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Original Research Article

Maternal and newborn health services in urban Andhra Pradesh: a household assessment

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ABSTRACT

Background: Maternal and newborn health services remain a crucial public health priority in India, reflecting the broader socio-economic and healthcare landscape. Despite initiatives, maternal mortality and morbidity persist due to inadequate access to healthcare services, delayed care, socio-cultural practices, and lack of awareness. In light of the persistence of maternal mortality and morbidity, the Commissioner of Health and Family Welfare (CH&FW), Andhra Pradesh (AP), has directed the lady health visitor (LHV) trainees of the Regional Training Centre (female) RTC (F), Kurnool, to conduct a household survey.

Methods: Data were collected using a pretested interview schedule communicated by the CH&FW, AP, via convenience sampling. Statistical analysis was performed using statistical package for the social sciences (SPSS) 21.0, and the chi-square test was used; a $p<0.05$ was considered statistically significant.

Results: The majority of households are Hindu (76%), BPL (80.8%), daily labourers (52.7%), and illiterate (35.5%). 98.1% have a pucca house, and 98.9% have a toilet. Among all pregnant women, 94% are registered before 12 weeks of pregnancy, 97% have ABHA, 60% have used only JSSK and 102 services, and 88% are planned for a safe birth. All deliveries have taken place in the hospitals. Of all respondents, 23.3% suffered from NCDs, and 6.7% incurred out-of-pocket expenses.

Conclusion: This study has compared the health indicators of the study region, with those at the state and national levels; however, the comparison is not suggestive. Anyhow, this study has highlighted gaps in the implementation of maternal and newborn health services. This study serves as an eye-opener for those who set common targets for all regions and a roadmap for policymakers to identify better strategies to improve maternal and newborn healthcare services.

Keywords: Household, Maternal, Newborn, Catastrophic, Out-of-pocket

INTRODUCTION

Maternal and newborn health services remain a crucial public health priority in India, reflecting the broader socio-economic and healthcare landscape. Despite initiatives such as Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA), Pradhan Mantri Matritva Vandana Yojana (PMMVY), Janani Shishu Suraksha Karyakram (JSSK), and Janani Suraksha Yojana (JSY), maternal mortality and morbidity persist, especially in rural and underserved regions.[1] In light of the persistent maternal mortality and morbidity, the Commissioner of Health and Family Welfare (CH&FW), Andhra Pradesh (AP), India, has directed the lady health visitor (LHV) trainees of the Regional Training Centre (female) (RTC-F), Kurnool, AP, to conduct a household survey as part of the curriculum to identify the gaps in maternal and newborn healthcare services.[2]

An LHV is a trained professional in the public healthcare sector that plays a crucial role in providing basic healthcare

services by preventing disease, promoting health, and prolonging the lives of the public, especially mothers and children.[3] They supervise the daily activities of the auxiliary nurse midwives (ANMs) who work under their control. The senior ANMs will be promoted to LHV posts after completing 42 days of residential training at the Regional Health and Family Welfare Training Centres (male) or RTC-F.

In the present context, "a household was defined as a group of people who normally live together and share meals from a common kitchen. This group can be either a single family or a group of unrelated individuals".[4]

Research gaps and need for the study

There is no research wing exclusively dedicated to studying the factors associated with maternal and newborn healthcare services in AP. In-depth studies on the topic in AP have been scarce. Hence, the study attempts to fill the gaps and provide an opportunity for policymakers and administrators to craft suitable policies and strategies to address the associated factors.

Aim

The current survey aims to evaluate growing challenges in Kurnool City's Mujafar Nagar and Kalluru zones, including fertility rates, maternal and child health (MCH) services, and respondents' awareness of health schemes, as well as differences in respondents' background characteristics.

Objectives

The objectives were to assess the socio-demographic profile of the respondents, to determine the association of awareness level of health schemes, equity gaps, and catastrophic health expenditure incurred, and to estimate the key health indicators in the surveyed population and compare with the state and national levels.

Hypothesis

The prevalence of health hazards, awareness levels, and utilization of health schemes at the community level are significantly correlated with respondents' background characteristics, such as age, gender, economic status, and educational level.

METHODS

Identification of respondents

A community-based descriptive cross-sectional study (household survey) was conducted for 42 days (25 November 2025 to 06 January 2026) among selected households in the Mujafar Nagar and Kalluru zones of Kurnool City, AP (part of the Urban Primary Health Centre (UPHC), Mujafar Nagar). Data were gathered from 1,000 respondents who were present throughout the survey and able to complete the interview schedule; those who were absent and were unable to complete the survey were excluded.

Data collection

As per the instructions of the CH&FW, AP, as part of the curriculum, the LHV trainees (40) of the RTC (F), Kurnool, were required to conduct a household survey in 25 households each, for a total of 1,000. After excluding 19 incompletely filled-out schedules, 981 were analysed and interpreted. A convenience sampling technique was employed to select respondents who were present on the day of data collection. Prior permission was obtained from the district medical and health officer, Kurnool. The study objectives were explained in detail to the respondents, and oral consent was obtained from each. A pre-tested interview schedule was used, which was communicated by the CH and FW, AP, consisting of 92 questions in 14 areas comprising background characteristics (age, gender, religion, economic status, family background, and disability), environmental characteristics, awareness levels of health schemes and utilization, non-communicable diseases (NCDs) and related factors, and catastrophic health expenditure.

