

A Study to Assess the Nutritional Status of Housewives of the Below Poverty Line Families Living in a Slum in the Kidderpore Area of Kolkata, India

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Poverty Line and Slum-Dwellers of India

- In India, monthly per capita consumption expenditure of Rs. 972 in rural areas and Rs. 1407 in urban areas, is considered as the poverty line.
- Therefore, a person spending $<$ Rs. 47 a day in urban areas and $<$ Rs. 32 a day in rural areas, is living below the poverty line in India.
- In urban areas, generally, the slum-dwelling people are living below the poverty line.
- A slum is a densely populated area (usually in a city) of substandard housing, unsanitary conditions and social disorganization.

Housewives of Below Poverty Line Families

- A housewife is a woman (usually married) managing a household. In other words, a housewife's main occupation is running or managing the home, caring for her children and other family members, cooking and storing food, buying necessary goods for the family etc.
- Housewives in the below poverty line (BPL) families are at a high risk of suffering from malnutrition, because of poverty, and the fact that they often give priority to the nutritional needs of their children, husband and other family members, neglecting their own.
- Hence, it is necessary to know, whether the housewives of the BPL families are suffering from malnutrition, and, if so, to what extent.

Objective

This study has attempted to assess the nutritional status of housewives of the BPL families living in a slum in the Kidderpore area of Kolkata (India).

Some Technical Details

- It is a cross-sectional study conducted on 96 housewives, in the age-group of 20-60 years (belonging to the BPL families living in a slum of the Kidderpore region of Kolkata); these 96 housewives had been selected using simple random sampling technique.
- The study period is 6 months, and the study was conducted between March 2018 and September 2018.
- During the study, house-to-house visit was undertaken with a predesigned and pretested questionnaire (for extracting relevant information) and suitable measuring instruments (for recording weight and height); besides, important physical signs and symptoms (indicating nutritional deficiency), if any, were also noted.

Sample Size

The sample size (n) was calculated using the equation:

$$n = \frac{z^2 p_1 (1-p_1)}{d^2}$$

where,

- z = level of confidence as per the standard normal distribution = 1.96 (for 95% level of confidence),
- p1 = estimated proportion of the population that represents the relevant characteristic i.e., malnutrition = 0.5 (since p1 is unknown, it is taken as 0.5),
- d = tolerated margin of error = 0.1 (for 10% allowable error).

After calculation, one gets, $n = 96.04 \simeq 96$.

Nutritional Status of Housewives

To understand the nutritional status of housewives, three indicators viz.,

- body mass index or BMI (the weight in kilograms divided by the square of the height in metres),
- presence of angular stomatitis (inflammation of one or both corners of the mouth due to vitamin B₂ deficiency and other reasons), and
- presence of pallor (pale colouring of the skin, generally of the face and the palms, due to anaemia and other reasons)

Nutritional Status of Housewives (contd.)

and one predisposing factor viz.,

- frequency of consumption of green leafy vegetables (green leafy vegetables constitute an important source of nutrition)

were considered.

For studying the nutritional status with the help of the aforesaid indicators and predisposing factor, the binomial tests were done at 5% level of significance.

Binomial Test

The formula for calculating the p-value (p11) is given by the equation:

$$p11 = 2 \frac{n!}{(n-X)! X!} p^X q^{(n-X)}$$

where,

- n = total number of housewives = sample size = 96,
- $X = n / 2 = 48$,
- p = proportion of cases corresponding to the first variable pertaining to an indicator (the value in the first column in any one of tables- 1 to 4),
- q = proportion of cases corresponding to the second variable pertaining to the same indicator (the value in the second column in the same table).

If $p11 < 0.05$, for a criterion, then one can draw an inference about the nutritional status of a significant number of housewives using the relevant indicator or factor; otherwise, no such inference can be drawn.

Some Important Relations

To ascertain

- whether there is a significant association between the frequency of consumption of green leafy vegetables and the occurrence of pallor among the housewives, and
- whether there is a significant relation between the physiological condition (i.e., whether a housewife is pregnant/lactating or not) and the presence of pallor among the housewives

the chi-square tests were done at 5% level of significance.

Note: It may be noted here that the nutritional needs of a pregnant/lactating woman is higher than those of a non-pregnant and non-lactating one.

Chi-Square Test

The formula for chi-square (χ^2) is given by the equation:

$$\chi^2 = \sum \frac{(O-E)^2}{E}$$

where,

- O = each observed value in any one of tables- 5 and 6,
- E = each expected value in the same table = (row total X column total / grand total) corresponding to each value in that table,
- p2 = p-value (calculated using relevant software system) corresponding to the chi-square value with 1 degree of freedom.

If $p2 < 0.05$, then it can be concluded that the relevant association is significant; otherwise, it (i.e., the pertinent association) is not significant.

