The GH-Method

Re-evaluation of Both FPG and PPG Predictions and their Major Contributing Factors Using Frequency Domain Analysis of GH-Method: Math-Physical Medicine (No. 022)

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Keywords: Glucose; Weight; Frequency-domain; Time-domain; Exercise

Abbreviations: FPG: fasting plasma glucose; PPG: postprandial plasma glucose

1. INTRODUCTION

The author wants to revalidate his previous findings about glucose predictions and their contributing factors via a frequency domain analysis instead of using time series and spatial analyses alone.

2. METHODS

The author has used 18,000 data for FPG study, and 64,000 data for PPG study over 1,046 days (6/1/2015 - 4/12/2018). These include measured and predicted glucose data and their 24 influential factors.

Furthermore, the author used Fourier Transform to convert all available time-based waveforms, including measured & predicted glucose, weight, food, exercise, weather, etc. into relevant frequency-based waveforms for comparison.

3. RESULTS

Based on time-series analysis of FPG: 99.9% accuracy
98% correlation (Predicted vs Actual)
65% correlation (Weight vs FPG)

Note:
Weight contribution on FPG: ~85%

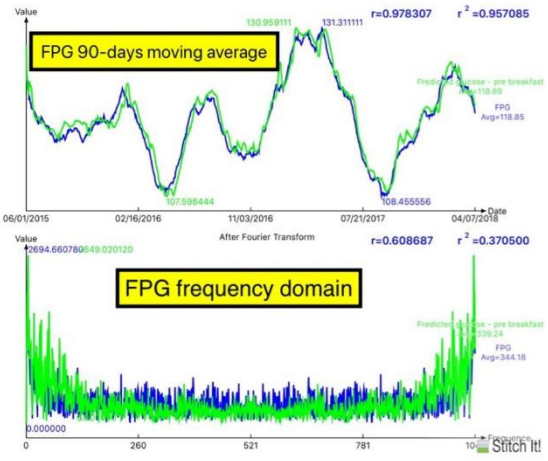
Based on frequency analysis of FPG:
61% correlation (Predicted vs Actual)
43% correlation (Weight vs FPG)

In addition, as we expected, the amplitude of weight waveform is smaller than the amplitude of FPG waveform.

Based on time-series analysis of PPG: 99.8% accuracy
83% correlation (Predicted vs Actual)
55% correlation (Carbs/sugar vs PPG)
-78% correlation (Exercise vs PPG)

Note:
Carbs/sugar and exercise combined contribution on PPG: 81%
Weather contribution on PPG: 9%
All other factors on PPG: 10%

Based on frequency analysis of PPG:
57% correlation (Predicted vs Actual)
51% correlation (Carbs/sugar vs PPG)
25% correlation (Exercise vs PPG)



Available online: 30 October 2023

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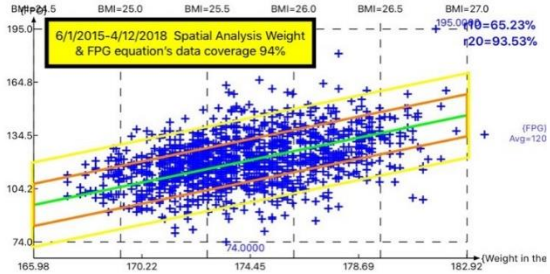

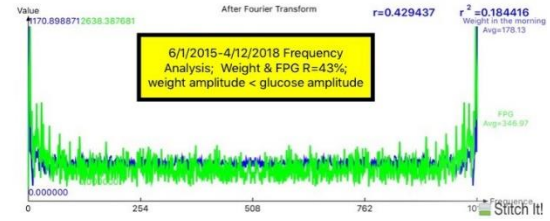

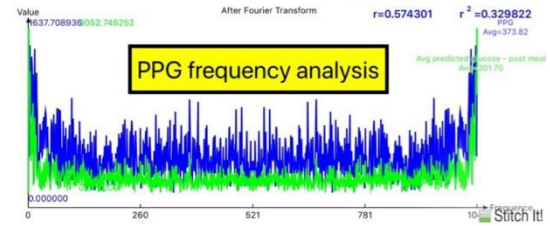

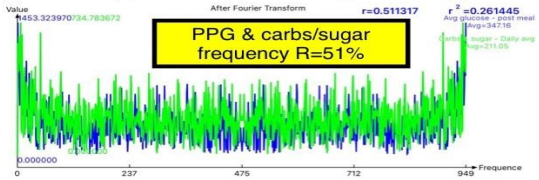

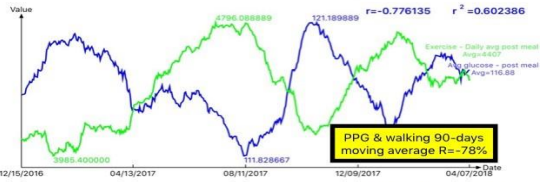

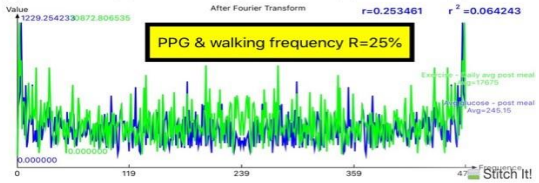

4. CONCLUSION

The results from frequency domain analysis have re-validated previous findings regarding FPG and PPG using both time-series and spatial analysis. All of these three analysis methods are a part of GH-Method: math-physical medicine.