

Supplementary materials

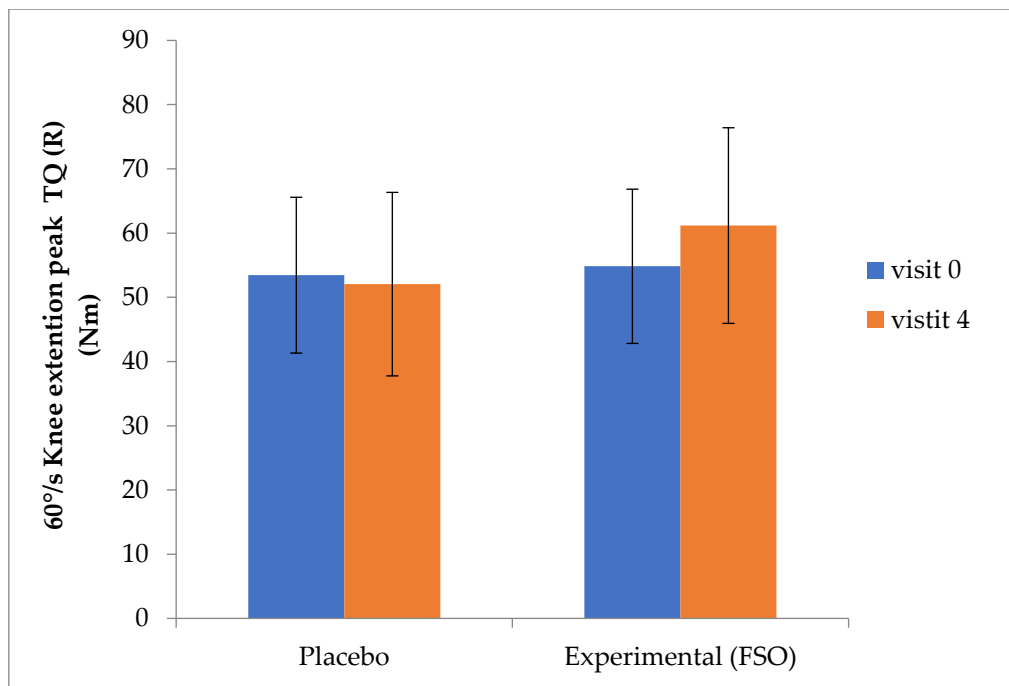


Figure S1. Measurement comparison of the 60°/s right knee extension peak TQ (Nm) in PP population. Each bar represents the mean \pm SD.

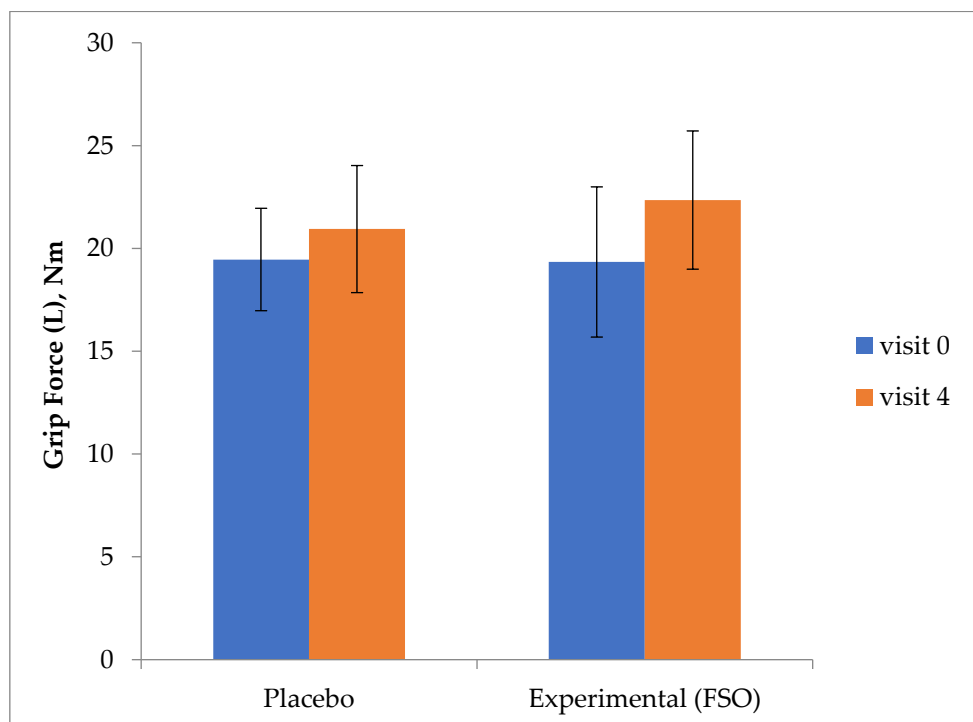


Figure S2. Measurement comparison of the left hand grip force (Nm) in PP population. Each bar represents the mean \pm SD.

