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ASSOCIATIONSHIP AND GAP BETWEEN KNOWLEDGE AND PRACTICE ON MATERNAL HEALTH AMONG PREGNANT WOMEN

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ABSTRACT

The present study carried out at purposively selected Diamond Harbour-1 block of South 24 Parganas District, West Bengal. One Sub Centre (SC) was selected from one Gram Panchayat (GP) which is situated beside GPs. Total eight SCs was selected for selection of respondents. Total 121 no. of respondents comprised of all the reproductive age group of 18-45 yrs women was selected. There was one condition for selection of pregnant women who were registered during January month of the year of 2013 on eight SCs and availed of the services from the same sub-centre throughout their pregnancy period to post partum period. Data was collected during month of January to December 2013 to assess the knowledge and practice among women on maternal health services for factors associated with Antenatal Care (ANC), Intranatal Care (INC) and Postnatal Care (PNC). The study revealed that women's health knowledge and practice has significant difference on that issues like 2 hrs rest in day and use of iodised salt during pregnancy, institutional delivery, home delivery conducted by trained personnel, rupees one thousand is provided from hospital after delivery, 3 times post natal health check up, colostrum feeding, exclusive breast feeding, 8 hrs rest in night time, food given for 6 months after delivery, need of family planning method, use of oral pill method, use of condom method, methods provided from SC, birth spacing.

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INTRODUCTION

As per World Health Organization, maternal health refers to the health of women during pregnancy, childbirth and the postpartum period. While motherhood is positive experience and expresses normal physiological state, too many women suffers during this phase from morbidity and mortality. Every pregnancy is associated with certain risk to life and health of mother and child. Morbidities related to pregnancy are diverse like fever, anemia, incontinence, weakness, depression which goes uncounted. Most maternal death occurs during delivery due to unpreparedness for childbirth and managing complications, which results in delivery by the mother itself or untrained attendant. These maternal deaths are unjust and avoidable if preventive measures are taken on time like ensuring antenatal care to all mothers, delivery by skilled birth attendant and timely referral to hospital. As in most rural and tribal areas, delivery takes place at home, far from emergency

obstetric services or without access to skilled attendant, there is more risk associated with mother and child life. Pregnancy and giving birth to a child are normal physiological process, but the circumstances both internal and external, in which the child is conceived and born, affect the life of mother and child. Every pregnancy is associated with certain amount of unpredictability of risk of complication. Socio-cultural beliefs and lack of awareness in mothers and family members on how to recognize danger signs and symptoms, where to go when complication occurs, results in delay in seeking care and unprepared families waste time in recognizing problem, getting organized, getting money, finding transport and reaching the appropriate referral facility. Maternal and Child Health Services (MCH) are the promotive, preventive, curative, rehabilitative health care directed to mother and children in the form of service programmes. In India women in reproductive age (18-45 years) and children below 5 years of age comprise 60% of the total population. Mother and children constitute a vulnerable section of population is more in rural environment. Naturally they need special health care attention. Hence the health services directed to women and children are

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given priority by government of India. The fact that more than 11 lakh women in India are estimated to die every year from pregnancy and child birth related causes due to inadequate knowledge of MCH services and illiteracy, poverty, population density, etc. The overall efforts of maternal & child health professionals involves practicing MCH to provide health care service based on most recent scientific research to assess & identify MCH problems and planned interventions. In this context, an attempt was taken to study the Association ship and Gap between Knowledge and Practice on health among pregnant women.

MATERIALS AND METHODS

Diamond Harbour-1 block of South 24 parganas district in West Bengal was purposively selected for the study. There are eight Gram Panchayets and 17 Sub Centres (SCs) in block. One Sub Centre was chosen within one Gram Panchayet. So 8 SCs, out of 17 SCs were selected for study. For research study, Sub Centre was selected as a sampling unit as sub centre is the peripheral outpost of existing health delivery system in rural area and provides all the primary health care services related to Maternal and Child Health. Data was collected from those respondents who were registered in SC in month of January 2013 for accessing maternity services and availing services throughout the factors associated with it during pregnancy, care of delivery and post partum period. Total 121 no. of respondents were selected. Quantitative and qualitative data collection method was carried out during January, 2013 to December 2013.

