Utilisation of Anganwadi services among pregnant women in rural Telangana: A cross sectional study

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ABSTRACT

Background: Anganwadi centers were providing integrated services comprising supplementary nutrition, immunization, health check-up, and referral services to children below six years of age and expectant and nursing mothers. After more than three decades of implementation, the success of Integrated Child Development Services (ICDS) program in tackling maternal and childhood problems still remains a matter of concern. Objectives: To estimate the proportion of pregnant women utilizing various services provided by the anganwadi centre. To assess the association between demographic factors and utilization of anganwadi services by pregnant women. Methods: A cross-sectional study with a sample size of 135 was conducted in three villages attached to a medical college. Pregnant women enrolled in anganwadi the center were included in the study. Data was collected by a predesigned pretested semi-structured questionnaire. Data was presented in proportions, odds ratio with confidence interval, and Chi-square test, Fisher test was applied to find the association between variables by using SPSS ver. 23. Results: The study showed 86.66% utilized supplementary nutrition services, 62.96% received health education, 85.92% took vaccines from anganwadi centre, 40.74% utilized referral services, and 82.22% utilized health checkups services provided by anganwadi centre. Distance from the centre was found to be an important determinant of the utilization of anganwadi services. Conclusions: There is a need to sensitize and motivate beneficiaries to utilize the services offered by anganwadi center.

Keywords: Anganwadi center, immunization, pregnant women, supplementary nutrition

Introduction

The Integrated Child Development Services (ICDS) was started on an experimental basis in 33 development blocks in 1975. In the next fifteen years, the outreach of ICDS services increased to 2426 blocks. This was nearly doubled during the next decade and increased to 6000 blocks.[¹] The population norms for setting up anganwadi center (AWC) have been revised to cover all habitations by scheduled caste and tribes and minorities. The norms are one AWC for 400–800 population in rural/urban areas and 300–800 population in tribal/reverine/desert/hilly and other difficult areas. At the end of 2014, about 7,067 ICDS projects and 13.42 lakh anganwadi centers/mini-AWC were functional in the country. About 104,100 children, pregnant, and lactating mothers are getting the benefit of scheme.[²]

The ICDS program includes a network of anganwadi centers, with anganwadi workers (AWW) providing integrated package of services comprising supplementary nutrition, immunization,

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health check-up, medical referral services, nutrition and health education for women and non formal education for children of the age group 3–6 years and the beneficiaries are pregnant women, nursing mothers, children upto 6 years age, adolescent girls, and other women in reproductive age.\textsuperscript{1,2} Malnutrition, poverty, and lack of maternity services are few social determinants of maternal mortality in Indian, which can be addressed through anganwadi centers. The success of the ICDS program in tackling maternal and childhood problems still remains a matter of concern in different parts of the country.\textsuperscript{3}

The rationale of this study is to assess the extent to which pregnant women were utilizing anganwadi services. This study may also help to evaluate the quality of services provided by anganwadi and emphasize the need to address the barriers and take necessary measures for improving utilization rates. There are very few studies analyzing the utilization of ICDS services, and hence this study was undertaken to evaluate the utilization of ICDS among pregnant women in Nalgonda district of Telangana state.

Materials and Methods

Study design, setting, and subjects

The study was a descriptive, crosssectional study conducted from April 2019 to July 2019 in three villages Cherlapally, Dandampally, and Marrigudem attached to a medical college in the Nalgonda district of Telangana state. Study participants were pregnant women who were enrolled from January 2018 to August 2018 in five anganwadi centers located in the above mentioned villages. Seriously ill subjects from the houses, which were locked on the day of data collection, who were not willing to participate, and persons who have participated in the pilot study were excluded from the study.

Sample size and sampling technique

Sample size was estimated to be 135 based on census method where all the pregnant women who fit into inclusion criteria were included in the study. A total of 172 pregnant women were registered from five anganwadi centers. 30 subjects were included in the pilot study, 5 subjects were not willing to participate in the study, and 2 subjects got shifted to other places, which resulted in data collection from 135 subjects.

