

USER SATISFACTION AND RETENTION OF Cu-T (IUD) AMONGST RURAL WOMEN IN ORISSA

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ABSTRACT

Intra Uterine Device (IUD) or Copper T (Cu-T) is one of the preferred contraceptive methods used by women. The present study was undertaken to find out the extent of client satisfaction on Cu-T and its retention by women in four rural districts of Orissa namely Angul, Ganjam, Mayurbhang and Sonepur. It was found that irrespective of the literacy level, IUD method is a widely accepted contraceptive method in all these areas. Most women preferred this method only after the birth of the first child. This is indicative of the fact that adopting a contraceptive method before achieving motherhood is still considered a social taboo in a state like Orissa. A majority (61 %) of the users expressed satisfaction with the use of IUD and retained the device. The use was more prevalent (49 %) in women in the age group of 25-29 yrs. The average retention time of IUD by women was 8-9 months and the maximum time was as high as >2 yrs in 34.69 per cent of the users. One of the important factors for Cu-T discontinuation was stated to be excess bleeding. False claims of using an IUD were found to be as high as 10.42 per cent. It was concluded that those who used the method were mostly satisfied and had very little to complain about.

Keywords: Intra-uterine device (IUD), Rural women, Cu-T retention, User satisfaction.

The most crucial problem of our country is the rapid growth of population. Soon after independence, our policy makers realized the need of a stabilized population growth in consistence with the economic growth. Thus, National Family Welfare Programme (NFWP) was launched in India in 1952 and the objective was to reduce the birth rate to the extent necessary for achieving a stabilized population.

All the family planning methods have their own advantages and disadvantages. As per NFHS-2¹, in rural Orissa, female sterilization is the most widely known family planning method. About 98 per cent of the currently married rural women in Orissa are aware of this terminal method. This obviously raises the following questions:

- Why IUD could not be made more acceptable though it is an effective method with low failure rate?
- Whether the post-insertion complications are high and are not followed-up properly?

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- Whether the health staff engaged for the job is not efficient or not sufficiently trained to handle the cases resulting defective insertion?
- Whether the low acceptance is due to unavoidable encroachment of women's privacy?

Keeping the above points under consideration, the present study was undertaken in four districts of rural Orissa to:

- Assess the effectiveness of the IUD (Cu-T) method in terms of the period of retention and client satisfaction and
- Examine the reasons of premature discontinuation of the method, if any.

METHODOLOGY

Personal interview approach was followed for collecting information from the users. The districts and the PHCs were selected before proceeding for data collection. A questionnaire was prepared and keeping the sensitiveness of information to be collected, the field officers were given basic training on how to approach the subjects. A team of four field officers along with the team leader collected the data. List of IUD users during the last three years, number of sub-centres and villages under a PHC was obtained. The field staff then interviewed the individual users by following the pre-tested questionnaire. While collecting data, assistance of the concerned MPW (female), Anganwadi worker and other health staff was taken as and when needed. A detail of the selected districts, PHCs, sub-centres, number of villages and sample size is shown in Table 1.

TABLE 1
SAMPLE SIZE VERSUS THE NUMBER OF VILLAGES
COVERED IN THE FOUR DISTRICTS OF ORISSA

Name of District	Name of PHC	Name of Sub-centres	Total village in the SC	No. of villages covered	Sample size
Angul	Kaniha	1. Badagunduri	11	3	43
		2. Samala	6	5	44
		3. Parabil	7	5	41
		4. Nalam	14	7	42
Ganjam	Khalikote	1. Pathra	6	5	47
		2. Bikrampur	5	1	42
		3. Matura	10	6	50
		4. Barasara	4	2	49
Mayubhanj	Kaptipada	1. Salachua	3	3	44
		2. Bisol	4	2	43
		3. Nududiha	5	5	39
		4. Kaptipada	3	1	38
Sonepur	Tarava	1. Kamasara	15	5	41
		2. Sivtalla	16	6	42
		3. Saragaja	11	2	43
		4. Mendha	4	2	40

FINDINGS AND DISCUSSION

There were 533 genuine IUD users against the total of 595 interviewed for the study. There were 10 percent of false/denial cases. Out of the four districts selected, false cases are highest in Sonepur followed by Angul and Mayurbhanj. Ganjam, however, did not report any false case. It is surprising to note that even after the Family Planning Programme was made target free in 1996-97, about 10 per cent cases are still reportedly the denial or false cases (Table 2).

TABLE 2
NUMBER OF CASES VERSUS PERIOD OF IUD INSERTION

NO. of cases	<1 year Cases	>1 year Cases	Total Cases
Total no. of cases selected	227	461	688
Total no. of cases contacted	198	397	595
Total no. of cases could not be contacted	29	64	93
Total denial/false cases	25(12.63)	37 (9.32)	62(10.42)
Total correct cases	173 (87.37)	360 (90.68)	533 (89.58)

Education is one of the important inputs for the success of family planning programme. However, the data revealed that about 45 per cent of the IUD acceptors were illiterate and 26 per cent were having education up to high school or above (Table 3). In Orissa, the female literacy is 50.97 per cent as per the provisional Census-2001. While comparing the present survey findings with the Census data, it was seen that no specific reason could be attributed for the preference of IUD method by the illiterate rural women. Furthermore, only 4.62 per cent of the women educated up to college and above were found using an IUD.

TABLE 3
EDUCATION LEVELS OF THE IUD USERS

Level of Education	<1 year cases	%	>1 year Cases	%	Total Cases	%of false cases
Illiterate	79	45.66	160	44.44	239	44.84
Primary	27	15.61	65	18.06	92	17.26
M.E.	15	8.67	48	13.33	63	11.82
High/HSc.	44	25.43	54	15.00	98	18.39
College & above	8	4.62	33	9.17	41	7.69
Total	173	100.00	360	100.00	533	100.00

When the data for recent IUD insertions, less than one year, were compared with more than one year, no significant difference in distribution was observed. Family Planning Programmes are always age-specific and directly related to the target fertility group. Proper adoption of family planning methods by married women of younger age group is claimed to have a direct impact on

the population growth. The findings from the present study have shown that about 85 per cent of the IUD users belonged to the age group 20-29. Out of total 533 IUD using women, the study revealed that 263 (49.34%) belonged to the age group of 25-29 followed by 35.27 per cent in the 20-24 age group. No IUD user was detected in the 40-44 yr age group (Table 4). The mean age group for the insertion of Cu-T was in the age group of 25-29 yrs.

TABLE 4
AGE DISTRIBUTION OF IUD USERS

Age group	Total cases	%
15-19	3	0.56
20-24	188	35.27
25-29	263	49.34
30-34	71	13.32
35-39	8	1.50
40-44	0	0.00
Total	533	100.00

Table 5 shows the distribution of IUD users by number of living children at the time of Cu-T insertion. During the study, no woman was found using IUD without a child. The findings were no different than what was already reported in NFHS-2. Contraceptive prevalence prior to the first child amongst married women in Orissa was very less (0.8%). In contrast, approximately 2.1 per cent of urban women under similar circumstances used contraceptives.

In the present study, about 80 per cent of the users had one or 2 living children at the time of adoption of the method. While comparing the data of recent, <1 year users with cases of 2-3 years old, it was observed that among the users with one child, the method was slightly better preferred by recent users with one children (42.2%) than cases with 2-3 children (39.72%). Women with 2 children generally preferred the terminal method rather than the IUD method. This is perhaps due to increasing awareness through the promotion of small family norm by the Government in recent years³.

TABLE 5
NUMBER OF LIVING CHILDREN AT THE TIME OF ACCEPTANCE OF IUD

Living children	<1 year cases	%	>1 year cases	%	Total cases	%
One	73	42.20	143	39.72	216	40.53
Two	64	36.99	144	40.00	208	39.02
Three	27	15.61	43	11.94	70	13.13
Four	5	2.89	22	6.11	27	5.07
Five & more	4	2.31	8	2.22	12	2.25
Total	173	100.00	360	100.00	533	100.00

The period of retention of IUD by women is shown in Table 6. About 43 per cent of cases continued the method for more than a year and 57 per cent less than a year.

TABLE 6
PERIOD OF RETENTION OF IUD (Continued Cases)

Period	<1 year cases	%	>1 year cases	%	Total	%
< 1 month	11	8.40	0	0.00	11	4.80
1-3 month	21	16.03	0	0.00	21	9.17
4-6 month	38	29.01	0	0.00	38	16.59
7-12 months	61	46.56	0	0.00	61	26.64
> 1 year & < 2 year	0	0.00	64	65.31	64	27.95
> 2 Year	0	0.00	34	34.69	34	14.85
Total	131	100.00	98	100.00	229	100.00

It is essential to analyse the reasons for discontinuation of the method with a view to provide proper feedback for improving the performance of the method.

