CO104

# Evaluating the Effectiveness of FitterLife: A Community-Based Virtual Weight Management Programme for Overweight Adults Without Diabetes or Hypertension in Singapore

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## INTRODUCTION

- **Rising health burden**: The prevalence of diabetes and overweight (including obesity) in Singapore has increased over the years to 8.6% and 36.2% respectively in 2017*, with overweight being associated with increased risk of developing diabetes and its complications.
- **Population health response**: To control the burden of diabetes, National Healthcare Group, one of Singapore's three regional health systems, moved upstream with population health initiatives called the War on Diabetes Community Intervention Programmes (WOD-CIP) to prevent development of diabetes.
- **FitterLife programme**: One of the WOD-CIP, was a community-based 12-week weight management programme targeting overweight adults without diabetes or hypertension. Programme components included health education, goal setting, physical activity, and diet management, which were delivered by Health Promotion Consultant and Health Coaches over nine sessions and three weeks of self-practicing.

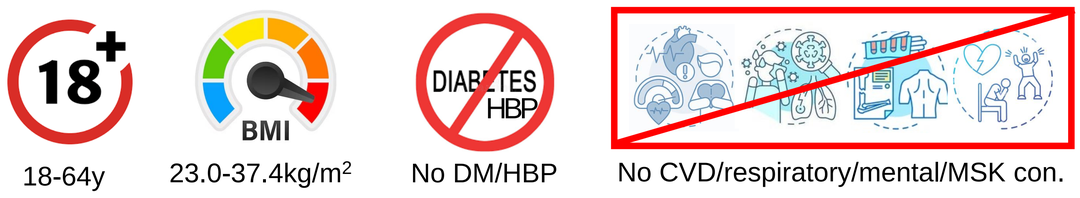
## OBJECTIVE

This study is to evaluate and quantify the effectiveness of FitterLife (FL) programme in reducing body weight or BMI, compared to those without intervention (Controls).

## METHODS

❖ **Design**: A retrospective matched cohort study with controls identified based on programme inclusion and exclusion criteria

❖ **FitterLife Programme Eligibility**:




18-64y | 23.0-37.4kg/m² | No DM/HBP | No CVD/respiratory/mental/MSK con.

❖ **Participants & Data Sources:**

✓(A) FitterLife programme participants (n=**306)**: Programme data including demographics and weight, BMI at 1st, 4th, 8th , 12th, 36th week.

✓(B) Eligible controls: Identified from an administrative database of a regional health system with demographics, medical history, weight and BMI data, etc.

❖ **Outcome Variables:**

✓ Weight loss target: ≥5% weight lost or ≥1 BMI unit reduction by week 12 as compared to those at week 1

✓ Continuous weight and BMI across four timepoints

❖ **Covariates:**

✓ Age at enrolment, gender, ethnicity (Chinese vs non-Chinese)

❖ **Statistical Analysis**:

✓ Analytical approach: Intention to Treat (ITT)

✓ Sample preparation: Propensity score matching (PSM) without replacement using radius caliper matching (width: 0.001) to create a trimmed cohort by excluding off support controls

✓ Matching quality assessment: Balance evaluation after PSM on trimmed cohort was assessed through standardised mean difference (SMD) and variance ratio (VR)

✓ Descriptive analysis: Comparing covariates and baseline weight and BMI between FitterLife participants and Controls before and after PSM

✓ **Modified Poisson regression** was conducted on both unmatched and matched samples

✓ **Average treatment-effect estimation**: using Inverse Probability Weighted Regression Adjustment (IPWRA)

✓ **Panel analysis**: Mixed-effect linear regression on the trimmed cohort to analyse magnitude of weight & BMI change from baseline, adjusted for covariates.

