Original Article

RISK FACTORS OF CHILHOOD MORTALITY IN URBAN SLUMS OF VARANASI

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Abstract:
Research Question: What are determinants of Childhood mortality of slums community? **Objective:** To know Socio-demographic risk factor (determinants) of Childhood mortality of slums community. **Material & Methods: Design:** Cross Sectional Study; interview technique. **Sample Size:** 1241 eligible couple from 1411 randomly selected household. **Statistical Analysis:** Biavariate and Multinomial logistic regression analysis. **Result:** The risk factors namely per capita income, education of father and mother, occupation of father and mother, frequency of children born, children ever born and surviving males and females child, spacing with which child was born, age at last birth and place of delivery of the last child, the mortality of the index child was significantly high if the child was of first parity.
Key Words: Closed Birth Interval, Per Capita Income, Index child, First parity.

Introduction :

The level of childhood mortality is a basic indicator of the quality of life in a society. Multiple factors related to social and economic conditions, health care and environment have a significant effect on childhood mortality, and improving child survival is a national priority in health care. (1). Child mortality has been found to have a very strong effect on fertility in a large number of countries across the globe (2). India Urban Slums Population is expected to reach 93.06 million by 2011while in 2001 it was 52.4 million (3). Higher the level of mortality higher would be the level of fertility. It is because couples try to replace the children who die (4). The place of replacement becomes faster in the event of death of male child, especially in urban slums, where sons are given more preference over daughters. The proportions of unplanned births were nearly twice in slum communities (5). In recent years policy makers and planners have focused a great deal of attention child mortality especially poor class society, the reason are that the childhood mortality reflects the main environmental factors affecting health of child, such as nutrition, sanitation, the communicable disease of childhood, and accidents occurring in and around the home. Socio-economic and demographic characteristics of any community play pivotal role in survivorship of children and consequently level of fertility (6). Thus, bearing in mind that to identify some socioeconomic and demographic risk factors of childhood mortality for policy maker and planners if modifiable, may be helpful think on certain strategies and effective intervention are made in time to reduce childhood mortality and to achieve National Rural Health Mission (NRHM) goals .

Material and Methods: A cross-sectional study was conducted from Varanasi Slum by interview technique. For study sample size short birth interval may lead to higher TFR if childbearing process is continued and adversely affects a mother's health and her children's chances of survival (7 & 8). Therefore birth spacing or pace of child bearing (high fertility) is in part, a response to experience with and fear of child mortality, as parent's tray to ensure that certain number of their children will survive. In the slum population of eastern U.P. no data on closed birth interval (CBI) was available. Therefore, a pilot study on 100 eligible couples from 80 families was carried out. The percent of eligible couple with CBI < 24 months was 34.3%, CBI 24-36 months was 44.6 % , CBI ³ 36 months was 20.9% and percent of eligible couple with at least two live births was 86.0. The average no. of eligible couples per family was 1.25.The proportion of eligible couples with CBI ³ 36 months is the least and forms the basis for comparing other groups. Therefore, proportion of eligible couples with CBI 36 months has been considered

to determine the sample size. Therefore sample size for taking 10% permissible error n = 4 PQ/L² was

$$n = \frac{4 \times 20.9 \times 79.1}{(2.09)^2} = 1514$$

since, the proportion of eligible couples with at least two live births is 0.86. Therefore, a sample of 1514/0.86 = 1760 eligible couples is required to interrogate.

For study purpose in 1760 eligible couples, in which 1241 eligible couples whose last child born within three years (12 to 48 months) prior to date of survey were selected to identify risk factors of death during infancy for avoid the effect of censoring in data. The eligible couple are selected from 1411 households of Varanasi slums using two-stage sampling procedure. At first stage 21 (10 per cent) slums were selected from a total of 218 slums identified by District Urban Development Authority (DUDA), Varanasi, using Probability Proportional to Size (PPS) systematic random sampling. At the second stage, from the prepared list of households of selected slums, 1408 household were selected following systematic random sampling procedure. The infant death of the child was considered as an event to occur. The influence of various specific risk factors, such as socioeconomic and demographic factors, the data was analyse by bivariate and multinomial logistic regression analysis methods.

Results: The bivariate analysis revealed that socio-economic factors such as per capita income of the family is below Rs 300 ($c^2 = 20.44$, df = 1, p = 0.00), education of father if illiterate ($c^2 = 19.40$, df = 2, p = 0.00), occupation of father if labour ($c^2 = 4.08$, df = 1, p = 0.04) education of mother if illiterate ($c^2 = 9.90$, df = 1, p = 0.00) were found to be significantly associated with survival status of children whereas, religion, caste and type of family were not found to be associated (p = 0.24, p = 0.20 and p = 0.44 respectively). Occupation of the female also contributed significantly towards the survivorship of children. Among demographic factors all variables (children ever born, ever surviving males and females, spacing with which child was born, age at last birth and place of delivery of the last child), except sex of the last child, were highly associated with the survival status of the index child. In case of higher order births i.e. >3, survival of the index child was significantly less (87.4%) compared to birth order 2-3 and further less (76.9%) for birth order one. Higher the number of ever-surviving male and female children, higher was the survival of index child. Place of delivery also contributed towards the survival of the child. More children (89.2%) were found surviving in case child was delivered at home.

