RESEARCH

METHODOLOGY
RESEARCH METHODOLOGY

The Present study had been conducted on 1000 migrant families of Uttar Pradesh who inhabited various localities for more than two decades named Durgapuri, Ambedkar Nagar, Partap Singh Wala, Gopal Nagar, Netaji Nagar, Chandan Nagar and Focal Point of Ludhiana. All these localities, mainly constituted by migrant families, were at the outskirts of the city and situated nearly 10 to 15 kilometers away from the city. Focal point and Ambedkar Nagar were situated about 12 kilometers away from the city. Ambedkar Nagar and Focal point had a largest chunk of the migrant population of U.P, Bihar and called as ‘Mini – U.P’. But all these localities were situated 10-20 kilometers from each other and hence there were frequent visits of the inhabitants from one locality to another. The Data collection was started in September 2005 and completed in March 2009. The families residing in these localities have migrated from U.P and residing in Ludhiana for more than two decades in search of their livelihood.

A questionnaire was designed to collect detailed information on fertility and mortality behavior of the family and their socioeconomic status (comprised by husband and wife and their children) with reproductive age ranging from 15-49 years. The Data was collected through personal interview with the subjects in the presence of head of the family. The eleven page questionnaire has six parts on which the data was collected. The first part deals with the information on the reproductive performance of the mother of the family and mortality occurrence among children in the family. Second part and third part include information on the father and children of the family. The fourth and fifth part include information on the household conditions and awareness about family planning methods. The last part includes information on the gender preference i.e. their sex preference attitude towards male child in the family.

According to census (2001) the eastern part of the Uttar Pradesh state adjoining Bihar was less developed as compared to the western U.P. Hence majority of the migration was taking place from the eastern region. The migrants belong from the districts of Saharanpur, Hardoi, Faizabad, and Unnao which constitute the eastern region of U.P had been selected for the present study.
Ludhiana with the population of about three million can be seen as the premier ‘second tier’ town of Punjab. While it is not the state capital, it is an important prosperous industrial centre. The visibility of migrant workers in Ludhiana, mostly from Bihar and Eastern Uttar Pradesh, is largely restricted to industrial areas of the city where they both live and work, even though they constitute up to 30 percent of the city’s population. The per capita availability of the food in the state is the highest in the country. Its contribution to common pool of food grains in terms of wheat and rice is the highest amongst all the states. That is why there is lot of migration from Uttar Pradesh and Bihar to this state. These migrants work in industries, hosieries and factories as technical and non technical workers. Majority of these migrant workers work in Bicycle factories, cloth processing units and hosieries. These migrants earn their livelihood by pulling rickshaws, driving autos and by working in Dhabas. The huge population of the migrant workers is being used by many politicians for casting false votes.

The migrants lived in colonies normally called ‘Vehras’. These ‘Vehras’ comprised of houses with kutcha or semi pucca surroundings and majority having common toilet facilities with non-piped water. These ‘vehras’ comprised by single rooms with common toilet facilities which had been mostly constructed by local rich people and have been rented out to these migrant populations. These ‘vehras’ had boundary walls with an entrance gate providing shelter to the inhabitants. The single room accommodation was used by full family, sometimes comprising of as many as ten members. These localities in majority had no proper sanitation as no spillage from kitchen and washing rooms had drains and were stagnating in pits nearby. In majority of the localities garbage was splintered around creating un-hygienic conditions.

Hence the inhabitants were exposed to poor sanitary and poor ventilation conditions leading to unhygienic environment resulting in repeated episodes of infectious diseases. These migrant workers were suffering from poverty syndrome, which is defined as low income, low education, poor sanitary conditions, and poor ventilations, too many children, birth too closely spaced, low parental education and low social status in the community (UNICEF, 1999).
Particularly the children in these localities of migrants, instead of going to schools, majority of the children of migrants under the pressure of lower socioeconomic conditions had opted for jobs like white washers, servants, hosiery workers and laborers. Thirty or forty families stayed together. These people remained economically and socially backward and were not mixing up with local population. This type of habitation was providing the UP migrants a platform to maintain their own traditions and identity and socio-cultural customs away from their original place of abode.

