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Research Paper Statistics

Antenatal Care for Safe Motherhood And Influence of Associated Variates on the Same

M.Mamatha Research scholar, Department of Statistics, Kakatiya University, Warangal.

V. Nageswara Rao Professor, Department of Statistics, Kakatiya University, Warangal.

ABSTRACT

Present study attempts to explore hinders in the effective utilization of antenatal care by using the National Family and Health Survey (NFHS-III) data. The NFHS-III data is a representative sample of households obtained from throughout India. In India the maternal and child health is not promoted aggressively except in few cases which are either at high risk or only in reach of a certain set of people. Relatively more number of the urban than the rural is utilizing the antenatal care. There is significant impact of literacy on the utilization of antenatal services. Poor and rich disparity is also a cause for the pregnant lady's not utilizing the antenatal services. Most of the pregnant women's choice for the delivery is private hospital/maternity home and government/municipal hospital. There is significant contribution of the News paper/ magazines, Televisions and Radio in creating awareness among women for the utilization of antenatal services.

KEYWORDS : Antenatal services, factors influencing utilization of ANC, Chi-square test, Cluster analysis.

1.Introduction:

Every year, In India many pregnant women die due to complications occurring during the pregnancy which ultimately causes the child and mother mortality or low birth weight of the child along with many other health related issues. The reason behind such a situation is mainly due to the lack of awareness in the majority of the Indian rural population who are uneducated. It is a well established fact that giving birth under the medical supervision having the trained personal will reduce the risk of the child as well as maternal mortality. Antenatal care (ANC) is the care that is received from healthcare professionals during the pregnancy. Antenatal care offers a series of appointments with a midwife, or sometimes with a doctor who specializes in pregnancy and birth (an obstetrician). However, the content and quality of antenatal care and the availability of effective referral and essential obstetric care are important for antenatal care to be effective. Antenatal care is one of the "four pillars" of safe motherhood, as formulated by the Maternal Health and Safe Motherhood Program, Division of Family Health, of the World Health Organization (WHO) (World Health Studies in HSO&P, 17, 2001). The other three pillars are family planning, clean/safe delivery and essential obstetric care. The ANC package was devised to ensure that women should be able to go safely through pregnancy and childbirth and have healthy infants, in other words, to prevent the dreaded outcomes: maternal death, and prenatal and infant death.

2.Methods:

In the first stage the chi-square test is applied to find the association of the variables. And in the next stage the multivariate data analysis technique (agglomerative hierarchical clustering) is adopted to find out the results.

2.1.Chi-square test:

One of the most useful non-parametric statistics is chi-square test. The formula for chi-square for testing the association between the categorical variables is

$$\chi^2 = \sum_{i=1}^{r} \sum_{j=1}^{c} \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$$

Where

r = number of rows

c = number of columns

O_{ij} = Observed frequency or Actual number in cell (i , j)

E_{ij}= Expected frequency in cell (i , j)

(r-1)*(c-1) = degrees of freedom

We compare test statistic with a critical value of null distribution corresponding to a fixed level of significance 'α'. If calculated value is less than the computed value then we accept the null hypothesis otherwise we reject the null hypothesis. We can also use the P-value for making a decision. It is defined as "the probability that the null hypothesis is true". For a fixed level of significance 'α' (usually 0.05 or 0.01, more rarely 0.10), we reject null hypothesis if the P-value is smaller than α, otherwise we fail to reject null hypothesis at level α.

We can compute P-value by using the following

formula

$$\text{P- value} = [\, 0.5^{df/2} / \Gamma(df/2)\,] \times (\chi^2)^{(df/2)-1} \times e^{-\chi^2/2}$$

Where

Γ-Gamma value
d.f- degrees of freedom
χ^2- Chi-square value

2.2.Agglomerative Hierarchical Clustering:

It is a multivariate statistical procedure that starts with a data set containing information about a sample of entities and attempts to reorganize these entities into relatively homogeneous groups. At each stage the methods fuse individuals or groups of individuals which are closest (or most similar). Differences between the methods arise because of the different ways of defining distance (or similarity) between an individual and a group containing several individuals or between two groups of individuals. The clustering of objects can be achieved by similarity/dissimilarity measure or by using correlation coefficient. The linkage of the clusters is done by average linkage clustering method where the distance between two clusters is the average of the distances between all possible pairs of cases in the resulting cluster.