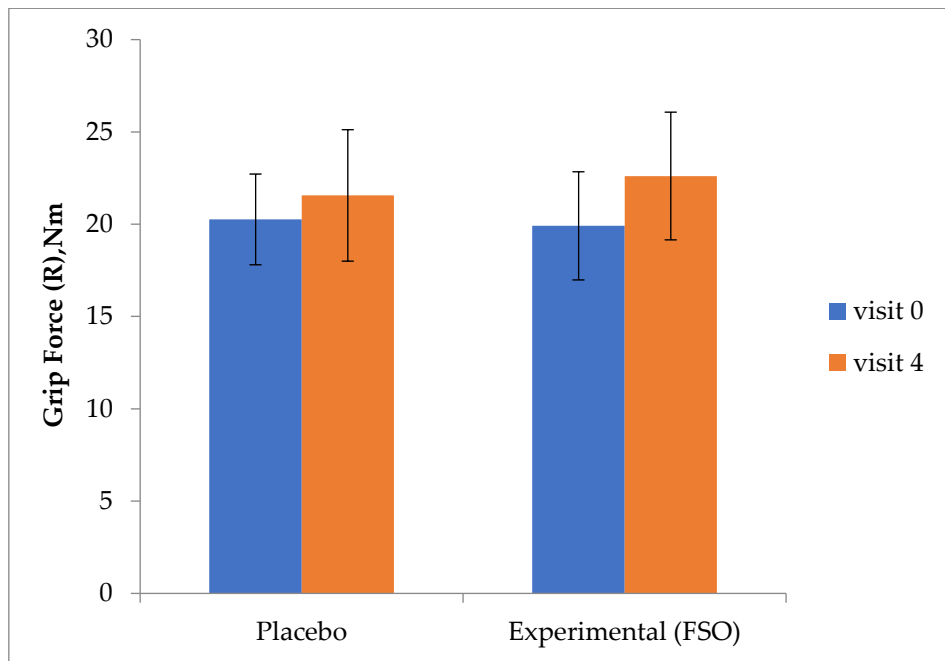


Figure S3. Measurement comparison of the right hand grip force (Nm) in PP population. Each bar represents the mean \pm SD.

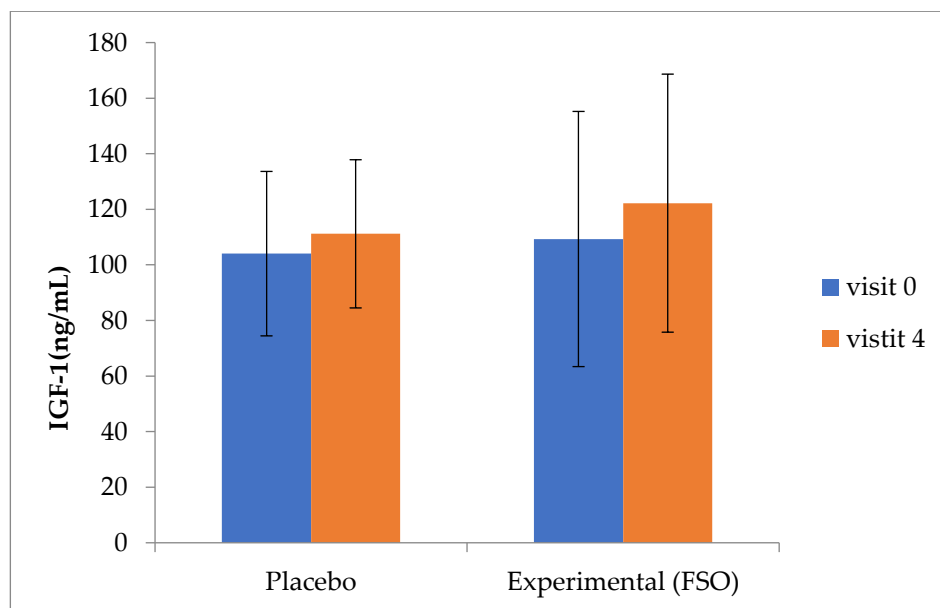


Figure S4. Measurement comparison of IGF-1 level in PP population. Each bar represents the mean \pm SD.

