

Level of Utilization of Intra- and Post-natal Services and Its Determinants at Grass-Root Level in Rural Jammu

Bhavna Sahni¹, Shalini Sobti², Dipender Kaur³

¹Assistant Professor, Department of Community Medicine, Government Medical College and Hospital, Jammu, Jammu and Kashmir, India, ²Assistant Professor, Department of Community Medicine, ASCOMS and Hospital, Sidhra, Jammu, Jammu and Kashmir, India, ³Assistant Professor, Department of Microbiology, ASCOMS and Hospital, Sidhra, Jammu, Jammu and Kashmir, India

ABSTRACT

Background: Many studies have revealed low utilization of the health-care services by different segments of the society for various reasons. Females in rural areas are most vulnerable which stresses on the imperative need of community-based studies of this kind.

Purpose: The present study has been designed to know the extent and determinants of utilization of intra- and post-natal services at subcenter level which forms the backbone of health-care delivery system in rural areas.

Materials and Methods: Maternal and child health records of 10 subcenters were thoroughly scrutinized to find the pattern of utilization of intra- and post-natal services by the antenatal females registered in the previous year and to examine the influence of maternal age and parity on the utilization of the same. A subsample of these registered females was home visited to cross-check validity of records and to collect further information regarding the influence of maternal literacy, socioeconomic status, and distance from subcenter on the utilization of these services. The data thus obtained were analyzed using appropriate statistical techniques.

Results: Nearly 80.34% of the deliveries were institutional and 19.66% were home deliveries. Pregnancy outcome was recorded as live birth for 98.02% and stillbirth for 1.98% females, but no statistical association was found when place of delivery and pregnancy outcome were compared with age and parity of the registered antenatal females. Analysis of the data obtained after home visits showed that maternal literacy, socioeconomic status, and distance from sub-center had a significant bearing on the utilization of both intra- and post-natal services, with the only exception being maternal literacy which did not influence the utilization of post-natal services significantly at the grass-root level.

Conclusions: A huge amount of data lies unutilized, yet effortfully maintained, at grass-root level which can be extrapolated for studying the patterns and determinants of utilization of health-care services, thereby helping to strengthen the delivery mechanisms to ensure the optimum use of these resources by future beneficiaries.

Key words: Cross-sectional, Intranatal, Literacy, Postnatal, Subcenter, Utilization

INTRODUCTION

Among the various stages of women's lives, the childbearing period represents a period of elevated risk and the care provided is critical for both the woman's and her child's health and survival. It is well established that giving birth in a medical institution under the care and supervision of trained health-care providers promotes child survival and reduces the risk of maternal mortality. Yet, many women in low- and

middle-income countries, including India, continue to deliver infants at home without the presence of a skilled attendant. Most maternal deaths occur during labor, delivery, or the first 24 h postpartum, and most complications cannot be predicted or prevented. This makes effective intrapartum care essential to reduce both mortality as well as morbidity.

Equally important is the postnatal care which is crucial in maintaining and promoting the health of the woman

CORRESPONDING AUTHOR:

Dr. Bhavna Sahni,
Assistant Professor, Department of Community Medicine, Government Medical College and Hospital, Jammu,
Jammu and Kashmir, India. Phone: +91-99062 05000.
E-mail: bhavnasahni@gmail.com

Submission: 01-2017; Peer Review: 02-2017; Acceptance: 03-2017; Publication: 04-2017

and the newborn infant, while providing an opportunity for health professionals to identify, monitor, and manage health conditions that may develop in the mother and newborn during the post-natal period. In addition, postnatal care provides health professionals with the opportunity to promote exclusive breastfeeding, personal hygiene, appropriate feeding practices, and family planning counseling and services.

As the subcenters are very important health post in delivery of various services, including maternal and child health (MCH), this study was formulated and conducted to find the level of utilization of intra- and post-natal services and its association with factors such as maternal literacy, socioeconomic status, and accessibility of subcenter.

