

4.2 Descriptive statistics

4.2.1 Statistical comparison

The dispersion of the data is characterized by the mean, variance, standard deviation and kurtosis. The analysis start from overall statistical value and be further investigate for gender and BMI groups.

From table 4.1, it is found that there are changes before and after the leech therapy treatment. Mostly, the after treatment shows increase value of mean. However, the dispersion of the data varies wider after the treatment.

For secondary bioimpedance parameters, Table 4.2 list out the average value that has no significant changes before and after treatment. Nevertheless, the standard deviation and kurtosis of the data shows smaller range of dispersion that signify higher accuracy of the data collected.

This trend follows for the comparison of the bioimpedance parameter for either female or male which increases value of parameter after the treatment for main bioimpedance parameter but almost constant changes for secondary bioimpedance parameter. In addition Table 4.7 to Table 4.16 also copied the same development as other table where increasing average value after treatment for main bioimpedance parameter and almost static changes for the secondary data.

Table 4.1 Statistics Comparison of Main Bioimpedance Parameters.

Main Bioimpedance Parameters	BEFORE TREATMENT				AFTER TREATMENT			
	Mean	Std. Dev	Variance	Kurtosis	Mean	Std. Dev	Variance	Kurtosis
Impedance at 5KHz	606.288 (6.31192)	99.80015	9960.069	-0.031 (0.307)	614.9760 (6.8051)	107.5987	11577.48	0.152 (0.307)
Impedance at 50KHz	532.524 (5.92733)	93.71928	8783.303	0.250 (0.307)	539.1680 (6.293)	99.52140	9904.510	0.307 (0.307)
Impedance at 100KHz	503.768 (5.74762)	90.87788	8258.789	0.311 (0.307)	509.8200 (6.0979)	96.41666	9296.172	0.468 (0.307)
Impedance at 200KHz	480.912 (5.59065)	88.39588	7813.832	0.333 (0.307)	486.5480 (5.9129)	93.49093	8740.554	0.488 (0.307)
Reactance at 50KHz	56.0024 (0.54192)	8.56844	73.418	0.627 (0.307)	57.2988 (0.57248)	9.05167	81.933	0.324 (0.307)
Resistance at 50KHz	529.552 (5.92272)	93.64643	8769.654	0.268 (0.307)	536.0960 (6.2859)	99.38897	9878.167	0.325 (0.307)
Phase Angle at 50KHz	6.1116 (0.05486)	0.86738	0.752	0.759 (0.307)	6.1756 (0.05187)	0.82008	0.673	0.726 (0.307)
Basal metabolic rate	1571.02 (16.9048)	267.2887	71443.249	-0.307 (0.307)	1563.972 (16.929)	267.6711	71647.84	-0.263 (0.307)
Intracellular water	19.9856 (0.29212)	4.61886	21.334	-0.851 (0.307)	19.9084 (0.29331)	4.63759	21.507	-0.874 (0.307)
Normal value of intra cellular water	20.876 (0.31739)	5.01842	25.185	-0.577 (0.307)	20.8760 (0.31739)	5.01842	25.185	-0.577 (0.307)
Extra-cellular water	16.2028 (0.16167)	2.55628	6.535	-0.637 (0.307)	16.0916 (0.16163)	2.55561	6.531	-0.657 (0.307)
Normal value of extra cellular water	14.938 (0.25583)	4.04502	16.362	-0.613 (0.307)	14.9380 (0.25583)	4.04502	16.362	-0.613 (0.307)
Total body water volume	36.5712 (0.44475)	7.03206	49.450	-0.828 (0.307)	36.3032 (0.44292)	7.00314	49.044	-0.798 (0.307)
Min total body water	34.740 (0.51184)	8.09286	65.494	-0.214 (0.307)	34.7400 (0.51184)	8.09286	65.494	-0.214 (0.307)
Max total body water volume	40.960 (0.60466)	9.56054	91.404	-0.515 (0.307)	40.9600 (0.60466)	9.56054	91.404	-0.515 (0.307)
Body cell mass	28.5508 (0.41722)	6.59679	43.518	-0.847 (0.307)	28.4452 (0.41888)	6.62314	43.866	-0.876 (0.307)

Table 4.2 Statistics Comparison of Secondary Bioimpedance Parameters.

Secondary Bioimpedance Parameters	BEFORE TREATMENT				AFTER TREATMENT			
	Mean	Std. Dev	Variance	Kurtosis	Mean	Std. Dev	Variance	Kurtosis
Percentage of fat	24.0016 (0.68868)	10.8889	118.569	-0.638 (0.307)	24.4584 (0.67994)	10.7507	115.578	-0.536 (0.307)
Min fat before test	10.4760 (0.15222)	2.40678	5.793	-0.117 (0.307)	10.4000 (0.15230)	2.40815	5.799	-0.164 (0.307)
Max fat	14.2480 (0.18570)	2.93615	8.621	0.549 (0.307)	14.1960 (0.18452)	2.91747	8.512	0.250 (0.307)
Percentage of lean	75.9984 (0.68868)	10.8889	118.569	-0.638 (0.307)	75.5416 (0.67994)	10.7507	115.578	-0.536 (0.307)
Min lean	48.1160 (0.66349)	10.4907	110.055	-0.479 (0.307)	47.7920 (0.65706)	10.3890	107.932	-0.392 (0.307)
Max lean	51.8880 (0.69685)	11.0182	121.401	-0.406 (0.307)	51.5880 (0.69523)	10.9926	120.838	-0.320 (0.307)
Dry lean weight	12.6292 (0.30020)	4.7465	22.530	-0.035 (0.307)	12.6168 (0.30066)	4.75387	22.599	-0.046 (0.307)
Percentage of water	56.9716 (0.54201)	8.5699	73.443	-0.119 (0.307)	56.5204 (0.53072)	8.39135	70.415	-0.036 (0.307)
Min water	34.7400 (0.51184)	8.0928	65.494	-0.214 (0.307)	34.7400 (0.51184)	8.09286	65.494	-0.214 (0.307)
Max water	40.9600 (0.60466)	9.5605	91.404	-0.515 (0.307)	40.9600 (0.60466)	9.56054	91.404	-0.515 (0.307)
Density	1.0442 (0.00152)	0.0240	0.001	-0.540 (0.307)	1.0434 (0.00151)	0.02383	0.001	-0.491 (0.307)
Nutrition	0.4520 (0.00155)	0.0245	0.001	-1.094 (0.307)	0.4510 (0.00160)	0.02533	0.001	-1.294 (0.307)
Normal nutrition	0.4138 (0.00095)	0.0149	0.000	-1.990 (0.307)	0.4138 (0.00095)	0.01498	0.000	-1.990 (0.307)
Third space value	0.3828 (0.06581)	1.0405	1.083	0.465 (0.307)	0.3032 (0.06479)	1.02447	1.050	0.761 (0.307)

Table 4.3 Statistics Comparison of Main Bioimpedance Parameters for Female.