**Limitations of the Study**

During sample collection the investigator made efforts to make the subjects understand aims and objectives of the study. The investigator tried her best to extract the required information from the respondents by applying checks and cross-checks. Every attempt was made to extract reliable information from the subjects but because of majority of the subjects were uneducated and belonging to lower socioeconomic groups, they were hard to be convinced and requested them to provide the accurate information. The investigator also explained them the purpose of the present study and its importance was made clear to the family members. It was also clearly communicated that the information being collected shall be kept strictly confidential. This helped in establishing good working rapport with the migrant family. An attempt was made to fill the questionnaire in the presence of head of the family, the female concerned and elder members of the family for the conformation of the information being provided to the investigator.

The date and time of the data collection was confirmed with the family/families a day prior to data collection, because of all the members of the family being working, it was difficult for the investigator to meet them all and hence visits and revisits had to be made to complete the information on the family. Moreover since majority of these families were living under un-hygienic conditions, it was difficult to visit them in late wee–hours. The migrants were mainly illiterate and orthodox. It was really difficult to convince them to answer the queries especially relating to their family income and their reproductive profile. It was really difficult to have exact date of birth of the subjects. After applying checks and crosschecks
like age at marriage, age at menarche confirmation from the elders were the determinants of the birth of the subject.

Difficulty was faced in the field in collecting accurate age record. Women of particular rural background has severe problem in age reporting. For women who didn’t know their age, the age of the women at different significant events of her life, such as her age at marriage, birth of the first child and the time gap between these events were taken into accounts. Reference calendars were also used to locate the women’s birth in relation to the date of local major events. The present age of the family members of these migrants was mainly confirmed by the public distribution cards (ration card issued by the government). The data collected through personal interviews of the subjects has been grouped into following into following heads and sub-heads for further analysis.

**DEMOGRAPHIC AND SOCIO-ECONOMIC PROFILE**

**Household Information**

- **Age:** Age of the each individual was calculated up to three decimal places by using decimal calendar provided by Wiener and Lourie method (1969).
- **Age at marriage:** Age at marriage of each individual was recorded by calculating their present age.
- **Educational Status:** To find out the educational status of the subjects under study, the data was grouped into five categories viz., illiterates means those persons who were unable to read and write, Upto primary level including all those individuals who attained education up to primary level, up to middle comprising persons having received education from sixth class to eighth, similarly Upto matric comprising person having received education to tenth class, graduation and post graduation on the basis of educational achievement by calculating their percentages.
- **Occupational Status:** Occupational status shows the economically active or productive segments of the population. The data belonging to these people understudy had been divided into seven categories (i) Professional (ii) Semi-professional (iii) Clerical, Shop-owner, farmer (iv) Skilled worker (v) Semi-skilled worker (vi) Un skilled (vii) Unemployed.
- **Income:** The income of the family from all sources was recorded by taking the subjects into confident that this information was only to be used for research purpose and other wise. The total dependants in the family were recorded for the calculation of per capita income. The
Per capita income ranged between 500 to >2000 and grouped in two four groups i.e. up to 500, 501-1000, 1000-2000 and > 2000.

**Socio Economic Status and Standard of living index**

The socio economic status of families was calculated from the education, occupation and income data using Kuppuswamy scale as follows:

Socio-economic Status Scale of Kuppuswami (Mishra and Singh, 2003)

<table>
<thead>
<tr>
<th>Score Card</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Education</strong></td>
</tr>
<tr>
<td>1. Illiterate</td>
</tr>
<tr>
<td>2. Primary school or Literate</td>
</tr>
<tr>
<td>3. Middle school certificate</td>
</tr>
<tr>
<td>4. High school certificate</td>
</tr>
<tr>
<td>5. Intermediate or Post high school diploma</td>
</tr>
<tr>
<td>6. Graduate or Post graduate</td>
</tr>
<tr>
<td>7. Professional</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Occupation</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Unemployed</td>
</tr>
<tr>
<td>2. Unskilled worker</td>
</tr>
<tr>
<td>3. Semi skilled worker</td>
</tr>
<tr>
<td>4. Skilled worker</td>
</tr>
<tr>
<td>5. Clerical, Shop or Farm owner</td>
</tr>
<tr>
<td>6. Semi Professionals</td>
</tr>
<tr>
<td>7. Professionals</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Family Income per month (in Rs.)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Below 500</td>
</tr>
<tr>
<td>2. Between 500 – 999</td>
</tr>
<tr>
<td>3. Between 1000 – 1999</td>
</tr>
<tr>
<td>4. Between 2000 – 2999</td>
</tr>
<tr>
<td>5. Between 3000 – 3999</td>
</tr>
<tr>
<td>6. Between 4000 – 4999</td>
</tr>
</tbody>
</table>
7. More than 5000

