CHAPTER III

METHODOLOGY

The methodology focuses on the methods of procedures adopted that was carried out in the present research. The present chapterdiscusses about the research design of the study. The chapter also explainsschematic conceptual framework with hypothetical relationship in detail.

The major terms used in the research are also operationally defined in the present chapter for clarity. The research design, variables under study, sample size and sampling procedure, tool for data collection and are further explained in detail in this chapter. The research procedure followed is described under the following heads:

3.1 Research design
3.2 Operational definitions
3.3 Variables and Schematic Diagram of the Variables
3.4 Sample, Sampling Size and Sampling Procedure
3.5 Selection and Construction of the Tool
3.6 Data Collection
3.7 Data Analysis

3. 1. Research design

A research design is an arrangement of condition for collection and analysis of data in manner that aims to combine relevance to the research purpose with scientific procedures. Research design is the specification of method and procedure used for acquiring the information needed for the study. A descriptive study determines and reports the way the things are (Kothari, 2012). According to Kothari and Garg, (2019) these Descriptive research studies are concerned with describing the characteristics of a particular individual, or of a Group". The Descriptive research design is most suitable for the present research as it dealt with the post facto data of the present research on

assessing the work environment of the classroom. According to Kothari and Garg, (2019) these Descriptive research studies are concerned with describing the characteristics of a particular individual, or of a Group".

The researcher also gathered data on the perceived comfort level, posturesadopted, psychosocial factorsrelated to the musculoskeletal pain and musculoskeletal pain experienced in general by the respondents from the selected Municipal Primary School of two cities of Gujarat, viz Vadodara and Anand.

3. 2. Operational Definitions

The terms used in the present study were operationally defined as follows:

- **Ergonomic Assessment** for the present study referred to the assessment of Existing Work Environment of the classroom, Postural Analysis of the Municipal Primary School Teachers,Psychosocial factors induced Musculoskeletal Pain and Musculoskeletal Pain experienced by the Municipal Primary School Teachers.

- **Musculoskeletal Pain** for the present study was the pain perceived by the respondents due to the injuries or illnesses to soft body tissue such as Muscles, Nerves, Tendons, Ligaments, Joints, Cartilage or Spinal Discs. The symptoms were in the form of pain, discomfort and inability to perform the task. Theinjuries caused by slips, trips, falls or other similar accidents were not considered as Musculoskeletal Pain in the present study. It was measured with the aid of Modified Dutch Musculoskeletal Pain tool covering body parts from neck to toes.

- **Primary School Teacher**for the present study was the one who were teaching the students from Standard 1 to 8 in Municipal Primary School.

- **Municipal Primary Schools** for the present study were the schools aided by the government funding and were located in different wards of the city for imparting education without charging any fees as compared to the private schools.

- **Work Environment of the Classroom** for the present study includedthe Physical factors like dimensions of the room, light, temperature, color of walls,color of ceilingand color of flooring,furniture types (chairs, tables, storage units, black board) and its placement in the classroom. During the data collection phase lockdown situation occurred the respondents were taking online classes from the school premises. The respondents were teaching the students through online mode via mobile and laptops. The respondents weretaking classes in their individual classroom for maintaining social distance from other teachers during school time.

- **Existing Facility in the classroom** for the present study included all the existing facilitators in the class room that was provided by the school authorities like lights, fans and furniture including writing board, writing table, chair, and storage unit.

- **Comfort level of the respondents** was assessed based on the perceived comfort level of the respondents on a three-point response structure as ‘Highly comfortable’, ‘Fairly comfortable’ and ‘Not at all comfortable’ scored as three, two and one.

- **Postural analysis**was done on the positions of the body with its parts of the respondents as a whole. In this method 4 codes were determined according to the body postures and movements. The codes show the musculoskeletal risk level of the respondents. The postures were analysed in terms of ‘normal’ or ‘stressful’ or ‘harmful’ or ‘very harmful’ by using “Ovako Working Posture

Analysing System" (OWAS), OWAS method was designed by Finish Occupational Health and Safety in 1992.

- **Psychosocial Factors** induced musculoskeletal pain among the primary school teachers were identified in general, at the workplace and at the Home. It was judged on a two-point continuum scale scored as 2 for Yes and 1 for No response. The data were then computed and categorized into "to high extent", "to medium extent" and "to low extent".

3. 3. Variables and Schematic diagram of the Variables

3. 3. 1 Independent Variables of the respondents includes

- **Personal Variables**

  1) Age in years
  2) Gender
  3) BMI (Body Mass Index)
  4) Monthly personal income (in Rs.)
  5) Years of Work Experience

- **Family Variables**

  (a) Family Type
  (b) Family Size
  (c) Monthly Family Income (in Rs.)