Main Bioimpedance Parameters	BEFORE TREATMENT				AFTER TREATMENT			
	Mean	Std. Dev	Variance	Kurtosis	Mean	Std. Dev	Variance	Kurtosis
Impedance at 5KHz	644.0444 (9.83510)	114.2735	13058.446	-1.127 (0.414)	653.311 (10.70583)	124.3905	15472.99	-0.924 (0.414)
Impedance at 50KHz	570.4963 (9.10466)	105.7866	11190.804	-0.938 (0.414)	577.8889 (9.73004)	113.0529	12780.95	-0.770 (0.414)
Impedance at 100KHz	541.6148 (8.76722)	101.8659	10376.671	-0.868 (0.414)	548.3259 (9.36469)	108.8078	11839.15	-0.624 (0.414)
Impedance at 200KHz	518.3630 (8.48479)	98.5843	9718.875	-0.845 (0.414)	524.5778 (9.02616)	104.8745	10998.66	-0.575 (0.414)
Reactance at 50KHz	56.2756 (0.88265)	10.25552	105.176	0.061 (0.414)	57.7933 (0.92596)	10.75864	115.748	-0.164 (0.414)
Resistance at 50KHz	567.6889 (9.08354)	105.5412	11138.947	-0.922 (0.414)	574.9704 (9.70464)	112.7578	12714.31	-0.751 (0.414)
Phase Angle at 50 KHz	5.7126 (0.06890)	0.80051	0.641	1.768 (0.414)	5.7911 (0.06116)	0.71063	0.505	1.128 (0.414)
Basal metabolic rate	1433.9037 (15.0974)	175.4154	30770.595	0.124 (0.414)	1430.13 (15.31532)	177.9480	31665.48	-0.109 (0.414)
Intracellular water	17.0593 (0.29902)	3.4742	12.070	-0.660 (0.414)	17.0030 (0.30412)	3.53353	12.486	-0.748 (0.414)
Normal value of intra cellular water	19.1667 (0.42370)	4.9229	24.235	-0.621 (0.414)	19.1667 (0.42370)	4.92291	24.235	-0.621 (0.414)
Extra-cellular water	15.0881 (0.20190)	2.3459	5.503	-0.600 (0.414)	15.0326 (0.20564)	2.38927	5.709	-0.834 (0.414)
Normal value of extra cellular water	12.7778 (0.28246)	3.2819	10.771	-0.621 (0.414)	12.7778 (0.28246)	3.28194	10.771	-0.621 (0.414)
Total body water volume	32.1089 (0.41740)	4.8497	23.520	-0.632 (0.414)	31.9600 (0.42686)	4.95969	24.599	-0.863 (0.414)
Min total body water	32.5926 (0.73762)	8.5704	73.452	0.285 (0.414)	32.5926 (0.73762)	8.57042	73.452	0.285 (0.414)
Max total body water volume	38.5185 (0.84784)	9.8510	97.043	-0.500 (0.414)	38.5185 (0.84784)	9.85102	97.043	-0.500 (0.414)
Body cell mass	24.3733 (0.42718)	4.9633	24.635	-0.660 (0.414)	24.2970 (0.43411)	5.04390	25.441	-0.759 (0.414)

Table 4.4 Statistics Comparison of Secondary Bioimpedance Parameters for Female.

Secondary Bioimpedance Parameters	BEFORE TREATMENT				AFTER TREATMENT			
	Mean	Std. Dev	Variance	Kurtosis	Mean	Std. Dev	Variance	Kurtosis
Percentage of fat	31.4089 (0.7253)	8.4273	71.019	-0.588 (0.414)	31.7237 (0.69834)	8.11403	65.837	-0.362 (0.414)
Min fat before test	11.7333 (0.1834)	2.1308	4.540	0.325 (0.414)	11.7037 (0.18092)	2.10215	4.419	0.217 (0.414)
Max fat	15.4667 (0.2468)	2.8672	8.221	0.335 (0.414)	15.4370 (0.24152)	2.80620	7.875	0.152 (0.414)
Percentage of lean	68.5911 (0.0725)	8.4273	71.019	-0.588 (0.414)	68.2763 (0.69834)	8.11403	65.837	-0.362 (0.414)
Min lean	41.7259 (0.5647)	6.5613	43.051	0.482 (0.414)	41.5778 (0.56716)	6.58976	43.425	0.120 (0.414)
Max lean	45.4593 (0.0621)	7.2181	52.101	0.454 (0.414)	45.3111 (0.62838)	7.30106	53.305	0.223 (0.414)
Dry lean weight	10.6481 (0.2686)	3.1206	9.738	-0.096 (0.414)	10.6356 (0.26837)	3.11816	9.723	-0.115 (0.414)
Percentage of water	51.7119 (0.5432)	6.3110	39.829	-0.962 (0.414)	51.4185 (0.52289)	6.07545	36.911	-0.584 (0.414)
Min water	32.5926 (0.7376)	8.5704	73.452	0.285 (0.414)	32.5926 (0.73762)	8.57042	73.452	0.285 (0.414)
Max water	38.5185 (0.8478)	9.8510	97.043	-0.500 (0.414)	38.5185 (0.84784)	9.85102	97.043	-0.500 (0.414)
Density	1.0279 (0.0015)	0.0179	0.000	-0.675 (0.414)	1.0271 (0.00145)	0.01683	0.000	-0.255 (0.414)
Nutrition	0.4715 (0.0013)	0.0150	0.000	-0.466 (0.414)	0.4713 (0.00128)	0.01485	0.000	-0.733 (0.414)
Normal nutrition	0.4000 (0.0000)	0.0000	0.000	-	0.4000 (0.00000)	0.00000	0.000	-
Third space value	-0.0385 (0.0991)	1.1522	1.327	-0.934 (0.414)	-0.0756 (0.09847)	1.14406	1.309	-0.663 (0.414)

Table 4.5 Statistics Comparison of Main Bioimpedance Parameters For Male.

Main Bioimpedance Parameters	BEFORE TREATMENT				AFTER TREATMENT			
	Mean	Std. Dev	Variance	Kurtosis	Mean	Std. Dev	Variance	Kurtosis
Impedance at 5KHz	561.9652 (4.87727)	52.30292	2735.595	0.538 (0.447)	569.9739 (5.37049)	57.59210	3316.850	0.215 (0.447)
Impedance at 50KHz	487.9478 (4.49009)	48.15087	2318.506	0.391 (0.447)	493.7130 (4.89058)	52.44559	2750.540	0.172 (0.447)
Impedance at 100KHz	459.3391 (4.32818)	46.41459	2154.314	0.297 (0.447)	464.6174 (4.72879)	50.71067	2571.572	0.100 (0.447)
Impedance at 200KHz	436.9478 (4.20390)	45.08177	2032.366	0.249 (0.447)	441.9043 (4.60599)	49.39369	2439.736	0.038 (0.447)
Reactance at 50KHz	55.6817 (0.56369)	6.04493	36.541	-0.513 (0.447)	56.7183 (0.60630)	6.50183	42.274	-0.61 (0.447)
Resistance at 50KHz	484.7826 (4.48902)	48.13938	2317.400	-0.365 (0.447)	490.4609 (4.88180)	52.35143	2740.672	0.161 (0.447)
Phase Angle at 50KHz	6.5800 (0.06462)	0.69297	0.480	-0.483 (0.447)	6.6270 (0.06559)	0.70342	0.495	0.002 (0.447)
Basal metabolic rate	1731.9826 (24.931)	267.3532	71477.72	1.172 (0.447)	1721.0957 (25.221)	270.4697	73153.859	1.067 (0.447)
Intracellular water	23.4209 (0.30020)	3.21931	10.364	0.669 (0.447)	23.3191 (0.30315)	3.25088	10.568	0.694 (0.447)
Normal value of intra cellular water	22.8826 (0.40647)	4.35886	19.000	0.515 (0.447)	22.8826 (0.40647)	4.35886	19.000	0.515 (0.447)
Extra-cellular water	17.5113 (0.20012)	2.14606	4.606	1.005 (0.447)	17.3348 (0.20147)	2.16057	4.668	0.930 (0.447)
Normal value of extra cellular water	17.4739 (0.31018)	3.32629	11.064	0.527 (0.447)	17.4739 (0.31018)	3.32629	11.064	0.527 (0.447)
Total body water volume	41.8096 (0.50304)	5.39455	29.101	0.840 (0.447)	41.4017 (0.50774)	5.44491	29.647	0.826 (0.447)
Min total body water	37.2609 (0.62446)	6.69654	44.844	0.393 (0.447)	37.2609 (0.62446)	6.69654	44.844	0.393 (0.447)
Max total body water volume	43.8261 (0.78148)	8.38049	70.233	0.450 (0.447)	43.8261 (0.78148)	8.38049	70.233	0.450 (0.447)
Body cell mass	33.4548 (0.42904)	4.60098	21.169	0.663 (0.447)	33.3148 (0.43349)	4.6487	21.610	0.685 (0.447)

Table 4.6 Statistics Comparison of Secondary Bioimpedance Parameters For Male.