For two sets of observations *A* and *B* the average linkage clustering is given by

$$\frac{1}{|A||B|} \sum_{a \in A} \sum_{b \in B} d(a, b).$$

3.Variables influencing the utilization of ANC:

According to the NFHS-III data, it is observed that 3.3 percent of the women are pregnant. Out of these pregnant women it is noticed that still 18.5% of the women do not have their antenatal checkups. Since early reporting of pregnancy in rural areas is rare a detailed analysis was carried out on 29968 pregnant women, of these, 13204

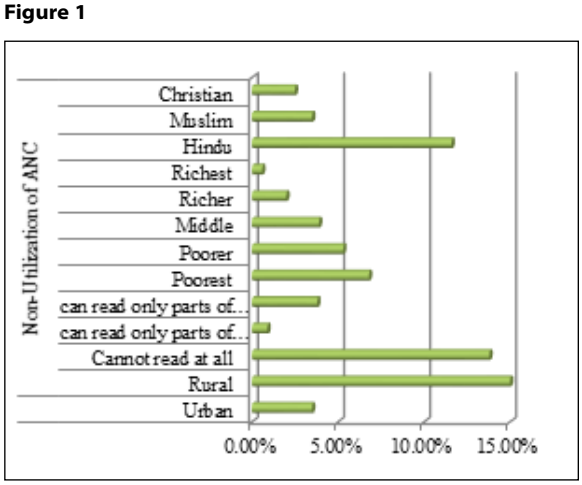
urban and 16764 rural are utilizing the antenatal service. This clearly indicates that even though more than 60% of the population of India lives in rural only few of them is utilizing the antenatal service. Out of 18.5% of the pregnant women not utilizing the antenatal service, the highest percentage that is 13.8% is the illiterate. This shows that education of the mother and the family appears as major influencing factor for not utilizing the antenatal care services among illiterates. Hence, illiterate women should be encouraged for the promotion of appropriate use of antenatal care to have an understanding of the Safe Motherhood. We observe a gradual increase in the use of antenatal care, when we move from the poorest to the richest. Even after many awareness programs and the government schemes still pregnant woman are not taken to any hospital for the safe mother and child birth process which directly causes in the pregnant woman mortality and prenatal deaths. This is considered to be a big problem since, the barrier of rich and poor is creating disturbance in our country even after advanced maternity care systems.

Out of total percentage of 17.6% of pregnant women who do not use antenatal services, Hindus account for 11.6%, Muslims account for 3.5% and the Christians account for 2.5%. Hence, importance of modern antenatal care should be emphasized in the religious settings in order to encourage the utilization of antenatal care services. The attributes Type of place of residence, Literacy, Wealth index, Religions verses antenatal care tells us that there is a statistically significant association between them showing that the pregnant women is influenced by all these factors for the utilization of antenatal care.

Table 1

		No Antenatal care	Chi-square value	DF	Asymptotic sig.
Type of place of residence	Urban	3.5%	1454.598	1	0.000
	Rural	15.0%			
Literacy	Cannot read at all	13.8%	3833.037	2	0.000
	Able to read only parts of sentence	0.9%			
	Able to read whole sentence	3.8%			
Wealth index	Poorest	6.8%	4466.215	4	0.000
	Poorer	5.3%			
	Middle	3.9%			
	Richer	2.0%			
	Richest	0.6%			
Religion	Hindu	11.6%	3284.730	9	0.000
	Muslim	3.5%			
	Christian	2.5%			

Figure 1



3.1.Impact of Media on utilization of ANC:

