CHAPTER III

METHODOLOGY

This chapter deals with the methodological steps adopted for the present investigation. The study aims at identifying the causes of occupational health problems of women workers. Further the aim was to assess the impact of occupational health problems on women workers' output and household development. So a descriptive research design was thought to be appropriate for this study. The research procedures followed have been described under the following sub-heads :

1. Conceptual Framework of the Study
2. Variables Under Study
3. Operational Definitions
4. Selection of the Sample
5. Development of the Instrument
6. Method of Data Collection
7. Analysis of Data

1. Conceptual Framework of the Study

It is theorized that occupational environment is the main source of occupational health problems : both physical and mental. These problems influence the quality and quantity of worker's output, which in turn may limit or enhance worker's contribution to her household development. This is depicted in a conceptual framework (Figure 1). It is comprised of four major elements as follows :

CONCEPTUAL FRAMEWORK TO STUDY OCCUPATIONAL ENVIRONMENT, OCCUPATIONAL HEALTH PROBLEMS, OUTPUT AND HOUSEHOLD DEVELOPMENT

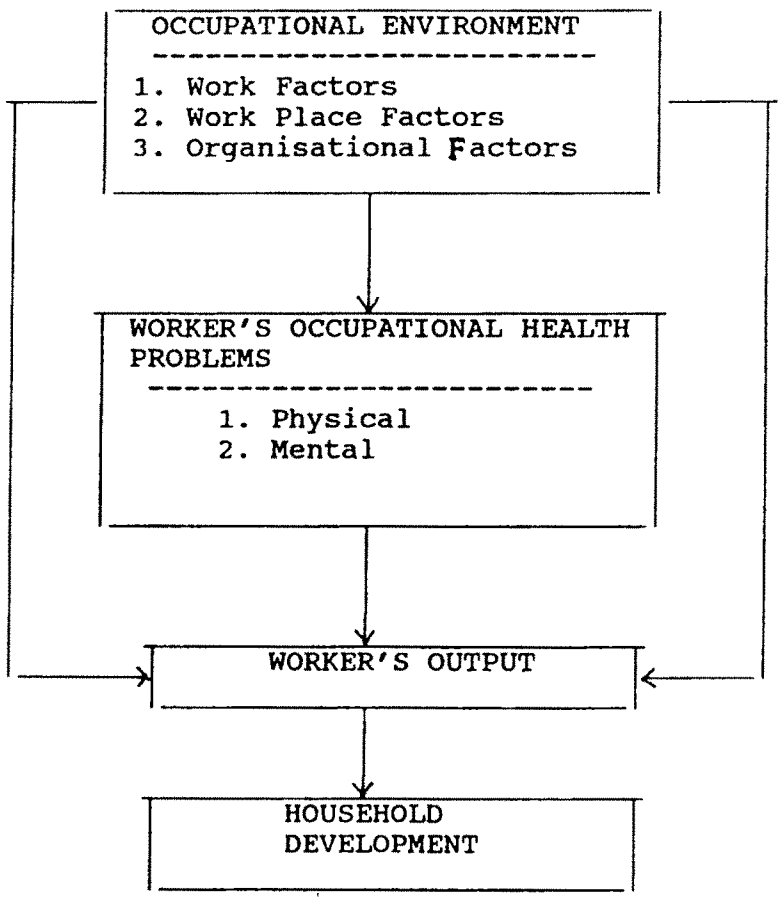

FIGURE 1

1a. Occupational Environment

This element is comprised of work factors, work place factors and organisational factors.

1a. (i) Work Factors

These include the posture at work, work duration, work movements, job security, overwork and job recognition. Unsuitable work factors create mismatch between worker's abilities and job demands.

1a. (ii) Work Place Factors

These consist of physical work conditions, mechanical factors, particulate matter and biological factors. Poor work place factors have detrimental effect on worker and it becomes intolerable for the worker to work in unhealthy environment.

1a. (iii) Organisational Factors

These represent human relations and labour welfare benefits at work place. Poor organisational factors cause low work motivation and dissatisfaction among workers.

So all these factors of occupational environment exercise an important and marked influence on the worker. Poor, undesirable and unsatisfactory occupational environment is the precursor of many occupational health problems.

1b. Occupational Health Problems

This component indicates a situation which results in some undesirable cost or reaction upon the worker. These problems create restrictions or lack of ability to perform an occupational activity in the manner considered normal for the worker. Occupational health problems are of two types :

1b. (i) Physical Health Problems

These include diseases, musculoskeletal disorders and injuries resulting from poor occupational environment.