Secondary Bioimpedance Parameters	BEFORE TREATMENT				AFTER TREATMENT			
	Mean	Std. Dev	Variance	Kurtosis	Mean	Std. Dev	Variance	Kurtosis
Percentage of fat	15.3061 (0.54574)	5.85241	34.251	0.679 (0.447)	15.9296 (0.58363)	6.25876	39.172	0.404 (0.447)
Min fat before test	9.0000 (0.16800)	1.80156	3.246	0.773 (0.447)	8.8696 (0.16410)	1.75979	3.097	0.895 (0.447)
Max fat	12.8174 (0.21556)	2.31161	5.344	1.649 (0.447)	12.7391 (0.21609)	2.31731	5.370	1.518 (0.447)
Percentage of lean	84.6939 (0.54574)	5.85241	34.251	0.679 (0.447)	84.0704 (0.58363)	6.25876	39.172	0.404 (0.447)
Min lean	55.6174 (0.85800)	9.20105	84.659	2.041 (0.447)	55.0870 (0.86120)	9.23529	85.291	2.305 (0.447)
Max lean	59.4348 (0.92091)	9.87566	97.529	1.924 (0.447)	58.9565 (0.93180)	9.99245	99.849	2.038 (0.447)
Dry lean weight	14.9548 (0.49044)	5.25935	27.661	0.721 (0.447)	14.9426 (0.49191)	5.27518	27.828	0.637 (0.447)
Percentage of water	63.1461 (0.60706)	6.50994	42.379	-0.083 (0.447)	62.5096 (0.61436)	6.58825	43.405	-0.166 (0.447)
Min water	37.2609 (0.62446)	6.69654	44.844	0.393 (0.447)	37.2609 (0.62446)	6.69654	44.844	0.393 (0.447)
Max water	43.8261 (0.78148)	8.38049	70.233	0.450 (0.447)	43.8261 (0.78148)	8.38049	70.233	0.450 (0.447)
Density	1.0635 (0.00131)	0.01408	0.000	0.737 (0.447)	1.0626 (0.00139)	0.01487	0.000	0.457 (0.447)
Nutrition	0.4290 (0.00078)	0.00837	0.000	-0.210 (0.447)	0.4270 (0.00080)	0.00858	0.000	0.260 (0.447)
Normal nutrition	0.4300 (0.0000)	0.00000	0.000	0.00000	0.4300 (0.00000)	0.00000	0.000	0.000
Third space value	0.8774 (0.05499)	0.58969	0.348	-0.016 (0.447)	0.7478 (0.05783)	0.62018	0.385	0.471 (0.447)

Table 4.7 Statistics Comparison of Main Bioimpedance Parameters for BMI Group 1

Main Bioimpedance Parameters	BEFORE TREATMENT				AFTER TREATMENT			
	Mean	Std. Dev	Variance	Kurtosis	Mean	Std. Dev	Variance	Kurtosis
Impedance at 5KHz	693.644 (18.0970)	121.3981	14737.51	-1.295 (0.695)	705.3778 (18.79392)	126.07344	15894.513	-0.832 (0.695)
Impedance at 50KHz	621.022(17.31705)	116.1663	13494.61	-1.298 (0.695)	628.7333 (17.51647)	117.50404	13807.200	-0.838 (0.695)
Impedance at 100KHz	590.044 (16.8752)	113.2023	12814.77	-1.289 (0.695)	597.4222 (17.20026)	115.38286	13313.204	-0.764 (0.695)
Impedance at 200KHz	564.733 (16.4730)	110.5045	12211.25	-1.305 (0.695)	571.0222 (16.70609)	112.06785	12559.204	-0.735 (0.695)
Reactance at 50KHz	58.5022 (1.10095)	7.38538	54.544	-0.264 (0.695)	60.9311 (1.33321)	8.94343	79.985	-0.463 (0.695)
Resistance at 50KHz	618.2667 (17.325)	116.2197	13507.02	-1.296 (0.695)	625.7333 (17.50940)	117.45665	13796.064	-0.829 (0.695)
Phase Angle at 50 KHz	5.5089 (0.10833)	0.72671	0.528	-1.125 (0.695)	5.6378 (0.10891)	0.73059	0.534	-1.174 (0.695)
Basal metabolic rate	1319.289 (33.148)	222.3610	49444.39	-0.967 (0.695)	1313.8222 (33.1506)	222.38125	49453.422	-0.926 (0.695)
Intracellular water	16.2178 (0.62667)	4.20380	17.672	-1.589 (0.695)	16.1400 (0.61907)	4.15284	17.246	-1.558 (0.695)
Normal value of intra cellular water	15.1556 (0.47162)	3.16375	10.009	-1.675 (0.695)	15.1556 (0.47162)	3.16375	10.009	-1.675 (0.695)
Extra-cellular water	13.7222 (0.34243)	2.29712	5.277	-1.371 (0.695)	13.6178 (0.33931)	2.27619	5.181	-1.358 (0.695)
Normal value of extra cellular water	11.0333 (0.42788)	2.87030	8.239	-1.768 (0.695)	11.0333 (0.42788)	2.87030	8.239	-1.768 (0.695)
Total body water volume	31.2022 (0.97020)	6.50830	42.358	-1.419 (0.695)	30.9956 (0.95945)	6.43615	41.424	-1.398 (0.695)
Min total body water	26.2222 (0.72745)	4.87987	23.813	-1.484 (0.695)	26.2222 (0.72745)	4.87987	23.813	-1.484 (0.695)
Max total body water volume	29.7778 (0.80959)	5.43093	29.495	-1.657 (0.695)	29.7778 (0.80959)	5.43093	29.495	-1.657 (0.695)
Body cell mass	23.1578 (0.89417)	5.99828	35.979	-1.588 (0.695)	23.0556 (0.88255)	5.92033	35.050	-1.560 (0.695)

Table 4.8 Statistics Comparison of Secondary Bioimpedance Parameters For BMI Group 1.

Secondary Bioimpedance Parameters	BEFORE TREATMENT				AFTER TREATMENT			
	Mean	Std. Dev	Variance	Kurtosis	Mean	Std. Dev	Variance	Kurtosis
Percentage of fat	17.1600 (1.09729)	7.36084	54.182	-0.338 (0.695)	17.5867 (1.10521)	7.41398	54.967	-0.240 (0.695)
Min fat before test	8.1111 (0.32910)	2.20765	4.874	-0.933 (0.695)	8.1111 (0.32910)	2.20765	4.874	-0.933 (0.695)
Max fat	11.1111 (0.37902)	2.54257	6.465	-0.321 (0.695)	11.1111 (0.37902)	2.54257	6.465	-0.321 (0.695)
Percentage of lean	82.8400 (1.09729)	7.36084	54.182	-0.338 (0.695)	82.4133 (1.10521)	7.41398	54.967	-0.24 (0.695)
Min lean	40.5556 (1.33165)	8.93297	79.798	-0.974 (0.695)	40.3333 (1.33523)	8.95697	80.227	-0.976 (0.695)
Max lean	43.5556 (1.40905)	9.45217	89.343	-0.961 (0.695)	43.3333 (1.414210)	9.48683	90.000	-0.950 (0.695)
Dry lean weight	7.9422 (0.61463)	4.12308	17.000	-1.287 (0.695)	7.9422 (0.61260)	4.10944	16.887	-1.307 (0.695)
Percentage of water	66.5711 (0.94971)	6.37084	40.588	-1.181 (0.695)	66.1200 (0.91369)	6.12924	37.568	-1.090 (0.695)
Min water	26.2222 (0.72745)	4.87987	23.813	-1.484 (0.695)	26.2222 (0.72745)	4.87987	23.813	-1.484 (0.695)
Max water	29.7778 (0.80959)	5.43093	29.495	-1.657 (0.695)	29.7778 (0.80959)	5.43093	29.495	-1.657 (0.695)
Density	1.0589 (0.00240)	0.01613	0.000	-0.798 (0.695)	1.0580 (0.00259)	0.01740	0.000	-0.742 (0.695)
Nutrition	0.4638 (0.00448)	0.03002	0.001	-1.804 (0.695)	0.4629 (0.00433)	0.02905	0.001	-1.824 (0.695)
Normal nutrition	0.4167 (0.00225)	0.01508	0.000	-2.039 (0.695)	0.4167 (0.00225)	0.01508	0.000	-2.039 (0.695)
Third space value	1.2622 (0.06994)	0.46918	0.220	-1.380 (0.695)	1.2378 (0.07030)	0.47160	0.222	-1.396 (0.695)

Table 4.9 Statistics Comparison of Main Bioimpedance Parameters For BMI Group 2.