3. 3. 2.Dependent variable

If one variable depends upon or was a consequence of other variable it is termed as dependent variable (Kothari, **2012**). The dependent variables selected for the present study werePsychosocial Factors related to the Musculoskeletal Pain

and Musculoskeletal Pain experienced by the Municipal Primary School Teachers,

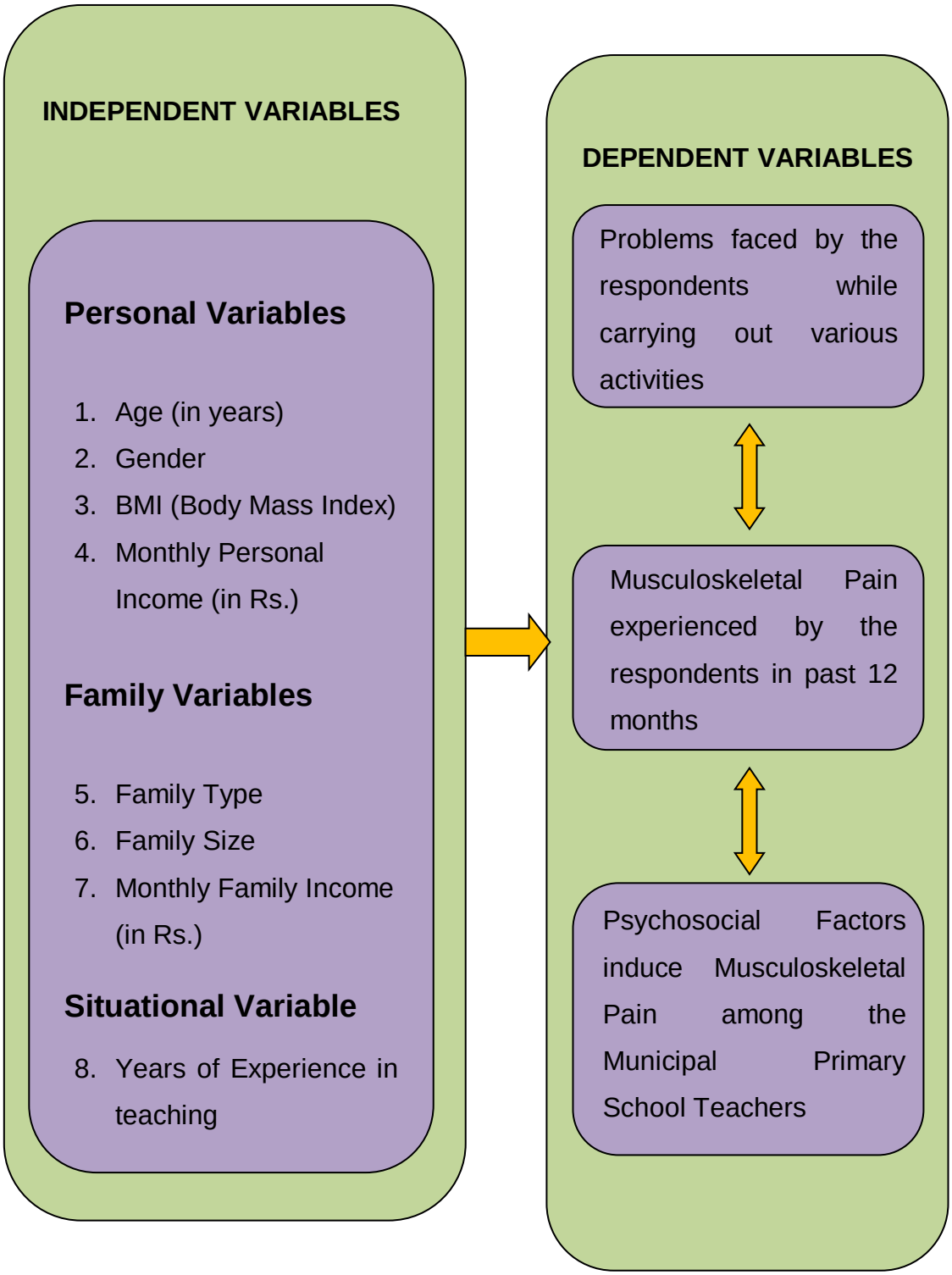

Figure 1: Schematic Framework to show Hypothetical Relationship between the Variable under the Study

3. 4. Sample, Sampling size and Sampling procedure

3. 4. 1. Locale of the Study

The researcher had selected Vadodara city andAnand city as locale for present study.Vadodara city andAnand city are located inGujarat, India.Vadodara city and Anand city were divided in 12 wards and 16 wards respectively.

3. 4. 2. Unit of Inquiry

The units of enquiry for the present study were the Teachers Teaching in Municipal Primary Schools. The respondents for the present study included municipal primary schools teachers belonging to Vadodara city and Anand city.

3. 4. 3. Sample and Sampling Procedure

The respondents for the present study were healthy and did not suffer from any chronic diseases at the time of data collection. The study was conducted in 105 Municipal Primary Schools located in 12 wards of Vadodara city and 27 municipal Primary Schools located in 16 wards of Anand city Gujarat respectively. Out of the total 650 primary school teachers Vadodara city had the total 500 primary school teachers in all the wards and Anand City had total of 150 primary school teachers in all the wards at the time of data collection.

From the total 250 municipal primary school teachers belong to Vadodara city and 122 municipal primary school teachers belong to Anand city had given consent to take part in the study. Therefore, purposive sampling technique was used for the selection of respondents from the municipal primary schools.A total of 372 teachers who were selected as respondents for the present study

had minimum of two years of teaching experience in primary school.

