PREVALENCE OF 'AT RISK' UNDER-FIVE CHILDREN IN A SOUTH INDIAN VILLAGE

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ABSTRACT

Children under-five years of age constitute about 14% of the total population. This age group is most affected by various common morbidities, some of which lead also to mortality in this vulnerable population. The major causes of deaths in the age group 0-5 years are preventable. It is therefore necessary to identify particularly those at risk and provide them with efficient paediatric services, because it is these at risk babies, which contribute so largely to perinatal, neonatal and infant mortality.

AIMS AND OBJECTIVES

1. To study the prevalence of at risk Under-Five children.
2. To study the socio-demographic factors affecting the Under-Five children.

MATERIALS AND METHODS

A cross-sectional observational study conducted in a rural field practice village of NRI Medical College, Guntur, for 6 months from January to June 2015, selected by simple random sampling method. A total of 150 under five children were selected by systematic random sampling from the village to identify thirteen risk factors.

RESULTS

Only half (51%) of the under five children were nourished normally, one-third are having mild-to-moderate malnutrition, 16% were suffering with severe malnutrition, based upon the mid-upper arm circumference. Nearly one-fourth of the under five children studied had none of the 13 risk factors observed in the present study; 63% of the children had two or more risk factors listed in the study.

CONCLUSION

The health auxiliaries should be properly trained to identify the risk under-five children.

KEYWORDS

Under-Five Children, Risk Approach, Risk Factors.

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INTRODUCTION

Every year 10.6 million children in the world die even before reaching their fifth birthday. India contributes around 25 percent of the global under-five deaths. At the national level, the mortality rate was estimated at 16.9 per 1000 under-five children. The rate for rural areas is about 17.9 and for urban areas 4.9. The mortality in female children is higher than the male children.¹ About 48 percent of children under-five children are stunted in their growth.² Child health indicators in developing countries show that improvement in child health is not enough.

Majority of the causes of mortality and morbidity in this age group are preventable through existing interventions. But owing to the lack of resources like money, manpower and time, all the under-five children cannot be given equal time and attention. Therefore, risk approach is an appropriate strategy and a managerial tool to provide better care to those in need.³

At risk group is a group of individuals in whom the frequency of risk factors is more than the other groups. In this study, risk factors were determined on the basis of recommendations given by the WHO Expert Committee.⁴ Identification of at risk children in rural areas and associated social, demographic and environmental factors is the first step in the implementation of risk strategy.

AIMS AND OBJECTIVES

1. To study the prevalence of at risk Under-Five children.
2. To study the socio-demographic factors affecting the Under-Five children.

METHODOLOGY

A cross-sectional observational study was conducted in Pedaparimi village selected by simple random sampling method from among the six villages falling under the Rural Field Practice Area of NRI Medical College, Guntur, for six months from January to June 2015. Sample size was calculated by using the formula $4pq/l^2$ at 40 percent prevalence and 20 percent allowable error. The computed sample size was 150. The village consists of 7230 population and 1575 families. The desired number of under-five children were selected by a systematic random sampling method from the list of children residing in the study village.

Data collection was carried out by conducting a house to house visit, interviewing the mothers of the selected children, by administering a pre-tested semi-structured schedule by the principal investigator.

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Anthropometric measurements and clinical assessment was done to identify thirteen risk factors recommended by the WHO Expert Committee.⁴ which includes 1) Birth weight <2500 grams, 2) Twins, 3) Birth order of five or more, 4) Birth spacing less than two years, 5) Present weight <70 percent of reference standard, 6) Early lactation failure and artificial feeding before six months, 7) Major congenital anomaly, 8) History of death of >two siblings within 12 months of age, 9) Death of either or both parents, 10) Children with chronic or recurrent gastroenteritis and/or recurrent respiratory infections (>5-6 episodes of infections per year), 11) Mother working outside for >eight hours, 12) Delay in giving supplementary feeds i.e. >6 months and 13) Mid-arm circumference less than 12.5 centimetres.

Weight of the child was recorded using Salter's scale. Mid-arm circumference was measured using Shakir's Tape. All the instruments used were standardised before conducting the study.

The data collected was analyzed using Microsoft Excel and EPI Info software. Relevant tests of significance applicable were done.

RESULTS

Socio-demographic profile (Table 1)

Nearly 60% of the fathers of the under five children had school level education. Thirty percent of the mothers of these children were illiterate and 86% were aged between 20-29 years. Most of the mothers (64%) were home makers and 30% were working on daily wages. Nearly half of the study subjects are living in Nuclear families and nearly two-thirds (64%) have family size ≤5 members. More than half the respondents are living in Hindu families and only 28.6% of the children belonged to the upper caste families.

