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Promotion of Weight Control in Hong Kong

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ABSTRACT

“Globesity” has been coined by the World Health Organization to describe the increasing prevalence of overweight and obesity all over the world. Obesity is a condition involving personal and social dimensions. There are studies investigating different risk factors of obesity, including the history and behaviours of family members, unhealthy diet as well as inadequate exercise. In a fast food culture, people tend to eat various types of food containing higher proportion of fat, sugar and salt. Inadequate physical activities also increase the risk of overweight and obesity. Weight control is an important strategy of health promotion in the community. The Hong Kong government has implemented the nutrition labelling scheme in order to help customers make informed food choices. The Department of Health has co-operated with schools to promote healthy eating and adequate exercise as well as a comprehensive weight control education. However, community awareness is also an important component that can affect the long-term maintenance of weight control in Hong Kong. Factors influencing community awareness include low health literacy, inadequate personal interest, and insufficient allocation of technical and financial resources. In order to increase the effectiveness of weight control promotion, education of weight control should be strengthened to enhance health literacy in the society. The health professionals should be encouraged to enrich and acquire more professional knowledge in obesity and weight management. To alleviate the prevalence of obesity continuously, the government, the schools and the public should take initiatives in the promotion of weight control in Hong Kong.

KEYWORDS: Obesity, Globesity, Weight Control, Nutrition Labelling, Community Awareness.

1 INTRODUCTION

Obesity is epidemical in the world. In developed and developing countries, the percentage of overweight and obesity for boys and girls have increased by 50% from 1980 to 2013 (Figure 1) (Ng et al., 2014). It arouses much public's concern because it will lead to poor body appearance, heart attacks, type II diabetes and even death (Gregg, 2013). For adults, obesity means a body mass index (BMI), which is 30kg/m^2 or above (WHO, 2016). However, the Centre for Health Protection (CHP) of the Hong Kong (HK) Government has adopted a "Classification of weight status" for Chinese adults in Hong Kong, in which a BMI between 23 and 24.9 is considered as overweight while those above are obese. The CHP conducted the "Behavioural Risk Factor Survey" in 2014, and found 20.8 percent of the populations aged 18-64 were obese (Centre for Health Protection, 2015a). Worse still, there is a continuous increase in the detection rate of obesity among HK secondary students from 1996 to 2013 (Figure 2) (Centre for Health Protection, 2015b). Therefore, weight control must be promoted widely in the HK community to alleviate the rising trend of obesity.

Age-standardised prevalence of overweight and obesity in children and adolescents aged 2 to 19 for developed and developing countries by sex, 1980 and 2013

Level of development	Sex	Year	
		1980	2013
Developed countries	Boys	16.9%	23.8%
	Girls	16.2%	22.6%
Developing countries	Boys	8.1%	12.9%
	Girls	8.4%	13.4%

Source: Global Burden of Disease Study 2013.

Figure 1: Age-Standard prevalence of overweight and obesity in children and adolescents aged 2 to 19 for developed and developing countries by sex, 1980 and 2013
(Source: Global Burden of Disease Study 2013)

Detection rate of overweight and obesity among secondary school students by sex, 1996/97 – 2013/14

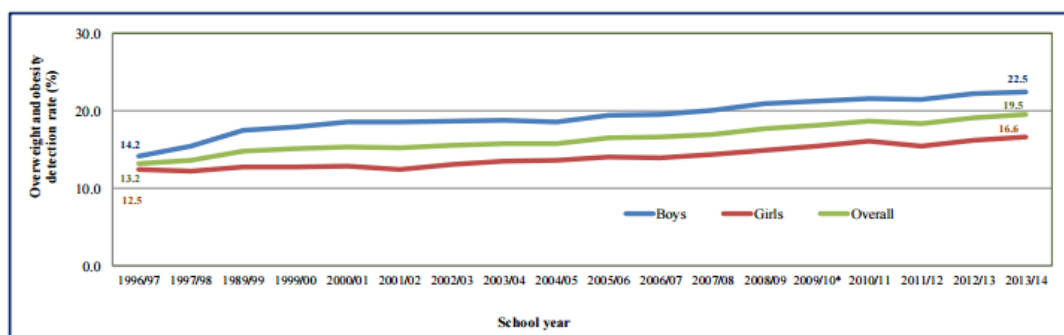


Figure 2: Detection rate of overweight and obesity among secondary school students by sex, 1996/97-2013/14
(Source: Non-Communicable Diseases Watch: Healthy Weight Healthy Kids 2015)

