

## Case Study of a Body Fat Rate Reduction Program for Mentally Retarded Children in Japan

Noriaki AZUMA\* · Akihiko ITO\*\*

(Received Nov. 30, 2004)

### Abstract

The purposes of this present study were (1) to modify the program of Anthony F. Rotatori's group into a program that is adjusted for Japanese children with mental retardation, and (2) to confirm the effectiveness of the modified weight-loss program. 4 samples in the experimental group and 3 samples in the control groups selected for this study were all above 160 of Rohrer index and 20% of fat degree. The first phase of the experiment was from June 18 to October 12, 1997 and the second phase was from October 13 to December 7, 1997. Samples were intervened in the experimental group only in the second phase.

Results showed a clear effectiveness with regard to body fat rates, rather than to weight itself, because the body fat rates of samples in the experimental group dropped sharply only in the second phase. This study concludes that our program based on the program of Rotatori's group is estimated to be effective in a short time for controlling the obesity of mentally retarded children.

Key Words : obesity, mental retardation, body fat rate

### Introduction

Concerning investigations of obesity among mentally retarded children, previously reviewed by Azuma & Ito (2002), 17 studies in total were found in Japan, and among them 7 studies describe the prevalence of obesity among mentally retarded children in Japan. The accuracy of these estimates of the prevalence of obesity, however, is unclear because the methods of measuring obesity and the number and ages of the participants varied. On the other hand, 20 studies done in the U.S. were found, and among these 9 studies focus on the effectiveness of the behavioral weight-loss program that was conducted by Anthony F. Rotatori's group. An important issue is to verify whether this program could be effective if it were applied in Japan.

---

\* Faculty of Education, Iwate University, Ueda, Morioka 020-8550

\*\* Iwate Prefectural School for Mental Retardation - Miyako

The two-fold purpose of this present study was (1) to modify the program of Rotatori's group into a program that is adjusted for mentally retarded Japanese children, and (2) to confirm the effectiveness of the modified weight-loss program.

The reasons that the authors chose the program of Rotatori's group are as follows :

- (1) In Japan, very few studies have been published that describe the prevalence of obesity among mentally retarded children, and the accuracy of these estimates of the prevalence of obesity is unclear.
- (2) Outside Japan, studies of Rotatori's group were mostly in regards to obesity among mentally retarded children.
- (3) The effectiveness of the behavioral weight-loss program that was conducted by Rotatori's group was clearly shown.
- (4) The program of Rotatori's group was considered a safe one, because neither special materials nor abnormal food therapies were used.

The outline of the program of Rotatori's group (Rotatori, Fox & Mauser, 1981) is as follows :

- (1) One of the primary causes of obesity is inappropriate behavior, for example, insufficient daily activity, low cognition of overeating, and various inappropriate eating habits.
- (2) The purpose of this program is mainly to encourage teachers to change behaviors of the students' eating habits in order to help them lose weight and maintain their lower weight.
- (3) Before the program is begun, teachers observe and write down eating habits of participants in order to plan the program, and choose the habits to be changed. After that they explain the planned program to the parents.
- (4) The program is divided into three stages. The first is the treatment stage, the second is the maintenance stage and the third is the follow-up stage.
- (5) As homework, participants write down what foods they have eaten, record their weight every day and evaluate the trained habits.
- (6) Based on the evaluation, rewards are given as reinforcement, for example, bowling trips, dances, and picnics with parents.

## Method

### Samples

As shown in Table 1, samples in both experimental and control groups were scored over 160 of Rohrer index and 20% of fat degree. Parents of students in the experimental group agreed that their children could participate in the program. Parents of students in the control group declared that their children did not participate in the program but they had agreed that students' height, weight and body fat rates could be measured. All samples were students of a school for mentally retarded children in Japan.