Study tool and data collection

Predesigned and pretested semi-structured questionnaire was used as a study tool and pilot study was conducted on 30 subjects initially and the questionnaire was translated into local language as a part of the standardization of the questionnaire. The questionnaire consists of sociodemographic variables such as age, gender, education, occupation, and socioeconomic status. It also consists of questions regarding the utilization of various services provided by anganwadi center. Data was collected by face to face interview method.

Ethical considerations

The study was approved by the institutional ethics committee and the study participants were briefed about the purpose and nature of the study, and informed consent was obtained before data collection.

Statistical analysis

Data was entered in Microsoft excel and analysis was done using SPSS statistical package version 23. Data was presented in proportions and odds ratios along with confidence interval (CI) were calculated, to assess the association between demographic variables and utilization of anganwadi services. Pearson's chi-square test and Fisher test were applied as the test of significance and $P < 0.05$ was considered as statistically significant.

Results

The mean age of study participants was 22.2 years (SD ± 3.39). The majority of participants were of age group 21–25 years (63.7%), housewife (80%), Hindus (88.1%), literates (72.6%), middle-class family (40%), and 87.41% resides within 2 km distance from anganwadi center.

The study showed that out of 135 pregnant women, 117 (86.66%) utilized supplementary nutrition services, 85 (62.96%) received nutrition and health education, 116 (85.92%) took vaccines from anganwadi center, 55 (40.74%) utilized referral services and 111 (82.22%) utilized health checkups services provided by anganwadi center [Table 1].

Pregnant women in the age group 26–30 years (90.9%), housewife's (98.9%), literate (89.8%), and lower socio-economic status class (100%) were utilizing supplementary nutrition services more as compared to other groups, however, the difference was statistically not significant. Majority (88.9%) of the pregnant women who were residing near to the anganwadi centre were utilizing supplementary nutrition compared to women residing far from the center and the difference was found to be statistically significant (OR = 3.365, 95% CI = 1.022–11.083, $P = 0.05$) [Table 2].

Study participants in the age group 26–30 years of age (90.9%), housewife's (87%), lower socio-economic status class (100%), and women residing near to anganwadi center (87.2%) were utilizing immunization services more as compared to other groups, however, the difference was statistically not significant. The majority (89.8%) of the pregnant women who were literates were utilizing immunization services when compared to illiterate women and the difference was found to be statistically significant (OR = 2.829, 95% CI = 1.045–7.657, $P = 0.03$) [Table 3].

Study subjects in the age group 26–30 years of age (90.9%), labor (92.6%), illiterates (86.5%), lower socio-economic status class (100%), and women residing near to anganwadi center (83.9%) were utilizing health check-up services more
The present study found that 86.6% of pregnant women were utilizing supplementary nutrition services from anganwadi centers, which was very essential in preventing malnutrition-related events. A study done by Madhavi H et al. showed that 94.23% pregnant women utilized supplementary nutrition and, in another study done by Preethy et al. in Udupi district, Karnataka it was 74.1% pregnant women. Dandotiya D et al. study in urban Bhopal reported that 83.7% of the beneficiaries utilized supplementary nutrition and Davis SF et al. study done in rural Rajasthan found that only 60.6% mothers utilized anganwadi services and most received services were immunizations (89.3%) and

as compared to other groups, however, the difference was statistically not significant [Table 4].

Pregnant women in the age group 21–25 years of age (67.4%), labor (70.3%), literate (62.3%), and lower socio-economic status class (100%) were utilizing health education services more as compared to other groups, however, the difference was statistically not significant. The majority (67.8%) of the pregnant women who were residing near to the anganwadi center were utilizing health education services compared to women residing far from the center and the difference was found to be statistically significant (OR = 5.053, 95% CI = 1.661-15.369, P = 0.002) [Table 5].

The most common reason for not utilizing supplementary nutrition services was not liking the taste and quality of food (38.9%) and the most common reason for not utilizing nutrition and health education services was lack of time to attend (66%) [Table 6].

**Discussion**

This cross-sectional study was taken up in the three villages attached to a medical college in the Nalgonda district of Telangana state. The majority of the study participants were of 21–25 years of age group, literates, middle class, Hindus, and homemakers.

