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A study to evaluate the effectiveness of self-instructional module on knowledge regarding management of neonatal asphyxia among staff nurses working in selected maternity hospitals at Tumakuru

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Abstract
Background of the study: Neonatal asphyxia assumed to intrapartum related hypoxia-ischemia, accounts for one million neonatal deaths annually. In the low resource setting neonatal asphyxia is usually defined as a failure to initiate or sustain spontaneous breathing at birth. In the resource replete setting neonatal asphyxia is a biochemical definition related to impaired gas exchange.

Objectives
- To assess the level of knowledge regarding management of neonatal asphyxia among staff nurses.
- To develop and administer a Self-Instructional Module on management of neonatal asphyxia.
- To evaluate the effectiveness of Self-Instructional Module regarding management of neonatal asphyxia among staff nurses.
- To find an association between the pretest knowledge score regarding management of neonatal asphyxia among staff nurses with their selected demographic variable.

Methodology: In the present study a Pre experimental design was selected, one group pre-test and post-test design was adopted. The conceptual frame work adopted for the present study was based on the J.W. Kenny"s open system model. Sample size of this study was 60 staff nurses. The sample was selected by purposive sampling technique. Data was collected by structured knowledge questionnaire and obtained were analysed and interpreted in the light of the objectives, using both descriptive and inferential statistics.

Result: Majority 68.3% of the staff nurses had inadequate knowledge and 31.7% had moderate knowledge in the pre-test. After administration of the structured knowledge questionnaire 71.7% of the subjects had adequate knowledge, 28.3% had moderate knowledge regarding management of neonatal asphyxia in the post test. Result proved that SIM was effective in improving the knowledge of the staff nurses regarding the management of neonatal asphyxia.

The calculated paired "t" value (Tcal= 31.38) was greater than the table value at 0.05 level of significance. H1- The mean post-test knowledge scores regarding management of neonatal asphyxia among staff nurses is significantly higher than the mean pre-test knowledge scores at 0.05 and 0.0 1 level of significance. There was no statistical association between selected socio-demographic and their knowledge scores at 0.05 and 0.01 level of significance.

Conclusion: The study concluded that Self-instructional module was effective in improving and update the knowledge of the staff nurses regarding the management of neonatal asphyxia.

Keywords: Knowledge; staff nurses; management of neonatal asphyxia, structured teaching programme

Introduction

"The belief in charms in protecting new born infants are very strong in Greece''

James Theodora Bent

Neonatal asphyxia is a condition in which a baby does not receive enough oxygen before, during, or directly after birth. In severe cases, it can cause serious complications and even be life threatening. Immediate treatment is necessary to ensure that the baby receives enough oxygen. Neonatal asphyxia occurs when an infant does not receive enough oxygen when born, potentially leading to difficulty breathing. It can happen just before, during, or after birth. Insufficient oxygen supply to the body can cause low levels of oxygen or a build-up of excess acid in the baby's blood. These effects can be life threatening and require immediate treatment. In mild or moderate cases, babies may recover fully.

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However, in severe cases, birth asphyxia can cause permanent damage to the brain and organs or be fatal. Birth asphyxia rates are lower in developed countries, with a rate of 2 in 1, 000 births Trusted Source. In areas of developing countries where there is limited access to neonatal care, this rate increases up to 10 times.

According to WHO (2018), asphyxia is the second leading cause of neonatal deaths worldwide. Based on the Health Profile of Central Sulawesi, in the Central Sulawesi Region in 2018, there were 385 cases of Neonatal deaths. While the Palu City Health Office in 2016, recorded neonatal deaths in Palu City were 16 cases with the most causes was asphyxia neonatorum which was 50%. Asphyxia neonatorum is a condition where new born experiences gas exchange and oxygen transport disruptions, resulting in a lack of oxygen supply and difficulty in removing carbon dioxide [4]. This condition is known as hypoxic-ischemic encephalopathy or HIE. In developed countries, around 0.5–1/1000 full-term infants born alive and experiencing HIE, and 0.3/1000 have significant neurological disabilities.

Neonatal asphyxia, or perinatal asphyxia, refers to oxygen deprivation during labor or delivery long enough to cause physical harm, and particularly brain damage. This oxygen deprivation can result from many factors, including excessive contractions, umbilical cord compression, preeclampsia, and instances of medical malpractice, including failure to respond to fetal distress in a timely or appropriate manner. When birth asphyxia is severe, it can injure brain cells and cause potentially fatal conditions, including Hypoxic-Ischemic Encephalopathy (HIE), brain injuries, seizures, and cerebral palsy. Because brain trauma is the most serious birth injury a baby can suffer, it has the potential for devastating long-term effects that create life-long challenges for victims and families. Children who suffer brain injuries during birth can also display increased signs and symptoms as they age.