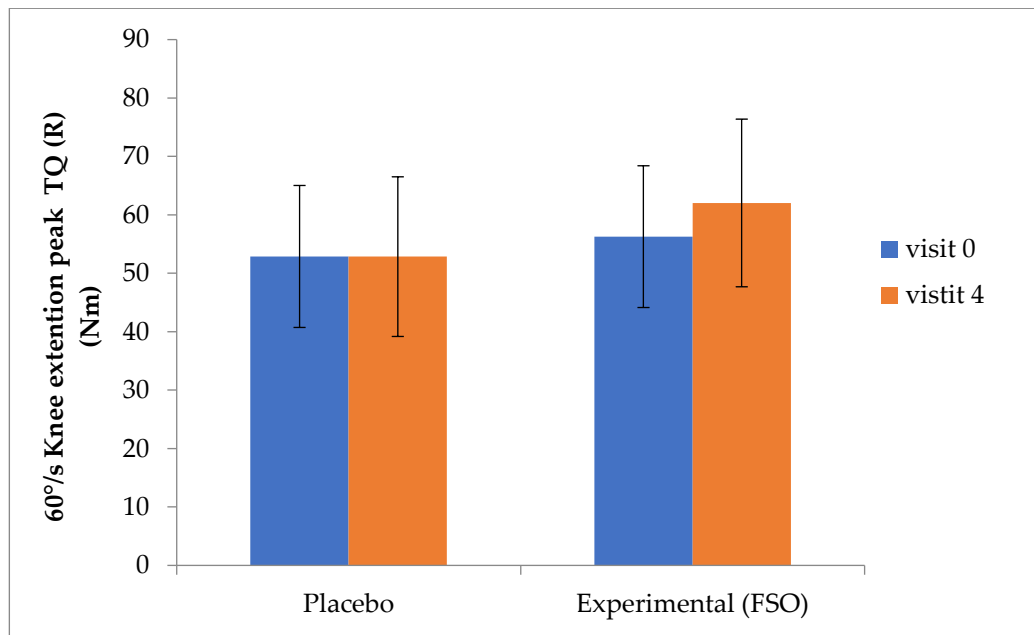


Figure S5. Measurement comparison of the 60°/s right knee extension peak TQ (Nm) in ITT population. Each bar represents the mean \pm SD.