RESULTS AND DISCUSSIONS

The percentages analysis between women's health knowledge and practice during ANC, INC and PNC stages were calculated and results are showed below tables. Table 1 depicted that the majority of 115 (95%) women knew urine test is done for pregnancy test. Only 6(5.0%) did not know about this. Whereas the majority 117 (96.7%) no. of respondents confirmed their pregnancy test with urine test and only 4 (3.3%) did not use urine test kits for pregnancy conformation. Study revealed that 69 (57%) respondents knew for registering their name to SC within 3-4 months after conceive and rest 52 (43%) respondents did not know that the name are registered to SC within 3-4 months. The majority 69(57%) respondents got registered their name within 3 to 4 month of pregnancy and 52 (43%) respondent did not. *Srivastava et al. (2014)* have seen the same result where as *Singh et al. (2012)*, *Araya (2013)* did not observe the same. It is found that only 46 (38%) women knew that at least four time health check up is to be done during pregnancy period and rest of the maximum respondents 75 (62%) did not know on this issued. *Eram et al. (2016)* has seen almost same result. This study showed that almost 100 (82.6%) respondents did health check up in four times during pregnancy period in SC and only 21(17.4%) mothers did not. *Jha et al. (2010)* have observed the same result but *Laishram et al. (2013)* found different. Study showed that maximum 82(67.8%) women had knowledge on two doses of Tetanus Toxide (TT) injections are given maintaining gap one month in between two injections during pregnancy period and 39 (32.2%) women had no knowledge about it. The majority of 115(95%) women were took two doses tetanus toxide (TT) injection within gapping on one month. Only 6 (5%) women did not take injection timely. *Agarwal et al. (2007)* found almost same result. During period,

about 71(58.7%) no of respondents knew that 100 Iron and Folic Acid (IFA) tablets are provided from SC to pregnant mother where this issues were unknown to 50 (41.3%) pregnant women. *Agarwal et al. (2007)* reported almost same findings. Whereas 84 (69.4%) informants were received 100 IFA tablets from Centre. And 37 (30.4%) did not receive 100 IFA tablets. Only 65(53.4%) pregnant women knew the importance of the consumed 100 IFA tablets for ANC to prevent anaemia where 56 (46.3%) respondents did not know its importance. *Eram et al. (2016)* has seen almost same result. And 60 (49.6%) respondents consumed 100 tablets in daily after conceive. And 61 (50.4%) women did not consume 100 tablets. *Jha et al.(2010)* pointed out the maximum no. of mothers received and least no. of mothers consumed 100 IFA tablets during the entire period of pregnancy. It is showed that during pregnancy, extra amount of food must be taken to pregnant women, this information was known to maximum no. of 118 (97.5%) respondents and only 3 (2.5%) women did not know it. Majority of respondents 112 (92.6%) were more concerned on extra dietary food and took during pregnancy period.

During ANC period, a pregnant women must need take rest 2 hrs in day and 8 hrs in Night, this knowledge had among 52 (43 %) and 54(44.6%) respondents and did not have among 28(23.1%) and 6(5.0%) respectively. It showed about 93 (76.9%) informants took 2 hrs rest in Day and 115 (95%) 8 hrs in night during pregnancy. Study showed that less no. of respondents 47 (38.8%) knew about use of iodised salt during pregnancy period and 74 (61.2%) did not know it. But maximum 80 (66.1%) respondents used iodised salt in their food and rest of respondents 41 (33.9%) did not use iodised salt. During pregnancy period nutritious food is provided from AWC, this information was known to 115 (95.0%) respondents and unknown to 6 (5.0%) respondents respectively. Again it is also observed that 109 (90.1%) respondents took nutritious food which is provided from Anganwadi centre (AWC) before delivery after registering name of Sub centre. Almost 109 (90.0%) women knew that during pregnancy period medicine is to be taken which is prescribed by doctor and this information was unknown to 12(9.9%) respondents where as 73 (60.3%) respondents were took medicine which was prescribed by doctors in emergency basis during pregnancy. It is seen from table -2 that out of 121 respondents, only 38 (31.4 %) respondents knew about Matri Zan facility and 83 (68.6%) did not know it. only 25 (20.7%) women used the Matri Zan facility at time of delivery and maximum 96 (79.3%) women did not use this as they reported that Matri Zan was not available on delivery time. Most of the respondent 90 (74.4%) had knowledge on importance of institutional delivery due to safe life and save baby and 31(25.6 %) respondent had no knowledge on it. *Angadi et al. (2013)* have seen a high proportion of preference for institutional delivery among pregnant women. Majority 87 (71.9%) women went to hospital for delivery (Govt or Private) and home delivery was occurred by 34 (28.1%) women. *Jha et al.(2010)*, *Pandey and singh (2015)* observed same result. But *Kanu et al. (2014)* reported less no. of women's deliveries occurred in health institution. Almost 91 (75.2%) mother thought that home delivery must be conducted by trained personnel and 30 (24.8%) mother did not. Here showed that in case of home delivery, almost 34 (28.1%) women had been supervised delivery by trained personnel in home delivery among 34(24.8%) respondents and followed five clean measures.

