

**Effect of Supplementation of Health Mix and Nutrition
Education on the Health and Nutritional Status
of Handloom Weavers**

By

Usharani, R.

A Thesis Submitted to

*Avinashilingam Institute for Home Science and Higher Education
for Women, Coimbatore - 641 043*

In Partial Fulfilment of the Requirements for the Degree of

**Doctor of Philosophy
in
Food Science and Nutrition**

November - 2014

CERTIFICATE

This is to certify that the dissertation entitled "**Effect of Supplementation of Health Mix and Nutrition Education on the Health and Nutritional Status of Handloom Weavers**" submitted to the Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore - 641 043 for the Degree of **Doctor of Philosophy in Food Science and Nutrition** is the record of original research work done by **Ms. R. Usharani**, during the period from **June 2011 to November 2014** under my supervision and guidance has not formed the basis for the award of any Degree / Diploma / Associateship / Fellowship or similar title to any candidature of any other University or Institute.

S. Kousalya

S for
Signature of the
Head of the Department

Usharani

Signature of the Supervisor

Nani

Signature of the Dean

DECLARATION

I hereby declare that the dissertation entitled "**Effect of Supplementation of Health Mix and Nutrition Education on the Health and Nutritional Status of Handloom Weavers**" submitted to the Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore - 641 043, in partial fulfilment of the requirements for the award of the **Degree of Doctor of Philosophy in Food Science and Nutrition** is the record of original research work done by me during the period from **June 2011 to November 2014** under the supervision and guidance of **Dr. (Tmt.) U.K. Lakshmi M.Sc., M.Phil., Dip. Ed., Ph.D, Former Dean, Faculty of Home Science, Professor and Head, Department of Food Science and Nutrition, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore - 641 043**, and that it has not formed the basis for the award of any Degree / Diploma / Associateship / Fellowship or similar title to any candidature of any other university or institute.



Signature of the Supervisor



Signature of the Candidate

ACKNOWLEDGEMENT

*The investigator submits her humble gratitude and salutations to **LORD GANESH**, for his immense blessings, to successfully complete this research work.*

*The investigator fondly remembers **Late Ayya Dr. T.S. Avinashilingam, Founder-President- First Chancellor and Late Amma Dr. (Mrs) Rajammal P. Devadas, Former Chancellor, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore** for realizing their vision on Home Science education which has made learning in the portals of this institution possible.*

*The investigator expresses her gratitude to **Dr. T.S.K. Meenakshisundaram M.A., M.Phil, Ph.D. (Honoris Caussa) Chancellor, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore**, for providing the infrastructural facilities for the conduct of the study.*

*The investigator is indebted to **Dr. (Mrs.) Sheela Ramachandran, M.Sc., P.G. Dip (F.Sc & P), Ph.D. (Avinashilingam), Vice Chancellor, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore**, for providing all amenities and for her immense support for the conduct of the thesis.*

*The investigator owes her heartfelt thanks and deep sense of gratitude to **Dr. (Mrs.) Saroja Prabhakaran, M.A., Dip. Ed. (Madras), Ph.D (Mother Teresa), Former Vice Chancellor and Director - Hall of Residence, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore** for extending all the necessary help for the smooth conduct of the research work.*

*The investigator records her gratitude to **Dr. (Mrs.) Gowri Ramakrishnan, M.Sc. (Madras), M.Phil., Ph.D (Avinashilingam), Former Registrar and Dr. (Mrs) A. Venmathi, M.Sc., Dip.Ed., M.Phil., Ph.D. Registrar (In charge), Professor and Head, Department of Family Resource Management, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore**, for providing all the amenities during the course of the research work.*

*The investigator expresses her heartfelt thanks to **Dr. G.P.Jeyanthi, M.Sc., M.Phil., (Bharathiar) , Ph.D (Avinashilingam) , Controller of Examinations** for her valuable help in carrying out the research work.*

The investigator owes her thanks to Former Deans, Dr. (Mrs.) S. Premakumari, M.Sc., M.Phil., Ph.D., and Dr. (Mrs.) K. Thangamani, M.Sc., Dip.Ed, M.Phil., Ph.D., Faculty of Home Science, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, for rendering necessary facilities for the conduct of the study.