<table>
<thead>
<tr>
<th>Total score</th>
<th>Socio-economic Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>26-29</td>
<td>Upper Class (I)</td>
</tr>
<tr>
<td>16-25</td>
<td>Upper Middle Class (II)</td>
</tr>
<tr>
<td>11-15</td>
<td>Lower Middle Class (III)</td>
</tr>
<tr>
<td>5-0</td>
<td>Upper Lower Class (IV)</td>
</tr>
<tr>
<td>&lt; 5</td>
<td>Lower Class (V)</td>
</tr>
</tbody>
</table>

**Standard of Living Index**

Standard of living index of every family covered in the present study has been calculated from the following information of the family collected during the data collection.

- Ownership of House
- Type of Residence
- Age of House
- Material used for making house
- Toilet Facility
- Source of Lightening
- Household Surroundings
- Main fuel for cooking
- Separate room for kitchen
- Ownership of irrigated land
- Ownership of Live stock
- Ownership of Durable goods
- Type of Drainage
- Disposal of Waste
- Type of Toilets

Thus the information on the above said parameters have been collected for the presence study and standard of living index is calculated by adding the following scores:

**House Type:**
- Pucca (4)
- SemiPucca (2)
- Kachha (0)

**Toilet Facility:**
- Own Flush Toilet (4)
- Public\Shared flush toilet\ own pit toilet (2)
- No Facility (0)

**Source of Lightening:**
- Electricity (2)
- Kerosene oil (1)
- No source of lightening (0)
**Main Fuel of Cooking:**
- Electricity (2)
- Liquid Petroleum Gas (2)
- Bio gas (2)
- Charcoal (1)
- Kerosene (1)
- Other fuel (0)

**Source of Drinking Water:**
- Pipe, hand pump (2)
- Well/public tap (1)
- No source of water (0)

**Separate room For Cooking:**
- Yes (2)
- No (0)

**Ownership of House:**
- Yes (2)
- No (0)

**Ownership of Irrigated Land:**
- Own house hold, at least some irrigated land (2)
- No irrigated land (0)

**Ownership of Live Stock:**
- Own live stock (2)
- No own live stock (0)

**Ownership of Durable goods:**
- Car/Tractor (4)
- Motorcycle/CTV/Fridge (3)
- Cycle/Fan/Radio/Sewing machine/TV (2)
- Cooker/Chair/Clock/Bed (1)

0-14 Low Standard of living Index
15-24 Medium Standard of living Index
25-27 High Standard of living Index

After calculating the standard of living Index the families lied between low, medium and high standard of living.

### REPRODUCTIVE PROFILE (FERTILITY BEHAVIOR OF THE FEMALE OF THE FAMILY)

For looking into the reproductive profile of the female of the family in the following information was extracted and was put to required analysis. The information included age of the female, age at marriage, age at menarche, age at menopause, total no of conceptions, age at each conception, result of each conception, miscarriage, abortion, still birth, duration between last two pregnancies and total no of surviving children. The information on above said parameters has been used in calculating the fertility rates.

**Safe Motherhood**
An attempt was also made to observe the awareness of the family towards the health of the mother and the child. The information included number of doses of TT taken, BP of mother checked, place of delivery, delivery assistance, first breastfeeding, duration of breastfeeding and amenorrhea and had been summarized in the form of table.

**Family Planning Practices**

The data was also collected on the awareness about family planning methods of the UP migrants. The information included the following parameters:-

- Knowledge of family planning methods.
- Type of methods used/not used.
- Reasons for not using methods.