1b. (ii) Mental Health Problems

These include mental strains, tensions, depression and worries etc.

These problems impair the physiological as well as psychological functioning of the workers and sometimes have serious repercussions on their lives.

1c. Worker's Output

This element refers to the money earned by the worker based on the quantity of work done by the worker in a specified period. (Piece rated income).

Breakdown of health or more frequent occupational health problems reduce the strength and capacity of the worker to work efficiently, which in turn severely limits and retards worker's output. Occupational environment under which a worker works also directly influences the output of the workers.

1d. Household Development

This component represents enhancement of quality of life of the family. More or less output in the form of money earned enlarges or restrains the scope of worker's household development. It means more of good things. It's main aim is to

make provisions for the family to enjoy better housing, more savings, additional durable goods and comforts, better nutrition, better health status, more access to education and skill and also to enhance the development of the respondent. Thus, woman worker's earnings play an important and crucial role in the development of her poor household.

The relationship between the elements is shown by bold lines.

2. Variables Under Study

The variables selected for the present study alongwith their relationship are shown schematically (Figure 2). In the following discussion, the dependent variable and the rationale for selecting the intervening and independent variables are highlighted.

2a. Dependent Variables

2a. (i) Worker's Output

Worker's output was considered as dependent variable. Worker's output and quality of occupational environment are closely related. A good occupational environment does not always assure a high level of productivity but the poor quality of it definitely discourages the output (Mathur, 1989). Occupational health problems resulting from poor occupational environment are one of the most important factors influencing worker's output. It is important to investigate this relationship. Not much research is available relating to this variable. Hence it was thought essential to include this variable in the present study.

