

Using GH-Method: Math-Physical Medicine to Calculate Individual Metabolism Category's Score for Maintaining General Health from the Endocrinology Viewpoint

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Abstract

The author developed his GH-Method: math-physical medicine (MPM) by applying mathematics, physics, engineering modeling and computer science (big data analytics and AI) to derive the mathematical metabolism. This study provides quantitative details of 10 metabolic categories for the metabolism index to achieve a better score for the 90-days moving average from the endocrinology viewpoint.

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

Introduction

This paper provides quantitative details of the 10 metabolic categories of 4 outputs and 6 inputs for the metabolism index (MI) model to achieve a better score on the general health status unit: GHSU: 90-days moving average of MI. The results provide insightful knowledge on maintaining general health from the endocrinology viewpoint. 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

The data collection for this analysis started from 2012 to 2015 and completed on 5/31/2019. Approximately 1.5 million data was collected from a severe type 2 diabetes patient, who is the author himself. The GH-Method: MPM methodology has been described in many of his previous publications.

His initial health conditions from 2010 - 2012 were:

- (1) Weight/Waistline/BMI: 220 lbs./44in./32 (obese).

- (2) Glucose/A1C: 280 mg/dL/10%.
- (3) Triglycerides/ACR: 1,161 mg/dL/116 mg/dL
- (4) Cardiac episodes: Five times
- (5) Other complications: Renal, retinal, foot ulcer and thyroid.

Results and Discussion

As shown in figure 2-9, here are his performance scores for the metabolism categories:

(1) **Energy infusion:**

- (1a) Water drinking: 5.56 bottles or 2,780 cc per day.
- (1b) Food and Meal Score/Quantity/Quality: 83%/86% of normal food portion/97% quality.
- (1c) Sleep score/Sleep hours/Wake up times: 86%/7.5 hours/1.56 times.

(2) **Energy consumption:**

- (2a) Walking steps: 16,200 per day and 4,200 per meal.
- (2b) Stress: Satisfaction level 97%.
- (2c) Daily Routine: Satisfaction level 96%.

As depicted in figure 1, due to his stringent and disciplined lifestyle management, his health conditions (metabolism outputs) are:

- 1. MI and GHSU: From > 100% (unhealthy) down to ~60% (healthy)
- 2. Weight/Waistline/BMI: 170 lbs./32 in./24.7
- 3. Glucose/A1C: ~116 mg/dL/~6.6%
- 4. Hypertension and hyperlipidemia: Both are under control
- 5. ACR: From 116 to 8 mg/g
- 6. Cardiac episodes and other complications: None.

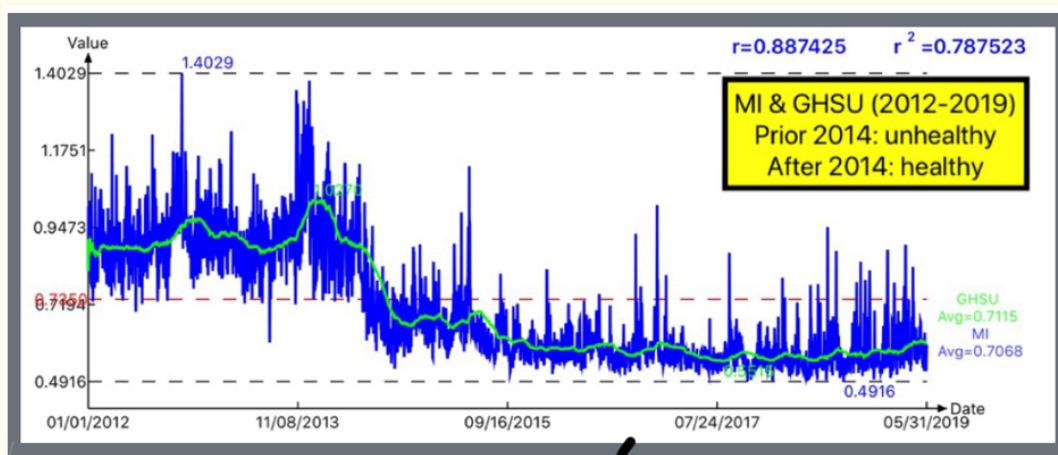


Figure 1: MI and GHSU.