The variables showing association with survival of index child at or below 20% level of significance in bivariate analysis were subjected to multinomial logistic regression analysis. The estimates of b coefficients, standard errors and adjusted odd's ratios along with CI's are calculated to see significant effects of risk factors. Results obtained reveals that higher was the frequency of children born (b = 2.45 for males and 2.44 for female), higher was the risk of mortality of the index child. The risk of death for the index child was higher in families with Per Capita Income (PCI) below Rs. 300 (AOR=2.17,CI :1.15-3.85) Survival of index child was greatly influenced by educational status of father. Higher the education, lower was the risk for death of the index child. Compared to illiterates the risk of death for the index child was one third (AOR = 0.33, CI : 0.18-0.61) where education of the father was primary to middle level and further reduced to one tenth (AOR = 0.09, CI : 0.03-0.30) where fathers education level was high school or above. Interestingly, more number of surviving male and female children and consequently total number of surviving children showed better survival status of index child, reflecting better care by the parents. Compared to no surviving male, mortality of the index child was less in those with 1-2 surviving male children (AOR = 0.15, CI: 0.07-0.35) and was still lower in those with 3 or more surviving males (AOR = 0.04, CI: 0.01-0.15). Similar trend was also seen with number of surviving female children. Compared to no surviving female child, mortality of index child was less in those with 1-2 surviving females (AOR = 0.05, CI: 0.02-0.12) and further lower in those with 3 or more surviving female children (AOR = 0.02, CI: 0.00-0.05). The spacing with which index child was born is responsible to determine the survival status of the child. The mortality of the index child was significantly high if the child was of first parity or born with the spacing below 24 months when compared with those born with spacing of ^{3}36 months.

Table1: Socio-economic determinants of survival status of last child born during last three years (12 to 48 months) :

Determinants	Number	Status of child		χ2 value	df	P-value
		Dead n = 152	Survived n = 1089			
Religion						
Muslim	189	14.8	85.2	1.37	1	0.24
Hindu	1052	11.8	88.2			
Caste						
OBC	962	12.9	87.1	1.64	1	0.20
SC/ST	279	10.0	90.0			
Types of Family						
Joint	748	12.8	87.2	0.60	1	0.44
Nuclear	493	11.4	87.2			
Per Capita Income (Rs.)						
Bellow 300	709	17.1	82.9	20.44	1	0.00
300 & above	532	8.6	91.4			
Education of Husband						
Illiterate/just literate	598	15.4	84.6	19.40	2	0.00
Primary to middle	459	11.8	88.2			
High school and above	184	3.3	96.7			
Occupation of Husband						
Labourer	966	13.3	86.7	4.08	1	0.04
Service	275	8.7	91.3			

Table 2 : Demographic determinants of survival status of last child born during last three years (12 to 48 months):

Determinants	Number	Status of Child		X² value	df	P-value
		Dead n – 152	Survived n – 1089			
Ever born children						
≥ 4	648	9.1	90.9	18.93	2	0.00
2 -3	420	12.6	87.4			
One	173	23.1	76.9			
Children ever surviving						
None	179	21.8	78.2	18.93	2	0.00
1-2	692	9.8	90.2			
≥ 3	370	12.2	87.8			
Age at last birth (yrs)						
≥ 3 0	336	13.1	86.9	28.30	2	0.00
20-29	745	9.3	90.7			
< 2 0	160	24.4	75.6			
Males ever born						
None	170	11.8	88.2	7.92	2	0.02
1-2	686	14.4	85.6			
≥ 3	385	8.6	91.4			
Males ever surviving						
None	251	29.1	70.9	82.97	2	0.00
1-2	652	8.0	92.0			
≥ 3	338	8.0	92.0			
Female ever born						
None	179	21.8	78.2	18.93	2	0.00
1-2	692	9.8	90.2			
≥ 3	370	12.2	87.8			
Female ever surviving						
None	244	32.8	67.2	119.26	2	0.00
1-2	718	7.4	92.6			
≥ 3	279	6.8	93.2			
Closed birth interval (mths)						
≥ 36	260	6.9	93.1	39.72	3	0.00
24-36	445	9.2	90.8			
< 2 4	363	17.4	82.6			
1ˢᵗ para	173	23.1	76.9			
Place of delivery						
Hospital	233	18.5	81.5	10.28	1	0.00
Home	1008	10.8	89.2			
Sex of last birth (Index child)						
Female	568	12.1	87.9	0.01	1	0.92
Male	673	12.3	87.7			

Table .3 : Socio-economic and demographic determinants of survival status of last child born during last three year (12 to 48 months):

