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Short Research Article

Results of Investigations and Recommendations Regarding How to Reduce Excessive Weight in People

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Abstract

In this paper we describe some important aspects regarding the problem of excessive weight in people and attempts to reduce this. Very often people suffer from this situation and do not use effective methods; for example, they may take inappropriate medical tablets/drugs, turn to a witch-doctor or fortune-teller, try to eat only vegetables and fruit, and so forth. Unfortunately, these approaches do not work well in all cases. Due to age and health condition, not everybody can maintain regular exercise. This motivates the approach described in this paper, where our methods for three persons help both to maintain normal weight over many years and to reduce it incrementally to a comfortable level. Calculations were made using results in MathCad for the investigations and recommendations regarding how to reduce excessive weight in people.

Keywords

weight, reduction, recommendations, examples

1. Introduction

There are several possible reasons as to why a person may gain superfluous weight:

- a slow-moving or sedentary lifestyle;
- eating often and excessively, preferring food high in fats, sugars or sweeteners;

- too much salt;
- remaining in a sitting position all day;
- a genetic predisposition (this is not considered in this paper).

There are many publications that attempt to deal with these issues, for example, Mak-Gregory Rob (2017), Richard (2006), Mak-Gregory (2018), Obinio (2018), Deliya (2005), https://www.livelib.ru/award/204-britanskaya-natsionalnaya-knizhnaya-premiya. Here we consider short answers firstly. The first and partly the fourth cases can be overcome if different movements are utilized (e.g., walking, squatting (not deep), movement of hands, head, back, shoulders, fingers, eyes, etc.). This must be done regularly for 40 to 50 minutes without fail during work or rest. The second and third cases are considered in detail below.

Recommendations using information from the first person

This person is about 65 years old. For approximately 30 years his weight has been between 72-74 kg, with height 1.78 m. How could this be maintained for this long period? Evidently, we have to make an analysis of his lifestyle, activities, and, of course, nutrition.

But first, we consider his nervous/mental system because if this is not healthy, then good food cannot help to enhance the duration of his life. One interesting peculiarity this man has is that he is a rather active person with many interests. He is interested in literature, mathematics, computers, sometimes writes poems, plays guitar and chess, and can solve different tasks and problems.

Our lives can be hard; at home or during work we can get into undesirable troubles. If such negative feelings cannot be dealt with quickly, then a person may suffer for a long time and their health deteriorates (which can also shorten their lifespan). Knowing this, the person in this study tried to divert his thoughts against negativity; he tries to think about forthcoming chess game, holidays, etc. This helps to neutralize the unpleasant moment, and he continues to sleep well at night. This is very important.

Further, we explain his position regarding eating.

Breakfast. Usually the main menu is as follows: a cup of tea with a small teaspoon of sugar, periodically with coffee and the same only with one small teaspoon with cream (or milk) without fail. Sometimes, he puts several types of coffee (not more than 10) into the cup and pours some hot water. In this case, he gets something average between tea and coffee (more tea). Also, he likes to drink tea with milk periodically. Moreover, he eats a piece of black bread without butter but with cheese or sausage, and sometimes both. During a week, he boils two or three eggs (lightly-boiled). During Saturday or Sunday, he has Hercules porridge or semolina (only one plate).

Lunch. If he has free time, he likes to drink a cup of tea with cottage cheese, sour cream and with sugar. Sometimes as an additional element he eats a small sweet roll. This is all that he eats, usually around 12 o'clock.

Half supper. Because of his working days he does not have enough time to eat his dinner; sometimes he eats his soup at home. It is made with boiled chicken or turkey (or the legs, wings, or breast) without

potatoes but with an onion. Usually, he adds some vermicelli and a little salt. Periodically, but not very often, he adds one small clove of garlic, or, instead of the soup, he eats one banana with or without water.

Supper. This is usually around half past nine in the evening. He eats pelmeni (not more than 10) with soured cream. Other times he eats sausages (1 or 2) with mustard or with horseradish plus a piece of black bread. He also drinks a cup of tea with maybe a fruitcake or a bun. Twice a week he eats a half teaspoon of honey.

If he eats salads, he makes them from tomato and cucumber with soured cream and without any mayonnaise usually, but with a little salt. Sometimes he adds some dill. Some discussion about juice, fruit, wine and others.

During the year he ate not more than two watermelons, three pears, 4 kg carrots, 5 kg potatoes, 3 kg sweet red capsicum, 1 pineapple, 5 kg white-head cabbages, 7 kg oranges, 4 kg mandarins, 14 kg bananas, 6 kg grapefruits, 2 lemons, 4 kg apples, 7 liters of juice/sap, and 7 kg of assorted nuts; he drank wine, vodka, or brandy approximately twice a week, 50 milliliters each time.

