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Research Protocol

Using GH-Method: Math-Physical Medicine to Quantitatively Define the Effectiveness of Food Portion Control and Daily Exercise to Fight Against Obesity

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Abstract

The author has been diagnosed with three chronic diseases including type 2 diabetes (T2D), hypertension, and hyperlipemia. Since 2010, he focused on T2D research to save his life. He collected and processed approximately 1.5 million data regarding his health and life details. In 2014, he developed a mathematical model of the metabolic system by using mathematics and various engineering modeling. This paper provides quantitative proof on how to reduce or control weight via meal portion and exercise by using the GH-Method: Math-Physical Medicine approach created by him.

Keywords: *Type 2 Diabetes; Chronic Diseases; Metabolism; Metabolic Conditions; Lifestyle Data; Artificial Intelligence; Hyperglycemia Control; Weight Management; Obesity; Math-Physical Medicine*

Introduction

This paper provides quantitative proof on the insightful and common knowledge of reducing or controlling weight via meal portion and exercise. The dataset is provided by the author, who uses his own type 2 diabetes metabolic conditions control, as a case study via the "math-physical medicine" approach of a non-traditional methodology in medical research.

Math-physical medicine (MPM) starts with the observation of the human body's physical phenomena (not biological or chemical characteristics), collecting elements of the disease related data (preferring big data), utilizing applicable engineering modeling techniques, developing appropriate mathematical equations (not just statistical analysis) and finally predicting the direction of the development and control mechanism of the disease.

Methods

In 2000, the author weighed 220 lbs. (100 kg) with a waistline of 44 inches (112 cm) and BMI of 32. In 2019, his average weight was 170 lbs. (77 kg) with a waistline of 32 inches (81 cm) and BMI of 24.7. He was diagnosed with three chronic diseases including diabetes, hypertension and hyperlipidemia, along with experiencing five cardiac episodes since 1994. By the year 2010, he started to conduct research on metabolic disorders in order to save his own life. In 2015, he had successfully reduced both his weight to ~170 lbs and his waistline to ~34 inches.

In early 2015, he developed a weight prediction model with various influential factors such as food, exercise, water, bowel movement, weather, stress, and more. He started to input data for three major variables into his system, i.e. meal portion, daily exercise and bowel movement.

Based on his collected big data of ~500,000, he then conducted time-series analysis and spatial analyses to calculate and observe the respective correlations between weight and its major influential factors.

Results

His predicted weight has reached to 99.8% accuracy and also maintained a 92% of R (correlation coefficient). The skewed slender knife shape of predicted vs. measured weight data cloud in spatial analysis also confirmed this strong relationship with high accuracy.

The R between weight and meal portion (average 86% of normal meal portion) is +69%. The positive R means that weight drops when he cuts his meal portion. The spatial analysis diagram further depicts weight as being maintained within the range of 168 - 174 lbs., when he sustains ~87% of meal portion (i.e. quantity of food).

The R between weight and exercise (average 15,565 daily walking steps, ~ 10 km or 6 miles per day) is -75%. The negative R means that weight drops when he increases his daily walking steps. The spatial analysis diagram further illustrates a reversed linear relationship existing between weight and exercise.

