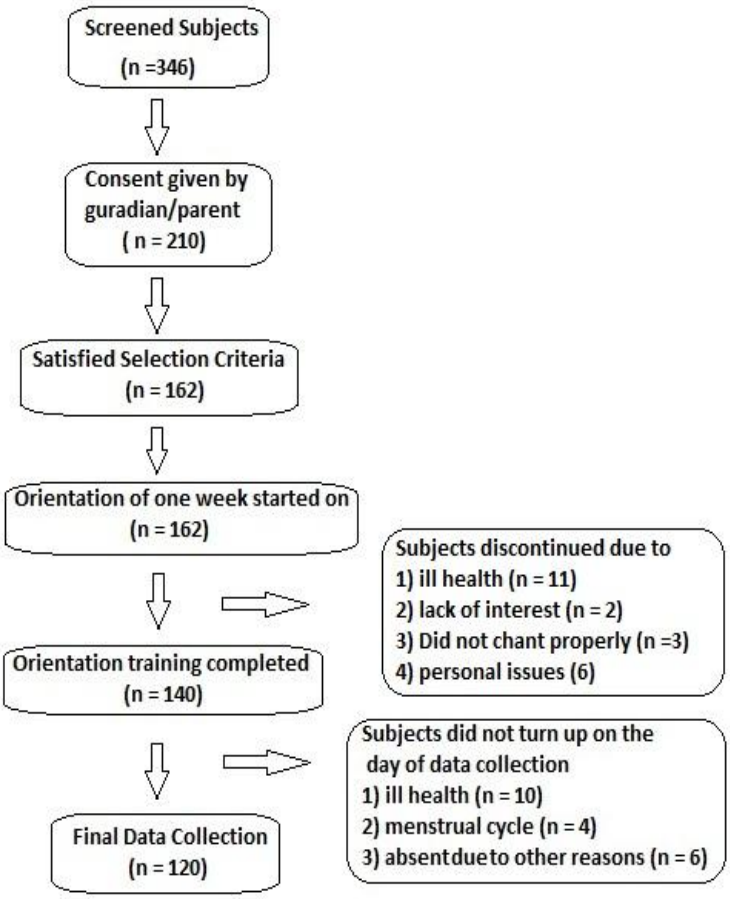
CHAPTER 7 RESULTS

7.1 STUDY PROFILE

Three hundred and forty-six subjects were screened. Out of which 210 subjects gave consent to participate in the study. Out of these 210 subjects, 162 satisfied the selection criteria and orientation training was started. Finally, 42 subjects left the project in between or didn't turn up on the date of data collection and final data collection was successfully performed on 120 subjects. Figure 13 provides the study profile in detail.

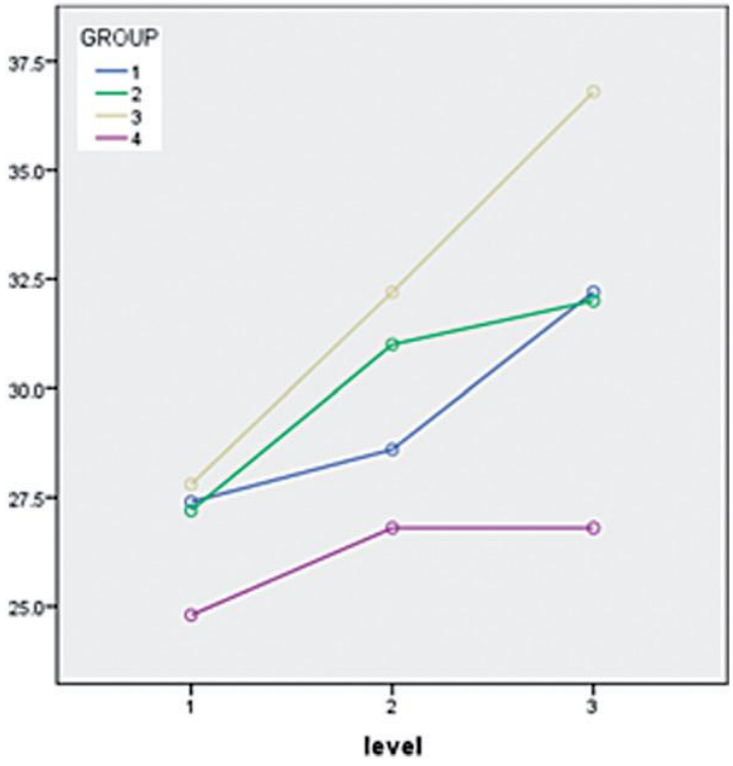
Figure 13: Study profile



7.2 STROOP PERFORMANCE RESULTS

As depicted in figure 14 below, for Stroop incongruent total scores (task condition), RM-ANOVA revealed significant main effects for the time points, $F(2, 15) = 28.57$, $p<0.001$, and a significant interaction between group and time point, $F(6, 32) = 4.64$, $p<0.05$. Follow-up Bonferroni's adjustment showed that total scores in incongruent Stroop task were significantly better in MPOFOM group after OM chanting as compared to those in MPOFSS group after SS chanting (Table 6; Figure 14). Within-group analysis showed that there was a significant improvement in total scores of incongruent Stroop task after OM chanting in MPONOM ($p<0.01$) and MPOFOM ($p<0.001$) groups as compared to the baseline and in MPOFOM group as compared to the post-mobile values ($p<0.05$) respectively (Table 7). Also, in MPONSS group, there was a significant improvement in scores of same task condition after SS chanting as compared to the baseline ($p<0.01$; Table 7). For other task conditions, no significant main effects or interactions were observed.

Figure 14: Graph showing changes in total scores of incongruent Stroop task in all the four groups at three points of time.



Group: 1: MPONOM; 2: MPONSS; 3: MPOFOM; 4: MPOFSS;

Level: 1: Baseline; 2: After 30 min of MPON/OF exposure; 3: After OM/SS chanting.

Y-axis: Total scores during Stroop Incongruent Task.

Table 6: Comparison within groups for Stroop performance at the baseline, after mobile phone on/off exposure and after OM/SS chanting.

Group	Variables		Baseline (mean ±SD) (1)	After mobile (mean ±SD) (2)	After OM/SS (mean ±SD) (3)	F Values (*Factor * level*)	P^a Value (1 vs 2)	P^a Value (2 vs 3)	P^a Value (1 vs 3)
MPONOM	CT	C	49.40 ± 5.73	50.60 ± 6.11	52.20 ± 6.06	1.71	1	1	1
		IC	1.00 ± 1.00	1.00 ± 0.71	1.00 ± 1.22		1	1	1
		T	50.40 ± 6.11	51.60 ± 5.77	53.20 ± 5.97		1	1	1
	ICT	C	25.60 ± 3.97	27.40 ± 7.37	30.60 ± 4.22	2.40	1	0.934	0.072
		IC	1.80 ± 2.17	1.20 ± 1.30	1.60 ± 1.14		0.624	0.533	1
		T	27.40 ± 3.97	28.60 ± 7.47	32.20 ± 4.66		1	0.821	0.033*
MPOFOM	CT	C	49.40 ± 13.16	55.80 ± 12.38	54.40 ± 6.19	1.93	0.466	1	1
		IC	0.40 ± 0.89	0.20 ± 0.45	0.40 ± 0.55		1	1	1
		T	49.80 ± 13.41	56.00 ± 12.19	54.80 ± 5.81		0.662	1	1
	ICT	C	26.00 ± 5.10	30.60 ± 3.91	35.40 ± 2.07		0.141	0.084	0.065
		IC	1.80 ± 1.48	1.60 ± 0.89	1.40 ± 1.14		1	1	1

		T	27.80 ± 4.60	32.20 ± 4.02	36.80 ± 2.77		0.234	0.034*	0.052
MPONSS	CT	C	47.20 ± 4.49	44.00 ± 4.64	48.20 ± 4.32	3.76	1	0.342	1
		IC	1.20 ± 1.30	2.20 ± 1.48	1.60 ± 1.14		0.267	0.914	1
		T	48.40 ± 4.62	46.20 ± 4.92	49.80 ± 4.92		1	0.276	1
	ICT	C	25.20 ± 3.56	29.20 ± 3.96	30.00 ± 5.39		0.057	1	0.072
		IC	2.00 ± 1.58	1.80 ± 1.92	2.00 ± 1.58		1	1	1
		T	27.20 ± 3.42	31.00 ± 2.83	32.00 ± 4.95		0.215	1	0.028*
MPOFSS	CT	C	44.60 ± 1.67	42.40 ± 6.58	47.20 ± 7.46	1.17	1	0.226	1
		IC	1.20 ± 1.30	1.40 ± 1.67	1.40 ± 1.14		1	1	1
		T	45.80 ± 2.39	43.80 ± 6.02	48.60 ± 7.02		1	0.19	1
	ICT	C	21.40 ± 8.88	24.20 ± 5.97	24.80 ± 4.32		0.985	1	0.616
		IC	3.40 ± 3.97	2.60 ± 2.19	2.00 ± 2.35		1	0.211	0.404
		T	24.80 ± 5.02	26.80 ± 4.44	26.80 ± 2.39		0.958	1	0.871