Determinants	ß estimates	SE of ß	Wald statistics	Df	P value	AOR	CI
Socio-economic Variables							
Intercept	14.55	2.12	47.30	1	0.00	-	-
Male ever born	2.45	0.43	32.08	1	0.00	11.11	5.00-25.00
Female ever born	2.44	0.42	34.12	1	0.00	11.11	5.00-25.00
Per Capita Income (Rs.)							
300 & Above	1.00	0.29	7.51	1	0.01	2.17	1.15-3.85
Below 300	0.79						
Education of Husband							
Illiterate/just literate	1.00						
Primary to Middle	-1.12	0.31	12.62	1	0.00	0.33	0.18-0.61
High school & above	-2.40	0.60	15.85	1	0.00	0.09	0.03-0.30
Education of Female							
Illiterate	1.00						
Literate	2.06	0.38	29.42	1	0.00	7.82	3.72-16.45
Demographic Variables							
Males ever surviving							
None	1.00						
1-2	-1.87	0.42	20.04	1	0.00	0.15	0.07-0.35
≥3	-3.25	0.71	21.22	1	0.00	0.04	0.01-0.15
Females ever surviving							
None	1.00						
1-2	-2.96	0.41	52.76	1	0.00	0.05	0.02-0.12
≥3	-4.20	0.64	42.87	1	0.00	0.02	0.00-0.05
Children ever surviving							
None	1.00						
1-2	-2.66	0.50	28.14	1	0.00	0.07	0.03-0.19
≥3	-1.43	0.83	3.01	1	0.08	0.24	0.05-1.20
Last closed birth intervals (mths)							
≥ 36	1.00						
24-36	0.64	0.39	2.78	1	0.10	1.89	0.89-4.00
<24	3.32	0.52	40.82	1	0.00	27.60	10.00-76.60
1ˢᵗ para	3.41	0.57	42.23	1	0.00	0.30	9.89-92.48

Discussions and Conclusion: The factors that influence the current status of survival of children have been identified by considering the status of last child as an infant death within three years born between 12-48 months prior to date of survey. The three socio-economic factors namely, per capita monthly income if below 300, education of father if illiterates and education of mother if illiterates have significant association with child loss. The risk of death of child has been more than two times (OR = 2.17, CI: 1.15-3.85) in females with lesser Per Capita Income (PCI). Various demographic factors have also shown considerably association with the loss of child. The number of surviving male children has been inversely associated with the loss of index child. More the number of surviving males, less has been the risk of loss of index child. Similar association was also observed with number of surviving females and total number of surviving children. The risk of child loss has been as high as two fold in case the child was closely spaced. Children receiving better care either because of better Income (PCI), education of couples or longer duration of spacing observed higher chance of survival. It is a matter of great concern to raise Per Capita Income (PCI) and level of education of women in the country and is a long term project. However through informal education about nursing of new born and better counselling to adopt spacing methods, survival of new born may be ensured.

Suggestion: Therefore, the policy maker or planner think about findings of this study : (a) The slum community of socio economic status such as education ,occupation, per capita income and strengthen its maternal and child health care activities for reduce levels of Childhood mortality, living in unhygienic condition need continuous counseling on consequences of frequent pregnancies and large family size (b) due to illiteracy age at consummation is also risk factor of childhood Mortality; (c) great attention should also be given to frequency of children born, delivery of family planning services to women uses contraceptive methods and to provide them with motivational messages about the health benefits of child spacing.

References:

1. Vaid A, Mammen A, Primrose B, Kang G: Infant mortality in an urban slums. Indian Journal of Pediatrics 2007; Vol 74, pp 27-31.

2. Syamala T. S. and Roy, T. K." Relationship between child mortality and fertility: A Few Empirical Evidence from Goa, India,1994, 23(1-2): pp 117-126,

3. Planning Commission Report: Report of committee on Slums Statistics /Census (CoS) by Housing and Urban poverty alleviation (HUPA) ; P.T.I. , Sept. 3, 2010.

4. National Family Health Survey 1998-99 (NFHS-2), International Institute for Population Sciences, Mumbai

5. Shobha J " Fertility and Child Survival : A Study of selected Slums of Hyderabad, Legal News and Views 6(10) Oct 1992, 362-64.

6. Bhandari N, Bahl R, Taneja S, Martines J, Bhan MK. Pathways to infant mortality in urban slums of Delhi, India: implications for improving the quality of community- and hospital-based programmes. *J Health Popul Nutr.* 2002;20:148–155. [PubMed]

7. Pandey A, Minja KC, Normash Y, Luthr Demodar S and Chand J: " Infant and Child

    Mortality in India" National Family Health Survey, Subject Report II, Mumbai,
    International Institute of Population, 1998.

8. Govind samy P, Kathrynm, Seo O, Rutstein J Ties Verma and S.A.E.: " High risk Birth and Maternity care DHS" Comparative study No.8, Culumbia Maryland macro International. 1993.