Table 7 explains the reason-wise and age-wise distribution of the cases where the method was discontinued. It may be seen from the findings that out of the total discontinuation cases, 51 per cent attributed exclusively to the reason for a permanent method or going for another child etc. For others (46.38 %), the method was discontinued due to some problem experienced by the user. The major problem experienced by the users during post insertion was bleeding (43.26%), white discharge (22.70%) and backache (16.31%). 12.05 per cent of removal cases reported to abdominal pain, head reeling/weakness and irregular period. Dissatisfaction by husbands contributed 5.67 per cent of the removal cases.

TABLE 7
REASONS FOR IUD DISCONTINUATION

Reasons	< 1 year cases	%	> 1 year cases	%	Total cases	% (total)	% (sub-total)
Prefer Other method	17	68.00	71	51.45	88	28.95	53.99
Want another child	6	24.00	61	44.20	67	22.04	41.10
Expelled	2	8.00	6	4.35	8	2.63	4.91
Sub-total	25	100.00	138	100.00	163	53.62	100.00
Removed due to							
i. Bleeding	5	29.41	56	45.16	61	20.07	43.26
ii. Backache	6	35.29	17	13.71	23	7.57	16.31
iii. Abdominal Pain	0	0.00	9	7.26	9	2.96	6.38
iv. White discharge	4	23.53	28	22.58	32	10.53	22.70
v. Head reeling/ weakness	0	0.00	7	5.65	7	2.30	4.96
v. Irregular period	0	0.00	1	0.81	1	0.33	0.71
vii. Husband dissatisfied	2	11.76	6	4.84	8	2.63	5.67
Sub-total	17	100.00	124	100.00	141	46.38	100.00
Total	42		262		304	100.00	

User Satisfaction

Table 8 reveals the extent of satisfaction by users of IUD method. It may be seen that about 61 per cent of the IUD users are satisfied with the method. Women who adopted the method during the last one year were found to be more satisfied (75%) than those using the method for more than a year. About 39 per cent of the users were reportedly dissatisfied with the method due to post-insertion complications.

TABLE 8
DURATION OF SATISFACTION WITH IUD

Users	<1 year cases	%	> 1 year cases	%	Total cases	%
Satisfied	130	75.14	194	53.89	324	60.79
Not satisfied	43	24.86	166	46.11	209	39.21
Total	173	100.00	360	100.00	5333	100.00

CONCLUSION

The findings from the present study show that about 10 per cent of all cases studied were reportedly denial/false cases. Among IUD users, 45 per cent were illiterate. No special preference to IUD by literate women was observed. It was mainly preferred by women (about 85%) in the age group 20-29 years. 80 per cent of users had one or two living children at the time of IUD insertion. Thus, no woman preferred this method prior to her motherhood. It was also seen that 57 per cent of the total users during last three years discontinued the method at some point or other. Preference to go for another child or sterilization was the reason stated by a little more than half (51%) of the respondents. 2.63 per cent of discontinued cases were due to expulsion. It is, thus, an important point for consideration by the concerned health personnel to put in remedial measures. The average period of retention of IUD was 8-9 months. About 47 per cent retained the IUD for more than a year and a little more than 10 per cent retained it for more than 2 years. 46.38 per cent of the discontinued cases were due to problems faced by the users. The main causes of discontinuation were heavy bleeding, white discharge and backache. Bleeding was a major problem for users having the Cu-T for 1-6 months while white discharge was of serious concern where Cu-T was retained for more than a year. Those who continued the method were mostly satisfied. Over all, 61 per cent of users felt satisfied with the method. These findings establish that a strong relationship exists between user satisfaction and the period of retention. It is possible that the magnitude of false cases may be more than what has been observed in this study. Thus, the State authorities need to look into the aspect of reporting of wrong and false cases and direct the field level health functionaries to take appropriate measures.

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HEALTH CARE SERVICE UTILIZATION FOR *KUsISUs* AND DIARRHOEAL DISEASES: A STUDY AMONGST SLUM DWELLERS IN *DELHI*

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ABSTRACT

A community based cross-sectional study was conducted during the period 2000-2002 in the slum populations of Balmiki Basti and Dhobi Ghat, Delhi, to find out the extent of utilization of present health care services meant for RTIs/STIs and diarrhoeal diseases. Males and females in almost equal proportions, comprising 32.9 per cent in the reproductive age group availed treatment for RTI/STIs in a Government allopathic health facility. In contrast, a significantly higher percentage (82.9 %) reported for treatment for diarrhoeal diseases. The main reason for preferring a Government health facility was the low cost of the treatment followed by easy availability of services. Quality of treatment and satisfactory behavior of the health care personnel were upto expectations in 80.3 per cent and 75.9 per cent of subjects respectively. Waiting time for availing the services varied between 2 (for 44.4%) to 4 hours (for 29.3%) of those interviewed. A vast majority (72.2%) of subjects expressed their willingness to pay more for further improvement of health care services in the Government sector.

Keywords: *Slum population*, RTI/STIs, Diarrhoeal diseases Utilization, Health care service utilization.

Nearly 30 per cent of India's population lives in urban areas. Migration over the last decade has resulted a rapid growth of population living in urban slums with deteriorating *living* conditions. It is generally believed that urban population has better health facilities *compared* to their *rural* counterparts. But, in *really*, in many towns and cities, there are areas in which the *health facility* for an urban *dweller* is no better than that of *rural* folks. The tertiary level health care located in an *urban area*, *often* recognized as a better facility, renders equally both to the *rural* as well as the urban population.

When an individual is ill, there are various *factors* that influence the way he behaves towards his illness. The *raclors* could be personal, *environmental* or social and In a way, reflect the health behaviour utilization of people. In developing countries, the morbidity and mortality due to *reproductive tract* infections/sexually transmitted infections are relatively very high *compared* to other health problems and many a times these are under reported. Similarly, diarrhoeal diseases contribute significantly to childhood morbidity and mortality because of the delay in seeking

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appropriate treatment. In the present study, two slum populations of Delhi were specially selected in order to analyze the health seeking behaviour of people and utilization of health care services with special reference to RTI/STI and diarrhoeal diseases in these localities.

MATERIAL AND METHODS

The present study was conducted in urban slums of Balmiki Basti and nearby slum of Dhobi Ghat, located behind Bahadur Shah Zafar Marg, Delhi. The area has an approximate population of 2,000. It consists of migrants from neighboring states of Delhi. It was a community based cross-sectional study conducted during 2000-2002. Besides a health center under the Department of Community Medicine, M.A.M. College, Delhi that provides comprehensive health services, other health care providers in these areas include few private practitioners, registered medical practitioners and traditional healers. Lok Nayak Hospital, Guru Nank Eye Centre and G.B. Pant Hospitals are the other tertiary level health facilities located within 2 km of this area.

Out of a total of 454 households, 419 were contacted for the purpose of the study. A pretested and pre-structured questionnaire was used for collecting information.

Information related to the utilization of health care facilities for RTIs/STIs were obtained from subjects in the reproductive age group of 15-49 years. Views on preferences for a particular health care facility in the existing health services setup were gathered from those over 15 years of age. Children less than 5 years were excluded while collecting data on the literacy rate of the study population

FINDINGS

The study population consisted of 1164 (57.9%) females. There were 375 (90.6%) Hindu and 39 (9.4%) Muslims households. Nuclear and joint families comprised 276 and 115 (27.8%) respectively. Only 23 (5.5%) were found living as singletons. All the subjects in the study population belonged to lower income groups. 752 (64.6%) of the males and 340 (40.2%) of the females were found gainfully employed. 665/1029(64.6%) of the males were found literate as against 247/762 (32.4%) of the females.

Out of total 1223 subjects in the age group of 15-49 years, 402 (32.9%) had sought treatment for RTIs/STIs in the past 5 years. These were 183/704(26%) males and 219/519(42.2%) females. Government (allopathic) facility was the preferred destination for treatment of RTIs/STIs by majority of males i.e. 116/183(63.4%) and females, 141/219(64.4%) (Table 1). Low cost of the treatment at the Government facilities was the main reason for such a preferential selection. As compared to females, significantly a higher proportion ($p<0.05$) of males (26.7%) expressed that Government services were easily available. As many as 62.5% of the males and 57.5% of the females expressed that the quality of services provided by the private practitioners are better. In terms of effectiveness, 70% females compared to 41.1% of the males ($p<0.05$) considered the treatment from private practitioners as very effective (Table 1). A few subjects (3) opined that Ayurvedic treatment has no side effects.

