Longevity Analysis by Comparing the Overall Metabolism and Life Routine Regularity for Two Periods *via* GH-Method: Math-Physical Medicine

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Abstract

The author describes one of his hypothetical theories on the relationship between life longevity and overall metabolism, the macrosystem view, specifically the stress and daily life routine regularity, two micro-categories. He has spent ~25,000 h over 7.5 years (2010–2019) to conduct research on metabolism, endocrinology, and chronic diseases, specifically diabetes. These big data analytics is based on ~600,000 data over 2.5 years. His developed metabolism model has shed some light about the impact on his life longevity due to his overall metabolic changes, especially his stress level and life routine regularity. Having a strong lifestyle management leads into a good metabolic state, which then converts into a strong immunity to fight against three major disease categories, chronic diseases and complications (50% of death), cancers (29% of death), and infectious diseases (11% of death), with the remaining 10% of non-diseases related to death cases. This is a logical way to achieve longevity which is the core of geriatrics.

Introduction

This paper describes one of the author's hypothetical theories on the relationship between life longevity and overall metabolism, the macrosystem view, specifically the stress and daily life routine regularity, two micro-categories.

Methods

The author has spent ~25,000 h over 7.5 years (2010–2019) to conduct research on metabolism, endocrinology, and

chronic diseases, specifically diabetes.

In 2014, he established a mathematical model for metabolism which includes 4 output categories (weight, glucose, blood pressure, and lipids) and 6 input categories (food, water, exercise, sleep, stress, and life routine regularity). There are approximately 500 detailed elements included in these 10 categories. The "theoretical development" and a complete set of their interactive relationships would be an immense task, which includes calculations of 500 ! - this step is a massive undertaking without any significant benefit. Therefore, the author assigned various weighting factors to these elements and to seek important but partial interactions to investigate. By utilizing concepts and methods of topology, nonlinear algebra from mathematics, and finite element method from structural and mechanical engineering, he was able to define an approximated metabolic mathematical model with two newly defined variables, metabolism index (MI) and general health status unit (GHSU), where the GHSU is the 90-days moving average MI. This dynamic model can be expressed through these two variables to describe a person's health status at any moment of time.

Results

In 2017, from 1/1/2017–12/31/2017, Period A was the author's "best performed" period, *i.e.*, lowest numerical scores (means the highest performance) on his 4 input categories, 6 output categories, MI, and GHSU.

Period B, from 1/1/2018–6/30/2019, is the "not-so-perfect performed" period, *i.e.*, higher numerical scores (means poorer performance) on all categories. During Period B, the author attended at least 35 worldwide medical conferences to present over 70 medical papers. In addition, during this 18-month period, he wrote a total of 162 medical papers with 22 full-length articles published in various medical journals. In summary, during Period B, he overworked himself at the cost of damaging his overall health conditions, possibly shortening his life expectancy to some degree.

The figures below illustrate the lifestyle and medical conditions performance score comparison between the two periods graphically (Figure 1 and 2). He focused on four subjects: MI, GHSU, stress level, and daily life routine regularity. The figure shows both the data table of numerical comparison and a bar chart of performance percentages against baseline conditions (Figure 3). Specifically, 73.5% is the baseline for both MI and GHSU, healthy if < 73.5% and unhealthy if > 73.5%. He uses 70% as the best possible condition for stress level and 50% as the best possible condition for daily life routines.

Although his score of MI and GHSU has only increased (*i.e.*, worsen) by 2% from Period A to Period B, most of his metabolic categories have the worst performance scores in Period B.

Most medical research have shown that majority of people, who lived long lives had a simple but routine lifestyle. Therefore, let us focus on the category of "life routine regularity". His performance score for this category has increased (*i.e.*, worsen) by 2%. More specifically, this increased numerical score (*i.e.*, worsen performance) is the combined results from air flights, hotel meals, disturbance of food, exercise routines, weather changes, living environment changes, jetlag, and sleep pattern disruption.

It is quite interesting to find out that his stress level has no significant change, the comparison factor between Period A and B is 100% that is no change. This is probably due to the fact that medical research for him is his personal hobby unlike most working people, which is the ways and means to make a living with the purpose of gaining fame, power, or money. In addition, he has not suffered any stress from a "boss" and some "deadlines" from his research like other working people with normal jobs.

