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Study of knowledge of mothers on immunization of children and its associated factors in Chennai, India

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ABSTRACT

Immunization is one of the most effective and cost-effective ways to protect children's lives and futures. Knowledge of mothers on immunization plays a major role in the immunization of the children. This study was conducted to assess the knowledge of mothers on immunization of the children. This was a cross-sectional study, conducted among 120 mothers who were selected using the purposive sampling technique, in 2020 in Chennai, India. Mothers having children below the age of 5 years were included in the study. Data were collected by interviews at their homes using a pretested, predetermined, and structured questionnaire. Data is entered in Excel and analyzed in SPSS 20 using appropriate descriptive (f, %, Mean, and SD) and inferential statistics (t-test, ANOVA, and chi-square test). The mean knowledge score on immunization was 10.75/20. The majority of the mothers had moderately adequate knowledge (63.3%), followed by inadequate knowledge (30%), and only 6.7% of them had adequate knowledge. Regarding immunization coverage, the majority of the children were fully immunized in time (74.2%), followed by delayed immunization (15.8%) and only 10% were non-immunized. Mothers' knowledge on immunization status was significantly associated with residence (Living area, $t= 2.13, p=0.035$) and educational status of the mothers ($F= 0.0979, p= 0.379$). Collected data is entered in Excel and analyzed in SPSS 20 using appropriate descriptive (f, %, Mean, and SD) and inferential statistics (t-test, ANOVA, and chi-square test). Educating mothers about immunization focusing on its benefits and cost-effectiveness using various strategies should be planned to increase the mothers' knowledge on immunization and immunization coverage.

Keywords: Children, Immunization, Knowledge, Mothers

1. INTRODUCTION

Immunization is key to child survival. Missing Routine Immunization (RI) can be life threatening for infants. Immunization is one of the most effective and cost-effective ways to protect children's lives and futures. More than half of the world's most vulnerable children still miss the essential vaccines they need to survive and live healthy lives. Globally, 1.5 million deaths could be avoided if children were vaccinated¹.

Over the years vaccines have provided highly cost effective improvements to human health by reducing avoidable human suffering, costs of care and treatment, economic consequences of work.²

In May 1974, the WHO launched the Expanded Immunization Program (EPI) globally, with a focus on prevention of 6 vaccine-preventable diseases by the year 2000. In India, EPI was launched in 1978 and it was re-designated as the Universal Immunization Program (UIP) in 1985^{3,4}.

It is well known fact that small pox which is killing disease is successfully eradicated from world using vaccination. In the last few decades India has made significant efforts and succeeded in improving health indicators, particularly those related to maternal and child health by using effective strategies especially focusing on immunization of children.

Immunization acts as a protective shield, keeping families and communities safe. By vaccinating our children, we are also protecting the most vulnerable members of our community, including new-born babies¹. One of the most significant contributions of the medical fraternity to mankind is the advent of vaccines. They are the most powerful, safe and cost-effective measures for prevention/control of a number of diseases.⁵

In India, under Universal Immunization Program (UIP) vaccines for six vaccine-preventable diseases (tuberculosis, diphtheria, pertussis (whooping cough), tetanus, poliomyelitis, and measles) are available for free of cost to all.⁶⁻⁸ However Despite the progress, infectious diseases continue to contribute to a significant proportion of child mortality and morbidity in India¹.

These facts clearly highlights the need and importance of immunizing the children to protect them from the preventable killer diseases. Therefore it is vital to assess the awareness of the public especially mothers on existing knowledge. It will help the health care professionals and policy makers on planning for the strategies in spreading awareness about the importance of immunization and ensure that parents and caregivers have the adequate knowledge about the immunization. They should know when and where to bring their children for vaccination, the duration between the doses and the importance of not missing a visit.

It is well known fact that, the mother plays a vital role in promoting the health of children. Mother is the decision maker in most of the families of India especially with regard to immunizing the children. Several misconceptions, ignorance and inadequacy of knowledge in relation to vaccine may prevent the mothers in vaccinating their children.