2 MAJOR RISK FACTORS OF OBESITY

2.1 History and behaviours of family members

Family history is a risk factor of obesity. In the "National Heart, Lung and Blood Institute (NHLBI) Twin Study" (1977), researchers observed that the familial aggregation for obesity was due to genetics instead of environment (Bell, Walley & Froguel, 2005). Different selected genes are

associated with the obesity phenotype in our body (Figure 3). Moreover, if the phenotypes of adipose tissue distribution are about 40 to 55%, the heredity of obesity tends to be higher (Research Chair in Obesity, 2016). Thereafter, the higher possibility inherited from the obesity genes, the higher is the rate of obesity.

Table 2 | **A selective list of genes that are associated with obesity phenotypes**

Gene*	Gene name*	Location*	Phenotypes measured	References
<i>ACDC</i>	Adipocyte, C1Q and collagen domain containing, adiponectin	3q27	BMI, waist circumference BMI	137 138,139
<i>ADRA2A</i>	Adrenergic receptor α -2A	10q24–q26	Skinfold ratio, abdominal fat Skinfold ratio	140,141 142
<i>ADRA2B</i>	Adrenergic receptor α -2B	2p13–q13	Basal metabolic rate, weight-gain	143,144
<i>ADRB1</i>	Adrenergic receptor β -1	10q24–q26	Weight, fat mass, BMI	145
<i>ADRB2</i>	Adrenergic receptor β -2 surface	5q31–q32	WHR, obesity, BMI, subcutaneous fat Fat accumulation, obesity Adipocyte lipolysis	146–152 151,152 153
<i>ADRB3</i>	Adrenergic receptor β -3	8p12–p11.2	WHR, BMI, weight-gain capacity, earlier onset	154–160
<i>LEP</i>	Leptin (obesity homologue, mouse)	7q31.3	Obesity, BMI	161–164
<i>LEPR</i>	Leptin receptor	1p31	BMI, fat mass, overweight Fat mass, overweight Fat mass	165–167 168 169
<i>NR3C1</i>	Nuclear receptor subfamily 3, group C, member 1 (glucocorticoid receptor)	5q31	Obesity, overweight	170–172
<i>PPARG</i>	Peroxisome proliferative activated receptor, γ	3p25	BMI, weight, fat mass BMI, overweight, fat mass	173–182 175,177,183
<i>UCP1</i>	Uncoupling protein 1 (mitochondrial, proton carrier)	4q28–q31	Weight, BMI WHR	184–188 189
<i>UCP2</i>	Uncoupling protein 2 (mitochondrial, proton carrier)	11q13	Obesity BMI, obesity, skinfold thickness	190 191–194
<i>UCP3</i>	Uncoupling protein 3 (mitochondrial, proton carrier)	11q13	Caloric intake, fat intake, fat mass, WHR, BMI Skinfold thickness BMI	189,195,196 196 197,198

Figure 3: A selective list of genes that are associated with obesity phenotypes (Source: National Heart, Lung and Blood Institute (NHLBI) Twin Study 1977)

Health-related behaviours in the family have been suggested as an important risk factor of obesity, especially among children and adolescents (Halliday et al., 2014). Parents play a significant role in the life of children, and children are easily susceptible to the behaviours of family members. For example, if family members always have unhealthy diet and inadequate exercise, some children may conform to such health-related behaviours. Furthermore, most behaviours are related to parenting styles, which can be classified into four types, including authoritative, authoritarian, permissive and unengaged. Parents can alter the home environment and hence change the behaviour of children (Kitzman-Ulrich et al., 2010). Similarly, parenting style may affect the obedience of the children. If the parenting style is authoritative, parents may guide the children on how to maintain a healthy diet and hence reducing the risk of overweight and obesity. In contrast, if the parenting style is unengaged, parents may not take care of their children actively. There would be poor family functioning, in which poor communication and poor health education exist between these parents and children (Mellor et al., 2012). As a result, children may fall victim to unhealthy diet and ignore the overweight and obesity problem. Obviously, poor family functioning and parenting styles will contribute to an increased risk of obesity.

