

Community test project on the intervention effect of low-frequency PEMF on the three highs

Foreword:

The conditions of three highs refer to high blood pressure, high blood fat (cholesterol), and high blood sugar. According to government statistics from 1981 to 2020, the rise of the three highs is an urgent problem. Over the past 40 years, Hong Kong people's diet and living habits have changed. They like to eat high-sugar, high-sodium, and high-calorie foods, which directly contribute to the worsening of the conditions of the three highs, and are the main causes of stroke, coronary heart disease, kidney failure, liver disease, and other serious diseases.

According to the 2015 data from the Census and Statistics Department,¹ there are about 2.04 million patients with chronic diseases in Hong Kong, accounting for about 30% of the population in Hong Kong. Among them, the rate of hypertension is the highest, accounting for 12.6%, followed by high cholesterol (5.3%) and diabetes (4.8%).

The Department of Health released a survey in 2017 and found that half of Hong Kong people were overweight and obese.² It is estimated that the number of patients with high cholesterol will increase by one million, 2.9 million people will have high cholesterol, and about 100 in every 1000 Hong Kong people over the age of 30 will suffer from cardiovascular disease in 10 years.

The purpose of this project is to provide Hong Kong urbanites with a new option to improve their health without changing their lifestyles and eating habits. Avail Charity Foundation Limited was selected by Healthy Formula to co-organize a community health clinical trial project.

Organizer: Healthy Formula.

(Hong Kong registered non-profit charitable organization, number: 91/17393).

Project Leader: Li Sze Man, Vice Chairman.

Lead Consultant: Lily Lai, Naturopathic Doctor.

Co-organizer: Avail Charity Foundation Limited.

Sponsor: Vibronex (HK) Biotechnology Limited.

Project Witnesses: Wong Shu Ming, MH, JP; Chan Siu Tong, MH, JP.

Laboratory Undertaker: Carelink Bioscience Limited, Uep Inspection Company Limited.

Statistical Analyst: Pin Ng, Professor of Economics.

Tested Product: Vnex® Water Energizer 1.0.

Test Objects: Age 54-86.

Test Period: 90 days.

Test Requirements: No long-term medication.

Test Content: Three high indexes: fasting blood sugar, total cholesterol, HDL cholesterol, LDL cholesterol, alkaline phosphatase, alanine aminotransferase, aspartate aminotransferase, and total protein.

¹ Thematic Household Survey Report No. 58, 2015, October, 8. 《主題性住戶統計調查第 5 8 號報告書》出版 [2015年10月8日]。

² Released survey of the Department of Health in 2017. 衛生署於2017年公布調查。

Fifty-seven people aged fifty-four to eighty-six participated in this test. Participants were required to maintain their original lifestyle and eating habits and drink two liters of water treated by PEMF low-frequency Vnex® Water Energizer 1.0 every day, about 250 ml per hour for three months. Indexes are compared before and after the treatment.

Test results:

Table 1 Descriptive statistics for the pre-treatment, post-treatment, changes in, and percentage changes in sample data.

The change of an index is defined as the difference between the post-treatment and pre-treatment values. Hence, a negative change indicates a decrease (improvement) in the index after the treatment. The percentage change is defined as the change expressed as a percentage of the pre-treatment value.

Pre-Treatment								
	<i>Fast. Blood Sugar</i>	<i>Total chol.</i>	<i>HDL chol.</i>	<i>LDL chol.</i>	<i>Alkaline phosp.</i>	<i>Alanine amino.</i>	<i>Aspartate amino.</i>	<i>Total protein</i>
Mean	6.02	5.57	1.79	3.48	101.61	43.71	24.45	82.81
Median	5.55	5.70	1.68	3.61	101.41	43.07	23.02	83.53
Mode	6.38	6.46	1.25	4.33	96.55	39.16	22.96	#N/A
Standard Deviation	1.74	1.42	0.49	1.08	19.69	9.50	6.24	5.59
Sample Variance	3.02	2.01	0.24	1.16	387.85	90.19	38.89	31.23
Kurtosis	12.33	-0.41	1.13	-0.34	0.78	-0.30	0.92	6.66
Skewness	2.91	-0.17	0.98	-0.33	0.10	0.39	0.60	-2.04
Range	11.20	6.30	2.36	5.05	108.30	41.56	33.12	31.56
Minimum	3.84	2.23	0.97	0.96	53.11	22.57	9.04	58.47
Maximum	15.04	8.53	3.33	6.01	161.41	64.13	42.16	90.03
Count	57	57	57	57	57	57	57	57
First Quartile	4.91	4.64	1.45	2.74	92.17	36.71	19.90	80.04
Third Quartile	6.41	6.50	2.06	4.33	113.36	50.50	28.70	87.24