The investigator is thankful to Dr. (Mrs.) Vasugi Raaja, M.Sc., Dip.Ed, M.Phil., Ph.D., Dean, Faculty of Home Science, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, for providing all the amenities for the conduct of the study.

The investigator conveys her special thanks, utmost gratitude and feels extremely privileged to work under the supervision of Dr. (Mrs.) U.K. Lakshmi, M.Sc., Dip.Ed., M.Phil., Ph.D., Former Dean, Faculty of Home Science, Professor and Head, Department of Food Science and Nutrition, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore without whose expert supervision, supreme knowledge and unparalleled dedication this research work would not have been possible. Her kind advice and support have been valuable on both academic and at personal level, for which the investigator is extremely grateful.

The investigator heartily thanks Dr. (Mrs). S.Kowsalya, M.Sc., M.Phil., Ph.D. Professor and Head (In charge), Department of Food Science and Nutrition, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore for rendering all the help for the conduct of the study.

The investigator expresses her heartfelt thanks to Mrs. S. Radha Devi, M.Sc. (Kerala), M.Phil (Madras), Associate Professor in Statistics, Department of Food Science and Nutrition, for her valuable suggestions in statistical analysis, in the course of the research work.

The investigator takes this opportunity to extend her thanks to all the Faculty Members of the Department of Food Science and Nutrition for their keen interest, affection and care shown throughout the research work. The department has been a wonderful place to study and work whose memories the researcher shall always cherish.

The investigator is also thankful to all the Laboratory Assistants of the Department of Food Science and Nutrition for their support to carry out the research work.

*The investigator expresses her special gratitude to **Mr. K. Rajendran, Handloom Appraiser, Sakthi Soudaeswari Amman Handloom Weavers Co-operative Society, AD Office, Coimbatore** and **Mr. R. Jegatheskumar, The Sakthi cotton cum Silk Handloom weavers Co-operative Productions and Sales society Ltd., Sirumugai, Coimbatore**, for the help rendered and continuous support in collection of data from handloom weavers.*

*The investigator is obliged to **Dr. T. Manickaraj, MBBS, D.Ortho, Aishwarya Hospital, Arni, Thiruvannamalai District**, for his technical support and guidance in various stages of her project and the investigator extend her heartfelt thanks to all the staff members of the Hospital, for their help and continuous support.*

*The investigator expresses her deep sense of gratitude to **Mr.R. Sakthivel, Senior TB Laboratory Supervisor, Arni, Thriuvannamalai District** and **Mrs. S. Usha, Lab technician, Popular Lab, Arni, Thriuvannamalai District** for their help in biochemical estimation and support to her research work. The investigator owes her thanks to **Mr. J. Chandru, MLT, Lab Technician of Venkateshwara Lab, Arni.** for their help in bio physical assessment (X-ray).*

*The investigator is immensely thankful to **Dr. L. Jaya Kumar, Rimp, Dsmp. Traditional Sidha Medical Practitioner, Arni** for his interest and involvement in the research work and providing valuable clinical suggestions and the required participants for the study. The investigator is extremely thankful to **Mr. J. Saibaba, National Agro Foundation, Chennai** for his valuable training and suggestions for the nutrient analysis of the Health mixes to conduct her study successfully.*

*The investigator expresses her heartfelt thanks to all the selected **Handloom Weavers** from selected areas for their willingness to participate and for their cooperation throughout the study.*

*The investigator owes her gratitude to the **University Grants Commission, New Delhi** for providing financial assistance under the Major Research Project, to conduct the study.*