Using this menu during the year, he maintains his weight constantly between 72 kg and 74 kg, 365 days each year (see Figure 1) and his blood pressure is 125/75 for approximately 30 years. Finally, every morning and evening he has a sponge-down using cold water from the tap in the bathroom, periodically swims in the swimming pool, undergoes his morning exercises, and uses dumbbells (3 kg for each hand). Medical control was made every month.

Thus, if such a lifestyle and diet appeal and can be realized in practice, then a long life and good health will follow.

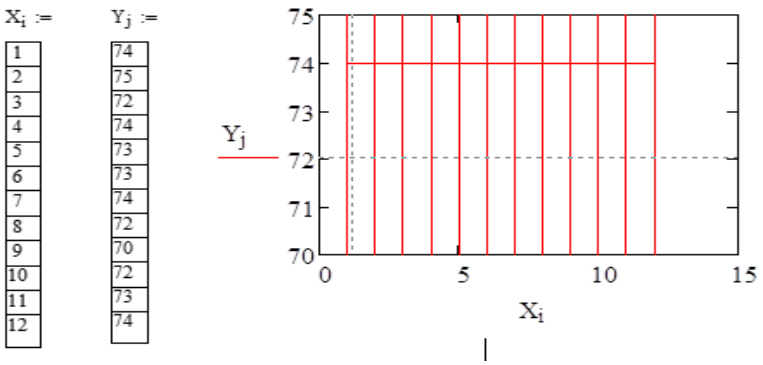

Figure 1. Diagram of the Oscillations of the Weight for the First Person (Average during 30 Years of His Life)

Recommendations using information from the second person

This person is 34 years old now. For approximately 5 years her weight has decreased from 70 kg to 57 kg. Her height is 1.58 m. How could this be achieved over 5 years only? Evidently, we have to make an analysis of her lifestyle, activities, and nutrition.

She was working at the factory.

The conditions in the shop were not good: high temperature, noisy, hard labour, high amount of responsibility for the results, with a very hard and even rather rude head of department. Hence, her nervous system was under constant stress. To improve her mood, she liked to eat too much fatty products such as pork, meat, shashlik/kebab, hamburgers, fast food, chops, sweets, chocolate, cakes, tarts, and beer. Eating such products, she was trying to ease her hard life and to calm down her nerves. But, unfortunately, her weight was growing practically constantly. Such a way of life is not good, which is why she decided to change this situation.

First, she retired from this stressful and hard job and began to work as an engineer in the design office and also as a pluralism (as the courier from time to time). This life was without noise and stress. From this moment she decided to look after her health and weight determinedly.

The doctor recommended that she changes her diet both with regard to the type of food and the quantity. She understood this immediately.

After this advice she stopped drink beer completely and discontinued eating fatty foods and sweets. The results can be seen in Figure 2. The curve shows the alteration of weight during the period from 2013 to 2019. All calculations have been performed using MathCad. Comparing the theoretical and experimental results, we see excellent correlation.

These are the notations used: Xi denote the years (2013, 2014, 2015, 2016, 2017, 2018 as 1-6); Yi is the weight, from 70 to 57 in accordance with the years; X0 and Y0 are the middle values for the even amounts (n = 6) of the measuring/weighing; h is the observation step (one year); H1 and H2 are constants; a, b, c are parameters for the parabola approximation to obtain the mathematical description of our process regarding the weight; Yi and Wi are the statistical data and the theoretical description accordingly.

Thus, in this case she attained the desired result in her life by means of changing her job and diet.

$$i := 1..6 \quad n := 6 \quad h := 1 \quad X_0 := \frac{X_1 + X_n}{2} \quad X_1 := 1 \quad X_n := 6$$