Statistical analysis

According to government guidelines, this survey categorized urban families as below the poverty line (BPL) if their annual income was less than INR 1,44,000, and families as above the poverty line (APL) if they exceeded the limit. The collected data were loaded into Microsoft Office Excel 2010, and statistical package for the social sciences (SPSS) 21.0 was used for statistical analysis. Mostly, frequency and cross-tabulation were employed with appropriate statistical percentages and ratios. The Chi-Square test was employed to determine the level of significance, with $p<0.05$ being deemed statistically significant.

RESULTS

Socio-demographic characteristics of respondents

According to Table 1, the majority of households are between the ages of 40-59 (46.9%), male (80.8%), Hindu (76%), BPL (80.8%), daily labourers (52.7%), and have poor literacy levels (35.5%). Moreover, 77.4% of households have an Ayushman Bharat Health Account (ABHA), 62.4% have four or more family members, and 23.4% receive social pensions.

Environmental characteristics of respondents

Table 2 shows that 98.1% of households have a pucca house, and almost the same proportion (98.9%) have a toilet. 97.5% of households dispose of kitchen garbage safely. Over three-fourths (78.9%) have a separate kitchen

and a pucca drainage system (89.3%). More than two-thirds (70.3%) of household members drink municipal water, and all use liquefied petroleum gas (LPG).

Pregnant women's health-related experiences and the support they received

Table 3 reveals that among all pregnant women (33 at the time of the survey), two-thirds (66.6%) are registered within the first eight weeks of pregnancy, 42.4% are anaemic (mild and moderate), and about one-fourth (24.2%) are at high risk. All the pregnant women received timely the Td injection, and 87.8% are planning for a safe birth. 97% received a full course of tablets containing iron and folic acid (I and FA) and calcium. More than four-fifths (82%) have availed of PMSMA and lab diagnostics. Over half (51.5%) of antenatal mothers have availed four antenatal check-ups, and 91% have procured take home ration (THR) from the Anganwadi Centre. On the contrary, of the five spontaneous abortions, three are held in private hospitals, and three are reported to have taken place during the first twelve weeks of pregnancy.

Postnatal women and children's health-related experiences and the support they received

Table 4 shows that all deliveries (20 at the time of the survey) are institutional (100%), but C-section rates are high (45%). All twenty are live births, all received timely immunization, and all have availed themselves of HBNC. Among all neonates, 75% have normal birth weight, 90% have an ABHA/Reproductive child health (RCH) ID, and 80% have procured a birth certificate. Among all postnatal mothers, 60% have availed themselves of JSSK and 102 services, and 80% have practiced exclusive breastfeeding.

On the other hand, ever-married women in the sample households (247) have adopted the tubectomy method of family planning, and just 5 women have reported using intra-uterine contraceptive device (IUCD).

Table 1: Percentage distribution of respondents by selected socio-demographic characteristics.

Selected variable	Frequency	Percentage
Surveyed location		
Mujafar Nagar	1983	51.6
Kalluru	1859	48.4
Total	3842	100.0
Socio-demographic characteristics		
Age in years		
20-39	278	28.3
40-59	460	46.9
60 and +	243	24.8
Total	981	100.0
Gender		
Male	793	80.8
Female	188	19.2
Total	981	100.0
Religion		
Hindu	746	76.0
Muslim	184	18.8
Christian	51	5.2
Total	981	100.0
Education		
Illiterate	348	35.5
School educated	383	39.0
Collegiates	250	25.5
Total	981	100.0
Occupation		
Daily labourers	517	52.7
Self-employed	184	18.8
Private employed	122	12.4
Others (govt. employee and pensioners)	158	16.1
Total	981	100.0
Economic status		
APL	188	19.2
BPL	793	80.8

Continued.

Selected variable	Frequency	Percentage
Total	981	100.0
Type of social pension receiving		
Widow	80	8.2
Old age	122	12.4
Others (handicapped, single women)	27	2.8
Not receiving	752	76.6
Total	981	100.0
Ayushman Bharat Health Account (ABHA)		
Having	759	77.4
Not having	222	22.6
Total	981	100.0
Size of the family		
<Two members	172	17.5
Three members	197	20.1
Four members	300	30.6
Five and above	312	31.8
Total	981	100.0
No. of eligible couples (ECs) in a household		
One	706	72.0
Two and above	36	3.6
Nil	239	24.4
Total	981	100.0
No. of 0–1-year-olds in each household		
One	49	5.0
Nil	932	95.0
Total	981	100.0
No. of 1–2-year-olds in each household		
One	68	6.9
Nil	913	93.1
Total	981	100.0
No. of 3–5-year-olds in each household		
One	125	12.7
Two and above	19	1.9
Nil	837	85.4
Total	981	100.0

Table 2: Percentage distribution of households by selected environmental characteristics.

Selected environmental characteristics	Frequency	Percentage
Structure of the house		
Pucca	962	98.1
Semi pucca	19	1.9
Total	981	100.0
In the house, separate cooking room		
Available	774	78.9
Not available	207	21.1
Total	981	100.0
Drinking water usage		
Municipality supply	690	70.3
Mineral (reverse osmosis - RO) water	291	29.7
Total	981	100.0
Drainage system		
Soakage pit	105	10.7
Pucca drainage	876	89.3

Continued.