*The investigator is grateful to **all the labourers**, who helped in the processing and preparation of the health mixes, without whom, the project would not have been completed.*

*The investigator expresses her special thanks to **Mrs.M.Ramya, Ms. K.U.Pavitra, Ms.Ramya Siva Selvi, Mr.K.Poovanan, Mr.P.Sathishkumar,** and all other friends who directly or indirectly helped her to complete this project report.*

*The investigator expresses her deep sense of gratitude to her uncles **Mr.G. Mani, Silk Weaver, Mr.A. Sundaram, Reference Assistant, Connemara Library, Chennai** and **Mr.S.Subramanian, Senior Manager, Technical Marketing, Chennai** for their continuous support and motivation to carry out her study successfully.*

*The investigator acknowledges with deep sense of reverence and gratitude to her lovable father **Mr.V.Rajaraman** and mother **Mrs.R.Sarala,** and all her **close relatives, brothers** and **sisters** for their constant motivation, loving concern and encouragement in every stage of the study.*

*The investigator acknowledges her deep sense of gratitude to **Mr. K. Selvakumar, Data Analyzer, Euro Informatics, S.B. Colony, Coimbatore,** for his help in statistical analysis and documentation of the research work.*

CONTENTS

CHAPTER NO.	TITLE	PAGE NO.
	LIST OF TABLES	
	LIST OF FIGURES	
	LIST OF PLATES	
	LIST OF APPENDICES	
I	INTRODUCTION	1
II	REVIEW OF LITERATURE	12
	A. Significance of Adulthood and the role of Handloom Weavers	12
	B. Nutritional and Health status of Handloom weavers	17
	C. Strategies to improve the Nutritional Status of Handloom Weavers	22
	D. Role of Functional foods in improving Nutrition and Health Status	26
III	METHODOLOGY	38
	Phase I	
	Eliciting the Socio Economic, Dietary and other Background details of the Handloom Weavers	39
	A. Selection of Area and Handloom Weavers for the Study	39
	B. Formulation of Interview Schedule	41
	C. Collection of Information on Socio Economic, Dietary and other Background details of the Handloom Weavers	41
	Phase II	
	Assessment of Nutritional and Health Status of the selected Handloom Weavers	43
	A. Assessment of Nutritional Status	43
	1. Anthropometric Measurements	
	2. Biochemical and Biophysical Assessment	
	3. Clinical Examination	
	4. Dietary Assessment	
	B. Assessment of Energy Balance and Work Output	52

CHAPTER NO.	TITLE	PAGE NO.
	Phase III	
	Formulation and Testing of Health Mixes	53
	A. Selection of Functional Foods	53
	B. Formulation and Preparation of Health Mixes based on Functional Foods	61
	C. Acceptability Testing, Nutrient Analysis and Antinutritional factors of Health Mixes	63
	D. Shelf life of Health Mixes	65
	E. Computation of Cost of Health Mixes	66
	Phase IV	
	Supplementation of Health Mixes to the selected Handloom Weavers	66
	A. Selection of Weavers for Supplementation Study	66
	B. Supplementation of Health Mixes	68
	C. Evaluation of the Effect of Supplementation	69
	Phase V	
	Conduct of Nutrition Education Program	69
	A. Selection of weavers for Nutrition Education	69
	B. Development of Nutrition Education Materials	70
	C. Conduct of Nutrition Education Program	79
	D. Evaluation of the Effect of Nutrition Education Program	79
	Phase VI	
	Data Analysis	80
IV	RESULTS AND DISCUSSION	83
	A. Socio Economic, Dietary and other Background details of the selected Handloom Weavers	84
	1. Socio economic profile of the weavers	
	2. Dietary background of the weavers	
	3. Life Style pattern of the weavers	
	4. Work related details of the weavers	
	5. Health Problems among the weavers	