Post-Treatment								
	<i>Fast. blood sugar</i>	<i>Total chol.</i>	<i>HDL chol.</i>	<i>LDL chol.</i>	<i>Alkaline phosp.</i>	<i>Alanine amino.</i>	<i>Aspartate amino.</i>	<i>Total protein</i>
Mean	5.63	5.18	1.44	3.00	69.37	21.43	24.56	71.64
Median	5.20	5.44	1.38	2.98	67.00	20.00	23.00	71.00
Mode	5.50	4.49	1.45	4.36	57.00	16.00	22.00	71.00
Standard Deviation	1.62	1.19	0.45	1.06	16.53	8.74	5.94	4.02
Sample Variance	2.62	1.43	0.21	1.13	273.24	76.37	35.28	16.13
Kurtosis	20.57	-0.80	4.11	-0.68	0.20	0.02	-0.56	1.06
Skewness	3.97	-0.04	1.73	0.28	0.69	0.75	0.57	-0.51
Range	10.64	4.98	2.42	4.47	77.00	37.00	24.00	19.61
Minimum	4.40	2.80	0.82	1.40	39.00	10.00	14.00	59.00
Maximum	15.04	7.78	3.24	5.87	116.00	47.00	38.00	78.61
Count	57	57	57	57	57	57	57	57
First Quartile	4.75	4.15	1.16	1.99	57.00	14.50	20.50	69.00
Third Quartile	5.80	6.09	1.58	3.78	79.50	26.50	28.00	74.00

Changes								
	<i>Fast. blood sugar</i>	<i>Total chol.</i>	<i>HDL chol.</i>	<i>LDL chol.</i>	<i>Alkaline phosp.</i>	<i>Alanine amino.</i>	<i>Aspartate amino.</i>	<i>Total protein</i>
Mean	-0.39	-0.39	-0.35	-0.49	-32.24	-22.28	0.12	-11.17
Median	-0.34	-0.32	-0.31	-0.22	-31.49	-22.13	0.02	-11.52
Mode	0.00	-0.92	-0.17	-0.91	#N/A	-22.13	0.00	-10.45
Standard Deviation	1.28	0.86	0.28	0.81	11.75	9.83	5.73	5.50
Sample Variance	1.64	0.74	0.08	0.66	138.07	96.72	32.85	30.26
Kurtosis	9.50	1.42	2.67	0.38	2.90	1.82	2.36	9.21
Skewness	1.32	-0.63	-1.11	-0.71	0.74	0.30	-0.39	1.85
Range	9.60	4.54	1.59	3.67	69.97	59.56	35.12	37.61
Minimum	-3.84	-3.06	-1.38	-2.49	-60.08	-50.13	-20.16	-22.08

Maximum	5.76	1.48	0.21	1.18	9.89	9.43	14.96	15.53
Count	57	57	57	57	57	57	57	57
First Quartile	-0.85	-0.86	-0.47	-0.89	-39.18	-28.86	-2.65	-13.53
Third Quartile	0.14	0.04	-0.18	0.01	-26.79	-17.72	4.23	-8.77