MATERIALS AND METHODS

A cross-sectional study was carried out in RS Pura Block of Jammu district to find the level of utilization of intra- and post-natal services provided at grass-root level of health-care delivery system, namely the subcenter and to examine the influence of factors such as age of the mother, order of pregnancy, maternal literacy, socioeconomic status, and accessibility of the subcenter on the utilization of these services. Out of 25 subcenters in RS Pura Block, 10 subcenters were chosen using simple random sampling. The records pertaining to MCH services rendered by these subcenters from January 1 to December 31 in the previous year were thoroughly reviewed. The antenatal, intra-natal, post-natal, family welfare, and immunization records were scrutinized. The present study focuses only on the level of utilization of intra- and post-natal services while the data pertaining to antenatal, family welfare, and childhood immunization have been published elsewhere.¹⁻³ Out of the pregnant females registered in these subcenters in the previous year, 10% were selected by systematic random sampling. With the help of village-level health workers, these selected females were visited at their respective houses. After obtaining informed verbal consent, these females were administered a pre-tested, semi-closed questionnaire to collect information regarding delivery of postnatal services and the influence of distance of their residence from subcenter, their literacy level and socioeconomic status of the family on utilization of intranatal and postnatal services as no information regarding these three factors was found in the registers available at the subcenters.

The data thus obtained were compiled, tabulated, and analyzed using appropriate statistical techniques which included Chi-square-test (with Yate's correction, wherever applicable) using Epi Info 6.04 version.

RESULTS

Table 1 shows data obtained after scrutinizing the records available at subcenter level. It was observed that among the total deliveries, 80.34% of the deliveries were conducted by doctor/medical officer and the rest 19.66% (18.90% + 0.76%) were domiciliary. Out of the domiciliary, 124 deliveries were conducted by trained birth attendants (TBAs), whereas five were conducted by multipurpose health worker (MPHW) (F). In the age group of 18-25 years and 26-35 years, an approximately equal percentage, i.e., four-fifths of the total deliveries were institutional deliveries. However, there was no statistically

significant association of age of the pregnant females with the place of delivery.

It was further observed that the number of women who opted for institutional delivery was high (81.46% and 73.68%, respectively) in both the groups of order of pregnancy "1-2" and "3 or more." However, among those with birth order 3 or more, a slightly higher percentage (25.26%) of deliveries were conducted by TBAs in comparison to that among those with birth order 1-2 (17.83%), but these results were statistically insignificant.

As it is evident from Table 2, three-quarters of total registered females belonged to the age group of 18-25 years. Stillbirths were slightly higher (3.61% as compared to 1.43%) in the 26-35 years age group, but no statistical association was found. Overall, pregnancy outcome was recorded as live birth for 98.02% of the antenatal females and stillbirth for 1.98% females, and on data analysis, no statistical association was found between the order of pregnancy and pregnancy outcome.

Data tabulated in Table 3 show that among institutional deliveries, <1% had still birth as the outcome compared to 6.2% in the domiciliary/home deliveries, and the association between pregnancy outcome and place of delivery was found to be highly significant ($P < 0.01$).

Since records displaying delivery of postnatal care were not maintained at any of the randomly chosen subcenters, only intra-natal records were analyzed from the available registers, followed by a household survey of 10% of the registered pregnant females (by systematic random sampling) from each selected subcenter to find the validity of the data recorded in these registers and to collect the data pertaining to post-natal care. Thus, a total of 75 females were contacted by house-to-house visits to study the influence of maternal literacy, socioeconomic status of the family, and accessibility of the subcenter on the utilization of intra- and postnatal services. The results obtained are as follows

As it is evident from Table 4, among 75 females who were contacted by house-to-house visits, it was seen that with increasing education of the mother and with increasing socioeconomic status, more number of deliveries were institutional. These findings were statistically highly significant. Furthermore, among females residing within 1 km distance from the subcenter, 94.87% deliveries were institutional and this association was found to be statistically highly significant ($P < 0.01$).

It can be seen in Table 5 that more than one-quarter (26.67%) of the contacted females did not report any post-natal contact from health worker(s), 18.67% reported one contact, and it was only slightly more than half of females who reported that two or more postnatal visits were made by the health workers. However, no statistically significant association between post-natal care and maternal literacy was found in contrast to highly significant association between socioeconomic status and post-natal contacts. Among females residing within 1 km distance from the subcenter, two-thirds of the females received two or more postnatal contacts, and the association between distance to the subcenter and number of post-natal contacts was found to be statistically highly significant.