CHAPTER NO.	TITLE	PAGE NO.
	B. Nutritional Status of the Handloom Weavers	108
	1. Anthropometric measurements of the weavers	
	2. Biochemical parameters of the weavers	
	3. Biophysical parameters among the men weavers	
	4. Clinical examination of the selected handloom weavers	
	5. Food and nutrient intake and energy balance among the weavers	
	C. Details regarding the Formulated Functional Food Mixes	124
	1. Acceptability testing of the Health mixes	
	2. Nutrient analysis of the Health mixes	
	3. Antinutritional factors in health mixes	
	4. Shelf life of the Health mixes	
	5. Cost analysis of the Health mixes	
	D. Impact of Supplementation of the Functional Food Mixes on the Handloom Weavers	131
	1. Anthropometric measurements of the handloom weavers	
	2. Biochemical parameters of the weavers	
	3. Biophysical parameters among the men weavers	
	4. Clinical Examination of the weavers	
	5. Work Output of the weavers	
	E. Impact of Nutrition Education Program	156
	Knowledge, Attitude and Practice scores of the weavers	
V	SUMMARY AND CONCLUSION	159
	BIBLIOGRAPHY	177
	APPENDICES	204

LIST OF TABLES

TABLE NO.	TITLE	PAGE NO.
I	COMPOSITION OF HEALTH MIXES	63
II	AGE WISE DISTRIBUTION OF THE SELECTED ADULT HANDLOOM WEAVERS	85
III	EDUCATIONAL STATUS OF THE SELECTED HANDLOOM WEAVERS	86
IV	GENDER WISE DISTRIBUTION OF THE SELECTED HANDLOOM WEAVERS	87
V	TYPE AND SIZE OF FAMILIES OF THE SELECTED HANDLOOM WEAVERS	88
VI	MONTHLY INCOME OF THE SELECTED HANDLOOM WEAVERS	89
VII	DISTRIBUTION OF FAMILIES ACCORDING TO EXPENDITURE PATTERN IN COIMBATORE DISTRICT	90
VIII	DISTRIBUTION OF FAMILIES ACCORDING TO EXPENDITURE PATTERN IN VELLORE DISTRICT	91
IX	DISTRIBUTION OF FAMILIES ACCORDING TO EXPENDITURE PATTERN IN THIRUVANNAMALAI DISTRICT	92
X	DETAILS OF LOAN GOT BY THE SELECTED HANDLOOM WEAVERS	93
XI	TYPE OF DIET AND MEAL PATTERN AMONG THE SELECTED HANDLOOM WEAVERS	94
XII	TYPE AND QUANTITY OF BEVERAGES CONSUMED BY THE SELECTED HANDLOOM WEAVERS	95
XIII	TYPE AND QUANTITY OF OIL CONSUMED BY THE FAMILIES OF THE HANDLOOM WEAVERS	96
XIV	FOOD INTAKE PATTERN OF THE FAMILIES OF THE HANDLOOM WEAVERS	97
XV	TYPE OF HOUSES OF THE SELECTED HANDLOOM WEAVERS	100
XVI	DETAILS OF TRANSPORT FACILITY USED BY THE SELECTED HANDLOOM WEAVERS	101