Abbreviations: CT = Congruent task; ICT = Incongruent task; C = Correct score; IC = Incorrect score; T = Total score

[a]Repeated measures ANOVA after Bonferroni's adjustment

*= $p < 0.05$

Table 7: Table showing comparison between MPOFOM and MPOFSS groups for Stroop Performance (Incongruent Task) at the baseline, after mobile phone on/off exposure and after OM/SS chanting

	Correct Score		F value	P[a] value	Incorrect Score		F value	P[a] value	Total Score		F value	P[a] value
	MPOFOM	**MPOFSS**			**MPOFOM**	**MPOFSS**			**MPOFOM**	**MPOFSS**		
Baseline	26.00 ± 5.10	21.40 ± 8.88	0.67	1	1.80 ± 1.48	3.40 ± 3.97	0.91	1	27.80 ± 4.60	24.80 ± 5.02	0.63	1
After mobile on/off	30.60 ± 3.91	24.20 ± 5.97	0.32	0.5	1.60 ± 0.89	2.60 ± 2.19	0.63	1	32.20 ± 4.02	26.80 ± 4.44	0.33	0.63
After OM/SS	35.40 ± 2.07	24.80 ± 4.32	5.38	0.005*	1.40 ± 1.14	2.00 ± 2.35	0.17	1	36.80 ± 2.77	26.80 ± 2.39	5.6	0.006*

Abbreviations: MPOFOM: mobile phone off followed by Om chanting; MPOFSS: Mobile phone off followed by 'SS' chanting.

[a]One way ANOVA after Bonferroni's adjustment

*= $p < 0.05$

7.3. fNIRS RESULTS

OxyHb changes during stroop task were analyzed across channels 1-18. Channels 14 and 15 did not work properly and hence were excluded from the analysis. Data of one subject in MPOFSS group was excluded due to increased artifacts. Finally, data was analyzed for 119 subjects with 30 subjects in each group except MPOFSS group, where final numbers of subjects were 29.

In our pilot study on 20 subjects, we observed that multivariate RM-ANOVA for all the 18 channels revealed significant main effects for levels [$F(2, 5) = 6.18$; $p<0.05$; Effect Size = 0.62] and significant interaction between level and group [$F(6, 12) = 5.82$, $p<0.05$; Effect Size = 0.60]. Subsequent RM-ANOVA tests for each channel showed significant main effects for the time points in fNIRS channels 2, 6, 7, 8, 10, 13, and 18 [Channel 2: $F(2, 26) = 3.51$, $p<0.05$; Channel 6: $F(2, 26) = 3.27$, $p<0.05$; Channel 7: $F(2, 26) = 6.11$, $p<0.01$; Channel 8: $F(2, 26) = 6.05$, $p<0.01$; Channel 10: $F(2, 26) = 3.11$, $p<0.05$; Channel 13: $F(2, 26) = 3.41$, $p < 0.05$; Channel 18: $F(2\ 26) = 3.46$, $p<0.05$] and a significant interaction between group and time point for channels 13 and 18 [Channel 13: $F(6, 26) = 2.50$, $p<0.05$; Channel 18: $F(2, 26) = 2.53$, $p<0.05$]. Post-hoc analysis through Bonferroni's correction further revealed that prefrontal oxygenation was significantly lesser in the MPOFOM group after OM chanting as compared to the MPONSS group after SS chanting in channel 13 ($p<0.05$) and channel 18 ($p<0.05$; Table 8; Figure 15 and 16). Within-group analysis showed that there was a significant reduction in oxygenation after OM chanting in the MPOFOM group as compared to post-MPOF values in channels 2, 6, 7, 8, 13, and 18 (Table 8). Also, in the MPONSS group, there was a significant increase in pre-frontal oxygenation in channel 10 after SS chanting as compared to the baseline ($p<0.05$; Table 8). For other fNIRS channels, no significant main effects or interactions were observed.

Table 8: Table showing comparison within groups for changes in oxyHb levels (µmol/Litre) in fNIRS channels

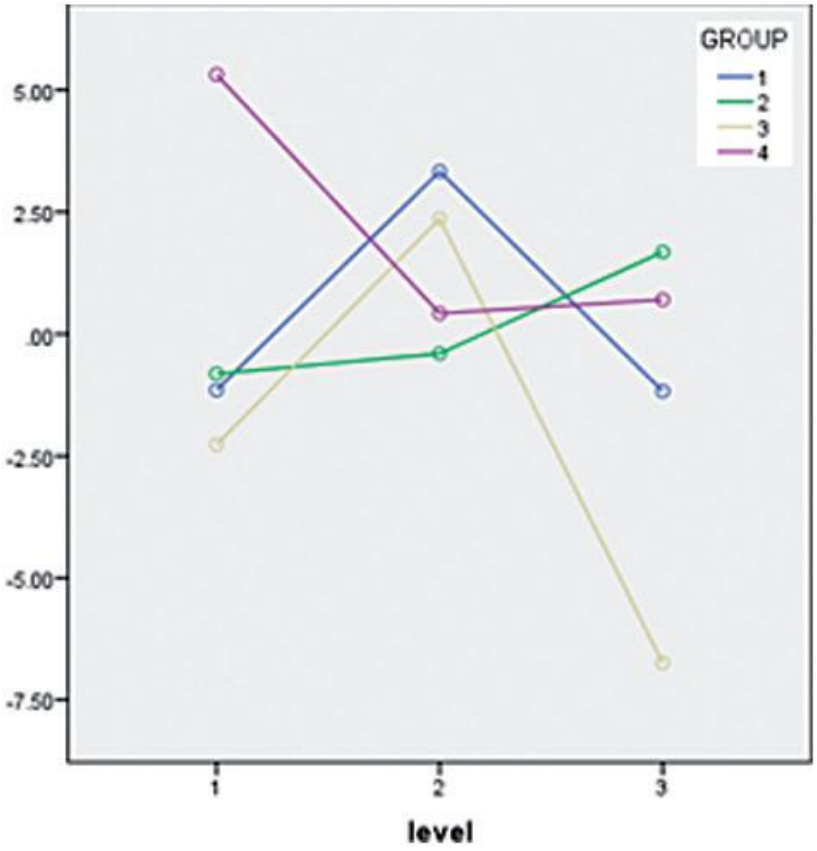
Group	Channel	Side	Baseline (mean ±SD) (1)	After mobile (mean ±SD) (2)	After OM/SS (mean ±SD) (3)	F Values (Factor * level)	P[a] Value (1 vs 2)	P[a] Value (2 vs 3)	P[a] Value (1 vs 3)
MPONOM	8	Left	-0.36 ± 5.00	4.45 ± 4.36	0.44 ± 5.83	5.12	0.034*	0.398	1
MPOFOM	1	Left	-3.63 ± 4.05	1.20 ± 1.30	1.60 ± 1.14	412.3	0.028*	0.563	1
	7	Left	1.37 ± 11.68	9.68 ± 4.61	-3.18 ± 11.69	2.762	1	0.709	0.002**
	17	Right	-2.16.37 ± 8.03	4.25 ± 2.93	-6.22 ± 8.11	3.167	0.978	0.642	0.026**
MPONSS	11	Right	-0.85 ± 5.71	3.10 ± 3.39	0.20 ± 4.88	692.21	0.001**	1	0.847
	17	Right	0.66 ± 6.03	3.89 ± 4.20	-0.58 ± 5.48	141.26	0.034*	1	1
MPOFSS	2	Left	4.18 ± 3.48	-6.66 ±7.20	0.12 ± 6.49	39.05	0.303	0.375	0.031*

Abbreviations: oxyHb: oxygenated hemoglobin; fNIRS: functional near infrared spectroscopy; MPONOM: mobile phone 'ON' followed by 'OM' chanting; MPOFOM: mobile phone 'OFF' followed by 'OM' chanting; MPONSS: mobile phone 'ON' followed by 'SS' chanting and MPOFSS (mobile phone 'OFF' followed by 'SS' chanting.