2.2 Unhealthy diet – cultural and psychological

Obesity is due to the unhealthy diet. When the energy intake is greater than the energy output, there is an imbalance. The calories intake and body mass will increase, where 60-80% body fat is contained (Hill, Wyatt & Peters, 2012).

In the cultural aspect, under the high-tempo lifestyle in big cities like HK, people put emphasis on the speed in the production of food instead of its value and benefits to health. There is a growing western fast food culture in societies worldwide. People get access to fast food easily through fast food chains. Around 80% students aged from 10 to 17 years always buy hamburgers and fried chips in

McDonald's (Santana, 2013). Thus, a great amount of fat contained in fast food will naturally be accumulated in the body, finally leading to obesity over time. Moreover, the local food environment, including the prices and availability of food, would influence people's diet (Cummins & Macintyre, 2006). For instance, supermarkets and convenience stores provide a variety of food choices to the public. An American study has found the presence of supermarkets to be associated with a lower prevalence of obesity and overweight, while that of convenience stores are being associated with a higher prevalence (Morland, Roux & Wing, 2006). On the other hand, as the "healthier" foods are generally more expensive, the poor may not get access to such foods easily, and hence the poor may not have "healthier" foods in their eating culture (Chung & Myers, 1999). They may be prone to develop the higher risk of obesity from unhealthy diet.

In the psychological aspect, stress can increase the risk of poor nutrition in the daily life. As mentioned above, the family is a complex system, in which different elements of the system are interconnected. Similarly, unhealthy diet in an individual may be caused by low income and financial pressures in a family (Skelton et al., 2012). Different types of stress in a family influence the food choices among family members. For example, stress in families may make family members overlook the importance of healthy diet because they may spend much time to consider their financial problems instead of the meals. This limits their food choice and they may have unhealthy diet more readily. As a result, it increases their risk of overweight or obesity. In the extreme cases, negative emotions and stress would cause bulimia nervosa, which is characterized by eating greater than normal amounts of food at least twice a week for half a year (Gregg, 2013). Binge eating not only reduces stress and anxiety temporarily, but also enhances positive emotion (Wall, 2016). About 70% people with bulimia nervosa are obese (Wall, 2016). However, a study has indicated that there are 55% increased risks to developing depression in obese persons and 58% increased risks to becoming obese among depressed persons (Luppino et al., 2010). So, there is an association between mental wellness and obesity.

2.3 Inadequate exercise

Inadequate exercise leads to poor metabolism in the body. Glucose and insulin metabolism in the body are affected by the exercise intensity. If people do little exercise, then little muscle glycogen will be utilized, and thus the insulin sensitivity will be lower. Then, excessive fats or carbohydrate obtained from the food will be accumulated inside the body, resulting in obesity (Kang, 1996). For example, people with osteoarthritis of the hip or knee may not always join physical activities because of the pain. They are also anxious and concerned about the condition becoming worse. In a study, among the 30 respondents with osteoarthritis of the hip, the BMI of 16 males are approximately 24 kg/m² (Lau, 2000). It has shown that people with degenerative joint diseases may become overweight easily because they do little exercise.

The Department of Health carried out "A Qualitative Study on Dietary and Exercise Practices of People in Hong Kong" in 2005. Among 41 working males and females, only 18 had participated in aerobic exercise of 20 minutes for less than once a week. Most of them were clerks and so they did not need to do a high level of exercise intensity in their work, but they still felt so fatigue due to other heavy workload (Department of Health, 2005). Therefore, if people had heavy workload at work and in daily living, they would spend less time in doing exercise.

In addition, if people do not have enough understanding towards the importance of exercise, they will be less likely to exercise (Frost, 2015). In a public opinion survey on physical exercise participation in Hong Kong, 12.1% of the young aged 12 to 24, and 28.3% of adults aged 25 to 59 have claimed that they do exercise daily. Only 28.6% of the young people understand that the primary reason for doing exercise is to enhance health (Figure 4) (Leisure and Cultural Services Department, 2006). These findings have reflected the inadequate community awareness towards physical exercise. They lack the desire to do exercise and hence leading to a sedentary lifestyle.