SCHEMATIC REPRESENTATION OF INTERACTION OF VARIABLES

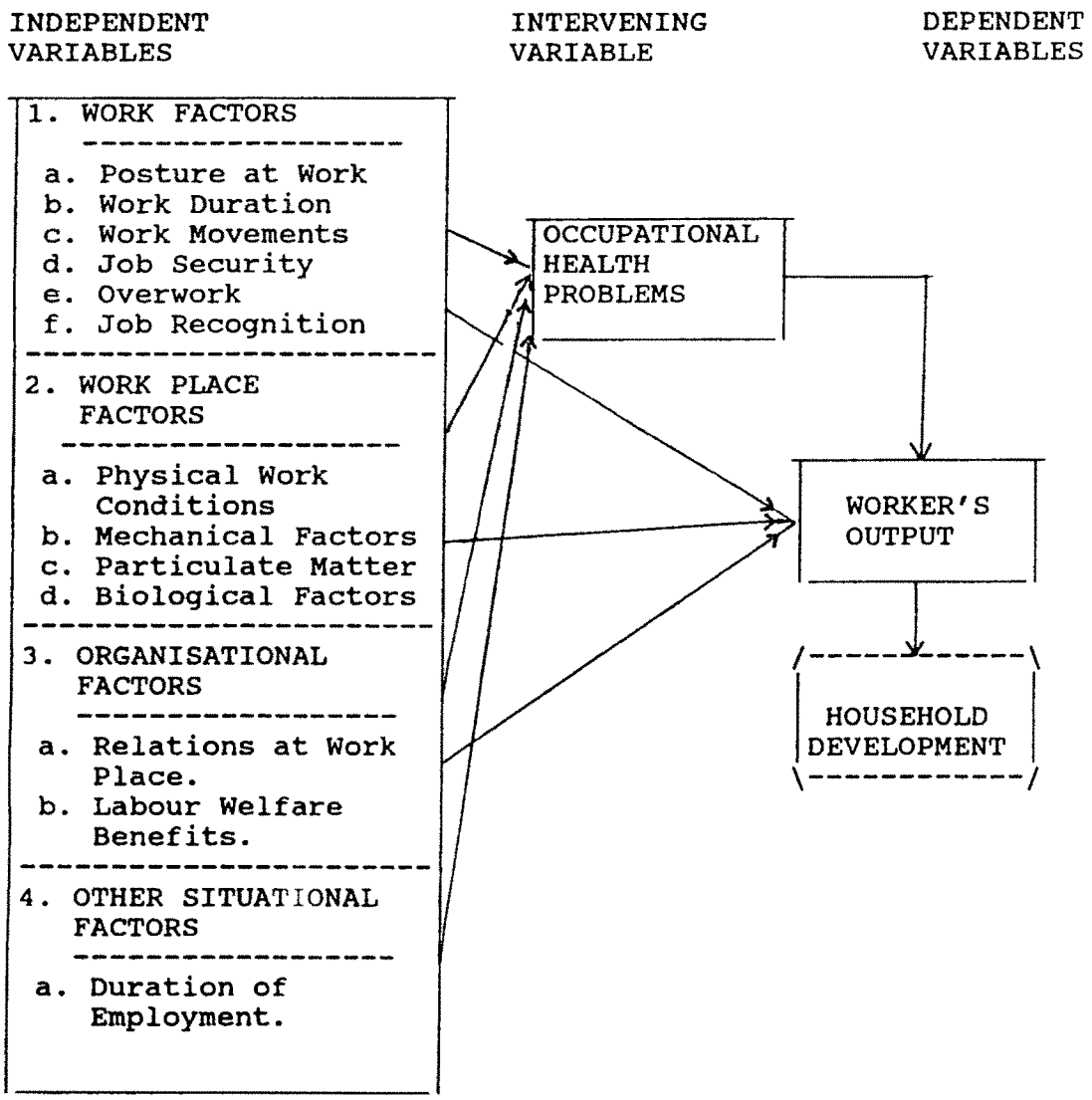

FIGURE 2

2a. (ii) Household Development

Women's contribution to income of family through employment definitely plays some role in improving and enhancing the quality of life of their households. Income earned by the worker affects the standard of living of the family. Worker's wages are highest

with highest output and higher output is the key to higher living and creates opportunity for improving the standard of living (Marull, 1966). To ascertain this relationship, it was thought imperative to include this variable.

2b. Intervening Variable

2b. (i) Occupational Health Problems

It was a key variable of the study. It was incorporated as intervening variable. The intervening variable acts as dependent variable being directly affected by other independent variables i.e., work factors, work place factors, organisational factors and other situational factors and it also acts as an independent variable in its effect on dependent variable on output of worker.

Occupational health problems indicate a situation which brings about disharmony and disorder in the life of the individual. It is a situation where a worker has no control and finds herself/himself incompatible to function satisfactorily on her/his own. The researches reviewed (Vishwanathan and Jaffery, 1990; Shariff, 1990; Gulati, 1991; Francis, 1992; Nair, 1992; Selvarani, 1992) showed that occupations account for most of the illnesses in the workers. Among the work related disorders are cancers of different organs, chemically induced nervous disorders, lung diseases, skin diseases and occupational accidents which cause disabilities, mental health problems and deaths. The studies revealed that there was not much literature on impact of occupational health problems on output of workers. Hence, this variable has been chosen for the study.

2c. Independent Variables

2c. (i) Work Factors

Posture at Work : It was considered as one of the most important components of work factors. It affects the performance of the worker at work place. Poor posture distorts the normal way of working and causes tiredness, backache, accidents and postural defects (Oja, Kuroinka and Karhu, 1981). Not many researchers explored posture at work as a variable in relation to occupational health problems, hence it was included in this investigation as a significant variable.

Work Duration : The vital part of overall work environment is the amount of time spent on the job and the number of hours worked. The health and efficiency of workers depend on the number of hours they have to work. In case of long working hours the worker is bound to be tired and slacken in her/his duties. This tiredness often becomes the cause of her/his shattered health which ultimately tells upon her/his efficiency (Upadhayay, 1980; Zaheeruddin, 1985). The investigator was hence keen to investigate the strength of this variable.

Work Movements : Work movements have a significant bearing on occurrence of occupational health problems (Gilmer, Von and Edward, 1977). When the work movements are repetitious, then the health problems are compounded many times. These movements result in boredom and lack of interest in work. Lack of information on this variable inspired the investigator to develop keen interest in studying this variable.

Job Security : Job security is believed to play an important role in lowering the level of illnesses. Lack of job security aggravate mental health problems. Workers feel insecure due to piece rated work and technical obsolescence. Job insecurity becomes a source of constant stress. Imagined fears of being eased out or fired from job make a worker sick with anxiety. Employers make use of this sort of insecurity to exploit workers (Selvarani, 1992). To explore this relationship and its authenticity, this variable was found to be of crucial value to the study.

Overwork : The jobs where wages are paid on the basis of piece rated output, there is a tendency to overwork for earning the promised wages. The workers are forced to work harder, forfeiting their valuable rest time which causes nervous troubles, tiredness and distruption of normal routine (Selvarani, 1992). Not many researchers included overwork as a variable in relation to occupational health problems and output of the worker. Such lacunae in the knowledge of this variable has motivated the investigator to find out the impact of this variable on occupational health problems.