Out of total 2099 subjects as many as 1050 (82.9%) had sought treatment for diarrhoeal diseases in the past five years, comprising 957/1164 (82.1%) of males and 709/845 (83.9%) of

TABLE 1
REASONS FOR PREFERING THE TYPE OF HEALTH FACILITY FOR RTIs/STIs IN THE PAST FIVE YEARS

Reasons#	Government		Private		Ayurvedic		Trad. Healer	
	M N=16	F n=141	M N=56	F n=40	M n=03	F n=15	M N=08	F n=23
Easy Availability	31* (26.7)	20 (14.2)	18 (32.1)	18 (45)	00 00	00 00	02 (25)	07 (30.4)
Effective treatment	18 (15.5)	31 (22)	23* (41.1)	28 (70)	02 (66.7)	08 (55.3)	03 (37.5)	03 (13)
Low-cost	81 (69.8)	97 (68.8)	00 (00)	00 (00)	00 (00)	00 (00)	02 (25)	00 (00)
Better Service	07 (6)	00 (00)	35 (62.5)	23 (57.5)	00 (00)	00 (00)	00 (00)	00 (00)
Faith in the System	03 (2.6)	00 00	00 00	00 00	03 (100)	13 (86.7)	05 (62.5)	17 (73.9)
Cordial Behaviour	00 (00)	00 (00)	15 (26.8)	08 (20)	00 (00)	00 (00)	00 (00)	00 (00)
Others	00 (00)	00 (00)	00 (00)	00 (00)	00 (00)	03 (20)	00 (00)	00 (00)

#Multiple responses

*Significant at p<0.05

Figures in parentheses are in percentage

TABLE 2
REASONS FOR PREFERRING THE TYPE OF HEALTH FACILITY FOR DIARRHOEAL DISEASES IN THE PAST FIVE YEARS

Reasons	Government		Private		Ayurvedic	
	M n=741	F n=536	M n=190	F n=84	M n=26	F n=89
Easy Availability	97 (13.1)	117 (21.8)	68 (35.8)	31 (36.9)	05 (19.2)	08 (9)
Effective Treatment	92 (12.4)	45 (8.4)	81* (42.6)	53 (63.1)	10 (38.5)	43 (48.3)
Low Cost	487 (65.7)	376 (70.1)	00 (00)	00 (00)	03 (11.5)	33 (37.1)
Better Service Facility	00 (00)	18 (3.3)	68' (35.8)	58 (69)	00 (00)	00 (00)
Faith in the System	73* (9.8)	10 (1.9)	00 (00)	00 (00)	15 (57.7)	31 (34.8)
Cordial Behaviour	00 (00)	00 (00)	18 (9.5)	15 (17.8)	00 (00)	00 (00)

#Multiple responses

Signifiant at p<0.05

Figures in parentheses are in percentage None had gone to a traditional healer

females. Majority of males 741/1164 (63.6%) and 536/845 (63.4%) females had sought treatment from Government (allopathic) facility because of low cost of treatment (65.7% males and 70.1 % females) (Table 2). Private practitioners were approached by significantly higher proportion ($p<0.05$) of females 53784(63.1%) due to the consideration of a better effective treatment as compared to males 81/190(42.6%). Services of private practitioner's were considered better by a significantly higher proportion ($p<0.05$) of females 58/84(69%) compared to males 68/190 (35.8%).

TABLE 3
DISTRIBUTION OF SUBJECTS BASED ON THEIR PREFERENCE
FOR THE TYPE OF HEALTH FACILITY

Health Facility	RTIs/STIs		Diarrhoeal Diseases	
	M n=777	F n=566	M n=777	F n=566
Allopathic (Govt.)	501*(64.5)	285 (50.3)	428 (55.1)	340 (60.1)
Allopathic (Private)	227 (29.2)	202 (35.7)	301 (38.7)	173 (30.6)
Ayurvedic	05 (0.6)	15(2.6)	12(1.5)	21 (3.7)
Traditional Healer	0*0 (00)	36 (6.4)	04 (0.5)	08(1.4)
Homeopathy	02 (0.2)	07(1.2)	00 (00)	00 (00)
No Response	42 (5.4)	21 (3.7)	32 (4.1)	24 (4.2)

Significant at $p<0.05$, Figures in parentheses are in percentage.

TABLE 4
REASONS FOR PREFERING THE TYPE OF HEALTH
FACILITY

Reasons	Allopathic (.G)		Allopathic (P)		Ayurvedic		Trad.	Healer	Homeopathy	
	RTIs n=786	DD n=768.6	RTIs n=429	DD n=474	RTIs n=20	DD n=33	RTIs n=36	DD n=12	RTIs n=09	DD n=00
Easy Availability	356 (45.3)	381 (49.6)	204 (47.5)	87 (18.4)	00 (00)	10 (30.3)	23 (63.9)	03 (2.5)	00 (00)	00 (00)
Effective Treatment	98 (12.5)	215 (28)	289 (67.4)	241 (50.8)	06 (37.50)	08 (24.2)	19 (52.8)	03 (2.5)	05 (55.5)	00 (00)
Low-Cost	529 (67.3)	506 (65.9)	00 (00)	00 (00)	00 (00)	00 (00)	08 (2.50)	07 (58.3)	02 (22.2)	00 (00)
Better Service	35 (4.4)	09 - (12)	246 (57.3)	269 (56.7)	00 (00)	00 (00)	00 (00)	00 (00)	00 (00)	00 (00)
Faith in the System	54 (6.9)	26 (57.3)	00 (00)	09 (1.9)	09 (56.2)	08 (24.2)	13 (40.6)	07 (58.3)	03 (33.3)	00 (00)
Cordial Behaviour	00 (00)	00 (00)	21 (4.9)	06 (1.3)	00 (00)	00 (00)	00 (00)	00 (00)	00 (00)	00 (00)
Others	00 (00)	00 (00)	11 (2.6)	00 (00)	06 (37.5)	11 (33.3)	00 (00)	00 (00)	00 (00)	00 (00)

#Multiple response

Figures in parentheses are in percentage.

When enquired about the preference for a health facility, a majority of subjects (1343) over 15 years of age, stated their preference for a Government facility (allopathic) both for RTIs/STIs (64.6% males and 50.25% females) and diarrhoeal diseases (55.1% males and 60.1% females). A higher proportion ($p < 0.05$) of males preferred the Government (allopathic) facility for RTIs/STIs as compared to females (Table 3). Again, the preference of opting Government (allopathic) facility was stated to be the low cost of the treatment (67.3% for RTIs/STIs and 65.9% for diarrhoeal diseases (Table 4)).

Waiting time during the last visit to a Government health facility was less than 2 hours for 272 (16.3%), more than 2 hours for 735 (44.1%), upto 4 hours for 489 (29.3%) and more than 4 hours for 170 (10.2%) subjects. Treatment was upto expectations for 1338 (80.3%) and not up to expectations for 328 (19.7%) subjects. Behaviour of staff was satisfactory for 1265 (75.9%) and not up to the mark for 40 (24.1%) subjects. Those interviewed, 1205 (72.3%) expressed their willingness to pay more for a more improved Government health facility whereas the rest 461 (27.7%) replied otherwise.

DISCUSSION

RTIs/STIs are widely prevalent all over the world but the rate of prevalence is mostly under-reported in developing countries. They have not been studied extensively due to the widespread belief that these don't profoundly affect the health status of a population. While there is some sketchy data on symptomatic STIs, there is paucity of information on the asymptomatic infections resulting STIs. There is also a wide variation in the perceptions of the people to the genital tract symptoms, which they experience. Some women may consider symptoms as normal while clinically it might be signifying the prevalence of the disease. In contrast, younger women may be more apprehensive of normal changes to be indicative of some related symptoms in RTI/STIs. In the present study only 26 percent of the males and 42.2 percent of the females had sought treatment for RTI/STIs in the last five years. This strengthens the fact that there is little understanding as to how people perceive these symptoms and how these are reflected in their treatment seeking behaviour. Very little information exists regarding the health care sought, the determinants of choice for a particular service, the acceptability of services and constraints involved.

In the present study, it is seen that 82.9 percent of the subjects had sought treatment for diarrhoeal diseases for the past five years. Diarrhoea continues to be a major public health problem in the developing countries. Rapid population growth has made it difficult to provide proper sanitation services such as piped water, sewerage facilities and garbage collection centres fast enough to keep pace with in expanding population, in slum areas, even if safe water is available, many households have no access to sanitary waste and garbage disposal, which are simply dumped or put-up to flames in the open. Poor environmental conditions are often blamed for the spread of infectious diseases in the slums in Chandigarh and also in other city slums.

Majority of the study subjects had sought treatment from a Government (allopathic) facility for both types of ailments due to low cost of the treatment. Gaur (1991) has reported similar findings from a study of urban slums in Rohtak. The study population consisted of people mainly from the lower income group. Their inability to pay for high cost of health services elsewhere also affects their health seeking behaviour. According to WHO, poor are given less choice of service.

from providers and offered lower quality amenities. Free of charge services don't always translate automatically into over utilization of services. Services that are free of direct charge are in reality not necessarily free or affordable, particularly for the poor, because of other costs of seeking health care, such as cost of medication (when not available free of charge), under the table payments, transportation or time lost from work. The fact that the total number of women utilizing a health care facility for RTIs/STIs was 64.4 percent from a Government (allopathic) facility and only 18.3 percent from private service providers reflects the economic condition and its influence on the choice of seeking the type of health facility. In this study, a significantly lower proportion of females compared to males were gainfully employed. Many patients were pluralistic in their choice of health care utilization in choosing between allopathic and traditional practitioners, government and private services. Those who can afford opt private sector services, as quality of service is often associated with cost. Women interviewed in the present study described this as the main reason for seeking a private (allopathic) facility for RTIs/STIs.

