

CHAPTER V

SUMMARY AND CONCLUSIONS

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Environment - The aggregate of external conditions - influences the life of human beings and ultimately determines the quality and survival of life. Man, with his varied activities, affects his environment in which he lives and in turn, is being affected by his environment.

The environmental quality is being constantly degraded by the activities of man. This is true not only for the macro but also for micro environment, that is, the household environment. The quality of micro environment is degraded to a great extent by smoke and fumes mainly due to combustion of fuels, use of various appliances, sound from various activities, lack of sanitation, lack of ventilation, excess of heat, poor lighting, etc. which affect the health of women as they spend maximum time in the kitchen.

A thorough review of literature revealed that the researchers have focused their attention mainly on outdoor environment and very little scientific data are available regarding indoor environmental quality. Hence, it was considered essential to study the quality of micro

environment, factors influencing it and its effects on health problems experienced by the homemakers. With this background the present investigation was undertaken with the following objectives :

Objectives of the Study

- 1) To find out the socio-economic and demographic characteristics of the respondents.
- 2) To assess the existing quality of micro environment in the kitchen and related problems faced by the respondents.
- 3) To find out the extent of exposure of respondents to media in relation to various aspects of environment.
- 4) To ascertain the level of knowledge of the respondents regarding the quality of environment.
- 5) To identify the practices followed by the respondents which affect the quality of environment in the kitchen.
- 6) To find out the health problems experienced by the respondents and their family members
- 7) To measure the environmental quality in the kitchens in terms of
 - a) air analysis
 - b) water analysis
 - c) sound levels
 - d) temperature levels
 - e) illumination levels

Hypotheses of the Study

- 1) The knowledge of the respondents regarding quality of environment will vary with following selected variables namely,
 - a) age of the respondent
 - b) educational level of the respondent
 - c) occupational status of the respondent
 - d) extent of exposure of respondents to media
- 2) The practices followed by the respondents which affect the quality of environment will vary with following selected variables namely,
 - a) age of the respondent
 - b) educational level of the respondent
 - c) occupational status of the respondent
 - d) income of the family
 - e) size of the family
 - f) extent of exposure to media by the respondent
- 3) There exists a positive relationship between knowledge of respondents and practices followed by respondents influencing quality of micro environment.
- 4) There exists a positive relationship between level of knowledge of the respondents and quality of environment.
- 5) There exists a positive relationship between practices followed by the respondents and quality of environment.

- 6) The quality of environment will vary with the locality in which respondents live.
- 7) There exists a positive relationship between quality of environment and health problems experienced by respondents.

Delimitations of the Study

- 1) The study was limited to three selected localities of Baroda city namely,
 - a) Industrial cum residential area
 - b) Commercial cum residential area
 - c) Residential area
- 2) The study was limited to 150 households comprising of 50 households from each locality.
- 3) The experiments were limited to measure the quality of micro environment in terms of :
 - a) air analysis
 - b) water analysis
 - c) sound levels
 - d) temperature levels
 - e) illumination levels

Methodology

Descriptive cum experimental research design was adopted for the present study. Interview technique was employed to gather required information and was supported by the observations made on the spot by the investigator regarding the existing quality of micro environment in the household kitchens.

The experiments were conducted to measure the environmental quality of household kitchens on various aspects in terms of air analysis, water analysis, sound levels, temperature levels and illumination levels.

A conceptual framework was developed to study the relationship of certain variables with quality of micro environment.

The interview schedule included structured questions divided into six sections which provided information pertaining to socio-economic and demographic profile of the respondents; existing quality of work environment which included questions related to kitchen size & orientation, ventilation, fuels, light, sound, heat stress, water, garbage disposal and building materials; extent of exposure to media; knowledge of respondents regarding quality of environment; practices

followed by the respondents influencing the quality of their work environment and health problems experienced by the respondents and their family members.

To measure the level of knowledge of the respondents regarding quality of environment, a knowledge test was developed and its validity and reliability was tested to standardize it.

The study covered household kitchens from three selected localities of Baroda city which included industrial cum residential, commercial cum residential and residential locality. A multistaged purposive cum random sampling design was used to select the households for the present study. Fifty households were chosen from each locality which comprised total 150 households. The data collection was done in two phases, namely, collection of empirical data and experimental work. The data were gathered personally making several visits. Home maker was the key informant for the investigation.

The data were scored, categorized, tabulated and presented in frequencies, percentages, mean and standard deviation for analyzing various information. Correlation coefficient, Analysis of Variance and 't' tests were employed to study the relationship of selected variables of the present investigation.