### Table 1: Distribution of pregnant women based on utilization of ICDS services (n=135)

| Anganwadi services (ICDS) | Utilized (%) | Not utilized (%) | Total (%) |
|---------------------------|--------------|-----------------|-----------|
| Supplementary Nutrition    | 117(86.66%)  | 18(13.34)       | 135(100)  |
| Nutrition and Health education | 85(62.96%)  | 50(37.04)       | 135(100)  |
| Immunization               | 116(85.92%)  | 19(14.08)       | 135(100)  |
| Referral services          | 55(40.74)    | 80(59.26)       | 135(100)  |
| Health check up            | 111(82.22%)  | 24(17.78)       | 135(100)  |

### Table 2: Association between sociodemographic factors and utilization of supplementary nutrition (n=135)

| Sociodemographic variables | Utilized (%) | OR (95% CI) | P   |
|----------------------------|--------------|-------------|-----|
| Age (Years)                |              |             |     |
| 15-20                      | 29 (82.8)    |             |     |
| 20-25                      | 76 (88.4)    | 0.636 (0.212-1.908) | 0.601 |
| 25-30                      | 10 (90.9)    | 0.483 (0.05-4.521)  | 0.094*|
| 30-35                      | 2 (66.7)     | 2.417 (0.188-31.147) | 0.201*|
| Occupation                 |              |             |     |
| House wife                 | 96 (98.9)    |             |     |
| Labor                      | 21 (77.8)    | 2.286 (0.77-6.783)  | 0.201*|
| Education                  |              |             |     |
| Literate                   | 88 (89.6)    |             |     |
| Illiterate                 | 29 (78.4)    | 2.428 (0.875-6.732)  | 0.094*|
| SES                        |              |             |     |
| Upper                      | 12 (75)      |             |     |
| Upper middle               | 26 (89.7)    | 0.346 (0.067-1.795)  | 0.365   |
| Middle                     | 49 (90.7)    | 0.306 (0.07-1.316)  |      |
| Lower middle               | 26 (81.3)    | 0.692 (0.164-2.917)  |      |
| Lower                      | 4 (100)      |             |     |
| Distance from AWC          |              |             |     |
| Far                        | 12 (70.6)    | 3.365 (1.022-11.083) | 0.05*  |

* Fisher test was used to calculate P-value, ** Near - 2kms and less

### Table 3: Association between sociodemographic factors and utilization of immunization services (n=135)

| Sociodemographic variables | Immunization services | Utilized (%) | OR (95% CI) | P   |
|----------------------------|-----------------------|--------------|-------------|-----|
| Age (Years)                |                       |              |             |     |
| 15-20                      | 29 (82.8)             |             |             |     |
| 20-25                      | 75 (87.2)             | 0.709 (0.240-2.094) | 0.185*   |
| 25-30                      | 10 (90.9)             | 0.483 (0.052-4.521) | 0.767   |
| 30-35                      | 2 (66.7)              | 2.417 (0.188-31.147) | 0.674   |
| Occupation                 |                       |             |             |     |
| House wife                 | 94 (87)               |             |             |     |
| Labor                      | 22 (81.5)             | 1.526 (0.497-4.685) | 0.356*  |
| Education                  |                       |             |             |     |
| Literate                   | 88 (89.8)             |             |             |     |
| Illiterate                 | 28 (75.7)             | 2.829 (1.045-7.657) | 0.035   |
| SES                        |                       |             |             |     |
| Upper                      | 13 (81.2)             |             |             |     |
| Upper middle               | 25 (86.2)             | 0.693 (0.134-3.575) | 0.736   |
| Middle                     | 45 (83.3)             | 0.867 (0.204-3.676) | 0.426   |
| Lower middle               | 29 (90.6)             | 0.448 (0.080-2.526) | 0.767   |
| Lower                      | 4 (100)               |             |             |     |
| Distance from AWC          |                       |             |             |     |
| Near**                     | 103 (87.2)            |             |             | 0.261*  |
| Far                        | 13 (76.5)             | 2.113 (0.609-7.335) | 0.480   |