Brief Literature Survey

Before undertaking this work, a brief literature survey was conducted, but no study related to the nutritional status of housewives of BPL families of Kidderpore area, was found.

Methodology

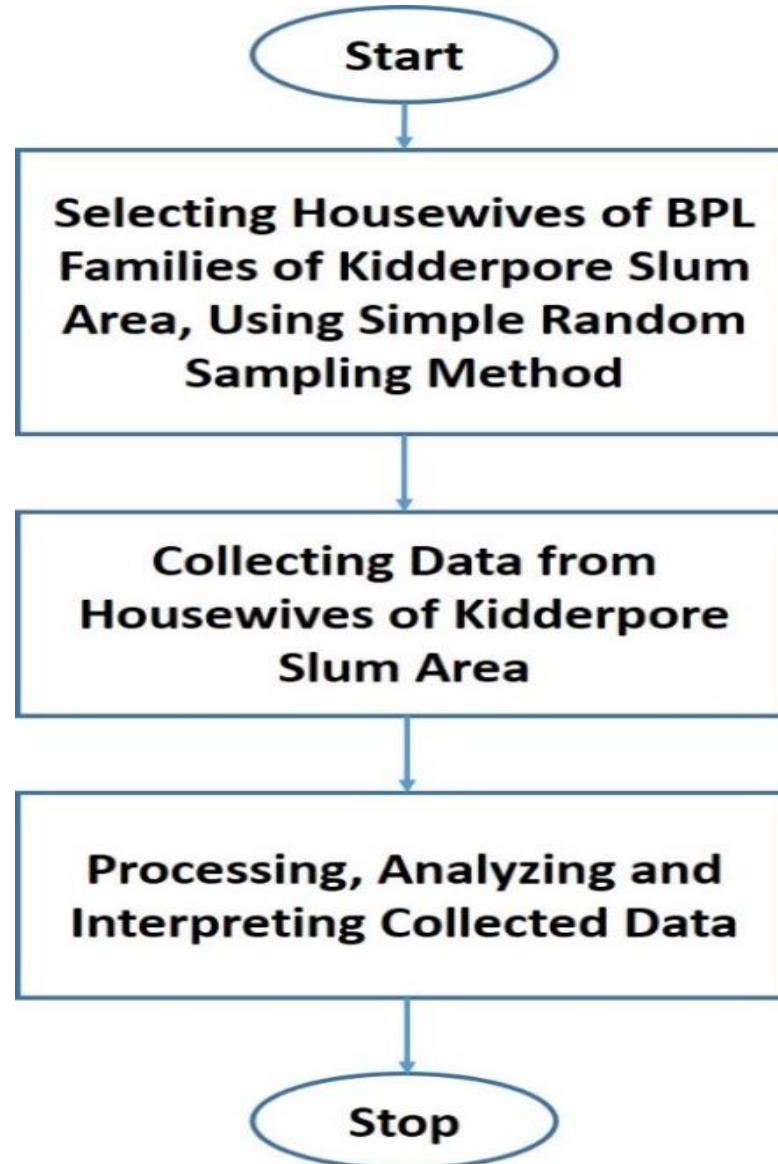


Fig.-1: Flowchart depicting the outline of the method

Table-1: Classification of housewives according to BMI

Normal/overweight (BMI \geq 18.00)	Underweight (BMI < 18.00)	Total
57	39	96

According to table-1, 57 housewives are either normal or overweight. Here, the p-value for the binomial test is, $p_{11} = 0.0292 < 0.05$. Thus, a significant number of the housewives are not suffering from malnutrition, so far as the BMI is concerned.

Lip Condition

Table-2: Categorization of housewives according to lip condition

Presence of angular stomatitis	Normal lip	Total
24	72	96

As per table-2, 72 housewives have normal lip. Here, the p-value for the binomial test is, $p_{11} = 1.6355 \times 10^{-7} < 0.05$. Therefore, a significant number of housewives are not suffering from malnutrition, so far as the occurrence of angular stomatitis is concerned.

Skin Colour

Table-3: Classification of housewives according to skin colour

Presence of pallor	No presence of pallor	Total
38	58	96

In table-3, 58 housewives do not have pallor. Here, the p-value for the binomial test is, $p_{11} = 0.0193 < 0.05$. Hence, a significant number of housewives are not suffering from malnutrition, so far as the occurrence of pallor is concerned.

Frequency of Consumption of Green Leafy Vegetables

Table-4: Grouping of housewives according to frequency of consumption of green leafy vegetables

0-3 days in a week	> 3 days in a week	Total
14	82	96

Table-4 shows that 82 housewives consume green leafy vegetables for more than 3 days in a week. Here, the p-value for the binomial test is, $p_{11} = 4.8793 \times 10^{-16} < 0.05$. So, a significant number of housewives are not predisposed to malnutrition, so far as the frequency of consumption of green leafy vegetables is concerned.