TABLE NO.	TITLE	PAGE NO.
XVII	LOCATION OF WORK PLACE OF THE SELECTED HANDLOOM WEAVERS	101
XVIII	PRACTICE OF EXERCISE AND YOGA BY THE SELECTED HANDLOOM WEAVERS	102
XIX	SMOKING AND ALCOHOLISM AMONG THE SELECTED MEN HANDLOOM WEAVERS	103
XX	WORKING HOURS AMONG THE SELECTED HANDLOOM WEAVERS	105
XXI	DURATION OF WEAVING TIME OF SAREES WITH SPECIFIC DESIGNS BY THE SELECTED HANDLOOM WEAVERS	106
XXII	HEALTH PROBLEMS EXPRESSED BY THE SELECTED HANDLOOM WEAVERS	107
XXIII	VISION PROBLEMS AMONG THE SELECTED HANDLOOM WEAVERS	107
XXIV	MEAN HEIGHT AND WEIGHT OF THE SELECTED HANDLOOM WEAVERS COMPARED WITH ICMR (2010) VALUES	108
XXV	BODY MASS INDEX OF THE SELECTED MEN AND WOMEN WEAVERS	109
XXVI	HAEMOGLOBIN LEVELS AND THE CATEGORY OF ANAEMIA AMONG THE SELECTED MEN WEAVERS	111
XXVII	MEAN BLOOD GLUCOSE AND SERUM CALCIUM LEVELS OF THE MEN WEAVERS	111
XXVIII	MEAN SERUM PHOSPHORUS AND VITAMIN D LEVELS OF THE MEN WEAVERS	112
XXIX	CLASSIFICATION OF MEN WEAVERS ACCORDING TO RANDOM BLOOD GLUCOSE AND SERUM CALCIUM LEVELS	113
XXX	SYSTOLIC AND DIASTOLIC BLOOD PRESSURE VALUES OF THE HANDLOOM WEAVERS	114
XXXI	MEAN BLOOD PRESSURE VALUES OF THE WEAVERS	115
XXXII	CLASSIFICATION OF MEN HANDLOOM WEAVERS BASED ON JNC (2004) HYPERTENSION GUIDELINES	116
XXXIII	CLINICAL SIGNS AND SYMPTOMS AMONG WEAVERS	117

TABLE NO.	TITLE	PAGE NO.
XXXIV	MEAN FOOD INTAKE PER DAY BY THE SELECTED MEN HANDLOOM WEAVERS	119
XXXV	MEAN NUTRIENT INTAKE PER DAY BY THE SELECTED MEN HANDLOOM WEAVERS	120
XXXVI	MEAN ENERGY INTAKE, ENERGY EXPENDITURE AND ENERGY BALANCE OF THE SELECTED HANDLOOM WEAVERS (PER DAY)	122
XXXVII	MEAN ACCEPTABILITY SCORES OBTAINED BY THE DEVELOPED FUNCTIONAL FOOD MIXES	124
XXXVIII	PROXIMATE PRINCIPLES OF THE DEVELOPED FUNCTIONAL FOOD MIXES	125
XXXIX	MINERAL CONTENT OF THE DEVELOPED FUNCTIONAL FOOD MIXES	126
XL	VITAMIN CONTENT OF THE DEVELOPED FUNCTIONAL FOOD MIXES	127
XLI	ANTI NUTRITIONAL FACTORS OF THE DEVELOPED FUNCTIONAL FOOD MIXES	128
XLII	MICROBIOLOGICAL TESTING OF THE SELECTED HEALTH MIXES	129
XLIII	COST ANALYSIS OF THE HEALTH MIXES	130
XLIV	MEAN WEIGHT OF THE SELECTED HANDLOOM WEAVERS BEFORE AND AFTER SUPPLEMENTATION	131
XLV	MEAN BODY MASS INDEX OF THE SELECTED HANDLOOM WEAVERS BEFORE AND AFTER SUPPLEMENTATION	132
XLVI	MEAN HAEMOGLOBIN CONTENT OF THE SELECTED HANDLOOM WEAVERS BEFORE AND AFTER SUPPLEMENTATION	134
XLVII	MEAN FASTING AND POST PRANDIAL BLOOD GLUCOSE LEVELS OF THE SELECTED DIABETIC HANDLOOM WEAVERS BEFORE AND AFTER SUPPLEMENTATION	137
XLVIII	MEAN SERUM CALCIUM AND PHOSPHORUS LEVELS OF THE SELECTED HANDLOOM WEAVERS WITH MUSCULOSKELETAL DISORDER BEFORE AND AFTER SUPPLEMENTATION	140