Conversion Table from Lifestyle Category Score to Satisfaction Level					From 2014 to 5/31/2019	
Category	Worst Condition Score	Best Condition Score	MI Score	Satisfaction Level (%)	Best Condition Unit	Note
Water	1.5	0.7	0.7690	91%	6 bottles (500 cc each)	drink 5.56 bottles or 2,780 cc per day
Stress	1.5	0.5	0.5283	97%	total of 19 conditions	a "stressless" life
Sleep	1.5	0.5	0.6400	86%	total of 9 conditions	quite good sleep conditions
Sleep Hours	4	8	7.1100	78%	8 hours per night	sleep ~7.5 hours per night
Wakeup Times	5	0	1.5600	69%		wake up 1.56 times per night
Food & Meal Score	1.5	0.5	0.6671	83%	50% quantity & 50% quality	need further more portion reduction
Food Quantity	1.5	0.5	0.8611	64%	70% of normal food portion	86% of normal portion per meal
Food Quality	1.5	0.5	0.5281	97%		balanced nutrition & low carb food
Walking Exercise	1.5	0.5	0.6869	81%	20,000 steps	16,200 steps/day & 4,200 steps/meal
Daily Routine	1.5	0.7	0.7353	96%		a "regular routine" daily life pattern

Figure 2: Scores or satisfaction levels of metabolic input.

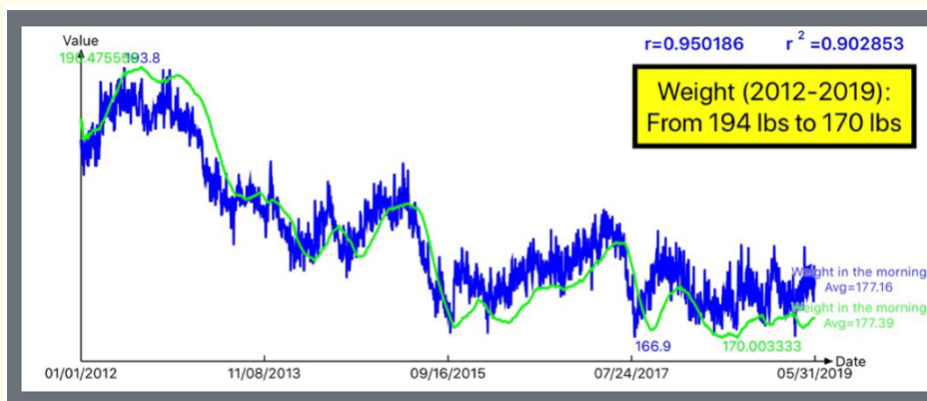


Figure 3: Scores or satisfaction levels of metabolic input.

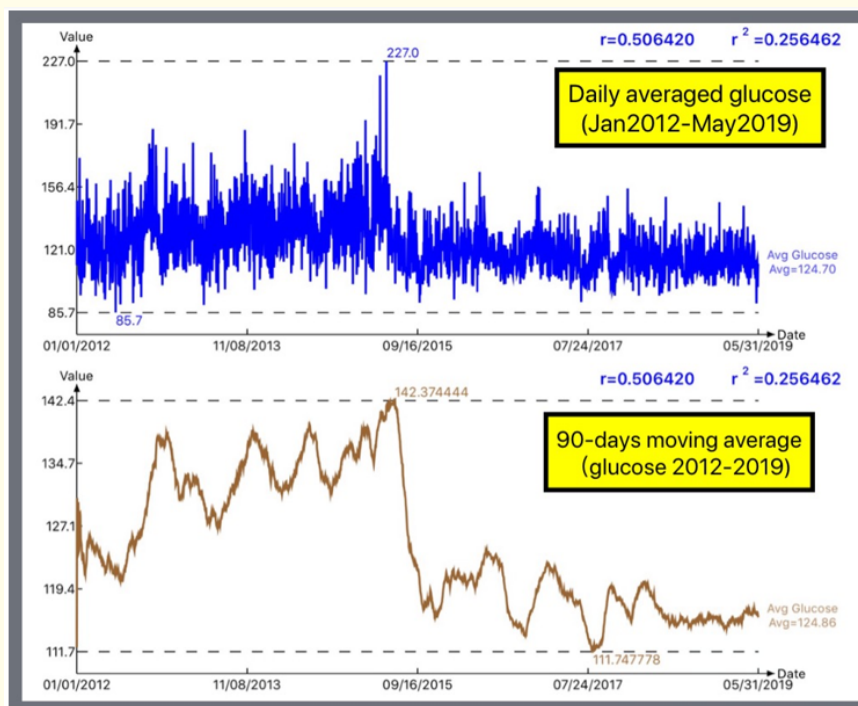


Figure 4: Scores or satisfaction levels of metabolic input.