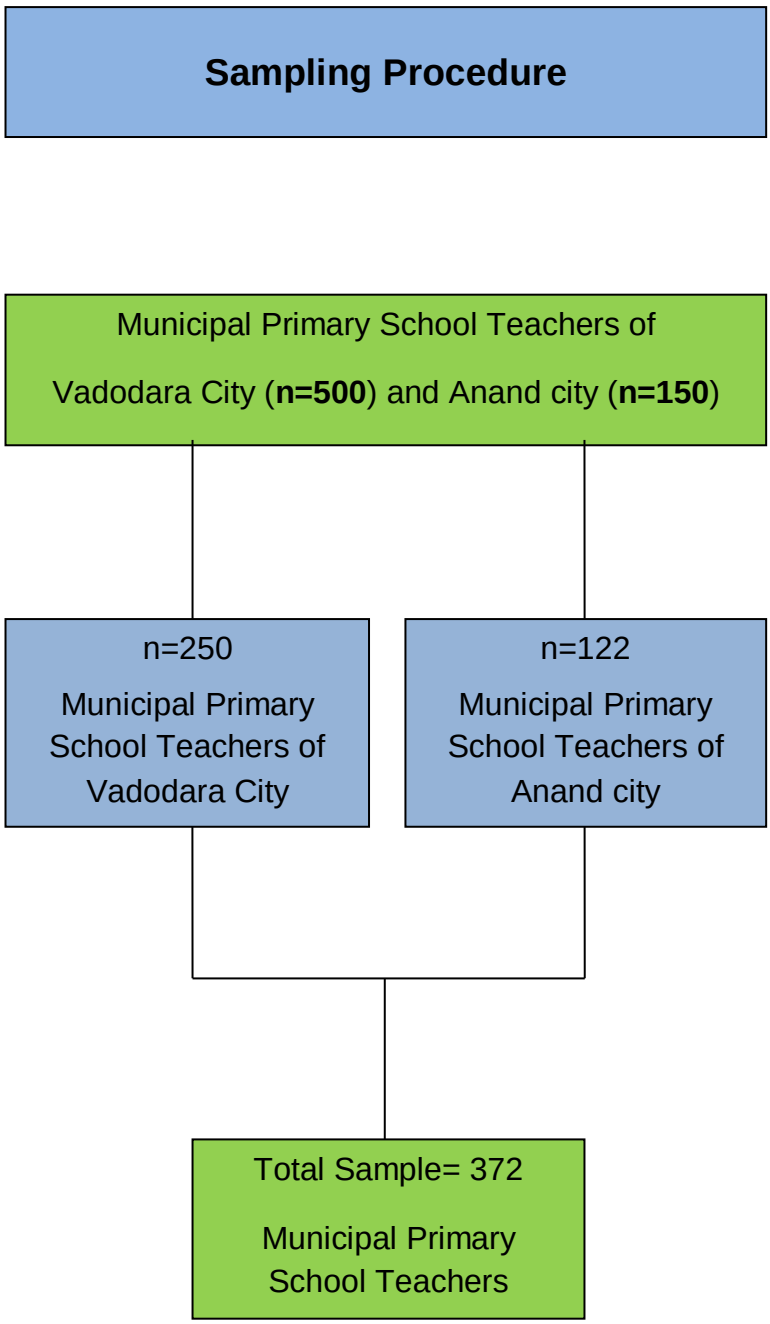

Figure 2: Sample Size and Sampling Procedure

3. 5. Selection and Construction of the tool

3. 5.1: Sample Selection Procedure

The respondents were selected through multistage sampling procedure:

- At the first stage, the researcher collected the list of Municipal Primary Schools from Nagar PrathmikShikshanSamiti of Vadodara and Anand city.
- The teachers who were having minimum of two years of work experience, possessing normal health status and not suffering from any chronic disease were selected as samples for the study. The samples were selected by taking prior permission from the Principals of Municipal Primary School and the willingness of the respondent to participate in the present research.
- Of the total 105 schools of Vadodara and 27 Schools of Anand, the researcher contacted the teachers with the prior permission from the Principal.
- During the data collection phase, the COVID-19 Pandemic and lockdown situation occurred. With the permission from the Municipal Primary Education Office (Nagar PrathmicShikshanSamiti) during COVID-19 Pandemic and lockdown situation, the researcher had adopted the online interview schedule method to collect the needed information.
- The total number of 372 Municipal Primary School Teachers who willingly gave their consent in filling the interview schedule online with help of Google form was selected purposively for the present research.

3. 5.2: Tools Used in Collecting Data

- The Google form as the tool was developed by reviewing the literature pertaining to the objectives of the study. The interview schedule gathered information on demographic data. The information collected on perceived comfort level of the respondents was made on the psychosocial factors related to the musculoskeletal pain experienced by the teachers, the prevalence of musculoskeletal pain, postures adopted by the respondents at workplace.

- The observation sheet was also used to assess the existing work environment of the classrooms and the existing dimension of the furniture available in the classroom.The researcher had developed the observation sheet in Google form to retrieve needed information of the existing work environment of the classroom and the existing dimension of the furniture available in the classroom.

3. 5.3: Construction of tool

The tool was created to fulfil the objectives of the research. By referring various sources such as books, journals, articles in printed media and in electronic media were referred to make the tool. The information covered in questionnaires about the research was divided in to the following sections:

Section 1 A: Observation Sheet of the Municipal Primary School Classroom was used to assess the existing work environment.