TABLE NO.	TITLE	PAGE NO.
XLIX	MEAN SERUM VITAMIN D LEVELS OF THE SELECTED HANDLOOM WEAVERS WITH MUSCULOSKELETAL DISORDER BEFORE AND AFTER SUPPLEMENTATION	143
L	MEAN SYSTOLIC AND DIASTOLIC BLOOD PRESSURE VALUES OF THE SELECTED HANDLOOM WEAVERS WITH HYPERTENSION BEFORE AND AFTER SUPPLEMENTATION	145
LI	CHANGES IN THE CLINICAL EXAMINATION AMONG THE SELECTED WEAVERS BEFORE AND AFTER SUPPLEMENTATION	149
LII	MEAN LENGTH OF CLOTH WOVEN BY THE HANDLOOM WEAVERS WITH DIABETES MELLITUS BEFORE AND AFTER SUPPLEMENTATION	150
LIII	MEAN LENGTH OF CLOTH WOVEN BY THE HANDLOOM WEAVERS WITH HYPERTENSION BEFORE AND AFTER SUPPLEMENTATION	152
LIV	MEAN LENGTH OF CLOTH WOVEN BY THE HANDLOOM WEAVERS WITH MUSCULOSKELETAL DISORDER BEFORE AND AFTER SUPPLEMENTATION	154
LV	MEAN KAP SCORES OF THE SELECTED HANDLOOM WEAVERS BEFORE AND AFTER EDUCATION	156

LIST OF FIGURES

FIGURE NO.	TITLE	PAGE NO.
1	MAP OF THE SELECTED DISTRICTS OF TAMIL NADU	40
2	STEPS IN THE PREPARATION OF FUNCTIONAL FOOD MIXES	62
3	RESEARCH DESIGN OF THE STUDY	80
4	AGE WISE DISTRIBUTION OF THE SELECTED HANDLOOM WEAVERS	84
5	EDUCATIONAL STATUS OF THE SELECTED HANDLOOM WEAVERS	85
6	MONTHLY INCOME OF THE SELECTED HANDLOOM WEAVERS	89
7	BODY MASS INDEX OF THE SELECTED HANDLOOM WEAVERS	109
8	MEAN FOOD INTAKE PER DAY BY THE SELECTED MEN HANDLOOM WEAVERS	119
9	MEAN NUTRIENT INTAKE PER DAY BY THE SELECTED MEN HANDLOOM WEAVERS	121
10	ENERGY BALANCE OF HANDLOOM WEAVERS WITH DIABETES MELLITUS, HYPERTENSION AND MUSCULOSKELETAL DISORDER	123
11	CHANGES IN HAEMOGLOBIN LEVELS OF THE HANDLOOM WEAVERS WITH DIABETES MELLITUS	135
12	CHANGES IN HAEMOGLOBIN LEVELS OF THE HANDLOOM WEAVERS WITH HYPERTENSION	135
13	CHANGES IN HAEMOGLOBIN LEVELS OF THE HANDLOOM WEAVERS WITH MUSCULOSKELETAL DISORDER	136
14	CHANGES IN THE FASTING BLOOD GLUCOSE LEVELS OF THE DIABETIC HANDLOOM WEAVERS	138
15	CHANGES IN THE POST PRANDIAL BLOOD GLUCOSE LEVELS OF THE DIABETIC HANDLOOM WEAVERS	139

