A STUDY TO EXAMINE MORBIDITY AND MORTALITY IN VLBW (VERY LOW BIRTH WEIGHT) NEONATES ADMITTED TO NICU IN CHANDIGARH

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INTRODUCTION

- Prematurity (where a gestational period is less than 37 weeks) is the significant reason for morbidity in neonates particularly in the neonates of very low birth weight (VLBW). Very low birth weight neonates as defined by WHO is the birth weight under 1500g upon birth regardless of gestational time.
- Among the results of perinatal, neonatal, and postnatal, the main determinant is birth weight. It is subject to the gestation length and the foetus intrauterine development (IUD). Globally, it is under 2% of the birth incidence of VLBW infants. The live births of VLBW in Indian children establish 4 % to 7 % and roughly 30 % is the mortality among the Neonates.
- Consequently, the study that current would assist with recognizing variables to add to morbidity pattern as well as to the mortality especially with the exceptional cases of admission of low-birth-weight neonates in the Neonatal Intensive Care Unit (NICU).

CONCEPTUAL FRAMEWORK

- The reason for selecting the mentioned research problem for my study is “Premature birth” which could be a leading factor for the mortality and morbidity among VLBW neonates. Premature birth is where gestational period is less than 37 weeks or as defined by WHO is the birth weight under 1500g during birth regardless of gestational time.
- To carry on the current study, a neonate Intensive care unit at a tertiary care hospital in Chandigarh have been identified where all the VLBW neonates admitted there would be examined from January 2019 – December 2019 with certain inclusion and exclusion criteria which has been discussed further in the document.

REVIEW OF LITERATURE

Author (year)	Study location	Sample size	Sampling techniques	Salient features
Tim Schindler, Louise Koller Smith, Kei Lui, Barbare Bajuk ND Srinivas Bolisetty (2017)	New South Wales, Australia	4454	Retrospective cohort study	Information of live-born babies in 10 NICU's (under 32 weeks of development) showed that there happened 345 (7.7%) deaths out of 4454 live new-born children. The most regular reason for death across all gestational gatherings was distinguished as major IVH (Intraventricular haemorrhage) trailed by Intense Respiratory Sickness and Sepsis.

Author (year)	Study location	Sample size	Sampling techniques	Salient features
S., Kabilan & Kumar, Mekalai (2018)	Govt. Stanley Medical College, Chennai, Tamil Nadu	154	Retrospective cross-sectional study	In the study were the VLBW babies enrolled in the medical college was 154, out of which 75 (48.7%) were females and 79 (51.3%) guys, most of which were in the gestational age between 33 weeks and 36 weeks (44.2%, n=68), the maternal sickness was available in 55 moms (33%) and gestational hypertension being the most well-known (9.6%, n=14). The two crucial factors studied in this which are answerable for the VLBW baby's mortality are mechanical ventilation and weight at the time of birth. RDS (respiratory disease syndrome) is the vital cause that has been identified for morbidity (33.6%, n=56) followed by asphyxia and sepsis. A mortality rate of 40.3% (n=62) was seen in this study.

Author (year)	Study location	Sample size	Sampling techniques	Salient features
Kaur, A., Thapar, K., Chhabra, G., & Jaslean, (2016)	Shri Guru Ram Das Institute of Medical Sciences and Research, Amritsar	75	Observational study	Sepsis (77.3%) was recognized as the significant reason for morbidity in VLBW children followed by HMD (Hyaline membrane disease) (66.7%) and Jaundice (65.3%). Out of the absolute nine mortality, three cases were discovered to be related for p value< 0.001 of IVH. In these three cases, the only point that was analogous with p-esteem <0.001 is pneumothorax.

Author (year)	Study location	Sample size	Sampling techniques	Salient features
Basu S, Rathore P, Bhatia BD (2008)	University Hospital of the Institute of Medical Science, Banaras Hindu University	75	Retrospective study	The study was to discover the mortality in neonates with VLBW for the paediatrics in India for three years. It has been found that the endurance for the rate of survival rate elevated with an expansion in the age of gestational and birth weight. Asphyxia in perinatal, Apnoea, Shock, and sepsis in neonatal are the elements found for mortality among neonatal and are responsible directly.

Author (year)	Study location	Sample size	Sampling techniques	Salient features
Mannan, M A et al (2012)	University of Science and Technology Chittagong, Bangladesh	35	Prospective study	From the study, it has been observed that the common problems that neonates with very low birth weight are 40% with apnea, further, 5.71% with anaemia, 5.71% with IVH, 2.86% with RDS.

RESEARCH GAP

In current patterns, there is a growing infant's number that is born and accompanied by the low weight at the time of birth. Children with these VLBW children are at great risk for acquiring Hypoglycaemia, Sepsis, Respiratory misery, Hyperbilirubinemia, when contrasted with term infants.

Health experts will not only able to anticipate and manage but also will get insight to prevent complications among neonates by scrutinizing the risk determinants commencing for the morbidities of very low weight at birth.

Affirmation of morbidity and mortality in VLBW neonates incline towards the assistant for formulating as well as the interventions to be implemented to decrease the rate for the mortality in neonates.

RESEARCH QUESTION	What are the factors responsible for very low birth weight in neonates during birth leading to their mortality and morbidity?	**RESEARCH OBJECTIVE**
General Objective: To examine morbidity and mortality in VLBW (very low birth weight) neonates admitted to NICU in Chandigarh.	**SPECIFIC OBJECTIVE**	To assess the association of the baby's sex with the outcome.
To find out the association of gestational age with the outcome.	To estimate the association between the gestational age and the time of neonates' death.	To associate the correlation between the mode of delivery and outcome.

RESEARCH METHODOLOGY

DESIGN – Prospective Cohort Study.

PLACE – Tertiary Care Hospital in Chandigarh

POPULATION – All neonates associated with VLBW admitted to Neonatal Intensive Care Unit.

PERIOD – Between January 2019 and December 2019.

SELECTION CRITERIA:

Inclusion: All the children admitted in NICU with low birthweight between January 2019 to December 2019.

Exclusion:

1.Neonates who are already having serious congenital abnormality.