Section 1 B: This section dealt with the information about the demographic profile of the respondents that covered background information of the teacher and their family information was also collected in this section.

Section 2: Perceived Comfort Level of the Teachers regarding the Existing Facility in the Classroom**,** Municipal Primary School Teachers had given their response/views about existing facilities in the school classroom furniture like chair, Table, Storage unit and Writing board.

Section 3 A - Postural Analysis of the Municipal Primary School Teachers was collected by the researcher with OVAS scale while carrying teaching activities in the classroom.

Section 3 B - Anthropometric Data of the Municipal Primary School Teachers was collected by the researcher to design furniture for the respondents.

Section 4 –Psychosocial Factors related to the Musculoskeletal Pain Scale among the Teachers was developed by the researcher. It was used to measure the effects of the Psychosocial Factors related to the Musculoskeletal Pain of the Municipal Primary School Teachers.

Section 5 – Musculoskeletal Pain experienced by the Municipal Primary School Teachers was gathered with the help of Modified Dutch Musculoskeletal Pain Scale. The scale was modified to collect the needed information regarding Musculoskeletal Pain prevalent among the Municipal Primary School Teachers.

3. 5.4: Development and Description of the Tool

The tool was constructed to accomplish the objectives of the study. The information covered in Google form about the study was divided in to the following sections:

- **Section 1 A -Existing Work Environment of the Classrooms**

  Observation Sheet was used to assess the existing work environment of the classrooms. The Physical factors like dimensions of the room, light, ventilation, temperature, colour on the walls and ceiling were collected. The researcher also gathered information onfurniture types (chairs, tables, storage units,

blackboard, etc.) in the classroom, number of chairs, number of table and number of storage unit existing in the classroom. The information regarding number of doors and windows recorded in this section.

The observationsheet contained data regarding the illumination level and temperature of the classroom. The sheet had columns to record the level of illumination and temperature which were measured through sound level meter, lux meter and Temperature and Hygrometer. The levels of illumination and temperature were recorded for twomunicipal primary school shifts, in morning (9:30-10:30am) and in afternoon (2:30-3:30pm).

Specifications of, lux meter and Temperature and Hygrometer were given as follows:

Lux meter specification (Plate 1)

Name: Digital Lux meter (Indi 6171)

Range: 0 – 50000 Lux

Sr. No: L-753831

Battery: one 1.5 Volt AAA battery

Feature: Light Weight, Battery Operated

Plate 1: Lux meter specification

Temperature and Humidity meter specification (Plate 2)

Model: HTC1

Name: Temperature and Hygrometer

In-Range: -10o C - 50o C (-14o F - 122o F)

oC ← → oF exchangeable

Accuracy: ± 1oC RH ± 5%

Indoor-hygro range: 10%RH to 99%RH

Humidity Resolution: 1%

Battery:one 1.5 Volt AAABattery Operated

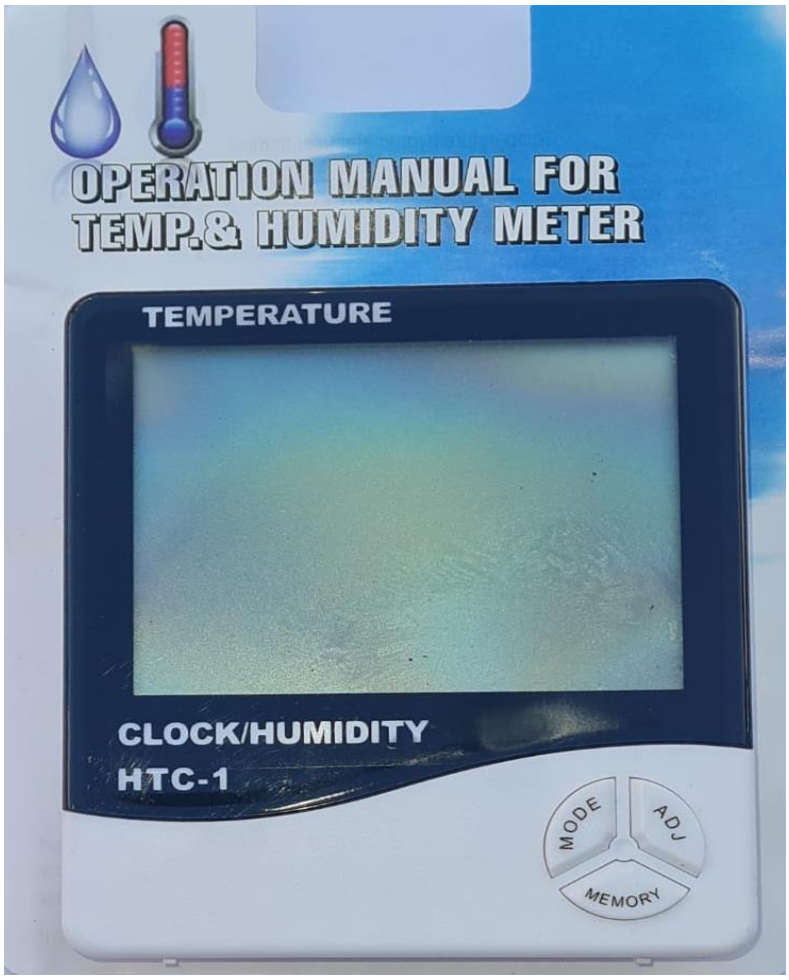

Plate 2: Temperature and Humidity meter

- **Section 1 B-Demographic Data of the respondent**

  This section contains questions regarding the personal and work related information of the respondents. Demographic Data of the Municipal Primary School Teachercovered the questions regarding background information of the teacher and their family information such as Gender, Age, Marital Status, Family Type, Family Size, Years of experience, Monthly Income (in Rs.), Travel distance from home to school, Subjects taught in school, School Working Hours, Number of recess undertaken, Duration of Recess (In Minutes), Working hours for computer work, Hours spent on Household work and Exercise undertakenfor Physical Fitness.

