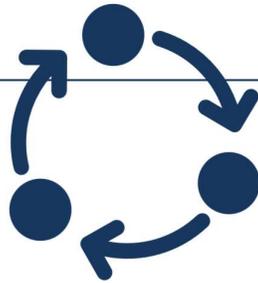# METHODOLOGY

CHAPTER - III
METHODOLOGY

The methodology is the overall strategy chosen to integrate different components, utilized to carry out research that defines a concise, coherent, and logical plan to tackle established research question(s) through the collection, interpretation, analysis, and discussion of data, ensuring effective addressing of the research problem (Thakur, 2021). The plan of investigation, operational definitions, and the procedure followed for the development of the tool are presented in this chapter. The procedure for the collection of data and its statistical analysis is described here. The major focus of the present investigation was to identify the problems experienced by the residents of small houses especially related to furniture in various areas of the house. After considering the same, the researcher proposed various multipurpose furniture options using a combination of furniture materials, suitable for small space houses. To achieve the objectives of the study, the sequence of procedure taken into consideration is presented in this chapter as follows.

3.1 Research design

3.2 Operational definitions

3.3 Locale of the study

3.4 Unit of Inquiry

3.5 Sample size and sampling procedure

3.6 Selection of tool

3.7 Development of the tool

3.8 Establishment of content validity of the tool

3.9 Establishment of reliability of the tool

3.10 Data Collection

3.11 Data analysis

3.12 Development of designs of multi-purpose furniture using a combination of Interior materials for small houses.

3.13 Development of a catalogue of proposed designs of multipurpose furniture

3.14 Intervention program for homeowners.

3.1. Research Design

"A research design also called a research strategy, is a plan to answer a set of questions" (McCombes, 2019). A descriptive research design was found to be most suitable for the current research. For the present study, the descriptive research design was selected. An in-depth study of the problems experienced by the residents of the small houses, especially related to furniture, was conducted in the various parts of Vadodara city.

3.2. Operational Definition

Certain terms were operationally defined for the present study. They are as follows:

3.2.1. Small spaces: In the present study small spaces are defined as a residential unit whose built-up area is up to 600 square feet.

3.2.2. Multi-purpose furniture: For the present study multi-purpose furniture is furniture with multiple usage/purposes or having more than one use.

3.2.3. Extent of problems: For the present study the extent of problems is defined as the extent to which the respondents experienced problems related to furniture in different areas of their residence.

3.3. Locale of the study

The locale of the study was Vadodara City. Vadodara. Samples were collected from all four zones viz. east, west, south, and north zone of Vadodara city which included 38 areas namely; Gotri, Vasna, Bhyli, Tarsali, Gorwa, Waghodia, Akota, Sama-Savli, Ellora Park, VIP Road, Productivity Road, Maneja, Harni, Kalali, Sevasi, Ajwa Road, Sun-Pharma Road, Karelibaug, Pratapnagar, Fatehgunj, Subhanpura, Mandvi, Makarpura, Raopura, Harni, Channi, Tandalja, Jambubet, Bapunagar, Dandia Bazar, Nagarwada, Wadi, Diwalipura, Samta, Shiyabaug, Jetalpur, Manjalpur, and Kevdabaug.

3.4. Unit of Inquiry

The sample for the study comprised homeowners residing in small houses, with a minimum qualification of 10th pass.

3.5. Sample size and sampling procedure

Areas were identified purposively comprising small houses; whose built-up area was up to 600 sq. ft. From each area, samples were identified through purposive sampling technique. A total of 270 houses were selected as samples, from various areas. The sample for the study comprised homeowners residing in small houses.

3.6. Selection of tool

The questionnaire was used for gathering demographic data and to study the problems experienced by the respondents regarding existing furniture in various areas of the house, which were considered for the present study. A questionnaire was used as a tool for the following reasons: (i) very large samples are desired, (ii) costs must be kept low, (iii) the target groups who are likely to have high response rates are specialized, (iv) ease of administration is necessary, and (v) moderate response rate is considered satisfactory (Ahuja, 2012).

3.7. Development of the tool

A thorough review facilitated the investigator in the construction of the tool. While preparing the questionnaire, care was taken to include all such questions that would elicit the information necessary to attain the objectives of the study.

The questionnaire comprised two sections.

Section I: Demographic profile of the respondents

This section dealt with the questions regarding the respondents' demographic information, which included name, address, phone no, family income, type of house, area of the residential unit, number of family members residing, age group of each family member, and Family Income.

Section II: Extent of Problems regarding existing furniture

This section dealt with the extent of problems experienced by the respondents residing in small houses. This section was further divided into 7 sub-sections.

- Extent of problems experienced by the respondents residing in small houses related to furniture in the Foyer. This subsection consisted of 5 statements.

- Extent of problems experienced by the respondents residing in small houses related to furniture in the Living Room. This subsection consisted of 16 statements.

- Extent of problems experienced by the respondents residing in small houses related to furniture in the Kitchen. This subsection consisted of 34 statements.