The list of daily life routine is shown in figure which has many items to factor in (Figure 4). Therefore, it is difficult to achieve a perfect score in this daily life routine category. His performance score in this category was 145% in Period A and 148% in Period B, which is an increase of 3%.
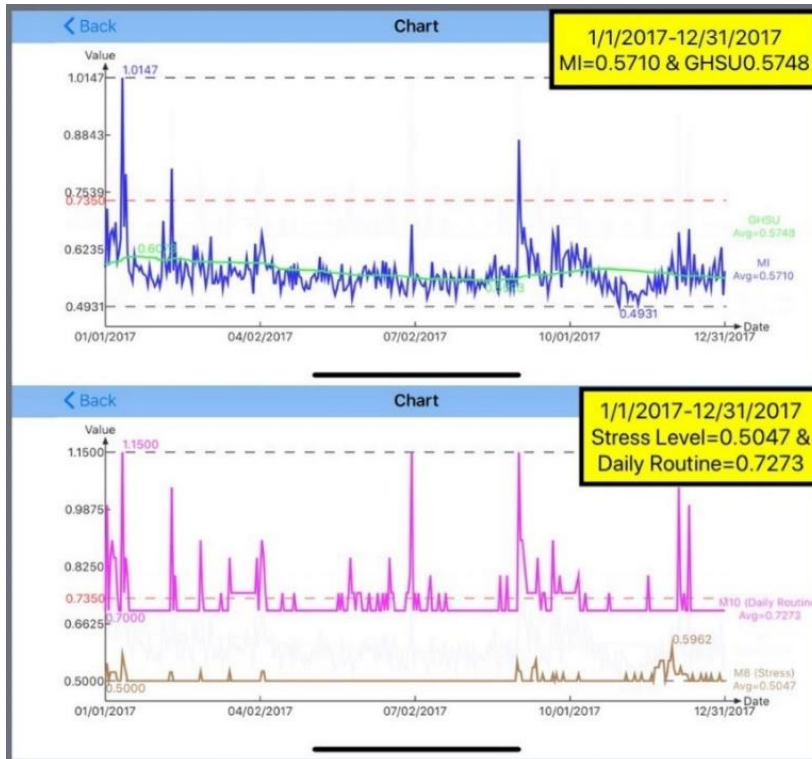
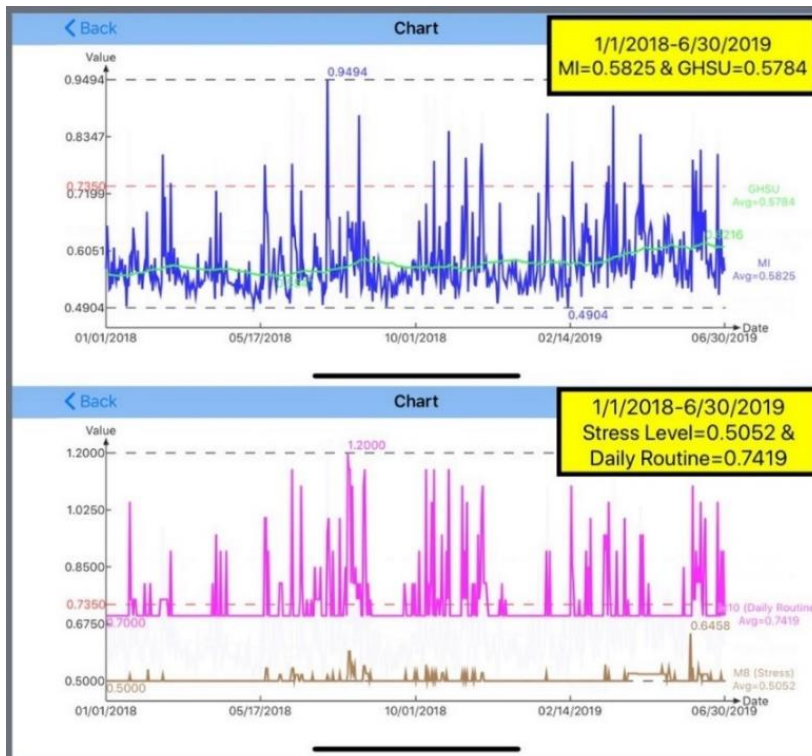**Figure 1:** MI/GHSU and stress/daily routine of Period A (1/1/2017–12/31/2017).