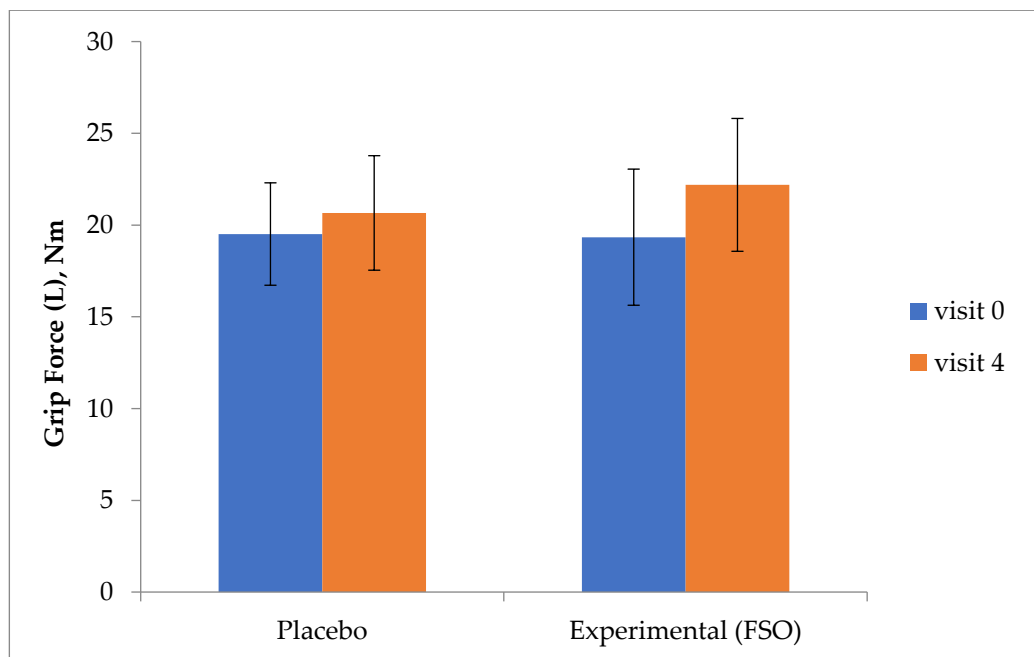


Figure S6. Measurement comparison of the left hand grip force (Nm) in ITT population. Each bar represents the mean \pm SD.

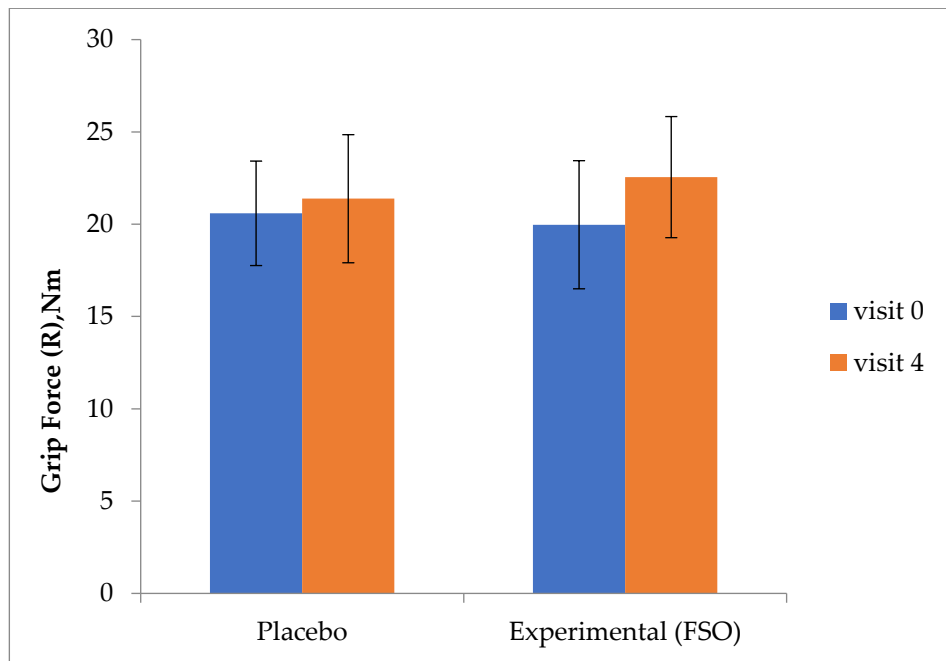


Figure S7. Measurement comparison of the right hand grip force (Nm) in ITT population. Each bar represents the mean \pm SD.

