

## A STUDY ON IMPACT OF NRHM ON NEONATAL CARE AND CLINICAL PROFILE OF NEONATES ADMITTED IN A SNCU OF A RURAL MEDICAL COLLEGE

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**ABSTRACT: OBJECTIVE:** To assess the impact of NRHM and to study the clinical profile of babies admitted. **METHODOLOGY:** A Retrospective descriptive study done in SNCU of Govt. Dharmapuri Medical College from Jan'2011 to Dec'2014. **RESULTS:** Nurses strength increased from 12 to 33. There was a significant increase in number of equipment's during the study period. Admissions increased from 2350 (2011) to 4552 (2014). About 40% babies were <2.5kg and preterm. The chief causes of admissions in the SNCU in 2014 were RDS (18.1%) Birth Asphyxia (18%), LBW (17.6%) and Meconium Aspiration Syndrome (15.1%). The major causes of death were RDS (40.4%) and Birth Asphyxia (27.5%). Death rate (9.6%), Referral out Rate (1.7%) and LAMA (3.7%) rates decreased and survival rate (85%) increased. **CONCLUSION:** Impact of NRHM was seen in increasing infrastructure and admissions and decreasing referral out, death rate and LAMA. The survival of Preterm and out born babies needs improvement.

**KEYWORDS:** SNCU, NRHM, Newborn, Out born, Preterm.

**INTRODUCTION:** India contributes to one fifth of global live births and more than a quarter of neonatal deaths. There has been a significant reduction in the quantum of neonatal and child deaths in the last two decades.<sup>[1]</sup> About 0.76 million neonates died in 2012, the highest for any country in the world that year.<sup>[2]</sup>

With the current Neonatal Mortality Rate (NMR) of 29 per 1000 live births, about 70% of Infant deaths and 56% of under-five child deaths in the country fall in the neonatal period.<sup>[2]</sup> The Millennium Development Goals-4 (MDG-4) which stipulates a two-thirds reduction in under-five deaths by 2015.<sup>[3]</sup> obviously cannot be achieved without ensuring a substantial reduction in the NMR. Of 40 countries with the highest NMR in 2009, six are far outside the African Continent (Afghanistan, Pakistan, India, Bhutan, Myanmar & Cambodia).<sup>[4]</sup>

The global burden of neonatal deaths is primarily concentrated in developing countries, where care of neonates is practically non-existent. The National Rural Health Mission (NRHM) was launched by the Honorable Prime Minister on 12<sup>th</sup> April 2005 to provide accessible, affordable and quality health care to the rural population especially the vulnerable groups.

One of the major thrust areas of NRHM is the reduction of Neonatal Mortality. There are many interventions under NRHM focusing on new borns including Navjat Shishu Suraksha Karyakram (NSSK) and Facility Based Newborn Care (FBNC).<sup>[5]</sup> The first step in improving early neonatal survival is to document the number and rate of deaths and identify their common causes.

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### The objective of this paper is:

- (1) To assess the impact of NRHM on Neonatal Care in Special New born Care Unit (SNCU) at a Rural Medical College.
- (2) To study the clinical profile and outcome of babies admitted in SNCU of rural medical college and compare the outcomes between the intramural and extramural neonates.

**METHODS:** Dharmapuri district is one of the backward districts in the Tamil Nadu state where healthcare delivery is also influenced by many social factors. The major determinants of health care outcome in the district are influenced by many social factors like illiteracy, poverty, teenage pregnancy, female infanticide, etc.

The district has many peculiarities- highest number of deliveries happening in PHC's and absence of any other level III neonatal care centre in the district both in private and public sector. The picture is same in the neighboring Krishnagiri district from where a significant number of neonates are referred here.

**ESTABLISHMENT OF SNCU:** The SNCU was established on 23.02.2011, at the Department of Pediatrics, Government Dharmapuri Medical College Hospital, Dharmapuri, Tamilnadu with funds from NRHM.

NRHM has provided neonatal trained nurses, security personnel and sanitary workers to this SNCU. The funds from NRHM was spent for salary of nurses, security personnel and sanitary workers, purchase of equipments and medicines like warmer, photo therapy, CPAP machine and ventilators etc., servicing of equipments, purchase of special medicines and special investigations which are not available in the hospital and training of health care personnel. The funding for the SNCU from NRHM has increased from 4.4 Lakhs in 2011 to 22.2 Lakhs in 2014.