[a]Repeated measures ANOVA after Bonferroni's adjustment

*= $p < 0.05$
**$p < 0.01$

Figure 15. Graph showing changes in oxyHb levels in channel 13 during Stroop task in all the four groups at three points of time

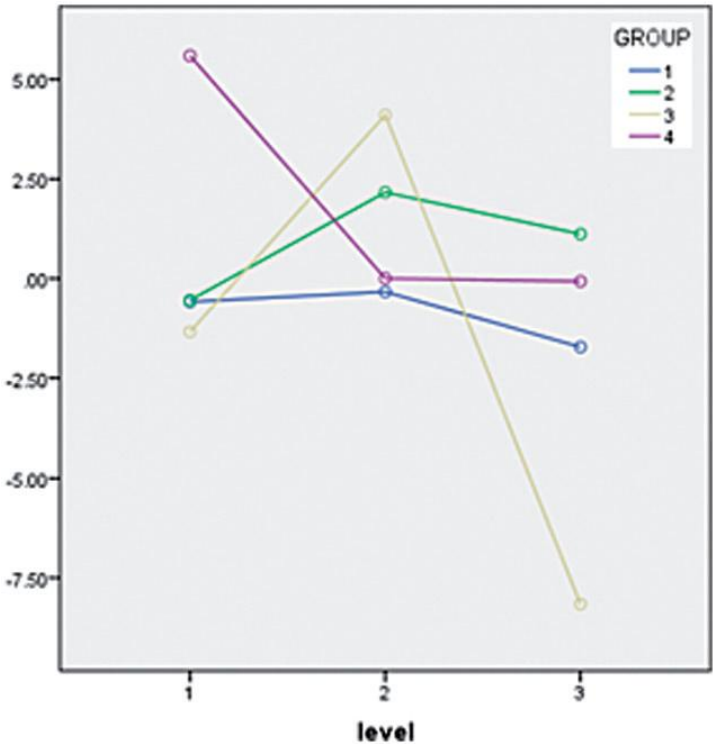


Group: 1: MPONOM; 2: MPONSS; 3: MPOFOM; 4: MPOFSS;

Level: 1: Baseline; 2: After 30 min of MPON/OF exposure; 3:After OM/SS chanting.

Y-axis: Concentration of oxygenated haemoglobin (oxyHb) expressed in μmol/l.

Figure 16. Graph showing changes in oxyHb levels in channel 18 during Stroop task in all the four groups at three points of time.



Group: 1: MPONOM; 2: MPONSS; 3: MPOFOM; 4: MPOFSS;

Level: 1: Baseline; 2: After 30 min of MPON/OF exposure; 3:After OM/SS chanting.

Y-axis: Concentration of oxygenated haemoglobin (oxyHb) expressed in μmol/l.

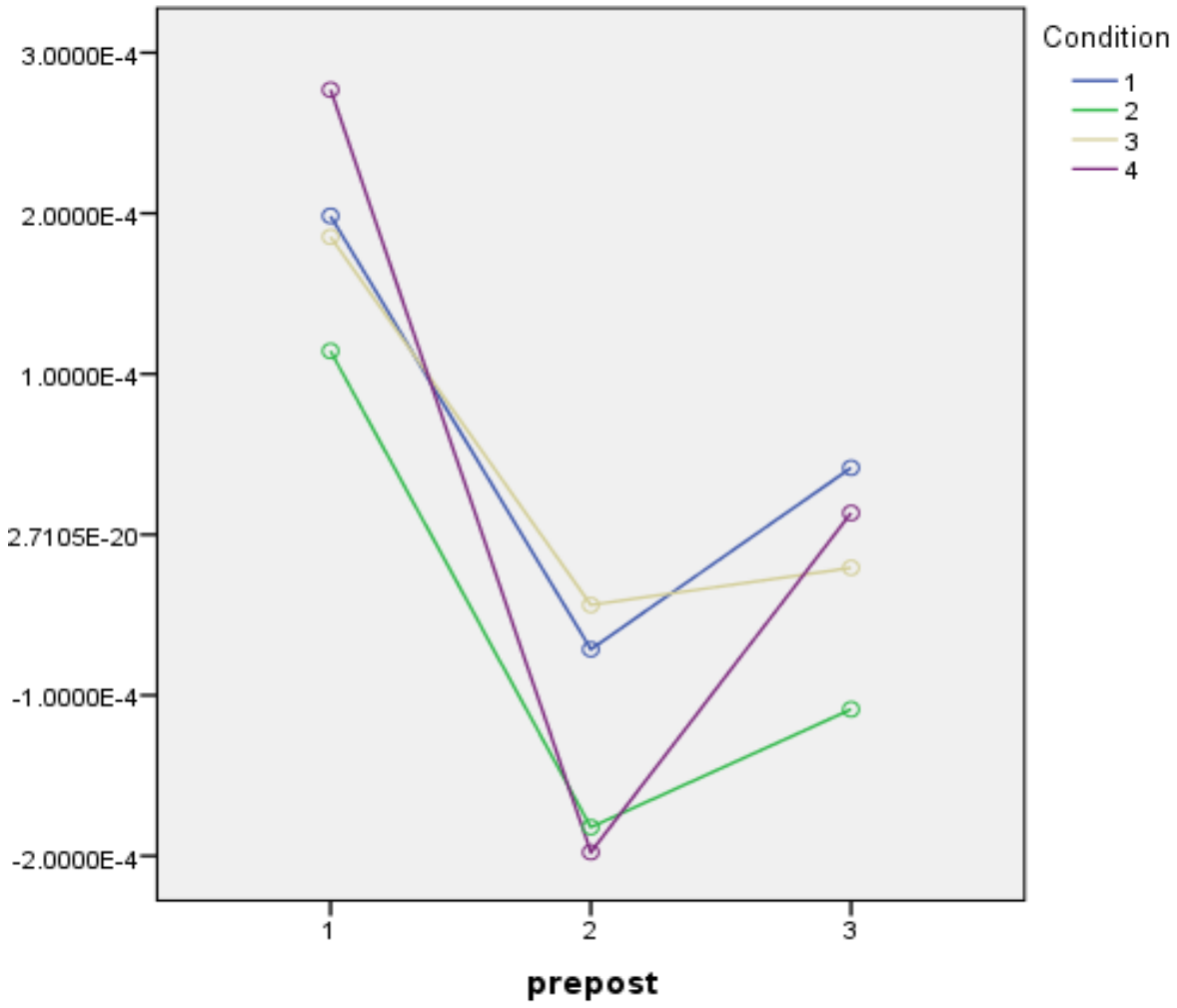
7.3.1 fNIRS Results: OxyHb changes during Stroop Left Pre-frontal Cortex

In the main study on 119 subjects, multivariate RM-ANOVA for all the channels on Left side (Channel 1-9) was performed. It revealed significant main effects for levels [$F(2, 2088) = 47.06$; $p<0.01$] and significant interaction between level and group [$F(6, 4178) = 2.33$, $p<0.05$]. Post-hoc analysis through Bonferroni's correction further revealed that prefrontal oxygenation was significantly lesser in all the four groups after mobile on/off exposure of 30 minutes (Figure 16). In the MPOFSS group there was a significant increase after SS chanting as compared to the post mobile value ($p<0.05$) (Figure 17).

7.3.1 fNIRS Results: OxyHb changes during Stroop Right Pre-frontal Cortex

Multivariate RM-ANOVA for all the channels on Right side (Channel 10-18) was performed. It revealed significant main effects for levels [$F(2, 2005) = 35.77$; $p<0.01$] and significant interaction between level and group [$F(6, 4012) = 4.37$, $p<0.01$]. Post-hoc analysis through Bonferroni's correction further revealed that prefrontal oxygenation was significantly lesser in all the three groups except MPONOM, after mobile on/off exposure of 30 minutes (Figure 17). In the MPONSS and MPOFSS groups there was a significant increase in oxygenation after SS chanting as compared to the post mobile values ($p<0.05$) respectively (Figure 18).

Figure 17. Graph showing changes in oxyHb levels in channels 1-9 (Left pre-frontal cortex) during Stroop task in all the four groups at three points of time.