Two-thirds of the under five children belonged to Lower and Lower Middle classes according to Uday Pareek's Socio-Economic Scale.

Nearly two-thirds of the children are living in pucca houses; 50% of the families are living in houses where the ventilation is not satisfactory. Two-thirds of the dwellings are overcrowded.

	Frequency	Percent
EDUCATION OF THE FATHER		
Illiterate	27	18.0
Primary School	12	8.0
Middle School	24	16.0
High School	52	34.7
Intermediate	17	11.3
Degree & Above	18	12.0
EDUCATION OF THE MOTHER		
Illiterate	45	30.0
Primary School	19	12.7
Middle School	23	15.3
High School	42	28.0
Intermediate	12	8.0
Degree & Above	9	6.0
MOTHERS' AGE (In years)		
≤19	7	4.7
20-29	129	86.0
30-39	13	8.7
≥ 40	1	0.7
OCCUPATION OF THE MOTHER		
Housewife	95	64.0
Daily Wager	46	30.0
Vegetable Seller	2	1.3
Tailor	5	3.3
Teacher	1	0.7
Engineer	1	0.7

TYPE OF FAMILY		
Nuclear	76	50.7
Joint	74	49.3
FAMILY SIZE		
≤5	96	64.0
>5	54	36.0
RELIGION		
Hindu	83	55.3
Muslim	32	21.3
Christian	34	22.7
Others	1	0.7
CASTE		
Upper Caste	43	28.6
Backward Caste	61	40.7
SC and ST	46	30.7
TYPE OF HOUSE		
Kutcha	11	7.3
Semi-Pucca	42	28.0
Pucca	97	64.7
SOCIO-ECONOMIC STATUS		
Lower Class	15	10.0
Lower Middle Class	84	56.0
Middle Class	39	26.0
Higher Middle Class	11	7.3
Upper Class	1	0.7

Table 1: Socio-Demographic Profile of Under-Five Children (n=150)

Marital History of the Mothers (Table 2)

More than 70% of the mothers are getting married even before they attain the age of twenty; 41.3% of the pregnancies were teenage pregnancies; 64% of the mothers were having two living children in the present study; 37.8% of the mothers followed any spacing method between the 1st and 2nd child for a period of 1-2 years. Nearly, 17% of the mothers reported at least a single child death.

	Frequency	Percent
AGE AT MARRIAGE OF THE MOTHERS		
≤ 19	106	70.7
20-29	43	28.7
≥ 30	1	0.7
AGE AT FIRST CHILD BIRTH		
≤ 19	62	41.3
20-29	87	58.0
30-39	0	0.0
≥ 40	1	0.7
NUMBER OF LIVING CHILDREN		
1	43	28.7
2	96	64.0
3	7	4.7
≥4	4	2.6
SPACING BETWEEN 1st & 2nd CHILD		
<1 Year	20	18.9
1-2 years	40	37.8
2-3 years	24	22.6
>3 years	22	20.7
SPACING BETWEEN 2nd & 3rd CHILD		
< 1 year	2	18.2
1-2 year	4	36.4
>2 years	5	45.4

Table 2: Marital History of the Mother (n=150)

Under Five Children (Table 3)

Out of the 150 under five children, 48% have a birth order of one and more than 83% were born with normal birth weight; 26.7% of the children were infants, 45% of the children were in 1 to 4-year age group and 27.3% were in their fifth year.

Most of the children (94%) in the present study were delivered in health institutions, Home deliveries accounting for the remaining 6%. Lower Segment Caesarean Section deliveries accounted for more than one-third (38.7%) and the Normal Vaginal deliveries for 60%.

Eight of the 150 children were born with congenital anomalies; they were Atrial Septal Defects, Cleft Lip, Cleft Palate, Patent Ductus Arteriosus, Hydronephrosis, Hypospadias and Hydrocephaly.

More than 94.7% of the children were ever breast fed during the first 6 months of life; 8 mothers initiated artificial feeds to baby during the first 6 months of life, of these 7 of them did so citing lactational failure or insufficient breast milk and one mother cited ill health.

A 37.4 percent of the mothers initiated breast-feeding within one hour after delivery and 91.3 percent of them started it within 6 hours of delivery; 94 babies were exclusively breastfed during the first six months of life. More than 40 percent mothers continued to breast-feed their babies, even after two years of age.