* Fisher test was used to calculate P-value, ** Near - 2kms and less

### Table 4: Association between sociodemographic factors and utilization of Health checkups (n=135)

| Sociodemographic variables | Health check up | Utilized (%) | OR (95% CI) | P   |
|----------------------------|-----------------|--------------|-------------|-----|
| Age (Years)                |                 |              |             |     |
| 15-20                      | 28 (80)         |             |             |     |
| 20-25                      | 71 (82.6)       | 0.845 (0.311-2.293) | 0.161*  |
| 25-30                      | 10 (90.9)       | 0.400 (0.044-3.669) | 0.736   |
| 30-35                      | 2 (66.6)        | 2 (0.158-25.342)  |      |
| Occupation                 |                 |             |             |     |
| House wife                 | 86 (79.6)       |             |             |     |
| Labor                      | 25 (92.6)       | 0.313 (0.069-1.422) | 0.426   |
| Education                  |                 |             |             |     |
| Literate                   | 79 (80.6)       |             |             |     |
| Illiterate                 | 32 (86.5)       | 0.650 (0.223-1.889) | 0.426   |
| SES                        |                 |             |             |     |
| Upper                      | 15 (93.7)       |             |             |     |
| Upper middle               | 24 (82.8)       | 3.125 (0.332-29.409) | 0.480   |
| Middle                     | 44 (84.5)       | 3.409 (0.402-28.904) | 0.085*  |
| Lower middle               | 24 (75)         | 5 (0.567-44.084)  |      |
| Lower                      | 4 (100)         |             |             |     |
| Distance from AWC          |                 |             |             |     |
| Near**                     | 99 (83.9)       |             |             | 0.185*  |
| Far                        | 12 (70.6)       | 2.171 (0.685-6.877) | 0.480   |

* Fisher test was used to calculate P-value, ** Near - 2kms and less
Table 5: Association between sociodemographic factors and utilisation of Health education services (n=135)

| Sociodemographic variables | Health education | OR (95% CI) | P  |
|----------------------------|------------------|-------------|----|
| Age (Years)                | Utilised (%)     |             |    |
| 15-20                      | 20 (57.1)        |             |    |
| 20-25                      | 58 (67.4)        | 0.644 (0.287-1.443) | 0.438 |
| 25-30                      | 5 (45.5)         | 1.600 (0.410-6.250) | 0.196 |
| 30-35                      | 2 (66.7)         | 0.667 (0.055-8.057) | 0.586 |
| Occupation                 |                  |             |    |
| House wife                 | 66 (61.1)        |             |    |
| Labor                      | 19 (70.3)        | 0.662 (0.266-1.647) | 0.373 |
| Education                  |                  |             |    |
| Literate                   | 62 (62.3)        |             |    |
| Illiterate                 | 23 (62.1)        | 1.048 (0.48-2.289) | 0.906 |
| SES                        |                  |             |    |
| Upper                      | 11 (68.7)        |             |    |
| Upper middle               | 20 (69)          | 0.990 (0.265-3.698) | 0.900 |
| Middle                     | 31 (57.4)        | 1.632 (0.498-5.348) | 0.266 |
| Lower middle               | 19 (59.4)        | 1.505 (0.422-5.365) | 0.417 |
| Lower                      | 4 (100)          |             |    |
| Distance                   |                  |             |    |
| Near**                     | 80 (67.8)        | 5.053 (1.661-15.369) | 0.002 |
| from AWC                   | 5 (20.4)         | 0.053 (1.661-15.369) | 0.002 |

Table 6: Reasons for not utilizing Anganwadi services

| S.No | Reasons for not utilizing supplementary nutrition services (n=18) | Frequency (%)* |
|------|------------------------------------------------------------------|----------------|
| 1    | Distance                                                        | 5 (27.8%)      |
| 2    | Place was unhygienic                                            | 6 (33.3%)      |
| 3    | Didn't like the taste and quality of the food                    | 7 (38.9%)      |
| 4    | Meant for poor                                                   | 4 (22.2%)      |

| S.No | Reasons for not utilizing nutrition and health education services (n=50) | Frequency (%)* |
|------|--------------------------------------------------------------------------|----------------|
| 1    | Distance                                                                 | 12 (24%)       |
| 2    | Not aware of sessions                                                     | 11 (22%)       |
| 3    | No time to attend                                                         | 33 (66%)       |

