Treatment of Diabetes: Standards of Care in Diabetes—2026. Diabetes Care 1 January 2026; 49 (Supplement_1): S166–S182. <https://doi.org/10.2337/dc26-S008>.
- RICHARD M. BERGENSTAL, YONGJIN XU, TIMOTHY DUNN, PRATIK CHOUDHARY, RAMZI AJJAN; 165-OR: Improving A1C and CGM Average Glucose Alignment—The Updated Glucose Management Indicator (GMI). Diabetes 20 June 2025; 74 (Supplement_1): 165–OR. <https://doi.org/10.2337/db25-165-OR>.