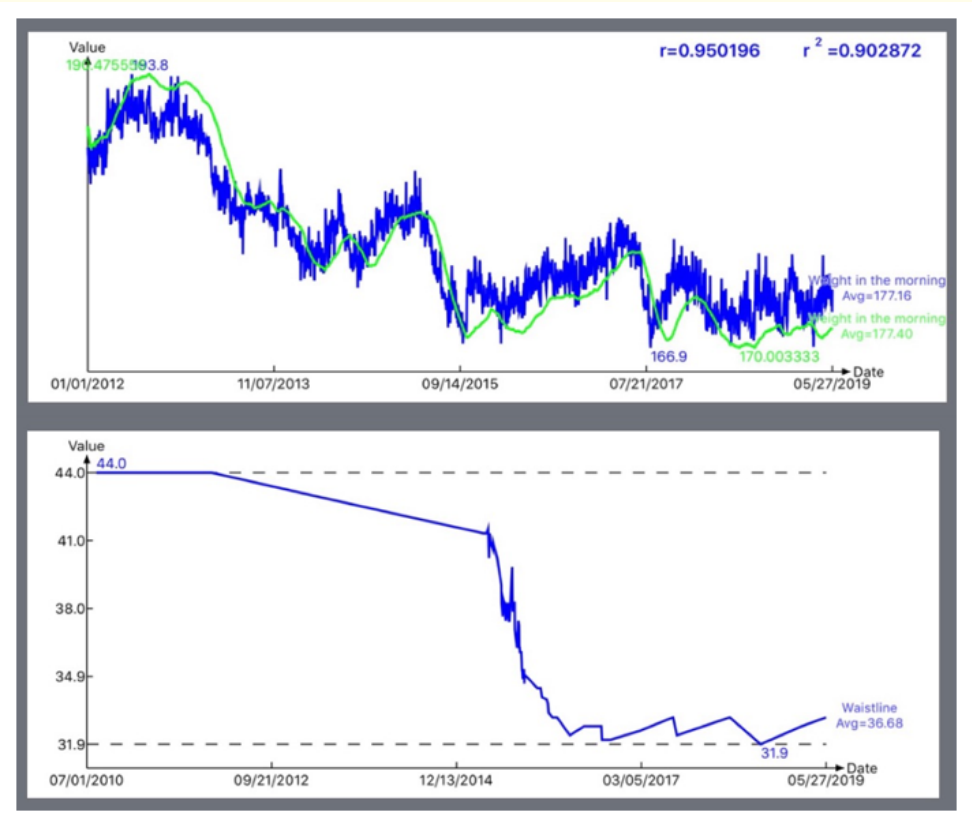

Figure 1: *Weight and waistline (2012 - 2019).*

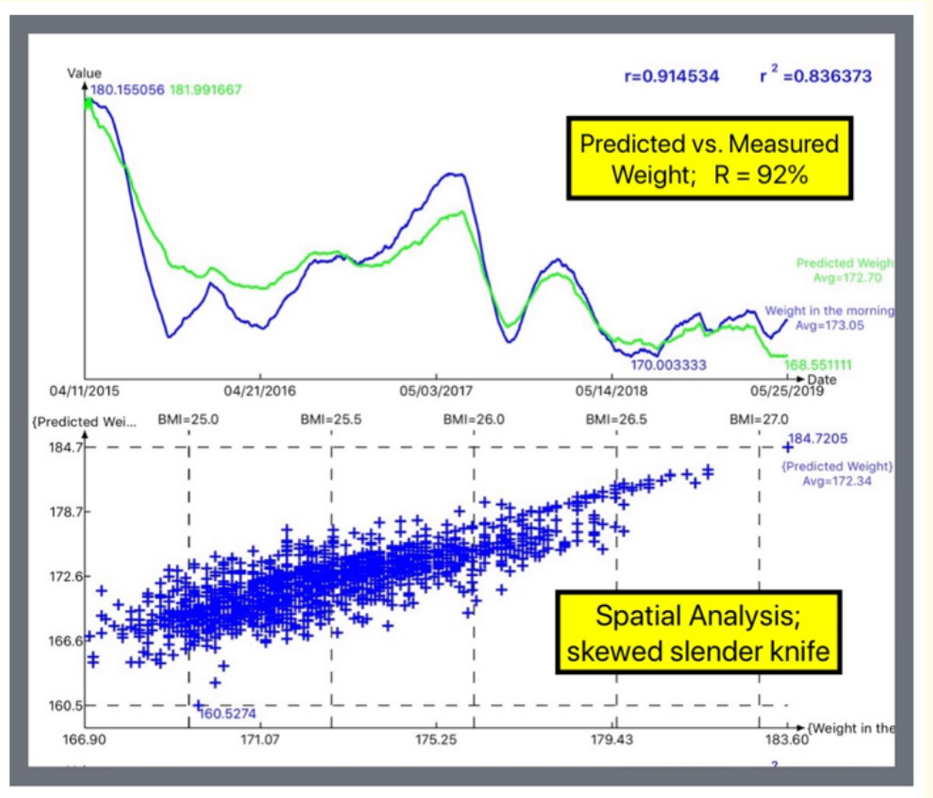

Figure 2: *Predicted and measured weight (2015 - 2019).*

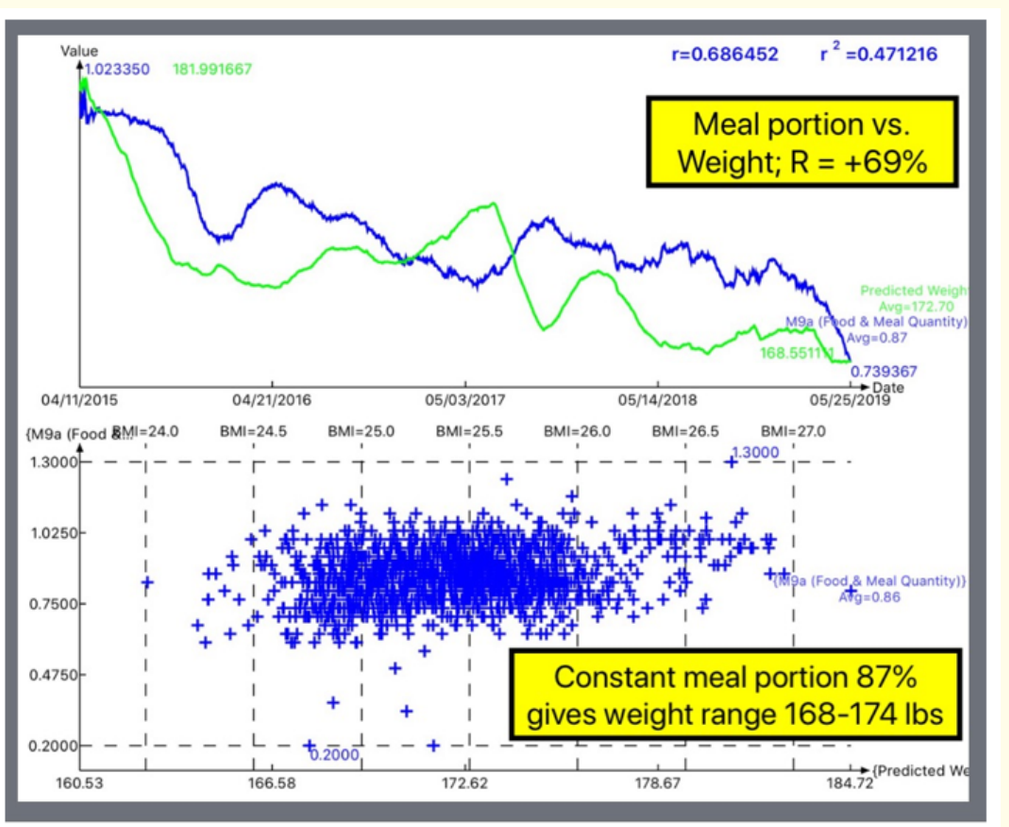

Figure 3: *Weight and meal portion (2015 - 2019).*