The present study indicated the awareness of the families about Family Planning Methods and further the families categorized in to users and non-users.

**Gender preference towards male child**

The data has been put to analysis for observing whether there was gender preference towards male child among the families and information has been recorded as follows:-

- Sex preference for particular child.
- Ideal no. of sons preferred.
- Ideal no. of daughters preferred.
- Preference for neither son nor daughter.

**Mortality**

To calculate mortality rates of U.P migrants prevalent amongst prenatal and postnatal periods, the following information was collected:-

- **Infant Mortality**
  - Age and sex of the infant.
  - Order of Birth.
  - Cause and year of death.

- **Child mortality**
  - Age and sex of the child.
  - Year of death.
  - Cause of death.
Prenatal mortality

- Order of conception.
- Age of mother.
- Sex of the fittest.
- Probable causes of death.

Neo-natal Mortality

- Order of conception.
- Sex of neonate.
- Probable cause of death.
- Adult Mortality.
- Sex of the adult.
- Probable cause of death.

ANALYSIS OF DATA

Surveys and observations give us the raw data in complex form. The purpose of the analysis was to unravel the knot to reduce the complexity, to separate the factors and to isolate the simple phenomena to make it understand how fertility, mortality and migration are interrelated to each other. The data collected were analyzed with the help of statistical methods. To measure the rates of fertility and mortality following mathematical tools had been taken into consideration.

Fertility

- **Crude Birth Rate**: - It is a ratio of total registered live births to the midyear population in some specified year, multiplied by 1000.

\[
\text{CBR} = \frac{\text{Total No of Births in a year}}{\text{Total Population}} \times 1000
\]

- **General Fertility Rate**: - It is the ratio of total yearly registered births to the population of women of child bearing age i.e. age group of 15 -49 years, multiplied by 1000.

\[
\text{GFR} = \frac{\text{Number of live births registered during the year}}{\text{Mid Year Population of woman between ages 15 - 49}} \times 1000
\]

- **Age Specific fertility Rate**: - It is a ratio of the number of births during the year to women in age interval divided by midyear population of women in the same age group, multiplied by 1000.

\[
\text{ASFR} = \frac{\text{No of Births in a year to women aged x = Bfx}}{\text{1000}}
\]
ASFRs are often expressed per 1000. Normally, seven are calculated, one for each five-year age group 15-19, 20-24…45-49, but single year rates are also common.

- **Total Fertility Rate**: - It is the sum of the age specific fertility rate of women at each age group interval from 15 to 49 years. Since the age group interval represents five year interval, the sum of age specific birth rate.

  \[
  TFR = \text{Summation of ASFR over all ages}
  \]

**Mortality**

Mortality rates can be measured by using mathematical tools as follows:

- **Crude Death Rate**: - It is the ratio of the total registered deaths of some specified year to the total population, at the middle of the year, multiplied by 1000.

  \[
  CDR = \frac{\text{Total Deaths Registered during the year}}{\text{Midyear population}} \times 1000
  \]

- **Infant Mortality Rate**: - The no. of children dying under one year of age divided by no. of live births that year, multiplied by 1000.

  \[
  IMR = \frac{\text{No. of Deaths Aged less than 12 months}}{\text{No. of live births occurred during a year}} \times 1000
  \]

- **Prenatal Mortality Rate**: - Number of deaths occurring to the phase surrounding the time of birth or 12th week of gestation to 28th day of newly born life, divided by total no of live births in a given year, multiplied by 1000.

  \[
  PMR = \frac{\text{No of deaths including still births, abortions, miscarriages}}{\text{Total no of live Births}} \times 1000
  \]

- **Neonatal Mortality Rate**: - Number of Deaths during the first 28 days completed days of life per 1000 live births in a given year or a period.

  \[
  NMR = \frac{\text{No of Infant deaths in one month}}{\text{Total no of live births}} \times 1000
  \]

- **Child Mortality Rate**: - The number of children dying between the ages of one to five, divided by no of live births, multiplied by 1000 in a given year or period.
CMR = \( \frac{\text{No of Child deaths up to 1 to 5 year of age}}{\text{Total no of Live Births}} \times 1000 \)

