

Sl. No.	CONTENT	PAGE NO.
	ABSTRACT	iii
1	INTRODUCTION	02
1.1	Rationale of The Study	04
2	ECOLOGICAL BALANCE ACCORDING TO ANCIENT SCRIPTURES: ANCIENT LITERATURE SURVEY	06
2.1	Introduction	07
2.2	Concept of Ecology According to Vedas: Rigveda	13
2.3	Ancient Definition of Ecology: Introspection into Bhagwad Gita	14
2.4	Various Ecological Factors	15
2.5	Ecological Cycles According to Ancient Texts	18
2.6	Causes of Imbalance in Ecosystem	22
2.7	Concept of Pancha Yajnya (Five Sacrifices) for Ecological Balance	24
2.8	Yoga for Balance in Ecology	28
2.9	A Model For Human-Ecology Interaction	29
3	REVIEW OF LITERATURE OF SCIENTIFIC INVESTIGATIONS	31
3.1	ELECTROPHOTONIC IMAGING (EPI)	32
3.1.1	EPI and Its Components	34
3.1.2	Mechanism of Action of EPI	35
3.1.3	Normal Range for Each EPI Component	38

3.1.4	Studies on Application of EPI in Medicine	38
3.1.4.1	Arterial Hypertension	39
3.1.4.2	Bronchial Asthma	39
3.1.4.3	Diabetes Mellitus	40
3.1.5	EPI as Marker of Pathology	40
3.1.5.1	Autism	40
3.1.5.2	Oncology	41
3.2	MOBILE PHONE – ELECTROMAGNETIC FIELD (MPEMF)	42
3.2.1	MPEMF Effect on Human Physiology	42
3.2.1.1	MPEMF might alter Protein Expression in Human Skin	43
3.2.1.2	MPEMF and Head Tumours	43
3.2.1.3	MPEMF Effect on Children and Adolescents	46
3.2.1.4	Association Between MPEMF and Inattention	46
3.2.1.5	MPEMF Affects Short Term Memory	47
3.2.1.6	EPI Study of Effect of Mobile Phone use on the Human Physiology	47
3.3	FUNCTIONAL NEAR INFRA-RED SPECTROSCOPY (fNIRS)	48
3.3.1	Introduction to fNIRS	48
3.3.2	Principles and Mechanism of fNIRS	50
3.3.3.	Applications of fNIRS	52
3.3.4	Review of fNIRS Research	53
3.3.4.1	<i>Effects of MPEMF on Cerebral blood flow using Functional Near Infrared Spectroscopy (fNIRS)</i>	54
3.4	REVIEW OF RESEARCHES ON MEDITATION	58

3.4.1.	Neuro-hemodynamic Effects of Om Chanting	59
3.4.1.	Meditations and Cerebral Blood Flow Changes	61
3.4.2.	Meditations and Stroop Task	65
3.5.	SUMMARY	68
4	AIM AND OBJECTIVES	69
4.1	Aim	70
4.2	Objectives	70
4.3	Research Questions	70
4.4	Hypothesis And Null Hypothesis	71
5	METHODS	72
5.1	SUBJECTS	73
5.1.1	Inclusion Criteria	73
5.1.2	Exclusion Criteria	74
5.1.3	Source	74
5.1.4.	Ethical Considerations	74
5.2	DESIGN	74
5.3	EMF EXPOSURE SETTINGS	77
5.4	fNIRS DEVICE	78
5.5	STROOP TASK AND PROCEDURE	80
5.6.	OM/SS CHANTING PROCEDURE	81
5.7.	ELECTRON- PHOTO IMAGING (EPI) ASSESSMENTS	81
5.7.1.	EPI Parameters	82

5.7.2.	EPI Procedure	83
6.	DATA EXTRACTION AND DATA ANALYSIS	84
6.1.1.	Brain Hemodynamics	85
6.1.2.	EPI Imaging	86
7	RESULTS	87
7.1	Study Profile	88
7.2	Stroop Task Results	89
7.3	fNIRS Results	94
7.4.	EPI Results	101
7.4.1.	<i>Within Group Results</i>	101
7.4.1.1.	<i>MPOF Group</i>	102
7.4.1.2.	<i>MPON Group</i>	102
7.4.2.	Between Group Results	103
8.	DISCUSSION	108
8.1	Cognition and Brain Hemodynamics	110
8.2	EPI Imaging	114
8.3	Strength of the Study	117
8.4	Limitations of the Study	118
8.5	Future Directions	118
9.	SUMMARY AND CONCLUSION	119
9.1	Summary	120
9.2	Conclusion	120

	REFERENCES	121
	APPENDICES	150
	Appendix I: Participant/Guardian Informed Consent	150
	Appendix II: Demography Sheet Format	152
	Appendix III: Abbreviations	153
	Appendix IV: Stroop Test Format	154

LIST OF TABLES

TABLE NO.	TITLE	PAGE NO.
1.	Review of fNIRS Studies in healthy individuals and psychiatric patients	56
2.	Meditation and Cerebral Blood Flow Changes	61
3.	Meditation and Stroop Color Word Task	65
4.	Demographic details of the subjects	76
5.	Channel distributions followed in the study while using fNIRS device	79
6.	Comparison within groups for Stroop performance at the baseline, after mobile phone on/off exposure and after OM/SS chanting	91
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	93

8.	Table showing comparison within groups for changes in oxyHb levels ($\mu\text{mol/Litre}$) in fNIRS channels	95
9.	Comparisons of electrophotonic imaging values of various organs before and after mobile phone “OFF” mode exposure	103
10.	Table showing comparisons of EPI values of various organs before and after MPON exposure	104
11.	Table showing comparisons of EPI values of various organs between MPOF and MPON groups before and after the exposure	106

LIST OF FIGURES

Figure No.	TITLE	PAGE NO.
1.	Pancha Maha Yanjas and their interrelation with the environment	27
2.	Electro Photonic Imaging (EPI) or Gas Discharge Visualization (GDV) Device	32
3.	Glow around human fingertips	33
4.	EPI Images of Ten Fingertips	34
5.	Energy Fields of Different Organs in the Human Body	35
6.	Figure showing the process of EPI data collection	36
7.	Figure showing electrical energy field around the finger	36
8.	EPI Field of The Body Reconstructed from Fingertips Energy	37
9.	Light from the light source is guided to the head by an optode in Banana curve	51
10.	Schematic Representation of the Study Design	75
11.	Settings of the Study	79
12.	Montage of the Study	79

13.	Study Profile	88
14.	Graph showing changes in total scores of incongruent Stroop task in all the four groups at three points of time	90
15.	Graph showing changes in oxyHb levels in channel 13 during Stroop task in all the four groups at three points of time	96
16.	Graph showing changes in oxyHb levels in channel 18 during Stroop task in all the four groups at three points of time.	97
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	99
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	100
19.	Figure showing comparison of subtle energy levels of “Overall Stress” in the all the four groups at three points of time	102
20.	Figure showing comparison of subtle energy levels of organs between MPOF and MPON groups after exposure	108