DISCUSSION

The present study revealed that 80.34% deliveries were institutional and 19.66% were home deliveries. This is well in tune with the target

Table 1: Distribution of registered antenatal females according to age, order of pregnancy and its association with place of delivery

Age and order of pregnancy	Place of delivery			Total	P value
	Institutional(%)	Domiciliary (%)			
		TBA (%)	MPHW (F) (%)		
Age of mother (years)					
18-25	391 (80.12)	93 (16.55)	4 (0.71)	488	$\chi^2=0.05$; $P=0.815$ (Not significant)
26-35	134 (80.72)	31 (13.78)	1 (0.44)	166	
36-45	2 (100.00)	-	-	2	
Total	527 (80.34)	124 (18.90)	5 (0.76)	656	
Order of pregnancy					
1-2	457 (81.46)	100 (17.83)	4 (0.71)	561	$\chi^2=3.11$; $P=0.077$ (Not significant)
3 and more	70 (73.68)	24 (25.26)	1 (1.05)	95	
Total	527 (80.34)	124 (18.90)	5 (0.76)	656	

PS: Postnatal records were not available at any of the selected subcenters, MPHW: Multipurpose health worker, TBA: Trained birth attendant

Table 2: Pregnancy outcome among registered pregnant females on the basis of age and order of pregnancy

Age and order of pregnancy	Pregnancy outcome		Total	P value
	Live births (%)	Stillbirths (%)		
Age of pregnant females (years)				
18-25	481 (98.57)	7 (1.43)	488	Yates corrected $\chi^2=1.94$; $P=0.1635$; (Not significant)
26-35	160 (96.39)	6 (3.61)	166	
36-45	2 (100.00)	-	2	
Total	643 (98.02)	13 (1.98)	656	
Order of pregnancy				
1-2	550 (98.04)	11 (1.96)	561	Yates corrected $\chi^2=0.09$; $P=0.7606$; (Not significant)
3 and more	93 (97.89)	2 (2.11)	95	
Total	643 (98.02)	13 (1.98)	656	

PS: Postnatal records were not available at any of the selected subcenters

Table 3: Distribution of registered pregnant females according to pregnancy outcome and place of delivery

Pregnancy outcome	Institutional delivery (%)	Home delivery (%)	Total	P value
Still births	5 (0.9)	8 (6.2)	13	$\chi^2=14.72$; $P=0.0001247$ (Highly significant)
Live births	522 (99.1)	121 (93.8)	643	
Total	527 (100.0)	129 (100.0)	656	

of the National Population Policy, 2000, to achieve 80% institutional deliveries. Similar observations were made by Khandekar *et al.*⁴ and Gupta *et al.*⁵ who reported 80% and 79% institutional deliveries, respectively. Other studies by Aggarwal *et al.*,⁶ Talwar *et al.*,⁷ Gupta and Pandey,⁸ Aggarwal *et al.*,⁹ Singh and Arora,¹⁰ and Khatib *et al.*¹¹ revealed that 30%, 62.24%, 65%, 68.2%, 41.7%, and 68.6% deliveries, respectively, were institutional. The fact that an appreciable percentage of deliveries were institutional in the present study could be because of the availability of a Community Health Center within the 5-10 km range of all the subcenters and the presence of a military hospital in the block.

Taking a closer look at our results, it is concluded that 80.34% deliveries were conducted by doctors, 18.9% of the deliveries were conducted by TBA, and only 0.76% were conducted by MPHW (F) which goes hand in hand with the national goal to achieve 100% deliveries by trained personnel

(National Population Policy, 2000). Very small percentage of deliveries conducted by MPHW (F) could be due to the fact that MPHW (F) was non-residents and not available most of the times for the purpose of delivery. Hence, it is the TBAs who are relied upon for conducting home deliveries. Similar observations were made by Gupta and Pandey,⁸ reporting 16.7% deliveries attended by trained dais. Much higher figures of 58.3% deliveries conducted by TBA were reported by Singh and Arora¹⁰ in four villages of Chandigarh, whereas Venkatesh *et al.*¹² reported that 70.4% of deliveries were conducted by TBAs in urban slums of Davangere city. This is in contrast with the study of Khandekar *et al.*⁴ who reported that majority of home deliveries were conducted by untrained personnel and Aggarwal *et al.*⁶ who reported 70% home deliveries, of which 81.9% were conducted by untrained village dais in peri-urban areas of East Delhi. Yadav and Singh¹³ also reported 90% home deliveries which were attended mainly by village dais.