Comparison on physical exercise habits of the young, the adults and the elderly

	The young (aged 12-24)	The adults (aged 25-59)	The elderly (aged 60 or above)	
Did physical exercise in the past 3 months	92.3%	75.5%	80.4%	The young and the adults indicated that they did physical exercise. However, the frequency and the amount were not adequate
Did physical exercise 3 times per week and spending on average 30 minutes or above in each occasion	24.6%	21.6%	53.1%	
Did physical exercise daily	12.1%	28.3%	85.5%	
Spending on average an hour or above in each occasion	73.9%	45.9%	42.2%	
Spending on average less than half an hour in each occasion	10.5%	25.2%	24%	
Preferred time period to do physical exercise	Afternoon (40%) Evening (27.5%)	Morning (38.3%) Evening (30.2%)	Morning (84.1%)	
Primary reason for doing physical exercise is "enhance health"	28.6%	59.1%	70.9%	

Figure 4: Comparison on physical exercise habits of the young, the adults and the elderly (Source: Public Opinion Survey on Physical Exercise Participation in Hong Kong 2006)

3 CURRENT WEIGHT CONTROL MEASURES

3.1 Promoting healthy eating through food pyramid and calories calculation apps

As a health protection strategy to control body weight in the community, the Department of Health has been promoting balanced and healthy food pyramids for different age groups. Adults are recommended to have at least three servings of vegetables and two servings of fruits everyday (Department of Health, 2015). The Department always upholds this principle in order to enhance the importance of having a balanced diet. In fact, vegetables consist of dietary fibres, which can induce greater satiety, but having a lower energy density. The total energy intake is naturally reduced (Papathanasopoulos & Camilleri, 2010). Therefore, in order to control the body weight, people are advised to adopt a healthy diet by having more vegetables and fruits instead of meats and fish in the daily food intake.

Meanwhile, the Government and schools have designed some electronic self-calories calculation applications for the public. For example, "My Wellness Tracker", designed by the Chinese University of Hong Kong (CUHK), aims to increase the awareness of the public on healthy eating and exercise (CUHK, 2012). This website lists different calories intakes in the food. It helps the public check the calories intake so that they can keep an energy balance in the body.

Thus, by implementing the above two methods, people can better understand the advantages of weight management, so that the perceived benefits of the promotion can be increased. They are more likely to take action to control their body weight, reducing the risk of obesity.

3.2 Promoting exercise programmes

The Government has implemented "Healthy Exercise for All Campaign" and "Sports for All Day" in the hope to encourage community-wide public engagement in sports. The Leisure and Cultural Services Development (LCSD) have also co-operated with the National Sport Associations and schools to organize the Outdoor Activities Carnival, Water Carnival, and so on (GovHK, 2016). Moreover, the HK Government has learned from the British Government's sports promotion in addressing the obesity problem. They have widely promoted fitness programmes for children, elderly and people with disabilities. The elderly can do static balancing exercises, while the children can join fitness training courses (GovHK, 2016). These programmes can encourage every HK citizen to

participate in physical activities of moderate intensity for at least 30 minutes every day (Leisure and Cultural Services Department, 2009). It is known that calories in the body will be burnt when doing continuing exercise for at least 10 minutes (Myao Clinic, 2014). Obviously and logically, these sports promotions are expected to be effective in helping to manage and control body weight in the society.

3.3 Nutrition labelling scheme

In the policy aspect, the Government has implemented the “Nutrition Labelling Scheme”. In the United States, the Food and Drug Administration (FDA) has regulated food labelling by implementing the law, in which the Nutrition Facts Panel, ingredient statement, and the net contents are mandated on the food label (Institute of Food Technologists, 2016). Meanwhile, the HK Government implemented the Food and Drug (Composition and Labelling) (Amendment: Requirements for Nutrition Labelling and Nutrition Claim) Regulation in 2008. Most pre-packaged food sold in HK has carried the nutrition labels since 1 July 2010 (Centre for food safety, 2010). This scheme can help shoppers to make informed food choices. Moreover, under the regulation, food producers are required to apply the nutrition principles when manufacturing foods. With these mandatory statutory measures, consumers can understand food and nutrition contents more readily, and are in a much better position in managing their body weight. Hence nutrition labelling is potentially effective in controlling body weight in the community and in reducing the risk of obesity of the local population.