Cordial behavior of the practitioner was another important factor that was highlighted in the present study. Sadly enough it was not true for government doctors. However, the present findings were not very much different than the reported arrogance and rudeness of health workers to patients reported from other centres as well.

The average waiting time for receiving the service at a Government hospital was stated to be less than 2 hours by 44 percent of subjects while for others (29.3%) it was 4 hours. This is comparable to average waiting time of 2 hours and 40 minutes as reported by Singh et al in his study in Trinidad and Tabago. This may be due to the imbalance in the doctor/patient ratio in government health institutions in many developing countries. Majority of the subjects observed that their visit to a Government hospital was up to expectations in relation to the behaviour of the staff. As per Singh et al, a health system performance cannot be accessed on such subjective dimensions as responsiveness-might be influenced by many other features of the system itself or by the respondents. Since poor people may expect less than rich people, they seem to be more satisfied even with unresponsive services. Willingness to pay more for improvement in the Government sector was another important finding of the present study. Similar views were also expressed in the study of OPD patients in a General hospital of Delhi.

CONCLUSION

A majority of the slum dwellers had availed of Government run health facilities in the past and would also prefer to do so in future. Many expressed their willingness to pay more for concerted efforts in improving the services. Necessary steps are therefore needed to increase the doctor patient ratio since it would help not only in catering better services but also improved utilization by people.

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AN INDIRECT TECHNIQUE FOR ESTIMATIONS OF INFANT AND CHILD MORTALITY: DATA ANALYSIS FROM INDIA AND BANGLADESH

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ABSTRACT

The analysis of modality data is of vital interest to policy planners and health administrators in the formulation of development strategies to meet the health needs and demands of people and also in the implementation and evaluation of public health programmes. The study of child mortality provides useful information on the current demographic situation in that region and indicates on the prospects of potential change in future. Death is a vital event recorded through the system of civil registration. But in developing countries, quality of registered data is not very much reliable because of its failure to reach to all groups of the population affected by illiteracy and ignorance. Because of many unreliable estimates arising out of the civil registration system, exploration of indirect techniques for estimating vital indicators has become a necessity.

In the present study, we have utilized an indirect technique for estimating infant mortality and under-five mortality rates by using the data of mean number of children ever born and living to currently married women aged 15-49 years. The method is essentially based on the technique of regression line analysis taking infant mortality rate or under five-mortality rate, as a dependent variable and the proportion of dead children among the total children born to currently married females (15-49 years) as independent variable. The regression line analysis was computed and tested using data from National Family Health Survey (India) and Demographic and Health Survey (Bangladesh). The observed and expected rates computed from regression line were found overlapping in most cases showing complete adequacy of the proposed indirect method.

Keywords: Mean children ever born, Mean children living, Proportion of dead children, Infant mortality rate, Under-five mortality rate, Indirect technique.

Mortality has historically played a dominant role in determining the growth of population. The recent spurt in population growth in most of the developing nations is because of the rapid fall in the level of mortality. Mortality has played a very important role in the analysis of demographic situation of any country and determines the prospects of a potential change in future. It has been argued by experts that infant mortality rate is an important indicator of the socio-economic condition, health and nutritional standard of a community. Nearly 20 per cent of all deaths among children occur between age one and five years.

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Death is a vital event and its incidence along with some ancillary information about the deceased is usually recorded through the system of civil registration. Though the system of civil registration has been introduced in many countries, the quality of registered data especially in underdeveloped and developing countries is inadequate both in its content and coverage. The incompleteness is not only because of the failure of the system to cover the entire geographic area of the country and to the all groups of population but also its failure to register all the vital events in a particular area.

The lack of accurate registration of vital events along with accurate census of population has forced demographers to devise procedures for estimating basic demographic parameters from inaccurate or incomplete data. The estimation of child mortality from proportion of dead amongst children ever born to women in standard age groups is now a familiar technique. It was first proposed by Brass (Coal and Demeny 1966, Brass and Coale 1968), known widely as the Brass method. It is probably the best applied of all indirect techniques (Brass 1975, Sullivan 1972, Trussell 1975). Among other alternate indirect techniques, Pallani (1978, 79) presented a technique for the cases in which the mortality has been declining. Sullivan (1972) used a different technique for estimating child mortality from observations on proportion of dead children amongst children ever born to women with reference to the duration of marriage. Islam and Alam (1996) computed child mortality by using child mortality index (MI).

In the present study we have proposed a technique for the estimation of child mortality from observations on proportions of dead children amongst children ever born to currently married women of the entire reproductive age group of 15-49 years. The method is simple to operate with minimum data requirements.

METHODOLOGY

The method is essentially based on the technique of regression line. Using the regression line concept, we have tried to establish the relationship between the proportion of dead children among the total children born to currently married females in the age group 15-49 years and infant mortality rate or under five mortality rate. Infant mortality rate or under five mortality rate was used as the dependent variable (Y) and proportion of dead children as independent variable (X).

The data for the present study are taken from National Family Health Survey (1992-93), India and Demographic and Health Survey (1996-97), Bangladesh. Ministry of Health and Family Welfare, Government of India initiated the National Family Health Survey, and all major states with population more than 15 million were considered in this study. For Bangladesh, data for the nation as a whole as well data against different regions were included. The proportion of dead children to currently married females (15-49 yrs) for Bangladesh and India are shown in Table 1 and Table 2 respectively.

Utilizing the above data, the regression lines for estimation of under-five mortality rate and infant mortality rate were obtained as under:

For under-five mortality rate (Per thousand live births): $Y = 835.9 X - 11.051$, ($R^2 = 0.8855$)

For infant mortality rate (Per thousand live births) $Y = 576 X - 3.7896$, ($R^2 = 0.8286$)

TABLE 1
PROPORTION OF DEAD CHILDREN TO CURRENTLY MARRIED
FEMALES IN THE AGE GROUP 15-49 YEAR (BANGLADESH)

Region	Mean Children Ever Born	Mean Children Alive	Proportion of Dead Children
Bangladesh	3.30	2.76	0.164
Urban	2.64	2.34	0.114
Rural	3.38	2.81	0.169
Barisal	3.32	2.78	0.163
Chittagang	3.69	3.07	0.168
Dhaka	3.28	2.72	0.171
Khulna	2.99	2.61	0.127
Rajshahi	3.06	2.55	0.165
Sylhet	3.74	2.95	0.211

TABLE 2
PROPORTION OF DEAD CHILDREN TO CURRENTLY MARRIED FEMALES

State	Mean Children Ever Born	Mean Children Alive	Proportion of Dead Children
India	3.11	2.65	0.148
Uttar Pradesh	3.58	2.86	0.201
Madhya Pradesh	3.18	2.64	0.170
Bihar	3.25	2.75	0.154
Haryana	3.13	2.73	0.128
Kerala	2.50	2.35	0.060
Gujarat	2.93	2.57	0.123
Maharashtra	2.95	2.62	0.112
Rajasthan	3.14	2.77	0.118
Punjab	2.93	2.69	0.082
Tamil Nadu	2.72	2.34	0.140
Andhra Pradesh	2.75	2.39	0.131
Karcatka	3.07	2.66	0.134
Orissa	3.03	2.51	0.172
West Bengal	3.00	2.60	0.133
Assam	3.69	3.10	0.160

FINDINGS AND DISCUSSION

Tables 3 and 4 show the estimates of under-five mortality rate and infant mortality rate for Bangladesh. The under-five mortality rate for Bangladesh is estimated at 126 per 1000 births, but there are wide variations by regions. Sylhet has the highest under five-mortality rate of 165 and the highest infant mortality rate of 118; other two regions with under-five mortality rate above the national average are Chittagong (129) and Dhaka (132). All regions excluding Khulna have relatively high infant mortality rate, which are higher than national average. Child mortality rate in rural areas of Bangladesh is 35 percent higher than urban areas.