Major Findings of the Study

I. Socio - Economic and Demographic Characteristics of the Respondents

This included description of personal characteristics of the respondents, family characteristics and general information on respondent's work environment.

(1) The age of the respondents ranged from 19 to 60 years with a mean of 36.01 years. About 47 per cent of the respondents belonged to middle age group.

(2) Almost one half of the respondents were illiterate, 34 per cent had primary level education and rest had medium level of education.

(3) Almost three-fourths of the respondents were not employed and only one-fourth of the respondents were gainfully employed outside the house.

(4) More than half of the respondents belonged to joint family system. The total number of family members in the study ranged from one to 13 with a mean of 5.9. Number of children in these families (132 families had children) ranged from one to six.

(5) The income of the families ranged from Rs. 500 to 3500 with only two families having their monthly income of Rs. 5000 and Rs. 6000 each. The mean income of the family was Rs. 1442.40 per month. About 47 per cent of the respondents belonged to low-high income group having income from Rs. 1001 to 2000. Further, it showed that families living in residential locality had the lowest mean income of Rs. 1255.20 whereas, families living in commercial cum residential locality had the highest mean income of Rs. 1606.00 per month.

(6) Majority of the respondents lived in semi pucca houses and very few respondents had pucca big house to live in. In residential locality, respondents living in semi-pucca houses were highest compared to other two groups.

(7) In most of the cases, houses, streets and religious places like temple or mosque were found in the immediate surroundings of their houses. More than one-fourth of the respondents had schools, bus stand and shops near by their houses.

(8) Only 37.3 per cent of the respondents had separate kitchen, whereas, half of them used part of the room as kitchen, 12.7 per cent had their kitchen in open yard of their house. One to three persons were usually working

in the kitchen in these households. The average time spent by the home makers in the kitchen for cooking and related activities was 4.84 hours per day.

II Existing Quality of Micro Environment in the Kitchen and Related Problems Faced by the Respondents

This contained detailed information on various aspects of micro environment of household kitchens on the basis of which the quality of micro environment was determined.

(9) More than half of the kitchen had improper orientation and only 48 per cent of the kitchen had proper orientation, out of which 31.3 per cent of the kitchens were in east direction and 16.7 per cent of the kitchens were in north direction.

(10) Most of the kitchens (89.3 per cent) had floor space below the recommended standard size. But three-fourths of the respondents felt that the space available in the kitchen was adequate for them to work.

(11) There was provision of doors in 98.7 per cent kitchens, whereas, in 1.3 per cent kitchens no door but only opening was provided. About 68 per cent of the respondents were working in the kitchens without windows which was very disappointing. Total open space in terms

of windows and ventilation was inadequate in majority of the kitchens. Only 34.7 Per cent of them had provision of mechanical ventilation in term of fan only. Majority of the respondents had buildings in immediate surrounding facing their kitchen.

(12) Overall quality of ventilation was poor in about 47 per cent of the kitchens. While comparing the quality of ventilation in the kitchens in three localities it was found that majority of the respondents in commercial cum residential locality had poor ventilation in the kitchen as most of them had buildings in their immediate surrounding.

(13) About 93 per cent of the respondents used kerosene and 34 per cent used wood daily as main fuels. About 70 per cent of the respondents used pressure stove, 46 per cent used wick stove and 34 per cent of them used wood stoves daily. Use of wood stove was higher in residential locality. More than 80 per cent of the respondents used to keep cook stoves on the floor which did not allow easy air draft. Very few of them had provision of platform in industrial cum residential locality and residential locality. More than 50 per cent of the respondents used to keep the cook stoves in the corner of the kitchen. Smoke outlet in form of window, ventilators or open roof was provided in 62 per

cent kitchens. Almost all of them felt discomfort while working in the kitchen mainly due to high temperature and presence of fumes.

(14) Overall, about 80 per cent of the respondents had municipal water supply system directly through tap in the house, 18.8 per cent used community tap and few used overhead tank, community hand pump and hand pump in the house. All the respondents stored water for various purposes mainly in earthenware, stainless steel and plastic vessels. Use of stainless steel was more in commercial cum residential locality.

Main place for keeping water vessels was platform in the kitchen. About 71 per cent of the respondents faced the problems at the place where water vessels were kept. The main problems were water seepage and collection, presence of mosquitoes and presence of moss. About 85 per cent of the respondents felt changes with the quality of water, such as too much chlorination, turbidity and change in taste. More number of respondents (94 per cent) felt changes in quality of water in residential locality compared to other two groups.