Main Bioimpedance Parameters	BEFORE TREATMENT				AFTER TREATMENT			
	Mean	Std. Dev	Variance	Kurtosis	Mean	Std. Dev	Variance	Kurtosis
Impedance at 5KHz	613.7565 (8.40637)	90.14828	8126.712	-0.532 (0.447)	627.2696 (9.31679)	99.91139	9982.286	-0.532 (0.447)
Impedance at 50KHz	534.5391 (7.70765)	82.65531	6831.900	-0.644 (0.447)	546.1130 (8.52846)	91.45757	8364.487	-0.622 (0.447)
Impedance at 100KHz	504.7130 (7.50977)	80.53328	6485.610	-0.746 (0.447)	515.3913 (8.23303)	88.28937	7795.012	-0.684 (0.447)
Impedance at 200KHz	481.0435 (7.34536)	78.77020	6204.744	-0.769 (0.447)	491.5565 (8.02184)	86.02460	7400.231	-0.736 (0.447)
Reactance at 50KHz	58.6626 (0.72873)	7.81472	61.070	0.049 (0.447)	60.0470 (0.77663)	8.32843	69.363	-0.284 (0.447)
Resistance at 50KHz	531.2783 (7.70225)	82.59748	6822.343	-0.661 (0.447)	542.8000 (8.51774)	91.34264	8343.477	-0.631 (0.447)
Phase Angle at 50 KHz	6.3678 (0.07681)	0.82372	0.679	0.381 (0.447)	6.3870 (0.07213)	0.77352	0.598	-0.354 (0.447)
Basal metabolic rate	1600.3478 (23.026)	246.9278	60973.33	-0.673 (0.447)	1587.635 (23.3495)	250.3954	62697.87	-0.667 (0.447)
Intracellular water	20.1704 (0.42918)	4.60244	21.182	-1.382 (0.447)	20.0191 (0.43833)	4.70052	22.095	-1.376 (0.447)
Normal value of intra cellular water	20.2130 (0.36563)	3.92096	15.374	-0.571 (0.447)	20.2130 (0.36563)	3.92096	15.374	-0.571 (0.447)
Extra-cellular water	16.1122 (0.22251)	2.38615	5.694	-1.003 (0.447)	15.9217 (0.22415)	2.40379	5.778	-0.909 (0.447)
Normal value of extra cellular water	14.7435 (0.34332)	3.68173	13.555	-1.144 (0.447)	14.7435 (0.34332)	3.68173	13.555	-1.144 (0.447)
Total body water volume	37.0974 (0.67209)	7.20731	51.945	-1.318 (0.447)	36.6296 (0.68192)	7.31277	53.477	-1.245 (0.447)
Min total body water	33.1304 (0.55876)	5.99199	35.904	-0.303 (0.447)	33.1304 (0.55876)	5.99199	35.904	-0.303 (0.447)
Max total body water volume	39.3478 (0.65100)	6.98123	48.738	-0.232 (0.447)	39.3478 (0.65100)	6.98123	48.738	-0.232 (0.447)
Body cell mass	28.8174 (0.61305)	6.57421	43.220	-1.383 (0.447)	28.6035 (0.62578)	6.71078	45.035	-1.370 (0.447)

Table 4.10 Statistics Comparison of Secondary Bioimpedance Parameters For BMI Group 2.

Secondary Bioimpedance Parameters	BEFORE TREATMENT				AFTER TREATMENT			
	Mean	Std. Dev	Variance	Kurtosis	Mean	Std. Dev	Variance	Kurtosis
Percentage of fat	19.6452 (0.77799)	8.34303	69.606	0.399 (0.447)	20.4852 (0.80497)	8.63237	74.518	0.262 (0.447)
Min fat before test	9.8609 (0.14661)	1.57216	2.472	-0.965 (0.447)	9.7391 (0.14141)	1.51650	2.300	-0.645 (0.447)
Max fat	13.5826 (0.16385)	1.75710	3.087	-0.531 (0.447)	13.4783 (0.16996)	1.82261	3.322	-0.427 (0.447)
Percentage of lean	80.3548 (0.77799)	8.34303	69.606	0.399 (0.447)	79.5148 (0.80497)	8.63237	74.518	0.262 (0.447)
Min lean	48.7739 (0.98571)	10.57062	111.738	-0.986 (0.447)	48.3130 (0.99291)	10.64776	113.375	-0.966 (0.447)
Max lean	52.4957 (1.02146)	10.95395	119.989	-0.922 (0.447)	52.0522 (1.03522)	11.10148	123.243	-0.883 (0.447)
Dry lean weight	13.2887 (0.39076)	4.19046	17.560	-0.311 (0.447)	13.2452 (0.39270)	4.21123	17.734	-0.35 (0.447)
Min water	33.1304 (0.55876)	5.99199	35.904	-0.303 (0.447)	33.1304 (0.55876)	5.99199	35.904	-0.303 (0.447)
Max water	39.3478 (0.65100)	6.98123	48.738	-0.232 (0.447)	39.3478 (0.65100)	6.98123	48.738	-0.232 (0.447)
Percentage of water	59.3496 (0.52147)	5.59209	31.271	2.096 (0.447)	58.5539 (0.54221)	5.81457	33.809	2.229 (0.447)
Density	1.0540 (0.00181)	0.01941	0.000	0.492 (0.447)	1.0522 (0.00187)	0.02008	0.000	0.226 (0.447)
Nutrition	0.4487 (0.00223)	0.02393	0.001	-1.707 (0.447)	0.4477 (0.00243)	0.02606	0.001	-1.825 (0.447)
Normal nutrition	0.417 (0.00139)	0.01494	0.000	-1.963 (0.447)	0.4170 (0.00139)	0.01494	0.000	-1.963 (0.447)
Third space value	0.8148 (0.04755)	0.50994	0.260	1.973 (0.447)	0.6887 (0.04711)	0.50519	0.255	3.187 (0.447)

Table 4.11 Statistics Comparison of Main Bioimpedance Parameters For BMI Group 3.