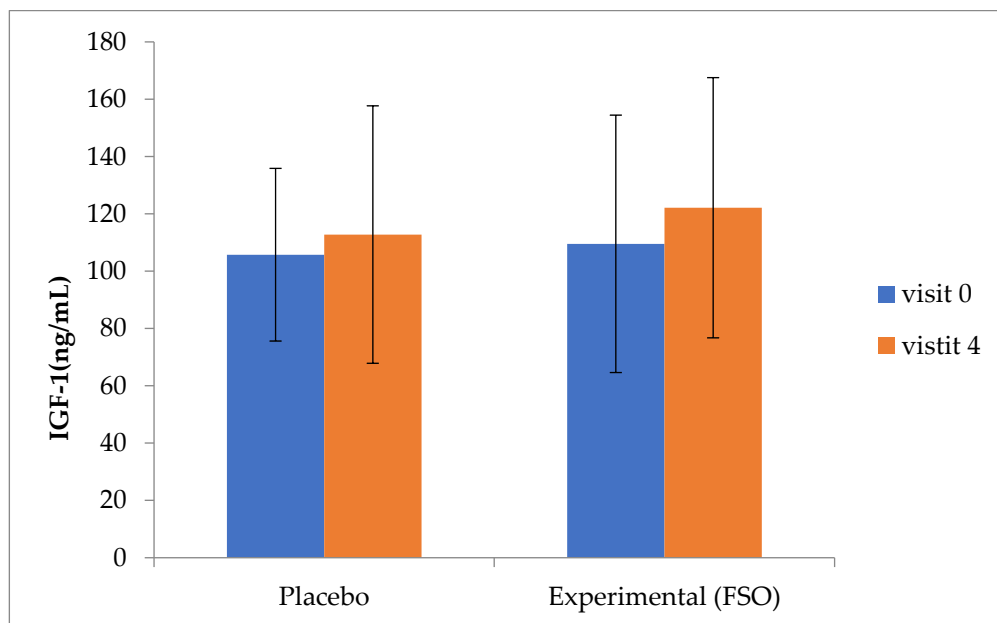


Figure S8. Measurement comparison of IGF-1 level in ITT population. Each bar represents the mean \pm SD.

Supplementary Table S1. Comparison between and within each group by (PP population)

| Variable | Observed value | | | Change from baseline | | | | p value** |
|--|----------------|---------------------|-----------|----------------------|----------|---------------------|----------|-----------|
| | Control (n=34) | Experimental (n=18) | p value** | Control (n=34) | p value* | Experimental (n=18) | p value* | |
| 60°/s knee extension peak TQ (R), Nm | | | | | | | | |
| Visit 2 | 53.45±12.13 | 54.83±12.01 | 0.628 | -1.41±10.38 | 0.736 | 6.33±11.10 | 0.15* | 0.037* |
| Visit 4 | 52.05±14.29 | 61.17±15.23 | 0.056 | | | | | |
| 60°/s knee flexion peak TQ (R), Nm | | | | | | | | |
| Visit 2 | 28.23±9.44 | 32.50±9.29 | 0.512 | 3.63±9.46 | 0.096 | 1.50±9.87 | 0.545 | 0.477 |
| Visit 4 | 31.86±11.89 | 34.00±13.66 | 0.959 | | | | | |
| 180°/s knee extension peak TQ (R), Nm | | | | | | | | |
| Visit 2 | 28.64±6.40 | 32.67±7.67 | 0.061 | 2.98±8.83 | 0.091 | 1.39±4.43 | 0.046* | 0.530 |
| Visit 4 | 31.62±9.10 | 34.06±7.85 | 0.285 | | | | | |
| 180°/s knee flexion peak TQ (R), Nm | | | | | | | | |
| visit2 | 20.95±5.28 | 25.94±5.97 | 0.053 | 1.71±4.69 | 0.138 | -0.78±3.88 | 0.429 | 0.094 |
| visit4 | 22.67±6.27 | 25.17±6.10 | 0.539 | | | | | |
| 60°/s knee extension peak TQ (L), Nm | | | | | | | | |
| Visit 2 | 57.17±17.03 | 62.00±14.80 | 0.310 | -2.26±16.42 | 0.516 | -3.74±12.66 | 0.171 | 0.734 |
| Visit 4 | 54.91±12.99 | 58.26±16.88 | 0.455 | | | | | |
| 60°/s knee flexion peak TQ (L), Nm | | | | | | | | |
| Visit 2 | 31.8±12.4 | 32.3±13.5 | 0.892 | -4.26±7.59 | 0.013* | -3.74±8.23 | 0.007*** | 0.824 |
| Visit 4 | 27.6±10.7 | 27.9±12.3 | 0.919 | | | | | |
| 180°/s knee extension peak TQ (L), Nm | | | | | | | | |
| Visit 2 | 31.78±9.11 | 34.22±8.06 | 0.342 | -0.17±6.79 | 0.903 | -1.39±5.79 | 0.262 | 0.516 |
| Visit 4 | 31.61±7.00 | 32.83±6.57 | 0.546 | | | | | |
| 180°/s knee flexion peak TQ (L), Nm | | | | | | | | |
| visit2 | 22.61±6.32 | 23.91±5.98 | 0.476 | 0.17±5.32 | 0.640 | 0.13±3.96 | 0.876 | 0.975 |
| visit4 | 22.64±5.33 | 24.04±7.02 | 0.454 | | | | | |