(15) It was found that 68 per cent of the respondents were not getting enough natural light in the kitchen during working hours, hence, 65 per cent of them were using artificial source of light during day time.

Fluorescent lamp placed as general lighting was used by 40 per cent and filament lamp was used by 35 per cent of the respondents. Local lighting was used by about one-tenth of the respondents.

It was observed that nearly 53 per cent of respondents had poor and 30 per cent had good natural light in the kitchen. For artificial light in the kitchen, 60 per cent had poor but 25 per cent had fair lighting.

(16) Majority of the respondents felt loud sound from the non-electrical equipments used in the kitchen, such as, pressure cooker, stone grinder and kerosene stove. Other sources of loud sound felt by the respondents in the house were dish washing activity, washing of clothes, conversation of people, moving of things and furniture, banging of doors and children making noise. Light and moderate vehicles were also felt as sources of loud noise by about 59 per cent of the respondents.

Majority of the respondents felt loud sound from many sources outside the house, such as, children playing in the street, music from neighbour's house, street animals, vendors, religious activities and loudspeakers in the street. Thus, most of the respondents lived in very noisy surroundings.

(17) Almost 77 per cent of the respondents did not use dust bin for the collection of kitchen garbage. Comparing the three localities, number of respondents not using the dust bin was highest in residential locality. Out of those using dust bin, 45 per cent were keeping it in open yard, rest used utility area or kitchen to keep the dust bin. Average 900 grams of kitchen waste was produced per day by the households. About 97 per cent of them had problems of insects and pests like mosquitoes, houseflies and rats.

(18) On the whole 84 per cent did not have drainage facility in the kitchen whereas, 73 per cent of them had drainage facility in the utility area, out of which residential locality had less per cent having drainage facility. More than half of them had drainage in good condition and rest had open or leaking drainage.

19. On the whole, 45 per cent kitchens had bricks and cement plastered walls and 32 per cent had bricks and mud plastered walls. In commercial cum residential locality more number (66 per cent) had cement plastered walls and in residential locality 64 per cent had mud plastered walls.

Forty per cent of the kitchens had flooring of stones, 35 per cent had tiles and 24 per cent had mud and cow dung flooring. More than 50 per cent in commercial

cum residential locality had flooring of stones, 56 per cent in the industrial cum residential locality had tiles and 44 per cent of the respondents in residential locality had mud and cow dung flooring. Majority of the respondents had corrugated iron sheets roofs, about 83 per cent had wooden doors, majority had wooden windows in the kitchen.

Stones were used for work surface in 48 per cent kitchens. Whereas, in residential locality 44 per cent had used mud and cow dung for work surface. Only 29 per cent had wash area or sink in the kitchen and R.C.C and stone were used in majority of the kitchens.

(20) All the respondents had storage facilities in the kitchen, such as, portable shelves or racks and open shelves on wall and wood and metal were used as storage materials in majority of the kitchens.

(21) About 47 per cent of the kitchen walls had medium colors, 27 per cent had dark and 26 per cent had light colors on the walls. In residential locality 54 per cent had medium color and in industrial cum residential locality 36 per cent had light color on the walls.

About 35 per cent of the kitchen walls were very rough in texture and only 4.7 per cent had very smooth texture of the kitchen walls. More number (46 per cent)

had very rough kitchen walls and no one had very smooth kitchen was in residential locality. More number of respondents had slightly smooth textured walls in industrial cum residential locality.

(22) About 55 per cent of the kitchens were found fairly clean, only 23 per cent were clean and 22 per cent were dirty in appearance. About 45 per cent of the houses had dirty surroundings and only 15 per cent had clean surroundings. In industrial cum residential locality 58 per cent had dirty surroundings whereas, in residential locality 28 per cent had clean surroundings.

(23) From the scores given to various aspects of micro environment, the quality of micro environment was judged as good, average or poor. It was found that respondents living in commercial cum residential locality had the highest scores on for quality of environment and respondents living in residential locality had the least mean score on quality of micro environment.

III Extent of Exposure of the Respondents to Media in Relation to Various Aspects of Environment

(24) Overall, 31 percent of the respondents watched television, 30 per cent listened to the radio and about 29 per cent of them used to read newspaper for about less than half an hour per day ; 66 per cent were exposed to relatives and 55 per cent were exposed to friends as sources of information.