3.4 Weight control education for the public

Health education is an “indivisible” but very important part in the weight control initiative. At the schools, teachers and nutritionists are invited to infuse the knowledge about obesity to students, including the causes and bad consequences. This can increase the students’ perceived severity arising from obesity. Students are also encouraged to try to control body weight to look nice and to prevent diseases. At the same time, the Department of Health regularly holds health talks, and produces leaflets and posters to encourage the public to lead a healthy lifestyle by maintaining a normal Body Mass Index (GovHK, 2016). Furthermore, the public can get access to weight control information through the internet, and so their perceived benefits from the promotion are increased. Generally speaking, people will tend to search the information and hence enhance their awareness towards weight management.

4 FACTORS AFFECTING CURRENT WEIGHT CONTROL PROMOTION

Community awareness towards obesity and its effects to health and well-being is not easy to assess. There are some other factors that may affect the feasibility of the promotional methods.

4.1 Health literacy

Health literacy means the capability to obtain and understand healthcare information in order to make appropriate health choices. All health promotions may be affected by the health literacy of a person (Hewitt, 2012). Therefore, health literacy of the people can affect the management of obesity in primary health care. If the health literacy of a population is high, the effectiveness of weight control promotion will be higher. In contrast, a low health literacy, which affects 59% of the Australian population, can influence the use of health services as well as the quality of communication between patients and health practitioners (Australian Primary Health Care Research Institute, 2016). Due to the lack of understandings towards obesity, patients would feel little confident to get involved in the discussion about weight control with health care providers actively. Then, they may miss the chances of prevention or management of obesity. This may adversely increase the risks of obesity. Therefore, the effectiveness of weight control promotion would be lower.

In the modern age, electronic information is readily available and somehow is flooding the social media. However, to the elderlies, such modern time health promotion may not be suitable because they may find it difficult to surf the internet due to inadequate knowledge in the technology (Selwyn, 2004). Furthermore, they are not familiar with electronic devices and programmes, and hence may not fully understand the control measures in the calories calculation applications. This decreases their ability to obtain adequate and correct healthcare information. As a result, they may not be actively concerned about the energy intake and their body weight. Thus, the elderlies are susceptible to obesity easily. Health education can fail to address inequalities in health since it reaches mainly the better-off groups and the more health literate people in the society.

Moreover, to the parents, health literacy can influence their attitudes towards the strategies of weight loss in children. A study has indicated that parents with inadequate health literacy are less likely to search information about the strategies in child weight control, resulting in poor child health outcomes. In contrast, those with higher health literacy would endorse more weight loss strategies to protect the health of children (Liechty et al., 2015). Therefore, health literacy of people can influence their knowledge, attitudes and practice in weight control.

4.2 Personal interest

Personal interest may affect health promotion. For example, due to gender difference and the social norms relating to ideal “leanness”, ladies always claim that they are overweight and experience more negative body satisfaction than men (Bhagal & Langford, 2014). Thus, females are more interested in controlling body weight than men (Lauren & Farrar, 2014). This will bring positive influence to the weight control promotion in females, and finally reduce the risk of obesity. In contrast, factors like heavy workload, psychological influences and fast food cultures affect people’s interest towards weight management, making the effectiveness of the promotion lower. Furthermore, the blogging culture can affect the personal interest in weight management. It has been found that the weight-loss bloggers would share their experiences in success and failures of the weight loss programs through the internet (Leggatt-Cook & Chamberlain, 2012). This can help to acquire the mutual support for weight loss. As a result, the communities with interests about the weight loss programs would appear around the blogs.

Moreover, personal interest is affected by the motivation of a person. The motives such as willingness to lose weight to improve the body shape can influence the attitudes towards weight control programmes. If person wants to improve the physical attractiveness, he or she would be more interested in controlling the body weight, and the motives would also help family members to engage in regular physical activity (Teixeira et al., 2012). Furthermore, the source and nature of motivation for weight loss could influence the personal interest. For instance, instructions from the health practitioners can affect personal decision on weight control because people believe that professional opinions are authoritative. As a result, more people would join the weight loss programmes. According to the Self Determination Theory, the extent of personal interest and behavioural change in weight control are personally endorsed and influenced by motivation (Deci & Ryan, 2011). Therefore, personal interest and motivation are potential barriers in weight control promotion.

