Study of Causative Factors Leading to Non-Utilization of Pulse Polio Immunization

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Abstract: Introduction: Polio is one of the 6 major killer disease identified in our country. The most unfortunate part of the disease is that it less often kills but universally makes the child disabled cripple. In India over 110 million children under 5 year of age are living cripple life because of poliomyelitis which is 2 out of 3 case of polio in the world. Poliomyelitis is acute viral infection caused by RNA virus. Aim and Objective: To identify the non-utilizers of pulse polio immunization, to study the factor leading to non-utilization of pulse polio immunization programme. Material and Methods: Study was hospital based descriptive study based on the interview of parents of children less than 5 years. Total 200 interviews were conducted of which 100 were non utilizer group and other 100 were utilizer group. Interview was based on pre-formed proforma. In this study method adopted was a rapid assessment procedure. Results: In this study 33% of the non-utilizers were not aware about PPI programme, about 67% of non-utilizers were aware about PPI of which 15% were due to transit during PPI, child illness (13%), parents business (9%), not aware of day (8%), not aware of need (6%), Nobody was available to take the child to PPI booth (5%), vaccinator was not available (5%). No conveyance (5%) and no knowledge about age group (1%). Discussion: One third (33%) of the non-utilizers were not aware about PPI programme which comes out to be a major reasons for non-utilization. About 2/3 of non-utilizers were aware about PPI of which the 1st important reason which lead to non-utilization was transit during PPI (15%). Other causes were illness of child (13%), parents business (9%), not aware of days (8%), not aware of need (6%), Nobody available to take the child to PPI booth (5%), no conveyance available to reach the PPI booth (5%), Vaccinator was not available (5%) and no knowledge about age group (1%). Conclusion: To evaluate the PPI programme and find out the factor causing non utilization of PPI. The non-utilizers and utilizers both were interviewed. Study shows that there was marked unawareness prevailing among the population about vaccination, about 33% of non-utilizers were not aware about PPI. This suggests that there was lack in social mobilization and community effort.

Keywords: Pulse Polio, Immunization, Non utilizers, Utilizers etc.
national level in December, 9, 1995 immunizing more than 87.81 million less than 3 years of age with OPV and 2nd phase 6 weeks later on 20th January 1996. 93.58 million Children were immunized with OPV.

To arrive specially at the goal of polio eradication, government has started intensified PPI in India conducting 4 nationwide PPI round between October, 99 and January 2000. In addition eight priority states (UP, MP, West Bengal, Bihar, Rajasthan, Assam, Gujrat and Orissa) had organise 2 supplementary PPI round between February and April 2000.

There are many hinderances in the implementation of PPI especially in a vast country like India resulting in its failure in various dimensions. Thus it is important to study all aspect of this programme.

Aim of the study to identify the non-utilizers of pulse polio immunization, to study the factor leading to non-utilization of pulse polio immunization programme, to study the socio-economic condition and demographic profile in non-utilizers of pulse polio immunization and to compare the different aspects of non-utilizers vs utilizers of pulse polio immunization.

MATERIAL AND METHODS
The present study was hospital based descriptive study based on the interview of parents of children less than 5 years. Total 200 interviews were conducted of which 100 were non utilizer group and other 100 were utilizer group. Interview was based on pre-formed proforma. In this study method adopted was a rapid assessment procedure. In the last 10 years this method was widely used and accepted approach in the evaluation of National programme of health (Taylor Commission, WHO, 1995).

This method gives us a quick and systematic data gathering to guide out policy based on the opinion of knowledge and practice of the person who have participated in National PPI programme. The study population was obtained from stratified and purposive sampling of parents of under 5 year.