This study was a descriptive-retrospective study carried out in the SNCU of the Pediatrics Department, Government Dharmapuri Medical College. New borns from Primary Health Centre (PHC), Government Hospitals (GH) and Private Hospitals of Dharmapuri as well as Krishnagiri Districts are referred here.

The study period was from Jan'2011 to Dec'2014.

**INCLUSIVE CRITERIA:** All new borns <28 days of life admitted in SNCU.

**EXCLUSIVE CRITERIA:** New born admitted >28 days of life.

These newborns were categorized as intramural (Inborn) if they delivered by any route in the GDMCH, Dharmapuri and extramural (Out born) if they born outside and referred here.

The data of inborn or out born, sex, gestational age, term or preterm, weight at birth/admission, referral centre, indications for admission, duration of hospitalization and outcome were collected from the medical records department and our SNCU database.

**STATISTICAL ANALYSIS:** Data were compiled and entered in Excel spread sheet. Proportion of all outcome measures was arrived and analyzed using Chi-Square Test and Odds ratio.

The study was approved by institutional, ethical and research committee.

**RESULTS:** With the help of NRHM funds, apart from investigations and medicines, many necessary instruments are bought for this SNCU from 2011-2014 [Figure-1]. There has been a quantum leap in the number of equipment's from the year 2011 -14. This SNCU is equipped at present with 34 radiant

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warmers, 18 Photo therapy units, 2 multipurpose monitors, 11 Ventilators, 3 CPAP machines, 9 Pulse oximeters, 23 syringe pumps and 1 autoclave machine, ABG machine and NIBB monitor. Our staff nurses strength also increased from 12 in 2011 to 33 in 2014.

Total admission in our SNCU gradually increased from 2350 in 2011 to 4552 in 2014. Male babies were 55.3% and 44.7% were female babies in 2014. Same pattern was seen in previous years too. The admission of intramural neonates (66.4% in 2014) was more than extramural neonates (33.6% in 2014) in all 4 years data [Table-I].

Among SNCU admissions, 40% of babies were <2.5Kg, out of which 35% were in 1500-2500 gm. category. In 1500-2500gm range, more intramural babies were seen.

When we consider the gestation of neonates admitted in SNCU, preterm admissions increased from 28.8% in 2011 to 40.1% in 2014. Greater percentage of inborn newborns (61.3% in 2014) were preterm than out born (38.7% in 2014).

**Morbidity Profile of Neonates Admitted:** The chief causes of admissions in the SNCU in 2014 were respiratory distress syndrome (RDS) (18.1%) followed by birth asphyxia (18%), low birth weight (LBW) (17.6%), meconium aspiration syndrome (MAS) (15.1%), sepsis (7.2%) and jaundice (5.6%) [Table-I].

Admissions of babies with RDS increased from 6.6% in 2011 to 14.8% in 2014. While babies admitted for RDS, MAS and birth asphyxia were more among inborn, babies with sepsis were more among the out born.

**Mortality Profile of Neonates:** The major causes of death in this study in decreasing order were RDS (40.4%), birth asphyxia (27.5%), sepsis (10.0%), prematurity (8.7%) and MAS (7.3%) in 2014 (Table-II).

The proportion of deaths due to RDS increased from 28.3% in 2011 to 40.4% in 2014. The proportion of deaths due to infections in the out born (14.2% in 2014) babies was more than inborn babies (5.8% in 2014) in all 4 years [Table-II].

**Age at Death and Birth Weight:** 82% of the neonates died within first week of life in 2014. Out of which about 30% of babies died within 24 hrs. of life. In all 4 years, similar pattern was seen [Table-II]. In this study, more babies of very low birth weight and extremely low birth weight died which is statistically significant ( $p$ -value <0.001, odds ratio <1500gms 57.6, <1000gms 78.5) [Table-III].

**Gestation, Intramural and Extramural:** In our SNCU, out of all preterm admissions, 14.2% of babies died and out of all term babies, 6.5% of babies died in 2014 [Table-II]. There is significant  $p$ -value ( $p$ <0.001) between preterm babies and neonatal deaths. The odds ratio 2.2 reveals the chance of having neonatal death is higher for the preterm babies [Table-III]. In 2014, death among extramural term (13.8%) and preterm babies (19%) were more than intramural term (3.3%) and preterm (11.3%) babies which is statistically significant ( $p$ <0.001) [Table-II and III].