Job Recognition : Recognition of work and scope for individual advancement and growth are the major factors that stretch the person's abilities to the full and play a great part in worker's efficiency (Schultz, 1978; Dastmalchian, Blyton and Adamson, 1989). Lack of enough literature exploring influence of lack of job recognition on health problems and output inspired the investigator to incorporate this variable in the present study.

2c. (ii) Work Place Factors

Physical Work Conditions : Physical work conditions consist of two general categories. The first consists of the physical space and related facilities which people use. The second consists of various aspects of ambient environment such as illumination, atmospheric conditions and noise. Better physical conditions represent the conditions which improve conditions of work and life for the workers, which lead to the increasing adaptation of the workers to her/his tasks. The undesirable physical conditions tend to impose certain constraints on the behaviour such as limiting the range of worker's movements or restricting her/his field of view (Maccormick, 1981). The influence of physical conditions on occupational health problems and on output of the worker has been studied and its significant association was established. Sunderstron and Sunderstron (1986) reported that a factory worker in uncomfortably hot conditions experiences psychological stress and consequently performs a complex task less effectively than at a comfortable environment and at the same time the worker feels dissatisfied with the working conditions and perhaps with the job itself. Selvarani (1992) found that bad working environment causes the worker to feel sick or suffer from fatigue, headaches and dizziness. Positive association between physical conditions and work performance was reported by Schultz (1978). Therefore, it was thought to be appropriate to include this variable for the present study in the context of occupational health problems and output of the workers.

Mechanical Factors : Mechanical factors create a significant impact on occupational health problems. Unsuitable and obsolete equipments or tools or machinery cause the worker to suffer from serious injuries to hands and arms (Francis, 1992; Vimal, 1992). So this variable was considered potent enough to be incorporated in the investigation.

Particulate Matter : Particulate matter in the form of dust and chemicals was found to be associated with occurrence of occupational health problems (Saxena, 1980; Francis, 1992; Vimal, 1992). Exposure to dust and chemicals at work place results in poisoning, cancer, stunted growth of children, deformities, blindness and diseases of lungs, liver and nervous system. The investigator was hence keen to investigate the strength of this variable in the present study.

Biological Factors : Biological factors are believed to play an important role in influencing occupational health problems. Wet or rotten matter contain a high content of bacteria and spores and mycelia of fungi, some of which are known to be pathogenic. Viable counts of such fungi may reach figures as high as 400 millions per gram of matter. When such masses of fungi exist in dust inhaled, they appear in sputum. Along with this inhalant, allergic symptoms occurs from sensitization to fungus spores or mould spores. These cause reactions in peripheral part of the bronchopulmonary tree (Legge, 1974). It was felt necessary to include this variable in the present study.

2c. (iii) Organisational Factors

Relations at Work Place : Industrial relation climate is defined as a subset of organisational climate that pertains to the norms and attitudes reflecting worker-management relationship in an organisation (Dastmalchian, Blyton and Adamson, 1989). Relations include the nature of relationship and social support from one's colleagues, boss and subordinates. Davidson and Cooper (1981) reported that everyday workers face people and situation about which there is uncertainty of outcome, wherein appropriate behaviour is not prescribed and validated by tradition and where the possibility of bodily or psychological harm exists. So the best of development can take place only when we have a fine blending of freedom and discipline.

Ramalingam (1961); Sunderstron and Sunderstron (1986) and Choudhary (1990) reported that workers are not motivated by financial incentives alone but the nature of relations are of major importance. Interaction between people is important and regulation of immediacy, psychological closeness or distance all affect an individual's mental health. Not only toxic substances found in work operations can cause serious illnesses but poor organisational relations can cause psychosomatic diseases. Good relations and greater participation in organisational structure lead to higher productivity, improved performance, lower staff turnover and lower levels of physical and mental illnesses. Thus, keeping in view the association between relations at work place and occupational health problems and output, the relations at work place was considered as important variable in the present context.

Labour Welfare Benefits : Labour welfare benefits are the combination of all efforts to make life worth living for the worker. According to ILO (1974) reports workers' welfare covers such services, facilities and amenities which may be established in or in the vicinity of an undertaking to enable the persons employed there to perform their work in healthy and congenial surroundings. The influence of labour welfare benefits on occupational health and output of the worker was studied and its significant association was established. Srivastava et al., (1967); ILO (1974); Lin (1984) and Sudhir (1992) stated that labour welfare benefits play an important role in contributing to social contentment, industrial stability and higher productivity and efficiency of working force. The investigator was hence keen to investigate the strength of this variable in the present study.