Only 28 percent of the respondents got some information mainly on importance of sanitation and sources and effects of pollution.

It was found that overall 70 percent of the respondents had medium level of exposure to media while 15 percent each had low and high level of exposure to media in relation to various aspect of environment. Comparing the three localities it was found, that in commercial cum residential locality respondents having medium level of exposure were higher (78 percent) and in residential locality respondents having medium level of exposure to media were lower (62 percent) .

IV Level of Knowledge of the Respondents Regarding Quality of Environment

(25) Majority of the respondents (68.7 per cent) possessed medium level of knowledge regarding quality of environment and only 20.7 per cent had high level of knowledge. Respondents having low level of knowledge were higher in residential locality compared to the other two groups.

V Practices Followed by the Respondents Which Affect the Quality of Micro Environment in the Kitchen

(26) Majority (62 per cent) of the respondents followed fair practices influencing quality of micro environment, only 18.7 per cent followed good practices.

While comparing the practices followed by the respondents among the three localities, it was found that, in industrial cum residential and commercial cum residential localities 24 per cent each followed good practices and in residential very few respondents followed good practices.

VI Health Problems Experienced by the Respondents and Their Family Members

(27) Majority of the respondents faced the problem of eye irritation most of the time while working in the kitchen. Respondents also faced the problems of sneezing (33 per cent), coughing (23 per cent) and headache (18 per cent) most of the time. Higher percentage of respondents faced these problems in commercial cum residential locality.

It was also found that majority of the adult family members suffered from cold, bronchitis and fever sometimes.

Most of the time 59 per cent children suffered from cold, 52 per cent from bronchitis, 35.6 per cent from fever and 33 per cent from diarrhoea. About 15 per cent of the home makers also suffered from blood pressure.

It was found that wide majority of the respondents had average health problems experienced while working in their micro environment.

VII Results of Experimental Work

(28) The results of air quality analysis showed that, out of 139 respondents using kerosene daily as main fuel, all the respondents had very high level of concentration of carbon monoxide and sulfur dioxide in their kitchens, but presence of nitrogen dioxide was not found in majority of the cases. Level of carbon monoxide ranged from 10 to 60 ppm and sulfur dioxide ranged from one to three ppm. Out of the 11 respondents using wood daily as main fuel, all had extremely high level of concentrations of carbon monoxide (150 to 500 ppm), sulfur dioxide (2 to 20 ppm) and nitrogen dioxide (1 to 3 ppm) in their kitchens.

(29) Majority (86.7 per cent) of the respondents were using drinking water having low to high level of pollution. The level of water pollution was found highest in residential locality (93 per cent). Very few respondents had clean drinking water.

(30) In 91 per cent of the kitchens, the sound level were above the recommended limits when activities were going on and ranged from 65 to 78 dB. Also it was found that, in more than half of the cases the sound levels were above the recommended limits even when no activities were being carried out and the range was 62 - 72 dB.

(31) All the respondents were working in the kitchen with temperature levels above recommended limits, the temperature levels ranged from 37 to 42=C.

(32) The illumination levels at the work place were below the recommended standards in 88 per cent of the kitchens and it ranged from 3 to 60 F.C. General illumination in the kitchen was found below the recommended limits in 74 per cent of the kitchens and it ranged from 5 to 42.5 F.C.

VIII Relationship Among the Variables

(33) In the present study it was found that, knowledge of the respondents regarding quality of environment varied due to age, educational level and exposure to media but did not vary due to occupational status.

(34) It was also found that the practices followed by the respondents which affect the quality of micro environment varied due to educational level, income of the family, size of the family and exposure to media whereas, age and occupational status did not affect the practices followed by the respondents. Positive correlation was established between knowledge and practices followed by respondents which affect the quality micro environment.

(35) The present investigation also revealed that, there is a relationship between knowledge of the respondents and quality of micro environment. It was also found that practices followed by respondents had a relationship with the quality of micro environment.

The findings of the study revealed that there did not exist any relationship between quality of environment and health problems experienced by the respondents.

Conclusions

On the basis of the findings of the present investigation following conclusions were drawn :

The sample of the study comprised of respondents having mean age of 36.01 years and half of them were illiterate. The mean family size was 5.91 and mean income of the family was Rs. 1442.40 per month and majority of them lived in semi pucca houses.