- **Section 2 -Perceived Comfort Level of the Teachers regarding the Existing Facility in the Classroom**

  This section contains questions regarding the Perceived Comfort Level of the Teachers regarding the existing facility in the classroom**.** The Municipal Primary School Teachers had given their response/views about existing facilities in the school classroom onthree point continuum as 'Highly comfortable', 'Fairly comfortable' and 'Not at all comfortable' score.

  Validity of the Scale:

  The scale developed for the research was submitted to a panel of seven judges possessing expertise in the field of Ergonomics. The judges for the content validity of the present research included were experts of Academics from the Department of Family Resource Management, SNDT, Women's' University, Mumbai, NirmalaNiketan College of Home Science, Mumbai BMS College of Home Science, Mumbai, India. They were requested to check the clarity and relevance of the content complying with the objectives of the research. They were also requested to state whether each statement fell in the category under which it was listed. A consensus of 80% agreement among the judges was taken as a yardstick for the inclusion of the content in the final tool. Therefore no changes had done in the final tool.

Reliability of the Scale

Pretesting of the scales was done to ensure the feasibility and clarity of the information asked in interview schedule. The interview schedule was pretested on a total of 30 non-sampled respondents. Reliability is the accuracy or precision of a measuring instrument (Kerlinger, 1983).

A measure is said to have a high reliability if it produces similar results under consistent conditions. Scores that are highly reliable are precise, reproducible and consistent from one testing occasion to another. That is, if the testing process were repeated with a group of test takers, essentially the same results would be obtained. Various kinds of reliability coefficients, with values ranging between 0.00 (much error) and 1.00 (no error), are usually used to indicate the amount of error in the scores."

Reliability for Comfort Level of the Teachers Regarding the Existing Facilities in the Class Room:

In order to test the reliability of the “Perceived Comfort Level of the Teachers Regarding the Existing Facilities in the Class Room” it was given to 30 non sampled respondents for the pre-testing to confirm the feasibility and clarity of the responses in the scale. For the present study, to measure the internal consistency Cronbech’s alpha was used. It was used to assess the consistency of results across items within a test.

Cronbech’s alpha is the most commonly used internal consistency, is usually interpreted as the mean of all possible split-half coefficients.In this method the odd and even items in the scale were correlated with each other. The reliability co-efficient was then computed by employing the Cronbech’s alpha formula was used.The reliability was found for Comfort Level of the Teachers Regarding the Existing Facilities in the Class Room. The reliability value ‘r’ was 0.910 for Comfort Level of the Teachers Regarding the Existing Facilities in the Class Room Scale which reflects

the high reliability of the tool.

Scoring of the Scale:

The information regarding height, width, and depth of existing furniture items (writing board, chair, table and storage unit), Lights in the classroom, air circulation in the classroom, noise in the classroom, the temperature in the classroom, Placement of Fans and Lights were asked. The three point continuum as 'Highly comfortable', 'Fairly comfortable' and 'Not at all comfortable' scoredas three, two and one in this section.

Level of comfort	Score Assigned
Highly Comfortable	3
Fairly Comfortable	2
Not At All Comfortable	1

- **Section 3 A - Postural Analysis of the respondents**

Postural Analysis data of the Municipal Primary School Teachers were collected by the researcher on the working postures of the respondents while carrying teaching activities in the classroom. The researcher used Ovako Working Posture Analyzing System (OWAS) scale for the research. OWAS method was designed by Finish Occupational Health and Safety in 1992. The Ovako Working Posture Analyzing System (OWAS) method is being used worldwide since that time. In this method 4 codes are determined according to intensity of the postures.

Scoring of the Scale:

The postures included the positions of the body with its parts during teaching hours in the class. The researcher observed the respondents while carrying different activities in the classroom and made notes of the body postures. The body postures adopted while teaching were identified and drawn using the pictorial method. The researcher had categorize and drawn twenty body postures.

The postures were identified regarding teaching in the classroom only. And not the activities been carried by the teacher in general due time constrain on the part of the teacher and the prevailing covid-19 pandemic at the time of data collection. The postures included namely were Standing Straight Posture, Slightly Bending Posture, Leaning Froward Posture, Full Bent Forward Posture, Leaning Forward and Flexuous Posture was collected. Other Postures like Hands Relax Posture, One Hand above Elbow Joint Posture, Both Hand above Elbow Joint Posture, Both Parallel to Shoulder Posture and Both Hands below Elbow Joint Posture were identify and noted.