**Sex-Ratio:** It is defined as the proportion of females to males in a given population, usually expressed as no of females per 1000 males.

\[
SR = \frac{\text{No of Female}}{\text{No of Males}} \times 1000
\]

**Survival Ratio of Children**

It is defined as the total no. of children survived per 1000 births.

\[
\text{Survival Ratio} = \frac{\text{No. of children survived}}{\text{Total no. of Births}} \times 1000
\]

**Dependency Ratio**

A measure showing the number of dependents (aged 0-14 and over the age of 65) to the total population (aged 15-64). Also referred to as the "total dependency ratio.

\[
\text{Dependency Ratio} = \frac{\text{Number of Dependents}}{\text{Population (Age 15-64)}} \times 100
\]

**Statistical Framework**

**Z-test**

In order to compare two proportions of respondents, Z-test i.e. test, of proportions, was applied as under:

\[
Z = \frac{P_1 - P_2}{\text{SE of } (P_1 - P_2)}
\]

\[
\text{SE of } (P_1 - P_2) = \sqrt{p \cdot q \cdot \left(\frac{1}{N_1} + \frac{1}{N_2}\right)}
\]

\[
P = \frac{N_1P_1 + N_2P_2}{N_1 + N_2}
\]

\[
q = 1 - p
\]

Where

\[
P_1 = 1\text{st proportion of respondents}
\]

\[
P_2 = 2\text{nd proportion of respondents}
\]
N_1 = Total number in first group
N_2 = Total number in second group

**Students’ t-test**

To compare the two mean values of a variable/parameter, students’ t-test was applied as under:

\[ t = \frac{X_1 - X_2}{SE(X_1 - X_2)} \]

\[ SE(X_1 - X_2) = \sqrt{S \cdot \frac{1}{n_1} + \frac{1}{n_2}} \]

\[ S = \sqrt{SD_1^2 \frac{n_1-1}{n_1} + SD_2^2 \frac{n_2-1}{n_2}} \]

\[ n_1 + n_2 - 2 \]

Where,

SE = standard error of mean difference
X_1 = mean value in one group
X_2 = mean value in second group
SD_1 = standard deviation in one group
SD_2 = standard deviation in second group
S = common standard deviation
n_1 = number of observations in one group
n_2 = number of observation in second group

**Regression Analysis**

In order to see the combined effect of socio-economic and other variables on different fertility/mortality rates, multiple regression analysis was done. It was done by using the following algebraic form as under:

\[ Y = a + b_1x_1 + b_2x_2 + \ldots + b_nx_n + \mu \]

Where

Y = Fertility/Mortality Rate (Dependent variable)
a = a constant term
X_1 \text{ to } X_n = \text{Independent variables}

b_1 \text{ to } b_n = \text{Regression coefficients of } X_1 \text{ to } X_n

\mu = \text{a random error term}

The regression coefficients were tested for their significance through t-test.

**Analysis of Variance (ANOVA)**

To compare more than two means at a time, analysis of variance (ANOVA) was carried out. The process of the analysis is given here under:

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>d.f.</th>
<th>T.S.S.</th>
<th>M.S.S.</th>
<th>F-ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Categories</td>
<td>n-1=a</td>
<td>S_1</td>
<td>S_1/a=x</td>
<td>x/y</td>
</tr>
<tr>
<td>Error</td>
<td>b-a=c</td>
<td>S_2</td>
<td>S_2/b=y</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>N-1=b</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Where

n = Number of categories to be compared (categories of age, education, etc.)

N = Number Of respondents

T.S.S = Total Sum of Squares

M.S.S = Mean Sum of Squares (TSS/d.f.)

d.f = Degree of Freedom.

**Coefficient of Correlation**

To see the relationship between two parameters/variables, Karl Pearson’s Coefficient of Correlation (r-value) was worked out by using the following formula:

\[ r(X,Y) = \frac{\sum xy}{\sqrt{\sum (x^2)(y^2)}} \]

Where

\[ x = X - \bar{X} \]

\[ x = \bar{X} - X \]

\[ y = Y - \bar{Y} \]