An 85% of the children were weaned at or after 6 months of age; 60% of the under five children suffered ≤ 3 episodes of Acute Respiratory Infections during the last 1 year; 82.7% of the children did not experience a single episode of Gastro-Intestinal Infections for the last 1 year. Febrile convulsions and typhoid fever were the other conditions reported by the mothers in their children.

More than 40% of the mothers of the under five children do not possess an immunization card; 87% of the children were either fully immunized or immunized for that particular age. Negligence on the part of the parents was the most common reason for the missed vaccines in nearly half of the 13% of the under five children.

	Frequency	Percent
BIRTH ORDER		
1	72	48.0
2	70	46.7
3	6	4.0
4	2	1.3
BIRTH WEIGHT (In Kilograms)		
> 3.2	27	18.1
2.5- 3.2	98	65.2
2-2.49	23	15.4
<2	2	1.3
AGE OF THE CHILD (IN MONTHS)		
0-12	40	26.7
>12-24	20	13.3
>24-36	22	14.7
>36-48	27	18.0
>48-60	41	27.3
SEX OF THE CHILD		
Males	76	50.7
Females	74	49.3
PLACE OF DELIVERY		
Institutional-Govt	44	29.3
Institutional-Pvt	97	64.7
Home	9	6.0
TYPE OF DELIVERY		
Normal Vaginal	90	60.0
Vaginal-Assisted	2	1.3

Caesarean Section	58	38.7
TYPE OF FEEDING		
Breast Milk	142	94.7
Artificial Feeds	6	4.0
Both	2	1.3
TIME TAKEN FOR INITIATION OF BREAST MILK		
< 1/2 Hour	19	12.7
1/2- 1 Hour	37	24.7
<1-3 Hours	60	40.0
>3- 6 Hours	21	14.0
After 6 Hours-1 Day	1	0.7
>1 day	6	4.0
Not given	6	4.0
AGE AT WEANING		
<6 Months	22	15.3
At or After 6 months	122	84.7
RECURRENT ARI (LAST 1 YEAR)		
No Episodes	47	31.3
≤ 3 Episodes	91	60.7
>3-5 Episodes	10	6.7
>5 Episodes	2	1.3
GASTROINTESTINAL INFECTIONS (LAST 1 YEAR)		
No Episode	124	82.7
1 Episode	20	13.3
2 Episodes	4	2.7
≥ 3 Episodes	2	1.3
IMMUNIZATION CARD AVAILABILITY		
Yes	88	58.7
No	62	41.3
IMMUNIZATION STATUS		
Fully Immunized	131	87.3
Partially Immunized	19	12.7
REASONS FOR MISSED VACCINES		
Out of Station	4	21.1
Forgot the date	6	31.6
Do not know	9	47.4

Table 3: Profile of the Under-Five Child (n=150)

Nutritional Status**Mid-Upper Arm Circumference (Table 4)**

Only half (51%) of the under five children were nourished normally, one-third are having mild-to-moderate malnutrition, 16% were suffering with severe malnutrition.

	Frequency	Percent
Normal	76	50.7
Mild-Moderate Malnourished	50	33.3
Severely Malnourished	24	16.0

Table 4: Nutritional Status based upon Mid-Upper Arm Circumference (n=150)

Weight for Age (Table 5)

Only one-thirds (34.7%) of the under five children were above 100% of the reference standard, 6.8% were below 70% of the reference standard.

WEIGHT FOR AGE	Frequency	Percent
<70%	10	6.8
71-80%	20	13.6
81-90%	25	17.0
91-100%	41	27.9
>100%	51	34.7

Table 5: Nutritional Status Based upon Weight for Age (n=150)

Risk Factor Prevalence (Table 6)

Nearly one-fourth of the under five children studied had none of the 13 risk factors observed in the present study; 63% of the children had two or more risk factors listed in the study.

	Frequency	Percent
No Risk factor	36	24.0
1 Risk factor	19	12.7
2 Risk factors	59	39.3
3 Risk factors	27	18.0
>3 Risk factors	9	6.0

Table 6: Risk Factor Prevalence (n=150)

At Risk Factors among the Under Five Children (Table 7)

Delay in initiation of Supplementary feeds is seen in three-fourths of the study population followed by birth spacing <2 years (44%) were the two common risk factors in the present study. More than one-third of the Under-5 children had working mothers.