The study population has been divided into two broad groups.
1. Group I non utilizers - Parents / Guardians of children under 5 years of age who did not receive any of the dose of NID as well as those who received only the of 1st dose.
2. Group II utilizers - Parents I Gardians of children under 5 year of age who received all doses of NID respective of their age

The questionare based on pre structured proforma for both groups includes.

a. Awareness and knowledge about PPI programme,
b. Awareness about routine immunization,
c. Reasons of non-utilization of PPI programme (only group I),
d. Socio-economic condition and demographic profile,
e. Various channels for receiving information of PPI programme,
f. Distance of polio centre from residence,
g. Consent from family member for PPI
h. Time availability for PPI

RESULTS
In this study 33% of the non-utilizers were not aware about PPI programme, about 67% of non-utilizers were aware about PPI of which 15% were due to transit during PPI, child illness (13%), parents business (9%), not aware of day (8%), not aware of need (6%), Nobody was available to take the child to PPI booth (5%), vaccinator was not available (5%). No conveyance (5%) and no knowledge about age group (1%).

Hindu and Muslim had equal incidence of awareness (66.2%) and Christians were 100% aware. Graduate parents showed 100% awareness while awareness among secondary passed was 83.3% and illiterate parents showed maximum percentage of unawareness i.e. (42.2%).

Similar trend was shown by fathers literacy level maximum (94.1%) number of graduate father showed awareness i.e. 90% of secondary passed father showed awareness while maximum incidence of unawareness was showed by illiterate father i.e. 51%.

Mothers occupation showed very significant effect on awareness 100% service class mothers were aware while 84.2% of housewife mothers were aware. Maximum incidence of unawareness belongs to labourer class mothers i.e. (46.6%). Similarly 94.7% service class fathers were aware while awareness among business class fathers was 64.2% and unawareness was maximum among labourer fathers i.e. (42.2%).

100% urban parents were aware while awareness among urban slums area were 92% and maximum number of unaware i.e. 52.6% was showed by rural area parents.

100% awareness was among HSEC, 69.5% MSEC parents were aware while maximum number of unawareness was prevailed among LSES parents.

93.7% fully vaccinated child parents showed awareness while it was 77.6% among partially vaccinated and maximum number of unawareness belongs to unvaccinated group i.e. 73.1%.

Joint family showed 90.6% of awareness while 50.9% of unawareness was showed by nuclear family.
Above table shows that about 34%, highest incidence among the non-utilizers was in below 1 year of age group and lowest 17% incidence among the utilizers was also in this age group. Low incidence was seen in 1-2 year and 2-3 year of age, 16% and 11% respectively among non-utilizers while highest incidence of utilizers was seen in this age group, 26% and 22% respectively, p value = < 0.02 which is significant.

Above table shows that sex distribution of children among non-utilizers is approximately equal in both sex (male 52%: female 48%) while there is male predominance i.e. 59% in utilizers group and 41% were female. Male and female ratio is 1.4: 1 in utilizers group, p > 0.10 which is not significant.

Above table shows that high incidence of non-utilizer and utilizer belongs to hindu religion (74:60) and lowest incidence of non-utilizers belongs to Christian (2%) as compared to utilizer Christian (10%) and muslim religion showed approximately equal percentage in both groups. Chi square=7.46268, df=2, p value=2.396053E-02 which is highly significant. p<0.05 therefore this data is statistically significant.

Above table showing 59% of non-utilizers belongs to rural area while 61% of utilizers belongs to urban area. Lowest incidence (16%) of non-utilizers belongs to urban area while 22% of utilizers belongs to rural area. p<0.001 which is highly significant.

<table>
<thead>
<tr>
<th>Literacy Status</th>
<th>Non utilizers (n=100)</th>
<th>Utilizers (n=100)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of Cases</td>
<td>Percentage</td>
</tr>
<tr>
<td>Illiterate</td>
<td>77</td>
<td>77</td>
</tr>
<tr>
<td>Primary</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Middle</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Secondary</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Graduate &amp; Above</td>
<td>8</td>
<td>8</td>
</tr>
</tbody>
</table>
Above table shows (77%) of the non-utilizers mother were illiterate and 8% were graduate or highly educated while lowest percentage of utilizer mothers were illiterate (11%) and highest percentage had secondary education (25%) and higher education (23%). p<0.001 which is highly significant.