2c. (iv) Other Situational Factors

Length of Job : The prevalence of disease increases with the increase in length of job of the worker (Pravizpoor, 1977). The impact of length of job on occupational health problems has not been revealed by many researchers. Therefore to get more information, it was thought to be appropriate to include this variable for the present study.

On the basis of the above observations, it was thought appropriate to include all the above mentioned variables in the present investigation.

3. Operational Definitions

Certain terms were operationally defined for measurement of variables of this investigation which are described as follows :

Occupational Environment

The environment considered for the present study is comprised of work factors, work place factors and organisational factors prevalent in the industries.

Posture at Work

It is the body position required in the performance of various tasks related to work.

Work Duration

It refers to number of hours of work at work place.

Work Movements

These are the motions needed for performing work (especially hand movements).

Job Security

It is the sense of guarantee of not losing the job.

Overwork

It is the work done over and above one's capacity to work.

Job Recognition

It is the acknowledgement of job through words of praise, cash or kind by the employer which provides motivation to worker.

Physical Work Conditions

These include physical aspects of work place e.g., noise, lighting, ventilation, flooring and temperature at work place. These also include water facility, toilet facility and dust bin facility.

Mechanical Factors

These deal with tools or equipment provided at work place to do the job.

Particulate Matter

It is the dust generated into atmosphere as a result of production processes.

Biological Factors

These refer to contact with fungus or insects at work place.

Relations at Work Place

The relations at work place refer to human behaviour reflecting the relationship between worker and employer, worker and supervisor, worker and colleagues.

Labour Welfare Benefits

These deal with anything done for the betterment of worker by employer. Benefits can be in the form of bonus, insurance, old age security, loan, provident fund, medical facility/allowance, tips at the time of festivals and distribution of gifts. Benefits also include other facilities e.g., housing creche, maternity benefits, training, canteen facility, recreation facility, conveyance facility, sitting and rest rooms.

Duration of Employment

It is the total period of employment of the worker.

Awareness

It is defined as worker's consciousness about sources of occupational health problems.

Occupational Health Problems

These are defined as diseases/injuries/health disorders resulting from occupational environment which may hinder the performance of a worker. These are based on subjective reporting of problems.

Output

It is defined as the amount of money earned by the worker on the basis of piece rated quantity of work.

Household Development

It refers to quality of life enjoyed by the family as a result of women workers' money income and to be assessed in terms of :

Development of Respondents

It includes respondents' control over family finances, role played in household decisions, respondents' freedom to participate in social/community activities and sharing of household work by other family members.

Development of Family Members

It deals with health status, education and acquiring of skills by family members.

Level of Living of Family

It refers to housing conditions, saving, possession of consumer durable items, consumption expenditure pattern and dietary pattern of the family.

4. Selection of the Sample

4a. Locale of the Study

The present study was carried out in Panipat district in Haryana state. Panipat has a name for handloom products. It is called city of handlooms. It's products have been enjoying a high reputation for their distinctive designs and excellent

workmanship in the world market. It is Asia's biggest export centre for handloom products. Total direct export is more than Rs. 350 crores/year. Most of direct export is to Germany, Japan and America. Out of the total export 70 per cent of export is of various types of floor coverings, 20 per cent of cushion covers, table mats, bed covers, table covers, curtain cloth and bags and 10 per cent of export is of running material (i.e., Tapestry and Khaddar etc.). Approximately one lakh weavers and 1.5 lakh assistant workers are benefitted from employment in these industries. There are three channels i.e., Haryana Handloom Weavers Apex Society, Weavers' Service Centre and Haryana Handloom and Handicraft Corporation which provide technical and financial assistance. These channels provide training, create new designs, help in export and hold exhibitions of different products.

As the researcher herself belongs to Panipat, hence well versed with social and cultural norms which facilitated her in establishing rapport with the respondents for ensuring reliable data.

4b. Sampling Design

A multistage purposive sampling design was followed to select the study area, industries and women workers. The stages comprised of selection of area, selection of industries and selection of workers (Figure 3).