In the present study, an effort was made to study the association of the age of mother and order of pregnancy with the utilization of intra- and post-natal services among the pregnant females registered at subcenter level. Further, it was found that maternal age and parity had no significant association with utilization of intra-natal care, but no post-natal records were maintained at a subcenter level which disabled the authors to comment on the record-based utilization of post-natal services. Abbas and Walker,¹⁴ Ciceklioglu *et al.*,¹⁵ and Chandhiok *et al.*¹⁶ found a significant association of age of females and parity

Table 4: Factors determining utilization of intra-natal services

Determinants of intranatal services	Intra-natal care			P value
	Home delivery (%)	Institutional delivery (%)	Total	
Maternal literacy				
Upto 10 th	14 (31.11)	31 (68.89)	45	0.00322 (Highly significant)
10 th -inter	-	24 (100.00)	24	
Degree and above	-	6 (100.00)	6	
Total	14 (18.67)	61 (81.33)	75	
Socioeconomic status				
BPL, lower, lower middle	12 (42.86)	16 (57.14)	28	0.000169 (Highly significant)
Middle class	2 (5.41)	35 (94.59)	37	
Higher middle, upper class	-	10 (100.00)	10	
Total	14 (18.67)	61 (81.33)	75	
Distance to subcenter				
0-1 km	2 (5.13)	37 (94.87)	39	0.003663 (Highly significant)
1.1-2 km	9 (39.13)	14 (60.87)	23	
2.1-3 km	3 (23.08)	10 (76.92)	13	
Total	14 (18.67)	61 (81.33)	75	

BPL: Below poverty line

Table 5: Determinants of post-natal care utilization

Determinants of postnatal services	Postnatal care by health workers			Total females	P value
	No contact	1 contact	≥2 contacts		
Maternal literacy					
Upto 10 th	14 (31.11)	12 (26.67)	19 (42.22)	45	0.54182 (Insignificant)
10 th -inter	4 (16.67)	1 (4.17)	19 (79.17)	24	
Degree and above	2 (33.33)	1 (16.67)	3 (50.00)	6	
Total females	20 (26.67)	14 (18.67)	41 (54.67)	75	
Socioeconomic status					
BPL, lower, lower middle	11 (39.29)	9 (32.14)	8 (28.57)	28	0.00938 (Highly significant)
Middle class	7 (18.92)	3 (8.11)	27 (72.97)	37	
Higher middle, Upper class	2 (20.00)	2 (20.00)	6 (60.00)	10	
Total females	20 (26.67)	14 (18.67)	41 (54.67)	75	
Distance to subcenter					
0-1 km	7 (17.95)	5 (12.82)	27 (69.23)	39	0.003939 (Highly significant)
1.1-2 km	5 (21.74)	8 (34.78)	10 (43.48)	23	
2.1-3 km	8 (61.54)	1 (7.69)	4 (30.77)	13	
Total females	20 (26.67)	14 (18.67)	41 (54.67)	75	

BPL: Below poverty line

with the utilization of intra-natal services. Khan *et al.*¹⁷ reported that maternal age did not influence the utilization patterns that, however, were associated with increasing parity. Khandekar *et al.*⁴ and Venkatesh *et al.*¹² also reported the association of parity with the utilization of intra- or post-natal services.

In the present study, 10% of the registered pregnant females were contacted by home visits, and it was observed that almost half of the contacted females reported ≥2 postnatal visits by MPH (F), TBA, or accredited social health activist and 18.67% reported one visit by the health staff. Wu *et al.*¹⁸ in a study conducted in China reported that very few women had any postnatal visits. Lal *et al.*¹⁹ reported much lower figures of 4.4% in Rohtak, whereas Agarwal *et al.*⁹ reported that postnatal care was not sought by 84% mothers.

It was observed that there existed a significant association between increasing maternal literacy and utilization of intra-natal services. Maternal literacy did not seem to be associated with post-natal care received by the mother as it was the responsibility of health workers to deliver post-natal care. Similar association of maternal literacy with the utilization of intra-natal care was also reported by Sood and Nagla,²⁰ Pandit *et al.*,²¹ Kavitha and Audinarayana,²² Khan *et al.*,¹⁷ Yadav and Singh,¹³ Singh and Yadav,²³ Singh and Yadav,²⁴ Venkatesh *et al.*,¹² Metgud *et al.*,²⁵ and Upadhyay and Sikdar.²⁶ Abbas and Walker,¹⁴ Obermeyer Potter,²⁷ Phoxay *et al.*,²⁸ Coimbra *et al.*,²⁹ Ciceklioglu *et al.*,¹⁵ and Ikeako *et al.*³⁰ also reported similar findings in different parts of the world. However, Titaley *et al.*,³¹ in a study in Indonesia, reported an association of attendance at postnatal clinics with maternal literacy.