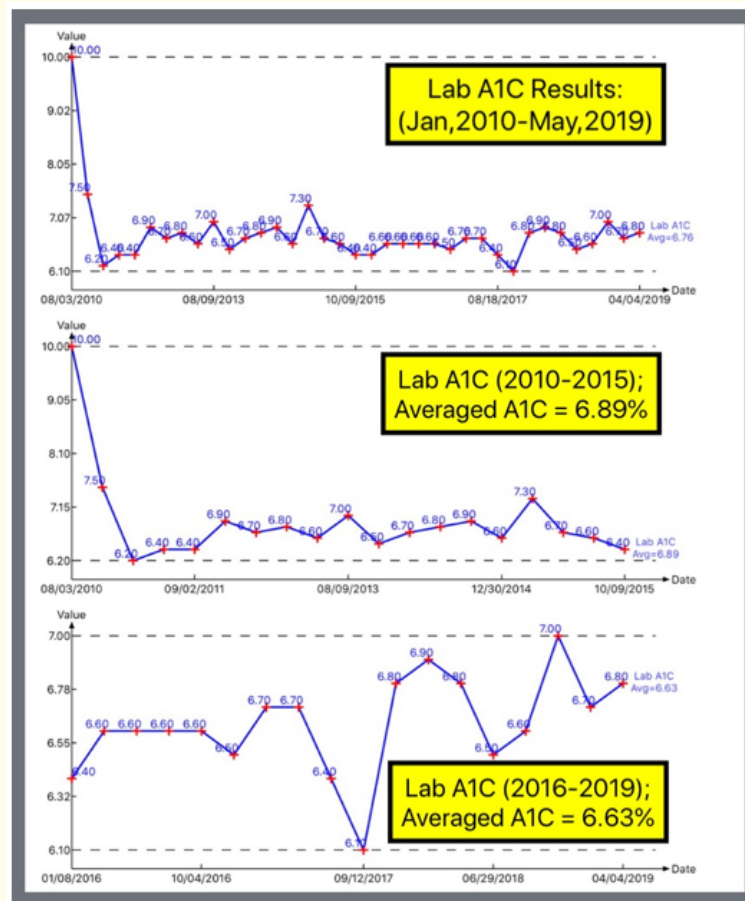


Figure 5: Scores or satisfaction levels of metabolic input.

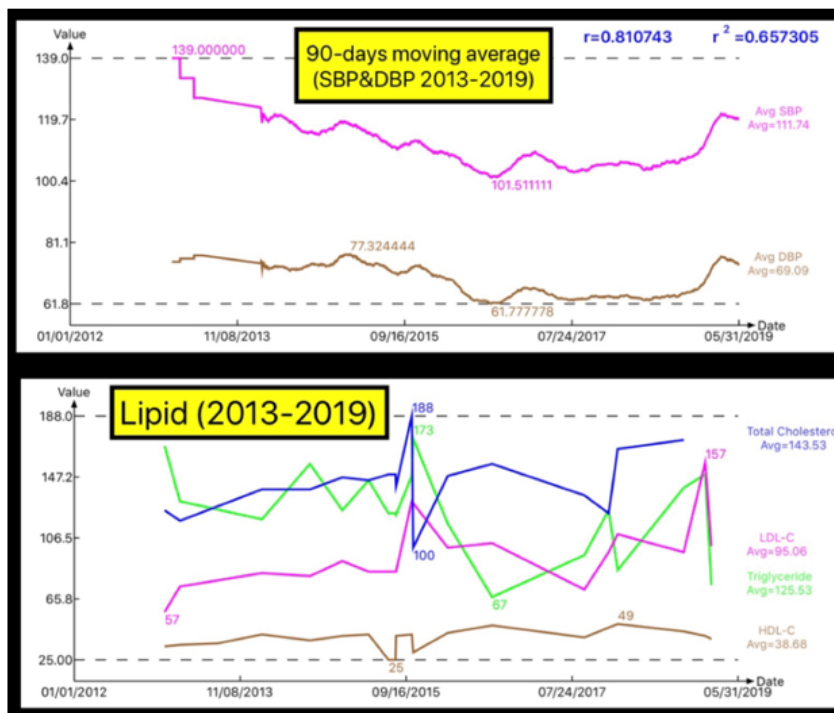


Figure 6: Blood pressure and lipids.