Exclusion:

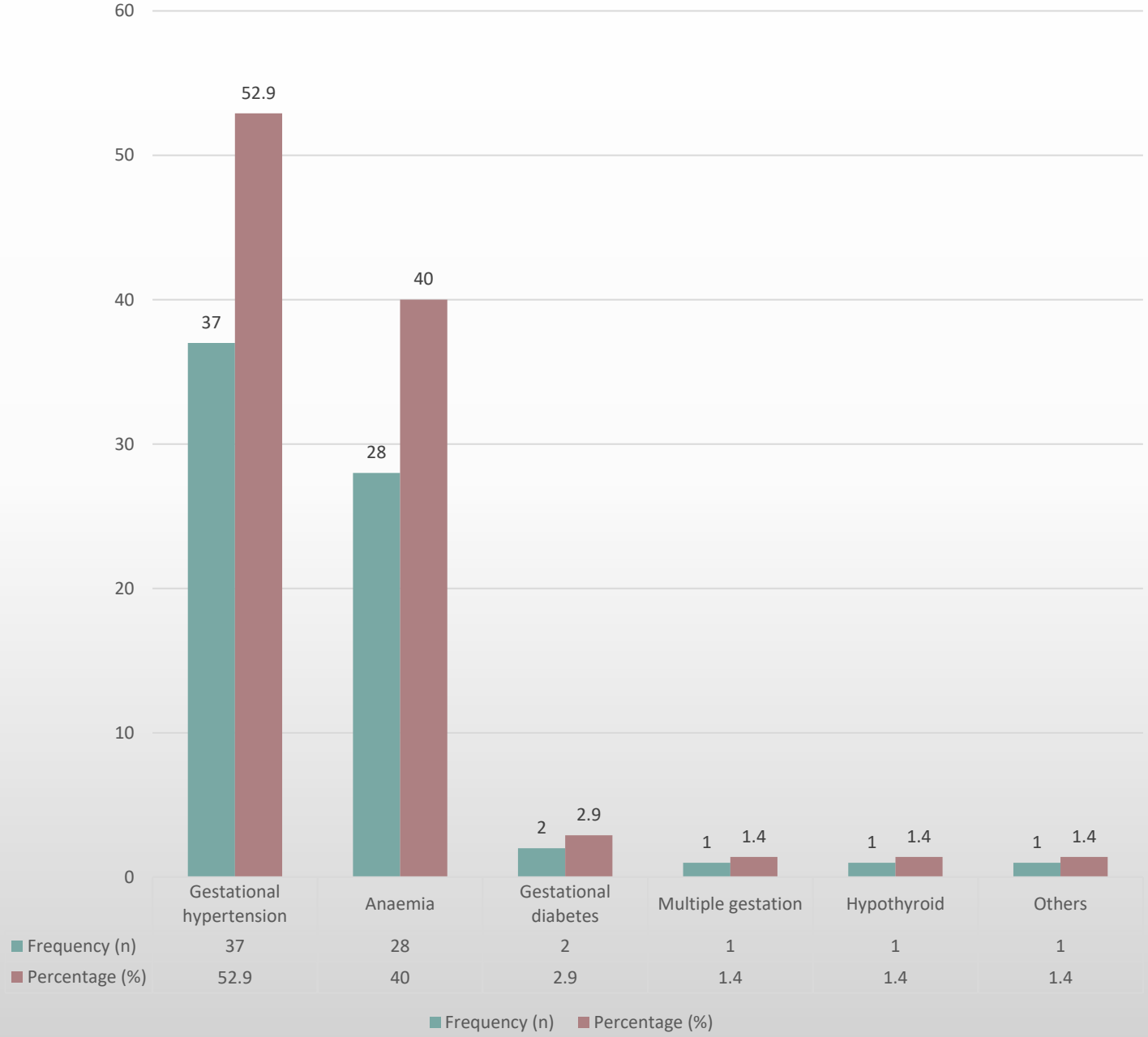
2.Chromosomal syndromes in neonates that are to be determined by clinically.

PLAN OF ANALYSIS:

Microsoft Excel 365 would be used for data analysis.