Table 1: Distribution of Postures according to their action category

Action Category	Postures	Posture Score
Action CategoryOne	**Normal Postures**	
	Both Below elbow Joint	1
	Hands Relax	1
	Sitting Position	1
	Standing with Legs Upright	1
	Standing Straight Position	1
Action CategoryTwo	**Stressful Postures**	
	20‘ Neck Forward Bent	2
	Leaning Froward	2
	One Above Elbow Joint	2
	Slightly bending	2
	Standing with one Leg Bent	2
	Standing with one Leg Upright	2
	Walking	2
Action CategoryThree	**Harmful Postures**	
	60‘ Neck Forward Bent	3
	Both Above Elbow Joint	3
	Both Parallel to Shoulder	3
	Full Bent Forward	3
	Standing with Legs Bent	3
Action CategoryFour	**Very Harmful Postures**	
	60‘ Neck Backward Bent	4
	Kneeling on One or Both Knees	4
	Leaning Forward and Flexion	4

The Standing posture with Legs Upright Posture, with One Leg Upright Posture, with Legs Bent Posture, one Leg Bent Posture and Walking Postures were also collected. The Sitting Position, Kneeling on One or Both Knees Posture, 20' Neck Forward Bent Posture, 60' Neck Forward Bent Posture and 60' Neck Backward Bent Posture were identify and presented in present section. The researcher had divided postures in four categories of musculoskeletal risk level.

- **Section 3 B -Anthropometric Data of the Respondent:**
  Anthropometric Data of the Municipal Primary School Teachersincluded anthropometric measurements of the Municipal Primary School Teachers i.e. their body Height (stature), Eye Height, Cervical Height, Standing Shoulder Height, Horizontal Reach, Vertical Reach, Sitting Knee Height, Popliteal Height and Elbow Rest Height were recorded in present section. The Anthropometric Data was used to design classroom furniture i.e. table, chair, Storage Unit and Writing Board.

Validity of the Scale

The interview schedule developed for the research was submitted to a panel of seven judges possessing expertise in the field of Ergonomics. The judges for the content validity of the present research included were experts of Academics from the Department of Family Resource Management, SNDT, Women's' University, Mumbai, Nirmala Niketan College of Home Science, Mumbai BMS College of Home Science, Mumbai, India. They were requested to check the clarity and relevance of the content complying with the objectives of the research. They were also requested to state whether each statement fell in the category under which it was listed. A consensus of 80% agreement among the judges was taken as a yardstick for the inclusion of the content in the final tool. Therefore no changes had done in the final tool.

- **Section 4 –Psychosocial Factors Induced Musculoskeletal Pain among the Respondent**

  Psychosocial Factors induced Musculoskeletal Pain Scale among the Respondent was developed by the researcher. It was used to measure the effects of the Psychosocial Factors induced Musculoskeletal Pain of the Municipal Primary School Teachers.

  Validity of the Scale

  The interview schedule developed for the research was submitted to a panel of seven judges possessing expertise in the field of Ergonomics. The judges for the content validity of the present research included were experts of Academics from the Department of Family Resource Management, SNDT, Women's' University, Mumbai, Nirmala Niketan College of Home Science, Mumbai BMS College of Home Science, Mumbai, India. They were requested to check the clarity and relevance of the content complying with the objectives of the research. They were also requested to state whether each statement fell in the category under which it was listed. A consensus of 80% agreement among the judges was taken as a yardstick for the inclusion of the content in the final tool. Therefore no changes had done in the final tool.

  Reliability for Psychosocial Factors Induced Musculoskeletal Pain among the respondent:

  In order to test the reliability of the "Psychosocial Factors Induced Musculoskeletal Pain among the respondent" it was given to 30 non sampled respondents for the pre-testing to confirm the feasibility and clarity of the responses in the scale. For the present study, to measure the internal consistency Cronbech's alpha was used. It was used to assess the consistency of results across items within a test.

  Cronbech's alpha is the most commonly used internal consistency, is usually interpreted as the mean of all possible split-half coefficients. In this method the odd and even items in the scale were

correlated with each other. The reliability co-efficient was then computed by employing the Cronbech's alpha formula was used. The reliability was found for Psychosocial FactorsInduced Musculoskeletal Pain among the respondent scale. And the reliability value 'r' was 0.980 for Psychosocial Factors Induced the Musculoskeletal Pain among the respondent scale which reflects the high reliability of the tool.

Scoring of the Scale:

The total numbers of statements for the whole tool were 40 statements. The statements include questions like, were the respondent Feeling tensed, Nervous, Frustrated in general. The statements in present section includes feeling exhausted by your work at School, Having too much workload, Had training to perform school tasks, Had sedentary job, Work rotation between you and your colleague, Doing repeated task, Got sufficient break-time, Shortage of teaching staff, Had cooperative and supportive supervisor, Done supervision of others, Having support from colleague, supervisor and principle, Kept well informed on every issues, Valued in school, Paid appropriate for the school work and Effect of personal and private matters on work and home were asked in this section.

The score will indicate that the respondent was having Psychosocial Factors induced Musculoskeletal Pain.The scale had 40 items on which the respondents were asked to rate each on Yes (Agree) and No (Disagree) response. The final score were arrived at by summating the score of each respondent on each statement. Higher scores reflected Low Musculoskeletal Pain among the respondents.

