

Exercise Intervention Program for Obese Children: A Game for Fun Approach

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Background



- Prevalence of childhood obesity is a global health problem.
- Preventing the development of obesity in children is a world-wide health priority
- The rise in childhood obesity over the past decade has been dramatic
- It is estimated that 43 million children under age 5 are overweight

[Background]

- In Hong Kong, the prevalence of overweight & obesity...
- Among secondary school students, it rose from 13.6% in 1998 to 17.7% in 2009
- Among primary school students, it rose from 16.4% in 1998 to 22.2% in 2009



[Background]

- Unhealthy dietary habit
- Physical inactivity and early engagement in sedentary lifestyle



[Purpose:



- The present study attempted to utilize an alternative 'game for fun' approach as the core activities in the exercise intervention programs for the obese children.
- to examine the pre-and-post differences in the selected anthropometric variables, respiratory function, and motor skill abilities after taking part in a five-week 'game for fun' approach exercise intervention program.

[Method:

- Twenty obese children (mean age = 11.1 ± 1.5) were recruited from a hospital and participated in a five-week exercise intervention program.
- There were two sessions per week and each session lasted for two hours.
- A Game for Fun approach exercise protocol was employed which involved a variety of traditional (e.g. hide and seek) and modified fun ball games.
- Sport-related gross motor skills, selected anthropometric variables, and respiratory function were assessed at baseline and post-intervention.

[Subjects:



- 20 overweight/obese children; 13 boys, 7 girls
- Age 8-14; Mean Age = 11.0 ± 1.5
- Mean height = $1.51 \pm 0.09\text{m}$
- Mean weight = $63.0 \pm 15\text{kg}$
- (*overweight/obese is defined as $>120\%$ median weight for height in local norm)
- Mean Body Mass Index = 27.7 ± 4.1

[





[Results:]

	Mean (SD): Pre	Mean (SD): Post	P-value (paired t)
BMI	27.7 (4.1)	28.0 (4.1)	0.030 *
Weight (kg)	63.0 (15.0)	64.0 (15.1)	0.006 *
% of body fat	37.8 (8.4)	38.6 (8.3)	0.116
FEV-1(L/sec)	2.24 (0.54)	2.37 (0.42)	0.089
FVC(L) (forced vital capacity)	2.68 (0.67)	2.83 (0.53)	0.033 *
FEV-1 / FVC	0.84 (0.06)	0.84 (0.06)	0.542
MVV(L/min) maximum voluntary ventilation	79.8 (14.6)	87.9 (17.2)	0.012 *
Locomotor Score	15.4 (3.3)	17.3 (1.3)	0.005 *
Object Control Score	12.9 (2.7)	15.1 (2.6)	0.002 *

[Selected Anthropometric Variables:]

	Pre-test	Post-test	Significance
Blood Pressure Systolic	112.2 ± 8.5 mmHg	111.2 ± 9.2 mmHg	nil
Blood Pressure Diastolic	74.4 ± 10.7 mmHg	72.9 ± 7.1 mmHg	nil
Left arm circum.	29.8 ± 3.4cm	28.9 ± 3.3cm	*
Right arm circum.	29.7 ± 3.5cm	28.7 ± 3.5cm	*
Waist-hip ratio	0.91 ± 0.5cm	0.89 ± 0.6cm	*
Thigh circumference	56.2 ± 4.6cm	56.3 ± 4.8cm	nil
Calf circumference	37.4 ± 3.1cm	37.7 ± 3.0cm	nil
Abdomen skinfold	53.6 ± 12.7mm	56.8 ± 13.8mm	nil

[Results: Locomotor ability]

	Pre-test	Post-test	Significance
Running	2.41 ± 0.8	2.82 ± 0.4	✓
Galloping	2.23 ± 0.9	2.76 ± 0.4	✓
Hopping	2.63 ± 0.9	3.19 ± 0.6	✓
Leaping	1.71 ± 0.7	2.06 ± 0.2	✓
Horizontal jumping	2.47 ± 0.5	2.65 ± 0.6	-
Sliding	3.59 ± 0.7	3.65 ± 0.6	-
Overall locomotor	15.5 ± 3.3	17.33 ± 1.3	✓

[Results: Object Control Ability]

	Pre-test	Post-test	Significance
Striking	1.73 ± 0.7	2.40 ± 0.7	✓
Stationary dribbling	2.25 ± 0.9	2.83 ± 0.6	✓
Catching	2.29 ± 0.6	2.47 ± 0.5	-
Kicking	2.31 ± 0.6	2.81 ± 0.4	✓
Overhead throwing	2.17 ± 0.6	2.41 ± 0.8	-
Underarm rolling	2.41 ± 0.6	2.94 ± 0.6	✓
Overall Object Control	12.9 ± 2.7	15.1 ± 2.6	✓



[Findings:]

- No more weight gain was found.
- Significant ($p < .05$) differences were found between the pre-and-post assessment in most selected anthropometric variables, such as both left and right arm circumferences, and waist-to-hip ratio.
- Significant ($p < .05$) improvement was found in the respiratory functions including forced vital capacity (FVC) and maximum voluntary ventilation (MVV).
- For the sport-related gross motor skill assessment, significant ($p < .05$) improvement were found in both locomotor (running, galloping, hopping, and leaping) and object-control (striking, dribbling, catching, kicking, and throwing) gross motor abilities.

[Conclusion:]

- The use of 'game for fun' approach in the exercise intervention program for the obese children appeared to be an effective way
- This approach may also serve as sports skills acquisition which is helpful to the obese children in future