Main Bioimpedance Parameters	BEFORE TREATMENT				AFTER TREATMENT			
	Mean	Std. Dev	Variance	Kurtosis	Mean	Std. Dev	Variance	Kurtosis
Impedance at 5KHz	574.9400 (9.46605)	66.93506	4480.302	-0.069 (0.662)	577.2600 (9.78374)	69.18146	4786.074	-0.304 (0.662)
Impedance at 50KHz	505.5600 (8.88999)	62.86174	3951.598	-0.212 (0.662)	507.8400 (8.86310)	62.67160	3927.729	-0.364 (0.662)
Impedance at 100KHz	478.0800 (8.50915)	60.16876	3620.279	-0.308 (0.662)	480.1200 (8.24436)	60.07874	3609.455	-0.419 (0.662)
Impedance at 200KHz	456.5600 (8.24602)	58.30817	3399.843	-0.369 (0.662)	458.1200 (8.24436)	58.29644	3398.475	-0.506 (0.662)
Reactance at 50KHz	53.6000 (1.38858)	9.81877	96.408	0.761 (0.662)	53.6140 (1.33647)	9.45030	89.308	0.978 (0.662)
Resistance at 50KHz	502.6800 (8.85467)	62.61200	3920.263	-0.222 (0.662)	504.9400 (8.83534)	62.47527	3903.160	-0.372 (0.662)
Phase Angle at 50 KHz	6.1060 (0.14539)	1.02806	1.057	0.888 (0.662)	6.0840 (0.13554)	0.95839	0.919	1.589 (0.662)
Basal metabolic rate	1645.52 (38.71205)	273.7356	74931.15	-1.158 (0.662)	1642.42 (38.60057)	272.9473	74500.21	-1.057 (0.662)
Intracellular water	20.9080 (0.57659)	4.07711	16.623	-1.629 (0.662)	20.8600 (0.56838)	4.01909	16.153	-1.563 (0.662)
Normal value of intra cellular water	22.8400 (0.49418)	3.49437	12.211	-1.244 (0.662)	22.8400 (0.49418)	3.49437	12.211	-1.244 (0.662)
Extra-cellular water	16.9120 (0.24710)	1.74726	3.053	-1.203 (0.662)	16.8760 (0.24688)	1.74573	3.048	-1.004 (0.662)
Normal value of extra cellular water	16.2600 (0.50488)	3.57006	12.745	-1.555 (0.662)	16.2600 (0.50488)	3.57006	12.745	-1.555 (0.662)
Total body water volume	37.8620 (0.85095)	6.01711	36.206	-1.516 (0.662)	37.7140 (0.83661)	5.91574	34.996	-1.363 (0.662)
Min total body water	37.6000 (0.72054)	5.09502	25.959	-1.115 (0.662)	37.6000 (0.72054)	5.09502	25.959	-1.115 (0.662)
Max total body water volume	44.8000 (0.83005)	5.86933	34.449	-0.996 (0.662)	44.8000 (0.83005)	5.86933	34.449	-0.996 (0.662)
Body cell mass	29.8700 (0.82084)	5.80419	33.689	-1.627 (0.662)	29.8140 (0.81419)	5.75720	33.145	-1.568 (0.662)

Table 4.12 Statistics Comparison of Secondary Bioimpedance Parameters For BMI Group 3.

Secondary Bioimpedance Parameters	BEFORE TREATMENT				AFTER TREATMENT			
	Mean	Std. Dev	Variance	Kurtosis	Mean	Std. Dev	Variance	Kurtosis
Percentage of fat	28.1080 (1.20645)	8.53090	72.776	-1.487 (0.662)	28.2640 (1.18886)	8.40653	70.670	-1.359 (0.662)
Min fat before test	11.4000 (0.22315)	1.57791	2.490	-1.262 (0.662)	11.3000 (0.23947)	1.69332	2.867	-1.341 (0.662)
Max fat	15.3000 (0.24785)	1.75255	3.071	-0.25 (0.662)	15.3000 (0.24785)	1.75255	3.071	-0.25 (0.662)
Percentage of lean	71.8920 (1.20645)	8.53090	72.776	-1.487 (0.662)	71.7360 (1.18886)	8.40653	70.670	-1.359 (0.662)
Min lean	50.7000 (1.47918)	10.45935	109.398	-1.477 (0.662)	50.2800 (1.43030)	10.11372	102.287	-1.333 (0.662)
Max lean	54.6000 (1.53623)	10.86278	118.000	-1.441 (0.662)	54.2800 (1.50971)	10.67524	113.961	-1.287 (0.662)
Dry lean weight	14.2640 (0.70891)	5.01275	25.128	-1.142 (0.662)	14.2860 (0.70844)	5.00946	25.095	-1.140 (0.662)
Percentage of water	52.4020 (0.60306)	4.26430	18.184	-1.131 (0.662)	52.2200 (0.57827)	4.08896	16.720	-1.133 (0.662)
Min water	37.6000 (0.72054)	5.09502	25.959	-1.115 (0.662)	37.6000 (0.72054)	5.09502	25.959	-1.115 (0.662)
Max water	44.8000 (0.83005)	5.86933	34.449	-0.996 (0.662)	44.8000 (0.83005)	5.86933	34.449	-0.996 (0.662)
Density	1.0350 (0.00258)	0.01821	0.000	-1.393 (0.662)	1.0346 (0.00261)	0.01843	0.000	-1.451 (0.662)
Nutrition	0.4502 (0.00357)	0.02527	0.001	-1.580 (0.662)	0.4502 (0.00362)	0.02559	0.001	-1.742 (0.662)
Normal nutrition	0.4120 (0.00210)	0.01485	0.000	-1.900 (0.662)	0.4120 (0.00210)	0.01485	0.000	-1.900 (0.662)
Third space value	0.0420 (0.06798)	0.48068	0.231	-0.319 (0.662)	-0.0220 (0.06242)	0.44138	0.195	0.193 (0.662)

Table 4.13 Statistics Comparison of Main Bioimpedance Parameters For BMI Group 4.

Main Bioimpedance Parameters	BEFORE TREATMENT				AFTER TREATMENT			
	Mean	Std. Dev	Variance	Kurtosis	Mean	Std. Dev	Variance	Kurtosis
Impedance at 5KHz	533.6000 (4.79618)	23.98090	575.083	-1.320 (0.902)	529.1600 (6.08897)	30.44487	926.890	1.408 (0.902)
Impedance at 50KHz	467.4400 (5.24407)	26.22035	687.507	-1.252 (0.902)	460.6800 (6.21791)	31.08955	966.560	0.769 (0.902)
Impedance at 100KHz	442.0000 (5.13615)	25.68073	659.500	-1.297 (0.902)	435.0800 (6.19272)	30.96358	958.743	0.456 (0.902)
Impedance at 200KHz	422.0800 (5.05237)	25.26183	638.160	-1.329 (0.902)	415.2800 (6.18453)	30.92265	956.210	0.342 (0.902)
Reactance at 50KHz	49.7200 (0.42012)	2.10060	4.412	-0.874 (0.902)	50.3080 (0.44204)	2.21019	4.885	-0.676 (0.902)
Resistance at 50KHz	464.8000 (5.26593)	26.32964	693.250	-1.255 (0.902)	458.0000 (6.26445)	31.32225	981.083	0.727 (0.902)
Phase Angle at 50 KHz	6.1160 (0.08360)	0.41801	0.175	-1.780 (0.902)	6.2960 (0.10496)	0.52479	0.275	-1.177 (0.902)
Basal metabolic rate	1686.96 (41.36297)	206.8148	42772.37	-0.479 (0.902)	1693.76 (37.87309)	189.3655	35859.27	-0.381 (0.902)
Intracellular water	22.5800 (0.75551)	3.77757	14.270	-0.235 (0.902)	22.7120 (0.68642)	3.43212	11.779	-0.037 (0.902)
Normal value of intra cellular water	26.3800 (0.73319)	3.66595	13.439	-0.773 (0.902)	26.3800 (0.73319)	3.66595	13.439	-0.773 (0.902)
Extra-cellular water	18.2600 (0.38397)	1.91985	3.686	-0.938 (0.902)	18.3320 (0.31100)	1.55502	2.418	-0.725 (0.902)
Normal value of extra cellular water	18.2200 (0.71698)	3.58492	12.852	-0.174 (0.902)	18.2200 (0.71698)	3.58492	12.852	-0.174 (0.902)
Total body water volume	39.7880 (1.25119)	6.25595	39.137	-0.224 (0.902)	40.0000 (1.08862)	5.44311	29.628	0.020 (0.902)
Min total body water	43.8000 (1.11355)	5.56776	31.000	-1.060 (0.902)	43.8000 (1.11355)	5.56776	31.000	-1.060 (0.902)
Max total body water volume	52.2000 (1.31276)	6.56379	43.083	-0.998 (0.902)	52.2000 (1.31276)	6.56379	43.083	-0.998 (0.902)
Body cell mass	32.2560 (1.08393)	5.41965	29.373	-0.237 (0.902)	32.4440 (0.97714)	4.88570	23.870	-0.031 (0.902)