Sl. No.	RISK FACTORS	Frequency	Percent
1	Birth wt. <2500 grams	25	16.7%
2	Twins	2	1.3%
3	Birth order of five or more	0	0.0%
4	Birth spacing <2 years	66	44.0%
5	Present wt. <70% of reference standard	10	6.7%
6	Early lactation failure and artificial feeding <6 months	8	5.3%
7	Major congenital anomaly	8	5.3%
8	History of death of >2 siblings within 12 months of age	0	0.0%
9	Death of either or both parents	2	1.3%
10	Children with chronic/recurrent gastroenteritis and/or recurrent respiratory infections	21	14.0%
11	Mother working outside for >8 hours	55	36.7%
12	Delay in giving supplementary feeds	114	76.0%
13	Mid-arm circumference <12.5cm	24	16.0%

Table 7: Prevalence of 'At Risk' Factors among the Under Five Children (n=150)

DISCUSSION

In the present study, illiteracy is high (30%) among the mothers of the under five children, when compared to their fathers. Mittal A, Singh J and Ahluwalia SK.⁵ observed 70.75% literacy rate in a similar study done in Urban slum population in Patiala, Punjab. The literacy rate was 55% among the mothers in the reproductive age group in the country according to NFHS-3.⁶

The literacy rate in the present study was better when compared to the national data, but similar to the urban population in Punjab.

Joint family system is very much presenting the rural areas with equal proportions of Joint and Nuclear families found in equal proportion in the study village.

Small family norm is catching up even in the rural areas; 70% of the families in the study population belong to the lower caste (Backward Classes and Scheduled Castes) communities. Nearly 2/3rds of the study population are living in families belonging to Lower middle class or Lower class categories according to the Uday Pareek's Socioeconomic status scale for rural areas.

Marital History

More than 70% of the rural women are getting married in their teens. Early marriages are universal in the villages. Since early marriages are common, majority of the women became mothers even before they crossed their twentieth year of life. Nearly two-thirds of the mothers were having two children-completed family.

According to NFHS-3, 85 percent of Indian women married before the legal minimum marriage age of 18 and three-quarters (74 percent) married before reaching age 20.⁶ Early child marriages are prevalent in the present study village similar to the national picture.

Under Five Child

About 95% of the present under five study populations are of birth order 1 or 2.

According to NFHS-3, seventy-seven percent of births to mothers aged 15-19 are of order one; by contrast 65 percent of births to mothers age 30-39 are of order four or higher.⁶

Sixteen percent of the under-five children were of Low Birth weight (less than 2.5 kilograms). NFHS-3 observed that one in five (22 percent) was of low birth weight in the country. The prevalence of Low birth weight is less in the present study.⁶

Institutional deliveries were found to be common (96%) in the present study village, but most of the mothers preferred private hospitals for intranatal care. Nearly one-fourths of the mothers delivered through Caesarean section, which is very high.

NFHS-3 observed that institutional deliveries account for 29% of births in rural India and are about equally divided between those that take place in a private health facility and those that take place in public institutions.⁶

More and more women prefer institutional deliveries, thanks to Janani Shishu Suraksha Karyakram launched by the Government of India.

Breastfeeding Practices

A 95% of the under five children were breastfed during the first six months of their life.

Data from the National Family Health Survey-3 done in years 2005-06 shows that ninety-six percent of children under age five have ever been breastfed and slightly less than half of children under six months of age are exclusively only one-thirds (34.7%) of the under five children were above 100% of the reference standard, 6.8% were below 70% of the reference standard breastfed.⁶ and it is 39% in the developing countries in 2010 according to Cair X, Wardlaw T and Brown DW.⁷

Breastfeeding is universal in the study village as like in any part of the country.

Time Taken For Initiation of Breast Feeding

According to NFHS-3, only one-quarter of last-born children who were ever breastfed started breastfeeding within half an hour of birth as is recommended and almost half (45 percent) did not start breastfeeding within one day of birth.⁶

Infections

Nearly 70% of the Under-Five study population had suffered from respiratory infections during the past 1 year. Nearly 13% of the study population experienced at least a single episode of gastrointestinal infections during the past 1 year.

NFHS-3 data showed that six percent of children under age five years showed symptoms of ARI in the two weeks preceding the survey; 9 percent of children under age five had diarrhoea in the two weeks preceding the survey.⁶

Shubhada Sunil Avachat, V.D. Phalke, D.B. Phalke in their study done in Loni in year 2009 found that environmental conditions, in which people live play an important role as far as the children at risk are concerned. The study also found that children who lived in pucca houses were the least at risk (31.37%) followed by kachcha-pucca (32.21%) and kachcha houses (36.41) and children living in houses with facilities were less likely to be at risk (41.79%) in comparison to their counterparts living in houses without proper ventilation (63.80%). Data again show that children living in overcrowded dwellings were more likely at risk (62.26%) than children living in less crowded environment (41.53%).⁸

Thus respiratory infections are more common than Gastrointestinal infections among the present study population. Thus housing and environmental standards need improvement to prevent respiratory and gastrointestinal infections.