Score range	
Low Extent	81-120
Medium Extent	41-80
High Extent	0-40

Section 5 –Musculoskeletal Pain experienced by the Municipal Primary School Teachers

Musculoskeletal Pain experienced by the Municipal Primary School Teacherswas gathered with the help of Modified Dutch Musculoskeletal Pain Scale. The scale was modified to collect the needed information regarding Musculoskeletal Pain prevalent among the Municipal Primary School Teachers.

Validity of the Scale:

The scale developed for the research was submitted to a panel of seven judges possessing expertise in the field of Ergonomics. The judges for the content validity of the present research included were experts of Academics from the Department of Family Resource Management, SNDT, Women's' University, Mumbai, Nirmala Niketan College of Home Science, Mumbai BMS College of Home Science, Mumbai, India.They were requested to check the clarity and relevance of the content complying with the objectives of the research.They were also requested to state whether each statement fell in the category under which it was listed.A consensus of 80% agreement among the judges was taken as a yardstick for the inclusion of the content in the final tool.Therefore no changes had done in the final tool.

The Modified Dutch Musculoskeletal Pain Scaleincluded questions like i.e. Musculoskeletal Pain experienced in various body parts in last twelve months, the cause of Musculoskeletal Pain in your various body parts, were the teachers experiencing radiating pain from back to the legs and radiating pain from Neck and shoulder pain till the arms during the past 12months was collected. The number of sick leaves and duration of leave in days was collected as filler information. The Description of last period of Musculoskeletal Pain experienced by the Municipal Primary School Teachers was included in present section.

3. 6. Data Collection of the study

The data of the present research was collected through the interview schedule method. The observations regarding the existing work environment of the classrooms and the interviews of the respondents were conducted personally by the researcher partly with prior permission from the concerned authorities. During the data collection phase, the COVID-19 Pandemic and lockdown situation occurred. With the permission from the Municipal Primary Education Office (Nagar Prathmic Shikshan Samiti) during COVID-19 Pandemic and lockdown situation, the researcher had adopted the online interview schedule method to collect the needed information.

3. 7. Data Analysis of the study

The procedure used to analyselike categorization, tabulation and statistical analysis were utilized to analyze the data.

3. 7.1. Categorization

The categories were made for further analysis of data as follows:

I. Age of the respondents

It was measured in terms of number of years completed by the respondents at time of data collection. The Minimum Age 21 years, Maximum Age 58 years and Mean age was 44.5 years.The obtain range of the age of the respondents on the basis of equal intervals are as follows:

21– 30 years

31 – 40 years

41 – 50 years

51– 60 years

II. Gender of the respondents

Itreferred to the gender of the respondents was categorized in,

Male

Female

III. Marital status of the respondents

Marital status of the respondents was categorized as follows:

Married
Single
Widow/ Separated/Divorced

IV. Type of family of the respondents

Type of family was categorized as follows:

Joint family

Nuclear family

V. Size of family of the respondents

Size of family referred to total numbers of family members living in the family. It was categorized as follows:

Small (1 - 4 members)
Medium (5 - 7 members)
Larger (≥ 8 members)

VI. Years of Experience in Teaching Profession(in years)

It was measured in terms of number of years completed by the respondents in teaching at time of data collection. The categories made were:

2- 10 years

11- 20 years

21- 30 years

>=30year

VII. Monthly Personal Income (In Rs.) of the respondents

Monthly personal income was referred to the income received by the respondents in Rs. per month it was categorized as follows.

Rs. ≤ 25000

Rs. 25,001 – 50,000

Rs. 50,001 – 75,000

Rs. 75,001 – 1,00,000

Rs. 1,00,001 – 1,25,000

Minimum years of teaching experience - 2 years, Maximum years of teaching experience - 38 years, and Mean years of teaching experience-28 years.

VIII. Monthly family income of the respondents

Monthly family income referred to the monthly family income (in Rs) received by the respondent's family members. It was categorized as follows:

Rs. ≤ 25000

Rs. 25,001 – 50,000

Rs. 50,001 – 75,000

Rs. 75,001 – 1,00,000

Rs. 1,00,001– 1,25,000

Rs. 1,25,001 – 1,50,000

IX. Perceived Comfort Level of the Teachers regarding the Existing Facility in the Classroom

Perceived Comfort Level of the Teachers regarding the Existing Facility in the Classroomwas categorized as follows:

Highly comfortable

Fairly comfortable

Not at all comfortable

X. ExistingEnvironmental Parameters like, Illumination, temperature:

It referred to illumination, temperature levels at (Table 2 & 3)the Municipal Primary School Classrooms.

Table 2: Categorization for the Illumination levels at Municipal Primary School Classrooms

Illumination
Morning shift (9:30 am-10:30am)
Below recommended level
Above recommended level
Afternoon shift (2:30pm-3:30 pm)
Below recommended level
Above recommended level

Table 3: Categorization for the temperature levels at Municipal Primary School Classrooms

Temperature
Morning shift (9:30 am-10:30am)
Below mean
Above or equal to mean
Afternoon shift (2:30 pm-3:30 pm)
Below mean
Above or equal to mean

3. 7.2. Coding

The data wereassigned to a numerical code and value so that they can be more easily fitted into appropriate categories (Bhattacharya, 2004). The assigning numerals to every possible response put in to category or classes is refers to coding (Kothari and Gurg, 2019). Coding plan was developed by the researcher assigning appropriate code numbers to every possible response.Then the information from each scale of the interview schedule and record sheet were transferred on excel sheet.