Table 4.14 Statistics Comparison of Secondary Bioimpedance Parameters for BMI Group 4

Secondary Bioimpedance Parameters	BEFORE TREATMENT				AFTER TREATMENT			
	Mean	Std. Dev	Variance	Kurtosis	Mean	Std. Dev	Variance	Kurtosis
Percentage of fat	37.0480 (1.33038)	6.65189	44.248	0.086 (0.902)	36.5720 (1.31491)	6.57454	43.225	-0.677 (0.902)
Min fat before test	13.4000 (0.27689)	1.38444	1.917	-1.899 (0.902)	13.6000 (0.25820)	1.29099	1.667	-1.775 (0.902)
Max fat	18.0000 (0.42817)	2.14087	4.583	-1.759 (0.902)	17.9600 (0.27976)	1.39881	1.957	-1.385 (0.902)
Percentage of lean	62.9520 (1.33038)	6.65189	44.248	0.086 (0.902)	63.4280 (1.31491)	6.57454	43.225	-0.677 (0.902)
Min lean	52.0000 (1.85293)	9.26463	85.833	-0.111 (0.902)	52.3200 (1.68890)	8.44452	71.310	-0.015 (0.902)
Max lean	56.6000 (1.93046)	9.65229	93.167	-0.267 (0.902)	56.6800 (1.75568)	8.77838	77.060	0.027 (0.902)
Dry lean weight	14.1840 (0.67692)	3.38461	11.456	-0.124 (0.902)	14.2520 (0.68260)	3.41298	11.648	-0.047 (0.902)
Percentage of water	46.4680 (0.79147)	3.95735	15.661	0.041 (0.902)	46.8440 (0.81433)	4.07166	16.578	-1.148 (0.902)
Min water	43.8000 (1.11355)	5.56776	31.000	-1.060 (0.902)	43.8000 (1.11355)	5.56776	31.000	-1.060 (0.902)
Max water	52.2000 (1.31276)	6.56379	43.083	-0.998 (0.902)	52.2000 (1.31276)	6.56379	43.083	-0.998 (0.902)
Density	1.0140 (0.00277)	0.01384	0.000	0.199 (0.902)	1.0168 (0.00287)	0.01435	0.000	-0.982 (0.902)
Nutrition	0.4476 (0.00296)	0.01480	0.000	0.061 (0.902)	0.4464 (0.00288)	0.01440	0.000	0.169 (0.902)
Normal nutrition	0.4060 (0.00245)	0.01225	0.000	0.593 (0.902)	0.4060 (0.00245)	0.01225	0.000	0.593 (0.902)
Third space value	-1.0520 (0.16853)	0.84267	0.710	-0.292 (0.902)	-1.0440 (0.16534)	0.82668	0.683	-1.234 (0.902)

Table 4.15 Statistics Comparison of Main Bioimpedance Parameters For BMI Group 5

Main Bioimpedance Parameters	BEFORE TREATMENT				AFTER TREATMENT			
	Mean	Std. Dev	Variance	Kurtosis	Mean	Std. Dev	Variance	Kurtosis
Impedance at 5KHz	512.6000 (6.59134)	25.52814	651.686	-1.608 (1.121)	518.2667 (6.18097)	23.93881	573.067	-1.613 (1.121)
Impedance at 50KHz	449.9333 (5.70753)	22.10516	488.638	-1.613 (1.121)	452.4667 (5.82512)	22.56061	508.981	-1.610 (1.121)
Impedance at 100KHz	426.2667 (5.55018)	21.49574	462.067	-1.613 (1.121)	427.8667 (5.79562)	22.44634	503.838	-1.609 (1.121)
Impedance at 200KHz	407.6667 (5.46562)	21.16826	448.095	-1.612 (1.121)	408.2667 (5.93093)	22.97037	527.638	-1.610 (1.121)
Reactance at 50KHz	46.5867 (1.36130)	5.27228	27.797	-1.609 (1.121)	49.2667 (0.84688)	3.27995	10.758	-1.596 (1.121)
Resistance at 50KHz	447.6667 (5.71020)	22.11550	489.095	-1.613 (1.121)	449.8000 (5.86694)	22.72255	516.314	-1.610 (1.121)
Phase Angle at 50 KHz	5.9667 (0.17665)	0.68417	0.468	-1.615 (1.121)	6.2733 (0.15537)	0.60174	0.362	-1.589 (1.121)
Basal metabolic rate	1659.80 (36.67102)	142.0263	20171.46	-1.615 (1.121)	1655.20 (35.97237)	139.3204	19410.17	-1.615 (1.121)
Intracellular water	22.4733 (0.27902)	1.08065	1.168	-1.607 (1.121)	22.5200 (0.30003)	1.16202	1.350	-1.616 (1.121)
Normal value of intra cellular water	27.4000 (0.46445)	1.79881	3.236	-1.615 (1.121)	27.4000 (0.46445)	1.79881	3.236	-1.615 (1.121)
Extra-cellular water	18.5467 (0.28113)	1.08882	1.186	-1.607 (1.121)	18.4667 (0.24527)	0.94994	0.902	-1.615 (1.121)
Normal value of extra cellular water	18.2667 (0.30963)	1.19921	1.438	-1.615 (1.121)	18.2667 (0.30963)	1.19921	1.438	-1.615 (1.121)
Total body water volume	38.9800 (0.51688)	2.00186	4.007	-1.613 (1.121)	38.8600 (0.47767)	1.85002	3.423	-1.613 (1.121)
Min total body water	48.0000 (1.52753)	5.91608	35.000	-1.615 (1.121)	48.0000 (1.52753)	5.91608	35.000	-1.615 (1.121)
Max total body water volume	55.3333 (1.11981)	4.33699	18.810	-1.615 (1.121)	55.3333 (1.11981)	4.33699	18.810	-1.615 (1.121)
Body cell mass	32.1133 (0.39302)	1.52215	2.317	-1.597 (1.121)	32.1733 (0.42252)	1.63640	2.678	-1.617 (1.121)

Table 4.16 Statistics Comparison of Secondary Bioimpedance Parameters For BMI Group 5.