SAMPLING DESIGN ADOPTED FOR THE PRESENT STUDY

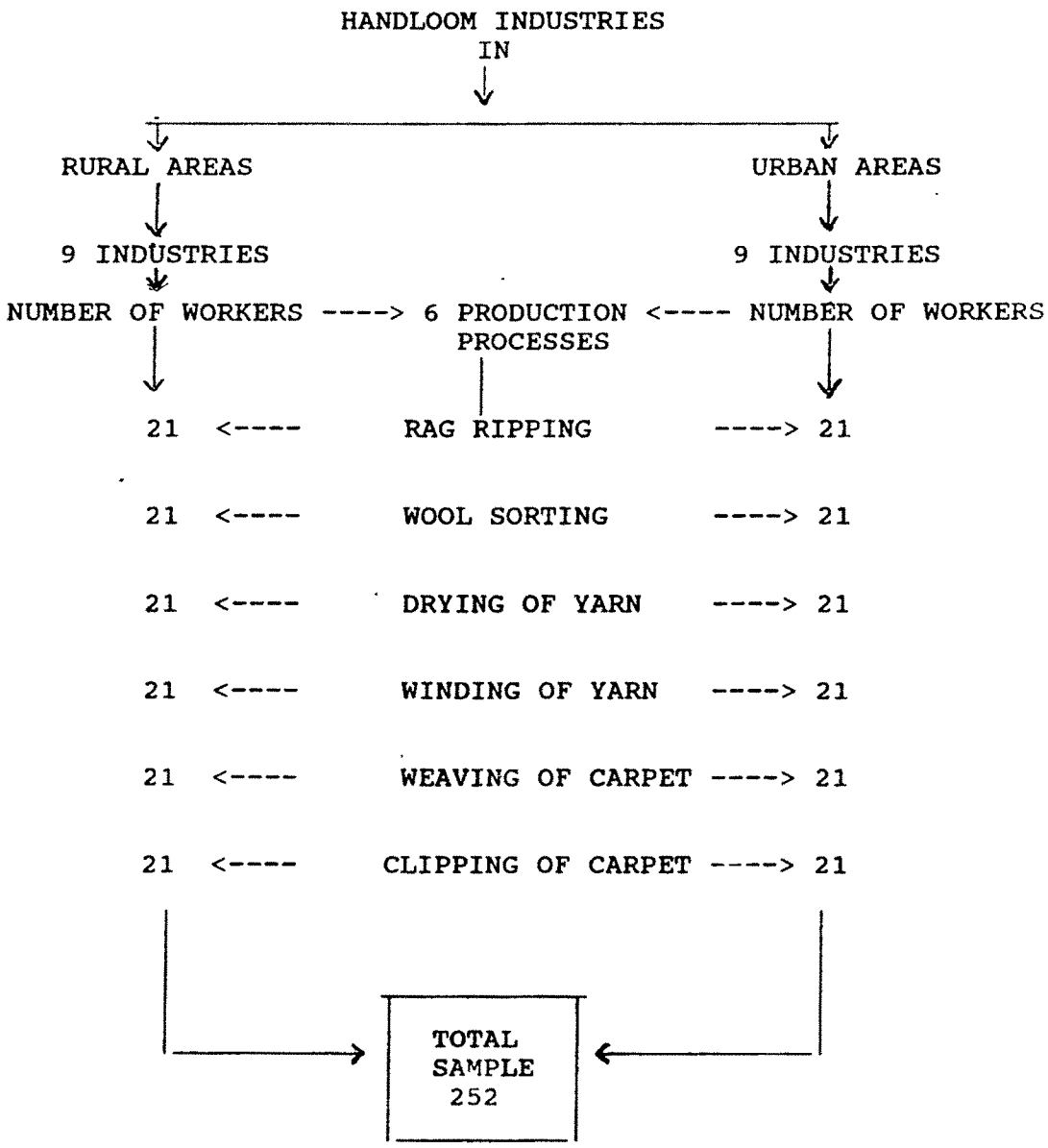

FIGURE 3

4c. Selection of Areas

A preliminary survey of areas where handloom industries were located was done. Barsat, Noorwala and Ugra-kheri (Rural areas)

and Industrial area, Krishan-pura and Devi-murti colony (Urban areas) along with their surrounding areas were selected.

4d. Selection of Industries

An attempt was made to select the units which had almost equal work timings and piece rated wages. Eighteen establishments engaged in yarn making, carpet making, dhurrie making and blanket making were selected : 9 from rural areas and 9 from urban areas.

4e. Selection of Women Workers

A total sample of 252 women workers was selected consisting of 126 women workers each from rural and urban areas. These workers were engaged in six different production processes i.e., rag ripping, wool sorting, drying of yarn, winding of yarn, weaving of carpet and clipping of carpet. In each production process, 42 workers (21 from rural and 21 from urban areas) were selected. Only married women especially with children were selected.

5. Development of the Instrument

The objectives formulated for the study guided the development of an interview schedule. The schedule comprised of six sections :

- Section I provided information on respondents' personal and family characteristics.