Percentage Changes								
	<i>Fast. blood sugar</i>	<i>Total chol.</i>	<i>HDL chol.</i>	<i>LDL chol.</i>	<i>Alkaline phosp.</i>	<i>Alanine amino.</i>	<i>Aspartate amino.</i>	<i>Total protein</i>
Mean	-0.04	-0.05	-0.19	-0.11	-0.31	-0.50	0.04	-0.13
Median	-0.06	-0.07	-0.19	-0.08	-0.33	-0.52	0.00	-0.14
Mode	0.00	#N/A	#N/A	#N/A	#N/A	#N/A	0.00	#N/A
Standard Deviation	0.25	0.17	0.14	0.24	0.11	0.19	0.29	0.07
Sample Variance	0.06	0.03	0.02	0.06	0.01	0.04	0.08	0.00
Kurtosis	27.71	5.28	2.13	1.58	7.86	3.48	16.86	17.67
Skewness	4.36	1.27	-0.18	0.56	2.02	1.38	3.16	3.17
Range	1.91	1.07	0.84	1.28	0.70	1.05	2.13	0.52
Minimum	-0.41	-0.41	-0.63	-0.58	-0.51	-0.80	-0.48	-0.25
Maximum	1.50	0.66	0.22	0.70	0.19	0.25	1.65	0.27
Count	57	57	57	57	57	57	57	57
First Quartile	-0.13	-0.14	-0.24	-0.28	-0.37	-0.65	-0.11	-0.16
Third Quartile	0.03	0.01	-0.10	0.01	-0.28	-0.41	0.14	-0.10

Chart 1 Boxplots for the changes and percentage changes in the indexes after the treatment. The thick solid line inside each box is the median, to the left of which half of the data points fall; the left edge of the box is the first quartile, to the left of which a quarter of the data points fall; the right edge of the box is the third quartile, to the right of which a quarter of the data points fall; the left whisker is 1.5 times the width of the box distance to the left of the first quartile; the right whisker is 1.5 times the width of the box distance to the right the third quartile. The points to the left and right of the left and right whiskers, respectively, are outliers.

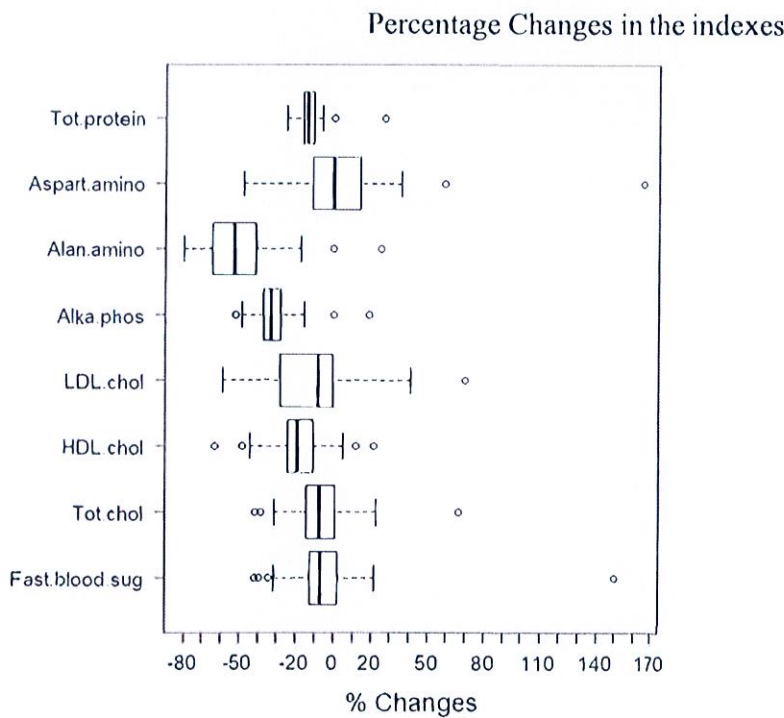
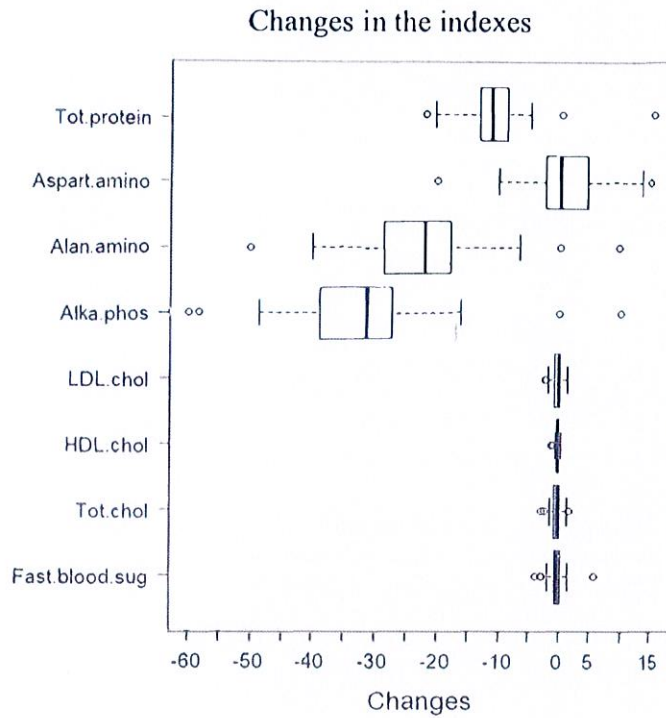