According to Volpe [2], hypoxemia may be defined as the "diminished amount of oxygen in the blood supply", while cerebral ischemia is defined as the "diminished amount of blood perfusing the brain". Cerebral ischemia is the more important of the two forms of oxygen deprivation because it also leads to glucose deprivation. The terms hypoxia-ischemia and asphyxia are often used interchangeably, but they are not equivalent from a pathophysiological viewpoint. Hypoxia-ischemia or pure ischemia are rarely observed in the new-born, while some combination of hypoxia, ischemia and hypercapnia are more common [5].

Need for the study
The World Health Organization describes neonatal asphyxia as failure to initiate and sustain breathing at birth. The aim of the study was to study the clinical profile and outcome at 3 months of age of full-term babies born with severe birth asphyxia and to analyses risk factors associated with adverse outcome. Full term neonates with severe birth asphyxia have significant mortality and significant number of survivors have abnormal neurological outcome at 3 months of age. Presence of certain clinical indicators is associated with increased risk of adverse outcome.

Statement of problem
A study to evaluate the effectiveness of Self-Instructional Module on knowledge regarding management on neonatal asphyxia among staff nurses working in a selected Maternity hospital at Tumkur, Karnataka.

Objectives of the study
- To assess the level of knowledge regarding management of neonatal asphyxia among staff nurses.
- To develop and administer a Self-Instructional Module on management of neonatal asphyxia.
- To evaluate the effectiveness of Self-Instructional Module regarding management of neonatal asphyxia among staff nurses.
- To find an association between the pertest knowledge score regarding management of neonatal asphyxia among staff nurses with their selected demographic variable.

Hypothesis
- **H₁:** The mean post-test knowledge scores regarding management of neonatal asphyxia among staff nurses is significantly higher than the mean pre-test knowledge scores at 0.05 and 0.0 1 level of significance.
- **H₂:** There is significant association between the mean pre-test knowledge scores regarding the management of neonatal asphyxia among staff nurses with selected socio-demographic variables

Assumptions
- The staff nurses working in selected maternity hospital may have some knowledge regarding management of neonatal asphyxia.
- Self-instructional module may enhance the knowledge of staff nurses regarding management neonatal asphyxia.

Delimitation
The study is delimited to those staff nurses in selected hospitals at Tumkur.
The study is delimited to the knowledge assessment only
Study period is limited to 4 to 6 weeks.
Sample size is limited to 60 staff nurses

Material and methods research approach: Evaluative Survey Approach.
Research design: Pre experimental design was selected: one group pre-test and post-test design.

Research settings
The study was conducted in two settings
1. Sri Siddhartha medical Hospital Tumkur and
2. District Hospital Tumkur

Sample size and sample: 60 staff nurses were selected.
Sampling technique: non probability purposive Sampling method.

Variables
Independent variable: Self Instructional Module
Dependent variable: knowledge regarding management of neonatal asphyxia among staff nurses in selected maternity hospitals, Tumkur.

Criteria for selection of samples inclusion criteria: Staff nurses who are working in selected maternity hospital, Tumkur.
- Staff nurses who are willing to participate in the study.

- Staff nurses who are available at the time of study.
- Staff nurses who can read and write English.

Exclusion Criteria
- Who are sick and who are critically ill.
- Who are not willing to participate in the study.

Result
Demographic data was analysed using Frequency and Percentage. Frequency, Percentage, Mean, Medium, Standard Deviation and Range were used to determine the knowledge scores. The 't' value was computed to show the effectiveness of structural instruction module and a chi-square test was to determine the association between the pre-test knowledge scores of subjects and selected socio-demographic variables.

Section–I: Demographic characteristics of staff nurses
- Majority (40%) of the respondents belongs to the age group of 27-31 years, 23% belongs to the age group of below 22-26 years, 23.3% belongs to the age group of 32-36 years and only 16.6% belongs to the age group of 37 years & above respectively.

- Majority (88.3%) of the respondents are female and 11,6% of the respondents are male respectively.
- Majority 56.6% are G.N.M staff, 11.6% are P.B. B.Sc. Nursing, 8.3% are B.Sc. Nursing and only 6.6% are M.Sc. Nursing staffs respectively.
- Majority (33.3%) of the respondents are having 5-7 years of working experiences, 18.6% of the respondents are having 2-4 years experiences 13.3% of the respondents are having >8 yrs. experiences and only 11.1% of the respondents are having <1year experiences respectively.
- Majority 91% have handled the new born with neonatal asphyxia, 8.3% who have not handled a new born with neonatal asphyxia nursing staffs respectively
- Majority 83.3% are attended the conference and NRP, 16.6% are not attended NRP of staff nurses respectively
- Majority (76.7%) have got information from books and 23.3% have got information from mass media.