Table-6: Distribution of Children by Father Literacy

<table>
<thead>
<tr>
<th>Literacy Status</th>
<th>Non-utilizers (n=100)</th>
<th>Utilizers (n=100)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of Cases</td>
<td>Percentage</td>
</tr>
<tr>
<td>Illiterate</td>
<td>49</td>
<td>49</td>
</tr>
<tr>
<td>Primary</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>Middle</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>Secondary &amp; Above</td>
<td>17</td>
<td>17</td>
</tr>
</tbody>
</table>

Above table shows that 49% of non-utilizer fathers were illiterate and 17% were graduate and lowest (10%) had secondary education while lowest percentage of utilizers were illiterate (7%) and primary education (2%) and highest percentage of utilizer father belonged to secondary education (43%) and graduate and above (39%). Chi square=68.95669, df=4, p=<10(-6) which is highly significant.

Table-7: Distribution of Children According to Both Parents Literacy

<table>
<thead>
<tr>
<th>Literacy Status</th>
<th>Non-utilizers (n=100)</th>
<th>Utilizers (n=100)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of Cases</td>
<td>Percentage</td>
</tr>
<tr>
<td>Both Illiterate</td>
<td>49</td>
<td>49</td>
</tr>
<tr>
<td>Both literate</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>One illiterate</td>
<td>28</td>
<td>28</td>
</tr>
</tbody>
</table>

Above table shows that high percentage of non-utilizers were seen when both parents were illiterate (49%) as compared to utilizers (7%) and lowest percentage of non-utilizers when both parent were literate as compared to 89% utilizers. p<0.001, which is highly significant.

Table-8: Occupation of Mother

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Non-utilizers (n=100)</th>
<th>Utilizers (n=100)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of Cases</td>
<td>Percentage</td>
</tr>
<tr>
<td>House wife</td>
<td>38</td>
<td>38</td>
</tr>
<tr>
<td>Labourer</td>
<td>58</td>
<td>58</td>
</tr>
<tr>
<td>Service</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

Above table shows that in relation to occupation of mother percentage of non-utilizers is significantly higher among labourer group mother (58%) and lowest among service class group (4%) and house wife 38%. While in utilizers highest percentage was among house wife mother (74%) and lowest in labourer group (9%). p<0.001, which is highly statistically significant.

In this study 64% of non-utilizers fatter belong to labourer group while 49% belongs to service class of utilizing father and lowest (15%) belongs to labourer group of utilizers. This data is statistically significant p<0.001. 66% of non-utilizers come under low socio-economic group while 67% of utilizers belong to middle (36%) and higher SEC group (31%). Lowest (11%), belongs to high SEC among non-utilizers p<0.001, which is highly significant.
Table 9: Routine Immunization

<table>
<thead>
<tr>
<th>Vaccination</th>
<th>Non utilizers (n=100)</th>
<th>Utilizers (n=100)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of Cases</td>
<td>Percentage</td>
</tr>
<tr>
<td>Unvaccinated</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>Partially vaccinated</td>
<td>58</td>
<td>58</td>
</tr>
<tr>
<td>Fully vaccinated</td>
<td>16</td>
<td>16</td>
</tr>
</tbody>
</table>

Above table shows highest percentage of non-utilizers partially vaccinated (58%) and lowest were fully vaccinated. While 74% of utilizers group were completely vaccinated and lowest were partially vaccinated (12%). p< 0.001, which is highly significant.

Table 10: Knowledge about PPI Programme

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Non utilizers (n=100)</th>
<th>Utilizers (n=100)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of Cases</td>
<td>Percentage</td>
</tr>
<tr>
<td>Not known</td>
<td>33</td>
<td>33</td>
</tr>
<tr>
<td>Partially knowledge</td>
<td>48</td>
<td>48</td>
</tr>
<tr>
<td>Exact knowledge</td>
<td>19</td>
<td>19</td>
</tr>
</tbody>
</table>

Above table shows that maximum number of both utilizers (52%) and non-utilizers (48%) had partial knowledge about PPI programme 33% of non-utilizers did not know about PPI and only 1% of utilizers were unaware about PPI and 47% of utilizers and 19% of non-utilizers had exact knowledge about PPI programme P<0.001, which is highly significant.