Selected environmental characteristics	Frequency	Percentage
Total	981	100.0
Kitchen garbage disposal through the:		
Municipality	956	97.5
Dung heaps	25	2.5
Total	981	100.0
Toilet facility		
Yes	970	98.9
No	11	1.1
Total	981	100.0
Having animals and disposing of animal garbage through the dung heaps		
Yes	9	0.9
No	972	99.1
Tot**al**	981	100.0
Cooking fuel usage		
Liquefied petroleum gas (LPG)	981	100.0
Total	981	100.0

Table 3: Percentage distribution of antenatal mothers by health-related events and services accessed.

Health related events and services availed	Frequency	Percentage
Pregnancy registration		
<8 weeks	22	66.6
8–12 weeks	9	27.3
>12 weeks	2	6.1
Total	33	100.0
Has the pregnant woman ABHA and mother and child protection (MCP) card?		
Yes	32	97.0
No	1	3.0
Total	33	100.0
Pregnancy status		
High risk	8	24.2
Normal position	25	75.8
Total	33	100
Term of pregnancy		
First	13	39.4
Second	14	42.4
Third	6	18.2
Total	33	100.0
Haemoglobin status of the pregnant		
Normal	19	57.6
Mild anaemia	7	21.2
Moderate anaemia	7	21.2
Total	33	100.0
Birth planning		
Planned	29	87.8
Not planned	4	12.2
Total	33	100.0
TD (tetanus and diphtheria) injection received		
1st dose	22	66.7
2nd dose	8	24.3
Booster dose	3	9.0
Total	33	100.0
Tab. I and FA 180 Nos. and calcium 360 nos.		
Received	32	97.0

Continued.

Health related events and services availed	Frequency	Percentage
Not received	1	3.0
Total	33	100.0
Tab. Albendazole		
Received	22	66.6
Not received (whose pregnancy is <16 weeks)	11	33.4
Total	33	100.0
Services such as PMSMA and lab. diagnostics		
Availed	27	82.0
Not availed	6	12.0
Total	33	100.0
Four Antenatal (A.N.) check ups		
Availed	17	51.5
Not availed (whose pregnancy is 1st and 2nd term)	16	48.5
Total	33	100.0
Supplementary food (take home ration - THR) received by AN mother at Anganwadi centre		
Received	30	91.0
Not received	3	9.0
Total	33	100.0
Place of spontaneous abortion held		
Private hospital	3	60.0
Home	2	40.0
Total	5	100.0
No. of weeks of the pregnancy if spontaneous		
Abortion held		
<12 weeks	3	60.0
12-16 weeks	2	40.0
Total	5	100.0

Table 4: Percentage distribution of postnatal women and children by health services accessed.

Selected variable	Frequency	Percentage
Place of delivery		
Govt. institutions	14	70.0
Private hospital	6	30.0
Total	20	100.0
Type of delivery		
Normal	11	55.0
Caesarean	9	45.0
Total	20	100.0
Birth result (all are live birth)	20	100.0
JSSK and 102 services		
Availed	12	60.0
Not availed	8	40.0
Total	20	100.0
Sex of the baby		
Male	11	55.0
Female	9	45.0
Total	20	100.0
Has the baby ABHA/RCH ID?		
Yes	18	90.0
No	2	10.0
Total	20	100.0
Age of the baby at the time of survey		
<6 months	15	75.0
Six months - one year	5	25.0

Continued.

Selected variable	Frequency	Percentage
Total	20	100.0
Birth certificate		
Procured	16	80.0
Not procured	4	20.0
Total	20	100.0
Baby weight at birth (gm)		
<2,500	5	25.0
>2,500	15	75.0
Total	20	100.0
Home based neonatal care (HBNC) availed	20	100.0
Home based young child care (HBYC)		
Availed	14	70.0
Not availed	6	30.0
Total	20	100.0
Exclusive breast feeding practiced		
Practiced	16	80.0
Not practiced	4	20.0
Total	20	100.0
Coverage with all basic vaccinations in children	20	100.0
Timely vitamin 'A'		
Received	4	20.0
Not received (infant age may be <9 months)	16	80.0
Total	20	100.0
Adoption of family planning (FP) permanent methods		
Tubectomy	247	NA
Adoption of temporary methods		
Intra-uterine contraceptive device (IUCD)	5	83.3
Oral pill cycles	1	16.7
Total	6	100.0

NA=Not applicable (it is not possible to calculate the percentage because there is no denominator, as none of the respondents adopted a vasectomy)

Table 5: Percentage distribution of respondents by awareness of health welfare schemes.

Awareness of health welfare schemes	Frequency	Percentage
ABHA		
Yes	628	64.0
No	353	36.0
Total	981	100.0
NTR Vaidya Sevalu		
Yes	693	70.6
No	288	29.4
Total	981	100.0
Janani Suraksha Yojana (JSY)		
Yes	232	23.6
No	749	76.4
Total	981	100.0
Pradhan Mantri Matru Vandana Yojana (PMVVY)		
Yes	156	15.9
No	825	84.1
Total	981	100.0
Pradhan Mantri Jan Arogya Yojana (PMJAY)		
Yes	153	15.6
No	828	84.4
Total	981	100.0

Continued.