3. 7.3. Tabulation

Tabulation consists of counting the number of cases which fall into the recognized categories (Bhattacharya, **2004**). It is also defined as the process of summarizing raw data and displaying the same in compact form (Table form) for further analysis (Kothari and Gurg, **2019**). The data was tabulated from the coding sheet to a tabular form for arriving at the frequencies and percentages.

3. 7.4. Data Analysis

According to MacDonald &Headlam (**2009**), Statistical analysis is a mathematical method of interrogating data. This is done by looking for relationships between different sets of data. The data were analyzed by utilized descriptive as well as relational statistics.

Descriptive statistics like frequencies, percentages, means and standard deviation were used to analyze the data. The data will be analysed by subjecting it to descriptive (frequencies, percentages & SD).

Relational Statistics like ANOVA, “t” test and Correlation of Coefficient were carried out to test the hypotheses postulated for the study.

Table 4: Rational statistics applied to test the Hypotheses

Tests	Independent Variable	Dependent Variable
ANOVA **F-test**	• Age (in years) • Years of Experience in Teaching	• Musculoskeletal pain experienced by the respondents in past 12 months
t-test	• Gender	• Musculoskeletal pain experienced by the respondents in past 12 months
(co-relation) **r-test**	• Body Mass Index (BMI) • Monthly Personal Income • Monthly Family Income • Type of Family • Number of Family Member	• Musculoskeletal pain experienced by the respondents in past 12 months
Tests	**Dependent Variable**	**Dependent Variable**
(co-relation) **r-test**	• Psychosocial Factors among the respondents	• Musculoskeletal pain experienced by the respondents in past 12 months
(co-relation) **r-test**	• Problems faced by the respondents while carrying out various activities	• Musculoskeletal pain experienced by the respondents in past 12 months

3.8. Ergonomic Intervention Programme

One of the objectives of the present research was the development of an ergonomic intervention programme for the selected Municipal Primary School Teachers and the School Authorities in suggesting healthy Teacher Friendly Postures and proposed Classroom Furniture Designs for the Teachers. The proposed Ergonomic intervention programme was organized to impart awareness among the Municipal Primary School Teachers,Principalsand the School Authorities regarding maintaining healthy postures in the classroom during teaching to reduce the musculoskeletal pain. The Ergonomic intervention programme was highlighting the findings of the research. The researcher wanted to improve Municipal Primary School Classroom by proposing the new classroom furniture design i.e. writing board, table, stepping stool and chair.

Out of 132 Municipal Primary Schools located in Vadodara and Anand city only 12Municipal Primary School Principals agreed for the intervention and give permission to selected Teachers to participate for the same. After the COVID-19 pendemic most of the Municipal Primary School Principals and Teachers were busy with the coming election tasks. The remaining teachers were busy with teaching and completion of the subject syllabus for upcoming exams. According to availability of free time in different schools the Ergonomic intervention programmes were planned more than once. The online webinars were designed and conducted on Ergonomic intervention programme planned for the Municipal Primary School Principals, Teachers and school Authorities.

3.8.1. Development of the Ergonomic Intervention Programme

The Ergonomic Intervention Programme was developed as follows:

The information regarding the Ergonomic Intervention Programme was developed with the help of review of literature collected for the research. The Ergonomic Intervention Programme was created with

the help of the experts from the fields of ergonomics, physiotherapists and the experts of Family and Community Resource Management Department.

The furniture designs were designed and developed with the help of experts from the fields of Interior Design and Furniture Design by the researcher. The Municipal Primary School details of existing conditions of the classroom were captured with the help of camera and dimensions of room and existing furniture were collected personally by the researcher. All the Existing Layout and Proposed Layout Drawings of furniture detail drawings of writing board, table and stepping stoolweredesigned and presented with help of AutoCAD software.

The researcher developed power point presentation for giving knowledge regarding the healthy teacher friendly postures for Municipal Primary School Principals, Authorities and Teachers. The proposed Classroom Furniture designs were also presented in the Ergonomic Intervention Programme. The Power Point Presentation was presented via online webinar mode.

3.8.2. Administration of Ergonomic Intervention Programme

The Municipal Primary School Principals were contacted by the researcheras they all were busy with many tasks, upcoming events and exams as well.The Principal of each school were briefed on the importance of healthy teacher friendly postures and Ergonomic Intervention Programme by the researcher. After the Ergonomic Intervention Programme the information document (Power Point Presentation) was given to the Municipal Primary School Principals, Teachers and Authorities (Nagar Prathmic Shikhsha Samitee). The researcher also provided the details of chair manufactures and seller details along with price list and it detailed description which included links of online seller and other information.

The researcher had requested Municipal Primary School Principals and teachers for using the stepping stool in the classroom setting as a part of implementing of intervention programme. The 39 Municipal Primary School Teachers were identified by the researcher for using the stepping stool for one week in the classroom. The teachers were requested to follow the healthy teacher friendly postures for one week. After one week feedback was taken by the researcher on feedback formwas developed by the researcher. The feedback form was prepared in English and Gujarati language for the ease of understanding of the teachers.