- Section II was designed to elicit information on occupational profile of women workers and also on various work factors, work place factors and organisational factors. It also contained awareness statements to measure level of awareness regarding sources of occupational health problems. Questions pertaining to satisfaction level of women workers with various factors of occupational environment were also included in this section.

- Section III dealt with occupational health problems arising from work factors, work place factors and organisational factors. The questions regarding type of medical facility provided by the employers, work done during illness, number of days leave taken, type of treatment taken and reasons for not taking treatment were included in this section. In addition to these, steps taken by women workers to overcome their difficulties were also included.

- Section IV was designed to elicit information on employers' view points about women workers' output, categories of jobs reserved for women, facilities provided to the workers and the improvements they wanted to make.

- Section V contained questions to assess the impact of occupational health problems on household work. It also contained questions pertaining to respondents' control over family finances, role played by respondents in household decisions, respondents' participation in social/community activities, sharing of household work, health status of

family members, education and acquiring of skills by family members and self help work in the family. The questions regarding housing conditions, saving, loan taken, possession of consumer durable items, expenditure pattern and dietary pattern, satisfaction with family living and future goals of respondents were also included.

- Section VI contained observation proforma about work place factors and some visible symptoms of health problems of workers.

5a. Development of Awareness Scale to Measure Awareness Level about Sources of Occupational Health Problems

The objective of assessing the level of awareness regarding sources of occupational health problems required a standardised scale to measure it. The content validity and reliability of the scale was determined as follows :

5a. (i) Item Collection

The content of the scale comprised of questions called items. Items relevant to study the awareness regarding sources of occupational health problems were developed after an extensive survey of related literature, bulletins and other publications. The most important factor considered in collecting and framing the items was that it should be within the level of women workers' understanding. These statements were then thoroughly screened and edited so as to make them simple, clear and meaningful.

Content Validity of the Awareness Scale : The validity of a scale concerns what the scale measures and how well it does so ? The content validity assesses the relevance of the scale to the stated purpose. The carefully edited 49 items were then submitted to a panel of 9 judges who were experts from Faculty of Home Science, M. S. University of Baroda and experts from Psychology Department (Industrial Psychologist). The judges were requested to indicate their judgement on clarity of each statement and relevance of each statement to the awareness being measured. The judges responses were then tabulated (Appendix I). Items with consensus of seventy per cent or more judgement on clarity of the statement and relevance to the awareness test were retained in the scale. As per the judgement of panel of experts five items were eliminated. Forty-four items were included in the awareness scale to be pre-tested.

5b. Pre-testing of the Schedule

The awareness scale was translated into Hindi language. The scale so developed and the interview schedule were pre-tested on 30 randomly selected non-sampled women workers in Panipat. Pre-testing was done to see the clarity of the interview schedule and to establish reliability of awareness scale. Minor changes were made in the schedule on the basis of pre-testing which was then utilized for the final collection of data.

5c. Reliability of the Instrument

Reliability refers to accuracy (consistency and stability) of measurement by a test (Anatasi, 1982).

For the awareness scale, test retest reliability method was used. To ascertain the reliability of the instrument, the following procedure was adopted :

5c. (i) Scoring of Responses on the Awareness Scale

The responses of the women workers on each item were quantified by ascribing scores. Scores of one to three were assigned to categories : 'Not aware', 'Somewhat aware' and 'Aware' respectively which indicated the extent of awareness.

5c. (ii) Reliability Coefficient of Awareness Scale

The scores of each woman worker in the first test and in the second test were totalled up and the variance was calculated. Reliability coefficient was calculated by using the following formula :

$$r_{xx'} = \frac{S_t^2}{S_x^2}$$

$r_{xx'}$ = Reliability coefficient

S_t^2 = Variance of the first test

S_x^2 = Variance of the retest.

The reliability coefficient computed was 0.81. The scale gave high reliability values indicating that the scale was reliable for measuring awareness of women workers.

6. Method of Data Collection

6a. Interview Method

The data were gathered personally by using interview method supported by observation. Women workers were the key informants of the investigation. A visit was made to each of the selected industries prior to data collection in order to establish a rapport with the employer and women workers to ensure full confidence and cooperation from the employers and women workers. The investigator was accompanied by well-known industrialists in the first visit and was introduced to the employers of various factories. The investigator visited each selected factory and interviewed the women workers utilizing the schedule. Respondents were interviewed in Hindi language. Attempts were also made to interview supervisors and male workers mostly informally. The employers of 18 factories were also interviewed. Considering the higher level of illiteracy and ignorance among large number of workers and moreover strict vigilance of the owner over the activities of workers, it was certainly tedious job to collect information. In many cases hostility of owners created problems and more tactful approach was used. The investigator also visited the houses of the workers wherever these were approachable. Data collection took 1 1/2 to 2 hours for each woman worker and hence the investigator was able to interview only 2 to 3 workers in a day. Data were gathered from the month of July 1993 to January 1994.