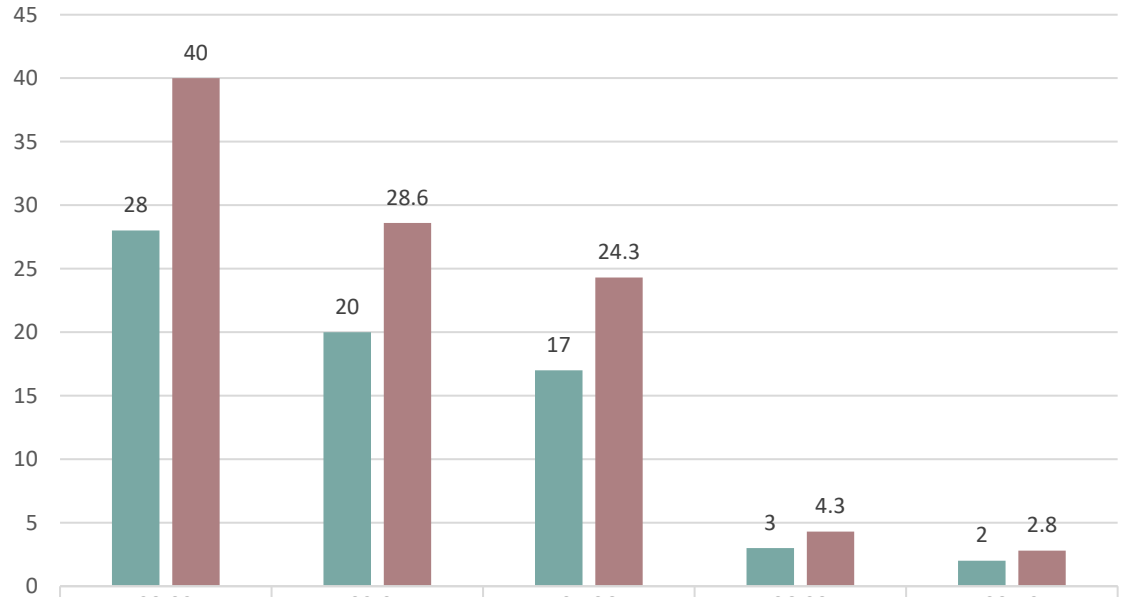
RESULTS

Graph 1 - Complications during delivery



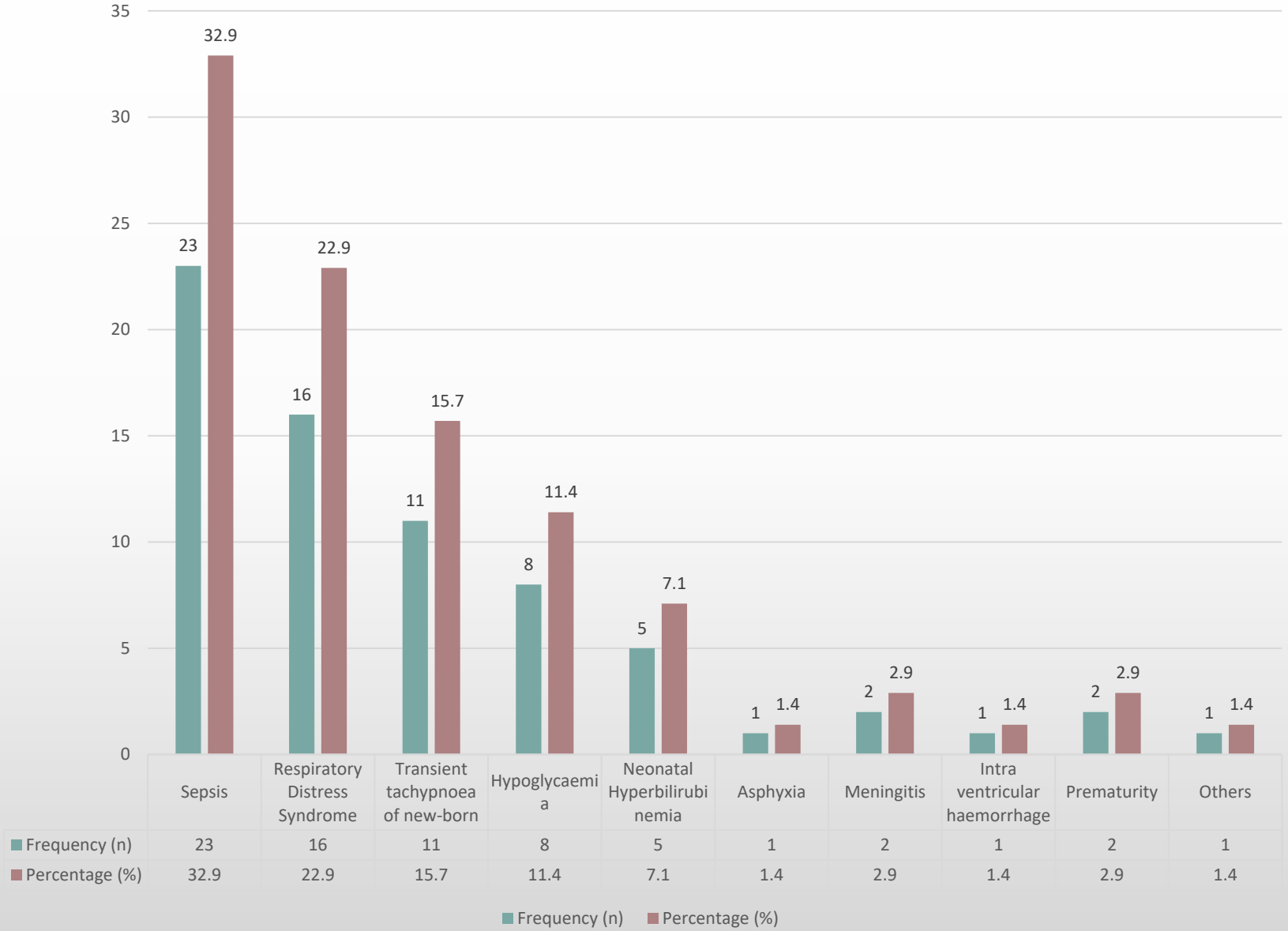
INTERPRETATION – The graph data for the complications during delivery which are further maternal risk factors came to be 52.9% with gestational hypertension followed by 40% with anaemia, a further 2.9% with gestational diabetes, 1.4% with multiple gestation, 1.4% with hypothyroid and 1.4% with others.

Graph 2 - Gestational age of neonates

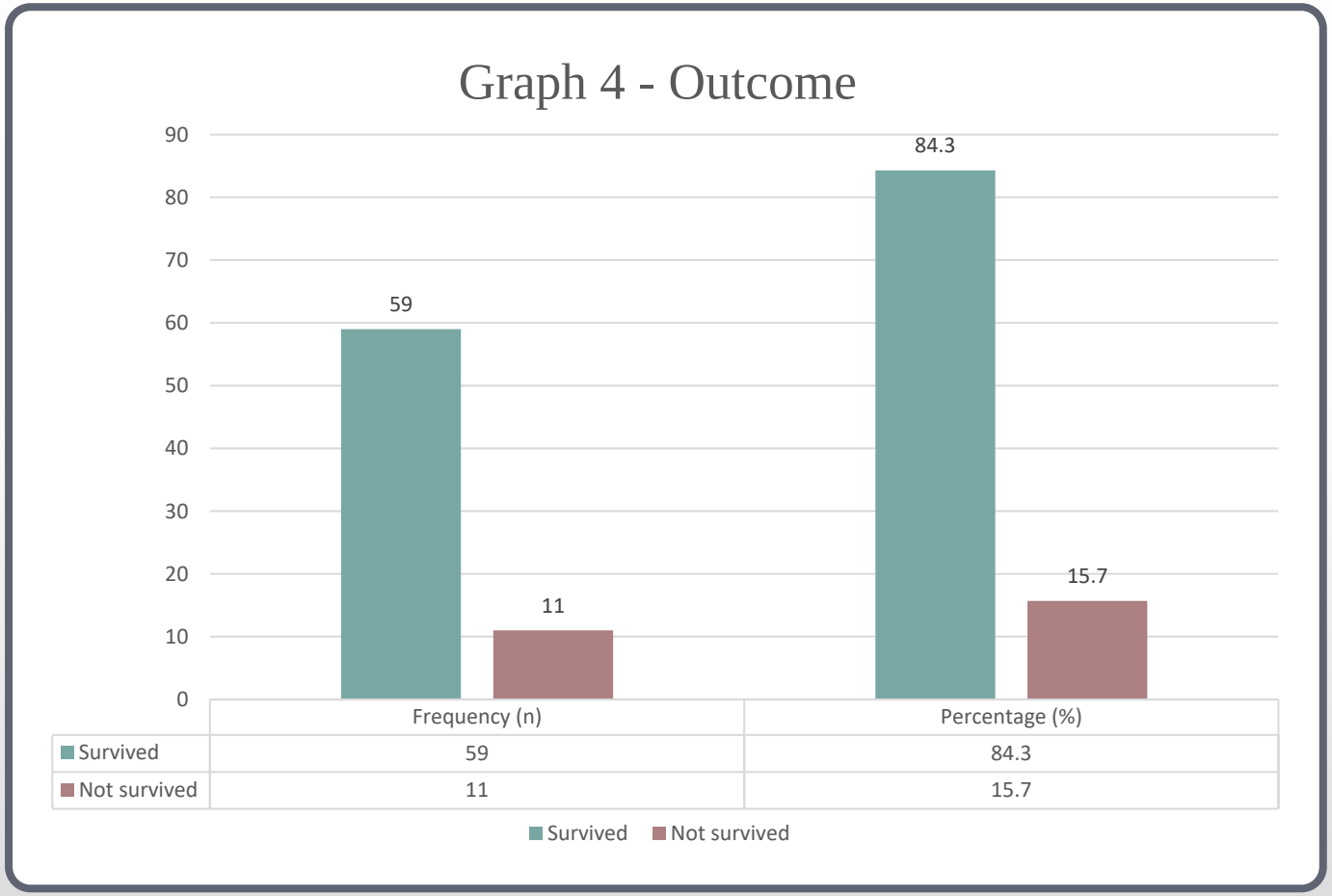


Among the sample size for the gestational age of neonates represented in the bar graph, found out that 40% are between the age of 28 weeks and 32 weeks, 28.6% are between the age of 32 weeks and 34 weeks, for the age between 33 years and 36 weeks is 24.3%, 4.3% are between the age of 36 weeks and 38 weeks and 2.8% are between the age of 38 weeks and 40 weeks.