As socioeconomic status of the family is known to have a direct bearing on the utilization of maternal care services, an effort was made in the present study to assess the relation between these two variables. It was observed that with increasing socioeconomic status, the percentage of females going in for institutional deliveries and post-natal care increased and the association was found to be statistically highly significant. Pandit *et al.*²¹ also found an association between socioeconomic status and utilization of maternal care services. Our findings showing a significant association between socioeconomic status and utilization of intra-natal services from hospitals are in tune with the findings of Sood and Nagla.²⁰ Regarding postnatal care, Titaley *et al.*³¹ also observed an association of socioeconomic status with the utilization of post-natal care from health facilities in Indonesia. However, in contrast to our findings, Khan *et al.*¹⁷ reported that socioeconomic status did not influence the utilization patterns of reproductive health services in rural Maharashtra.

Regarding the relation of distance from the subcenter and utilization of intra- and post-natal services, the current study revealed that as the distance from the subcenter increased, the utilization of these services decreased and the results were highly significant at $P < 0.01$. This finding reiterates the fact that in countries such as India, where distances to health facilities are quite large in rural areas, geographical access to health-care facilities is a significant barrier to institutional delivery. In addition, it is important to improve road and transport infrastructure to reduce inequity in access to health facilities and thereby increase institutional deliveries. These findings corroborated with the observations made by Phoxay *et al.*²⁸ and Titaley *et al.*³¹ Further, our findings are also in tune with the observation made in a Southwest Ethiopia study that each kilometer increase in walking distance to the nearest health center resulted in a reduction of institutional delivery service by 22% (adjusted odds ratio = 0.78, 95% confidence intervals: 0.64-0.96). This is contrary to the findings of Mishra and Retherford³² who found geographical access to be a weakly significant determinant of institutional delivery.

CONCLUSIONS

From the present study, it can be concluded that enormous data are available, even at the peripheral - most points in the health-care delivery system which should be harnessed by means of record-based surveys to divulge useful information about the various factors influencing delivery and utilization of health-care services at grass-root level. However, sensitization of MPHWs regarding maintenance of records can be of great value as it was seen in the current study that ante- and intra-natal data were meticulously noted in the respective registers, but since postnatal care is not given due emphasis, the data pertaining to the same could not be traced in any of the scrutinized records. The study, therefore, brings out that a thorough review, surveillance, and audit of these records can be of great help not only to the policymakers but also to the implementers of health-care delivery so as to ensure equitable access, utilization, and delivery of health care services.

ACKNOWLEDGMENTS

We would like to thank Dr. D S Jamwal, Ex-Professor, Department of Community Medicine, for his sound advice,

guidance, and support. Heartfelt thanks to all the MPHWs at various subcenters who provided detailed records and helped us in contacting females through home visits.