**Outcome of admitted Neonates:** Most of the neonates admitted in SNCU survived and discharged well (85% in 2014). Discharge rate was significantly increased from 74.4% in 2011 to 85% in 2014. Whereas referral out (5% in 2011, 1.7% in 2014), left against medical advice (LAMA) (9% in 2011, 3.7% in 2014) decreased from 2011 to 2014 in this SNCU. The total death rate and inborn death rate decreased from 2011 to 2014 (11.6% to 9.6% and 9.3% to 6.3% respectively). The significant  $p$ -value

( $p < 0.001$ ) of the chi-square test reveals there is good improvement exists in view of inborn, out born and total outcome of SNCU compared to 2011 and 2014 of NRHM except out born death rate [Table-IV].

**DISCUSSION:** India has been at the forefront of the global effort to reduce the childhood and neonatal mortality. Government of India recognizes newborn health as a national development necessity. There are many programs and interventions including Facility Based Newborn Care (FBNC) through NRHM to address maternal and newborn health.

Our study clearly shows there is increasing trend of admissions in the SNCU of GDMCH, Dharmapuri. It was ranked second in the Tamil Nadu state in the year 2014 in terms of number of admissions in the state. In spite of fact that Dharmapuri district's birth rate decreased marginally from 17.7% in 2011 to 17.4% in 2014, increasing admissions in the SNCU, clearly shows increasing new born care and SNCU utilization for both Dharmapuri and Krishnagiri Districts. It is mainly due to NRHM which provided adequate manpower and equipment's to this Rural Medical College SNCU which was started before 4 years.

Referral from government hospitals (9.4% to 22.2%), primary health centres from both districts as well as referral from private hospitals (5.5% to 14%) also increased for the past 4 years, which proved the positive opinion about this SNCU. This is supported by increased survival rate of 74.4% in 2011 to 85% in 2014 and also there is decreasing trend in LAMA, referral out and death rate in this study.

Rate of referral out (1.7%) and of LAMA (3.7%) was lower than other studies reported.<sup>[6-11]</sup> The mortality rate of 9.6% (2014) in the current study is much lower than all other studies.<sup>[6,11-13]</sup> except Canada.<sup>[14]</sup> where 7.6% was the mortality rate. But the Canada study was conducted at a well-developed country, where babies died due to late complications of preterm. Also they are well equipped with better facilities like Extra Corporeal Membrane Oxygenation, total parental nutrition and a higher doctor to patient and nurse to patient ratio.

Intramural admissions were more than extramural admissions in all 4 years in our study, which is similar to study by Patil R. B. et al.<sup>[11]</sup> But extramural admissions were more in Uttarakand.<sup>[6]</sup> and Nigeria.<sup>[15]</sup> This hospital is a tertiary level centre and high risk pregnancies are referred here. So, inborn admissions are more.

In our study, preterm admissions increased from 28.8% to 40.1% mainly because of increased referral of preterm babies as well as high risk pregnancies. This finding is similar to other studies from India.<sup>[6,11]</sup> Low birth weight babies continue around 40% in our study, whereas it is 60% in Rakholia, et al.<sup>[6]</sup> and 50% in Patil R.B, et al.<sup>[11]</sup>

The chief causes of admissions in the SNCU were RDS (18.1%), followed by birth asphyxia (18%), LBW (17.6%), MAS (15.1%), sepsis (7.2%) and jaundice (5.6%). The findings are similar to Rakholia, et al.<sup>[6]</sup> and Patil R. B, et al. <sup>[11]</sup>. Studies from Africa [15, 17], Nepal.<sup>[12]</sup> and Dhaka.<sup>[16]</sup> showed more admissions due to Sepsis. Jaundice and Sepsis were more common causes for admission in a study by Gauchan.E, et al.<sup>[13]</sup> In the developed countries, the scenario is different with extreme prematurity, asphyxia and congenital anomalies being the direct causes as seen in a study at Canada by Simpson, et al.<sup>[14]</sup> In our study, babies with RDS, MAS and birth asphyxia were more among inborn probably due to more high risk pregnancies were referred, long distance referral from periphery as well as late referral of antenatal mothers from periphery to medical college hospital.