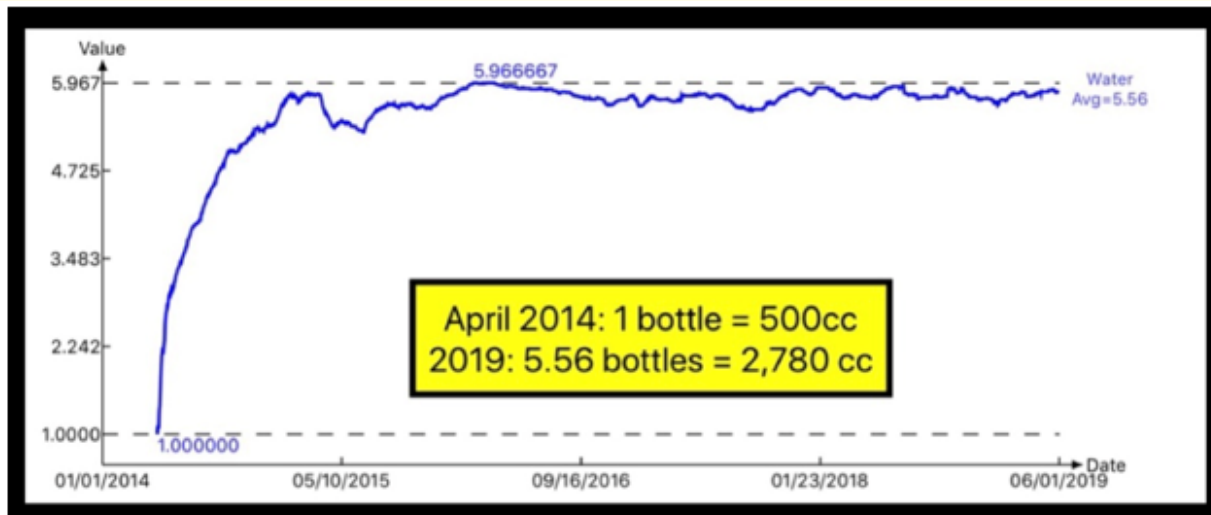


Figure 7: Scores or satisfaction levels of metabolic input.