REFERENCES

- Sahni B, Sobti S. Utilization of Antenatal care among Pregnant Females registered at sub-centre level in a rural area of Jammu in India. *Int J Healthcare Biomed Res* 2013;1:269-78.
- Sahni B, Sobti S, Sharma V, Jamwal DS. A study of utilization and determinants of family welfare services in rural Jammu. *JEMDS* 2013;2:8006-12.
- Sahni B, Sobti S, Jamwal DS. Childhood immunization coverage at sub-centre level in rural Jammu. A record-based cross-sectional study. *Indian J Matern Child Health* 2013;15:1-7.
- Khandekar J, Dwivedi S, Bhattacharya M, Singh G, Joshi PL, Raj B. Childbirth practices among women in slum areas. *J Fam Welf* 1993;39:13-7.
- Gupta M, Thakur JS, Kumar R. Reproductive and child health inequities in Chandigarh Union Territory of India. *J Urban Health* 2008;85:291-9.
- Aggarwal OP, Kumar R, Gupta A, Tiwari RS. Utilization of antenatal care services in Periurban area of East Delhi. *Indian J Community Med* 1997;22:29-32.
- Talwar R, Chitkara A, Khokhar A, Rasania SK, Sachdeva TR. Determinants of utilization of ante-natal care services amongst attendees in a public sector hospital in Delhi. *Health Popul Perspect Issues* 2005;28:154-63.
- Gupta RK, Pandey A. Care of the pregnant woman in East Delhi: Present status and some correlates. *Indian J Prev Soc Med* 2006;37:32-7.
- Agarwal P, Singh MM, Garg S. Maternal health care utilization among women in an urban slum in Delhi. *Indian J Community Med* 2007;32:203-5.
- Singh A, Arora AK. The changing profile of pregnant women and quality of antenatal care in rural North India. *Indian J Community Med* 2007;32:135-6.
- Khatib N, Zahiruddin QS, Gaidhane AM, Waghmare L, Srivatsava T, Goyal RC, *et al.* Predictors for antenatal services and pregnancy outcome in a rural area: a prospective study in Wardha district, India. *Indian J Med Sci* 2009;63:436-44.
- Venkatesh RR, Umakantha AG, Yuvaraj J. Safe motherhood status in the urban slums of Davangere city. *Indian J Community Med* 2005;30:6.
- Yadav RJ, Singh P. Immunization status of pregnant women in Bihar. *Indian J Community Med* 1998;23:15-8.
- Abbas AA, Walker GJ. Determinants of the utilization of maternal and child health services in Jordan. *Int J Epidemiol* 1986;15:404-7.
- Ciceklioglu M, Soyer MT, Ocek ZA. Factors associated with the utilization and content of prenatal care in a Western urban district of Turkey. *Int J Qual Health Care* 2005;17:533-9.
- Chandhiok N, Dhilon BS, Kambo I, Saxena NC. Determinants of antenatal care utilization in rural areas of India: A cross-sectional study from 28 districts (an ICMR task force study). *J Obstet Gynecol India* 2006;56:47-52.
- Khan AG, Roy N, Surender S. Utilization of reproductive health services in rural Maharashtra. *J Fam Welf* 1997;43:37-44.
- Wu Z, Viisainen K, Li X, Hemminki E. Maternal care in rural China: a case study from Anhui province. *BMC Health Serv Res* 2008;8:55.
- Lal S, Kapoor S, Vashisht BM, Punia MS. Coverage and quality of maternal and child health services at sub center level. *Indian J Community Med* 2001;26:16-20.
- Sood AK, Nagla BK. The extent and pattern of utilisation of health services by rural women - A study in district Rohtak, Haryana. *Indian J Prev Soc Med* 1994;25:110-7.
- Pandit DD, Pai NP, Waingankar PJ. Evaluation of MCH services provided by an urban health centre. *Health Popul Perspect Issues* 1996;19:41-9.
- Kavitha N, Audinarayana N. Utilisation and determinants of selected MCH care services in rural areas of Tamil Nadu. *Health Popul Perspect Issues* 1997;20:112-25.
- Singh P, Yadav RJ. Antenatal care of pregnant women in India. *Indian J Community Med* 2000;25:112-7.
- Singh P, Yadav RJ. Status of ante-natal coverage in four states. *Health Popul* 2001;24:148-56.
- Metgud CS, Katti SM, Mallapur MD, Wantamutte AS. Utilization patterns of antenatal services among pregnant women: A longitudinal study in rural area of North Karnataka. *Al Ameen J Med Sci* 2009;2:58-62.
- Upadhyay P, Sikdar DP. Attitudinal difference among women of different educational status towards infant and mother care. *Al Ameen J Med Sci* 2009;2:52-7.
- Obermeyer CM, Potter JE. Maternal health care utilization in Jordan: a study

- of patterns and determinants. *Stud Fam Plann* 1991;22:177-87.
28. Phoxay C, Okumura J, Nakamura Y, Wakai S. Influence of women's knowledge on maternal health care utilization in Southern Laos. *Asia Pac J Public Health* 2001;13:13-9.
 29. Coimbra LC, Silva AA, Mochel EG, Alves MT, Ribeiro VS, Aragão VM, *et al.* Factors associated with inadequacy of prenatal care utilization. *Rev aude Publica* 2003;37:456-62.
 30. Ikeako LC, Onah HE, Iloabachie GC. Influence of formal maternal education on the use of maternity services in Enugu, Nigeria. *J Obstet Gynaecol* 2006;26:30-4.
 31. Titaley CR, Dibley MJ, Roberts CL. Factors associated with non-utilisation of postnatal care services in Indonesia. *J Epidemiol Community Health* 2009;63:827-31.
 32. Mishra V, Retherford RD. The effect of antenatal care on professional assistance at delivery in rural India. *Popul Res Policy Rev* 2008;27:307.

HOW TO CITE THIS ARTICLE:

Sahni B, Sobti S, Kaur D. Level of Utilization of Intra- and Post-natal Services and Its Determinants at Grass-Root Level in Rural Jammu. *Int J Prevent Public Health Sci* 2017;2(6):7-12.