Media is an outlet for the effective communication of information. In India the most popular means of mass communication are News paper, Radio and Television. The careful observation to find the affect of media in passing the need of the ANC has shown that, out of 18.5% of pregnant women not utilizing antenatal care 16.8% does not read news paper at all. That means, more than 90% of pregnant not using pregnancy care, do not read news paper/ magazine at all. Hence, pregnant women who read Newspaper/magazine are more likely to use antenatal care than who do not read it at all. It proves that Newspaper/magazine has a strong role in using antenatal care. Out of 18.5% of pregnant women not utilizing antenatal care, 12.3% do not listen to Radio at all. That means, more than 65% of pregnant women not using pregnancy care, do not listen to radio at all. Hence, pregnant women who listen to the radio are more likely to use antenatal care than to who do not listen to radio at all. It proves that Radio also plays a vital role in the utilization of antenatal care. Out of 18.5% of pregnant women not utilizing antenatal care, 11.8% do not watch television at all. That means almost 65% of pregnant women not using pregnancy care do not watch television at all. Hence, pregnant women who watch television are more likely to use antenatal care than who do not. It proves that television also has a strong role in the utilization of antenatal care. Hence, the attributes Reading newspaper, listening to radio and watching Television verses antenatal care tells us that there is a statistically significant association between them. Since the media (Newspaper/magazine, Radio and Television) plays a wonderful role in communicating about the antenatal services an up-to-date and attractive maternal health care program should be promoted through Newspaper/magazine and broadcast through electronic media.

Table 2

	Newspaper/ magazine	Radio	Television
Not at all	16.8%	12.3%	11.8%
Less than once a week	1.1%	2.8%	2.5%
At least once a week	0.5%	1.8%	1.8%
Almost every day	0.2%	1.6%	2.5%
Chi-square value	2725.167	454.441	4111.962
Degrees of freedom	3	3	3
Asymptotic sig.	.000	.000	.000

3.2.Availability of antenatal services-A Cluster analysis:

A detailed study on the utilization of various ANC shows that the top two places of utilization of antenatal service is Private hospital/maternity home and government/municipal hospital. It also apparent that the third most popular antenatal care is at home (parent's home/other home/their home) that runs under medical supervision.

Hierarchical clustering analysis is computed for finding the similarities in utilization of antenatal care services. This clustering technique operates sequentially from the stage in which each antenatal care is considered to be single member cluster to the final stage in which there is a single group containing 13 sources of antenatal care. The following 13 sources of the ANC are considered for the study are Your home, Other home, Parent's home, Govt./municipal hospital, Govt. dispensary, UHC/UHP/UFWC, CHC/Rural hospital/PHC, Sub-centre, Anganwadi/ICDS centre, Anganwadi/ICDS centre, Pvt. hospital/maternity home, Other private, Village clinic by ANM, NGO/Trust hospital/clinic.

Figure 2

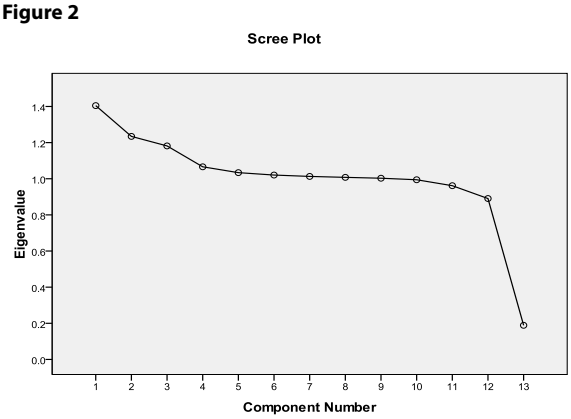


Table 3: Cluster Membership	
Case	9 Clusters
Antenatal care: your home	1
Antenatal care: other home	2
Antenatal care: parent's home	3
Antenatal care: govt./municipal hospital	4
Antenatal care: govt. dispensary	5
Antenatal care: UHC/UHP/UFWC	2
Antenatal care: CHC/Rural hospital/PHC	6
Antenatal care: sub-centre	7
Antenatal care: Anganwadi/ICDS centre	8
Antenatal care: Pvt. hospital/maternity home	9
Antenatal care: other private	2
Antenatal care: village clinic by ANM	2
Antenatal care: NGO/Trust hospital/clinic	2

From the agglomerative schedule, at the first stage since, dissimilarity is less for variable 2(Other home) and variable 6(UHC/UHP/UFWC) they are combined and cluster created by their joining appears in stage 2.Now in stage 2, the variable 2(Other home) and variable 12(Village clinic by ANM) are combined for proceeding to the stage 3.Now in stage 3, the variable 2(Other home) and variable 13(NGO/Trust hospital/clinic) are joined to form the cluster. The process is continued for 12 stages and the last stage joins the variable 1(Your home) and variable 10(Private hospital/maternity home).