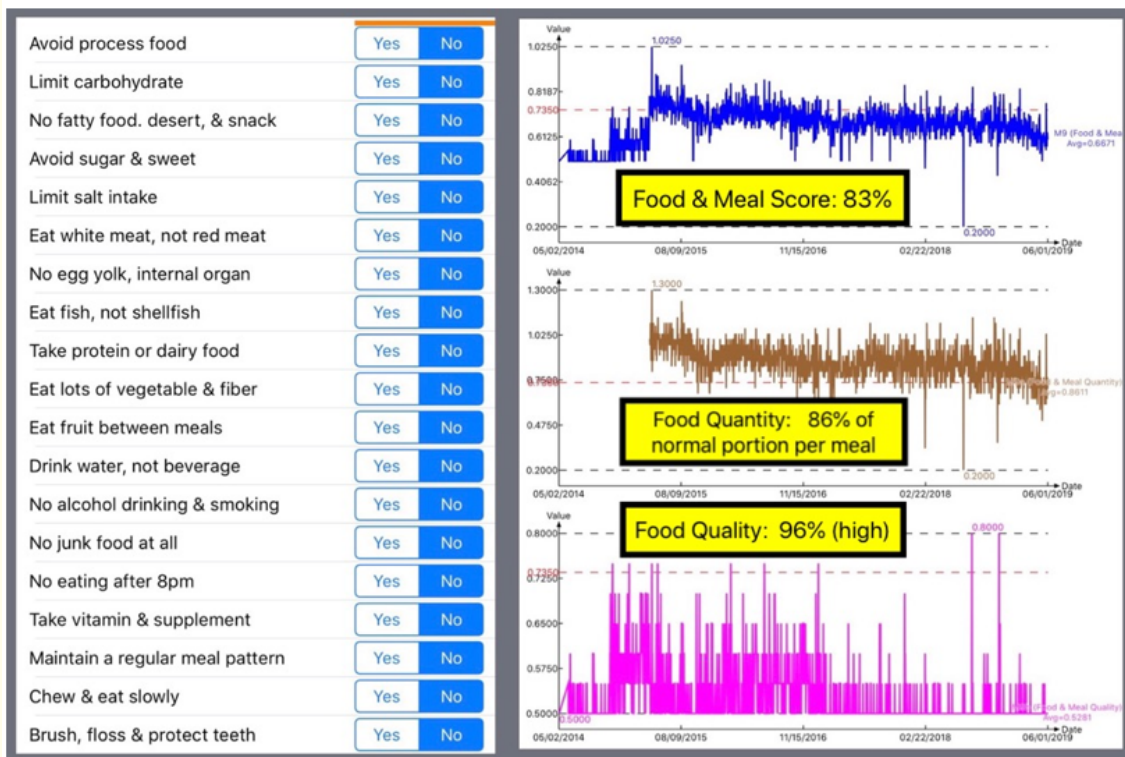


Figure 8: Scores or satisfaction levels of metabolic input.

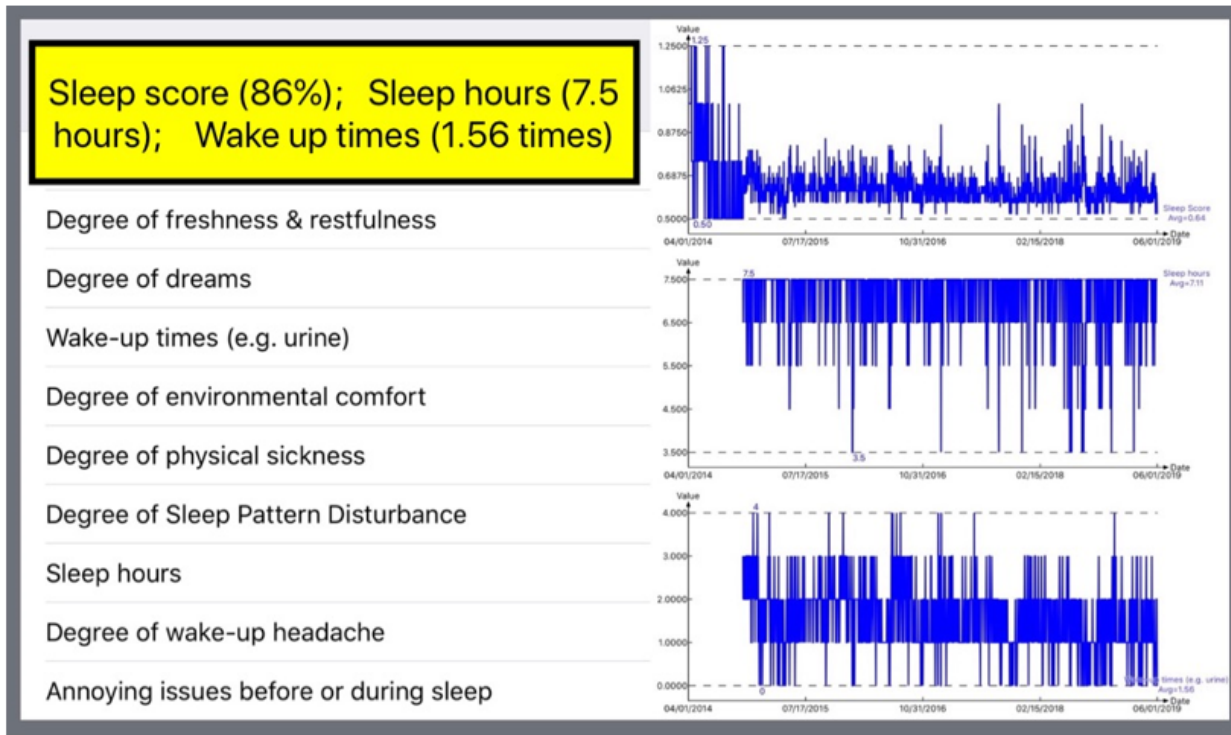


Figure 9: Scores or satisfaction levels of metabolic input.