Awareness of health welfare schemes	Frequency	Percentage
Total	981	100.0

Awareness of health welfare schemes among respondents

Table 5 reveals that a high percentage of the respondents are aware of ABHA (64%) and NTR Vaidya Sevalu (70.6%). On the contrary, a greater percentage of all respondents are unaware of JSY (76.4%), PMVVY (84.1%), and PMJAY (84.4%).

The household's persistent health issues and out-of-pocket expenses associated with hospitalization

Table 6 shows that among the sample households, 23.3% (229 of 981) have at least one member suffering from an NCD (at the time of the survey). Of all sufferers with NCDs, 39.8% (91 of 229) have multiple NCDs, 53.3% are aged 40–59 years, and 68.1% have an ABHA. However, 6.7% of households have at least one member hospitalized in the year preceding the survey. Among all hospitalized patients (66), over one-fourth (28.8%) have undergone surgery, and 18.2% have suffered from heart diseases. Of all patients, about three-fourths (71.2%) are admitted to private hospitals, and almost the same number (72.7%) have availed themselves of NTR Vaidya Sevalu (free health insurance scheme). Despite a large percentage of patients utilizing a free health insurance scheme, 95.4% of all victims have paid for OOPE. Of them, 16.6% have spent more than Indian rupee (INR) 81,000 each. About two-fifths (38.5%) of female respondents aged 40 years or more have used Mahila master health check-up (MMHC).

Table 6: Percentage distribution of the surveyed population by prevailing health issues followed by out-of-pocket expenses incurred towards hospitalization.

Selected variable	Frequency	Percentage
Distribution of non-communicable diseases (NCDs)		
Hypertension	75	32.8
Diabetes	47	20.5
Heart related diseases	16	6.9
Suffering with multiple NCDs	91	39.8
Total	229	100.0
Age distribution of the NCD patients		
>21-39	12	5.2
>40-59	122	53.3
>60 and +	95	41.5
Total	229	100.0
Is an NCD patient has ABHA?		
Yes	156	68.1
No	73	31.9
Total	229	100.0
Has a family member been hospitalized in the past year?		
Yes	66	6.7
No	915	93.3
Total	981	100.0
Cause of hospitalization		
Heart diseases	12	18.2
Road accidents	5	7.6
Cataract operation	5	7.6
Deliveries	6	9.0
Kidney and liver disease	7	10.6
Surgeries	19	28.8
Others	12	18.2
Total	66	100.0
Hospital management where the patient was hospitalized?		
Govt.	19	28.8

Continued.

Selected variable	Frequency	Percentage
Private	47	71.2
Total	66	100.0
Has the patient availed of NTR Vaidya Sevalu?		
Yes	48	72.7
No	18	27.3
Total	66	100.0
Out-of-pocket expenses (OOPE) incurred towards hospitalization INR (Indian rupee)		
<20,000	25	37.9
20,000-40,000	12	18.3
40,000-60,000	9	13.6
60,000-80,000	6	9.0
81,000<	11	16.6
Nil	3	4.6
Total	66	100.0
Type of disability and ABHA holding		
Mental retardation	1	16.7
Physical disability	5	83.3
Total	6	100.0
Availing the Mahila Master Health Check-up (MMHC) by the female respondents aged 40 years or more		
Availed	64	38.5
Not	102	61.5
Total	166	100.0

The association between the key health-related issues of respondents (households) and selected background variables

This section analyzes the association between key health-related issues and selected background characteristics of respondents and interprets them lucidly.

DISCUSSION

Association between the awareness of respondents of health welfare schemes, hospitalization, and selected variables

Age versus awareness of ABHA

According to data presented in panel 1 of Table 7, the percentage of respondents who are aware of ABHA is slightly higher among those who are younger in age (21–39 and 40–59) than among those who are 60 years of age or older (66.5% and 65.9%, respectively versus 57.6%).

Education versus awareness of ABHA

According to panel 2 of Table 7, the percentage of respondents who are aware of ABHA is significantly higher among college-educated than among those who are illiterate and have a school education (70.4% versus 60.9% and 62.7%, respectively).

Income versus awareness of ABHA

Panel 3 of Table 7 reveals that the percentage of respondents aware of ABHA is significantly higher among those living in APL families than among those living in BPL families (72.3% versus 62.0%). The association between knowledge of the ABHA of respondents and their age, education, and income is statistically significant ($p<0.05$, $p<0.046$, and $p<0.005$, respectively).

Age, education, and income versus awareness of PMMVY

The percentage of respondents, who are aware of ABHA, in relation to their age, income, and level of education, as shown in panels 1–3 of Table 7, displays a comparable trend in panels 4–6 concerning awareness of PMMVY (age in years: 21-39 (20.9%) versus 40-59 (15.0%) and 60 and + (11.9%); education: collegiate (22.0%) versus illiterate (12.9%) and school educated (14.6%); and income: APL (22.9%) versus BPL (14.2%), respectively).

Gender versus awareness of PMMVY

Panel 7 of Table 7 shows that the percentage of respondents who are aware of PMMVY is higher among men compared to women (17.2% versus 10.6%).

The association between respondents' awareness of PMMVY and their age, education, income, and gender are statistically significant ($p<0.016$, $p<0.008$, $p<0.003$, and $p<0.016$ respectively).

