# EFFECTS OF CHANGES IN BODY FAT PERCENTAGE IS CORRELATED TO CHANGES OF HEART RATE RECOVERY, RESTING HEART RATE AND BLOOD PRESSURE.

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**Introduction:** High body fat percentage is a worldwide life style issue which is left to solve. Body fat percentage is one of the indicators to determine the health of an individual. Apart from diet, exercise has a big role for body fat control of which we have to activate the beta oxidation at target heart rate achieved during exercise over a period of time. With the correct dosage of exercise, body fat percentage can be reduced to a healthy range. Heart rate recovery (HRR) is an important prognostic marker to determine the risk of developing heart disease or even cause death[1]. Research study has proved that aerobic exercise provides benefit to cardiovascular health[2, 3, 4]. The purpose of this research is to determine the correlation of body fat percentage, heart rate recovery and other cardiovascular heath (resting heart rate, blood pressure).

**Subjects:** All subjects used are random sampled. We have 35 adults of which 16 are males and 19 are females. 19 of the adults have high body fat percentage (HBF) which is higher than our recommended range (Male<25%, Female<32%) which 7 of them are males and 12 are females. Within the 35 subjects, it includes 7 hypertension (HTN), 1 diabetes (DM) and 2 prostate cancer (PCa) patients. 8 of the patients processed multiple conditions. 16 subjects are healthy but they averagely unfit with physical fitness assessment (PFA) mean value < 40%.

| All subjects | |
|---|---|
| **Conditions** | **Subjects** |
| HBF | 11 |
| HBF + HTN | 5 |
| HBF + HTN+DM | 1 |
| HBF + HTN + PCa | 1 |
| HBF + PCa | 1 |
| Healthy Subjects | 16 |
| **Total** | **35** |

**Methods:**

All subjects are measured with skinfold measurement method. Sites of measurement for male are chest, abdominal, axilla, and suprailiac whereas the sites of measurement for female are triceps, abdominal and suprailiac. The patients will undergo aerobic exercise (Treadmill) of 30 minutes & 20 minutes resistance exercise of 80% sub maximal intensity (5-8 reps). Heart

rates are monitored during aerobic exercise. There are 3 sessions in the aerobic exercise: warm up (1st to 5th minutes), aerobic session (5th to 25th minutes) and cooling down (25th to 30th minutes). Subjects trained at 60-65% target heart rate from 5th to 25th minutes. Heart rate recovery is recorded at 26th minutes during cooling down session. (Table 2.1) The heart rates are monitored with the heart rate monitor of the treadmill (Star Trac S Trc). The subjects' BF% is measured monthly to check progression.

| Healthy range of Health and fitness components | | | | |
|---|---|---|---|---|
| Health component | Range | | | |
| HRR | ≥12bpm | | | |
| RHR | Male | ≤78bpm | Female | ≤72bpm |
| BF% [5] | Male | <25% | Female | <32% |
| BP | <140/90mmHg | | | |
| Fitness% | ≥40% | | | |

**Result:** All patients have trained for an average of 10 sessions/month. 11 of 16 of the HBF subjects have reduced their body fat percentage by 2-7.4% with the right dosage of exercise. 5 of the HBF subjects has increase their body fat percentage by 0.3-0.6%, which could be skinfold error. Out of 27 subjects who have low HRR (HRR<12bpm), 21 have increased over 12bpm. 6 out of 7 HTN patients has reduced their blood pressure to a healthy range (Systolic<140mmHg, Diastolic<90mmHg). Out of 33 subjects who have poor RHR (Male>72bpm, Female>78bpm), 30 have improve their RHR to healthy range (Male≤72bpm, Female≤78bpm). resting heart rate DM patient's blood glucose level has reduced by 26.92% (from 13mmol/L to 9.5mmol/L). The 16 unfit subjects have increased the mean value of the PFA score from 36.74% to 41.03%.

**Conclusion:** After exercise with the correct dosage, there is 86.34% improvement over every aspect of the health & fitness aspect (BF% 68.75%, HTN 85.71%, DM 100%, PCa 100%, HRR 77.78%, RHR 90.91%, Fitness% 81.25%). 11 of the HBF subjects has improved their body composition due to reduction of body fat percentage. With a healthy body fat percentage, it has direct correlation to the following parameters. Thus, these parameters are correlated. (Table 1.1, 1.2, 1.3, 1.4)

| Categories | N=35 F= 19 M=16 | Before | Changes (%) | |
|---|---|---|---|---|
| HBF | N=19 | BF% >25% | N=16 (84.21%) | BF%<25 |
| HTN | N=7 | Resting BP ≥140/90 mmHg | N=6 (85.71%) | Resting BP <140/90 mmHg |
| DM | N=1 | Blood Glucose >13 mmol/L | N=1 (100%) | Blood Glucose < 9.5 mmol/L |
| PCa | N=2 | Dyna Strength < 250 N | N=2 (100%) | Dyna Strength > 400 N |
| Changes in HRR | N=27 | HRR < 12 bpm | N=21 (77.78%) | HRR ≥ 12 bpm |
| Changes in RHR | N=33 | M=72bpm F=78bpm | N=30 (90.91%) | M≤72 bpm F≤78 bpm |
| Changes in Fitness% | N=16 | Mean PFA=36.74% (<40%) | N=13 (81.25%) | Mean PFA=41.03% (>40%) |

HTN = Hypertension DM = Diabetes Mellitus PCa = Prostate Cancer

HRR = Heart rate recovery RHR = Resting heart rate PFA = Physical Fitness Assessment

N= Total number F= Female M=Male

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