Table 1. Percentage of women's health Knowledge and Practice during ANC

Sl. No	Items	Knowledge (N=121)				Practice (N=121)			
		Yes		No		Yes		No	
		Fr	%	Fr	%	Fr	%	Fr	%
1	Urine test for pregnancy	115	95.0	6	95.0	117	96.7	4	3.3
2	Registration done 3- 4 months	69	57.0	52	43.0	101	83.5	20	16.5
3	Four times health check up	46	38.0	75	62.0	100	82.6	21	17.4
4	Dose of TT injection timely	82	67.8	39	32.2	115	95	6	5.0
5	IFA tablets provided From SC	71	58.7	50	41.3	84	69.4	37	30.4
6	Consumed 100 IFA tablets	65	53.7	56	46.3	60	49.6	61	50.4
7	Extra amount of food taken	118	97.5	3	2.5	112	92.6	9	7.4
8	2 hours rest in day time	52	43.0	69	57.0	93	76.9	28	23.1
9	8 hours rest in night time	54	44.6	67	55.4	115	95	6	5.0
10	Iodised salt used in food	47	38.8	74	61.2	80	66.1	41	33.9
11	Nutritious food provided from AWC	115	95.0	6	5.0	109	90.1	12	9.9
12	Medicine prescribed by doctor	109	90.0	12	9.9	73	60.3	48	9.7

Table 2. Percentage of women's health Knowledge and Practice during INC

Sl.No	Items	Knowledge (N=121)				Practice (N=121)			
		Yes		No		Yes		No	
		Fr	%	Fr	%	Fr	%	Fr	%
1	Matri Zan facility	38	31.4	83	68.6	25	20.7	96	79.3
2	Institutional delivery	90	74.4	31	25.6	87	71.9	34	87.0
3	Home delivery by Trained personnel	91	75.2	30	24.8	34	87.0	87	71.9
4	Rs. 500/- given from SC	66	54.5	55	45.5	16	13.2	105	86.8
5	Rs. 1000/- given from hospital	72	59.5	49	40.5	41	33.9	80	66.1

Table 3. Percentages of women's health Knowledge and Practice during PNC

Sl. No	Items	Knowledge (N=121)				Practice (N=121)			
		Yes		No		Yes		No	
		Fr	%	Fr	%	Fr	%	Fr	%
1	3 times health check up	73	60.3	48	39.7	101	83.5	20	16.5
2	Colostrum feeding	32	26.4	89	73.6	60	49.6	61	50.4
3	Exclusive breast feeding	82	67.8	39	32.2	72	59.5	49	40.5
4	2 hours rest in day time	94	77.7	27	22.3	103	85.1	18	14.9
5	8 hours rest in night time	22	18.2	99	81.8	79	65.3	42	34.7
6	Extra amount of food taken	109	90.1	12	9.9	117	96.7	4	3.3
7	Food provided from AWC for 6 months after delivery	72	59.5	49	40.5	81	66.9	40	33.1
8	Need of Family Planning method	115	95.0	6	5.0	92	76.0	29	24.0
9	Oral pill method	116	95.9	5	4.1	92	76.0	29	24.0
10	Condom method	57	47.1	64	52.9	16	13.2	105	86.8
11	Methods provided from SC	50	41.3	71	58.7	41	33.9	80	66.1
12	Birth spacing	56	46.3	65	46.5	57	47.1	64	52.9