Therefore it is important to understand and assess the knowledge of mothers on immunization and factors associated with it. Hence, this study is undertaken to assess the knowledge of mothers with under five children about vaccination and its association with immunization status of the children and sociodemographic variables.

2. METHODS AND MATERIALS

This was a cross-sectional study, conducted among 120 mothers who were selected using purposive sampling technique, in 2020 in Chennai, India. Mothers were selected proportionately from Non slum and slum area considering the 30% of slum in Chennai city (70% and 30% respectively). Mothers having child below the age of 5 years were included in the study. Data were collected after obtaining oral consent, by interviews at their home using pretested, predetermined tools such as Demographic variables proforma of parents and children, Check list on immunization status and knowledge Questionnaire. Knowledge Questionnaire consisted of 20 MCQs on immunization with 4 sub components such as general aspects (7), Specific vaccine (4), Side Effects (3), and general care related to immunization (6). Each item consisted of stem and 4 options (one right response and 3 distractors). Individual scores were summed for obtaining total score. Obtained score is converted into Percentage and interpreted as follows (75-100% Adequate knowledge, 50-74% Moderately Adequate knowledge, Below 50% - Inadequate Knowledge. Data is entered in Excel and analyzed in SPSS 20 using appropriate descriptive (f, %, Mean and SD) and inferential statistics (t test, ANOVA, and chi square test).

3. RESULTS

Table 1: Frequency and Percentage Distribution of Demographic Variables of Parents (N= 120)

| Variables | f | % |
|-------------------------------------|----|------|
| Residence | | |
| Non slum | 84 | 70.0 |
| Slum | 36 | 30.0 |
| Religion | | |
| Hindu | 75 | 62.5 |
| Christian | 33 | 27.5 |
| Muslim | 12 | 10.0 |
| Type of Family | | |
| Nuclear | 76 | 63.3 |
| Joint family | 44 | 36.7 |
| Educational Status of Father | | |
| Illiterate | 16 | 13.3 |
| High School | 36 | 30.0 |
| Hr Secondary | 43 | 35.8 |
| Graduate | 25 | 20.8 |
| Educational Status of Mother | | |
| Illiterate | 3 | 2.5 |
| High School | 28 | 23.3 |
| Hr Secondary | 62 | 51.7 |
| Graduate | 27 | 22.5 |
| Occupation (Father) | | |
| Employee | 77 | 64.2 |
| Business | 8 | 6.7 |
| Laborer | 30 | 25.0 |
| Unemployed | 5 | 4.1 |
| Occupation (Mother) | | |

| | | |
|---|-----|------|
| Employee | 23 | 19.2 |
| Home maker | 82 | 68.3 |
| Labourer | 15 | 12.5 |
| Monthly Family Income | | |
| Up to 5000 | 12 | 10.0 |
| 5001 to 10000 | 79 | 65.8 |
| 10001to 20000 | 13 | 10.8 |
| 20001 to 30000 | 8 | 6.7 |
| Above 30000 | 8 | 6.7 |
| No of Children | | |
| 1 child | 74 | 61.7 |
| 2 children | 43 | 35.8 |
| 3 children and more | 3 | 2.5 |
| Place of Delivery | | |
| Primary health centre | 14 | 11.7 |
| Government hospital | 86 | 71.7 |
| Private hospital | 20 | 16.7 |
| House | 0 | 0 |
| Native State | | |
| Tamil Nadu | 109 | 90.8 |
| AP/ Telangana | 6 | 5.0 |
| Others | 5 | 4.2 |
| Source of Information | | |
| Mass media /News paper | 3 | 2.5 |
| Health care worker | 95 | 79.2 |
| Neighbours | 12 | 10.0 |
| Family members | 10 | 8.3 |
| Mode of Transport | | |
| On feet by walk | 52 | 43.3 |
| Own vehicle | 32 | 26.7 |
| Auto | 21 | 17.5 |
| Public transport | 15 | 12.5 |
| Time taken to reach Health Care Facility | | |
| <30 Minutes | 92 | 76.7 |
| 30-60 Minutes | 22 | 18.3 |
| > 60 Minutes | 6 | 5.0 |

Table 1 reveals that majority of them were from nonslum area (70%), Hindus (62.5%), from nuclear families (63.3%), fathers were employed (64.2%), mothers were home makers (68.3%), with monthly income of 5001 to 10,000 (65.8%), had one child (61.7%), were from Tamil Nadu, delivered in hospital, received information from health care workers(79.2%) and health care facility was within 30 minutes reach. Regarding other variables, 35.8% of fathers have studied upto Hr Secondary, 43.3 % of them had health care facility within walkable distance.