The cluster membership shows that the 13 sources of antenatal services are clustered according to the following pattern consisting 9 clusters.

- First cluster is formed by unique antenatal care: your home
- The second cluster is due to antenatal cares: other home, UHC/UHP/UFWC, other private, village clinic by ANM, NGO/Trust hospital/clinic
- The third cluster is formed by unique antenatal care: parent's home
- Fourth cluster is formed by unique antenatal care: government/municipal hospital
- Fifth cluster is formed by unique antenatal care: government dispensary
- Sixth cluster is formed by unique antenatal care: CHC/rural hospital/PHC
- Seventh cluster is formed by unique antenatal care : sub centre
- Eighth cluster is by unique antenatal care : Anganwadi/ICDS center
- Ninth cluster is formed by unique antenatal care private hospital/maternity home.

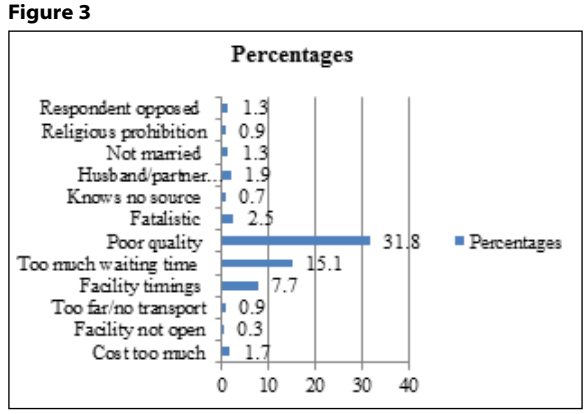
Since, the second cluster is due the antenatal cares: other home, UHC/UHP/UFWC, other private, village clinic by ANM, NGO/Trust hospital/clinic showing that these five antenatal cares possess similarity between them with respect to their utilization. This shows that there is a similarity between these five information sources with respect to their utilization.

3.3.Reasons for not using health care facility:

The size, complexity and geographical variation among the Indian population results into several reasons for non-utilization of antenatal care. We have considered the 12 reasons which influence the pregnant women for not using the deliver care at health facility. Antenatal care utilization is significantly associated with the level of quality of service for utilization during the pregnancy. Result of the study shows that most common reason of not taking antenatal care by our women is due to the too much waiting time at the health facilities.

We see that 31.8% of the pregnant women did not use the delivery care because of its poor quality. The second biggest reason for not using the delivery care is too much waiting time at the facility. It is also clear that 7.7% of the pregnant women did not use the delivery care due to the facility timings. All the other reasons contribute to a little percentage for not using the delivery care. Hence, delays in accessing health facility is associated with the problems or constraints that women face which is usually due to poor quality the service, due to the waiting and facility timings of the service, fatalistic nature, opposition from the husband, too much cost of the facility.

Figure 3



4.Conclusions:

The primary goal of the antenatal care is to achieve safe motherhood by reducing the maternal and child mortalities. The visits of antenatal care prevent many health problems in pregnant women by carefully treating pregnant women under the trained health workers. Utilization of antenatal services is a complex phenomenon influenced by many factors. The education level, type of place of residence, rich and poor barriers are proved to be significant factors influencing the utilization of antenatal services. The Newspaper/magazine, Radio and Television prove to be the best in communicating about the antenatal services. The present study revealed that the most popular antenatal care services are Private hospital/maternity home and Government / municipal hospital. Out of the 12 reasons behind the pregnant women didn't deliver at the health facility, the facility timings, poor quality of the service and too much waiting time to get the service prove to be major reasons . From the study, it is suggested that more awareness and the knowledge of the antenatal services should be promoted by print and electronic media to achieve the best utilization of antenatal care services. As the level of education enhances the knowledge about the antenatal care among the pregnant women, education for the women should be made mandatory by the government. Efforts towards ensuring the utilization should be targeted towards rural areas, the importance of modern antenatal care should be emphasized even in the religious settings and younger women should be encouraged to utilize antenatal care services.

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