Table 2: Sample arithmetic mean changes and confidence interval estimates for population arithmetic mean changes in various indexes.

This table presents the sample arithmetic mean changes for the sample of 57 participants and the 95% and 99% confidence interval estimates of the population mean changes of various indexes for the population without taking western medication. The change is measured as the difference between the post-treatment and pre-treatment index values; hence a negative change indicates an improvement in the index value.

95% level of confidence				
	Sample Mean	Lower Limit	Upper Limit	Statistical Significance
Fasting blood sugar	-0.39	-0.73	-0.05	Yes
Total cholesterol	-0.39	-0.61	-0.16	Yes
HDL cholesterol	-0.35	-0.42	-0.27	Yes
LDL cholesterol	-0.49	-0.70	-0.27	Yes
Alkaline phosphatase	-32.24	-35.36	-29.12	Yes
Alanine aminotransferase	-22.28	-24.89	-19.67	Yes
Aspartate aminotransferase	0.12	-1.40	1.64	No
Total protein	-11.17	-12.63	-9.71	Yes
99% level of confidence				
	Sample Mean	Lower Limit	Upper Limit	Statistical Significance
Fasting blood sugar	-0.39	-0.84	0.06	No
Total cholesterol	-0.39	-0.08	-0.07	Yes
HDL cholesterol	-0.35	-0.45	-0.25	Yes
LDL cholesterol	-0.49	-0.77	-0.20	Yes
Alkaline phosphatase	-32.24	-36.39	-28.09	Yes
Alanine aminotransferase	-22.28	-25.75	-18.81	Yes
Aspartate aminotransferase	0.12	-1.91	2.14	No
Total protein	-11.17	-13.11	-9.22	Yes

Table 3: Percentages of sample participants and confidence interval estimates for percentage in the population with an improvement in various indexes.

This table presents the percentages of participants in the sample of 57 participants who experience an improvement (negative change) in various indexes while not taking western medicine along with the 95% and 99% confidence interval estimates for the percentages in the population with improvements. A participant experiences an improvement in an index when the change, which is defined as the difference between the post-treatment and pre-treatment index values, has a negative value. The sample percentage of participants with an improvement in an index is computed as the number of sample participants who experience a negative change in the index divided by the sample size and multiplied by 100%.

95% level of confidence			
	Sample Percentage Improvement	Lower Limit	Upper Limit
Fasting blood sugar	65%	53%	77%
Total cholesterol	68%	56%	80%
HDL cholesterol	93%	86%	100%
LDL cholesterol	74%	62%	85%
Alkaline phosphatase	96%	92%	101%
Alanine aminotransferase	96%	92%	101%
Aspartate aminotransferase	46%	33%	59%
Total protein	96%	92%	101%
99% level of confidence			
	Sample Percentage Improvement	Lower Limit	Upper Limit
Fasting blood sugar	65%	49%	81%
Total cholesterol	68%	53%	84%
HDL cholesterol	93%	84%	102%
LDL cholesterol	74%	59%	80%
Alkaline phosphatase	96%	90%	103%
Alanine aminotransferase	96%	90%	103%
Aspartate aminotransferase	46%	29%	63%
Total protein	96%	90%	103%