Income versus awareness of NTR Vaidya Sevalu

Panel 8 of table 7 indicates that a higher percentage of respondents affiliated with the APL category are aware of NTR Vaidya Sevalu compared to those from BPL category families (84.6% versus 67.3%).

The association between awareness of NTR Vaidya Sevalu of respondents and their income is statistically highly significant (p<0.000).

Age, gender, education, and income versus awareness of JSY

The similar trend in the percentage of respondents aware of ABHA and PMMVY across age, gender, education, and income, as mentioned in panels 1–7 of Table 7, is repeated in panels 9–12 regarding awareness of JSY (age in years: 21-39 (28.4%) versus 40-59 (23.7%) and 60 and + (18.1%); gender: males (25.5%) versus females (16.0%); education: collegiate (31.2%) versus illiterate (17.2%) and school educated (24.5%); and income: APL (34.0%) versus BPL (21.2%), respectively).

The association between awareness of respondents of JSY and their age, gender, education, and income are statistically significant (p<0.022, p<0.003, p<0.000, and p<0.000, respectively).

Occupation versus awareness of JSY

Panel 13 of Table 7 indicates that the percentage of respondents working as daily labourers who are aware of JSY is lower than that of those who are self-employed or privately employed (20.9% versus 25.5% and 36.1%, respectively).

The association between awareness of JSY and occupation is statistically highly significant (p<0.003).

Earlier studies also disclosed that the levels of awareness and accessibility of government welfare schemes vary across populations, with the differences strongly influenced by background characteristics such as age, education, gender, occupation, and income.[5,6]

Income versus hospitalization

Panel 14 of Table 7 indicates that the percentage of respondents hospitalized is significantly greater in the APL category compared to the BPL category (14.4% versus 4.9%).

The need for healthcare is greater among low-income individuals. Reasons cited included the lack of nearby medical facilities, the cost of care, long waiting times, and various personal and economic obligations. Families with higher incomes typically have a greater capacity to manage significant medical expenses and often have access to private health insurance to assist with these costs. From a policy perspective, it is crucial for public health funding to be allocated effectively to address the healthcare needs of all individuals, especially those in poverty, whose needs are often unmet. Previous studies have provided similar findings.[7]

The association between the income and the hospitalization is statistically highly significant (p<0.000).

The association between the adoption of tubectomy operation by the respondents and selected variables

Education versus adoption of tubectomy operation

Panel 1 of Table 8 shows that the percentage of illiterate respondents who adopted the tubectomy operation is lower than that of respondents who are college-educated and have a school education (18.4% versus 28.4% and 29.2%, respectively).

There is an inverse relationship between family size and education, with more educated families typically having fewer children. People with higher levels of education are more likely to postpone marriage and childbirth and have greater access to the media, medical institutions, and family planning tools, which makes them more conscious of reproductive health. A woman's decision to have a tubectomy is also influenced by her spouse's educational background, which leads to the establishment of a modest family norm. Previous studies have reported similar findings.[8-10]

The association between education and adoption of tubectomy operations is statistically highly significant (p<0.001).

Occupation versus adoption of tubectomy operation

Panel 2 of Table 8 shows that the percentage of respondents who are working as daily labourers and those who have adopted tubectomy is lower than that of their counterparts who are self-employed, privately employed, and others (20.9% versus 27.7%, 30.3%, and 32.3%, respectively).

In general, the daily labourers and self-employed are either illiterate or school-educated, and they have minimal access to mass media compared to the college-educated, resulting in less awareness about contraceptive methods. The illiterate people believe the myths and misconceptions about family planning (FP) methods. In addition, many women face societal pressure and patriarchal norms that discourage them from using FP methods. Previous studies have reported similar findings.[11]

The association between the occupation and adoption of tubectomy operations turned out to be highly significant (p<0.009).

Income versus adoption of tubectomy operation

Panel 3 of Table 8 reveals that the percentage of respondents who have adopted a tubectomy operation is higher among those who are living in the APL category than among those who belong to families in the BPL category (36.7% versus 22.4%).

Many Indians are unable to obtain an education and continue to live in poverty due to several factors, including inadequate educational infrastructure, a lack of access to high-quality education, and a lack of understanding of the value of education. FP methods are not accepted when there are more children because there are more hands to earn money for the impoverished. Earlier studies have reported similar findings.[12]

The association between income and the adoption of tubectomy operations is statistically highly significant (p<0.000).

Size of the family versus adoption of tubectomy operation

According to panel 4 of Table 8, the percentage of respondents with three family members who have adopted a tubectomy procedure is lower than that of respondents with four or more family members (7.6% versus 35.3% and 36.2%, respectively).

The desire for a male child to continue the inheritance and to enjoy the property leads to an increase in family size. Conservative and orthodox people oppose family planning measures. It is believed that the birth of a child is a blessing from God. Therefore, one can't take part in FP measures. Wives have no control over their spouses' sexual activity. Therefore, Indians have faced large population growth in an unplanned manner. Earlier studies have reported similar findings.[11]

The association between the size of family and the adoption of tubectomy operations is statistically highly significant (p<0.000).

Comparison of present survey findings with selected other surveys

The results of the current survey have been compared with those from the National Family Health Survey (NFHS 5), the sample registration system (SRS), and the guidelines of the government of AP as follows.