Under scheme of Janany Surakha Yojana, 66(54.5%) mothers knew Rs 500/- as subsidy is provided from SC after delivery and 55(45.5%) mother did not know. Most of the respondent 72 (59.5%) had knowledge about subsidy is given from hospital but 49(40.5%) did not know about it. Only 16 (13.2%) women were followed the procedure for giving money from Sub centre and all of them were received rupees five hundred from SC. Again for getting the money from hospital after delivery 41 (33.9%) mothers were followed the procedure and all of them took rupees one thousand from hospital. Rest of 80 (66.1%) women did not get the money as they did not maintain the process as per entitlement of Scheme. It is evident from the table -3 that majority of women 73(60.3%) knew three times health check up is needed and 48(39.7%) did not know about it during post natal care. It is seen that majority of 101 (83.5%) respondents practiced on post natal health check up at three times and 20(16.5%) women did not it. Tesfahun *et al.* (2014) found almost same. The item was importance of colostrums feeding is done within 1 hours after delivery, this information was unknown to maximum 89 (73.6%) women and 32(26.4%) women knew it. 60 (49.6%) lactating mothers fed colostrums within 1 hr and 61(50.4%) did not follow the colostrums feeding within time.

Deepti *et al.* (2010) observed almost same results. It is seen that the issue was exclusive breast feeding is done up to 6 month after delivery 82(67.8%) women knew about it and 39(32.2%) mothers did not know about it. Almost 72 (59.5%) mothers fed breast milk exclusive on 6 month after delivery where 49(40.5%) mother did not follow this good practice. Chatman (2005) found that majority of mothers initiated breast feeding but it practiced minimizing at last 6 months. During post natal period, Maximum 94 (77.7%) mothers had knowledge about 2 hours rest need in day time and 27 (22.3%) had no knowledge on this item. Correspondingly in night time 8 hours rest is needed, this was unknown to 99(91.8%) and known to 22(18.2%) mothers. 103 (85.1%) and 79 (65.3%) women practiced the good behaviour as 2 hours rest in day time and 8 hours rest in night time where did not follow this practice in day time by 18(14.9%) and night time by 42(34.7%) women respectively. (59.5%) mothers fed breast milk exclusive on 6 month after delivery where 49(40.5%) mother did not follow this good practice. Chatman (2005) found that majority of mothers initiated breast feeding but it practiced minimizing at last 6 months. During post natal period, Maximum 94 (77.7%) mothers had knowledge about 2 hours rest need in day time and 27 (22.3%) had no knowledge on this item.

Table 4. Relationship between Women's Health Knowledge and Practice During ANC

Sl. No	Items	Chi-square (χ^2)	Asymp. Sig. (2-sided) (p)
1	Urine test for pregnancy	.216	.642
2	Registration done 3- 4 months	.482	.487
3	Four times health check up	.994	.319
4	Taken TT injection timely	.004	.953
5	IFA tablets provided From SC	.841	.359
6	Consumed 100 IFA tablets	1.175	.278
7	Extra amount of food	.247	.619
8	2 hours rest in day time	4.803 *	.031*
9	8 hours rest in night time	1.997	.158
10	Iodise salt used in food	18.537 *	.000*
11	Nutritious food provided from AWC	.322	.570
12	Medicine prescribed by doctor	.223	.636

Note: Significance level: * p < 0.05, df-1

Table 5. Relationship between Women's Health Knowledge and Practice during INC

Sl. No	Items	Chi-square (χ^2)	Asymp. Sig. (2-sided) (p)
1	Matri Zan facility	2.320	.128
2	Institutional delivery	18.523 *	.000*
3	Home delivery by Trained personnel	5.247 *	.022*
4	Rs. 500/- given from SC	.154	.695
5	Rs. 1000/- given from hospital	4.807*	.028*