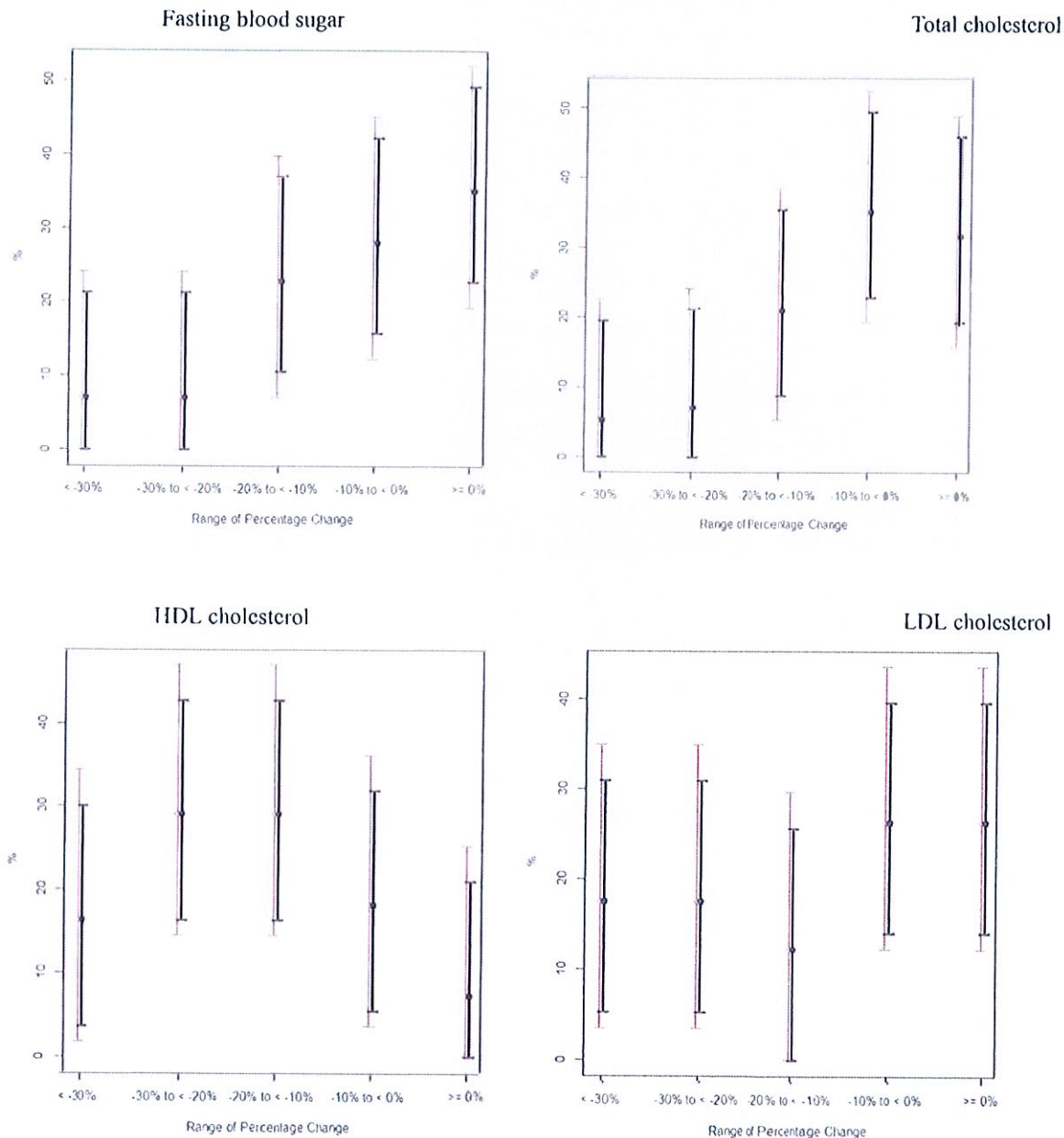
Table 4 Sample results of the various percentage improvements in indexes.