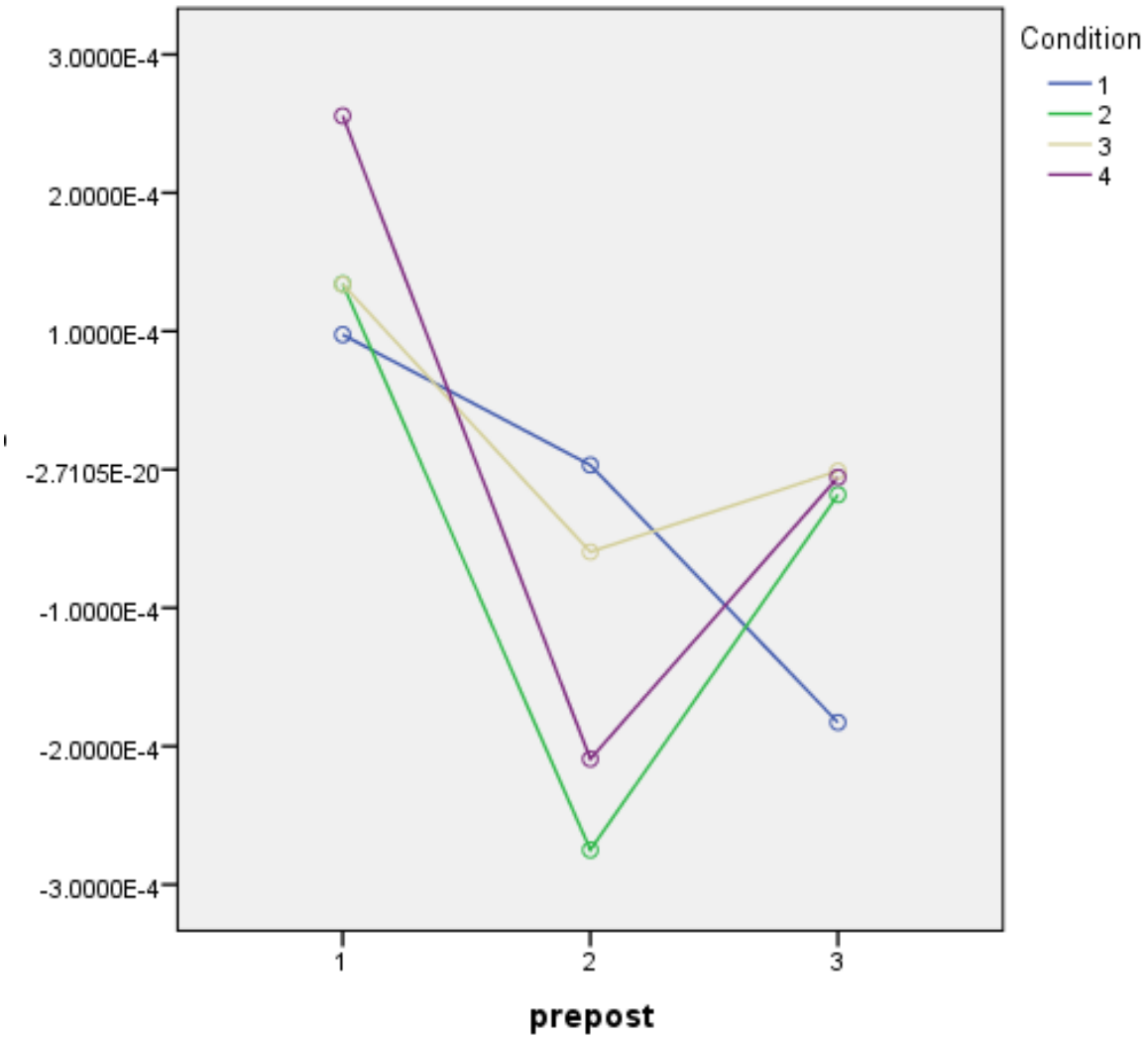


Group: 1: MPONOM; 2: MPONSS; 3: MPOFOM; 4: MPOFSS;

Level (prepost): 1: Baseline; 2: After 30 min of MPON/OF exposure; 3:After OM/SS

Y-axis: Concentration of oxygenated haemoglobin (oxyHb) expressed in µmol/l.

Figure 18. Graph showing changes in oxyHb levels in channels 10-18(Right pre-frontal cortex) during Stroop task in all the four groups at three points of time.



Group: 1: MPONOM; 2: MPONSS; 3: MPOFOM; 4: MPOFSS;

Level (prepost): 1: Baseline; 2: After 30 min of MPON/OF exposure; 3:After OM/SS

Y-axis: Concentration of oxygenated haemoglobin (oxyHb) expressed in μmol/l.

7.4. EPI RESULTS

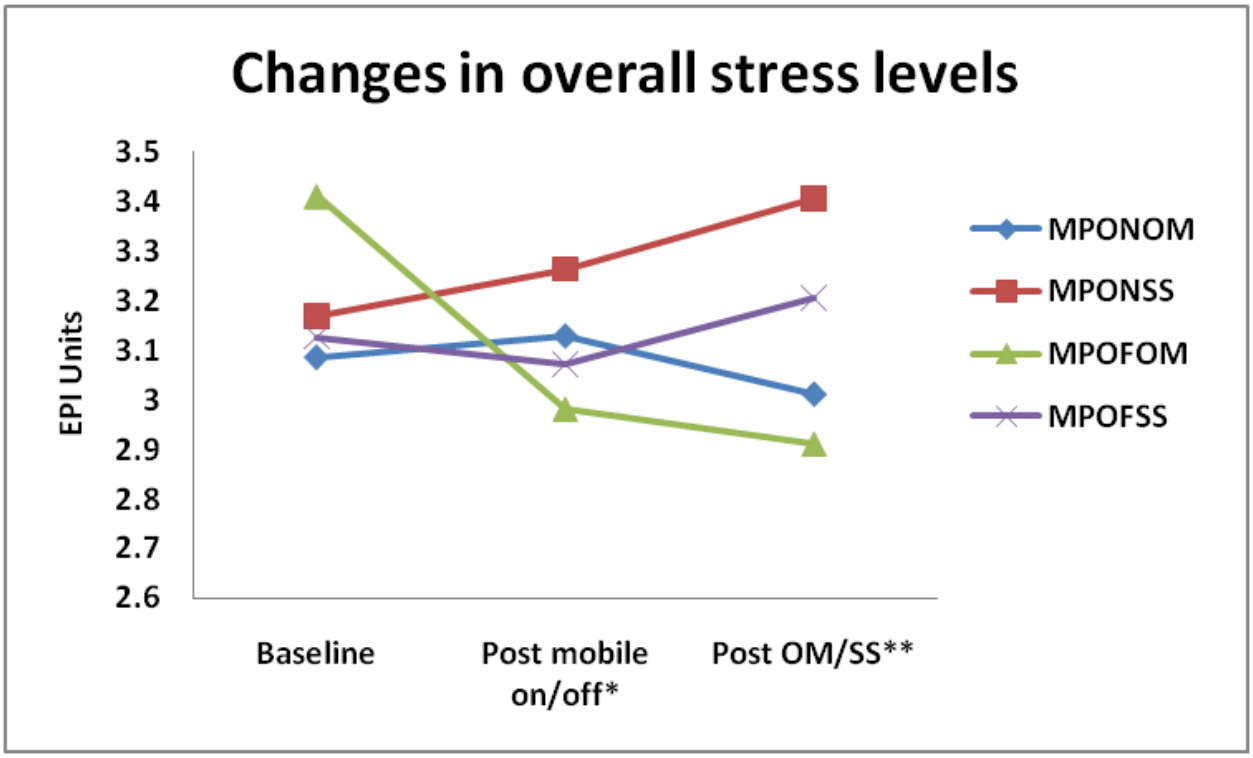
Multivariate RM-ANOVA for all the 43 subtle energy variables revealed significant interaction between level and group [$F(12, 195) = 2.83$, $p < 0.05$; Effect Size: 0.42]. Post hoc analysis through Bonferroni's correction further revealed that overall stress levels increased significantly ($p = 0.04$) and the subtle energy levels for following areas reduced significantly after MPEMF exposure in MPON groups compared to MPOF groups: a) Pancreas ($p = 0.001$); b) Thyroid gland ($p = 0.002$); c) Cerebral cortex area ($p < 0.01$); d) Cerebral vessels area ($P < 0.05$); e) Hypophysis ($p = 0.013$); f) Left Ear and Left Eye ($p < 0.01$); g) Liver ($p < 0.05$); h) Right Kidney ($p < 0.05$); i) Spleen ($p = 0.04$) and j) Immune System ($p = 0.02$; Figure 15). Further, it was observed that after 5 minutes of OM chanting the Overall Stress levels significantly reduced in MPONOM and MPOFOM groups as compared to the values after SS chanting in MPONSS and MPOFSS groups ($p < 0.04$; Figure 19). For other variables there was no significant change.

7.4.1. Within-group results

7.4.1.1. *Mobile phone in "OFF" mode group*

Many EPI parameters showed significant changes after 30 min of sham exposure compared to the baseline (Table 9). Two areas showed significant increase in subtle energy levels: Root mean square of integral area ($P < 0.01$) and coronary area ($P < 0.01$). On the other hand, twenty-six areas showed significant reduction in subtle energy levels. These were as follows: Integral area, right jaw, throat, left jaw, left ear, cerebral cortex zone, cervical zone, thorax, sacrum, coccyx, blind gut, appendix, ascending colon, thorax, immune, right kidney, cardiovascular zone, cerebral vessel zone, hypophysis, adrenal area, urogenital system, spleen, nervous system, duodenum, ileum, and mammary glands (Table 9).

Figure 19: Figure showing comparison of subtle energy levels of "Overall Stress" in the all the four groups at three points of time



Abbreviations: MPON = Mobile phone ON group; MPOF = Mobile phone OFF group;Post mobile on/off = after exposure to mobile phone for 30 minutes in either on or off mode; Post OM/SS = after 5 minutes of OM or SS chanting

7.4.1.2. *Mobile phone in "ON" mode group*

After MPEMF exposure of 30 min, it was observed that 13 EPI parameters showed significant changes compared to the baseline (Table 10). Of the 13, one area showed a significant increase in subtle energy levels (left ear: $P < 0.01$) and 11 areas showed a significant reduction. Areas showing significant reduction were as follows: Right ear, cerebral cortex zone, thorax, coccyx, blind gut, liver, right kidney, thyroid, pancreas, adrenal, immune system, and nervous system (Table 10).

7.4.2. Between-group comparisons

We have observed that the subtle energy levels were significantly reduced after MPEMF exposure in MPON group compared to MPOF group for the following areas: (a) Pancreas (P = 0.001), (b) thyroid gland (P = 0.002), (c) cerebral cortex area (P < 0.01), (d) cerebral vessels area (P < 0.05), (e) hypophysis (P = 0.013), (f) left ear and left eye (P < 0.01), (g) liver (P < 0.05), (h) right kidney (P < 0.05), (i) spleen (P = 0.04), and (j) immune system [P = 0.02; Table 11 and Figure 20].