Secondary Bioimpedance Parameters	BEFORE TREATMENT				AFTER TREATMENT			
	Mean	Std. Dev	Variance	Kurtosis	Mean	Std. Dev	Variance	Kurtosis
Percentage of fat	42.4933 (0.53572)	2.07484	4.305	-1.613 (1.121)	42.6600 (0.54675)	2.11755	4.484	-1.605 (1.121)
Min fat before test	14.3333 (0.12599)	0.48795	0.238	-1.615 (1.121)	14.0000 (0.21822)	0.84515	0.714	-1.615 (1.121)
Max fat	19.0000 (0.21822)	0.84515	0.714	-1.615 (1.121)	19.0000 (0.21822)	0.84515	0.714	-1.615 (1.121)
Percentage of lean	57.5067 (0.53572)	2.07484	4.305	-1.613 (1.121)	57.3400 (0.54675)	2.11755	4.484	-1.605 (1.121)
Min lean	50.6667 (1.20185)	4.65475	21.667	-1.615 (1.121)	50.3333 (1.07644)	4.16905	17.381	-1.615 (1.121)
Max lean	55.3333 (1.25988)	4.87950	23.810	-1.615 (1.121)	55.3333 (1.25988)	4.87950	23.810	-1.615 (1.121)
Dry lean weight	13.5933 (0.71517)	2.76985	7.672	-1.615 (1.121)	13.5333 (0.70957)	2.74816	7.552	-1.615 (1.121)
Percentage of water	42.6800 (0.17841)	0.69096	0.477	-1.609 (1.121)	42.5933 (0.23472)	0.90905	0.826	-1.615 (1.121)
Min water	48.0000 (1.52753)	5.91608	35.000	-1.615 (1.121)	48.0000 (1.52753)	5.91608	35.000	-1.615 (1.121)
Max water	55.3333 (1.11981)	4.33699	18.810	-1.615 (1.121)	55.3333 (1.11981)	4.33699	18.810	-1.615 (1.121)
Density	1.0067 (0.00126)	0.00488	0.000	-1.615 (1.121)	1.0067 (0.00126)	0.00488	0.000	-1.615 (1.121)
Nutrition	0.4547 (0.00133)	0.00516	0.000	-2.308 (1.121)	0.4500 (0.00000)	0.00000	0.000	0.00000
Normal nutrition	0.4000 (0.0000)	0.00000	0.000	0.000	0.4000 (0.00000)	0.00000	0.000	0.00000
Third space value	-2.0400 (0.04000)	0.15492	0.024	-1.209 (1.121)	-2.1267 (0.06508)	0.25204	0.064	-1.491 (1.121)

4.3 Analysis of Bioimpedance parameter

The effect of the leech therapy is analyzed through the Bioimpedance parameters by using the statistical tool that compare the two mean of the readings together. This is suitable being pictured by the analysis of pair T-test. Both before and after effect of the treatment are statistically tested and the results are obtained in Table 4.17. It is cascaded by looking on the overall comparison, gender, BMI, diseases, age groups, occupations and number of treatments. It is shown that most of it holds significance value for p value less than 0.05. From Table 4.17 to 4.29, most of the data shows value which is less than 0.05 except for some cases. These can be detected in tables of data for BMI group, disease group and obvious value for the category of occupations. In some data especially the secondary bioimpedance parameter shows missing data due to insufficiency of parameter.

Table: 4.17 Overall Comparisons of Bioimpedance Parameters before and After Treatment.

Main Bioimpedance Parameters	P	Secondary Bioimpedance Parameters	P
Impedance value at 5KHz	0.000	Percentage of fat	0.000
Impedance value at 50KHz	0.000	Min fat	0.004
Impedance value at 100KHz	0.000	Max fat	0.052
Impedance value at 200KHz	0.000	Percentage of lean	0.000
Reactance at 50KHz	0.000	Min lean	0.000
Resistance at 50KHz	0.000	Max lean	0.000
Phase Angle at 50 KHz	0.012	Dry lean weight	0.157
Basal metabolic rate	0.000	Percentage of water	0.000
Intracellular water	0.008	Min water	-
Normal value of Intracellular water	-	Max water	-
Extra-cellular water	0.000	Density	0.005
Normal value of extra cellular water	-	Nutrition	0.005
Total body water volume	0.000	Normal nutrition	-
Min total body water volume	-	Third space value	0.000
Max total body water volume	-		
Body cell mass	0.011		

Table: 4.18 Comparisons of Main Bioimpedance Parameters before and After Treatment between Genders.

Main Bioimpedance Parameters	P (Female)	P (Male)
Impedance value at 5KHz	0.000	0.000
Impedance value at 50KHz	0.001	0.000
Impedance value at 100KHz	0.002	0.000
Impedance value at 200KHz	0.006	0.000
Reactance at 50KHz	0.000	0.000
Resistance at 50KHz	0.001	0.000
Phase Angle at 50 KHz	0.078	0.011
Basal metabolic rate	0.048	0.000
Intracellular water	0.218	0.002
Normal value of Intracellular water	-	-
Extra-cellular water	0.016	0.000
Normal value of extra cellular water	-	-
Total body water volume	0.039	0.000
Min total body water volume	-	-
Max total body water volume	-	-
Body cell mass	0.244	0.003

Table: 4.19 Comparisons of Secondary Bioimpedance Parameters before and After Treatment between Genders.

Secondary Bioimpedance Parameters	P (Female)	P (Male)
Percentage of fat	0.015	0.000
Min fat	0.452	0.000
Max fat	0.507	0.002
Percentage of lean	0.015	0.000
Min lean	0.075	0.000
Max lean	0.075	0.000
Dry lean weight	0.200	0.424
Percentage of water	0.013	0.000
Min water	-	-
Max water	-	-
Density	0.077	0.025
Nutrition	0.794	0.000
Normal nutrition	-	-
Third space value	0.076	0.000

Table: 4.20 Comparisons of Main Bioimpedance Parameters before and After Treatment Between BMI Group.

Main Bioimpedance Parameters	P (1)	P (2)	P (3)	P (4)	P (5)
Impedance value at 5KHz	0.000	0.000	0.031	0.503	0.001
Impedance value at 50KHz	0.001	0.000	0.003	0.315	0.033
Impedance value at 100KHz	0.002	0.000	0.003	0.275	0.093
Impedance value at 200KHz	0.013	0.000	0.020	0.266	0.468
Reactance at 50KHz	0.000	0.000	0.955	0.195	0.002
Resistance at 50KHz	0.001	0.000	0.003	0.311	0.049
Phase Angle at 50 KHz	0.007	0.684	0.419	0.001	0.004
Basal metabolic rate	0.000	0.000	0.063	0.387	0.005
Intracellular water	0.004	0.004	0.024	0.348	0.089
Normal value of Intracellular water	-	-	-	-	-
Extra-cellular water	0.000	0.000	0.165	0.493	0.054
Normal value of extra cellular water	-	-	-	-	-
Total body water volume	0.000	0.000	0.014	0.482	0.023
Min total body water volume	-	-	-	-	-
Max total body water volume	-	-	-	-	-
Body cell mass	0.008	0.005	0.049	0.364	0.167

Table: 4.21 Comparisons of Secondary Bioimpedance Parameters before and After Treatment Between BMI Group.

Secondary Bioimpedance Parameters	P (1)	P (2)	P (3)	P (4)	P (5)
Percentage of fat	0.000	0.000	0.080	0.281	0.038
Min fat	-	0.004	0.024	0.096	0.019
Max fat	-	0.010	-	0.840	-
Percentage of lean	0.000	0.000	0.080	0.281	0.038
Min lean	0.001	0.000	0.000	0.303	0.038
Max lean	0.001	0.000	0.001	0.819	-
Dry lean weight	1.000	0.005	0.154	0.054	0.000
Percentage of water	0.000	0.000	0.025	0.354	0.160
Min water	-	-	-	-	-
Max water	-	-	-	-	-
Density	0.044	0.000	0.159	0.032	-
Nutrition	0.044	0.139	1.000	0.185	0.160
Normal nutrition	-	-	-	-	-
Third space value	0.086	0.000	0.002	0.897	0.013

Table: 4.22 Comparisons of Main Bioimpedance Parameters Before and After Treatment Between Age Group:

Main Bioimpedance Parameters	P (1)	P (2)	P (3)	P (4)	P (5)
Impedance value at 5KHz	0.000	0.000	0.051	0.000	0.000
Impedance value at 50KHz	0.000	0.000	0.066	0.000	0.000
Impedance value at 100KHz	0.000	0.000	0.062	0.000	0.001
Impedance value at 200KHz	0.000	0.000	0.048	0.000	0.004
Reactance at 50KHz	0.000	0.000	0.612	0.000	0.777
Resistance at 50KHz	0.000	0.000	0.067	0.000	0.000
Phase Angle at 50 KHz	0.000	0.374	0.027	0.001	0.435
Basal metabolic rate	0.000	0.000	0.044	0.000	0.001
Intracellular water	0.029	0.008	0.062	0.182	0.024
Normal value of Intracellular water	-	-	-	-	-
Extra-cellular water	0.000	0.000	0.020	0.000	0.001
Normal value of extra cellular water	-	-	-	-	-
Total body water volume	0.000	0.000	0.058	0.000	0.001
Min total body water volume	-	-	-	-	-
Max total body water volume	-	-	-	-	-
Body cell mass	0.029	0.013	0.053	0.179	0.021

Table: 4.23 Comparisons of Secondary Bioimpedance Parameters Before and After Treatment Between Age Group.