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In the present study, RDS (40.4%) was the main cause of death followed by birth asphyxia (27.5%), sepsis (10%), prematurity (8.7%) and MAS (7.3%). The proportion of deaths due to RDS increased from 28.3% in 2011 to 40.4% in 2014, whereas death due to other complications of prematurity decreased from 16.5% in 2011 to 8.7% in 2014.

Many studies from India and Asian countries.<sup>[6,7,11]</sup> showed that prematurity was the leading cause of death followed by sepsis and asphyxia.

In our study, with available facilities like bed side X-Ray, we can arrive the diagnosis of RDS in prematurity. It is essential to identify the common complications of preterm which leads to more death. So that interventions can be focused towards this in future.

The proportion of deaths due to infections in the outborn babies (14.2% in 2014) were more than inborn babies (5.8% in 2014). This is again mainly due to lack of poor hygiene, sterile delivery room care, transport related complications and multiple handling of babies. The higher death rate due to birth asphyxia are mainly by delayed referral of high risk mothers and asphyxiated babies referred from long distance of both districts.

However, African countries show higher death rates due to jaundice and tetanus.<sup>[15,17]</sup> The results are in contrast to developed countries, where extreme prematurity, gastrointestinal complications and congenital malformations are the main causes, as better neonatal care ensures lesser sepsis and better survival of children with RDS and MAS.<sup>[14]</sup> Most of the neonates died within 1<sup>st</sup> week of life. It is mainly due to preventable causes like prematurity, birth asphyxia and MAS rather than sepsis related deaths occur after 1<sup>st</sup> week. Also, very low birth weight and extremely low birth weight babies are more prone to death, where our focus is very much needed. In our study, death among preterm decreased from 23% in 2011 to 14.2% in 2014. It is mainly due to NRHM's initiative to improve our SNCU with more staffs and facilities like surfactant therapy, CPAP and ventilators.

But total mortality rate in out born babies (16.2% in 2014) is not improving as in inborn babies (6.3% in 2014). It is mainly due lack of proper delivery care as well as immediate neonatal care given to babies, difficulty in transport of sick neonates, poor stabilization before transport, hypothermia, oxygenation and ventilation in cases of apnea and long distance travel of vulnerable newborns.

In our study, out born preterm deaths decreased from 40.8% in 2011 to 19% in 2014. This is mainly due to National Ambulance Service (102/108) under NRHM, which are very much useful to transport neonates. But referral transport system for mothers and newborns should be continuously improved through evaluation, use of technology and transport protocols (pre-transport stabilization, care during transport, communication between the referrer and recipient, etc.,).

In spite of this improving performance of this SNCU, in November 2014, again this SNCU and Dharmapuri district was in national news as there was a cluster of neonatal deaths. Media made it a very sensational issue where our SNCU was in daily news. But this issue paved the way for general public awareness about neonatal deaths, more infrastructure for SNCU and overall improvement of neonatal care across the state.

Babies admitted in SNCU is shown by CCTV camera to parents and effective counseling were given to parents regularly all over the state.

The NMR and Infant Mortality Rate (IMR) of Dharmapuri district are 15 and 19, whereas for Tamilnadu state is 15 and 21, which is very low when compared to National NMR of 29 and IMR of 42. So, media should be informative for the society rather than creating panic among people.

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**LIMITATION:** Maternal details were not studied in the present study.

Since this SNCU is only 4 years old, the impact of NRHM could not be ascertained fully and more positive impact could be felt in the coming years.

**CONCLUSIONS:** There is a greater impact of NRHM in this SNCU in view of increasing infrastructure, instruments and man power. Admissions increased two folds in the past 4 years. Referral out, death rate, LAMA were decreased.

40% of neonates were preterm and LBW, whereas RDS followed by birth asphyxia, LBW and MAS were main causes of admissions. RDS, birth asphyxia and sepsis were common causes of mortality.

The inborn death rate significantly reduced whereas the care of preterm and outborn babies needs improvement.

NRHM, in its first few years of operation has been highly successful in bringing all the sick neonates under SNCU care. Post Dharmapuri issue, NRHM has done greater capacity building in all the SNCU's in the state. This, coupled with the greater awareness about neonatal care among the public will pave the way for further reduction in NMR. Under the auspices of NRHM, Tamilnadu is poised for a NMR on par with the developed nations.