Table 11: Knowledge about Disease Polio

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Non utilizers (n=100)</th>
<th>Utilizers (n=100)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of Cases</td>
<td>Percentage</td>
</tr>
<tr>
<td>Yes</td>
<td>89</td>
<td>89</td>
</tr>
<tr>
<td>No</td>
<td>11</td>
<td>11</td>
</tr>
</tbody>
</table>

Above table reveals that 89% of non-utilizer and 98% of utilizers knew about the disease of polio while 11% of non-utilizers and only 2% of utilizers did not know about disease of polio. p<0.05, which is highly significant.

DISCUSSION

A study of causation factor leading to non-utilisation of PPI was carried out in the Department of Paediatrics. Total 200 interviews were conducted out of which 100 were non-utilizers and rest 100 was utilizers (control group). The study population was obtained from stratified purposive sampling of children attending OPD ward. The method adopted was rapid assessment procedure.

Reason of non-utilisation

One third (33%) of the non-utilizers were not aware about PPI programme which comes out to be a major reasons for non-utilization. About 2/3 of non-utilizers were aware about PPI of which the 1st important reason which lead to non-utilization was transit during PPI (15%). Other causes were illness of child (13%), parents business (9%), not aware of days (8%), not aware of need (6%), Nobody available to take the child to PPI booth (5%), no conveyance available to reach the PPI booth (5%), Vaccinator was not available (5%) and no knowledge about age group (1%).

The above data shows that 1/3 of non-utilizers have never heard about PPI which reflects the failure in part of the information displayed inspite of heavy expenditure spent on publicity of PPI programme. Among the aware non-utilizers (67%), non-utilization was because of transit during PPI and child illness (28%), unaware about need (6%), unaware of NID (8%) and no knowledge about age group. This reflected the lack of proper information given to community about PPI. 10% of non-utilizers consented of lack of conveyance to reach PPI booth and unavailability of vaccinator at PPI booth. This shows improper facilities given to community for PPI. 14% non-utilizers were because of parents business and no one available at home to bring the child to PPI booth. These findings support the need to continue to place major emphasis on activities which increase public awareness before each
The present study reported approximately similar result as given by Bandhoupadhyay et al. [2]. The present study evaluated incidence for not known about PPI 33% as compared to 43% child illness 13% as compared to 10% parents business 9% as compared to 27%. This elicits that in present study busy parent constitutes less percentage. Vaccinator not present as compared 3% child illness 13% Vs 10%. Evaluation of PPI 1996-97 by ministry of health and family welfare the reason for non utilizers.

Awareness was more among Hindu (74.6%) and christian (14.9%) while among unaware non utilizers Hindu religion was pre dominant (75.7%) and there was no incidence of unawareness among christian religion. Muslim had approximately equal proportion between utilizers and non-utilizers. Literacy of mother shows significant impact on awareness about PPI. Result shows that 93.9% (31) of unaware mothers were illiterate as compared to 68.6% (46) of aware group non utilizer mothers. Highly educated graduate aware mother also show significant number of non-utilizers 11.9% (8) while no incidence was seen in unaware group. Literacy of father has also some impact on awareness. 75.7% (25) of unaware non utilizers father were illiterate as compared to aware group (35-8%).

Low socio economic condition comprise 66% of non-utilizers of which 40% come under aware group and 26% were unaware group which is 59% of aware non utilizers and (78.7%) of unaware group of non-utilizers. High SEC showed no incidence of unawareness and Muslims were approximately equal incidence in both groups. Nuclear family showed high incidence 87.8% (29) among unaware group of non-utilizers while joint family showed low incidence (12.2%) of unawareness and more awareness i.e (73%).