Note: Significance level: * p < 0.05, df-1

Table 6. Relationship between Women's Health Knowledge and Practice during PNC

Sl. No	Items	Chi-square (χ^2)	Asymp. Sig. (2-sided) (p)
1	3 times health check up	3.873*	.049*
2	Colostrum feeding	8.645*	.003*
3	Exclusive breast feeding	23.396*	.000*
4	2 hours rest in day time	1.481	.224
5	8 hours rest in night time	5.270*	.022*
6	Taken extra amount of food	.455	.500
7	Food provided from AWC for 6 months after delivery	21.586*	.000*
8	Needed follow Family Planning	20.028*	.000*
9	Oral pill method	16.546*	.000*
10	Condom method	20.702*	.000*
11	methods provided from SC	44.269*	.000*
12	Birth spacing	24.748*	.000*

Note: Significance level: * p < 0.05, df-1

Correspondingly in night time 8 hours rest is needed, this was unknown to 99(91.8%) and known to 22(18.2%) mothers. 103 (85.1%) and 79 (65.3%) women practiced the good behaviour as 2 hours rest in day time and 8 hours rest in night time where did not follow this practice in day time by 18(14.9%) and night time by 42(34.7%) women respectively. knowledge and unawareness maximum no 80 (66.1%) respondents did not take any methods from SC. Almost 56 (46.3%) women knew regarding birth spacing and 65(53.7%) did not know it. But Eram et al. (2016) found some different as the most of respondents knew about birth spacing. Where as birth spacing were maintained and not maintained by 57(47.1%) women and 64(52.9%) women respectively. Next chi-square test was calculated for analysis the difference between knowledge and practice among women on issues of maternal health services during ANC, INC and PNC stages and result showed in table 4, 5 & 6 as below. Data revealed that during ANC period knowledge and practice among women has significant association with 2 hrs rest in day time and iodised salt used in food. It is observed from table 5 during INC period knowledge and practice among women has significant association with institutional delivery, home delivery by trained personnel and Rs. 1000/- is given from hospital. It is seen during PNC period knowledge and practice has significant association with 3 times health check up, colostrums feeding, exclusive breast feeding, 8 hrs rest in night time, food given for 6 month after

delivery, needed follow of family planning, used of oral pill method, condom method, provided from SC and birth spacing respectively.

Conclusion

From the above study it can be concluded that majority of respondents knew the importance of four times health check up and they did health check up during pregnancy due to self awareness and concerns. Less no. of mothers did not pregnancy test with help of urine test kits as because they did not expose to non family members in sprite of high knowledge on it. Maximum women received IFA tablets during Pregnancy but feeling bad after eating it, so they avoid it. High knowledge was among respondents on importance of institutional delivery due to safe life and save baby though few women gave birth at home because they feel shy and embarrassed to be assisted by male doctors or miss behave of nurses during labour period. Most of the women knew about the scheme of Janani Suraksha Yojana (JSY) and did not access the subsidy which is given from sub centre and Govt. hospital due to unavailability of mother's identity proof documents with unopened individual bank a/c after delivery. Maximum no. of women knew about three times health check up is needed during post natal period and they followed this practice due to accessible of more information by health

service provider and lactating mother were more concern on it. It is seen that high knowledge on exclusive breast feeding but low practice due to unawareness and unconcern. Regarding the usage of family planning methods, an important dimension is the type of contraception used during PNC period. Oral pill was the most common chosen method used by maximum couples than compared to other (condom, copper-T, tubectomy, vasectomy) contraceptive method. Knowledge level was low among women providing contraceptive method from sub centre in free of cost. Study revealed that health knowledge and practice among women has significant association on 2 hrs rest in day time and iodised salt used in food during ANC. It was observed during INC period knowledge and practice among women has significant association with institutional delivery, home delivery by trained personnel, and Rs. 1000/- is given from hospital. During PNC period knowledge and practice has significant association with 3 times health check up, colostrums feeding, exclusive breast feeding, 8 hrs rest in night time, food given for six months after delivery, needed follow family planning, use of oral pill method, condom method, provided from SC, birth spacing respectively. Overall, continuous & complete health education by means of BCC activities and strengthening health services will help in increasing the knowledge & thereby practices regarding maternal health among women as well as community.