**RECOMMENDATIONS:** Reducing preterm delivery by increasing antenatal care and improving literacy and socio-economic factors.

Improving preterm survival by antenatal corticosteroids, early resuscitation care and improving preterm transport.

Improving survival of out born babies by strengthening New Born Stabilization Units, SNCU's at government hospitals, district head quarter hospitals and better transportation of babies.

**What Already Known:** Through various NRHM programmes, neonatal care improved across the country.

**What the Study Adds:** SNCU admissions doubled in the past 4 years. Total death rate and intra mural death rate decreased from 11.6% to 9.6% and 9.3% to 6.3% respectively. Efforts to improve survival of preterm and outborn babies is the need of the hour to further reduce NMR. With NRHM initiatives, Tamilnadu is poised to witness a NMR on par with developed countries.

**Contributors:** J. Balaji and K.S.Kumaravel contributed in concept and design of the study. J. Balaji, P. Punitha, M. Ashok Kumar, K. V. Pugalendhi Raja, K. S. Kumaravel all contributed in case management and implementation of NRHM program and monitoring. K. V. Pugalendhi Raja is the nodal officer of SNCU. J. Balaji and K. S. Kumaravel involved in analysis of data, revised the manuscript for important intellectual content and K. S. Kumaravel act as guarantor of the study. The final manuscript was reviewed and approved by all the authors.

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	2011		2012		2013		2014	
	Nos.	%	Nos.	%	Nos.	%	Nos.	%
<b>PLACE OF BIRTH</b>								
Intramural	1460	62.1%	2246	62%	2659	64.1%	3024	66.4%
Extramural	890	37.9%	1377	38%	1491	35.9%	1528	33.6%
<b>TOTAL</b>	<b>2350</b>	<b>100%</b>	<b>3623</b>	<b>100%</b>	<b>4150</b>	<b>100%</b>	<b>4552</b>	<b>100%</b>
<b>SEX</b>								
Male	1324	56.3%	2111	58.3%	2360	56.9%	2517	55.3%
Female	1026	43.7%	1512	41.7%	1790	43.1%	2035	44.7%
<b>TOTAL</b>	<b>2350</b>	<b>100%</b>	<b>3623</b>	<b>100%</b>	<b>4150</b>	<b>100%</b>	<b>4552</b>	<b>100%</b>
<b>GESTATION</b>								
Term	1673	71.2%	1838	50.7%	2335	56.3%	2725	59.9%
Preterm	1838	28.8%	1785	49.3%	1815	43.7%	1827	40.1%
<b>TOTAL</b>	<b>2350</b>	<b>100%</b>	<b>3623</b>	<b>100%</b>	<b>4150</b>	<b>100%</b>	<b>4552</b>	<b>100%</b>
<b>BIRTH WEIGHT</b>								
>2500gm	1352	57.5%	2050	56.6%	2401	57.9%	2708	59.5%
1500-2499gm	860	36.6%	1376	38.0%	1542	37.2%	1600	35.1%
1000-1499gm	94	4.0%	170	4.7%	172	4.1%	194	4.3%
<1000gm	44	1.9%	27	0.7%	35	0.8%	50	1.1%
<b>DIAGNOSIS</b>								
Respiratory Distress Syndrome	305	13%	566	15.6%	853	20.6%	829	18.2%
Other causes of Respiratory Distress	154	6.6%	414	11.4%	538	13%	672	14.8%
Meconium Aspiration Syndrome	379	11.9%	395	10.9%	566	13.6%	687	15.1%
Birth Asphyxia	416	17.7%	704	19.4%	798	19.2%	818	18%
Sepsis / Pneumonia / Meningitis	176	7.5%	271	7.5%	291	7%	326	7.2%
Major Congenital Malformation	40	1.7%	86	2.4%	138	3.3%	99	2.2%
Jaundice requiring Phototherapy	105	4.5%	228	6.3%	221	5.3%	254	5.6%
Hypothermia	10	0.4%	14	0.4%	7	0.2%	15	0.3%
Hypoglycemia	11	0.5%	20	0.6%	44	1.1%	53	1.2%
Others	854	36.3%	925	25.5%	694	16.7%	799	17.6%