Graph 3 - Complications during birth

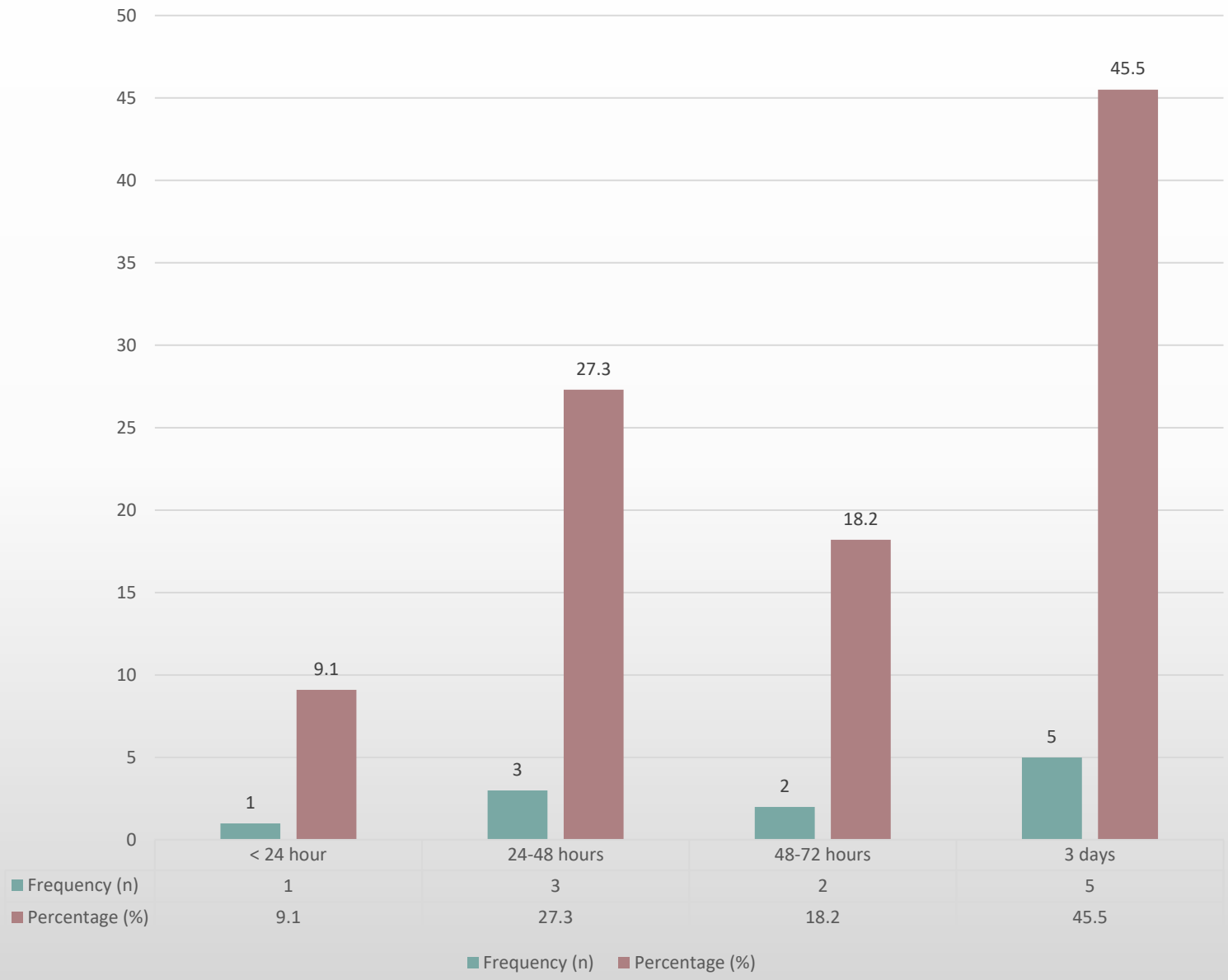


The graph about the complications during birth came to be 32.9% with sepsis followed by 22.9% with RDS, a further 15.7% with transient tachypnoea of new-born, 11.4% with hypoglycemia, 7.1% with neonatal hyperbilirubinemia, 1.4% with asphyxia, 2.9% with meningitis, 1.4% with intraventricular haemorrhage, 2.9% with prematurity, 1.4% with others.



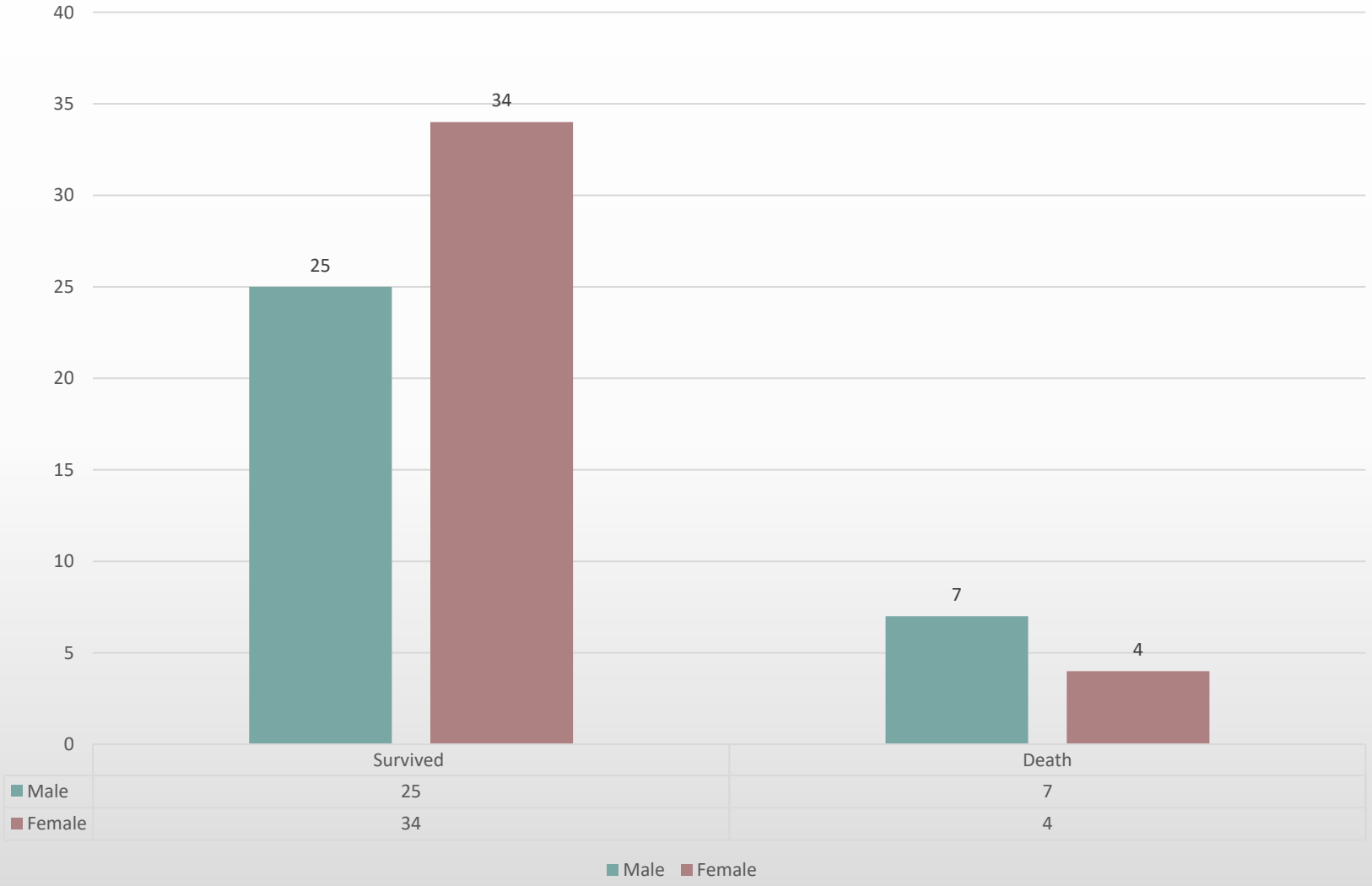
The graph about the outcome from the sample size, it has been observed that the survival outcome is 84.3%, while the percentage of not survived is 15.7.