Table 2: Frequency and percentage Distribution of Variables of Children (N=120)

| Variables | f | % |
|---|-----|------|
| Age in years | | |
| 1 | 59 | 49.2 |
| 2-3 | 28 | 23.3 |
| 4-5 | 33 | 27.5 |
| Gender | | |
| Male | 65 | 54 |
| Female | 55 | 46 |
| Birth Weight | | |
| Normal | 93 | 77.5 |
| Low Birth Weight | 27 | 22.5 |
| Gestational Age | | |
| Small for Gestational age | 25 | 20.8 |
| Appropriate for Gestational age | 72 | 60.0 |
| Large for Gestational age | 23 | 19.2 |
| Immunization Card | | |
| Available | 119 | 99.2 |
| Not Available | 1 | .8 |
| Vaccinated the child (Atleast once) | | |

| | | |
|--|-----|-------|
| Yes | 120 | 100.0 |
| No | 0 | 0 |
| Place of Vaccination | | |
| 1 Primary Health Center | 26 | 21.7 |
| 2 Government hospital | 83 | 69.2 |
| 3 Urban Health Nurse | 5 | 4.2 |
| 4 Private Hospital | 6 | 5.0 |
| Willingness to immunize the child (in Future) | | |
| Yes | 120 | 100 |
| No | 0 | 0 |

Table 2 depicts that, around half of the children were aged 1 year (49.2%), male children (54%). Majority of the children’s birth weight was normal (77.5%), appropriate for gestational age (60%), had immunization card (99.2%), vaccination was given in government hospital (69.2%). All of them (100%) supported and willing for immunisation in future and vaccinated the child atleast once).

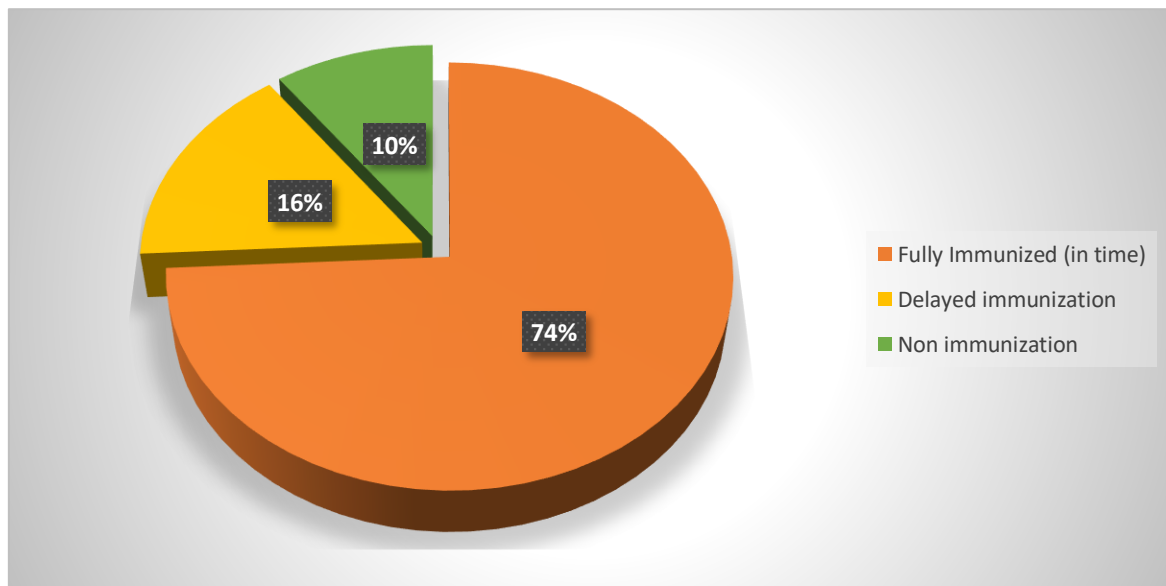


Fig. 1: Immunization Coverage of the Children

Figure 1 reveals that, majority of the children were fully immunized in time (74.2%), followed by delayed immunization (15.8%) and only 10% were non immunized.

