

# Suitability of a weight loss digital therapeutic platform post bariatric metabolic surgery: A multidisciplinary perspective

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# Background

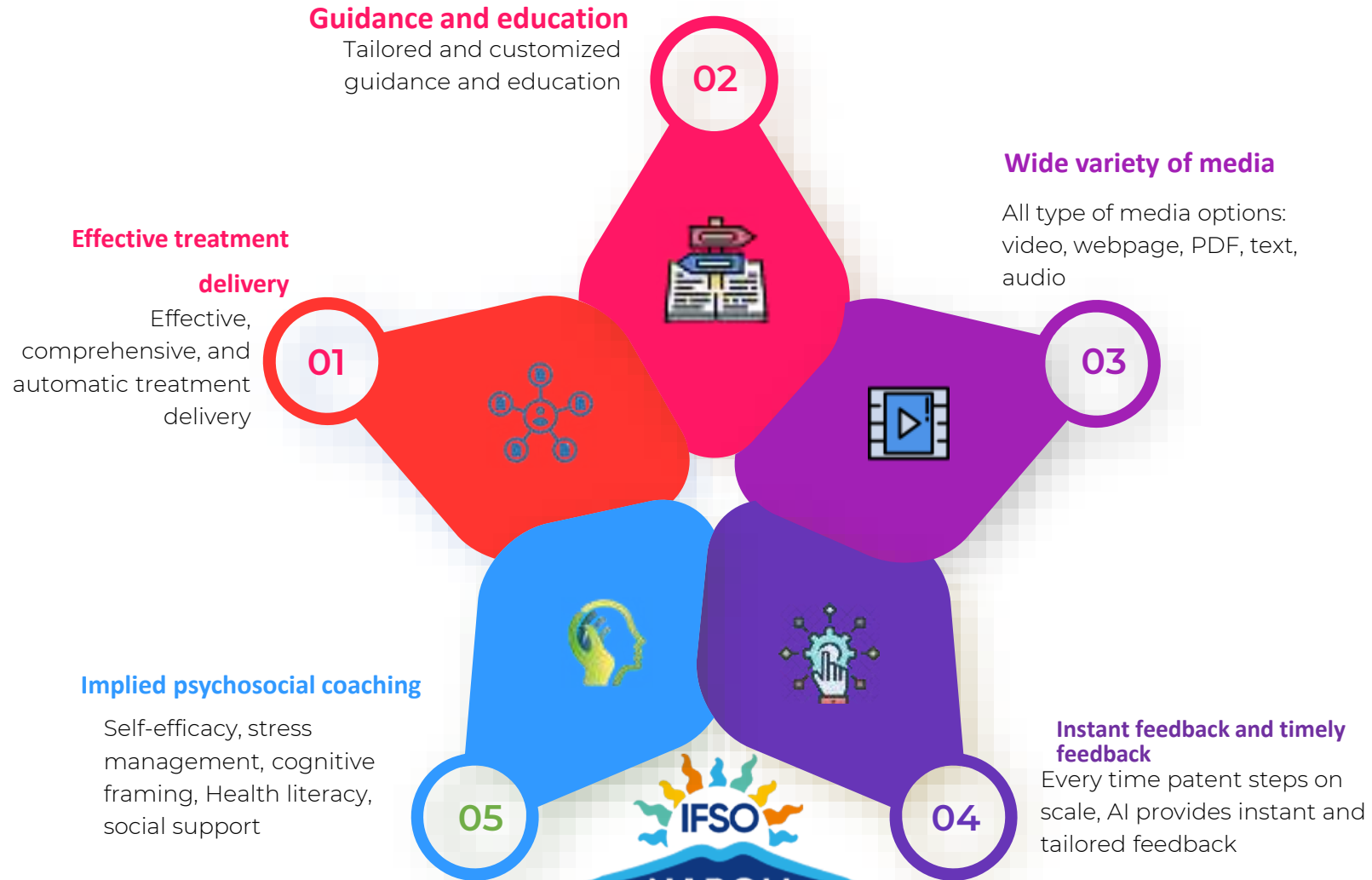
What is a digital therapeutics?