Overall quality of micro environment was average with variations on the basis of the locality in which the respondents lived. Improper orientation of the kitchen, inadequate floor space, inadequate open space interms of windows and ventilators led to poor ventilation in most of the kitchens. Little more than half of the kitchens were fairly clean and little less than half of the houses had dirty surroundings.

The air quality was poor because of the high concentration of air pollutants such as carbon monoxide, sulfur dioxide and nitrogen dioxide in the indoor air. The quality of drinking water was poor because in majority of the water samples the pollution was above the permissible standard limit. Most of the respondents lived in a very noisy surrounding exposed to various sources of loud sounds. The sound levels were above permissible limits while activities were going on in

kitchen and in more than half of the cases sound levels were above the standard even when the activities were not going on in the kitchen. The temperature levels were above recommended comfortable levels in all the kitchens while cooking was going on and even when cooking was not going on. The illumination levels during the day time at the work place were below the recommended values in all the kitchens.

Respondents had medium level of exposure to media, possessed medium level of knowledge regarding quality of environment and followed fair practices influencing quality of micro environment. Respondents had average level of health problems and were suffering mainly from eye irritation, sneezing, coughing and headache most of the time while working in the kitchen.

Age, educational level and extent of exposure to media affected the knowledge of the respondents significantly. Practices followed by the respondents were affected by the educational level, income and size of the family and exposure to media. The knowledge of respondents had a direct effect on the practices followed by the respondents which affect the quality of micro environment. Knowledge regarding quality of micro environment and practices followed by the respondents had direct impact on existing quality of micro environment. Health problems of the respondents was not significantly related with the quality of micro environment.

Thus, the overall quality of micro environment was average and several factors other than locality had an impact on quality of micro environment.

Implications of the Study

The present study brought out a number of implications for policy formulations and action programmes for different public and private institutions, government functionaries, educationists, technologists, engineers and town planners, environmentalists, home scientists, NGO's and women organisations who are concerned about environment and women. Certain implications have been listed as follows :

In the present study, almost half of the respondents were found illiterate and since lack of education emerged as one of the major constraints in maintaining quality of micro environment, literacy programmes need to be taken up by the government and education must be made compulsory for all.

Knowledge of the respondents was found as a driving factor for quality of micro environment in the present study and hence, education on environment should be imparted right from childhood.

Awareness regarding environmental sanitation and quality could be spread through formal and informal programmes by NGO's, social workers, women activists

and home scientists who are concerned about quality of environment and quality of life of women.

The message regarding importance of quality of environment and its impact on quality of life with special emphasis on quality of micro environment and impact on life of women and their family members could be spread among the masses through the use of various media.

Proper zoning and land uses should be strictly implemented by the town planners and urban development authorities to ensure good quality of environment for all, since, it was found in the present study that quality of environment varied in different localities.

The environmentalists should insist upon the local authorities to provide number of green belts in the city since, trees help to control sound and air pollution to certain extent.

There should be efficient garbage collection system and sewage disposal system in each and every corner of the city to curb the nuisance of garbage on roads which makes the surrounding dirty, promotes growth of insects which ultimately spread the diseases and lead to poor health status of citizens. Further, if properly collected and treated, garbage - organic in nature- could turn into rich bio-manure that can be used for greenery promotion activities.

Local authorities should provide clean drinking water and at the same time repair and maintenance of water supply system should be made more vigorous and efficient because somewhere during transportation to the houses, the water gets polluted.

Building by-laws should be made more strict and minimum standards for natural light and ventilation should be established for each and every house as the findings of the study revealed that most of the respondents worked in poorly lighted and ventilated kitchens.

Combustion of poor quality of fuels for cooking resulted in poor quality of indoor air and led to major discomforts in kitchen. Hence, government should promote use of solar cooker, improved wood stoves at subsidised rate for low and middle income group strata of the society.

Environment friendly construction materials and better building technologies suitable for regional conditions should be used by engineers and housing board authorities.

Last but not least, each one of us has a role to play in rehabilitating our environment which will lead to better quality of environment and healthy life for the present as well as future generations.

Recommendations for Future Research

- 1) An in-depth study of each individual aspect of micro environment could be taken up.
- 2) Air quality analysis could be studied in detail with effects of other parameters of micro environment.
- 3) Assessment of quality of lighting (both natural and artificial lighting) for various activities in home can be conducted.
- 4) Physical, chemical and bacteriological examination of drinking water from various sources could be conducted.
- 5) Sound control measures taken by home makers can be studied.
- 6) An analytical case study on quality of micro environment and its impact on health of the women can be taken up.