Table 1 Samples

	disorder	sex	age	I.Q.	S.Q.	height (cm)	weight (kg)	body fat rate (%)	Rohrer index	fat degree (%)
experimental group										
A	M.R.	male	10	—	55	124.9	33.6	35.0	167.3	33.0
B	Down S.	male	10	30	26	122.5	32.7	27.0	187.7	43.4
C	M.R.	male	12	18*	25	151.4	56.8	38.0	165.4	37.6
D	M.R.	female	14	74	—	162.5	75.5	45.0	179.0	45.5
control group										
E	M.R.	female	10	—	66	133.6	38.9	26.0	163.1	33.2
F	M.R.withA**	female	13	15*	23	157.0	78.3	40.0	202.3	63.8
G	M.R.withA**	male	11	74	56	144.5	49.9	37.0	165.4	36.3

\*: D.Q. \*\*: Autism

### Procedure

The experiment was conducted from June 18 to December 7, 1997, and was divided into two phases. The first phase was from June 18 to October 12. Intervention of samples was not done either in the experimental group or control group, and only their weight and body fat rates were measured, on June 18, July 9, August 22 and September 16. The second phase was from October 13 to December 7, 1997. Weight and body fat rates of samples were measured both in the experimental group and control group on October 16, November 5 and December 1. Body fat rates were measured by the vital impedance method.

The program to intervene samples was begun only in the experimental group in the second phase, that is, after October 13. As in the first phase, intervention in the second phase was not done in the control group samples.

Before the second phase was begun, the following survey for the experimental group was conducted:

- (1) Time schedule, for example, the time when they wake up and the quantity of food in their home. The survey was conducted for two days.
- (2) Total thermal quantity throughout the day was measured by "Calorie counter select 2" made by Suzuken Company in Japan. The survey was conducted in both school and home for one week.
- (3) Questionnaires about dietary habits that was checked by the students' mothers.
- (4) Based on data of (1), (2) and (3) trial programs were planned for each individual sample and were described to the students' mothers.
- (5) The programs were revised based on opinions, and were then finalized.

As space here does not permit all main programs to be shown for the 4 samples in the experimental group, one program for sample A in Table 1 is shown below as an example:

## First week :

- (a) Sample A eats meals only three times per day-breakfast, lunch and supper. He eats a snack only one time per day.
- (b) As a snack he eats a small portion of noodles, rather than a large portion.  
(In Japan noodles are a popular snack.)

## Second week :

- (a) Pattern of the first week continues.
- (b) Before eating he drinks one cup (100cc) of water.
- (c) He does not drink water while eating, because when he drinks water with food he eats too much.

## Third week :

- (a) Patterns of the first and second week continue.
- (b) Soda pop is diluted in half by water or ice.

## Fourth week :

- (a) Patterns of the first, second and third week continue.
- (b) Eating noodles as a snack is forbidden.
- (c) Sample A does not drink soda pop, but rather tea without sugar.

## Fifth week :

- (a) Patterns of the first, second, third and fourth week continue.

## Sixth week :

- (a) Patterns of the first, second, third, fourth and fifth week continue.

## Seventh week :

- (a) Patterns of the first, second, third, fourth and fifth week continue.

## Eighth week ;

- (a) Patterns of the first, second, third, fourth, fifth and sixth week continue.

No intervention was done in three samples in the control group, and only their weight and body fat rate were measured on the same day when samples in the experimental group were measured.

## Results

Results show effectiveness with regard to body fat rates rather than to weight itself. Body fat rates of Samples A, B, C and D in the experimental group are shown below in Figures 1, 2, 3 and 4, respectively.