Table 9: Comparisons of electrophotonic imaging values of various organs before and after mobile phone "OFF" mode exposure

S.N.	Variable	N	PRE mean±SD	POST mean±SD	95% Confidence Interval		P[a] Value
					Lower	Upper	
1	IA	30	-0.19±0.23	-0.80±0.31	0.48	0.73	0.00**
2	RMS IA	30	0.59±0.16	0.95±0.17	-0.45	-0.26	0.00**
3	IE	30	1.97±0.19	1.99±0.19	-0.08	0.03	0.43
4	RT Eye	30	-0.09±0.59	-0.15±0.67	-0.24	0.36	0.67
5	RT Ear	30	-0.34±0.94	-0.77±1.01	-0.02	0.89	0.06
6	RT Jaw	30	-0.13±0.97	-1.00±1.19	0.29	1.43	0.01**
7	Throat	30	0.19±0.78	-0.89±0.95	0.77	1.39	0.00**
8	LT Jaw	30	-0.50±0.55	-1.60±0.62	0.77	1.43	0.00**
9	LT Ear	30	-0.06±0.41	-0.47±0.65	0.12	0.69	0.01**
10	LT Eye	30	0.26±0.53	0.17±0.11	-0.15	0.33	0.46
11	CZ Cortex	30	0.26±0.11	-0.22±0.32	0.33	0.64	0.00**
12	Cervical	30	-0.09±0.34	-0.60±0.98	0.21	0.82	0.00**
13	Thorax	30	-0.34±0.46	-0.94±0.97	0.14	1.07	0.01**
14	Lumbar	30	-0.67±0.35	-1.12±1.19	-0.07	0.95	0.09
15	Sacrum	30	-0.04±0.37	-1.31±0.99	0.92	1.62	0.00**
16	Coccyx	30	0.24±0.54	-1.36±1.03	1.33	1.86	0.00**
17	Blindgut	30	0.04±0.92	-1.39±0.95	1.06	1.79	0.00**
18	Apdx	30	-0.22±0.73	-1.84±0.72	1.26	1.97	0.00**
19	Asc Colon	30	-0.43±0.51	-1.41±1.11	0.52	1.43	0.00**

20	Trs Colon	30	0.07±0.29	-0.03±0.22	-0.06	0.26	0.2
21	Thorax	30	0.23±0.27	-0.42±0.95	0.33	0.97	0.00**
22	Immune	30	-0.32±0.56	-1.10±0.87	0.36	1.21	0.00**
23	GB	30	-0.49±0.61	-0.82±1.14	-0.18	0.83	0.19
24	Liver	30	-0.01±0.45	-0.25±0.93	-0.12	0.61	0.18
25	RT Kid	30	0.17±0.45	-0.88±0.55	0.75	1.36	0.00**
26	CV	30	-0.40±0.61	-0.84±0.75	0.17	0.72	0.00**
27	CZV	30	0.04±0.22	-0.40±0.36	0.3	0.57	0.00**
28	Hypophy	30	-0.45±0.71	-0.17±0.75	-0.48	-0.08	0.01**
29	Thyroid	30	-0.65±0.66	-0.66±1.12	-0.45	0.47	0.97
30	Pancreas	30	-0.75±0.92	-0.46±1.14	-0.63	0.06	0.11
31	Adrenal	30	0.04±0.58	-0.20±0.62	0.01	0.47	0.04*
32	UGS	30	0.12±0.40	-0.71±0.73	0.5	1.14	0.00**
33	Spleen	30	-0.70±0.61	-1.57±0.99	0.32	1.44	0.00**
34	NS	30	-0.55±0.96	-1.22±1.19	0.18	1.15	0.01**
35	Hypoth	30	-0.05±0.56	-0.31±0.64	-0.04	0.56	0.08
36	Epiphy	30	-0.29±0.75	-0.29±0.76	-0.11	0.11	0.96
37	Duod	30	-0.42±0.40	-0.79±0.94	0.11	0.63	0.01**
38	Ileum	30	0.09±0.53	-0.47±0.73	0.13	0.98	0.01**
39	MG	30	0.35±0.20	0.27±0.11	0.01	0.15	0.02*
40	LT Kid	30	-0.50±0.63	-0.76±1.10	-0.16	0.68	0.22
41	Heart	30	-0.02±0.36	-0.31±0.77	-0.01	0.59	0.06
42	Coronary	30	-0.12±0.28	-0.53±0.59	0.14	0.67	0.00**

Abbreviations: MPON: Mobile phone ON group; MPOF: Mobile phone OFF group; IA: Integral Area; RMS IA: Root mean square of Integral Area; IE: Integral Entropy; RT: Right; LT: Left; CZ: Cerebral Zone; Apdx: Appendix; Asc: Ascending; Trs: Transverse; Kid: Kidney; GB: Gall Bladder; CV: Cardio-vascular; UGS: urogenital System; NS: Nervous System; Hypophy: Hypophysis; Hypoth: Hypothalamus; Epiphy: Epiphysis; Duod: Duodenum; MG: Mammary Gland

[a] Paired samples t test

*P < 0.05

**P < 0.01

Table 10: Table showing comparisons of EPI values of various organs before and after MPON exposure

S.N.	**Variable**	**N**	**PRE mean±SD**	**POST mean±SD**	**95% Confidence Interval**	**Pa**

					Lower	Upper	Value
1	IA	30	-0.82±0.50	-0.95±0.51	-0.09	0.35	0.23
2	RMS IA	30	0.80±0.13	0.84±0.14	-0.11	0.02	0.16
3	IE	30	2.01±0.15	1.99±0.22	-0.08	0.12	0.66
4	RT Eye	30	-0.30±0.65	-0.53±1.15	-0.21	0.67	0.28
5	RT Ear	30	-0.46±0.65	-0.95±1.05	0.08	0.91	0.02*
6	RT Jaw	30	-0.77±0.96	-1.17±1.13	-0.15	0.95	0.15
7	Throat	30	-0.88±1.05	-0.97±1.00	-0.51	0.68	0.77
8	LT Jaw	30	-2.17±0.68	-1.94±0.99	-0.74	0.29	0.38
9	LT Ear	30	-1.85±1.10	-1.26±1.05	-1.16	-0.03	0.04*
10	LT Eye	30	-0.95±1.11	-0.71±0.79	-0.69	0.2	0.27
11	CZ Cortex	30	-0.62±0.56	-1.07±0.71	0.09	0.82	0.02*
12	Cervical	30	-0.24±0.87	-0.58±0.96	-0.08	0.75	0.11
13	Thorax	30	-0.81±0.87	-1.34±1.04	0.05	1.02	0.03*
14	Lumbar	30	-1.29±0.75	-1.57±0.88	-0.13	0.69	0.17
15	Sacrum	30	-1.18±0.76	-1.48±0.76	-0.07	0.67	0.11
16	Coccyx	30	-0.43±0.84	-1.10±0.66	0.35	0.99	0.00**
17	Blindgut	30	-0.40±0.89	-1.23±0.75	0.43	1.23	0.00**
18	Apdx	30	-1.27±0.96	-1.44±0.89	-0.27	0.62	0.44
19	Asc Colon	30	-0.85±0.88	-1.08±0.98	-0.36	0.82	0.43
20	Trs Colon	30	-0.57±0.80	-0.63±0.66	-0.14	0.26	0.52
21	Thorax	30	-0.50±0.94	-0.35±0.95	-0.59	0.29	0.5
22	Immune	30	-0.81±0.96	-0.78±1.10	-0.45	0.38	0.87
23	GB	30	-1.12±0.72	-1.20±0.86	-0.24	0.42	0.59
24	Liver	30	-0.87±0.83	-1.67±0.78	-0.1	0.66	0.04*
25	RT Kid	30	-0.77±0.96	-1.81±0.93	-0.33	0.65	0.03*
26	CV	30	-1.00±1.00	-1.01±0.95	-0.32	0.34	0.95
27	CZV	30	-0.77±0.81	-0.72±0.71	-0.25	0.15	0.63
28	Hypophy	30	-0.75±1.02	-0.82±1.10	-0.25	0.39	0.65
29	Thyroid	30	-1.05±0.94	-1.57±1.00	0.15	0.89	0.01**
30	Pancreas	30	-1.13±1.02	-1.88±1.04	0.33	1.17	0.01**
31	Adrenal	30	-1.11±0.90	-1.85±0.95	0.33	1.16	0.01**
32	UGS	30	-0.71±0.86	-0.97±0.79	-0.07	0.59	0.12
33	Spleen	30	-1.20±0.99	-0.89±1.12	-0.69	0.07	0.11
34	NS	30	-1.36±1.11	-0.77±1.18	-1.15	-0.03	0.04*
35	Hypoth	30	-0.63±0.92	-0.02±0.59	-1.03	-0.18	0.01**
36	Epiphy	30	-0.69±0.88	-0.71±0.90	-0.31	0.34	0.91
37	Duod	30	-0.72±0.88	-1.03±0.95	-0.08	0.69	0.11
38	Ileum	30	-0.77±1.09	-0.64±0.89	-0.59	0.33	0.56
39	MG	30	-0.34±0.74	-0.25±0.91	-0.51	0.33	0.66
40	LT Kid	30	-0.43±0.64	-0.65±0.96	-0.1	0.53	0.18
41	Heart	30	-0.32±0.59	-0.26±0.63	-0.37	0.24	0.68
42	Coronary	30	-0.66±0.69	-0.73±0.61	-0.27	0.4	0.68