Graph 5 - Time of death



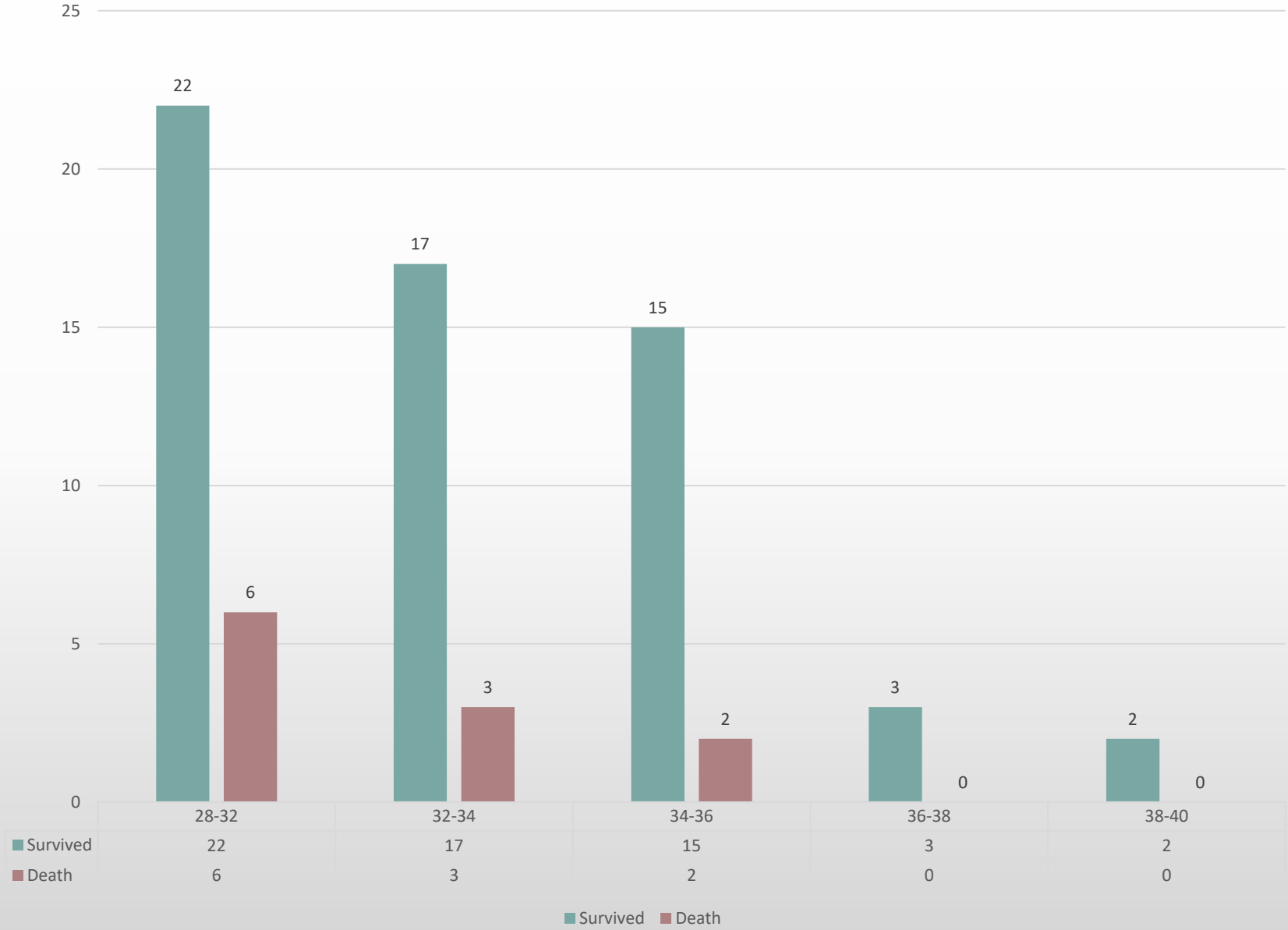
The graph about the time of death from the sample size depicts that 9.1% with < 24 hours, 27.3% for 24 hours -48 hours, 18.2% is for 48 hours-72 hours and 3 days is 45.5%.