Table 3: Frequency and Percentage Distribution of Levels of Knowledge of Mothers of Under 5 children on Immunization (N=140)

| Levels of Knowledge | f | % |
|---------------------|----|------|
| Adequate | 8 | 6.7 |
| Moderately Adequate | 76 | 63.3 |
| Inadequate | 36 | 30.0 |

Table 3 depicts that, majority of the mothers had moderately adequate knowledge(63.3%), followed by inadequate knowledge (30%) and only 6.7% of them had adequate knowledge.

Tab 4: Descriptive Statistics of Knowledge of Mothers of Under 5 children on Immunization (N=140)

| Components | Obtainable Score | Obtained Score | | Obtained Score | SD |
|---------------------|------------------|----------------|---------|----------------|------|
| | | Minimum | Minimum | | |
| General Aspects | 0-7 | 0 | 7 | 3.73 (53) | 1.38 |
| Specific Vaccines | 0-5 | 0 | 5 | 1.99 (40) | 1.36 |
| Side Effects | 0-3 | 0 | 3 | 1.85 (62) | 0.64 |
| General Care | 0-5 | 0 | 5 | 3.18 (64) | 1.10 |
| Global Score | 0-20 | 5.0 | 17 | 10.75 (54) | 2.41 |

Table 4 reveals that, global mean score of knowledge was 10.75 (54%). Highest mean score % (64%) was found in general care , followed by side effects(62%), general aspects (53%), while lowest mean %score was in specific Vaccines (40%).

Table 5: Association Between Levels of Knowledge of Mothers Regarding Immunization and Immunization Status

| Knowledge Scores | Immunization Status | | Chi Square value | P value |
|-------------------|-------------------------|------------------------------|------------------|---------|
| | Fully Immunized in time | Delayed and Non Immunization | | |
| Upto Mean Scores | 51 | 20 | 0.5 | 0.53 |
| Above Mean Scores | 38 | 11 | | |

Table 5 reveals that, there is no association between mothers knowledge and immunization status (p=0.53).

Table 6: Association Between Selected Variables and Levels of Knowledge of Mothers Regarding Immunization (N= 120)

| Variables | n | Knowledge Score | | Test Value (t/F) | P value |
|-------------------------------------|----|-----------------|------|----------------------------|--------------|
| | | Mean Score | SD | | |
| Residence | | | | | |
| Nonslum | 84 | 11.3 | 2.45 | t 2.13 | 0.035 |
| Slum | 36 | 10.3 | 2.29 | | |
| Educational Status of Father | | | | | |
| Illiterate | 16 | 9.81 | 2.26 | ANOVA F 0.933 | 0.427 |
| Primary | 36 | 10.92 | 1.90 | | |
| School | 43 | 10.86 | 1.95 | | |
| Graduate | 25 | 10.92 | 3.62 | | |
| Educational Status of Mother | | | | | |
| Illiterate | 3 | 9.60 | .58 | ANOVA F 3.002 | 0.033 |
| Primary | 28 | 10.33 | 1.73 | | |
| School | 62 | 11.08 | 2.11 | | |
| Graduate | 27 | 11.22 | 3.34 | | |
| Monthly Family Income | | | | | |
| Up to 5000 | 12 | 10.76 | 1.76 | ANOVA F 1.044 | 0.388 |
| 5001-10,000 | 79 | 10.96 | 2.20 | | |
| 10001-20,000 | 13 | 9.52 | 2.85 | | |
| 20001- 30,000 | 8 | 10.38 | 2.26 | | |
| Above 30,000 | 8 | 11.00 | 4.17 | | |
| No of Children | | | | | |
| 1 | 74 | 10.58 | 2.62 | ANOVA F 0.979 | 0.379 |
| 2 | 43 | 11.17 | 1.87 | | |
| More than 2 | 3 | 9.67 | 4.04 | | |

Table 6 depicts that, mothers’ knowledge on immunization status was significantly associated with residence (Living area t= 2.13, p=0.035) and educational status of the mothers (F= 0.0979, p= 0.379).