| | | | | | | | | |
|-------------------------------|---------------|---------------|-------|----------------|---------|--------------|----------|--------|
| ASM/height² | | | | | | | | |
| visit2 | 2.58±0.27 | 2.65±0.25 | 0.400 | -0.01±0.11 | 0.695 | -0.01±0.13 | 0.592 | 0.882 |
| visit4 | 2.57±0.26 | 2.63±0.23 | 0.415 | | | | | |
| ASM/weight x 100 | | | | | | | | |
| visit2 | 10.45±0.75 | 10.84±1.05 | 0.152 | -0.17±0.46 | 0.094 | -0.11±6.62 | 0.388 | 0.729 |
| visit4 | 10.28±0.64 | 10.73±0.92 | 0.061 | | | | | |
| Total Body Fat | | | | | | | | |
| visit2 | 37.67±4.56 | 35.40±6.54 | 0.177 | 0.70±1.61 | 0.051 | 0.87±1.13 | 0.001*** | 0.674 |
| visit4 | 38.99±4.02 | 36.56±6.55 | 0.202 | | | | | |
| Abdominal Fat | | | | | | | | |
| visit2 | 118.4±28.4 | 106.7±39.8 | 0.260 | 9.77±16.39 | 0.009** | 8.93±7.96 | 0.000*** | 0.827 |
| visit4 | 128.2±25.9 | 115.7±41.3 | 0.226 | | | | | |
| Grip Force (L), Nm | | | | | | | | |
| visit2 | 19.46±2.49 | 19.34±3.65 | 0.901 | 1.48±2.31 | 0.006** | 3.00±2.49 | 0.000*** | 0.036* |
| visit4 | 20.94±3.09 | 22.35±3.36 | 0.146 | | | | | |
| Grip Force (R), Nm | | | | | | | | |
| visit2 | 20.26±2.46 | 19.91±2.93 | 0.667 | 1.60±2.07 | 0.006** | 2.70±1.47 | 0.000*** | 0.011* |
| visit4 | 21.56±3.56 | 22.61±3.46 | 0.315 | | | | | |
| Pyruvate | | | | | | | | |
| visit2 | 0.545±0.150 | 0.574±0.163 | 0.546 | 0.03±0.20 | 0.753 | 0.03±0.17 | 0.390 | 0.962 |
| visit4 | 0.557±0.122 | 0.604±0.136 | 0.229 | | | | | |
| Lactate | | | | | | | | |
| visit2 | 8.17±1.90 | 9.38±3.70 | 0.321 | 1.79±3.38 | 0.018* | 1.34±2.90 | 0.037* | 0.632 |
| visit4 | 10.00±3.83 | 10.72±4.02 | 0.694 | | | | | |
| IGF-1 (ng/mL) | | | | | | | | |
| visit2 | 104.04±29.58 | 109.31±45.91 | 0.646 | 7.13±25.18 | 0.188 | 12.91±23.36 | 0.015* | 0.424 |
| visit4 | 111.17±26.67 | 122.22±46.43 | 0.329 | | | | | |
| hsCRP | | | | | | | | |
| visit2 | 0.15±0.25 | 0.16±0.36 | 0.949 | -0.032±0.167 | 0.371 | 0.066±0.343 | 0.369 | 0.228 |
| visit4 | 0.12±0.11 | 0.22±0.69 | 0.492 | | | | | |
| EQ-5D-3L | | | | | | | | |
| visit2 | 0.822±0.186 | 0.798±0.178 | 0.663 | 0.049±0.156 | 0.144 | 0.061±0.124 | 0.027* | 0.775 |
| visit4 | 0.871±0.173 | 0.859±0.157 | 0.812 | | | | | |
| VAS | | | | | | | | |
| visit2 | 0.782±0.226 | 0.771±0.209 | 0.862 | 0.061±0.169 | 0.098 | 0.074±0.140 | 0.019* | 0.778 |
| visit4 | 0.843±0.215 | 0.845±0.172 | 0.975 | | | | | |
| IPAQ | | | | | | | | |
| visit2 | 1968.8±1655.9 | 2216.9±1241.1 | 0.579 | 796.36±1746.13 | 0.053 | 268.2±1302.9 | 0.334 | 0.255 |
| visit4 | 2676.6±2393.4 | 2485.1±1089.4 | 0.730 | | | | | |
| Dietary Intake | | | | | | | | |
| visit2 | 1699.1±359.8 | 1562.4±479.8 | 0.280 | -53.19±316.44 | 0.429 | 50.72±280.54 | 0.395 | 0.245 |
| visit4 | 1645.9±410.4 | 1613.1±512.0 | 0.812 | | | | | |

The data is expressed as the mean ± SD for pre and post outcomes and comparison between two groups.