Present study found that 85.92% of women utilized immunization services, whereas in a study conducted by Banerjee B in Kolkata, found that 93% of mothers had utilized immunization services.[21] Almost 100% of subjects utilized immunization services in Dandotiya D et al. study and Jayasheela E et al. study, however, the proportion is only 18.75% in Patil KS et al. study. The current study revealed that 82.22% of the pregnant women utilized anganwadi center for a health check-up and 89.18% of those women traveled less than 2 km for availing health check-up services. According to a study in Pakistan 39% of women whose travel time to the nearest health facility was 15 min or less, made at least three antenatal care visits, compared to 30% of women who lived more than 15 min of the nearest facility.[23] Another study in Nigeria by Dairo MD et al. revealed a very strong association between distance and antenatal care visits.[24] Nearly 97% of the subjects in Dandotiya D et al. study and Moosan H et al. study utilized the anganwadi center for health check-up services.[8,11] In the studies conducted by Jose MJ et al., Meena JK et al. in the urban slum of Delhi and Patil KS et al., only 45.3%, 40%, and 31.25% of the subjects received health check-up services in anganwadi.[18,20] In a study conducted by Kshirsagar VY et al. in Maharashtra, only 12.8% of women had good knowledge about anganwadi services and review by Kumar G et al. stated that only 55.4% of pregnant women in India received benefits from the anganwadi center.[25,26] Udayar S et al. study conducted in Karnataka found that only 33.5% of pregnant women received ICDS benefits.[27]

Among the study subjects, 89.8% literates had received supplementary nutrition as compared to illiterates (78.4%) and the association was not statistically significant. In this study association between the distance of anganwadi center from house and the utilization of supplementary nutrition services in pregnant women was found to be significant. (OR = 3.365, 95% CI = 1.022–11.083, P < 0.05). The majority of the literates have utilized immunization services when compared to illiterates and the difference was found to be statistically significant (OR = 2.829, 95% CI = 1.045–7.657, P < 0.05). Among the study subjects, 83.9% of women availed health check-up in a health facility, which is at a distance of 2 km from the place of residence as against women staying more than 2 km (70.6%) and the difference was not statistically significant. Abusalehshariff et al. found that the presence of health care services within five km of the village significantly increased antenatal check-ups (ANC) visits and similar results were shown by Zulfi Khan et al. in a study conducted in the urban area of Uttar Pradesh.[28,29] It was observed that women belonging to lower socio-economic classes followed by the middle class were more likely to visit for antenatal check-ups when compared to upper class women. Contrary to the current study, it was found that women with lower-income groups had less than three ANC visits as compared to those with high-income groups in a study.
done by Anita G et al. in East Delhi and the difference was statistically significant. Among the study subjects 80.6% of literates had undergone health check-up services as compared to illiterates (86.5%), but the association was not statistically significant. Contrasting findings were observed in Uttarakhand study conducted by Digambar A et al. where literates (89%) were taking more antenatal check-ups compared to illiterates (22.3%) and in a study conducted in Nigeria showed that literates (82.1%) were taking more antenatal care than illiterates (50%). A study in Maharashtra conducted by Mumbare SS et al. showed that the education of mothers had a significant association with the utilization of antenatal care services. The current study also found that receiving health education is statistically associated with the distance between the household and anganwadi center. The majority of the participants who received health education were residing near to the center.

The most common reason for not utilizing supplementary nutrition services in the current study was not liking the taste and quality of food (38.9%), followed by unhygienic conditions in anganwadi center (33.3%). A similar finding was observed in Jose MJ et al. study, in which quality issue was the most (16.1%) common reason. Moosan H et al. study reported difficulty in reaching the center as the most common reason among pregnant women for not availing anganwadi services. The present study found that lack of time (66%) was the most common reason for not utilizing nutrition and health education services whereas, Mundodan JM et al. study reported being not aware of sessions as most (13.82%) common reason. Preethy et al. study found that household work (43%), distance (40%), and lack of awareness (13%) as barriers for women to utilize anganwadi services.