4. DISCUSSION

Immunization is one of the most cost-effective public health interventions since it provides direct and effective protection against preventable morbidity and mortality. Mothers’ knowledge on Immunization plays vital role in immunizing the child. This study was conducted to assess the knowledge of mothers with under five children about immunization and its association with immunization status of the children and sociodemographic variables.

Study findings reveal that majority of them were from nonslum area (70%), Hindus (62.5%), from nuclear families (63.3%), fathers were employed (64.2%), mothers were home makers (68.3%), with monthly income of 5001 to 10,000 (65.8%), had one child (61.7%), were from Tamil Nadu, delivered in hospital, received information from health care workers (79.2%) and health care facility was within 30 minutes reach. Regarding other variables, 35.8% of fathers have studied upto Hr Secondary, 43.3 % of them had health care facility within walkable distance.

With regard to children, around half of the children were aged 1 year (49.2%), male children (54%). Majority of the children’s birth weight was normal (77.5%), appropriate for gestational age (60%), had immunisation card (99.2%), vaccination was given in government hospital (69.2%). All of them (100%) supported and willing for immunisation in future and vaccinated the child atleast once).

The immunization coverage status in present study is, majority of the children were fully immunized in time (74.2%), followed by delayed immunization (15.8%) and only 10% were non immunized. According to NFHS-4 data this figure is improved to National

statistics of immunization, which is 62% of coverage in 2015-2016⁹. These improvement on immunization coverage may be due to government's action and strategies which are planned and implemented in India in recent years.

In the present study on assessment of knowledge of mothers about immunization revealed that, global mean score of knowledge was 10.75 (54%). Highest mean score % (64%) was found in general care , followed by side effects(62%), general aspects (53%), while lowest mean % score was in specific Vaccines (40%). Findings also reveal that, majority of the mothers had moderately adequate knowledge(63.3%), followed by inadequate knowledge (30%) and only 6.7% of them had adequate knowledge. These findings are consistent with other study findings^{10,11}.

Present study findings revealed that, there is no association between mothers' knowledge and immunization status ($p=0.53$). Study findings also revealed that, mothers' knowledge on immunization status was significantly associated with residence (Living area)- ($t= 2.13, p=0.035$) and educational status of the mothers ($F= 0.0979, p= 0.379$). i.e. Knowledge scores of mothers on immunization was higher among educated mothers from non-slum area than the uneducated mothers residing in slum area. In fact educational status of the mothers and living area are interrelated factors that, mothers residing slum area are tend to be uneducated and vice versa. It also reflects the fact that, education has direct impact on mothers' knowledge on immunization which may also positively influence practice on immunization.

The present study also revealed that health care workers were the main source of information on immunization which is encouraging and reflects the responsibility taken by the health care workers on achieving immunization coverage. Knowledge and awareness regarding immunization among mothers was emphasized in many studies^{10,11}. It underscores the fact that, health care professionals including nurses must plan awareness programmes on immunization to enhance the knowledge among mothers which is essential to improve immunization coverage.

5. CONCLUSION

Overall study findings revealed that majority of the mothers have moderately adequate level of knowledge on immunization of Children. The knowledge was significantly associated with living area and educational status of the mothers. Knowledge scores of mothers on immunization was higher among educated mothers from non-slum area than the uneducated mothers residing in slum area. These findings highlight the need for future efforts to improve parents' knowledge, practice and immunization coverage targeting various population such as urban, rural, migrated population and slum area. This study findings also reinforce the need for organizing the awareness programmes on immunization by health care professionals to enhance the knowledge among mothers which is essential for improvement of immunization coverage.

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