Table 1: Profile of babies admitted in SNCU, GDMCH, Dharmapuri

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Mortality Profile (Cause of death)	2011			2014		
	Intra mural (%)	Extra mural (%)	TOTAL (%)	Intra mural (%)	Extra mural (%)	TOTAL (%)
Respiratory Distress syndrome	40 (29.4%)	37 (27.2%)	<b>77 (28.3%)</b>	82 (43.4%)	94 (38.1%)	<b>176 (40.4%)</b>
Meconium aspiration syndrome	10 (7.4%)	16 (11.8%)	<b>26 (9.6%)</b>	12 (6.3%)	20 (8.1%)	<b>32 (7.3%)</b>
HIE / Moderate – Severe Birth Asphyxia	47 (34.6%)	30 (22.1%)	<b>77 (28.3%)</b>	53 (28.0%)	67 (27.1%)	<b>120 (27.5%)</b>
Sepsis / Pneumonia / Meningitis	10 (7.4%)	26 (19.1%)	<b>36 (13.2%)</b>	11 (5.8%)	35 (14.2%)	<b>46 (10.6%)</b>
Major Congenital Malformation	3 (2.2%)	1 (0.7%)	<b>4 (1.5%)</b>	8 (4.2%)	10 (4.0%)	<b>18 (4.1%)</b>
Prematurity	20 (14.7%)	25 (18.4%)	<b>45 (16.5%)</b>	17 (9.0%)	21 (8.5%)	<b>38 (8.7%)</b>
Others	6 (4.4%)	1 (0.7%)	<b>7 (2.6%)</b>	6 (3.2%)	0	<b>6 (1.4%)</b>
Cause not established	0	0	0	0	0	0
<b>Age at death</b>						
< 1 day	26 (36.1%)	46 (63.8%)	<b>72 (26.5%)</b>	54 (39.1%)	84 (60.9%)	<b>138 (31.7%)</b>
1-6 days	66 (48.5)	70 (51.5%)	<b>136 (50.0%)</b>	89 (40.3%)	132 (59.7%)	<b>221 (50.7%)</b>
> 7days	44 (68.8%)	20 (31.3%)	<b>64 (23.5%)</b>	46 (59.7%)	31 (40.3%)	<b>77 (17.7%)</b>
<b>Birth Weight / Weight at the time of death</b>						
> 2500gm	14 (1.9%)	20 (4.4%)	<b>34 (2.8%)</b>	44 (2.3%)	74 (9.3%)	<b>118 (4.4%)</b>
1500 – 2499gm	30 (5.6%)	32 (10.0%)	<b>62 (7.2%)</b>	76 (7.7%)	94 (15.3%)	<b>170 (10.6%)</b>
1000 – 1499gm	80 (55.4%)	62 (72.5%)	<b>142 (60.9%)</b>	43 (48.3%)	61 (58.1%)	<b>104 (53.6%)</b>
< 1000gm	12 (68.7%)	22 (84.6%)	<b>34 (77.3%)</b>	26 (86.7%)	18 (90.0%)	<b>44 (88.0%)</b>
<b>Gestation</b>						
Term	55 (5.7%)	61 (8.6%)	<b>116 (6.9%)</b>	63 (3.3%)	113 (13.8%)	<b>176 (6.5%)</b>
Preterm	81 (16.4%)	75 (40.8%)	<b>156 (23.0%)</b>	126 (11.3%)	134 (19.0%)	<b>260 (14.2%)</b>
Post term	0	0	0	0	0	0