REFERENCES

- Agarwal, P., Singh, M. M. and Garg, S. 2007. 'Maternal health-care utilization among women in an urban slum in Delhi' *Indian Journal of Community Medicine* 32(3)pp.203-205.
- Angadi, M.M., Hiremath, B.R. and Sorganvi, V. 2013. 'A study on factors influencing selection of place of delivery among pregnant women in urban slums of Bijapur city, Karnataka' *Al Ameen J Med Sc.* 6(2) pp.189-192
- Brahmbhatt, MM, Sheth, JK. and Balaramanamma, DV. 2013. 'A study of knowledge, attitude & practice towards contraception among married women of reproductive age group having ≤ 2 children residing in Vasna ward, Ahmedabad, Gujarat, India' *Healthline, Journal of Indian Association of Preventive and Social Medicine* 4 (2)pp.8-12 .
- Browne, E.N., Marty, J.O., Djan, J.O., Twum, S. and Opoku, S.A. 1995. 'Utilization of Maternal Health services in Ejisu district, Ghana' *West Afr J Med.* 14(1)pp. 24-28.
- Deepti, S., Garq, R. Padma, A. and Singh, T. (2010) Breast feed Med. www.pubMed.NCBI 5(6) pp.303- 307
- Eram, U., Anees, A., Tamanna, Z. 2016. 'Knowledge Regarding Antenatal Care Services in Mothers (15-49 Years) in Rural Areas of Aligarh' *International Journal of Scientific Study* 4(9)pp.66-69
- Indian Public Health Standards (IPHS) FOR Sub-centres 2007. Directorate General of Health Services, Ministry of Health & Family Welfare, Government of India.
- Jha, R. K., Gopalakrishnan, S., Ajitha, K., Kuberan, D., Manishkumar, M. and Makade, K. 2010. 'Utilization of Maternal Health care Services in Kancheepuram District, Tamil Nadu' *Indian Journal of Maternal And Child Health*, 12 (4)pp.1-7.
- Kanu, JS. , Tang, Y. and Liu, Y. 2014. 'Assessment on the Knowledge and Reported Practices of Women on Maternal and Child Health in Rural Sierra Leone: A Cross-Sectional Survey. PLoS ONE 9(8)
- Laishram, J., Thounaojam, D U., Panmei, J., Mukhia, S. and Sanayaima, H. 2013. Knowledge and Practice of Antenatal Care in an Urban Area, *Indian Medical Gazette*
- Lim, SS., Dandona, L., Hoisington, AJ., James, LS., Hogan, CM. And Gakidou, E. 2010. 'India's Janani Suraksha Yojana, a conditional cash transfer programme to increase births in health facilities: an impact evaluation' *Lancet.* 375 pp. 2009-2023.
- Pandey, K.K. and Singh, D. R. 2015. 'Importance of Socio-Demographic Factors on Utilization of Maternal Health Care Services in India' *J. Stat. Appl. Pro.* 4(3) pp. 447-457.
- Park K. 2007 'Preventive and Social medicine' Jabalapur: Banasidas Bhanot Publishers: 20th Edn. pp. 448-449
- Sood, A. & Sood, N. 2015. 'A study of knowledge, attitude & practice towards contraception among married women of reproductive age group having ≤ 2 children residing in rural area of District Amritsar, Punjab' *Indian Journal of Maternal and Child Health.* 17(2)pp.1-6
- Srivastava, A., Mahmood, S. E., Mishra, P. and Shrotriya, VP. 2014. 'Correlates of Maternal Health Care Utilization in Rohilkhand Region, India' *Ann Med Health Sci Res.* 4(3) pp.417-425.
- Tesfahun, F., Worku, W., Mazengiya, F. and Kifle, M. 2014. 'Knowledge, Perception and Utilization of Postnatal Care of Mothers in Gondar Zuria District, Ethiopia: A Cross-Sectional Study' *Maternal Child Health Journal* 18 pp. 2341-2351
- Thaddeus, S. and Maine, D. 1994. 'Too far to walk: Maternal mortality in context' *Social Science and Medicine* 38: 1091.
- The Registrar General & Census Commissioner, India, New Delhi. 2010. (Ministry of Home Affairs, Government of India).
- World Health Organization 1998. 'Pregnancy is special let's make it safe. World Health Day, Safe Motherhood' Geneva: World Health Organization.