Age wise distribution

The maximum percentage of non-utilizers were among under 1 year of age group (34%) of which 21% belongs to less than 6 month of age. Under 1 year of age which is very vulnerable to risk of polio myelitis? It is very essential that this age group needs to be targetted more intensively for coverage with routine immunisation as well as PPI programme. The incidence of non-utilizers were 16%, 11%, 17% and 22% in age group of 1-2 year, 2-3 year, 3-4 year and 4-5 year respectively. Lowest incidence of non-utilizers was seen in age group of 1-2 year and 2-3 years, while the significant coverage of PPI was seen in 1-2 year then 2-3 year of age group and least coverage of PPI was under 1 year of age (17%). Which justified the highest incidence of non-utilizers was among under 1 year of age group. The incidence of utilizers were 16% and 19% in 3-4 year and 4-5 year age group respectively.

Bir Singh et al. 1996 reported that the coverage for PPI was lowest in the age group 0-6 months and highest coverage was in the age group 13-18 month. Same result was reflected in the present study also.

This present study is against the study done by Bir Singh et al. 1996 showed that non acceptance was significantly higher in Muslim as compared to Hindu religion. Bir Singh et al. 1996 [1] reported religion wise distribution of acceptors and non-acceptors of PPI doses. Non-utilizers labourer father had highest incidence (64%) followed by service class, business 19 14% respectively and 3% children have their father (expired). Among utilizers highest incidence was in service class group (49%) followed by business group (36%) and labourers (15%). Predominant sources of information about PPI were found to be Television (30.7%) followed by information from health worker (27%) and friends (12.5%).

Bandhoupadhyay et al. [2], reported that TV reached largest percentage of immunized children (6.4%). The effect of TV was marked in the children who did not visited during enumeration. Of the 361 children not reached by enumeration visit 76% were immunized and 24% were not immunized of those "non enumerated" children 67% learned of PPI through TV compared to 33% of those who had not been immunized (Odd ration 4.2 p< 0.0000).

CONCLUSION

The strategy is to Provide two additional dose of OPV to all children less than 5 years of age on two single days in a year. The PPI are organised during the low transmission season of polio viruses, at an interval of 6-8 weeks. Now we have completed 4 rounds of PPI session and one intensified round.

This year study was conducted to evaluate the PPI programme and find out the factor causing non utilization of PPI. The non-utilizers and utilizers both were interviewed. Study shows that there was marked unawareness prevailing among the population about vaccination, about 33% of non-utilizers were not aware about PPI. This suggests that there was lack in social mobilization and community effort. 67% of non-utilizers were aware of days inspite of that they do not go for PPI. This could be due to dis-enhancement with the programme and reduction in community participation and can be overcome by increase in the educational nature of material provided to the community. The sufficient staff with updated technical information should be made available to make this possible. Because of repeated PPI cycle community fatigue was observed which important negative aspect of PPI programme is.

Obviously literacy has a definite role in promoting acceptance of PPI doses. Under 6 months of age group children is very vulnerable to risk of...
poliomyelitis so this age group need to be targetted more intensively for coverage with routine immunization as well as PPI.

The important mass media like TV and interpersonal communication played a significant role in generating awareness therefore this media should be judiciously used to enhance the awareness and education about PPI.

Apart from continuing with the methods used till now to create awareness about PPI more and more innovative approach for the same need to be utilized so that every single parent in the community is made aware of PPI days in the times to come.

There is a below optimal relationship between health worker and community which results in the less coverage of PPI especially in the rural area.

**RECOMMENDATIONS**

1. Communication messages especially to unreached families should adress the information of fixed day/fixed place for PPI.
2. Special efforts should be made to inform about PPI to the homeless and those in transit.
3. The political commitment, social mobilization and management of PPI days is exemplary and need to be sustained until eradication of polio from India.
4. Inter personal communication is still the main demand generating option for remote and rural / tribal population. Efforts to mobilise health workers, anganwadi workers, teachers, panchayat and other NGOs working individual for each area need to be strengthened.
5. Cold chain maintenance - polio vaccine is a labile vaccine, proper storage and transportation facilities should be improved to maintain the potency of vaccine on NID and at PHC level.
6. Many families do not know the reason for extra dose of polio drops hence the level of awareness in general population should be improved.
7. Number of polio booth should be increased to reduce the distance from the residence in the rural community.

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