Graph 6 - Association of babies' sex with outcome



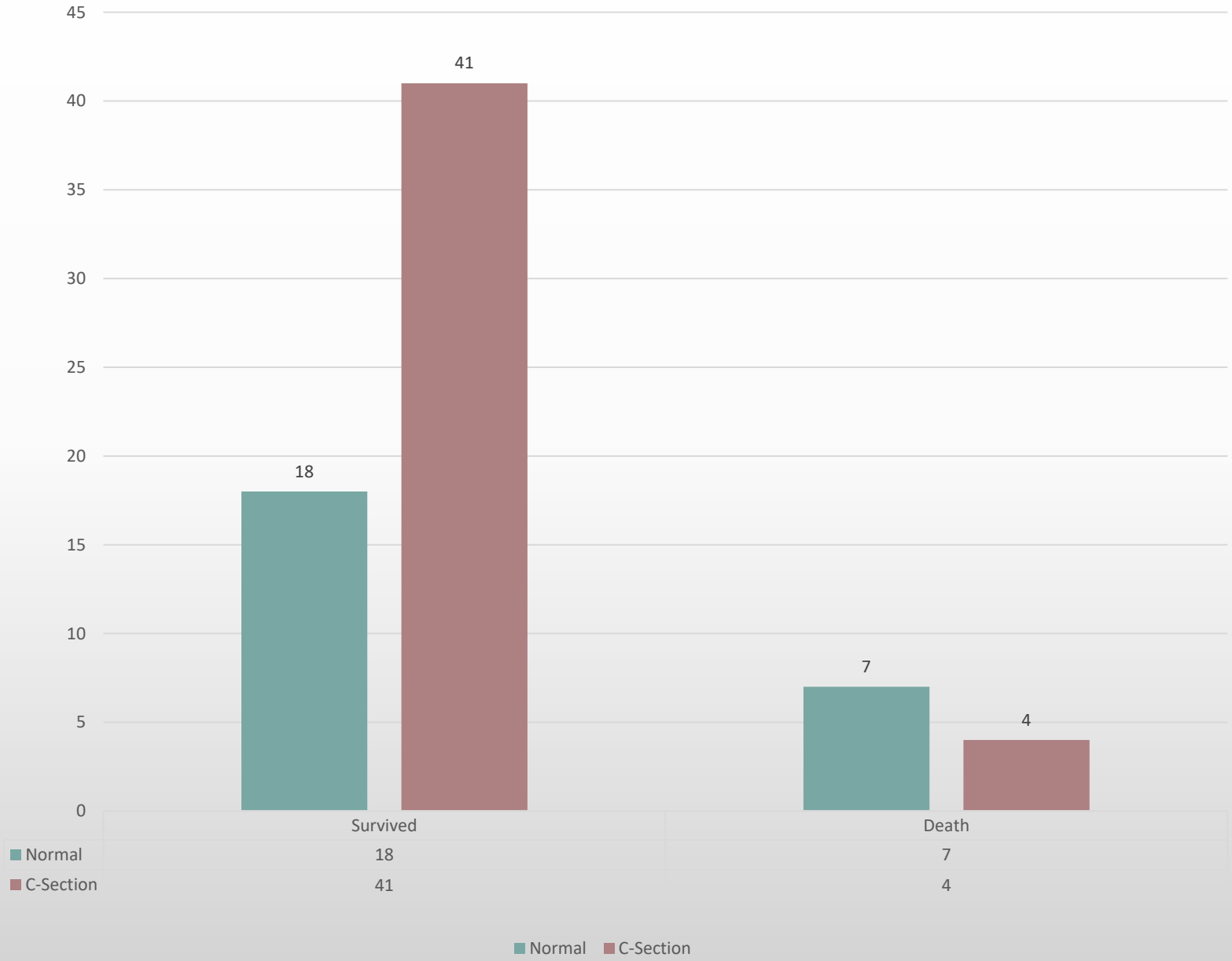
To find out the association between babies' sex and the outcome, bivariate analysis was carried out with the help of t-test in excel. It has been observed that there is no statistic significance in the association of babies' sex with the outcome with 90% of a confidence interval and p came out to be more than 0.1 ($p>0.1$).

Graph 7 - Association of gestational age with outcome



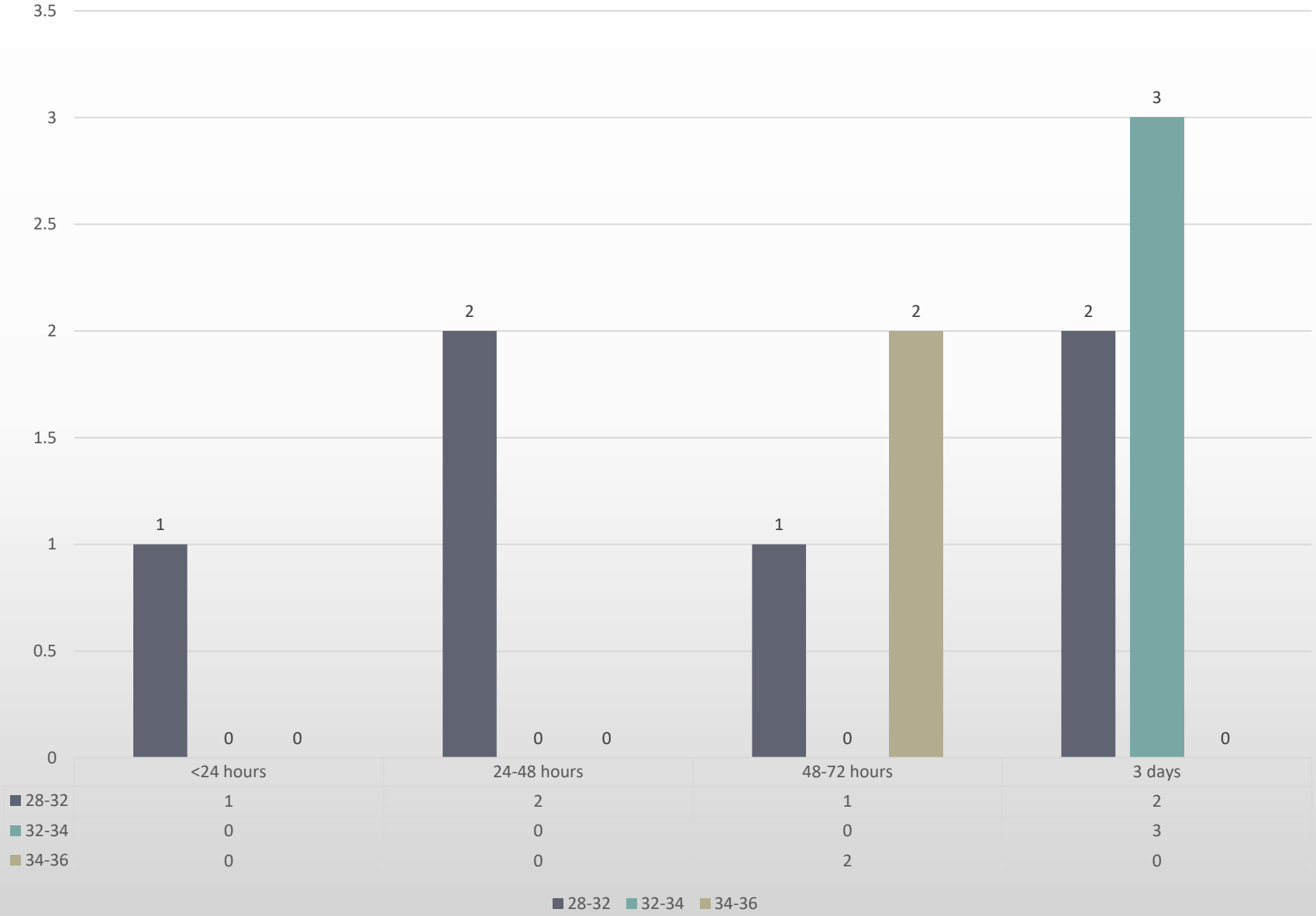
To find out the association between gestational age and the outcome, it has been emerged out from the analysis that gestational age found having statistically significant association ($p<0.1$) with the outcome.