Comparison of key indicators of the surveyed population by the guidelines of government of AP and the results of SRS 2023

Table 9 indicates that the sex ratio at birth is lower than the national average (818 versus 917), and the number of eligible couples per 1,000 population in study region is greater than the AP state average (202 versus 185-195). Regrettably, the overall birth rate in the preceding year of the survey has also declined among the surveyed population compared to the national average (12.8% versus 14.9%).[13,14]

Comparison of key indicators of the surveyed population by the results of NFHS 5

Panel 01 of Table 10 shows that overall, the environmental background characteristics of respondents in the present survey are better than those of the state and national averages (NFHS 5).

Panel 2 of Table 10 indicates that the research area's average family size is higher than the state average (3.9 versus 3.5). Furthermore, the area selected has a higher proportion of Muslim respondents than the state and national averages (22.3% versus 7.0% and 15.4%, respectively).

Panel 3 of Table 10 indicates that overall, antenatal care is better in study region than the state and national averages. Conversely, study region had fewer antenatal women who had four or more antenatal care check-ups than the state and national norms (51.5% versus 68.0% and 68.6%, respectively).

Panel 4 of Table 10 shows that, thankfully, all births are live and take place in hospitals in study region, whereas the said indicators are modestly lower in the state and national averages (live births: 100%, 91%, and 94%; births take place: 100%, 97%, and 93.8%, respectively).

Notably, every child in the study region received the recommended vaccinations on time, which has not been accomplished across the state or country (100.0% versus 69.5% and 56.7%, respectively). The indicators of postnatal and child health services are overall better in study region than in the state and nation, except for caesarean section: (45% versus 42% and 32.3%, respectively) and birth weight less than 2.5 kg (25% versus 16.2% and 17.4%, respectively).

Panel 5 of Table 10 reveals that supplementary food received from the Anganwadi Centre during pregnancy is better in the study region (91%) than in the state (85%) and the nation (52.3%). Panel 6 of Table 10 indicates that the percentage of female respondents who adopted FP sterilization in study region is higher than that of the state average (100% versus 98%). On the contrary, the contraceptive prevalence rate (CPR) is lower in study region than the state and the national averages (32.5% versus 71% and 69.3%, respectively).[15]

Table 7: Association between the awareness of respondents on health welfare schemes, hospitalization and selected variables.

Selected variables	Aware of Ayushman Bharat Health Account (ABHA)						χ^2 value P value
	Yes		No		Total		
	Fre.	%	Fre.	%	Fre.	%	
Age (years)							5.984

Continued.

Selected variables	Aware of Ayushman Bharat Health Account (ABHA)						χ^2 value P value
	Yes		No		Total		
	Fre.	%	Fre.	%	Fre.	%	
21-39	185	66.5	93	33.5	278	100.0	0.05*
40-59	303	65.9	157	34.1	460	100.0	
60 and more	140	57.6	103	42.4	243	100.0	
Total	628	64.0	353	36.0	981	100.0	
Education							
Illiterate	212	60.9	136	39.1	348	100.0	6.176 0.046*
School educated	240	62.7	143	37.3	383	100.0	
Collegiates	176	70.4	74	29.6	250	100.0	
Total	628	64.0	353	36.0	981	100.0	
Income							
APL	136	72.3	52	27.7	188	100.0	6.996 0.005**
BPL	492	62.0	301	38.0	793	100.0	
Total	628	64.0	353	36.0	981	100.0	
Aware of Pradhan Mantri Matru Vandana Yojana (PMMVY)							
Age (years)							
21-39	58	20.9	220	79.1	278	100.0	8.257 0.016*
40-59	69	15.0	391	85.0	460	100.0	
>60	29	11.9	214	88.1	243	100.0	
Total	156	15.9	825	84.1	981	100.0	
Education							
Illiterate	45	12.9	303	87.1	348	100.0	9.718 0.008**
School educated	56	14.6	327	85.4	383	100.0	
Collegiates	55	22.0	195	78.0	250	100.0	
Total	156	15.9	825	84.1	981	100.0	
Income							
APL	43	22.9	145	77.1	188	100.0	8.449 0.003**
BPL	113	14.2	680	85.8	793	100.0	
Total	156	15.9	825	84.1	981	100.0	
Gender							
Male	136	17.2	657	82.8	793	100.0	4.819 0.016*
Female	20	10.6	168	89.4	188	100.0	
Total	156	15.9	825	84.1	981	100.0	
Aware of NTR Vaidya Sevalu (free health insurance scheme)							
Income							
APL	159	84.6	29	15.4	188	100.0	21.768 0.000***
BPL	534	67.3	259	32.7	793	100.0	
Total	693	70.6	288	29.4	981	100.0	
Aware of Janani Suraksha Yojana (JSY)							
Age (years)							
21-39	79	28.4	199	71.6	278	100.0	7.634 0.022*
40-59	109	23.7	351	76.3	460	100.0	
>60	44	18.1	199	81.9	243	100.0	
Total	232	23.6	749	76.4	981	100.0	
Gender							
Male	202	25.5	591	74.5	793	100.0	7.621 0.003**
Female	30	16.0	158	84.0	188	100.0	
Total	232	23.6	749	76.4	981	100.0	
Education							
Illiterate	60	17.2	288	82.8	348	100.0	15.977 0.000***
School educated	94	24.5	289	75.5	38325	100.0	
Collegiates	78	31.2	172	68.8	0	100.0	
Total	232	23.6	749	76.4	981	100.0	

Continued.