Table 2: Mortality profile of babies admitted in SNCU, GDMCH, Dharmapuri



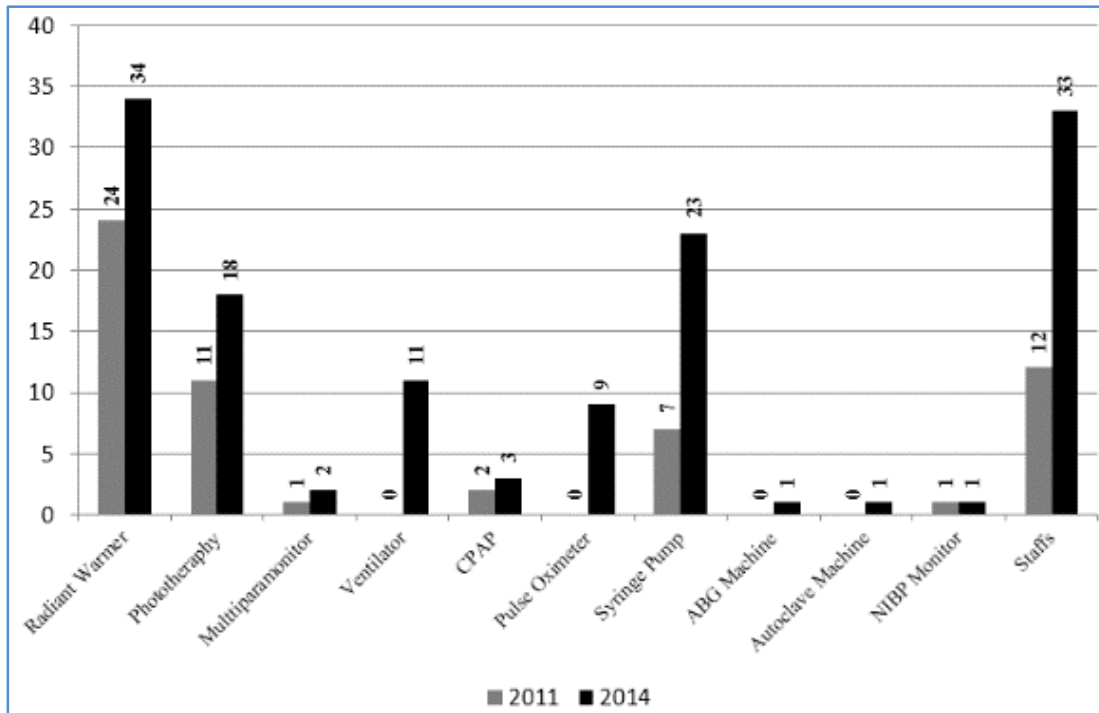
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<b>Correlation between Intramural and Extramural Admissions and Outcome</b>								
	<b>Discharged</b>		<b>Referred</b>		<b>LAMA</b>		<b>Death</b>	
	No	%	No	%	No	%	No	%
Intramural	8228	87.6%	158	1.7%	275	2.9%	728	7.8%
Extra Mural	3808	72%	204	3.9%	429	8.1%	845	16%
<b>Chi-square test value :568.9, P &lt;0.001</b>								
<b>Correlation between Birth Weight and Outcome</b>								
	<b>&gt;2500gms</b>		<b>1500-2499gms</b>		<b>1000-1499gms</b>		<b>&lt;1000gms</b>	
	No	%	No	%	No	%	No	%
Death	416	4.9%	561	10.4%	471	74.8%	125	80.1%
Survived	8095	95.1%	4817	89.6%	159	25.2%	31	19.9%
<b>Odds Ratio</b>			<b>2.2</b>		<b>57.6</b>		<b>78.5</b>	
<b>Chi-square test value: 3788.9 p&lt;0.001</b>								
<b>Correlation between Gestation and Outcome</b>								
	<b>Death</b>		<b>Survived</b>		<b>Odds Ratio</b>			
	No	%	No	%				
Term	643	7.5%	7928	92.5%				
Preterm	930	15.2%	5174	84.8%	<b>2.21</b>			
<b>Chi-square test value: 222.8 P&lt;0.001</b>								
<b>Correlation between Diagnosis and Outcome</b>								
	<b>Death</b>		<b>Survived</b>		<b>Total</b>			
	No	%	No	%	<b>No</b>			
Respiratory distress	568	22.2%	1985	77.8%	<b>2553</b>			
Meconium aspiration syndrome	103	5.3%	1824	94.7%	<b>1927</b>			
HIE / Moderate - Severe Birth Asphyxia	427	15.6%	2309	84.4%	<b>2736</b>			
Sepsis / Pneumonia / Meningitis	232	21.8%	832	78.2%	<b>1064</b>			
Major Congenital Malformation	54	14.9%	309	85.1%	<b>363</b>			
Other reasons	605	10%	5427	90%	<b>6032</b>			
<b>Chi square test value : 575.2 P&lt;0.001</b>								
<b>Table 3: Statistical Analysis of profile and outcome of babies admitted in SNCU, GDMCH, Dharmapuri</b>								