Graph 8- Association of mode of delivery with outcome



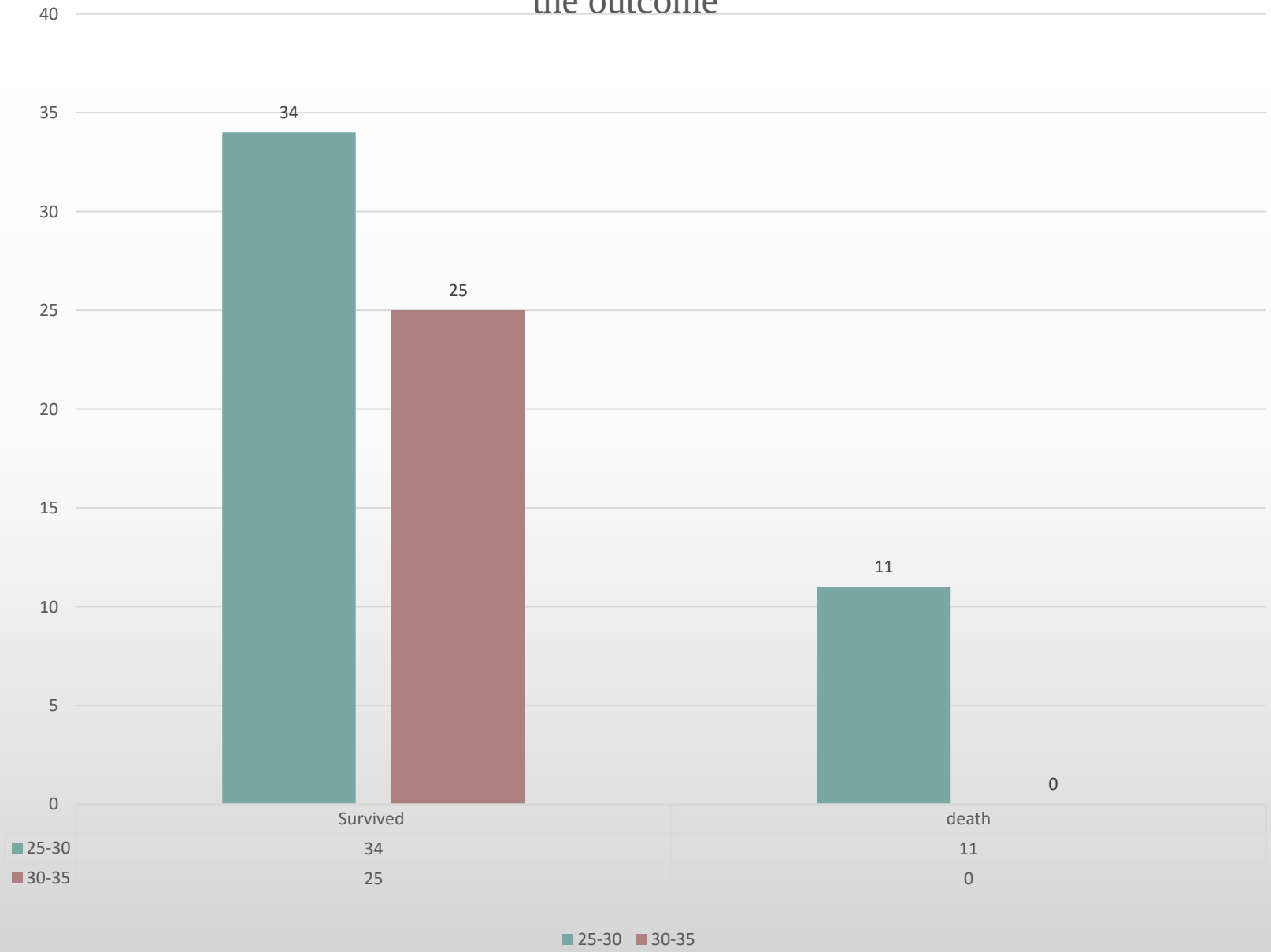
The bar graph about the association of mode of delivery with outcome depicts that the outcome of the neonates has no statical significance with the mode of delivery ($p>0.1$).

Graph 9- Association between the gestational age and the time of neonates' death



The graph depicts that there is a statistically significant ($p<0.1$) association between the gestational age and the time of neonates' death.

Graph 10 - Association of maternal age at the time of delivery with the outcome



The graph depicts that there is a statistically significant association ($p<0.1$) between the maternal age at the time of delivery and the outcome.


DISCUSSION

On the whole, from the current sample size of neonates of very low birth weight neonates, 38 (54.3%) were females and 32 (45.7%) were males. Furthermore, it has been observed that the factors for the morbidity and mortality pattern noticed higher among male neonates as contrasted to females.

Moreover, it has been observed that among preterm neonates there is 93% of mortality on contrasting term neonates with 7%. A study was done by Mannan et al and in their research, it has been concluded that the mortality rate amongst VLBW neonates and are preterm is more when compared to the term VLBW neonates.

Additionally, the common risk factors for maternal that could be a link with very low birth weight and mortality among neonates is first, gestational hypertension (n= 37, 52.9%) accompanied by anaemia (n= 28, 40%). A similar study conducted by Mannan et al, observing a more significant rate of mortality among the neonates born to mothers who had complexities during pregnancy than the neonates born with mothers where no pregnancy complications were observed.

- The two crucial factors studied by Kabilan et al in this which are answerable for the VLBW baby's mortality are mechanical ventilation and weight at the time of birth.

- RDS (respiratory disease syndrome) is the vital cause that has been identified for morbidity (33.6%, n=56) followed by asphyxia (32.4%, n=54) and sepsis (27.6%, n=46). A mortality rate of 40.3% (n=62) was seen in this study.

- Further, it has been observed in the study that the incidence rate for the 90% of neonates with very low birth weight is 33.6% followed by the 76% of mortality rate.

- However, in the present study, the dominant conditions about fatality and morbidity against neonates existing with VLBW are 32.9% with sepsis followed by 22.9% with RDS. Sepsis being considered as the primary basis concerning the mortality within the very low birth weight neonates deems for 32.9%.

- During the observation of data, it came out that the outcome of the neonates has no statical significance ($p>0.1$) with the mode of delivery either normal or C-section.
- Another study has been done by Mannan et al in which it has been discovered that neonates specifically who stayed at the hospital due to repetitious difficulties were majorly the neonates with very low birth weight and diverse pattern of mortality has been observed.

- The influential account for morbidity in an observational investigation regarding mortality and morbidity done by Thapar K et al is sepsis accompanied by hyaline membrane disease plus Jaundice, mostly with the gestational age between 33 weeks and 36 weeks (44.2%, n=68).
- Comparable to this, in our study, Morbidity in VLBW neonates is 32.9% with sepsis followed by 22.9% with RDS.
- Moreover, it has been found out that 40% are between the age of 28 weeks and 32 weeks, 28.6% are between the age of 32 weeks and 34 weeks, for the age between 33 years and 36 weeks is 24.3%, 4.3% are between the age of 36 weeks and 38 weeks and 2.8% are between the age of 38 weeks and 40 weeks.

- A review investigation by Schindler et al finds out that 35% of sepsis followed by 27% respiratory distress syndrome, 22% of transient tachypnoea of newborn and 12% hypoglycemia are the usual frequent morbidity amongst neonates of very low birth weight also, the common probable reason of mortality is IVH (Intraventricular haemorrhage) trailed by Intense Respiratory Sickness and Sepsis.
- While, in this study, the significant determinant of mortality existing is first, 32.9% with sepsis followed by RDS of 22.9%.