Relevance to the practice of primary care physicians

Malnutrition and infections are the main health problems affecting the health of the mother and these can be prevented by effective utilization of ICDS services. Primary care physicians and his team play a key role in promoting the package of services delivered under ICDS and works in coordination with anganwadi centers. Primary care physicians should be aware of barriers for utilization of anganwadi services among the beneficiaries in the community in order to plan appropriate sensitization activities for motivating them to avail the services in view of reducing maternal morbidity and mortality and by projecting utilization rates and barriers the current study will come in handy to plan the activities for promoting ICDS.

Conclusion

Although the majority of the pregnant women were utilizing anganwadi services except for health education and referral services, there is a need to sensitize and motivate beneficiaries in order to improve the utilization rates of services delivered by anganwadi center. Distance from anganwadi center was significantly associated with utilization of services. The health care team should motivate and encourage pregnant women who were residing far away from anganwadi center or develop alternate strategies for them to utilize the services, which are meant to improve their nutritional and health status thus resulting in positive pregnancy outcomes.

Strengths and limitations

Highlighting the rate of utilization and factors associated with the utilization of services offered by anganwadi center to pregnant women is the strength of the study. Not much literature is available, which highlights the utilization of anganwadi services by pregnant women, which is another positive aspect of the current study. However, few limitations could not be avoided, particularly restricting to only five anganwadi centers, which limits the generalization of the results.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient (s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