6b. Informal Discussions

The information particularly with respect to rate of wages, facilities provided and categories of jobs for women workers was collected during informal discussion with male colleagues, supervisors and also with employers. This helped in cross verification of data.

6c. Observation

Indepth observation of various work place factors and facilities available at work place was carried out and recorded. Women workers' visible symptoms of health problems were also observed and noted down by the investigator.

6d. Clinical Examination

Clinical examination of symptoms of chest problems was carried out on 60 women workers. Only those women workers who had reported more frequent chest problems during interview time were selected provided they were willing to get examined and those who were on the job for about 10 years. The selected workers were examined by a chest specialist. The reports of the clinical examination were useful to cross validate the information given by the workers.

7. Analysis of Data

7a. Categorization and Scoring of Data

For the purpose of analysis, data were categorized and scored as follows :

7a. (i) Suitability of Work and Work Place Factors

These were categorized and scored as follows :

Category	Scores
To a great extent	3
To a less extent	2
Not at all	1

The pattern of scoring was reversed for the items indicating negative characteristics of work factors and work place factors.

7a. (ii) Suitability of Relations at Work Place

The suitability of each type of human relation was categorized and scored as follows :

Category	Scores
Always	3
Sometimes	2
Never	1

The pattern of scoring was reversed for the items indicating negative characteristics of human relationships at work place.

7a. (iii) Labour Welfare Benefits

Labour welfare benefits were measured on two point scale as follows :

Category	Scores
Provided	2
Not provided	1

7a. (iv) Awareness Level

Awareness level of women workers about sources of occupational health problems was categorized and scored as follows :

Category	Scores
Aware	3
Somewhat Aware	2
Not aware	1

7a. (v) Occupational Health Problems

A list of 66 statements indicating occupational health problems was made and extent of occurrence of problems was categorized as : 'Always', 'Sometimes' and 'Never' and which was scored as 3, 2 and 1 respectively.

Total occupational health problems score would range from a minimum of 66 to a maximum of 198. It is thus assumed that higher the score, higher the extent of occurrence of occupational health problems felt by women workers. Categories of extent of number of occupational health problems suffered by women workers were also made.

Category	Scores
Too many	Above mean
Many	Below mean

7a. (vi) Output

Extent of output in terms of income was categorized and scored as follows :

Category	Scores
More	Above mean
Less	Below mean

7a. (vii) Household Development

Extent of household development was judged on the basis of information provided by respondents in relation to their individual development, development of their family members and level of living of family before they took the employment and at the time of interview. One extra score was given if there was any change after they took employment. So difference between before and after conditions was considered as household development scores. On the basis of scores obtained, the following categories of extent of household development were made.

Category	Scores
More	Above mean
Less	Below mean

7b. Statistical Analysis of Data

The data collected were coded according to code numbers assigned and were analysed employing descriptive as well as relational statistics.

7b. (i) Descriptive Statistics

The personal and family variables, occupational profile of women workers, suitability of occupational environment, frequency of occurrence and extent of severity of occupational health problems and employers' view points were represented in frequencies and percentages. Level of awareness was represented in mean scores and output was represented in mean output. Data pertaining to type of impact of occupational health problems on household work and impact of income earnings on household development were also represented in frequencies and percentages.

7b. (ii) Relational Statistics

Chi-square was used to find out the association between the variables and t-test was employed to find out the differences among groups. Linear stepwise multiple regression and Karl Pearson Product Moment Correlation were computed to find out the relationship between variables.

Before doing the multiple regression analysis, outliers were detected. Outliers are considered to be those sample points in the data which exhibit extremities in their behaviour and influence very heavily the analysis of the data. Presence of even few outliers in the data can lead to the wrong analysis if they are not detected and removed from the data before any analysis is applied. Therefore, quite often, they are called as 'bad points' in the data. It is a well-known principle in statistics saying that the presence of a single bad point in the data has more

adverse effect on the regression analysis than that of a good point when it is removed from the data.

With this point of view in mind, regression diagnostics was applied and data was cleaned by removing 10 outliers. Then multiple (stepwise) regression techniques were applied to the data.