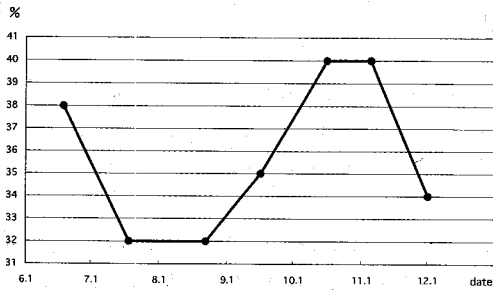


Fig.1 Body fat rate of sample A

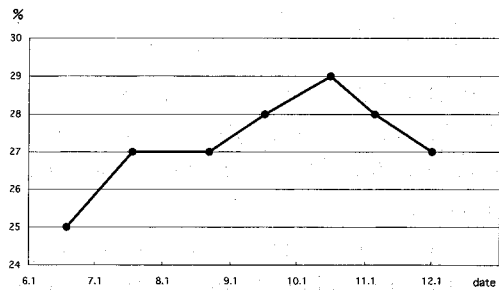


Fig. 2 Body fat rate of sample B

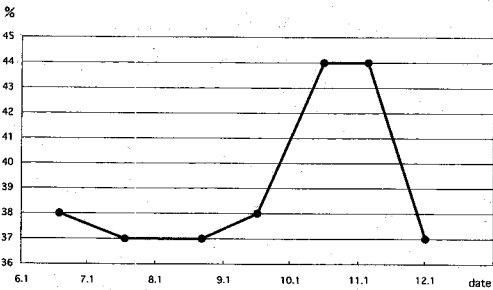


Fig.3 Body fat rate of sample C

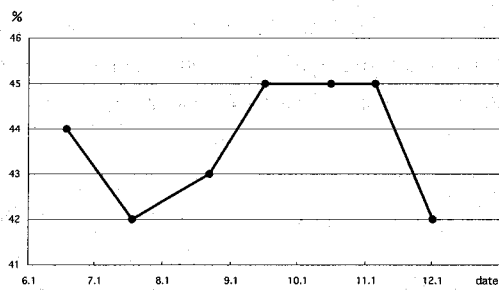


Fig. 4 Body fat rate of sample D

The body fat rates of Samples E, F, and G in the control group are shown below in Figures 5, 6 and 7, respectively.

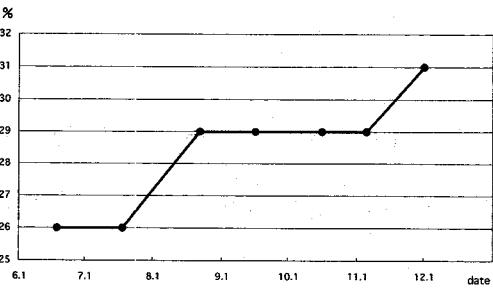


Fig. 5 Body fat rate of sample E

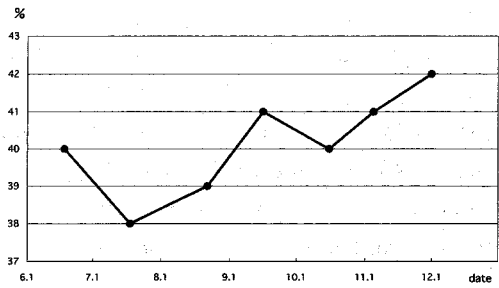


Fig. 6 Body fat rate of sample F

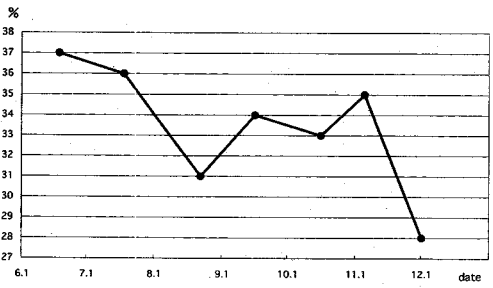


Fig. 7 Body fat rate of sample G

### Discussion

As observed in Figures 1, 2, 3 and 4, body fat rates of Samples A, B, C and D in the experimental group gradually increased before October. However, they dropped sharply in November. Before October 12 intervention was not done in Samples A, B, C and D, but was begun after October 13.

As observed in Figures 5 and 6, the body fat rates of Samples E and F in the control group gradually increased throughout this experimental period; that is, both in the first and second phases. The body fat rate of Sample G in the control group, however, gradually decreased throughout the experimental period. Shortly after this experiment had begun, a liver dysfunction of Sample G was diagnosed because of his obesity and the medical doctor intervened significantly in reducing his obesity. This is the reason for Sample G's decreasing fat rate.

### Conclusion

Since this experimental program design, based on that of Rotatori's group, is estimated to be effective in controlling the obesity of mentally retarded children within a short period of time, it may be implemented by teachers and parents of mentally retarded children in successfully controlling their obesity.

### References

- Azuma, N., & Ito, A. (2002) Obesity in children with mental retardation: A review of the literature. *Japanese Journal of Special Education*, 39(4), 65-72.
- Rotatori, A. F., Fox, R., & Mauser, A. (1981) Validation of the weight reduction treatment package for the retarded. *Journal of Behavioral Medicine*, 4, 231-238.