$X_i :=$

1
2
3
4
5
6

$Y_i :=$

70
68
66
63
60
57

$$X_0 = 3.5 \qquad Y_0 := \sum_i \frac{Y_i}{n} \qquad Y_0 = 64 \qquad H_1 := n \cdot \frac{n^2 - 1}{12}$$

$$H_1 = 17.5 \qquad H_2 = 37.333$$

$$a := \frac{1}{12 \cdot H_2} \cdot \left[3 \cdot \left[\sum_i \left[Y_i \cdot (2 \cdot i - n - 1)^2 \right] \right] - \left(n^2 - 1 \right) \cdot \left(\sum_i Y_i \right) \right] \qquad a = -0.161$$

$$b := \frac{1}{2 \cdot H_1} \cdot \left[\sum_i \left[Y_i \cdot (2 \cdot i - n - 1) \right] \right] \qquad b = -2.629$$

$$c := Y_0 - \frac{H_1 \cdot a}{n} \qquad c = 64.469$$

$$W_i := a \cdot \frac{(X_i - X_0)^2}{h^2} + b \cdot \frac{X_i - X_0}{h} + c$$

$W_i =$

70.036
68.05
65.743
63.114
60.164
56.893

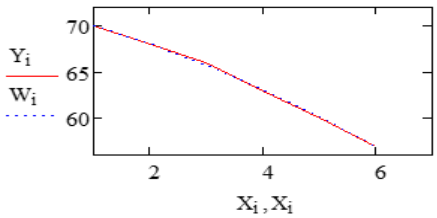

Figure 2. The Reduction in Weight over Six Years

Recommendations using information from the third person

This person is 22 years old now. For approximately 2 years his weight has reduced from 101 kg to 81 kg. His height is 1.77 m. How could this be achieved? Evidently, we have to make an analysis of his lifestyle, activities, and nutrition.

First, he liked to sleep for a long time on the sofa or his bed; he liked to luxuriate each time after breakfast, lunch, dinner, supper, tea or coffee. He liked to eat chocolate and ice cream, sausages, polonies, white bread, and fatty food. He began to eat more fruit, fish, and vegetables. He was very lazy, in truth. Suddenly one case helped him: he fell in love with a young girl who likes to play tennis very much. They decided to play this together. To be in good form for the sport he compelled himself to get up at half past seven in the morning to run to the tennis court. Training usually took about one hour. At first, he suffered from his large, excessive weight. As a result of the doctor's recommendation he began to eat less (see Figure 3).

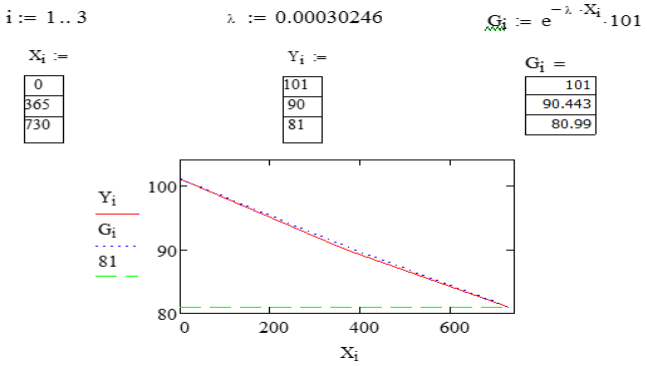

Figure 3. Change of Weight over Two Years: Xi are Days, Yi and Gi is the Weight

Theoretical formula Gi gave us practically the same result as the statistical data Yi.

During the year, this man ate not more than four watermelons, five pears, 3 kg carrots, 4 kg potatoes, 2.5 kg sweet red capsicums, 1 pineapple, 6 kg white-head cabbages, 8 kg oranges, 6 kg mandarins, 16 kg bananas, 7 kg grapefruits, 4 lemons, 7 kg apples, 8 liters of juice/sap, and 4 kg of assorted nuts; he drank wine, vodka, or brandy approximately twice a week, 40 ml each time.

Using such a menu during each year and altering his lifestyle, he reduced his weight from 101 kg to 81 kg (see Figure 3). Currently he goes to sleep and gets up in time freely!

Finally, every morning and every evening he has his sponge-down using cold water from the tap in the bathroom, takes his morning exercises, and uses dumbbells (5 kg for each hand). Owing to the fact that some of food he excluded on the whole. Now, he is active more often and for long distances. He ceased lying for long periods; he began to eat less and less, including ice cream. These actions helped him to reduce his weight little by little, and after two years his weight became 81 kg only.

Finally, we see that sport and the right food (plus love, of course) gave an excellent result!

2. Results and Conclusion

During the course of our study, we examined a lot of information connected with the problem depicted above, such as papers, the Internet, patents, etc. (Strath et al., 2019; Malik, Li, Pan, De Koning, Schernhammer, Willett, & Hu, 2019). It seems to us that our examples about how to decrease the weight of people will be not only interesting but also helpful in practice. A beneficial diet can be applied practically very often without the need for medical tablets and injections. To reduce the desire for excessive food, our advice is to drink some water or eat one banana. But don't use any dumb-bells if your heart isn't well.

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