- Extent of problems experienced by the respondents residing in small houses related to furniture in the Dining Room. This subsection consisted of 14 statements.

- Extent of problems experienced by the respondents residing in small houses related to furniture in Bedrooms. This subsection consisted of 36 statements.

- Extent of problems experienced by the respondents residing in small houses related to furniture in the Bathroom. This subsection consisted of 04 statements.

- Other Extent of problems experienced by the respondents residing in small houses related to furniture items. This subsection consisted of 11 statements.

3.8. Establishment of content validity of the tool

The scale was subjected to the establishment of content validity. To test the validity of the tool prepared, the scales were given to a panel of 11 judges from the Family and Community Resource Management and Interior Design Field. They were requested to check the clarity and relevance of the content for each subsection. They have also requested to state whether each statement fell in the category under which it was listed. A consensus of 80 percent among the judges was taken as a yardstick for the inclusion of the statement in the final tool.

A Catalogue including the proposed multipurpose furniture for various areas of the residential unit, which can be used as a ready reference by the residents of small spaces was designed. This was given for validation to 3 judges. They were asked to judge the content of the Catalogue for its relevance, clarity, and overall presentation.

3.9. Establishment of reliability of the tool

To test the reliability of the scale on problems experienced by the homeowners residing in small houses; "pretesting" was done on 30 respondents who were non-sample and then the reliability value was calculated. The reliability of the scales was established through the split-half method. The scales were divided in two using the odd and even method for the split-half method. The coefficient of correlation was found between the two halves. The spearman-Brown correction formula was applied to estimate the reliability coefficient for the entire scale. The reliability values were found to be high for the problem scale as reported here.

Table 1: Reliability value of Problem Scale

Sr. No.	Scale	Reliability Value
1.	Extent of Problem	0.89

3.10. Data Collection Method

The data was collected with the help of a questionnaire. Data were gathered by the investigator from January to August 2020. The respondents who lived in small houses having built-up areas up to 600sq.ft. were selected as samples through purposive sampling for the present study. Data were collected from all four zones of Vadodara city which included the following 38 areas; Gotri, Vasna, Bhyli, Tarsali, Gorwa, Waghodia, Akota, Sama-Savli, Ellora Park, VIP road, Prodectivity road, Maneja, Harni, Kalali, Sevasi, Ajwa Road, Sun-Pharma Road, Karelibaug, Pratapnagar, Fatehgunj, Subhanpura, Mandvi, Makarpura, Raopura, Harni, Channi, Tandalja, Jambubet, Bapunagar, Dandia Bazar, Nagarwada, Wadi, Diwalipura, Samta, Shiyabaug, Jetalpur, Manjalpur, and Kevdabaug. The homeowners who were willing to participate in the study were considered for data collection. The purpose of the research was explained, and a rapport was built to get the true responses. The investigator personally distributed and collected back the filled-in questionnaire. The rate of return was 100 percent.

3.11. Data analysis

The data analysis procedure comprised categorization, coding, tabulation, and statistical analysis. According to Best and Khan (2006), the word statistics is sometimes used to describe the numerical data gathered it describes a group of behaviours or characteristics abstracted from several individual observations combined to generalize. Data were analysed and tables and graphs were prepared for clear representation and simple understanding of Section I Background information and Section II Problem scale.

3.11.1 Categorization

3.11.1.1 Demographic profile of the respondents:

Data related to educational qualification, occupation of the respondents, type of family, number of members in the family and their age, monthly

family income of the respondent, type of house, type of property, size of the house (in square feet), and duration of stay in the house (in years), were categorized for further analysis.

i. Educational Qualification of the respondents: Formal education gained by the respondent was categorized as follows:

1. Elementary
2. Higher Secondary
3. Graduate
4. Postgraduate

ii. Occupation of the respondent: It was categorized based on the gainful employment of the respondent as follows:

1. Employed (Service/Business/Self Employed)
2. Unemployed
3. Retired

iii. Type of Family: The Family Type was studied based on several family members staying together under one roof at the time of data collection and was classified as follows:

1. Nuclear
2. Joint

iv. Number of members in the family: The composition of the family was studied by calculating the number of Members in the Family and their ages and was categorized as follows:

1. 1 to 3
2. 4 to 7
3. 8 or above

v. Monthly Family income of the respondent: It referred to the monthly income incurred by the entire family from various sources. It was categorized (in ₹) as:

1. Less than 10000
2. 10000 to 50000
3. 50000 to 100000
4. More than 100000

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vi.   Type of House: The type of house is referred to as a residential unit in which the respondents resided at the time of the survey. It was categorized as follows:

         1.   Flat/ Apartment
         2.   Bungalow
         3.   Tenement
         4.   Duplex
         5.   Studio Apartment
         6.   Row house

vii.   Size of House (in square feet): The size of the house was purposively selected up to 600 sq. ft., which was categorized as follows:

         1.   Up to 400 Sq. Feet
         2.   400 to 600 Sq. Feet

viii.   Duration of stay in the house (in years): The duration of stay in the house was referred to as the number of years from which the respondents resided in that residential unit at the time of data collection. It was categorized as follows:

         1.   2 to 4
         2.   5 to 7
         3.   More than 7

3.11.1.2 The Extent of Problems: This section dealt with the extent of problems experienced by respondents residing in small houses. This section was further divided into 7 sub-sections, related to Furniture in Foyer, Furniture in Living Room, Furniture in Kitchen, Dining Room, Furniture in Bedroom, Furniture in Bathroom, and other problems related to Furniture items. The respondents were asked for their agreement or disagreement on the statements on a two-point continuum. The respondents were asked to respond to the problems experienced in terms of "Experienced" and "Not Experienced" the scores from 2 through 1 were given to the statements.