- Evidence-based therapeutic interventions for patients by means of qualified software programs to prevent, manage, or treat medical conditions.

## Weight Management Features in DTx



## AI Role in DTx



## Method

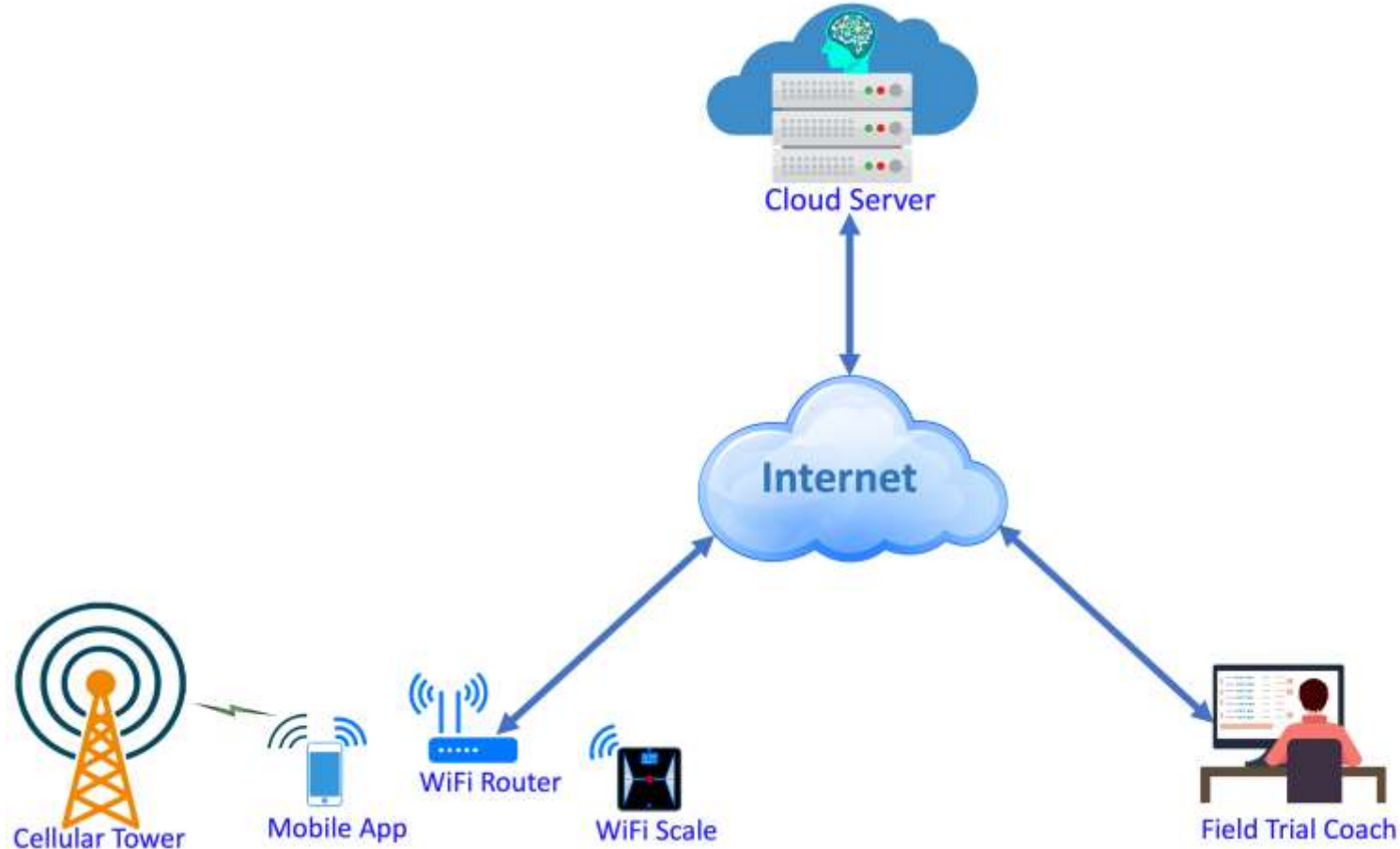
- n=391 (59% male, 41% female)
- $\mu_{Age} = 43.56$  ,  $\sigma_{Age} = 12.60$  years, and range of 21-71 years
- 6 groups (buckets)