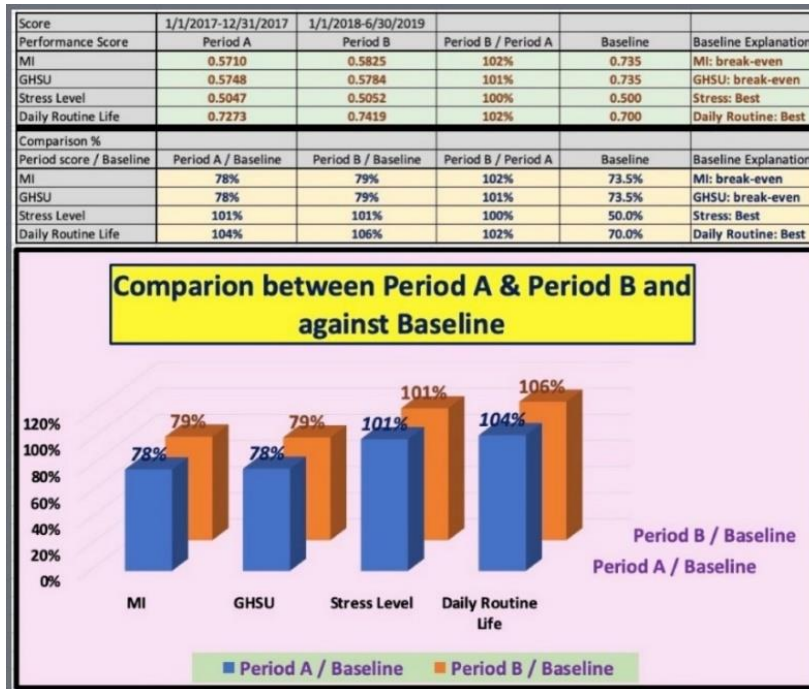**Figure 2:** MI/GHSU and stress/daily routine of Period B (1/1/2018–6/30/2019).

Score	1/1/2017-12/31/2017	1/1/2018-6/30/2019			
Performance Score	Period A	Period B	Period B / Period A	Baseline	Baseline Explanation
MI	0.5710	0.5825	102%	0.735	MI: break-even
GHSU	0.5748	0.5784	101%	0.735	GHSU: break-even
Stress Level	0.5047	0.5052	100%	0.500	Stress: Best
Daily Routine Life	0.7273	0.7419	102%	0.700	Daily Routine: Best
Comparison %					
Period score / Baseline	Period A / Baseline	Period B / Baseline	Period B / Period A	Baseline	Baseline Explanation
MI	78%	79%	102%	73.5%	MI: break-even
GHSU	78%	79%	101%	73.5%	GHSU: break-even
Stress Level	101%	101%	100%	50.0%	Stress: Best
Daily Routine Life	104%	106%	102%	70.0%	Daily Routine: Best

Figure 3: Comparison between Period A and Period B (MI, GHSU, stress, and daily routine).

Figure 4: Daily life routine.

Conclusion

These big data analytics is based on ~600,000 data over 2.5 years. His developed metabolism model has shed some light about the impact on his life longevity due to his overall metabolic changes, especially his stress level and life routine regularity. Based on the findings from this specific analysis, the author has decided to change his lifestyle and work on a different approach to deliver and distribute his medical research results which does not involve a heavy travel schedule.

His metabolism model is an effective tool to investigate the subject of geriatrics and longevity. Moving from the inner circle toward the outside rings, the figure (Figure 5) depicts that lifestyle management leading into a good metabolic state, which then converts into a strong immunity to fight against three major disease categories, chronic diseases and complications (50% of death), cancers (29% of death), and infectious diseases (11% of death), with the remaining 10% of non-diseases related to death cases. This is a logical way to achieve longevity which is the core of geriatrics. References 1–4 provide more details regarding the author's work in this research area.
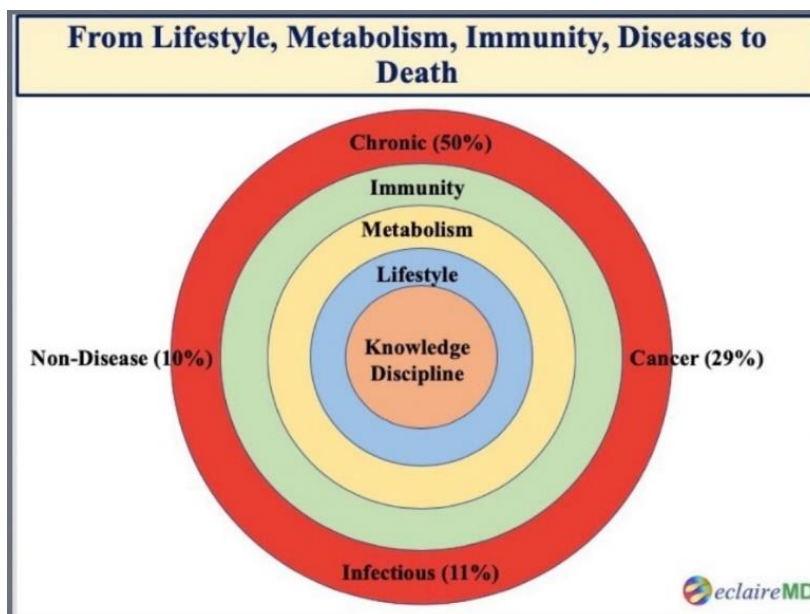
Figure 5: From lifestyle through metabolism, immunity, diseases and to death.

References

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