- Banaras Hindu University has conducted a retrospective study and found out that the endurance for the rate of survival rate elevated with an expansion in the age of gestational and birth weight.
- Asphyxia in perinatal, Apnoea, Shock, and sepsis in neonatal are the elements found for mortality among neonatal and are responsible directly.
- However, in the current study, came to be 32.9% with sepsis followed by 22.9% with RDS, a further 15.7% with transient tachypnoea of new-born, 11.4% with hypoglycemia, 7.1% with neonatal hyperbilirubinemia, 1.4% with asphyxia, 2.9% with meningitis, 1.4% with intraventricular haemorrhage, 2.9% with prematurity, 1.4% with others.


CONCLUSION

A clear picture has been observed for the factors accountable for mortality and morbidity in VLBW neonates at the time of birth. Risk is high for mortality among VLBW neonates. There is an urgency for an efficient precautionary strategy so as to prevent early gestational deliveries and to minimize the degree of morbidity rate and mortality rate in the union territory.

The common risk factors for maternal that could be a link with very low birth weight and mortality among neonates is first, gestational hypertension accompanied by anaemia. In order to diminish such circumstances, there is a necessity to increase the monitoring of prenatal check-ups and counselling sittings required to follow the suggestive advice as directed by the gynaecologist.

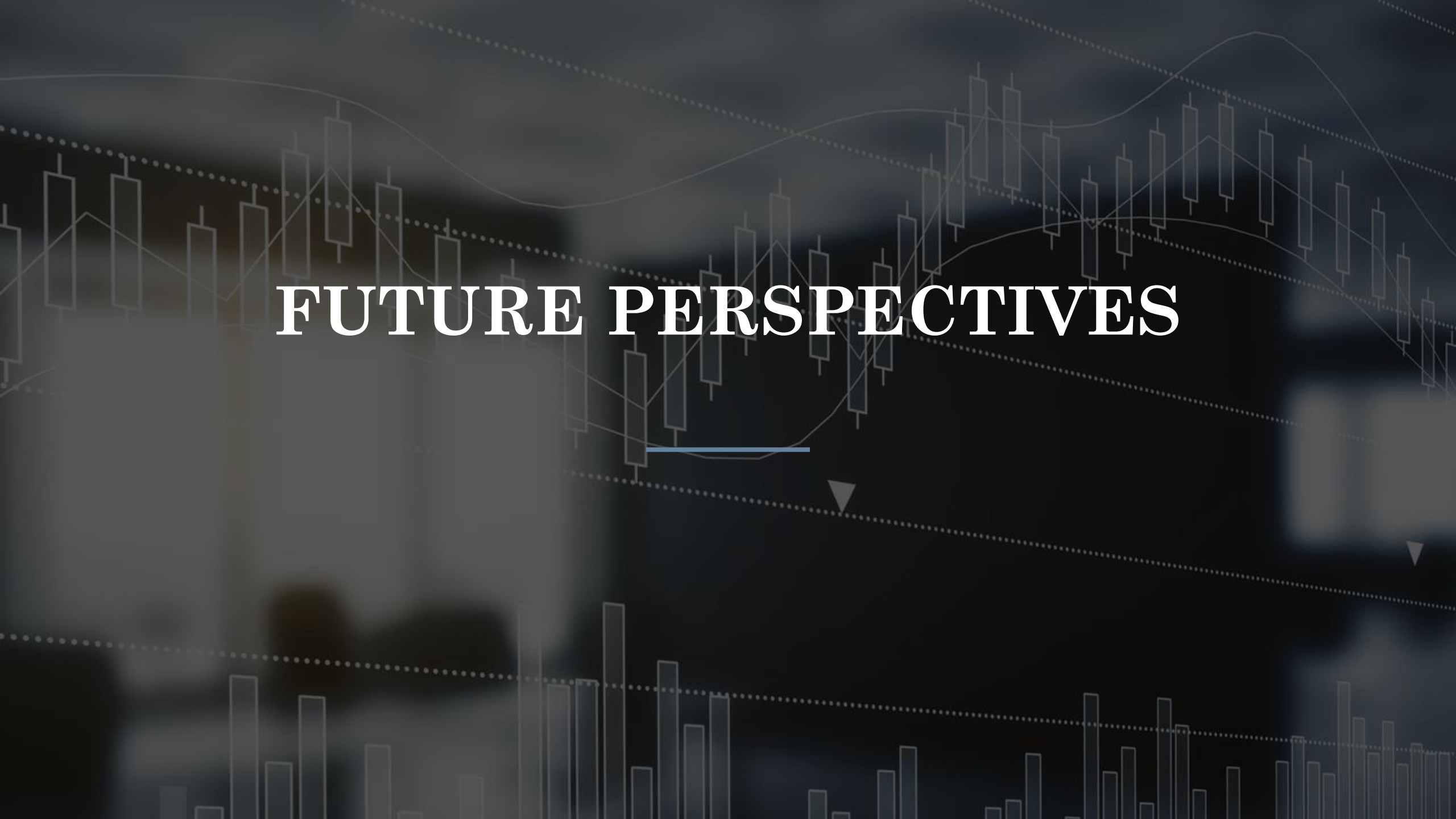
In the study, it has been observed that among expecting mothers, there is a dire need for counselling at the nutritional front so as to overcome the number of anaemic mothers. This will have a positive effect or lessen down the rate of incidence among infants with very low weight at the time of birth.

LIMITATIONS

- The current study was conducted among VLBW neonates and was between the weight of 900 grams and 1500 grams at the time of birth.
- Had it been a change in inclusion criteria where infants below 900 grams, there would have been different and probably better results to get a clearer picture for the specified objectives.
- If the current prospective study included data from primary care hospital as well as secondary care hospital then, a more reliable knowledge would have been come out for Chandigarh.
- To add to it, had it been the size of the sample more, the result would have been in a better picture.
- Furthermore, due to the small sample size, a 90% of confidence interval has been used to determine the statistical significance.

RECOMMENDATIONS

- To decrease the level of prematurity and VLBW birth rates, relevant practices need to be selected. The services for antenatal care could be strengthened through proper knowledge on health simultaneously, spreading the awareness about the complications among neonates with very low birth weight at the time of birth.
- In order to lessen down the complexities among mothers during pregnancy and neonates with very low birth weight, the need for sufficient care such as practicing ENC (Essential Newborn Care) during the period of antenatal.
- The utilization of ENC has been linked with the sessions for counselling at the time of delivery. At the community level, women empowerment, as well as training of the staff, is highly recommended via promotion of knowledge.
- A proposal for the adviser would work closely so as to acknowledge and examine the emotional stress a parent must be going through and also to survive perinatal mood disorders.
- Proper training and understanding of the methodology of quality improvement would act as a liaison between the current operating standards and the implementation of findings of the research.



FUTURE PERSPECTIVES

There is a need to imply preventive strategies at different levels of antenatal care and postnatal care, especially emphasizing the detection at an early level and managing effectively PIH (Pregnancy Induced Hypertension).

In order to foster the criteria for the well-being of neonates, it is a crucial time to act upon the transportation amenities for the neonates.


Thank
You