## RESULTS

❖ **Baseline characteristics before and after PSM**

✓ After matching, all variables achieved balance with non-significant mean differences, absolute bias <5%, and variance ratios for baseline weight and BMI within the ideal range of 0.5-2.0.

| Baseline characteristics | Pre matching | | p-value | Post matching | | p-value |
|---|---|---|---|---|---|---|
| | FitterLife | Control | | FitterLife | Control | |
| | n=306 | n=5,087 | | n=306 | n=306 | |
| **Age** | 47.8 ± 10.7 | 47.5± 11.9 | 0.676 | 47.8 ± 10.7 | 48.1 ± 11.6 | 0.805 |
| **Gender** | | | <0.001 | | | 0.876 |
| Male | 68 (22.2) | 2265 (44.5) | | 68 (22.2) | 66 (21.6) | |
| Female | 238 (77.8) | 2822 (55.5) | | 238 (77.8) | 240 (78.3) | |
| **Chinese** | 255 (83.3) | 3563 (70.0) | <0.001 | 255 (83.3) | 257 (83.9) | 0.853 |
| **Weight** | 73.6 ± 12.1 | 72.9 ± 12.2 | 0.325 | 73.6 ± 12.1 | 72.7 ± 12.0 | 0.125 |
| **BMI** | 28.1 ± 3.6 | 27.2 ± 3.2 | <0.001 | 28.1 ± 3.6 | 28.0 ± 3.5 | 0.605 |

❖ **Treatment effect of FitterLife on weight loss at Week 12**

✓ FitterLife participants were more likely to achieve weight loss target compared to matched controls (45.8% vs 13.6%, adjusted IRR=3.37, 95% CI: 2.87, 3.93).

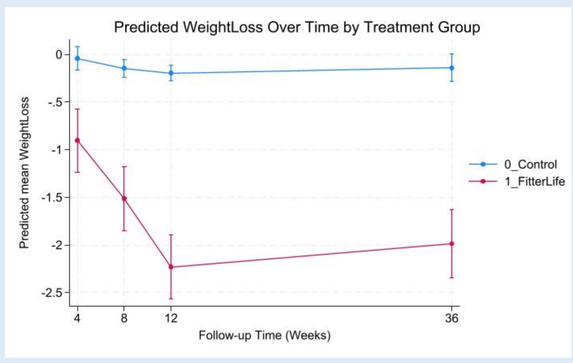
| Statistical methods | Achieved ≥5% reduction in weight or ≥1 kg/m² reduction in BMI | | | | |
|---|---|---|---|---|---|
| | FitterLife | Controls | P-value | Adjusted incidence rate ratio (ref: Controls) | 95% confidence interval |
| Modified Poisson regression on unmatched sample | 140 (45.8%) | 644 (12.7%) | <0.001 | 3.32 | 2.85, 3.86 |
| Modified Poisson regression on matched sample | 140 (45.8%) | 41 (13.6%) | <0.001 | 3.37 | 2.87, 3.93 |
| IPWRA (ATET) | 45.7% | 13.7% | <0.001 | 0.32 | 0.26, 0.38 |

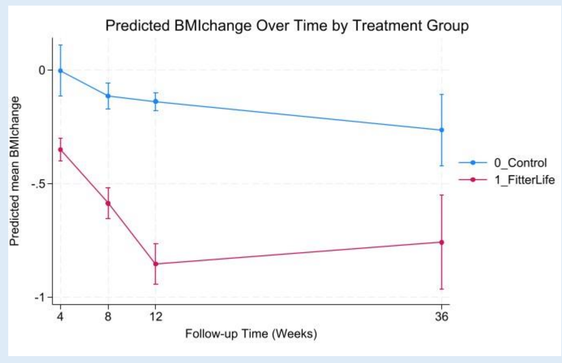
*Adjusted for age, female, Chinese, baseline BMI.*

❖ **Trajectories of weight and BMI change: FitterLife vs Control groups**

✓ FitterLife group demonstrated a notable decrease in both weight and BMI throughout the programme period (12 weeks).

✓ This positive effect persisted at week 36, although there was a slight tendency for some participants to regain weight.




## CONCLUSION

❖ FitterLife programme participants were more likely to achieve ≥5% weight loss or ≥ 1 BMI unit reduction at week 12 compared to matched controls.

❖ FitterLife programme participants experienced a trend of weight loss over time, in contrast to the control group during the programme period. This positive effect persisted six months after the programme concluded, although there was a slight tendency for some participants to regain weight.

❖ FitterLife was effective in supporting weight loss among the study population. The findings support its potential as a scalable, community-based intervention.

❖ Full cost-per-participant and cost-effectiveness analyses, as well as projected long-term health benefits, should be considered when evaluating the programme's scalability.

*The WOD-CIP was funded by Minister of Health, Singapore (Letter of Award number: MH34:31/2).*