TABLE 3
REGION-WISE ESTIMATED AND OBSERVED VALUES OF UNDER-FIVE MORTALITY RATE (UMR) FOR BANGLADESH

Region	Estimated U.M.R.	Observed U.M.R.	Percent Difference
Bangladesh	126.0	127.8	-1.4
Urban	84.2	96.2	-12.4
Rural	130.2	130.9	-0.5
Barisal	125.2	119.5	4.8
Chittagang	129.4	131.3	-1.5
Dhaka	131.9	130.3	1.2
Khulna	95.1	86.8	9.6
Rajshahi	126.9	126.2	0.0
Sylhet	165.3	179.1	-7.7

TABLE 4
STATE-WISE ESTIMATED AND OBSERVED VALUE OF UNDER-FIVE MORTALITY RATE (UMR) FOR INDIA

Region	Estimated U.M.R.	Observed U.M.R.	Percent Difference
India	112.7	109.3	3.1
Uttar Pradesh	157.0	141.3	11.1
Madhya Pradesh	131.0	130.3	0.6
Bihar	117.7	127.5	-7.7
Haryana	95.9	98.7	-2.8
Kerala	39.1	32.0	22.2
Gujarat	91.8	104.0	-11.8
Maharashtra	82.6	70.3	17.4
Rajasthan	87.6	102.6	-14.6
Punjab	57.5	68.0	-15.4
Tamil Nadu	106.0	86.5	22.5
Andhra Pradesh	98.5	91.2	7.9
Karnataka	101.0	87.3	15.6
Orissa	132.7	131.0	1.3
West Bengal	100.1	99.3	0.8
Assam	122.7	142.2	-13.7

Tables 3 and 5 show the percentage difference between the observed and estimated values of under-five mortality rate and infant mortality rate for Bangladesh. A 10 percent cut off difference between the observed and estimated values of under-five mortality rate and infant mortality rate was used to judge the adequacy of the proposed method. With this criterion, the observed and estimated values were found quite close to each other. In fact, for Bangladesh eight out of nine values showed differences less than 10 percent (For Bangladesh - 1.4%, Bangladesh (Rural) -0.5%, Barisal 4.8%, Chittagong - 1.5%, Dhaka 1.2%, Khulna 9.6%, Rajshahi 0.0% and Sylhet -7.7%). The difference between the observed and estimated values of under-five mortality rate was between 10 to 20% for urban area of Bangladesh. In the case of infant mortality rate, it was less than 10 percent for Bangladesh (Rural), Dhaka, Khulna and Rajshahi. But the difference

between the observed and estimated values of infant mortality rate was found varying between 10 to 20 percent for Bangladesh (Urban), Chittagang and Sylhet.

TABLE 5
REGION-WISE ESTIMATED AND OBSERVED VALUES OF INFANT
MORTALITY (IMR) RATE IN BANGLADESH

Region	Estimated U.M.R.	Observed U.M.R.	Percent Difference
Bangladesh	90.7	89.6	1.2
Urban	61.9	72.7	-14.9
Rural	93.6	91.2	2.6
Barisal	90.1	86.3	4.4
Chittagang Dhaka	93.0	76.8	21.1
	94.7	90.8	4.3
Khulna	69.4	75.2	-7.8
Rajshahi	92.4	94.6	-2.3
Sylhet	117.7	138.0	-14.7

TABLE 6
STATE-WISE ESTIMATED AND OBSERVED VALUE OF INFANT MORTALITY
(IMR) RATE IN INDIA

Region	Estimated U.M.R.	Observed U.M.R.	Percent Difference
India	81.4	78.5	3.8
Uttar Pradesh	112	99.9	12.1
Madhya Pradesh	94.1	85.2	10.5
Bihar	84.9	89.2	-4.8
Haryana	69.9	73.3	-4.6
Kerala	30.8	23.8	29.3
Gujarat	67.1	68.7	-2.4
Maharashtra	60.7	50.5	20.2
Rajasthan	64.2	72.6	-11.6
Punjab	43.4	53.7	-19.1
Tamil Nadu	76.8	67.7	13.5
Andhra Pradesh	71.7	70.4	1.8
Karnatka	73.4	65.4	12.2
Orissa	95.3	112.1	-15.0
West Bengal	72.8	75.3	-3.3
Assam	88.4	88.7	-0.4

Tables 4 and 6 show estimates of under-five mortality rate and infant mortality rates for major states in India. The under-five mortality rate for India is estimated at 113, but there are wide variations reported between states. Five states located mostly in central and eastern parts of the country like Madhya Pradesh, Uttar Pradesh, Bihar, Orissa and Assam have relatively high under-five mortality rate which are higher than national average. Uttar Pradesh has highest child mortality rate in India with an under-five mortality rate of 157, which is 28 percent higher than national average. A second group of eight states Haryana, Gujarat, Maharashtra, Rajasthan, Punjab, Tamil Nadu, Andhra Pradesh, Karnataka and West Bengal have child mortality in the moderate range. A

third group of states viz. Kerala and Punjab have low under-five mortality rate of 39 and 58 per 1000 live births respectively.

Fourth columns of the Tables 4 and 6 show the percent difference between the observed and estimated values of under-five mortality rate and infant mortality rate. The percent difference between the observed and estimated values of under-five mortality rate was less than 10 percent for about half of the values. Out of sixteen values, seven values had differences less than 10 percent (India 3.1%, Madhya Pradesh 0.6%, Bihar-7.7%, Haryana -2.8%, Andhra Pradesh 7.9%, Orissa 1.3% and West Bengal 0.8%) and between 10 to 20 percent for Karnataka, Rajasthan, Maharashtra, Punjab, Gujarat and Assam and more than 20% for Tamil Nadu and Kerala.

In the context of infant mortality rate, the difference was less than 10 percent for India, Bihar, Gujarat, Andhra Pradesh, West Bengal and Assam. However, for Uttar Pradesh, Karnataka, Madhya Pradesh, Rajasthan, Tamil Nadu, Punjab, Maharashtra and Orissa the difference was between 10 to 20 percent. For the state of Kerala, the difference was more than 20 percent.

On the basis of the above it is reasonable to conclude that the proposed technique has the potential to provide quick estimates of infant and child mortality from a limited but easily available data on allied indicators.

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BIRTH WEIGHTS IN A BANGALORE HOSPITAL: IS THE CITY WOMEN IN THE PHASE OF A NURTITION TRANSITION?

S.R. Srikrishna* and Chitra Stephen*

ABSTRACT

A study of 959 live births at a tertiary-level hospital in Bangalore over a period of one-year revealed the prevalence of low birth weight in 25.8 per cent of the cases with a mean birth weight of 2775 gm closely matching the figures for the country (24.8% and 2633 gm respectively). However, unlike other studies, birth weight was found associated only to maternal height while showing no relationship to maternal Body Mass Index (BMI) or anemia. Closer scrutiny of the study population revealed a BMI distribution that varied significantly from other studies. It was observed that a larger proportion of the mothers had a BMI of 20 and above. This situation, in which low maternal height coupled with a normal BMI, mimics the scenario of a "nutrition transition" thus far described only in women migrating from India and settling abroad adopting western dietary habits. Improved maternal weight not affecting the birth weight as observed in the present study may be explained by the theory offered by some researchers that intra-uterine growth is limited by the "foetal supply line which in turn is strongly influenced by the mother's own foetal development. It is also stated that it will take at least two generations for this restriction to be removed. While urban studies, such as this, provide us an encouraging glimpse of the improved birth weights that India is likely to witness in near future, this must be weighed against the increasing evidence that short heighted Indian mothers with access to better levels of nutrition may in fact place their off springs at a higher risk of diabetes and coronary heart disease in adulthood.

Keywords: Body mass index, Nutrition, Pregnancy, Foetal development, Low birth weight

Despite concerted efforts to improve the quality of maternal health, the proportion of babies born in India weighing 2,500 gm or less remains at 24.8 per cent.¹ Half of all perinatal and one-third of all infant deaths are directly or indirectly related to low birth weight.² It is, therefore, considered a crucial area for clinical and epidemiological investigations and a target for public health interventions. This also entails a clear understanding of the multifactorial origins of Low Birth Weight (LBW) in India which is known to include genetic factors, parity, maternal height and pre-pregnancy weight, pregnancy weight gain, socio-economic status and pregnancy-related complications. The weight of an infant at birth, besides being an important determinant of further growth and development of the infant, also broadly reflects the level of nutrition of a community.

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While one cannot entirely exclude the role of genetic factors, studies have shown that the birth weights of babies born from ovum donation (where the egg from one woman is transferred to another) are strongly related to the weight of the recipient mothers and unrelated to the weight of the donors. This suggests that growth in-utero is primarily determined by the mother's nutritional stores at the time of conception and her diet during pregnancy. Kramer after review of the determinants of LBW concluded that maternal nutritional factors, both prior to and during pregnancy accounted for more than 50 per cent of the levels of intra-uterine growth retardation seen in rural areas of many developing countries.

The present study focuses on the maternal nutritional factors prior to pregnancy including pre-pregnancy weight, height and weight gain during pregnancy while identifying other maternal, foetal and placental factors that might also influence birth weight.

OBJECTIVES

- (i) To measure the prevalence of low birth weight (LBW) among live births at a tertiary level hospital in Bangalore city.
- (ii) To determine the association between LBW and maternal nutritional factors.
- (iii) To identify other maternal, foetal and placental risk factors, which may play a role in LBW.

MATERIALS AND METHOD

As a descriptive cross-sectional study, antenatal records of all women who delivered in the St. John's Medical College Hospital (SJMCH), Bangalore over a period of one-year were examined. The study included all the registered cases having three or more ante-natal visits. The subjects included in the present study were those having live births only either through normal, assisted, instrumental or Caesarean section deliveries.