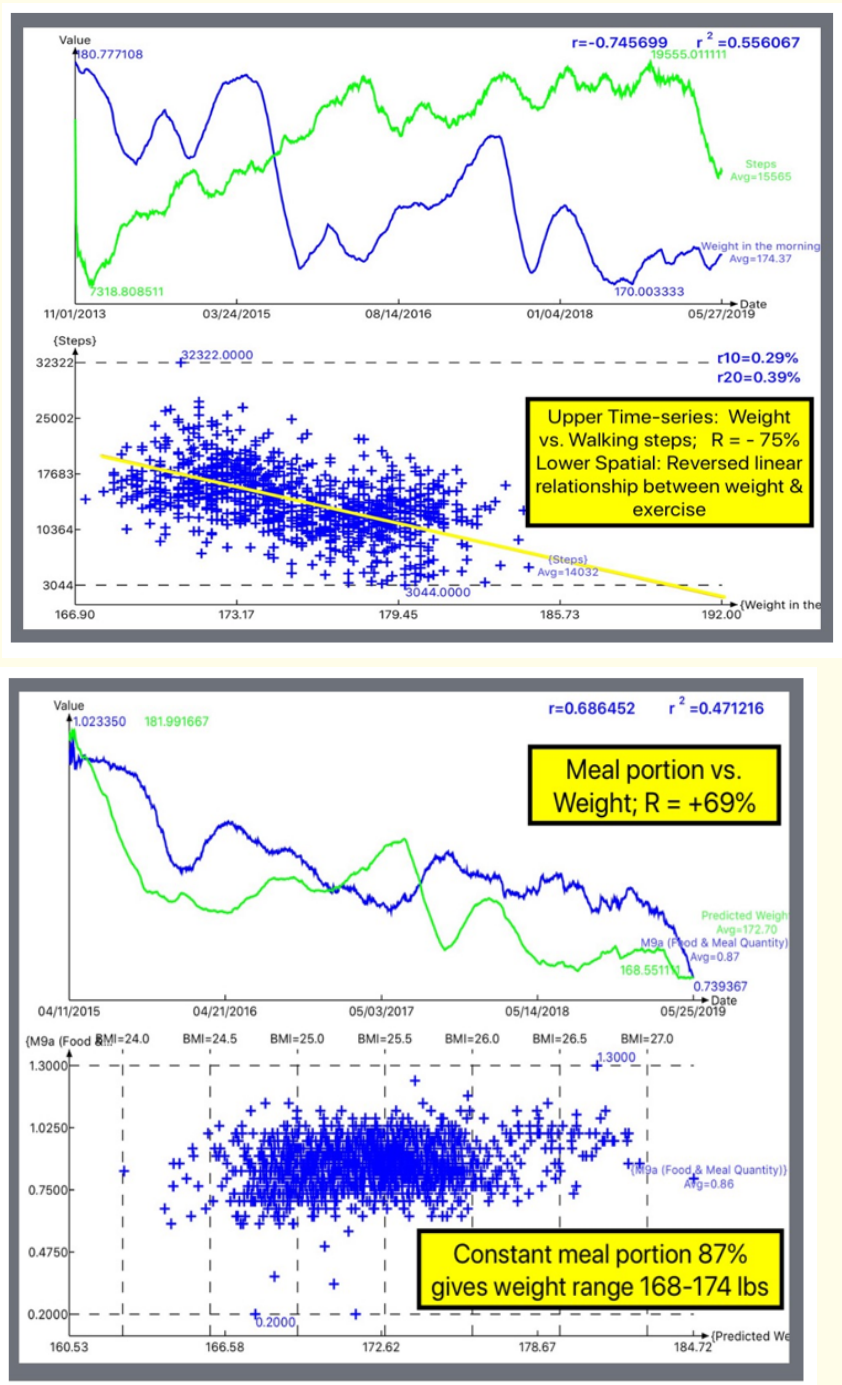

Figure 4: *Weight and exercise (2014 - 2019).*

Conclusion

This quantitative analysis further proves the common knowledge and wisdom of "eating less and exercising more to reduce and maintain weight".

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