Selected variables	Aware of Ayushman Bharat Health Account (ABHA)						χ^2 value P value
	Yes		No		Total		
	Fre.	%	Fre.	%	Fre.	%	
Income							
APL	64	34.0	124	66.0	188	100.0	13.913 0.000***
BPL	168	21.2	625	78.8	793	100.0	
Total	232	23.6	749	76.4	981	100.0	
Occupation							
Daily labourer	108	20.9	409	79.1	517	100.0	13.630 0.003**
Self employed	47	25.5	137	74.5	184	100.0	
Private employed	44	36.1	78	63.9	122	100.0	
Others	33	20.9	125	79.1	158	100.0	
Total	232	23.6	749	76.4	981	100.0	
Hospitalization							
Income							
APL	27	14.4	161	85.6	188	100.0	21.544 0.000***
BPL	39	4.9	753	95.1	793	100.0	
Total	66	6.7	914	93.3	981	100.0	

*, **, ***=significant at 0.05, 0.01 and 0.001 levels, respectively, Fre.=frequency; %=percentage

Table 8: Association between the adoption of tubectomy operation by the respondents and selected variables.

Selected variables	Tubectomy Adoption						χ^2-value, p value
	Yes		No		Total		
	Fre.	%	Fre.	%	Fre.	%	
Education							
Illiterate	64	18.4	284	81.6	348	100.0	13.246 0.001***
School educated	112	29.2	271	70.8	383	100.0	
Collegiates	71	28.4	179	71.6	250	100.0	
Total	247	25.2	734	74.8	981	100.0	
Occupation							
Daily labourer	108	20.9	409	79.1	517	100.0	11.622 0.009**
Self employed	51	27.7	133	72.3	184	100.0	
Private employed	37	30.3	85	69.7	122	100.0	
Others	51	32.3	107	67.7	158	100.0	
Total	247	25.2	734	74.8	981	100.0	
Income							
APL	69	36.7	119	63.3	188	100.0	16.394 0.000***
BPL	178	22.4	615	77.6	793	100.0	
Total	247	25.2	734	74.8	981	100.0	
Size of the family							
3 members	28	7.6	341	92.4	369	100.0	98.176 0.000***
4 members	106	35.3	194	64.7	300	100.0	
>5	113	36.2	199	63.8	312	100.0	
Total	247	25.2	734	74.8	981	100.0	

, *=Significant at 0.01 and 0.001 levels, respectively; Fre.=frequency; %=percentage

Table 9: Comparison of key indicators of the surveyed population by other reports.

Indicator	Kurnool urban	State level (CH and FW guidelines)		National level (SRS 2023 Results)	
		Per 1,000 Pop.	*Difference	Per 1,000	*Difference
No. of eligible couples (ECs) per 1,000 population	202	185-195	+ (High)	NA	NA
Sex ratio at birth (girls per 1,000 boys)	818	NA	NA	917	-89

Continued.

Indicator	Kurnool urban	State level (CH and FW guidelines)		National level (SRS 2023 Results)	
		Per 1,000 Pop.	*Difference	Per 1,000	*Difference
The overall birth rate over the past year (per 1,000 population)	12.8	NA	NA	14.9 (urban)	-2.1

*+=indicator of Kurnool city is higher than those of the state and nation, *- (minus) =Kurnool City's indicator is lower than others, NA=not applicable; CH&FW=Commissioner of health and family welfare, AP; SRS=sample registration system

Table 10: Comparison of current key indicators of Kurnool urban versus NFHS 5 results.