The table shows the sample percentages for the various indexes over the different ranges of percentage changes: < -30%, -30% to < -20%, -20% to < -10%, -10% to < 0%, and >= 0%. The more negative a percentage change, the higher the percentage improvement; hence a positive percentage change signifies a percentage deterioration.

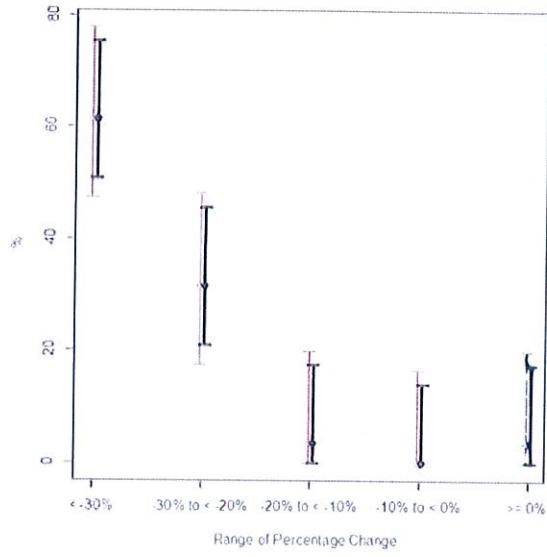
Sample Percentage Change	< -30%	-30% to < -20%	-20% to < -10%	-10% to < 0%	>= 0%
Fasting blood sugar	7%	7%	23%	28%	35%
Total cholesterol	5%	7%	21%	35%	32%
HDL cholesterol	16%	29%	29%	18%	7%
LDL cholesterol	18%	18%	12%	26%	26%
Alkaline phosphatase	61%	32%	4%	0%	4%
Alanine aminotransferase	91%	4%	2%	0%	4%
Aspartate aminotransferase	4%	12%	11%	19%	54%
Total protein	0%	11%	70%	16%	4%

Chart 2 Plots of the confidence interval estimates for the various population percentage improvements in indexes.

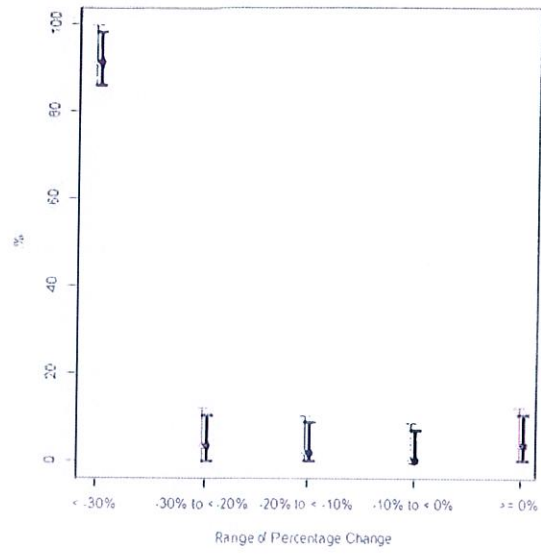
The series of charts show the 95% (narrower thicker black) and 99% (wider thinner red) confidence interval estimates for the population percentages for the various indexes over the different ranges of percentage changes: < -30%, -30% to < -20%, -20% to < -10%, -10% to < 0%, and >= 0%. The more negative a percentage change, the higher the percentage improvement; hence a positive percentage change measures the percentage deterioration. The narrower thicker black intervals are the 95% confidence interval estimates while the wider thinner red intervals represent the 99% confidence interval estimates for the population percentages. The black dots inside the intervals indicate the sample percentages.