* P values were compared within each group.

** P values were compared between groups. Results with statistically significant differences are indicated in bold.

Supplementary Table S2. Comparison between and within each group (ITT population)

| Variable | Observed value | | | Change from baseline | | | | p value** |
|--|----------------|---------------------|-----------|----------------------|----------|---------------------|----------|-----------|
| | Control (n=34) | Experimental (n=18) | p value** | Control (n=34) | p value* | Experimental (n=18) | p value* | |
| 60°/s knee extension peak TQ (R), Nm | | | | | | | | |
| Visit 2 | 52.88±12.15 | 56.21±12.13 | 0.320 | -0.04±10.13 | 0.985 | 5.77±10.58 | 0.010** | 0.048 |
| Visit 4 | 52.85±13.66 | 62.04±14.35 | 0.023* | | | | | |
| 60°/s knee flexion peak TQ (R), Nm | | | | | | | | |
| Visit 2 | 28.46±9.24 | 31.00±9.90 | 0.344 | 2.99±9.43 | 0.118 | 1.50±9.33 | 0.607 | 0.567 |
| Visit 4 | 31.46±11.86 | 32.50±13.29 | 0.768 | | | | | |
| 180°/s knee extension peak TQ (R), Nm | | | | | | | | |
| Visit 2 | 29.19±6.33 | 32.98±8.19 | 0.072 | 2.64±8.47 | 0.123 | 1.88±4.21 | 0.031* | 0.680 |
| Visit 4 | 31.83±8.61 | 34.81±8.04 | 0.206 | | | | | |
| 180°/s knee flexion peak TQ (R), Nm | | | | | | | | |
| visit 2 | 21.58±5.13 | 24.92±5.70 | 0.031* | 0.87±5.62 | 0.429 | -1.00±4.18 | 0.233 | 0.176 |
| visit 4 | 22.45±6.31 | 23.92±6.19 | 0.403 | | | | | |
| 60°/s knee extension peak TQ (L), Nm | | | | | | | | |
| Visit 2 | 57.58±16.48 | 62.27±14.89 | 0.287 | -2.31±15.42 | 0.368 | -4.19±11.98 | 0.087 | 0.625 |
| Visit 4 | 55.27±12.70 | 58.08±16.84 | 0.500 | | | | | |
| 60°/s knee flexion peak TQ (L), Nm | | | | | | | | |
| Visit 2 | 29.73±13.08 | 31.11±12.83 | 0.668 | -2.88±8.33 | 0.090 | -0.38±5.32 | 0.230 | 0.203 |
| Visit 4 | 26.85±10.34 | 30.31±12.87 | 0.290 | | | | | |
| 180°/s knee extension peak TQ (L), Nm | | | | | | | | |
| Visit 2 | 31.27±9.04 | 34.54±8.35 | 0.182 | 0.38±6.66 | 0.771 | -1.42±6.13 | 0.247 | 0.313 |
| Visit 4 | 31.65±7.10 | 33.12±8.75 | 0.511 | | | | | |
| 180°/s knee flexion peak TQ (L), Nm | | | | | | | | |
| visit 2 | 21.92±6.39 | 23.69±5.76 | 0.300 | 0.31±5.30 | 0.801 | 0.54±4.34 | 0.531 | 0.864 |