Abbreviations: MPON: Mobile phone ON group; MPOF: Mobile phone OFF group; IA: Integral Area; RMS IA: Root mean square of Integral Area; IE: Integral Entropy; RT: Right; LT: Left; CZ: Cerebral Zone; Apdx: Appendix; Asc: Ascending; Trs: Transverse; Kid: Kidney; GB: Gall Bladder; CV: Cardio-vascular; UGS: urogenital System; NS: Nervous System; Hypophy: Hypophysis; Hypoth: Hypothalamus; Epiphy: Epiphysis; Duod: Duodenum; MG: Mammary Gland

[a] Paired samples t test

*P < 0.05

**P < 0.01

Table 11: Table showing comparisons of EPI values of various organs between MPOF and MPON groups before and after the exposure

S.N.	Variable	N	Pre MPOF mean	Pre MPON mean	P[a] Value	Post MPOF Mean	Post MPON mean	P[a] Value
1	IA	30	-0.19±0.23	-0.82±0.50	0.11	-0.80±0.31	-0.95±0.51	0.18
2	RMS	30	0.59±0.16	0.80±0.13	0.06	0.95±0.17	0.84±0.14	0.01*
3	IE	30	1.97±0.19	2.01±0.15	0.42	1.99±0.19	1.99±0.22	0.92
4	RT Eye	30	-0.09±0.59	-0.30±0.65	0.22	-0.15±0.67	-0.53±1.15	0.14
5	RT Ear	30	-0.34±0.94	-0.46±0.65	0.59	-0.77±1.01	-0.95±1.05	0.52
6	RT Jaw	30	-0.13±0.97	-0.77±0.96	0.10	-1.00±1.19	-1.17±1.13	0.58
7	Throat	30	0.19±0.78	-0.88±1.05	0.08	-0.89±0.95	-0.97±1.00	0.76
8	LT Jaw	30	-0.50±0.55	-2.17±0.68	0.11	-1.60±0.62	-1.94±0.99	0.13
9	LT Ear	30	-0.06±0.41	-1.85±1.10	0.09	-0.47±0.65	-1.26±1.05	0.01**
10	LT Eye	30	0.26±0.53	-0.95±1.11	0.1	0.17±0.11	-0.71±0.79	0.01**
11	CZ Cortex	30	0.26±0.11	-0.62±0.56	0.07	-0.22±0.32	-1.07±0.71	0.01**
12	Cervical	30	-0.09±0.34	-0.24±0.87	0.03*	-0.60±0.98	-0.58±0.96	0.92
13	Thorax	30	-0.34±0.46	-0.81±0.87	0.02*	-0.94±0.97	-1.34±1.04	0.14
14	Lumbar	30	-0.67±0.35	-1.29±0.75	0.08	-1.12±1.19	-1.57±0.88	0.11
15	Sacrum	30	-0.04±0.37	-1.18±0.76	0.12	-1.31±0.99	-1.48±0.76	0.48
16	Coccyx	30	0.24±0.54	-0.43±0.84	0.06	-1.36±1.03	-1.10±0.66	0.26
17	Blindgut	30	0.04±0.92	-0.40±0.89	0.12	-1.39±0.95	-1.23±0.75	0.50

18	Apdx	30	-0.22±0.73	-1.27±0.96	0.11	-1.84±0.72	-1.44±0.89	0.08
19	Asc Colon	30	-0.43±0.51	-0.85±0.88	0.06	-1.41±1.11	-1.08±0.98	0.24
20	Trs Colon	30	0.07±0.29	-0.57±0.80	0.79	-0.03±0.22	-0.63±0.66	0.76
21	Thorax	30	0.23±0.27	-0.50±0.94	0.79	-0.42±0.95	-0.35±0.95	0.79
22	Immune	30	-0.32±0.56	-0.81±0.96	0.08	-1.10±0.87	-0.78±1.10	0.22
23	GB	30	-0.49±0.61	-1.12±0.72	0.10	-0.82±1.14	-1.20±0.86	0.16
24	Liver	30	-0.01±0.45	-0.87±0.83	0.09	-0.25±0.93	-1.67±0.78	0.03*
25	Rt Kid	30	0.17±0.45	-0.77±0.96	0.12	-0.88±0.55	-1.81±0.93	0.04*
26	Cardio V	30	-0.40±0.61	-1.00±1.00	0.07	-0.84±0.75	-1.01±0.95	0.48
27	Cereb ZV	30	0.04±0.22	-0.77±0.81	0.06	-0.40±0.36	-0.72±0.71	0.03*
28	Hypophy	30	-0.45±0.71	-0.75±1.02	0.22	-0.17±0.75	-0.82±1.10	0.01**
29	Thyroid	30	-0.65±0.66	-1.05±0.94	0.07	-0.66±1.12	-1.57±1.00	0.01**
30	Pancreas	30	-0.75±0.92	-1.13±1.02	0.15	-0.46±1.14	-1.88±1.04	0.01**
31	Adrenal	30	0.04±0.58	-1.11±0.90	0.04*	-0.20±0.62	-1.85±0.95	0.01**
32	UroGen	30	0.12±0.40	-0.71±0.86	0.09	-0.71±0.73	-0.97±0.79	0.20
33	Spleen	30	-0.70±0.61	-1.20±0.99	0.03*	-1.57±0.99	-0.89±1.12	0.01**
34	Nerv S	30	-0.55±0.96	-1.36±1.11	0.06	-1.22±1.19	-0.77±1.18	0.17
35	Hypoth	30	-0.05±0.56	-0.63±0.92	0.06	-0.31±0.64	-0.02±0.59	0.09
36	Epiphy	30	-0.29±0.75	-0.69±0.88	0.07	-0.29±0.76	-0.71±0.90	0.07
37	Duod	30	-0.42±0.40	-0.72±0.88	0.11	-0.79±0.94	-1.03±0.95	0.35
38	Ileum	30	0.09±0.53	-0.77±1.09	0.06	-0.47±0.73	-0.64±0.89	0.45
39	MG	30	0.35±0.20	-0.34±0.74	0.07	0.27±0.11	-0.25±0.91	0.41
40	LT Kid	30	-0.50±0.63	-0.43±0.64	0.69	-0.76±1.10	-0.65±0.96	0.69
41	Heart	30	-0.02±0.36	-0.32±0.59	0.03	-0.31±0.77	-0.26±0.63	0.79
42	Coronary	30	-0.12±0.28	-0.66±0.69	0.12	-0.53±0.59	-0.73±0.61	0.22

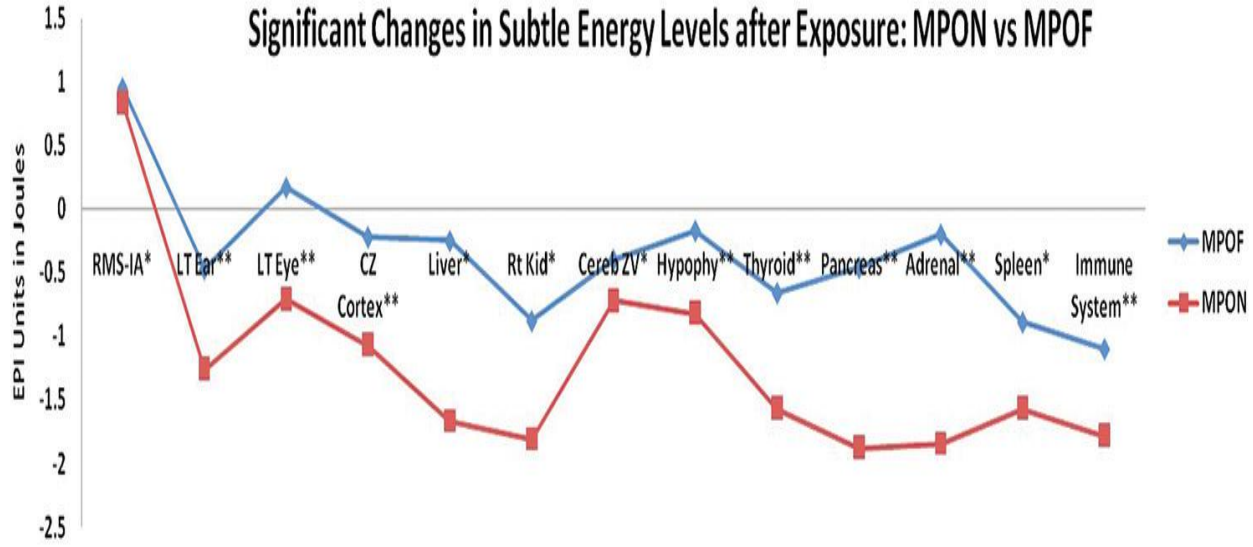
Abbreviations: MPON: Mobile phone ON group; MPOF: Mobile phone OFF group; IA: Integral Area; RMS IA: Root mean square of Integral Area; IE: Integral Entropy; RT: Right; LT: Left; CZ: Cerebral Zone; Apdx: Appendix; Asc: Ascending; Trs: Transverse; Kid: Kidney; GB: Gall Bladder; CV: Cardio-vascular; UGS: urogenital System; NS: Nervous System; Hypophy: Hypophysis; Hypoth: Hypothalamus; Epiphy: Epiphysis; Duod: Duodenum; MG: Mammary Gland