Secondary Bioimpedance Parameters	P (1)	P (2)	P (3)	P (4)	P(5)
Percentage of fat	0.000	0.000	0.032	0.000	0.001
Min fat	0.001	0.038	0.096	-	0.024
Max fat	0.024	0.765	0.356	-	0.000
Percentage of lean	0.000	0.000	0.032	0.000	0.001
Min lean	0.000	0.002	0.073	0.004	0.033
Max lean	0.000	0.006	0.132	0.004	0.008
Dry lean weight	0.880	0.295	0.004	0.599	0.000
Percentage of water	0.000	0.000	0.046	0.000	0.000
Min water	-	-	-	-	-
Max water	-	-	-	-	-
Density	-	0.007	0.032	-	0.001
Nutrition	0.004	1.000	0.746	0.001	0.146
Normal nutrition	-	-	-	-	-
Third space value	0.000	0.000	0.298	0.000	0.021

Table: 4.24 Comparisons of Main Bioimpedance Parameters Before and After Treatment between Diseases Group.

Main Bioimpedance Parameters	P (1)	P (2)	P (3)	P (4)	P(5)	P(6)
Impedance value at 5KHz	0.000	0.000	0.020	0.000	0.000	0.000
Impedance value at 50KHz	0.000	0.001	0.009	0.000	0.000	0.000
Impedance value at 100KHz	0.000	0.001	0.004	0.006	0.005	0.000
Impedance value at 200KHz	0.000	0.002	0.001	0.016	0.016	0.001
Reactance at 50KHz	0.000	0.176	0.013	0.689	0.000	0.008
Resistance at 50KHz	0.000	0.001	0.008	0.000	0.001	0.000
Phase Angle at 50 KHz	0.008	0.208	0.000	0.552	0.000	0.262
Basal metabolic rate	0.000	0.002	0.024	0.000	0.000	0.085
Intracellular water	0.001	0.003	0.002	0.038	0.723	0.281
Normal value of Intracellular water	-	-	-	-	-	-
Extra-cellular water	0.000	0.000	0.025	0.000	0.000	0.010
Normal value of extra cellular water	-	-	-	-	-	-
Total body water volume	0.000	0.001	0.017	0.000	0.004	0.007
Min total body water volume	-	-	-	-	-	-
Max total body water volume	-	-	-	-	-	-
Body cell mass	0.002	0.003	0.002	0.033	0.429	0.280

Table: 4.25 Comparisons of Secondary Bioimpedance Parameters Before and After Treatment Between Diseases Group.

Secondary Bioimpedance Parameters	P (1)	P (2)	P (3)	P (4)	P(5)
Percentage of fat	0.000	0.001	0.014	0.000	0.000
Min fat	0.000	0.002	1.000	0.023	-
Max fat	0.000	0.160	0.009	0.324	0.022
Percentage of lean	0.000	0.001	0.014	0.000	0.000
Min lean	0.000	0.000	0.102	0.009	0.746
Max lean	0.000	0.001	0.003	0.000	0.110
Dry lean weight	0.117	0.034	0.327	0.860	0.110
Percentage of water	0.000	0.001	0.011	0.000	0.001
Min water	-	-	-	-	-
Max water	-	-	-	-	-
Density	0.004	0.057	0.032	0.006	-
Nutrition	0.000	0.044	0.185	1.000	0.000
Normal nutrition	-	-	-	-	-
Third space value	0.000	0.038	0.638	0.166	0.000

Table: 4.26 Comparisons of Main Bioimpedance Parameters before and after Treatment Between occupations Group.

Main Bioimpedance Parameters	P (1)	P (2)	P (3)	P (4)	P(5)
Impedance value at 5KHz	0.000	0.013	0.052	0.000	0.000
Impedance value at 50KHz	0.000	0.037	0.423	0.000	0.000
Impedance value at 100KHz	0.000	0.032	0.639	0.004	0.000
Impedance value at 200KHz	0.000	0.057	0.894	0.011	0.001
Reactance at 50KHz	0.000	0.001	0.000	0.623	0.001
Resistance at 50KHz	0.000	0.041	0.465	0.000	0.000
Phase Angle at 50 KHz	0.158	0.001	0.000	0.214	0.033
Basal metabolic rate	0.000	0.058	0.477	0.003	0.000
Intracellular water	0.004	0.865	0.625	0.028	0.621
Normal value of Intracellular water	-	-	-	-	-
Extra-cellular water	0.000	0.022	0.191	0.002	-
Normal value of extra cellular water	-	-	-	-	-
Total body water volume	0.000	0.031	0.359	0.003	0.000
Min total body water volume	-	-	-	-	-
Max total body water volume	-	-	-	-	-
Body cell mass	0.005	1.000	0.526	0.026	1.000

Table: 4.27 Comparisons of Secondary Bioimpedance Parameters Before and After Treatment between Occupation Group.

Secondary Bioimpedance Parameters	P (1)	P (2)	P (3)	P (4)	P(5)
Percentage of fat	0.000	0.039	0.726	0.001	0.000
Min fat	0.000	-	0.253	0.023	-
Max fat	0.007	-	1.000	0.012	-
Percentage of lean	0.000	0.039	0.726	0.001	0.000
Min lean	0.000	-	0.347	0.032	-
Max lean	0.000	-	0.167	0.027	-
Dry lean weight	0.256	1.000	0.057	0.002	0.374
Percentage of water	0.000	0.026	0.410	0.001	0.000
Min water	-	-	-	-	-
Max water	-	-	-	-	-
Density	0.057	0.041	0.167	0.001	-
Nutrition	0.356	-	0.005	0.246	-
Normal nutrition	-	-	-	-	-
Third space value	0.000	0.012	0.004	0.076	0.001

Table: 4.28 Comparisons of Main Bioimpedance Parameters before and after Treatment between numbers of Treatment Group.

Main Bioimpedance Parameters	P (1)	P (2)	P (3)
Impedance value at 5KHz	0.000	0.000	0.000
Impedance value at 50KHz	0.000	0.001	0.002
Impedance value at 100KHz	0.000	0.011	0.001
Impedance value at 200KHz	0.001	0.046	0.001
Reactance at 50KHz	0.000	0.354	0.007
Resistance at 50KHz	0.000	0.002	0.001
Phase Angle at 50 KHz	0.000	0.744	0.080
Basal metabolic rate	0.001	0.002	0.002
Intracellular water	0.234	0.011	-
Normal value of Intracellular water	-	-	-
Extra-cellular water	0.000	0.001	0.001
Normal value of extra cellular water	-	-	-
Total body water volume	0.001	0.001	0.001
Min total body water volume	-	-	-
Max total body water volume	-	-	-
Body cell mass	0.259	0.012	-

Table: 4.29 Comparisons of Secondary Bioimpedance Parameters Before and After Treatment between numbers of Treatment Group.

Secondary Bioimpedance Parameters	P (1)	P (2)	P (3)
Percentage of fat	0.000	0.002	0.001
Min fat	0.023	0.022	-
Max fat	0.263	0.011	-
Percentage of lean	0.000	0.002	0.001
Min lean	0.001	0.000	-
Max lean	0.003	0.000	-
Dry lean weight	0.898	0.067	0.374
Percentage of water	0.000	0.001	0.001
Min water	-	-	-
Max water	-	-	-
Density	0.835	0.001	0.016
Nutrition	0.019	0.133	-
Normal nutrition	-	-	-
Third space value	0.000	0.063	0.541