Indicator	Kurnool	State level (NFHS results)		National level (NFHS results)	
	%	%	*Difference of %	%	*Difference of %
Environmental characteristics of the respondents in urban areas					
Having pucca houses	98.1	93.0	-5.1	85.0	-13.1
Semi-pucca houses	1.9	5.9	+4.0	13.0	+11.1
Improved source of drinking water supply	100.0	97.0	-3.0	99.0	-1.0
Toilet facility	98.9	97.0	-1.9	96.0	-2.9
Clean fuel for cooking	100.0	96.6	-3.4	59.0	-41.0
In the house, separate cooking room facility	78.9	77.0	-1.89	72.0	-6.9
Having domestic animals/birds	0.9	NA	NA	10.0	+9.1
Socio-demographic characteristics of the respondents in urban areas					
On average, households are comprised members	3.9	3.5	-0.4	NA	NA
Hindus	72.6	82.7	-10.1	78.2	-5.6
Muslims	22.3	7.0	+15.3	15.4	+6.9
Christians	5.1	10.1	-5.0	3.3	+2.8
Percentage of antenatal services received in urban areas					
Terminated in foetal wastage	15.1	9.0	+6.1	NA	NA
A.N. mothers registered within the 1st trimester	93.9	82.0	+11.9	87.2	+6.7
Received antenatal care	100.0	95.0	+5.0	95.7	+4.3
Among registered pregnants received MCP Cards	97.0	97.0	0.0	94.9	+2.1
Mothers had four or more A.N. care check ups	51.5	68.0	-16.5	68.6	-17.1
A.N. mothers consumed Tab. IFA 180 nos.	97.0	41.0	+56.0	34.4	+62.6
A.N. mothers received Tab. Albendazole 400 mg	66.6	27.0	+39.6	31.5	+35.1
Tetanus toxoid two doses given to A.N. mothers	100.0	85.8	+14.2	85.1	+14.9
Percentage of post-natal and child health services received in urban areas					
Births take place in a health facility	100.0	97.0	+3.0	93.8	+6.2
Delivered by caesarean section	45.0	42.0	+3.0	32.3	+12.7
Live births	100.0	91.0	+9.0	94.0	+6.0
Exclusively breastfed	80.0	68.0	+12.0	59.6	+20.4
Birth weight less than 2.5 kg	25.0	16.2	+8.8	17.4	+7.6
Children have a birth certificate	80.0	86.5	-6.5	82.0	-2.0
Timely coverage of all basic vaccinations in children	100.0	69.0	+31.0	56.7	+43.3
Received supplementary foods during pregnancy from Anganwadi Centre	91.0.0	85.0	+6.0	52.3	+38.7
Family welfare services received in urban areas					
Contraceptive prevalence rate (CPR) among currently married women age 15-49	32.5	71.0	-38.5	69.3	-36.8
Male sterilization	0.0	0.4	-0.4	0.3	-0.3
Female sterilization	100.0	98.0	+2.0	NA	NA
Use of spacing methods	0.7	<1.0	0.0	NA	NA

*+=indicator of Kurnool City is higher than those of the state and nation. Whereas, *- (minus) =Kurnool City's indicator is lower than others and NA=not available

Limitations

This study has focused on the urban but not the rural. Hence, it is challenging to generalize the results of this study to all households in the Kurnool district or the state, as such data is not available. To ascertain why people do not avail the health welfare programmes, the study did not collect qualitative data. Such data will be essential to refine the findings. However, the LHV trainees were unable to collect such data because the interview schedule did not permit them to go beyond the limits. Despite LHV trainees' efforts to gather data, the researcher believes that important data may have been underreported or not reported at all, which could affect the data's accuracy. The researcher believed that with this inadequate data, it would be difficult to convince decision-makers and others that lapses in maternal and infant healthcare services are a serious issue. As a result, it will be challenging to determine how to prioritize and create successful initiatives.

CONCLUSION

The household survey conducted by the LHV trainees provided an opportunity for overall discussion and drew the following conclusions. This study has provided an opportunity to compare the health indicators of the study region with those at the state and national levels. However, the comparison has highlighted that many key indicators of the study region are better than the state and national levels. It is also noticed that, without taking into account local realities such as literacy levels, socio-demographic and economic factors, awareness levels among the communities, medical facilities, the shortage of health personnel and their professional skills, and the targets already achieved in the region, the common targets are set for all regions on par with national and state norms, which may enable under-reporting or over-reporting. In this context, this study serves as an eye-opener for those who set common targets for all regions. As such, it should be encouraged in the future to evaluate health programmes to set targets to fulfil the needs of the regions. However, the household survey conducted by the LHV trainees highlighted gaps in the implementation of maternal and newborn healthcare services, enabling them to be addressed at the beneficiary level. Moreover, the study's findings validate the hypothesis.

Recommendations

The following recommendations are offered based on the study's findings to address the problems and improve the quality of care for pregnant mothers and newborn.

Increasing access to quality maternal and child care services: Make that all women have access to comprehensive care during childbirth and the early postpartum period, as well as high-quality prenatal care, including trained birth attendants. Ensure all newborn and children receive proper care, including follow-ups. Expansion of healthcare infrastructure; Improving nutritional status before and during pregnancy.

Addressing socioeconomic barriers: Make efforts to reduce socioeconomic barriers that influence the health of mothers and newborn, such as those related to education, healthcare, and nutrition.

Encouraging healthy behavioral change among the communities: ASHAs, Anganwadi teachers, and other healthcare professionals should promote healthy behavioral change in communities regarding prenatal care and neonatal and child care, identifying challenges in pregnancy and child health, preparing for childbirth, and preventing NCDs

Strengthening community involvement and community mobilisation: To manage unintended pregnancies, to spread important information about postponing marriage age, spacing, age at first birth, and delaying birth, encouraging institutional deliveries, utilizing health welfare schemes, and guiding women during ANC check-ups through five key mechanisms to create demand generation including Accredited Social Health Activists (ASHA), Village Health and Nutrition Day (VHND), Village Health, Sanitation and Nutrition Committee (VHSNC), women's groups of different types – self-help groups (SHGs), mother's groups and the elected local panchayat.

Capacity building of health professionals: Providing comprehensive training and capacity-building initiatives, mainly through physical presence and hands-on training.

Leveraging digital health and utilization of social media: To improve maternal care and address utilization issues, digital health solutions and social media can be used. Pregnant women and high-risk pregnancies can be monitored by mobile health applications, which can also serve as reminders for antenatal care and newborn check-ups. Digital technologies can also improve data collection for programme monitoring and evaluation. Widespread publicity is to be conducted on the importance and utilization of health welfare schemes by needy people, especially free health insurance schemes, to overcome the OOPE.

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