[a] Independent samples t test

*P < 0.05

**P < 0.01

Figure 18: Figure showing comparison of subtle energy levels of organs between MPOF and MPON groups after exposure



Abbreviations: MPON = Mobile phone ON group; MPOF = Mobile phone OFF group; RMS IA = Root mean square of integral area; RT = Right; LT = Left; CZ = Cerebral Zone; Cereb ZV = Cerebral zone Vessels; Kid = Kidney

CHAPTER 8 – DISCUSSION

CHAPTER 8 - DISCUSSION

8.1. COGNITION AND BRAIN HEMODYNAMICS

The present work was planned to assess feasibility of the protocol for future larger trials.. We found the protocol to be feasible and none of the subjects reported any side-effects. We did not observe any significant difference between MPON or MPOF conditions for Stroop Task performance or brain haemodynamics, but there was a tendency for better Stroop incongruent performance and reduced oxygenation in some channels after OM chanting as compared to SS chanting. Previously, Regel et al. (2011) reviewed 41 studies, where distinct cognitive tasks were employed at various levels of difficulty to evaluate effects of MPEMF. Six studies revealed an increase in performance speed whereas seven studies reported a decrease. Similarly, accuracy of performance was reduced and elevated in several experiments. Most of the previous studies have not found any effect of MPEMF exposure for less than 20 min on brain haemodynmaics (Regel et al., 2011); therefore, in the present trial, we chose 30 min of exposure. In the present study, even after 30 min of MPEMF exposure, we did not observe any significant improvement or decline in cognitive performance or changes in brain haemodynamics. The present study used a task (Stroop task) which requires less duration and yet is complex enough to elicit a cognitive response (Stroop, 1935). Previously, a cross-sectional study used the Stroop task to find out associations between cognitive performance and mobile phone use and found that mobile phone use was associated with faster and less accurate response to higher level cognitive tasks (Abramson, Benke, Dimitriadis, Inyang, Sim, Wolfe, et al., 2009). In another study, the acute effect of 45 min of MPEMF exposure was tested on 168 subjects using the Stroop paradigm. Subjects were in the age range of 18–42 years. It was observed that, with neutral Stroop condition, the mean reaction time of subjects was significantly lesser, when exposed to MPEMF signals, than in the sham condition, whereas with incongruent Stroop condition, there was no significant difference

between the groups (Cinel, Boldini, Fox, & Russo, 2008). In the present study, we did not find any difference in performance between MPEMF and sham exposure for either congruent or incongruent Stroop task after 30 min of exposure. This may be due to a very small sample size in the present study as compared to the study by Cinel et al. (2008). Probably, 45 min of MPEMF exposure would have produced some changes in cognitive performance, as observed by Cinel et al. (2008), but, since the institutional ethical committee did not permit exposure of mobile phone radiation for more than 30 min to teenagers, the duration of 30 min was chosen for our study.

A previous positron emission tomography (PET) study found increased cerebral blood flow (CBF) in the prefrontal cortex after 30 min exposure to a 900-MHz GSM signal (Huber, Treyer, Schuderer, Berthold, Buck, Kuster, et al., 2005). Another similar PET study showed decreased cerebral blood flow in the temporal cortex after a continuous 51 min exposure to a 902-MHz GSM signal (Aalto, Haarala, Bruck, Sipila, Hamalainen, & Rinne, 2006). A brain energy metabolism study carried out using PET on 13 young male subjects exposed to a pulse modulated 902.4MHz GSM for 33 min while performing a simple visual vigilance task also showed that relative cerebral metabolic rate of glucose was significantly reduced in the temporo-parietal junction and anterior temporal lobe of the right hemisphere ipsilateral to the exposure (Kwon, Vorobyev, K€ann€al€a, Laine, Rinne, Toivonen, et al., 2011). Another study investigated the effects induced by an exposure to a GSM signal on brain BOLD (blood-oxygen-level dependent) response, as well as its time course while performing a Go–No-Go task. BOLD response of active brain areas and reaction times (RTs) while performing the task were measured both before and after the exposure. It was observed that reaction times to the somato-sensory task did not change as a function of exposure (real vs sham) to GSM signal. BOLD results revealed a significant activation in inferior parietal lobule, insula, precentral, and postcentral gyri associated with Go responses after both ‘real’ and ‘sham’

exposure, whereas no significant effects were observed in the between-group analysis. The authors concluded that there were no changes in BOLD response as a consequence of EMFs exposure (Curcio, Nardo, Perrucci, Pasqualetti, Chen, Del Gratta, et al., 2012). Most of these researches used a 900MHz GSM signal which corresponds to the 2G spectrum and the results were mixed. In the present study, depending on the increasing use, we exposed subjects to 2170MHz UMTS (which corresponds to 3G spectrum MPEMFs) to find that results may not differ much with the band of EMFs. Very few studies have used a fNIRS device to assess effects of MPEMF before. In one study (Wolf, Haensse, Morren, & Froehlich, 2006), effects of GSM 900MHz signals (EMF) were assessed on the cerebral blood circulation using near-infrared spectrophotometry in a three armed (12 W/kg, 1.2 W/kg, sham), double blind, randomized crossover trial in 16 healthy volunteers. During exposure there was a borderline significant short -term responses of oxyhaemoglobin (oxyHb) and deoxyhaemoglobin (deoxyHb) concentration, which correspond to a decrease of cerebral blood flow and volume. The authors found that there was no detectable dose–response relation or long-term response with 20 min of exposure and the detection limit was a fraction of the regular physiological changes elicited by functional activation. The above study did not use a cognitive task along with the fNIRS device.

In the present study, we did not assess the effect of MPEMF during the exposure on brain haemodynamics, but only after the exposure, on the haemodynamic responses during a cognitive challenge. This is to understand the mechanism through which MPEMF exposure may affect cognitive functions. Our results also demonstrated no significant change. The only effect we observed was a slight tendency towards higher activation during Stroop interference after MPEMF exposure in channel 10 (right side) in the MPONSS group after SS chanting as compared to the baseline. Since the sample size in the present work is very small as compared to previous researches, it is difficult to draw definitive conclusions at present.

Cognition enhancing effects of OM chanting have been reported in a few studies earlier . In a comparative study, middle latency auditory evoked potentials were recorded in 18 male volunteers with ages between 25–45 years before, during and after 20 min of OM chanting as compared to chanting of syllable 'one'. There was a significant difference between regular practitioners and naive subjects' response in terms of increase and reduction in peak amplitude of Na waves, suggesting experience dependent neural changes due to OM chanting (Telles, Nagarathna, & Nagendra, 1994). Previously, Singh et al. (2014) assessed the immediate effect of 20 min of OM meditation (mental chanting with effortless defocusing on syllable 'OM') on Stroop task using fNIRS technology. They found that the mean reaction time was shorter during Stroop colour word task with concomitant reduction in total haemoglobin after OM meditation as compared to random thinking for same duration, suggestive of improved performance and efficiency after OM meditation in task-related to attention. Our findings with OM chanting of 5 min are similar to this study (Singh et al., 2012), i.e. there may be lesser pre-frontal activation with better performance on cognitive tasks after OM chanting. This may suggest improved efficiency, i.e. better cognitive output with lesser utilization of resources after OM chanting. Previous researches also report that meditation may induce a state of reduced psycho-physiological arousal with enhanced awareness and attention (Subramanya & Telles, 2009). Thus, chanting OM verbally may have similar effects, as produced by mental chanting with effortless defocusing on syllable OM, even when it is chanted for as small a duration as 5 min.

Although there were between-group differences (MPOFOM vs MPOFSS) where incongruent Stroop task performance after OM chanting was significantly better as compared to SS chanting, this result was found within the MPOFOM group only and not in the MPONOM group. In our study, each subject performed the Stroop task three times and the last performance was after OM/SS chanting. As Stroop tasks are known to produce a practice

effect (Lemay, Bedard, Rouleau, & Tremblay, 2004), the possibility of the results being obtained simply due to practice effect cannot be denied. Also, the sample size in our study is very small to draw any conclusion. Deactivation of pre-frontal cortices following OM chanting may be due to the vibrations produced by the sound 'OM', which may have a stimulating effect on branch of vagus nerve in the ear canal (Kalyani et al., 2011).