It is known that the prevalence rate of established factors contributing to LBW like HIV positive cases and other complications were significantly higher among the unregistered compared to the registered group. However, since details regarding all variables were not available for the unregistered cases, they were not included in the present study.

Definition of Terms

Low Birth Weight: Birth weight of a newborn baby who weighs 2,500 gms or less irrespective of gestational age with the measurement being taken within the first hour of life.

Term: A foetus having reached the period between 37 completed weeks but less than 42 completed weeks.

Maternal Weight and Weight Gain: As in most of the studied cases pre-pregnancy weight was not available, the weight of the mother in the first trimester was used as proxy for this weight. Moreover, weight gain in the first trimester is not considered significant¹⁰. Similarly, weight gain was calculated as the difference between this figure and the last weight recorded before delivery.

The various variables considered for the study were:

A. Maternal

(i) Nutritional

1. Maternal height (in cm)
2. First trimester maternal weight (in kg)
3. Body Mass Index
4. Maternal pregnancy weight gain (in kg)
5. Hemoglobin level (in g%)
6. Iron supplementation

(ii) Other

7. Maternal age
8. Parity
9. Disease states complicating pregnancy

B. Foetal

10. Birth weight (in gm)
11. Sex
12. Gestational age (in days)

C. Placental

13. Placental weight (in gm)
14. Placental abnormalities

All data were entered in Excel software EPI6 and analysed.

FINDINGS AND DISCUSSION

A total of 1,640 deliveries occurred in SJMCH during the study period i.e. October 2001 to 30 September 2002, of which, 969 were registered (58.5%) and 681 (41.5%) were unregistered deliveries. There were 98 reported still-births during this study period.

To obtain a clear understanding of the nutritional status of the mothers, relationship between maternal height and weight to birth weight of babies is shown in Table 1 and 2.

The findings show that mothers (105) who were less than 145 cms in height delivered LBW babies (86) in comparison to the mothers (854) with more than 145 cm height who had only 161 LBW babies (Table 1).

Using 145 cm as the cut off height for short stature, it was found that the height of the mothers showed a significant positive correlation with low birth weight (Chi-Square value: 194.4;p value: 0.000. Other Indian studies too had earlier reported similar results.

TABLE 1
CORRELATION BETWEEN MATERNAL HBGHT AND BIRTH WEIGHT

Maternal Height	Birth Weight		
	Normal Weight	Low Birth Weight	Total
<145 cm	19 (18.10) (2.67)	86 (81.90) (34.82)	105(100) (10.95)
>145 cm	693 (81.15) (9723)	161 (18.85) (100)	854 (100) (89.05)
Total	712(74.24) (100)	247(25.75) (100)	959 (100) (100)

Figures in parentheses are in percentage)

It was found that out of the total 959 women, *only* 186 women weighing more than 40 kg delivered low *birth weight babies* while there were 61 mothers less than 40 kg Weight delivered LBW *babies*. 77.6 per cent of the women weighing 40 kg or more had delivered normal *weight babies* compared to 52.7 per cent of the mothers weighing less than 40 kg [Table 2].

TABLE 2
CORRELATION BETWEEN PRE-PREGNANT MATERNAL WEIGHT AND BIRTH WEIGHT

Pre-pregnant Maternal Weight	Birth weight		
	Normal Weight	Low Birth Weight	Total
<40 kg.	68 (52.7) (9.6)	61(47.3) (24.7)	129(100) (13.5)
>40 kg.	644 (77.6)	186 (22.4) (75.3)	830(100) (86.5)
Total	712 (74.2) (100)	247(25.8) (100)	959(100) (100)

(Figures in parentheses are in *percentage*)

Table 2 shows a significant correlation between pre-pregnant maternal weight and the birth weight. These results are similar to the findings of Campbell et al. The use of BMI as a method of detecting mothers at the risk of delivering LBW babies has been advocated as a convenient index independent of age, parity and height in the study of the South-East Asia Region.

The BMI of the study group was calculated and compared with a "standard" group as described by Naidu et al.

It was observed that the nutritional status of the population of women attending antenatal clinics at SMCH is significantly better than that of the average Indian woman ($p < 0.01$). This may be due to the fact that this group represents a population of a higher socio-economic status than the average Indian woman. As per National Family Health Survey-2, the proportion of women with BMI below 18.5 was 35.8 per cent and the same in the study population was only 16.78 p cent.

TABLE 3
COMPARISON OF DATA ON BMI AND LBW
BETWEEN SJMCH, BANGALORE AND NIN,
HYDERABAD

Body Mass Index	Low Birth Weight	
	SJMCH	NIN
<16	9 (3.6%)	43 (7%)
16-16.9	8 (3.3%)	55 (9%)
17-18.4	27(10.9%)	165 (26.83%)
18.5-19.9	41 (16.6%)	153 (24.87%)
20-24.9	86 (34.8%)	189 (30.7%)
25 and above	76 (30.8%)	10(1.6%)
TOTAL	247(100%)	615(100%)

As can be seen from Table 3, the present study did not indicate any significant association between BMI of the mother and the birth weight. This was in contrast to the findings of the study from the National Institute of Nutrition. When the proportion of LBW in each of the categories of BMI was compared with similar groups in the NIN study, the distribution of LBW was found to be significantly different ($p < 0.01$).

This may be explained by the fact that improvement in nutritional status of a generation (for example in the group following immigration) is seldom reflected in birth weight improvements in the same generation. Barker and Fall have stated that the growth of babies in utero is constrained by the "foetal supply line" through which nutrients are transferred from mother to child. The performance of this "line" is strongly influenced by the mother's own development as a foetus. At least two generations are needed to pass before such restrictions to foetal supply by this factor is completely removed.

It is seen that maternal weight gain showed a significant correlation with the birth weight (Table 4). These results are similar to what has been reported by Deshmukh et al. Out of the 187 mothers who had gained more than 12 kg during pregnancy, 170 mothers (90.9%) delivered normal weight babies whereas only 17 (9.1%) had LBW babies. Similarly, mothers who had gained a weight of 6.5 to 12 kg during pregnancy, 75.1 per cent had normal weight babies and the remaining 24.9 per cent delivered LBW babies (Table 4).

TABLE 4
CORRELATION BETWEEN MATERNAL WEIGHT GAIN
DURING PREGNANCY AND BIRTH WEIGHT

Maternal Weight Gain	Birth Weight		
	Normal Weight	Low Birth Weight	Total
<6.5 kg	17(23.3) (2.4)	56 (76.7) (22.6)	73(100) (7.6)
6.5-12 kg	525 (75.1) (73.7)	174 (24.9) (70.5)	699(100) (72.9)
>12 kg	170 (90.9) (23.7)	17(9.1) (6.9)	187(100) 919.5)
Total	712(74.2) (100)	247 (25.8) (100)	959(100) (100)

Figures in parentheses are in percentage

The study shows that out of 731 mothers with normal weight deliveries, 82.63 per cent had a placental weight more than half kg and the remaining 17.37 per cent (127) less than half kg. A significant correlation (Table 5) between placental weighty and birth weight has been observed (Chi-Yates corrected 111.15; p:0.000). This is in agreement with the findings of a study by jaya et al carried out on 3,835 singleton babies in Kerala.

TABLE 5
CORRELATION BETWEEN PLACENTAL WEIGHT AND BIRTH WEIGHT

Placental Weight	Birth Weight		
	Normal	Low Birth Weight	Total
<500 gm	127 (51.42) (17.37)	120 (48.58) (52.63)	247(100) (25.76)
>500 gm	604 (84.83) (82.63)	108(15.17) (47.37)	712(100) (74.24)
Total	731 (76.23) (100)	228 (23.77) (100)	959 (100) (100)

(Figures in parentheses are in percentage)

The findings from Table 6 are similar to those reported by Pinheiro et al but contradict those studies which have established a significant relationship between anaemia and low birth weight. All the mothers included in the present study had regularly complied in taking the recommended doses of a minimum of 100 irom and folic acid tablets.

TABLE 6
CORRELATION OF HAEMOGLOBIN LEVELS OF MOTHERS AND BIRTH WEIGHT

Placental Weight	Birth Weight		
	Normal Weight	Low Birth Weight	Total
Hb<11gms/dl	317 (72.87) (44.53)	118(27.13) (47.77)	435(100) (45.36)
Hb>11 gms/dl	395 (75.38) (55.47)	129 (24.62) (52.23)	524(100) (54.64)
Total	712 (74.24) (100)	247 (25.76) (100)	959 (100) (100)

(Figures in parentheses are in percentage)

It is seen that 94.80 per cent (675) women with more than 259 days of gestqtional age had normal weight babies. Regression ananlysis on the daa presented in Table 7 shows a significant association between gestonial age and birth weight (r: 0.59, F- statistic: 521.72 and p<0.05). This relationship has been studied by many investigators and forms the basis of the curves used to create the WHO "universal" gestation specific growth charts.