Immunization

The present study did not find a single child unimmunized. An 87% children were fully immunized, 13% were immunized only partially which is mainly due to the negligence on the part of the parents, not remembering the due date of the vaccines by the mothers especially.

Data from NFHS-3 (2005-06) done in India observed that 44% of children aged 12-23 months are fully vaccinated and 5% have not received any vaccinations.⁶

Mothers were able to show vaccination cards for 38% of children age 12-23 months. Vaccination coverage for each type of vaccine is much higher in urban areas than in rural areas. Fifty-eight percent of children in urban areas age 12-23 months have received all of the recommended vaccinations by the time of the survey, compared with only 39% of children in rural areas.⁶

Malnourishment

Nearly half of the under-five children are malnourished going by mid-upper arm circumference. Severe malnourishment is seen in 16% of the study subjects and 6.8% of the children were below 70% of the weight for age reference standard.

According to the National Family Health Survey-3 (2005-06) done in India, almost half of children under five years of age (48%) are stunted and 43% are underweight. The proportion of children who are severely undernourished is also notable: 24% are severely stunted and 16% are severely underweight.⁶

The prevalence of malnutrition in the present study population is similar to that at the national level.

Prevalence of 'At Risk' Factors

One in every four children in the present study was found to be at risk for three or more factors. Three out of four under five children had at least one risk factor. Sixty three percent of Under Five children were found to be at risk for two or more factors. The prevalence was 67.3% in Delhi as reported by Bhasin SK et al.⁹ done in 1991-92. Chaudary et al.¹⁰ and Lai.¹¹ have reported 51% children to be 'at risk,' whereas Bhansal.¹² reported 89% of the study population to be 'at risk.'

The prevalence of 'at risk' factors is similar to the study done in Delhi by Bhansal SK, et al. Also, the difference in the prevalence may be due to different criteria adopted for identification of 'at risk' factors.

There is a need to identify the risk factors for Under Five children in Indian conditions, which should be specific so that Health Workers in rural areas can identify and provide better care and attention to them.

CONCLUSION

Identification of at risk under five children in the community will help in provision of better delivery of health care services. The health workers should be properly trained to identify the at risk under five children.

REFERENCES

1. Government of India (2008) Sample Registration System. Statistical Report 2007, Report No. 2 of 2008. Ministry of Home Affairs, New Delhi.
2. UNDB (2005), Human Development Report 2005 International Co-operation at Cross Roads: Aid, Trade and security in an unequal world, Oxford University Press.
3. Sathe PV (1997): Correlates of Infant Mortality: Epidemiology and Management for Health Care for All; Popular Prakashan, 2nd Edition, p 435-436.
4. WHO EXPERT COMMITTEE (1978): Risk Approach for Maternal and Child Health Care; Offset Publication, WHO Geneva, p 39.
5. Mittal A, Singh J, Ahluwalia SK. Effect of maternal factors on nutritional status of 1 to 5-year-old children in urban slum population. Indian J Community Med 2007;32:264-7.
6. National Family Health Survey-3, 2005-2006. Ministry of Health and Family Welfare, Government of India.
7. Cai X, Wardlaw T, Brown DW. Global Trends in Exclusive Breastfeeding. Int Breastfeed J 2012;7:12.
8. Shubhada Sunil Avachat, Phalke VD, Phalke DB. Epidemiological correlates of Under 5 children at risk: A Study in Field Practice Area of Rural Medical College, Loni. Health and Population: Perspectives and Issues 2009;32:73-77.
9. Bhasin SK, Pandit K, Kapil U, et al. Prevalence of 'At Risk' Factors in Under Five children. Indian Pediatrics 1994;31:1537-9.
10. Chaudhary TKY, Kumar B, Dutta PK, et al. Identification of 'high risk' under five children in an urban community. Indian J Pub Health 1987;1:45-49.
11. Lai S. 'At risk' factors in rural area. Indian J Pediatr 1981;48:605-608.
12. Bansal SM. Study of prevalence of sickness in children under three years of age: Identifying the 'risk factors' of a rural community of Haryana. Thesis submitted for MD Preventive and Social Medicine, University of Rohtak, Rohtak, 1979.