References

1. Evaluation report on ICDS. Programme Evaluation Organisation Planning Commission; Govt. of India. March 2011.
2. Park K. Park's Textbook of Preventive and Social Medicine. 25th ed. Jabalpur: M/S BanarsidasBhanot Publishers; 2019. p. 647-8.
3. Agarwal KN, Agarwal DK, Agarwal A, Rai S, Prasad R, Agarwal S, et al. Impact of integrated child development services (ICDS) on internal nutrition and birth weight in rural Varanasi. Indian Pediatr2000;37:1321-7.
4. Madhavi H, Singh HK, Bendigiri ND. A study of utilization of integrated child development services (ICDS) scheme and beneficiaries-satisfaction in rural area of Gulbarga district Pravara Med Rev 2011;3:13-7.
5. Preethy J, Navaneetha M, Ansuya. A study to identify the knowledge and utilization of integrated child development scheme (ICDS) services among women in Udupi District, Karnataka.InJNursEdu2011;3:23-7.
6. Dandotiya D, Priya A, Toppo M, Melwani V, Sethia S. A study on utilization and satisfaction of ICDS services in Aanganwadis of Urban Bhopal. Ind J Youth Adoles Health 2018;5:30-3.
7. Davis SF, Payne HE, Hine CA, Gray BL, Crookston BT. Factors associated with accessing ICDS services among women in rural Rajasthan, India. Health 2018;10:1271-82.
8. Bariya B, Patel NA, Nayak S. Utilization of supplementary nutrition food packets by pregnant and lactating mothers in urban areas of Valsad, Gujarat. Healthline J 2017;8:42-6.
9. Jayasheela E, Peram V. Assessment of nutritional status of pregnant and lactating women attending ICDS Anganwardicentres (AWC) in rural areas of Medak district. IntJAppRes2019;5:106-10.
10. Evaluation of Integrated Child Development Services (ICDS) 2005: Volume B: Himachal-Pradesh. Socio-Economic and Educational Development Society (SEEDS), New-Delhi, p. 52. Available from: www.ncaer.org/downloads/Reports/HumanDevelopmentinindia.pdf.[Last accessed on2019 Jul 15].
11. Moosan H, Stanley A, Prabhakaran AO, Vijayakumar K, Jayasree AK, Gopakumar S. Comparison of health-care utilization pattern and its correlates among the tribal and nontribal population of Kerala. Indian J Community Med 2019;44:57-61.
12. Lal S, Khanna P, Vashisht BM, Punia MS, Satpathy S, Kumar S. Participation of pregnant and lactating mothers in ICDS programme in rural area. Indian J Matern Child Health 1995;6:76‑9.
13. Dash NC. Impact Assessment/Evaluation of ICDS programme in the state of Orissa. Bhubaneswar: Centre for Rural Development. p. 170. Available from: www.ksrmeccs.ac.in/ACCESS/TO-Child-Development-SERVICE. [Last accessed 2019 Aug 14].
14. Francis PT, Paul N. Utilization of Anganwadiservices in a rural population of Kerala. Indian Pediat2015;54:65-6.
15. Khan AA, Singh AK, Gupta SB, Singh JP, Khan H, Maheshwari S. Assessment of supplementary nutrition service utilization at Anganwadi centresin rural area of district Bareilly. Indian J Forensic Community Med 2016;3:20-4.
16. Talati KN, Nimbalkar S, Phatak A, Patel D. Take home ration in ICDS programmes: Opportunities for integration with health system for improved utilisation via mamta card and e-mamta. BJM Glob Health 2016;1(Suppl 1):A7-8.
17. Mundodan JM, Metgud CS. Nutritional and health education services under integrated child development services in an urban area of North Karnataka. NII J Community Med 2015;7:16-20.
18. Jose MJ, Johnson AR, Thomas A, Mendez D, Sebastian C. Barriers to utilization of anganwadi services by pregnant women and lactating mothers: A hospital based cross sectional study in rural South Karnataka. Int J Community Med Public Health 2019;6:2634-9.
19. Paul L, Chellan R, Sahoo H. Unmet need of integrated child development services (ICDS) among economically weaker sections in Indian Society. SocSciSpectr 2017;3:141-53.
20. Patil KS, Kulkarni MV. Knowledge and utilization of integrated child development services (ICDS) scheme among women in an urban slum- A community based study. Indian J Forensic Community Med 2016;3:267-71.
21. Banerjee B. Maternal care rendered at an urban health centre of a metropolitan city. Indian J Community Med 2006;31:183-4.
22. Agha S, Carton TW. Determinants of institutional delivery in rural Jhang, Pakistan. Int J Equity Health 2011;10:31.
23. Dairo MD, Owoyokun KE. Factors affecting the utilization of Antenatal care services in Ibadan, Nigeria. Benin JPost Grad Med 2010;12:4-9.
24. Meena JK, Verma A, Kumar R. Evaluate of integrated childhood development services (ICDS) program implementation in an urban slum of Delhi, India. Int J Res Med Sci 2017;5:34437.
25. Kshirsagar VY, Mohite RV. Impact of integrated child development services (ICDS) on morbidity status of children and knowledge, attitude, and practice of mothers towards ICDS: A comparative study. Indian J Child Health 2019;6:69-73.
26. Kumar G, Choudhary TS, Srivastava A, Upadhyay RP, Tanuja S, Bahl R, et al. Utilisation, equity and determinants of full antenatal care in India: Analysis from the National Family Health Survey 4. BMC Pregnancy Childbirth 2019;19:327.
27. Udayar S, Parveen M. Study of awareness and utilization pattern of antenatal and delivery services among tribal women of the reproductive age group in Kodagu district, Karnataka. Int J Med Sci Public Health 2020;9:1-6.
28. Abusaleh S, Geeta S. Determinants of maternal health care utilisation in India: Evidence from a recent household survey. Available from: www.ncaer.org.[Last accessed on2019 Aug 14].
29. Zulfia K, Mehnaz S, Siddiqui A R, Athar A, Salman K, Sandeep S. All slums are not equal: Maternal health conditions among two urban slum dwellers. Indian J Community Med 2012;37:50-6.
30. Anita G, Pragti C, Kannan AT, Gayatri S. Determinants of utilization pattern of antenatal and delivery services in an urbanized village of East Delhi. Indian J PrevSoc Med 2010;41:240-5.
31. Chimankar DA, Sahoo H. Factors influencing the utilization of maternal health care services in Uttarakhond. Ethno Med 2011;5:209-16.
32. Mumbare SS, Rege R. Ante natal care services utilization, delivery practices and factors affecting them in tribal area of North Maharashtra. Indian J Community Med 2011;36:287-90. doi: 10.4103/0970-0218.91331.