TABLE 7
CORRELATION BETWEEN GESTATIONAL AGE (IN DAYS) AND
BIRTH WEIGHT

Gestational Age	Birth Weight		
	Normal Weight	Low Birth Weight	Total
Pre-term (<259 days)	37 (31.09) (5.20)	82 (68.91) (33.20)	119 (100) (12.41)
Term (>259 days)	675 (80.36) (94.80)	165(19.64) (66.80)	840 (100) (87.59)
Total	712(74.24) (100)	247 (25.76) (100)	959 (100) (100)

(Figures in parentheses are in percentage)

Table 8, unlike other studies, shows no significant correlation between parity of the mother and birth weights of the babies. A similar relationship was found by Mathai et al who reported that on an average, first born infants were weighed 130 gm lighter than later born babies.

TABLE 8
CORRELATION BETWEEN PARITY AND BIRTH WEIGHT

Parity	Birth Weight		
	Normal	Low Birth Weight	Total
PRIMI	402 (74.31) (56.46)	139 (25.69) (56.28)	541(100) (56.41)
MULTI	310(74.16) (43.54)	108(25.84) (43.72)	418(100) (43.59)
Total	712(74.24) 100	247 (25.76) (100)	959 (100) (100)

(Figures in parentheses are in percentage)

No significant association was found in the present study between the sex and birth weight of the live born infants. This is in contrast to the findings of Hirve et al who in his study of 129 live births in Pune, found that girls compared to boys had a higher chance of being LBW (RR=1.45). In the present study, out of total low birth weight babies (247), 121 (48.99%) were boys and almost equal proportion of them (51.01%) were girls. However, the proportion of normal weighed male babies was ten per cent higher than those of female babies (Table 9).

It is observed that with the increase in mother's age, the risk of delivering LBW babies also increases. While 22.6 per cent of the mothers less than 19 years had LBW babies, it was 25.3 per cent for the age group of 19 to 30 years and 30.5 per cent for mothers 30 years and above (Table 10).

TABLE 9
CORRELATION BETWEEN SEX OF THE BABY AND
BIRTH WEIGH

Sex of the Baby	Birth Weight		
	Normal	Low Birth Weight	Total
Female	321 (71.81) (45.08)	126 (28.19) (51.01)	447(100) (46.61)
Male	391 (76.37) (54.92)	121 (23.63) (48.99)	512(100) J53.39)
Total	712(74.24) (100)	247 (25.76) (100)	959(100) (100)

Figures in parentheses are in percentage)

Table 10 shows maternal age having no significant association with birth weight. This is in contrast to the findings of Mathai et al who found that maternal age was a factor affecting birth weight²³.

TABLE 10
CORRELATION BETWEEN MATERNAL AGE AND
BIRTH WEIGHT

Maternal Age Group	Birth Weight		
	Normal	Low Birth Weight	Total
<19 years	24 (77.4) (3.4)	7 (22.6) (2.8)	31 (100) (3.2)
19-30 years	622 (74.7) (87.4)	211(25.3) (65.4)	833(100) (86.9)
>30 years	66 (69.5) (9.2)	29 (30.5) (118)	95(100) (9.9)
Total	712(74.2) (100)	247 (25.8) (100)	959 (1.00) (100)

(Figures in parentheses are in percentage)

In terms of risk factors, the two important conditions that revealed a significant association with LBW were severe Pregnancy Induced Hypertension (PIH, Chi-Yates Corrected: 40.58; p=0.000) and Gestational Diabetes Mellitus (GDM, Fisher Exact Mailed p value: 0.045). The relationship to PIH has been documented by other authors too²⁴. 95 percent of the mothers with severe PIH had LBW babies. Interestingly, no mother with the risk of GDM had a LBW baby (Table 11).

Di-amniotic, di-chorionic placenta showed a significant association with LBW. 66.7 per cent of women with diamniotic, dichorionic placenta had LBW babies as in the case of twin pregnancy. 44,4 per cent of women with placenta praevia had also LBW babies (Table 12). It is known that each twin and its placenta normally weigh less than the neonate and placenta of a singleton pregnancy²⁵.

TABLE 11
CORRELATION BETWEEN PLACENTAL RISK FACTORS
AND BIRTH WEIGHT

Maternal Risk Factor	Birth Weight		
	Normal	Low Birth Weight	Total
Severe PIH	1(5) (0.2)	19(95) (9.5)	20(100) (2.7)
GDM	10(100) (1.9)	0(0) (0)	10(100) (1.4)
Previous LSCS	21 (84) (3.97)	4(16) (1.99)	25 (100) (3.43)
Mild PIH	41 (78.9) (7.75)	11 (21.1) (5.47)	52(100) (7.12)
No Risk Factor	456 (73.5) (86.2)	167 (26.8) (831)	623(100) (85.34)
Total	529 (72.5) (100)	201 (27.5) (100)	730 (100) (100)

(PIH - Pregnancy Induced Hypertension, GDM - Gestational Diabetes Mellitus; LSCS-Lower Segment Caesarean Section; Figures in parentheses are in percentage)

TABLE 12
CORRELATION BETWEEN PLACENTAL RISK FACTORS AND BIRTH WEIGHT

Placental Risk Factors	Birth Weight		
	Normal	Low Birth Weight	Total
Placenta Praevia	5 (55.6) (0.7)	4 (44.4) (1.6)	9(100) (0.9)
Diamniotic, Dichorionic	6 (33.3) (0.8)	12(66.7) (4.9)	18(100) (1.9)
Abruptio placenta	4(80) (0.6)	1(20) (0.4)	5(100) (0.5)
Cord Abnormalities	5(100) (0.7)	0(0) (0)	5(100) (0.5)
No Risk Factor	691 (75.4) (97.1)	335 (24.6) (91.1)	916(100) (95.5)
Total	712(74.2) (100)	247 (25.8) (100)	959 (100) (100)

(Figures in parentheses are in percentage)

Foetal distress (FD) and Intra Uterine Growth Retardation (IUGR) were significantly associated with the birth weight of the live born infant. This is expected, as pregnancies associated with IUGR result in a small foetus, placenta and oligohydramnios²⁶. All the mothers with the risk of FD and IUGR had no chance of delivering a normal weight baby and only 12.5 per cent of the mothers with the risk of IUGR only had delivered normal weight babies in the present study (Table 13).

TABLE 13
CORRELATION BETWEEN FOETAL RISK FACTORS AND BIRTH WEIGHT

Foetal Risk Factor	Birth Weight		
	Normal	Low Birth Weight	Total
IUGR	3(12.5) (0.4)	21 (87.5) (8.5)	24(100) (2.5)
Foetal Distress (FD) and IUGR	0(0) (0)	6(100) (2.4)	6(100) (0.6)
No Risk Factor	709 (76.3) (99.6)	220 (23.7) (89.1)	929(100) (96.9)
Total	712(74.2) (100)	247 (25.8) (100)	959 (100) (100)

(IUGR: Intra Uterine Growth Retardation; FD: Foetal Diseases, Figures in parentheses are in percentage)

CONCLUSION

It is increasingly clear that maternal nutrition plays a crucial role in the development of the foetus. While low birth weight remains an area of great concern in developing countries, it is hoped that with programmes targeted at improving maternal nutrition through dietary and iron supplementation, this magnitude of the problem will slowly decrease. Secular changes have already been noticed with birth weights improving by 74 gm over a period of 27 years. As mentioned earlier, the BMI of the study population appears to reflect the nutritional levels of a higher socio-economic group similar to those of an immigrant population exposed to westernised diets with high energy intake and sedentary lifestyle. However, this has not resulted in the expected decrease in LBW, probably because of the fact that at least two generations are needed to pass before perceptible alterations in the "foetal supply line" occur. Another area of concern is that improved nutrition, by itself may not bring about an increase in mother's height and muscularity as poor hygiene and resultant frequent infections continue. Thus, the "nutrition transition" will translate into stunted children who are fat. This transition between chronic malnutrition and "Western/Indian Urban" nutrition would bring about imbalances in growth and nutrition through different developmental stages of life. During pregnancy, this would give rise to mothers termed as "short fat women" who are expected to provide sub-optimal intrauterine environments with raised blood glucose levels resulting in fat and 'macrosomic' babies exhibiting an increased risk of developing Type 2 diabetes and coronary heart disease in later years. Similarly, retarded foetal growth followed by accelerated or "catch up" growth after birth will be associated with heart disease in later life.

While the phenomenon of "nutrition transition" currently being encountered among urban populations is an encouraging indication of better availability and accessibility to food, the obvious advantages of this must be considered in the light of convincing proof that this might have long term negative effects on the health of offsprings in the present as well as future generations.

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**EXPOSURE TO MASS MEDIA AND ITS IMPACT ON THE USE
OF FAMILY PLANNING METHODS BY WOMEN IN GOA**

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ABSTRACT

The impact of women's exposure to television, radio and newspapers and its influence on their use of family planning methods was analysed from the data collected from 250 married women in the age group 15-45 years in a northern Goa district. The study revealed that the current use of family planning practice by women was 48.4 percent. The use of family planning methods was found to be positively correlated with women's exposure to information on family planning methods in television, radio or newspapers. The multivariate logistic regression analysis subsequently established that this association was independent of women's education, place of residence and number of living children.