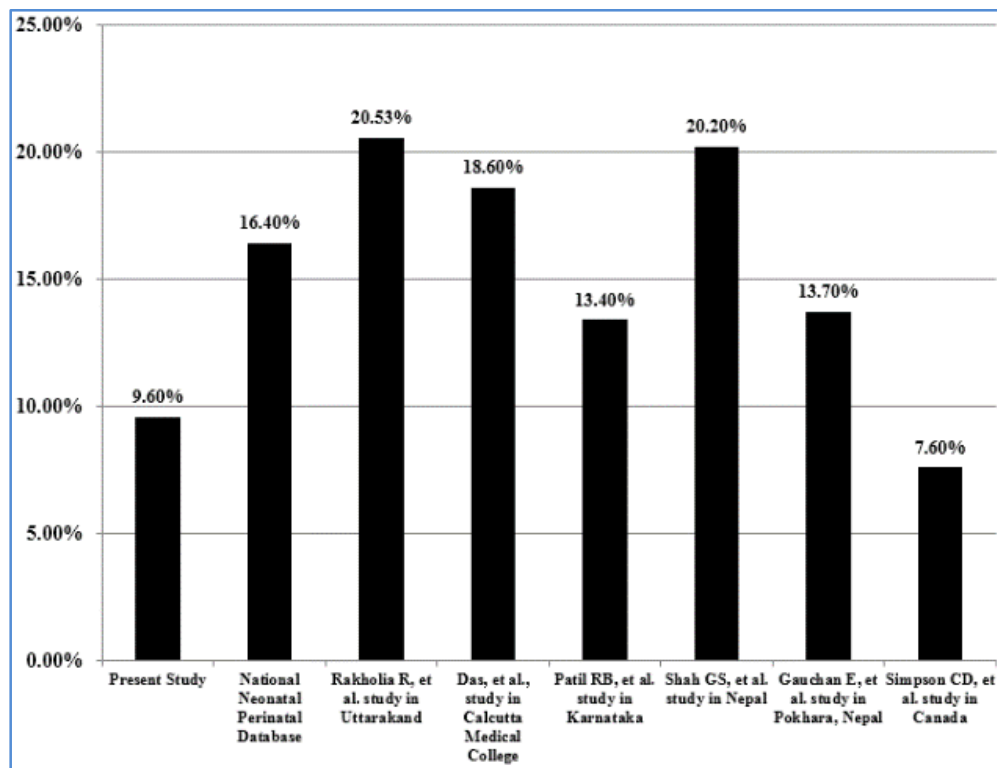
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<b>Impact of NRHM on Admissions</b>				
<b>Year</b>	<b>No. of Deliveries conducted</b>	<b>Intramural Admissions</b>	<b>Extramural Admissions</b>	<b>Total</b>
2011	4899	1460	890	2350
2012	5750	2246	1377	3623
2013	5838	2659	1491	4150
2014	6167	3024	1528	4552
<b>Impact of NRHM on Overall Outcome</b>				
	<b>2011</b>		<b>2014</b>	
	<b>No</b>	<b>%</b>	<b>No</b>	<b>%</b>
Discharged	1748	74.4%	3870	85%
Referred	118	5%	76	1.7%
LAMA	212	9%	170	3.7%
Death	272	11.6%	436	9.6%
<b>Chi square test value: 167.7 p &lt;0.001</b>				
<b>Impact of NRHM on Outcome among Intramural Admissions</b>				
	<b>2011</b>		<b>2014</b>	
	<b>No</b>	<b>%</b>	<b>No</b>	<b>%</b>
Discharged	1179	80.8%	2744	90.7%
Referred	60	4.1%	27	0.9%
LAMA	85	5.8%	64	2.1%
Death	136	9.3%	189	6.3%
<b>Chi square test value: 117.5 p&lt;0.001</b>				
<b>Impact of NRHM on Outcome among Extramural Admissions</b>				
	<b>2011</b>		<b>2014</b>	
	<b>No</b>	<b>%</b>	<b>No</b>	<b>%</b>
Discharged	569	63.9%	1126	73.7%
Referred	58	6.5%	49	3.2%
LAMA	127	14.3%	106	6.9%
Death	136	15.3%	247	16.2%
<b>Chi square test value: 53.22 p&lt;0.001</b>				
<b>Table 4 : Impact of NRHM in SNCU, GDMCH, Dharmapuri</b>				

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**Fig. 1: Equipments and staff position in SNCU, GDMCH, Dharmapuri from 2011-2014**



**Fig. 2: Comparison of Mortality Rates of various studies with present study**

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