FIGURE NO.	TITLE	PAGE NO.
16	CHANGES IN THE SERUM CALCIUM LEVELS OF THE HANDLOOM WEAVERS WITH MUSCULOSKELETAL DISORDER	141
17	CHANGES IN THE SERUM PHOSPHORUS LEVELS OF THE HANDLOOM WEAVERS WITH MUSCULOSKELETAL DISORDER	142
18	CHANGES IN THE VITAMIN D LEVELS OF THE HANDLOOM WEAVERS WITH MUSCULOSKELETAL DISORDER	143
19	CHANGES IN THE SYSTOLIC BLOOD PRESSURE VALUES OF THE HANDLOOM WEAVERS WITH HYPERTENSION	144
20	CHANGES IN THE DIASTOLIC BLOOD PRESSURE VALUES OF THE HANDLOOM WEAVERS WITH HYPERTENSION	146
21	X-RAY OF A NORMAL KNEE, THE SPACE BETWEEN THE BONES INDICATES HEALTHY CARTILAGE (ARROWS). (RIGHT) X-RAY OF AN ARTHRITIC KNEE SHOWING SEVERE LOSS OF JOINT SPACE	148
22	CHANGES IN THE LENGTH OF CLOTH WOVEN BY THE HANDLOOM WEAVERS WITH DIABETES MELLITUS	151
23	CHANGES IN THE LENGTH OF CLOTH WOVEN BY THE HANDLOOM WEAVERS WITH HYPERTENSION	153
24	CHANGES IN THE LENGTH OF CLOTH WOVEN BY THE HANDLOOM WEAVERS WITH MUSCULOSKELTAL DISORER	155
25	CHANGES IN THE KAP SCORES OF THE HANDLOOM WEAVERS WITH DIABETES MELLITUS	157
26	CHANGES IN THE KAP SCORES OF THE HANDLOOM WEAVERS WITH HYPERTENSION	157
27	CHANGES IN THE KAP SCORES OF THE HANDLOOM WEAVERS WITH MUSCULOSKELETAL DISORDER	158

LIST OF PLATES

PLATE NO.	TITLE	PAGE NO.
1	COLLECTION OF BACKGROUND INFORMATION	42
2	MEASUREMENT OF HEIGHT	42
3	MEASUREMENT OF WEIGHT	42
4	DRAWING OF BLOOD SAMPLE	51
5	MEASUREMENT OF BLOOD PRESSURE	51
6	CLINICAL EXAMINATION	51
7	ACCEPTABILITY TESTING	64
8	NUTRIENT ANALYSIS OF HEALTH MIXES	64
9	EVALUATION OF SHELF LIFE OF HEALTH MIXES	64
10	DISTRIBUTION OF HEALTH MIXES TO THE HANDLOOM WEAVERS	67
11	CHARTS DEVELOPED	72
11a	CHARTS DEVELOPED	73
12	POSTERS DEVELOPED	74
13a	BOOKLETS DEVELOPED IN TAMIL	75
13b	BOOKLETS DEVELOPED IN ENGLISH	76
14	DISPLAY OF FOOD GROUPS	77
15	CONDUCT OF NUTRITION EDUCATION AT DIFFERENT PLACES	78

LIST OF APPENDICES

APPENDIX NO	TITLE	PAGE NO.
I	INTERVIEW SCHEDULE TO ELICIT DETAILS REGARDING SOCIO-ECONOMIC BACKGROUND, DIETARY PATTERN, LIFE STYLE AND HEALTH STATUS OF THE WEAVERS	204
II	SENSORY EVALUATION SCORE CARD	215
III	QUESTIONNAIRE TO TEST KNOWLEDGE, SATTITUDE AND PRACTICE SCORE	216
IV	ETHICAL CLEARANCE CERTIFICATE FROM AVINASHILANGAM INSTITUTE FOR HOME SCIENCE AND HIGHER EDUCATION FOR WOMEN, COIMBATORE	221
V	CERTIFICATE OF ANALYTICAL TECHNIQUES OFFOOD ANALYSIS AT FOOD SAFETY DIVISION, RESEARCH DEVELOPMENT (NATIONAL AGRO FOUNDATION) TARAMANI CHENNAI	222
VI	CERTIFICATE OF RESEARCH ETHICS AND POST RESEARCH PERSPECTIVES	223
VII	CERTIFICATE OF PATH FINDER – EXPLORE, EXPERIMENT, ELUCIDATE RESEARCH	224
VIII	PUBLICATIONS	225