4.3 Allocation of technical and financial resources

Weight control promotion requires human, technical and financial resources. Technical resources include equipment and specialist skills. At the ethical level, health professionals should bear the responsibility to make good use of their special skills to promote the correct weight control methods to the public. However, it is difficult to guarantee all health professionals do possess the appropriate and effective promoting skills in weight management. If they do not have sufficient nutritional knowledge to advice on healthy food choices, they may be misleading the public. Thus, technical skills are very important in weight control promotion. On the other hand, promotional activities involve costs. The health economics can influence the decision making and resource allocation for the prevention of obesity (Ananthapavan et al., 2014). The level of population obesity

varies among different market-based capitalist countries. Whether there is equitable distribution of wealth and social welfare spending depends on the government policy and regulations in economy (Egger, Swinburn & Islam, 2012). When planning the strategies of management of population obesity, if the decision makers do not possess a systemic approach to fair and evidence-based priority setting, the effectiveness of weight control promotion will be adversely affected (Mitton & Donalson, 2009). Hence, it is difficult to widely promote weight control to the public if the government does not provide enough funding for promotional programmes and community-based weight control projects.

5 RECOMMENDATIONS

In order to make the weight control practices sustainable, the HK Government should increase the sources of funding, apart from the recurrent budget, through community fundraising and forming partnerships with charity organizations like Tung Wah Group of Hospitals and the Hong Kong Jockey Club. It may require longer time to achieve the goals since many health promotions have failed to be sustainable due to insufficient funding provided in short term (Goodman et al., 1993). However, whether funding programmes can increase the effectiveness and coverage of weight control promotion cannot be known easily. Therefore, the Government should regularly examine whether funding bodies are providing sufficient funds to projects and should conduct formal studies through research. It should monitor the allocation and benefits of financial resources on promotional programmes. Furthermore, in order to encourage the public to join various weight management programmes, health organizations can use financial incentives such as discount vouchers and prizes to attract the subjects. If participation rate is higher, the effectiveness of weight control promotion is potentially higher, and so is the sustainability.

On the other hand, weight control promotions are effective if there are health-literate politicians, health-literate health professionals and health-literate public in the society. Thus, in order to allow the community to become more health-literate, the government should promote weight management to them by leaflets, posters, newspapers, television and via the social media. For instance, nutritionists and health educators can carry out promotion not only at schools, but also at the elderly centres and hospitals, targeted at the elderlies. Moreover, weight control advertisement can be widely posted in buses, ferries, MTR, and other crowded and busy public areas so that accessibility to the information can be enhanced.

Apart from the government and public actions, in terms of the professional and ethical aspects, each health professional should have a role of possessing enough promotion skills and knowledge in weight management. The Hong Kong Institute of diabetes and obesity (HKIDO) and CUHK conducts a certificate course in obesity and weight management for healthcare professionals so that they can understand the epidemiology and pathophysiology of obesity through interactive case study discussions (HKIDO, 2015). Moreover, the HK government should consider adopting the actions in the United States (US), where the American College Health Association (ACHA) provides principles for hiring health promotion professionals. For example, health professionals should implement evidence-based health promotion and develop alternative goals for health promotion initiatives to maximize effectiveness in the US (ACHA, 2014). Furthermore, they need to identify their roles in asking about and assessing patient risk, providing advices on developing an effective weight management plan as well as arranging follow up for the obese patients (Australian Primary Health Care Research Institute, 2016). This can help the professionals to update their knowledge and hence increase the effectiveness in weight control education and promotional activities.

6 CONCLUSION

The epidemic of obesity over the world is described as “Globesity”. Risk of overweight and obesity include family factors, unhealthy eating habits, lack of exercise, etc. Although there are benefits in the current measures of weight control, different barriers exist, including inadequate health

literacy, personal interest, and technical and financial resources. It has been found that inadequate motivation is the root cause of these barriers. People who lack motivation in the weight loss would contribute to the lack of understandings towards technology and obesity. This affects the accessibility to health information and influences the qualities of communication between the clients and health professionals, resulting in a decrease in the effectiveness of weight control promotion. Furthermore, government regulations in economy and health policy can influence the resources allocation in obesity prevention. In the long term perspective, it is necessary to continue professional training, enhance public awareness, provide a wide coverage of education in weight management as well as raise funds in the local community. With these measures, it is hoped that the promotion of weight control can be more effective and sustainable.

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