| | | | | | | | | |
|-------------------------------|--------------|--------------|-------|-------------|----------|----------------|----------|---------|
| visit 4 | 22.08±6.02 | 24.23±6.87 | 0.241 | | | | | |
| ASM/height² | | | | | | | | |
| visit 2 | 2.59±0.26 | 2.65±0.24 | 0.428 | -0.02±0.11 | 0.465 | -0.01±0.12 | 0.696 | 0.839 |
| visit 4 | 2.58±0.26 | 2.64±0.22 | 0.357 | | | | | |
| ASM/weight x 100 | | | | | | | | |
| visit 2 | 10.40±0.74 | 10.83±1.03 | 0.085 | 0.18±0.46 | 0.053 | -0.10±0.58 | 0.379 | 0.580 |
| visit 4 | 10.22±0.66 | 10.73±0.91 | 0.023 | | | | | |
| Total Body Fat | | | | | | | | |
| visit 2 | 37.63±4.63 | 35.05±6.51 | 0.066 | 0.66±1.53 | 0.037* | 0.83±1.09 | 0.001** | 0.674 |
| visit 4 | 38.29±4.65 | 35.88±6.37 | 0.074 | | | | | |
| Abdominal Fat | | | | | | | | |
| visit 2 | 118.56±34.10 | 106.85±38.86 | 0.240 | 9.77±16.39 | 0.004*** | 5.28±27.29 | 0.000*** | 0.472 |
| visit 4 | 128.20±32.11 | 116.28±40.49 | 0.240 | | | | | |
| Grip Force (L), Nm | | | | | | | | |
| visit 2 | 19.51±2.79 | 19.34±2.80 | 0.853 | 1.15±2.87 | 0.057 | 2.85±2.39 | 0.000*** | 0.025** |
| visit 4 | 20.66±3.12 | 22.19±3.62 | 0.112 | | | | | |
| Grip Force (R),Nm | | | | | | | | |
| visit 2 | 20.59±2.83 | 19.97±2.80 | 0.439 | 0.79±2.94 | 0.192 | 2.58±1.44 | 0.000*** | 0.010** |
| visit 4 | 21.38±3.47 | 22.55±3.28 | 0.221 | | | | | |
| Pyruvate | | | | | | | | |
| visit 2 | 0.56±0.16 | 0.58±0.16 | 0.785 | 0.02±0.21 | 0.651 | 0.030.651±0.16 | 0.398 | 0.852 |
| visit 4 | 0.55±0.12 | 0.60±0.13 | 0.620 | | | | | |
| Lactate | | | | | | | | |
| visit 2 | 8.23±1.88 | 9.62±3.82 | 0.227 | 1.58±3.47 | 0.036* | 1.28±2.86 | 0.039* | 0.745 |
| visit 4 | 9.83±3.83 | 10.90±4.03 | 0.486 | | | | | |
| IGF-1 (ng/mL) | | | | | | | | |
| visit 2 | 105.75±30.12 | 109.54±44.92 | 0.733 | 7.03±24.64 | 0.176 | 11.80±22.77 | 0.013* | 0.422 |
| visit 4 | 112.77±27.23 | 122.13±45.47 | 0.391 | | | | | |
| hsCRP | | | | | | | | |
| visit 2 | 0.15±0.25 | 0.16±0.35 | 0.830 | -0.03±0.16 | 0.371 | 0.05±0.33 | 0.440 | 0.276 |
| visit 4 | 0.12±0.11 | 0.22±0.68 | 0.463 | | | | | |
| EQ-5D-3L | | | | | | | | |
| visit 2 | 0.827±0.187 | 0.783±0.205 | 0.426 | 0.041±0.148 | 0.169 | 0.066±0.126 | 0.014* | 0.524 |

| | | | | | | | | |
|-----------------------|---------------|---------------|-------|--------------|-------|--------------|--------|-------|
| visit 4 | 0.868±0.179 | 0.849±0.164 | 0.688 | | | | | |
| VAS | | | | | | | | |
| visit 2 | 0.790±0.226 | 0.747±0.254 | 0.526 | | | | | |
| visit 4 | 0.840±0.220 | 0.831±0.182 | 0.868 | 0.050±0.162 | 0.126 | 0.084±0.155 | 0.011* | 0.454 |
| IPAQ | | | | | | | | |
| visit 2 | 1744.7±1555.0 | 2155.1±1250.9 | 0.311 | | | | | |
| visit 4 | 2451.3±1995.3 | 2466±1069.5 | 0.974 | 623.8±1551.7 | 0.061 | 311.0±1291.4 | 0.250 | 0.452 |
| Dietary Intake | | | | | | | | |
| visit 2 | 1745.8±373.2 | 1609.8±477.2 | 0.258 | | | | | |
| visit 4 | 1698.6±414.4 | 1671.7±522.6 | 0.838 | -47.2±302.0 | 0.433 | 61.9±270.1 | 0.254 | 0.176 |

The data is expressed as the mean ± SD for pre and post outcomes and comparison between two groups.

* P values were compared within each group.

** P values were compared between groups.