Table 2: Categorization and range of scores for the Extent of Problems experienced by the respondents residing in small houses related to furniture in various areas of the house.

The extent of problems experienced by the respondents residing in small houses related to furniture in various areas of the house.	Score Range
Furniture in Foyer	
Experienced problems	05-07
Not experienced	08-10
Furniture in Living Room	
Experienced problems	16-23
Not experienced	24-32
Furniture in Kitchen	
Experienced problems	34-50
Not experienced	51-68
Furniture in the Dining Room	
Experienced problems	14-20
Not experienced	21-28
Furniture in Bedroom	
Experienced problems	36-53
Not experienced	54-72
Furniture in Bathroom	
Experienced problems	4-5
Not experienced	6-8
Other Furniture related problems	
Experienced problems	11-16
Not experienced	17-22

Table 3: Categorization and range of scores for the Extent of Problems experienced by the respondents regarding overall problems experienced by the respondents residing in small houses.

Extent of problems experienced by the respondents residing in small houses related to furniture in various areas of the house.	Score Range
Experienced problems	120-179
Not experienced	180-240

The respondents were asked to respond to a 2-point continuum scale in terms of "Experienced" and "Not Experienced". The scores of 2 through 1 were ascribed to each of the statements which depicted the extent of the problem. The possible score ranged between 120 to 240, which was divided into 2 categories with almost equal intervals and was made for a total of 120 statements in the scale. Range scores of 120 to 179 indicated a low extent of problems experienced by the respondents and 180 to 240 indicated a high extent of problems experienced by the respondents.

3.12. Development of designs of multi-purpose furniture using a combination of Interior materials for small houses.

Multipurpose furniture was designed as a solution to the problem of the limitation of space in small houses. Multipurpose furniture using various methods of transformation and folding was designed. The materials proposed were selected considering the Indian climatology and availability. The development of new designs was done for each room of the residence. The furniture was designed keeping in mind the small houses; hence the dimensions of the furniture were considered by the researcher. Design development comprised of Floor plans, Elevations, and Sectional details of multipurpose furniture, along with the 3D views, with detailed specifications of material.

Table 4: List of multi-purpose furniture proposed for small spaces

	Furniture for Foyer and Living room
1)	Utility storage with shoe rack and pull-out seating bench
2)	Three-seater sofa with shoe rack and utility storage
	Furniture for Kitchen and Dining room
3)	Three-seater sofa cum bed with foldable Four-seater dining (One table and Four chairs)
4)	Portable pre-preparation center with extendable dining table, chairs, and storage
	Furniture for Bedroom, Bathroom, and other areas
5)	Study unit with dressing and storage
6)	Wardrobe with foldable iron board and study area and chair
7)	Extendable Bed, storage, and folding seating
8)	Folding office and Dressing
9)	Centre Table, Storage, Chair, and bed

3.13 Development of a catalogue of proposed designs of multipurpose furniture

A catalogue was designed, consisting of the designs of proposed multipurpose furniture for various areas of the residential unit, specially designed for small houses. The catalogue consisted of 2D, and 3D drawings prepared in AutoCAD 2022 and SketchUp 2022 design software respectively. Detailed specifications and construction details of the furniture, along with the material and cost were suggested in the catalogue. A Catalogue including the proposed multipurpose furniture for various areas of the residential unit, which can be used as a ready reference by the respondents of small spaces was designed. The prices mentioned are according to the market research done by the researcher during the duration of the research and may vary with changes in the price of the material used. The price would also depend on the brand of products and raw materials used, and the labour cost will vary according to the expertise of the labour.

3.14 Intervention program for the homeowners

An intervention program was conducted to enhance the knowledge regarding multipurpose furniture and its use and benefit in the interiors of small houses. The designs of multipurpose furniture proposed in the catalogue were also discussed with the beneficiaries of the intervention program. Initially light was thrown on the importance of multipurpose furniture design in small spaces, especially in small houses. Different ways of designing multipurpose furniture were discussed, in the intervention program. Each design was explained along with its construction details, design materials, and cost. The material availability was also discussed by the researcher to facilitate the homeowners of the small houses to create the proposed furniture items at home. The cost of local labourers in Vadodara city was also identified. The contacts were also shared with the beneficiaries of the intervention program who were willing to build one or more types of proposed multipurpose furniture for their own house.

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