Pallor & Consumption of Green Leafy Vegetables

Table-5: Association between the frequency of consumption of green leafy vegetables and the presence of pallor, among the housewives

Frequency of consumption of green leafy vegetables	Presence of pallor	No presence of pallor	Total
0-3 days in a week	12	2	14
> 3 days in a week	26	56	82
Total	38	58	96

As per table-5, out of the 14 housewives who consume green leafy vegetables for not more than 3 days in a week, 12 have pallor, and among the 82 housewives who consume green leafy vegetables for more than 3 days in a week, 56 do not have pallor. Here, the p-value for chi-square test is, $p = 1.3598 \times 10^{-4} < 0.05$. So, there is a significant relation between the frequency of consumption of green leafy vegetables and the presence of pallor, among the housewives, and more is the frequency of consumption, less is the chance of occurrence of pallor.

Pallor & Physiological Condition

Table-6: Relation between physiological condition and presence of pallor, among the housewives

Physiological condition	Presence of pallor	No presence of pallor	Total
Pregnant/lactating housewife	26	7	33
Non-pregnant and non-lactating housewife	12	51	63
Total	38	58	96

According to table-6, out of the 33 pregnant/lactating housewives, 26 have pallor, and among the 63 non-pregnant and non-lactating housewives, 51 do not have pallor. Here, the p-value for chi-square test is, $p = 1.3142 \times 10^{-8} < 0.05$. Hence, there is a significant association between the physiological condition and the presence of pallor, among the housewives, and the chance of occurrence of pallor is more among the pregnant/lactating housewives than among the non-pregnant and non-lactating ones.

Implications

The results of the binomial tests and the chi-square tests indicate that:

- A significant number of housewives of the concerned slum of the Kidderpore region, are not suffering from malnutrition, so far as the three indicators viz., BMI, presence of angular stomatitis, and presence of pallor are concerned.
- A significant number of housewives are also not predisposed to malnutrition as indicated by the predisposing factor viz., frequency of consumption of green leafy vegetables.
- A probable cause for the two aforesaid outcomes is that Kidderpore, being a port area, offers various jobs with not-very-low salaries to the slum-dwellers.

Implications (contd.)

- There is a significant association between the frequency of consumption of green leafy vegetables and the presence of pallor, among the housewives, and the chance of the occurrence of pallor lessens with the increase in the frequency of consumption. This is an expected result.
- There is a significant relation between the physiological condition and the occurrence of pallor, among the housewives, and the pregnant/lactating housewives are more susceptible to the occurrence of pallor than the non-pregnant and the non-lactating ones.
- A probable cause for the aforesaid result is that the pregnant/lactating housewives of the concerned slum are not getting sufficient nutrition to meet their higher nutritional needs.

Implications (contd.)

- Therefore, though a significant number of housewives of that slum are not suffering from malnutrition, this is not the case for most of the pregnant/lactating women among them.

Conclusions (Outcomes)

- This study shows that a significant number of housewives of the concerned slum of the Kidderpore region are neither suffering from, nor predisposed to, malnutrition, so far as the three indicators and one predisposing factor are concerned.
- The above result is interesting because, in India, the slum-dwelling people are generally considered to be belonging to the BPL category, and the housewives of BPL families normally suffer from malnutrition.
- A possible explanation for the aforesaid anomalous outcome is that, since Kidderpore is a port area, a considerable number of slum-dwellers of this region are employed with not-very-low salaries.

Conclusions (Outcomes) (contd.)

- This work also shows that there is a significant association between the frequency of consumption of green leafy vegetables and the presence of pallor, among the housewives, and that the chance of the occurrence of pallor lessens with the increase in the frequency of consumption.
- Another outcome of the study is that there is a significant relation between the physiological condition and the occurrence of pallor, among the housewives, and that the pregnant/lactating housewives are more susceptible to the occurrence of pallor than the non-pregnant and the non-lactating ones.
- The above result shows that the nutritional levels of the housewives of the concerned slum are not sufficient to meet the higher nutritional needs of most of the pregnant/lactating women among them.

Conclusions (Recommendations)

- To ascertain the theory that Kidderpore port area offers sufficient employment opportunities to the slum-dwelling people with not-very-low salaries , a thorough study on the occupations and incomes of the people of the concerned slum, should be undertaken.
- Also, other indicators associated with the nutritional status of the housewives of that slum, should be investigated.
- Besides, nutritional studies should be conducted on the housewives living in other nearby slums (if any) of this region, to see whether similar results are obtained.

Conclusions (Recommendations) (contd.)

- To address the problem of insufficient nutritional levels of the pregnant/lactating housewives of BPL families, the government can take appropriate measures to provide financial assistance to these women (i.e., the pregnant/lactating housewives of BPL families).
- Besides, the government can take necessary steps to educate the members (both male and female) of BPL families regarding the higher nutritional needs of the pregnant/lactating women.

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Thank You