### Participants baseline weight (kg) and BMI

	Weight Bucket 1 65-85 Kg	Weight Bucket 2 86-105 Kg	Weight Bucket 3 106-125 Kg	Weight Bucket 4 126-145 Kg	Weight Bucket 5 146-165 Kg	Weight Bucket 6 166-181 Kg	Overall 65-181 Kg
No. of participants	61	78	83	60	66	43	391
Start weight mean, $\mu_{wt}$	76.0	95.8	113.5	135.2	154.8	172.1	124.6
Start weight SD, $\sigma_{wt}$	6.1	3.3	6.1	5.8	5.2	4.5	31.57
Start BMI mean, $\mu_{BMI}$	31.9	36.7	42.2	48.6	52.6	57.4	34.9
Start BMI SD, $\sigma_{BMI}$	3.0	4.1	4.7	6.0	6.5	6.2	8.5

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## Results (Part 1)

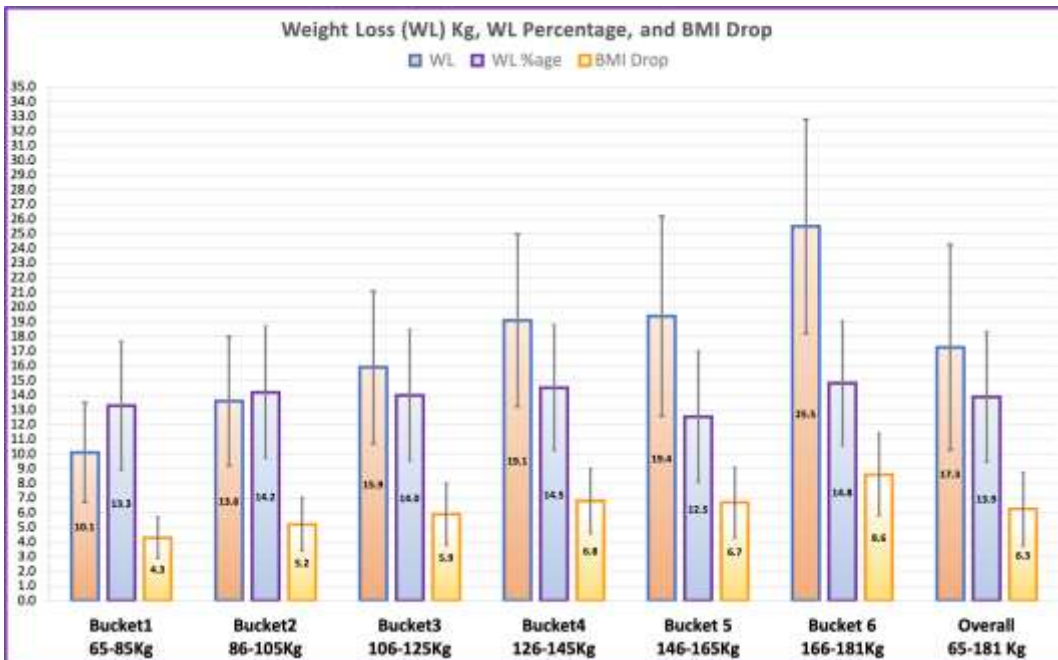
For all buckets combined, 13.9% weight loss, 95% CI 13.45 -14.33,  $p < 0.0001$

Table 1

	Weight Bucket 1 65-85 Kg	Weight Bucket 2 86-105 Kg	Weight Bucket 3 106-125 Kg	Weight Bucket 4 126-145 Kg	Weight Bucket 5 146-165 Kg	Weight Bucket 6 166-181 Kg	Overall
Weight loss percentage	13.29	14.20	14.00	14.50	12.53	14.81	13.89
%age weight loss 95% CI	12.18 – 14.38	13.20 – 15.19	13.03 -14.96	13.41 -15.58	11.45 – 13.60	13.54-16.07	13.45-14.33