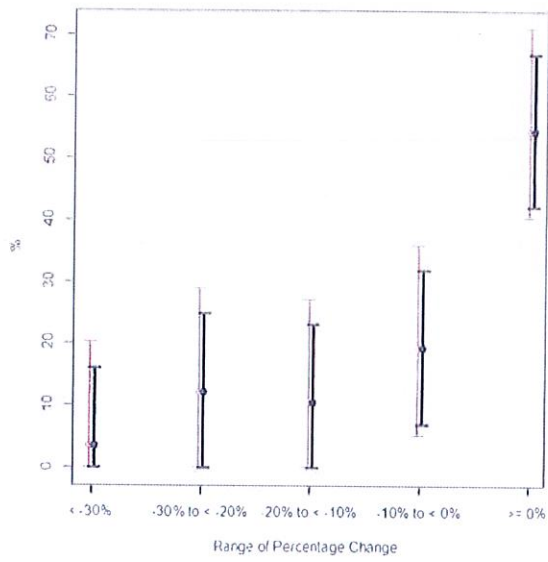
Alkaline phosphatase



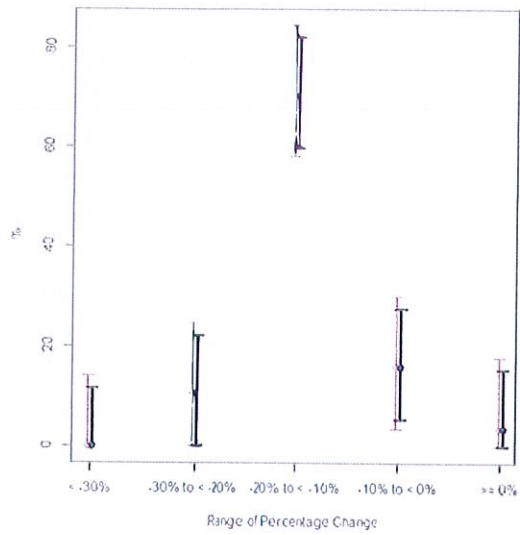
Alanine aminotransferase



Aspartate aminotransferase



Total protein



Discussion of the results:

Table 1 presents the descriptive statistics for the pre-treatment, post-treatment, changes in, and percentage changes in the sample data while Chart 1 shows the visual distribution of the data via the boxplots. From Table 1 and Chart 1, we can see that at least 50% of the participants experience some improvement after the treatment for all the indexes except aspartate aminotransferase. The amount of improvement, however, varies quite a bit across the different indexes. This pertains only to the particular sample being collected. To see whether the same can be inferred to the population, some statistical inferences will need to be performed. The results are presented in Table 2.

Table 2 presents the sample arithmetic mean changes and confidence interval estimates for the population mean changes in various indexes. It can be seen from Table 2 that all indexes except aspartate aminotransferase show a mean improvement after the treatment in the sample. Based on the 95% confidence interval estimates, it can also be inferred that all indexes except aspartate aminotransferase show a mean improvement in the population at the 95% level of confidence since the value zero does not fall inside the interval estimates and their upper limits are below zero. At the higher 99% level of confidence, however, one additional index, fasting blood sugar, in addition to aspartate aminotransferase cannot be inferred to have any amount of mean improvement in the population.

Table 3 presents the percentages of participants in the sample of 57 participants who experience an improvement (negative change) along with the 95% and 99% confidence interval estimates for the percentages in the population who experience an improvement in various indexes. It shows that more than 90% of the participants in the sample have improved HDL cholesterol, alkaline phosphatase, alanine aminotransferase, and total protein indexes after the treatment. However, if these sample results are used to make inferences on the population, we can infer that more than 90% of the population will see improvement on only alkaline phosphatase, alanine aminotransferase, and total protein since the lower limits of their respective 95% and the 99% confidence level estimates are at least 90%. The table also shows that more than 50% of the participants in the sample see improvements in all indexes except aspartate aminotransferase, which is consistent with what we have seen in Table 1 and Chart 1. When drawing inferences from the sample percentages to the population, we have to look at the confidence interval estimates. We can conclude at the 95% level of confidence that more than half of the population will see improvements in all indexes except aspartate aminotransferase since the lower limits of all indexes except aspartate aminotransferase are above 50%. However, if a higher 99% level of confidence is used, then more than half of the population will experience improvements in all indexes except fasting blood sugar as well as aspartate aminotransferase.