Keywords: Exposure to mass media, Family planning methods, Awareness by women.

The government of India had initiated the National Family Planning Programme in 1952 with the sole objective of reducing the birth rate to the extent necessary for stabilization of population at a level consistent with the growth of the national economy. The programme was renamed as Family Welfare Programme in 1977 and Reproductive and Child Health (RCH) programme in 1997¹. The important objectives of this programme are to provide contraceptives services and reproductive health care for women and child.

Though the family planning programme was not successful in reducing the birth rate during the last fifty years, it has succeeded in generating an universal knowledge about family planning methods among the masses. But even with high awareness on family planning methods, there exists a wide gap between the knowledge and practice of these methods. There are different communication strategies used to motivate the couples in order to support behavioural practices for family planning methods at home. The important communication channels used for dissemination of the RCH programme are television, radio and newspapers. The present study was undertaken to find out the impact of exposure of these channels on the use of family planning methods by the married women in a northern district of Goa.

MATERIALS AND METHOD

A pre-designed and tested questionnaire was used to collect data from married non-

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pregnant women aged 15-45 years in a Northern Goa District. The samples were selected using a two-stage stratified random sampling method. In the first stage, 20 rural blocks and 5 urban blocks were selected and in the second stage, 10 married non-pregnant women aged 15-45 years were selected from each of the first stage units. Thus, a sample size of 250 married women was included in the present study. The exposure to mass media by women was assessed by asking the question whether they watched television, listened to radio or read newspapers articles on family planning at least once a week for a period of one year preceding the study. The dependent variable on the use of family planning practices was defined as the "currently married women or her husband using any contraceptive method".

The data were analyzed using chi-square and odds ratio (OR) test. The multivariate logistic regression analysis was used to study the effect of socio-demographic variables for women's exposure to mass media in the use of family planning methods.

FINDINGS AND DISCUSSION

The background characteristics of the women are shown in the Table 1. Approximately 35 percent of women in the 25-30, 28.8 percent in the 30-35 and 17.6 percent were in the 35-45 year age group. 20.0 percent of women were urban residents. Hindus comprised 66.4 percent of the subjects and 26.4 percent were Christians. While 13.2 percent were illiterates, 11.6 percent had education up to primary level (I to IV standard), 22 percent had schooling up to secondary level (V to IX standard) and 53.2 percent had completed Secondary School Certificate (SSC) and above. It was also observed that 79.2 percent of women had access to television, 46.8 percent to radio and 46.3 percent to newspapers.

The use of family planning practice was found to be 48.4 percent. Table 2 shows the association between the use of family planning methods and exposure to television by women. The use of family planning method was 54.4 percent among the women exposed to television programmes on family planning methods. The practice of family planning methods was significantly higher among the women who were exposed to television. The odds ratio analysis indicates that the married women who were exposed to family planning messages in television were 2.44 times more likely to use the family planning methods compared to the women who were not exposed to these programmes.

Table 3 shows the association between exposure to radio and the use of family planning methods by women. The use of family planning was 12.7 percent more among women exposed to radio than those not exposed. Women who were exposed to radio broadcasting messages on family planning methods were 1.66 times more likely to use the family planning methods than those not exposed to this medium.

TABLE 1
BACKGROUND CHARACTERISTICS
OF WOMEN

Age Group (Year)	Number	Percent
15-19	9	3.6
20-24	38	15.2
25-30	87	34.8
30-34	72	28.8
35-45	44	17.6
Place of residence		
Urban	50	20.0
Rural	200	80.0
Education Level		
Illiterate	33	13.2
Primary	29	11.6
Secondary	55	22.0
SSC and above	121	53.2
Access to mass media		
Television	198	79.2
Radio	117	46.8
Newspaper	114	46.3
Total	250	100.0

TABLE 2
CORRELATION BETWEEN EXPOSURE TO TELEVISION AND USE OF FAMILY
PLANNING METHODS BY WOMEN

Exposed to television	Use of family planning methods		No use of family planning methods		Total	
	Number	Percent	Number	Percent	Number	Percent
Seen messages about family planning	98	54.4	82	45.6	180	100.0
Not seen messages about family planning	23	32.9	47	67.1	47	100.0
Total	121	48.4	129	51.6	250	100.0

($X^2 = 9.40$, degrees of freedom =1, PO.01, Highly significant. O.R.= 2.44)

TABLE 3
CORRELATION BETWEEN EXPOSURE TO RADIO AND USE OF FAMILY
PLANNING METHODS BY WOMEN

Exposed to radio	Use of family planning methods		No use of family planning methods		Total	
	Number	Percent	Number	Percent	Number	Percent
Listened to messages about family planning	57	55.9	45	44.1	102	100.0
Not listened to messages about family planning	64	43.2	84	56.8	148	100.0
Total	121	48.4	129	51.6	250	100.0

($\chi^2 = 3.86$, degrees of freedom =1, $P < 0.05$, Significant. O.R= 1.66)

The association between the exposure to newspapers and the use of family planning methods by women is presented in Table 4. The use of family planning methods was 1.96 times more among women reading newspapers carrying family planning messages than those who were not exposed.

TABLE 4
CORRELATION BETWEEN EXPOSURE TO NEWSPAPER AND USE OF
FAMILY PLANNING METHODS BY WOMEN

Exposed to Newspaper	Use of family planning methods		No use of family planning methods		Total	
	Number	Percent	Number	Percent	Number	Percent
Read messages about family planning	61	58.1	44	41.9	105	100.0
Not read messages about family planning	60	41.4	85	58.6	145	100.0
Total	121	48.4	129	51.6	250	100.0

($\chi^2 = 6.84$, degrees of freedom =1, $P < 0.01$, Highly significant. O.R = 1.96)

Table 5 shows results of logistic regression analysis indicating odds ratio for the use of family planning. Other variables such as women's education, place of residence and number of living children, factors which have significant influence on women's exposure to mass media were considered as constant.

The analysis clearly established that exposure by women to television or newspaper significantly increased their use of family planning methods irrespective of their education, place of residence and number of living children. The women exposed to family planning messages in television were 2.14 times more likely to practice family planning methods than those unexposed. The women exposed to newspapers carrying family planning messages were two times more likely to practice family planning compared to those who were not exposed.

TABLE 5
THE ODDS RATIO ANALYSIS OF THE USE OF FAMILY
PLANNING METHODS

Variables	Odds ratio	P-Value
Exposure to Television		
No (Ref)	1	
Yes	2.14	P<0.05*
Exposure to Radio		
No (Ref)	1	
Yes	1.13	P>0.05 NS
Exposure to NewsDaDer		
No (Ref)	1	
Yes	2.01	P<0.05*
Women's education		
Illiterate (Ref)	1	
Primary	2.05	P>0.05 NS
Secondary	0.32	P<0.05*
S.S.C.and above	1.17	P>0.05 NS
Place of residence		
Rural (Ref)	1	
Urban	0.74	P>0.05 NS
No. of living children	2.15	P<0.05*

*- Indicates significant at 5 percent of level of significance) NS- Not significant. Ref indicates Reference group.

The National Family Health Survey 2 (N.F.H.S. II, 1997) reported that use of family planning methods in Goa was 47.5 percent. Ever use of family planning methods by women was as high as 74.4 percent who were exposed to family planning messages in television, 46.5 percent to radio and 42.5 percent who read messages in family planning in news papers. The figures were not very much different than those obtained in the present study.

The John Hopkins Centre for Communication Programme (1999) evaluated the impact of television drama in Bangladesh. The evaluation of the programme revealed that current use of family planning was 52.8 percent among women exposed to television drama on family planning messages, while the current use of family planning was 38.4 percent among those who did not watch television.

Westoff Charles and Rodriguez German (1995) in their study conducted in Kenya observed that use of family planning methods among married women aged 15-49 years exposed messages from radio on family planning was 26.0 percent compared to 14.3 percent in women who were not exposed.

Kiragu Karungari (1996) in Uganda reported that 44.5 percent women who received messages on family planning in radio used any of the family planning methods compared to percent women who were not exposed. The use of family planning method by women was significantly higher in those who were exposed to newspapers carrying information on family

planning. Similarly, 48.6 percent among women exposed to information on family planning in newspapers used any of the family planning methods compared to 38.4 percent who were not exposed.

CONCLUSION

The present study was to find out the impact of electronic and print media namely television, radio and news paper on the use of family planning methods by women in Goa. The exposure to television, radio and newspaper was found positively associated with use of family planning methods. The multivariate analysis also confirmed that exposure to television and newspapers on family planning message significantly increased the use of family planning methods by women in the study population. The implication derived from the present study is that the electronic and print media which would further enhance the acceptability of presently available family planning methods.

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