Table 2

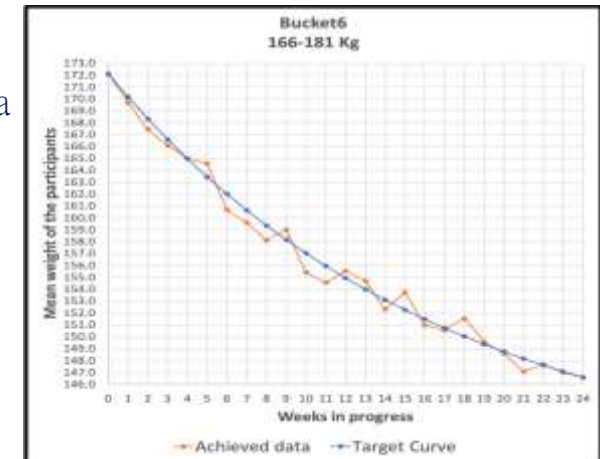
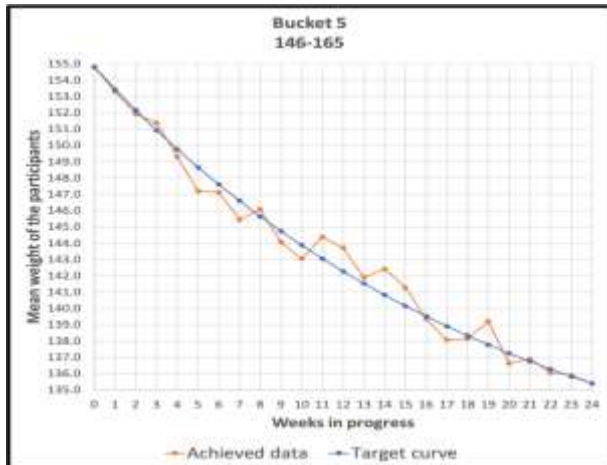
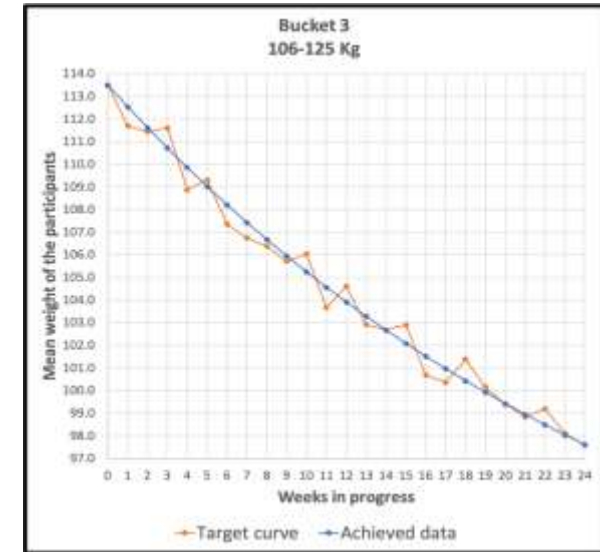
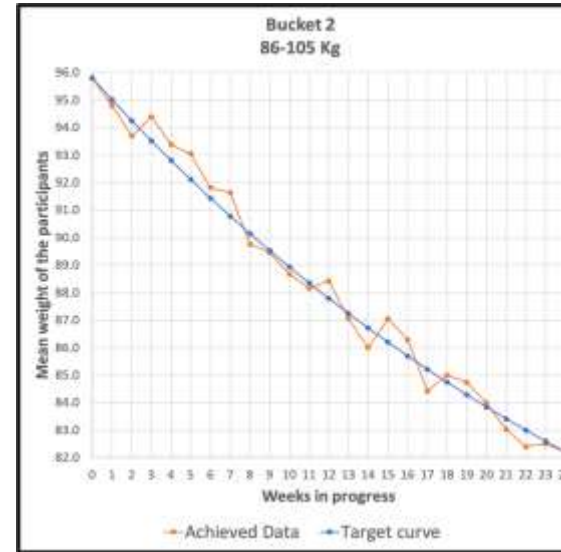
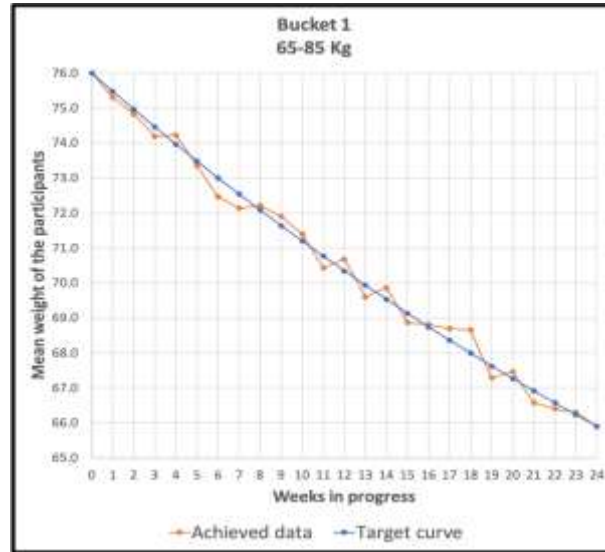
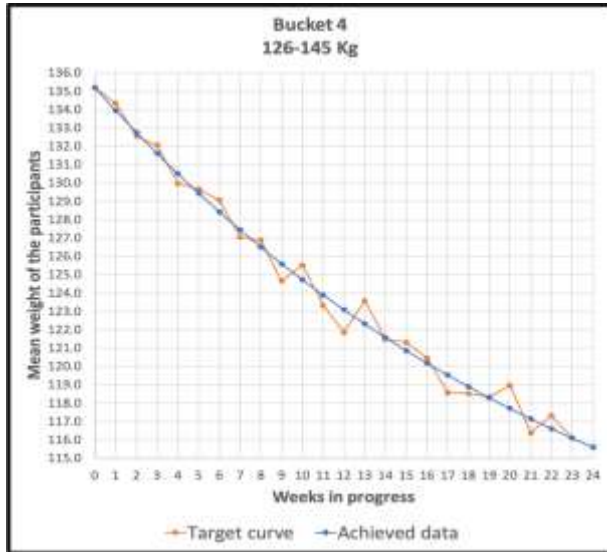
Bivariate correlation between study's additional parameters along with p-value of the correlation						
	Weight loss %age	Age	Sub goals reassignment	Accountability circle members	Challenges participation	Gender
Weight loss %age	1					
Age	-0.103 $p < 0.05$	1				
Sub goals reassignment	-0.679 $p < 0.05$	0.029 $p = 0.56$	1			
Accountability circle members	0.523 $p < 0.05$	-0.050 $p = 0.32$	-0.556 $p < 0.5$	1		
Challenges participation	0.639 $p < 0.05$	-0.125 $p < 0.05$	-0.380 $p < 0.05$	0.348 $p < 0.05$	1	
Gender	0.101 $p < 0.05$	0.039 $p = 0.43$	0.0284 $p = 0.57$	-0.023 $p = 0.64$	0.060 $p = 0.24$	1





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## Results (part 2)

Weekly progress charts for each weight bucket for 24 weeks.

Weight loss weekly short-term goals and trend is governed by the weight loss formula given below.

$$W_{loss} = \frac{\Delta W}{1 - e^{-\frac{rn}{10}}} \left( e^{-\frac{rn}{10}} - e^{-\frac{r\tau}{10}} \right); \tau, r \neq 0$$

$W_{loss}$ ,  $\Delta W$ ,  $\tau$ ,  $r$ , and  $n$  are weight to lose at each short-term goal, total weight loss, time to lose weight in weeks, and  $r$  is the curve tension.



# Conclusion and Future Work

- **Conclusion**

- **An evidence-based, well-designed digital therapeutics with proper guidance through an AI agent and human coach, motivation, and accountability can achieve more than 10% weight loss in less than 6 months. It's a promising technological solution for pre and post-op weight loss.**

- **Future Work**

- **Digital therapeutics complementing GLP-1 field study**
- **Digital therapeutics for post bariatric surgery exclusive weight management field study**



Thank You!  
Questions?