Figure 10: Scores or satisfaction levels of metabolic input.



Figure 11: Stress.

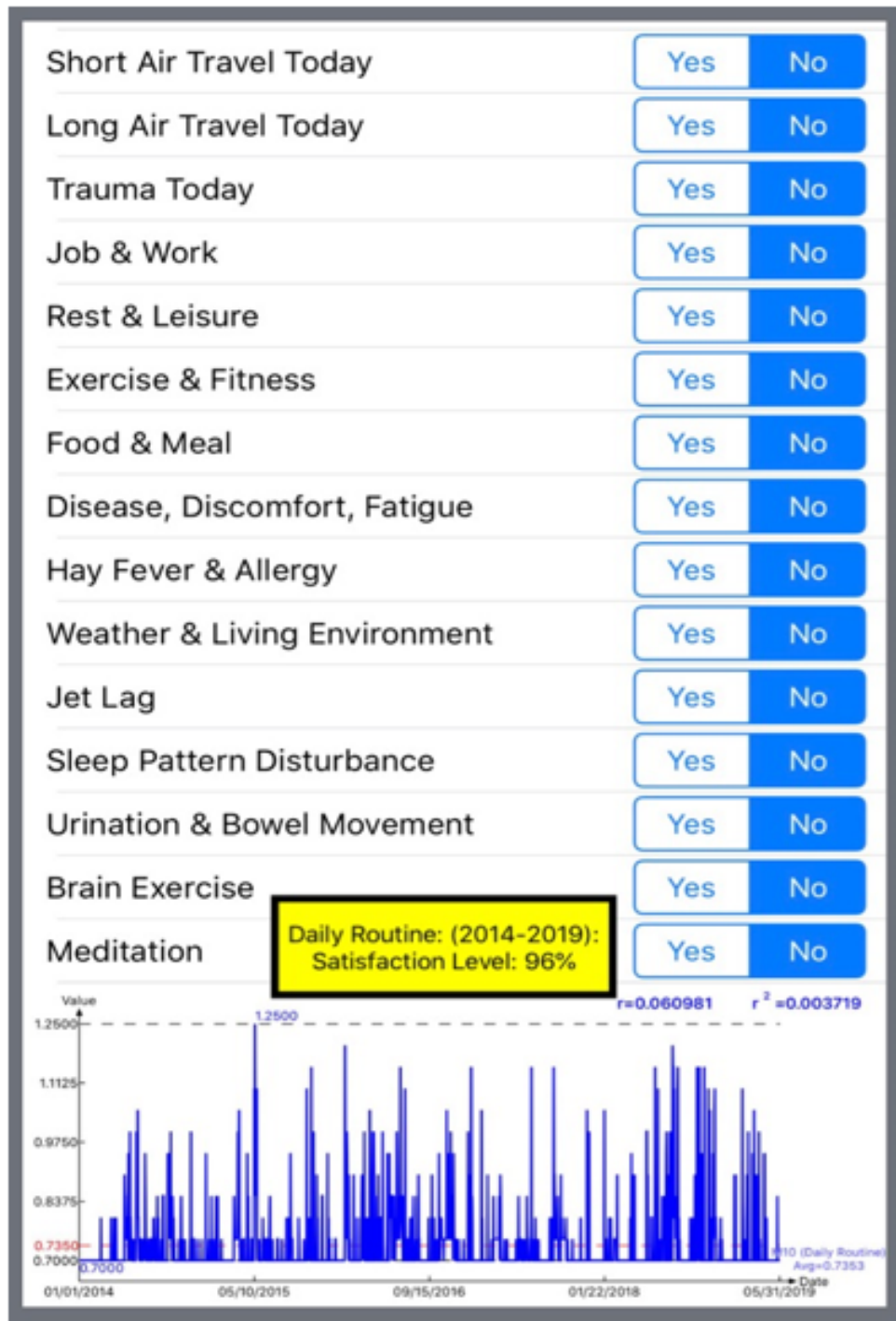


Figure 12: Daily routine.

Conclusion

This paper presents the summarized results of the author's 8.5 year's effort to control his metabolic disorders via a scientific and quantitative lifestyle management program by using the GH Method: math-physical medicine. The comparison of health conditions at 2012 and 2019 shows significant improvements. Using this kind of health maintenance program is extremely beneficial for controlling many endocrine diseases.

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