8.2. EPI IMAGING

In the present study, we observed that both MPEMF and sham exposure of 30 min produced significant changes in EPI parameters. Overall, predominantly, most of the EPI areas showed a reduction in subtle energy levels after both MPEMF and sham exposure, respectively. However, there were 11 areas where subtle energy levels were significantly lesser after MPEMF exposure compared to sham. These areas are predominantly related to endocrine glands (pancreas, thyroid, and adrenals), brain area (cerebral cortex and cerebral vascular area), liver, and right kidney.

Previously, to the best of authors' knowledge, only one pilot study measured immediate effect of mobile phone radiations on subtle energy levels of 17 adults (Kononenko et al, 2000). The duration of exposure and details of MPEMF characteristics were not provided in that study; therefore, it is difficult to compare the results. Moreover, the EPI parameters assessed in the study were markers of overall subtle energy levels and balance rather than detailed organ-wise subtle energy assessments. Authors observed that immediately after MPEMF exposure, there was a definite influence on the human bioelectromagnetic field (BEM) in a way that the coronas (overall areas representing the subtle energy level of body) became reduced, more fragmented and incomplete. This suggests that overall subtle energy levels were reduced in the previous study. These findings are similar to our observations

where we also found larger subtle energy reductions in 11 areas-after MPEMF exposure compared to sham which leads to reduced size and more fragmentations of the EPI images.

We have observed that some areas showed a reduction in subtle energy levels after both MPEMF as well as sham exposure. These areas are predominantly related to the spinal column (cervical zone, sacrum, and coccyx), thorax, gastrointestinal tract (jejunum, ileum, and blind gut), and brain activity (cerebral cortex) and these effects are most probably produced due to sitting still on a chair in a dark room without moving the head and body parts much (as these requirements were common to both MPEMF and sham exposure groups). Studies have shown that sitting silently or performing meditations may significantly affect the subtle energy status of the subjects (Deo et al, 2015).

As depicted in the between-group comparisons above (Table 8), primarily the endocrine gland areas (pancreas, thyroid, and adrenals) along with liver, right kidney, spleen and immune system areas stand out as distinct markers of MPEMF exposure in our study. MPEMF had an energy lowering effect on these organs and this might suggest an enhanced risk of developing malfunctioning of endocrine organs and thereby deficiency of corresponding hormones. This may increase the risk of developing diabetes, hypothyroidism, or adrenocortical insufficiency. Interestingly, in a recent study, 159 students in the age range 12–17 years were recruited (Meo et al, 2015). Ninety-six male students were from school-1 where students were exposed to high-energy MPEMF (9.601 nW/cm^2 at a frequency of 925 MHz for a duration of 6 h daily, 5 days a week) and 63 male students were from school-2 where students were exposed to low-energy MPEMF (1.909 nW/cm^2 at a frequency of 925 MHz for 6 h daily, 5 days a week). At the end, it was observed that the mean HbA1c for the students who were exposed to high-energy MPEMF was significantly higher (5.44 ± 0.22) than the mean HbA1c for the students who were exposed to low-energy MPEMF (5.32 ± 0.34) (P = 0.007). The authors conclude that students who were exposed to high-energy

MPEMF generated by mobile phone base stations had a significantly higher risk of type 2 diabetes mellitus compared to their counterparts who were exposed to low-energy MPEMF (Meo et al, 2015).

In comparison to the above study where 2G network was used, in the present study, in view of increasing popularity, we exposed the subjects to 3G network with average MPEMF energy of ~130.5 nW/cm^2 at a frequency of 2100 MHz. We observed that subtle energy levels of organs, including pancreas, reduced significantly after 30 min of MPEMF exposure as compared to sham. Similarly, previous studies have found the effects of MPEMF on brain physiology, brain blood flow, metabolism, cognition, and autonomic functions (Andrzejak et al, 2008; Haarala et al, 2003; Aydin et al, 2011). This correlates well with subtle energy changes that have been observed in the present study, for example, reduction in subtle energy at cerebral cortex and cerebral vessel area as compared to sham (Table 8). This suggests that subtle energy levels may be affected with much lesser duration of exposure at higher MPEMF energy. It is known that subtle energies are affected at much earlier stage before the physical manifestation of pathology and if the interrupting stimuli are removed, its correction also precedes a physiological correction (Kostyuk et al, 2011; Korotkov et al, 2010; Korotkov et al, 2002). Probably, this is the reason that we did not observe any significant reduction in baseline subtle energy levels of the pancreas or other organs for both MPEMF as well as sham exposure group. This may be due to the fact that subjects were not exposed to mobile phones for the last 24 h before data collection and this might have brought favorable changes in their subtle energy values.

It is difficult to understand the possible mechanism through which MPEMF might affect subtle energy levels of the subjects. We monitor subtle energy of "Chi" (or prānā) moving in the body through EPI system. The body is basically an electrical network of the nervous system and long and short distance cellular communications are also hypothesized through

electromagnetic (EM) signals in the body (Becker & Selden, 1985). Thus, it is likely that any EM input from outside the body will affect the electrical communication within the body. This is obvious in the use of devices such as cardiac pacemakers, motor nerve stimulation for muscle activity, and transcutaneous electrical nerve stimulators for pain suppression. It is likely that the external EM coupling as in a cell phone use?? is related to disruption of normal communication and control that goes on in the body. Lack of control could result in a wide range of cellular dysfunctions.

It is interesting to note that in the present study, though MPEMF exposure was given on the right side only, left eye and left ear also got affected. Within-group comparisons revealed that subtle energy levels actually increased in the left ear and reduced in the right ear after MPEMF exposure (Table 7). However, below the neck, effects are more or less on the same side of MPEMF exposure. This can be explained by two effects: One related to direct (contra-lateral) compensatory mechanism for the EM energy input and the second (related to ipsilateral involvement of most organs below the neck) through nervous system stimulation (global effects). These findings need more intense study to draw reliable conclusions.

It may also be important to observe laterality of breathing (left nostril dominance or right nostril dominanc) since contralateral brain hemispheres tend tobe more active. This in its turn could affect results of both Stroop task and sbtle energy flow and hence, EPI parameters. This needs another study to clarify the influence of breathing laterality.

8.4 STRENGTH OF THE STUDY

The present study followed a randomized controlled design with large sample size and used an objective functional neuro-imaging device, along with a standard validated cognitive task to assess the effect of MPEMF exposure and OM chanting on a good sample of teenagers.

The present study also used a novel way of assessing MPEMF effects on human bio-energy field using EPI imaging.

8.5 LIMITATIONS OF THE STUDY

As a traditional version of Stroop was used, it was not possible to record the reaction time along with Stroop performance scores. We did not perform standard laboratory assessments which may include biochemical makers of dysfunction of various organs, imaging procedures and measurements of electrical activity (such as electroencephalogram [EEG] or electrocardiogram [ECG]), etc. This would have provided an idea about the strength of correlation between subtle energy changes and corresponding possible anatomical and physiological alterations induced by MPEMF exposure. Since the changes at subtle energy level seem to occur much earlier than those produced at the biochemical level, it is difficult to say that a definite correlation would be found between EPI parameters and biochemical markers at the same moment. Still, future researches should explore this area, probably with a cohort study design.

8.6 FUTURE DIRECTIONS

All subjects in our study belonged to similar socioeconomic status and age range; we included subjects who owned a smart phone for more than last 6 months; therefore, we assume that both MPEMF and sham exposure groups had similar baseline exposure. In the future, we plan to measure associated biochemical variables, blood flow changes, and electrical activity of organs such as heart and brain using ECG and EEG along with EPI imaging for the establishment of correlation factors. We also plan to assess the effect of MPEMF exposure for longer duration (weeks to months) and at different points of time so as to develop a possible dose response curve between MPEMF dosage and corresponding subtle energy changes of organs.

CHAPTER 9– SUMMARYAND CONCLUSION

9.1. SUMMARY

Brain hemodynamics as well as Stroop task performance were not affected by mobile phone status (on or off) but task performance in incongruent Stroop condition was significantly better after OM chanting than SS chanting. 3G MPEMF exposure of 30 minutes does not have immediate effects in cognition and brain blood flow of teenagers. OM chanting of 5 minutes reduces blood flow to pre-frontal cortices but enhances executive functions of teenagers, suggesting improved efficiency.

EPI study shows that the images were significantly different between the MPON and MPOF groups. This suggests that there are definite effects of MPEMFs on human subtle energy levels and they are quantifiable. Thirty minutes of MP-EMF exposure increased overall stress and reduced subtle energy levels of endocrine glands, brain, liver, kidney, spleen and immune system of healthy teenagers. Following MP-EMF exposure, 5 minutes of OM chanting led to better reduction in overall stress levels as compared chanting SS.

9.2. CONCLUSION

MPEMF exposure of 30 minutes did not affect cognition and brain hemodynamics in teenagers but had subtle energy reducing effects on several important organs. MPEMF exposure also increased overall stress levels as measured by EPI. OM chanting of 5 minutes enhanced cognition with consumption of lesser resources (deactivation of pre-frontal cortices). It also resisted stress inducing effects of MPEMF on subtle energy.