As we can see from Table 1 and Chart 1, the amount of improvement varies quite a bit for each index. To further explore the extent of the variation in improvement in the various indexes, Table 4 and Chart 2 present the sample percentages over the different ranges of percentage changes ($< -30\%$, -30% to $< -20\%$, -20% to $< -10\%$, -10% to $< 0\%$, and $\geq 0\%$) along with their 95% and 99% confidence intervals. They show that the highest percentage of participants (35%) in the sample see a percentage change in fasting blood sugar that falls in the $\geq 0\%$ range, which indicates a deterioration. Also, the highest percentage of participants see a percentage change in total cholesterol (35%) in the -10% to $< 0\%$ improvement range, HDL cholesterol (29%) in the -30% to $< -20\%$ and -20% to $< -10\%$ improvement ranges, LDL cholesterol (26%) in the -10% to $< 0\%$ improvement range and the $\geq 0\%$ deterioration range, alkaline phosphatase (61%) in the $< -30\%$ improvement range, alanine aminotransferase (91%) in the $< -30\%$ improvement range, aspartate aminotransferase (54%) in the $\geq 0\%$ deterioration range, and total protein (70%) in the -20% to $< -10\%$ improvement range, respectively. This corroborates the results shown in Table 3 that the treatment improves the HDL cholesterol, alkaline phosphatase, alanine aminotransferase, and total protein indexes for over 90% of the participants while improving all indexes except aspartate aminotransferase for more than 50% of the participants at the 95% level of confidence and improving all indexes except aspartate aminotransferase and fasting blood sugar for more than 50% of the participants at the higher 99% level of confidence.

Conclusions:

Under the premise of not changing eating habits and daily routine lifestyle, a three-month experiment was completed. At a 95% confidence level, the results show statistically significant improvements in fasting blood sugar, total cholesterol, HDL cholesterol, LDL cholesterol, alkaline phosphatase, alanine aminotransferase, and total protein, which are likely to cause body organ inflammation, indicating that PEMF drinking water has a positive effect on the human body. High cholesterol and blood sugar are the main causes of stroke, coronary heart disease, diabetes, and other serious diseases; hence improving sterol is important in improving human health, and reducing fasting blood sugar is important in avoiding the occurrence of diabetes.

In addition, the improvement of liver function indexes such as alkaline phosphatase, alanine aminotransferase, and total protein shows that PEMF has a positive effect on improving liver function and has obvious positive effects on human health.

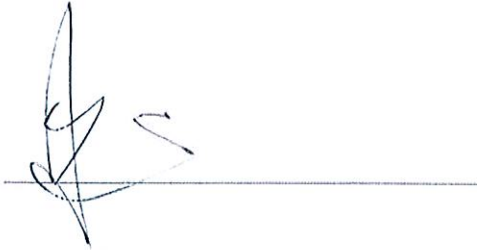
Limitations:

The conclusions are drawn from a sample of 57 participants with age 54-86 without any change in lifestyles and eating habits. Just as in any experiment, care should be exercised when trying to draw conclusions on populations with different demographics.

November 2022 Community test project on the intervention effect of low-frequency PEMF on the three highs

Organizer:

Project Leader: Li Sze Man, Vice Chairman



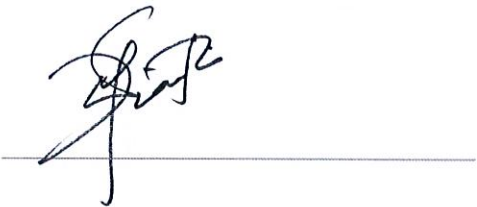
Lead Consultant:

Lily Lai, Naturopathic Doctor



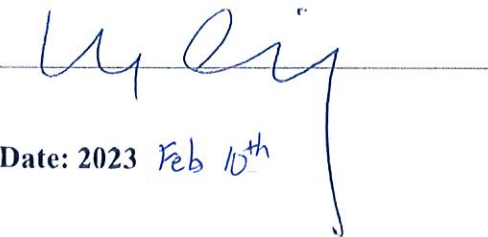
Statistical analyst:

Pin Ng, Professor of Economics



Project Witness:

Wong Shu Ming, MH, JP



Date: 2023 Feb 10th

Project Witness:

Chan Siu Tong, MH, JP