Section II: knowledge level of staff nurses regarding the management of neonatal asphyxia
Table 1: Analysis and interpretation of knowledge scores of subjects.

Table 1 Analysis and interpretation of knowledge scores of staff nurses on management of neonatal asphyxia, n=60

Items	Total	Mean % of knowledge score of subjects		
		Pre-test (x)	Post-Test (y)	Enhancement (x-y)
Self-instructional module	1800	36.0	83.4	47.4

Table no 1: reveal that there was a 47.4% enhancement in knowledge after administration of the Self-Instructional Module.
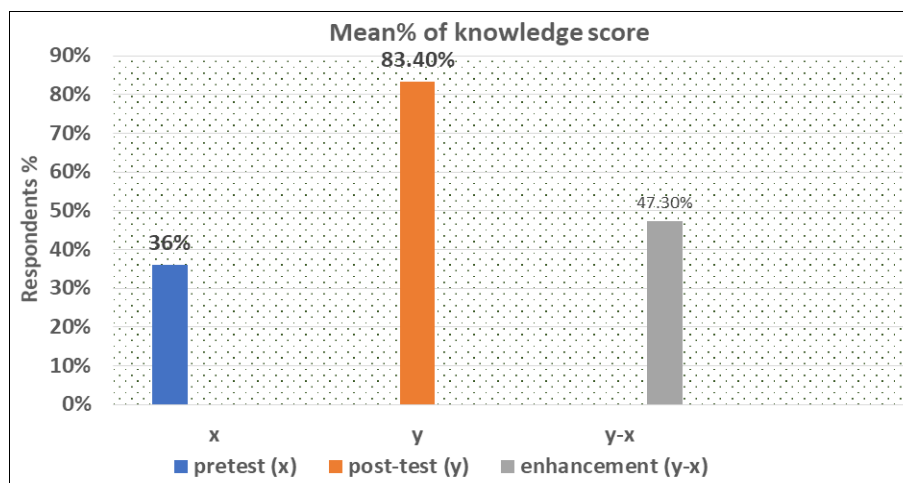
Fig 1: The column graph represents the mean % enhancement knowledge score of subjects according to their knowledge scores.

Table 2: Mean, Median, Standard Deviation of knowledge score of subjects on management of neonatal asphyxia, n=60

Area of analysis	Mean	Median	Standard deviation
Pre-test (x)	10.80	10	5.06
Post-test (y)	25.03	25	3.55
Differences (y-x)	14.23	14	1.51

Table no 2: reveal the mean knowledge score in the pre-test was 10.80, median was 10, standard deviation was 5.06, and whereas in post-test mean knowledge score was 25.03, median was 25, standard deviation was 3.55. Therefore, overall mean score was 14.23, median was 14, standard deviation was 1.51.

Table 3: Frequency and Percentage distribution of knowledge score of subjects on management of neonatal asphyxia.

Level of knowledge	Range of scores	Pretest		Post-test	
		Number (f)	Percentage (%)	Number (f)	Percentage (%)
Good	24-30	0	0	43	71.7
Average	16-23	19	37	17	28.3
Poor	1-15	41	68.33	0	0
Overall		60	100	60	100

Table no 3: show the level of knowledge regarding management of neonatal asphyxia, in pretest 19 (37%) subjects had average knowledge, 41(69%) subjects had poor knowledge and in post-test 43 (71.7%) subjects had good knowledge, 17 (27.3%) subjects had average knowledge.
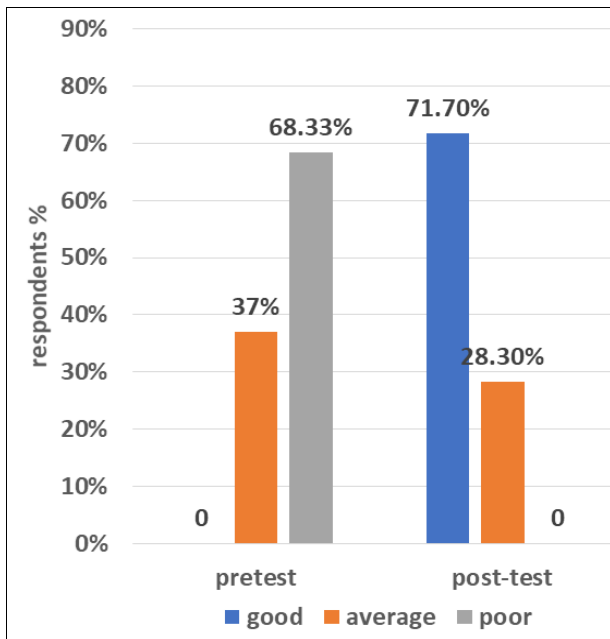
Fig 2: The column graph represents the knowledge level in pre-test and post-test

Section III: testing of hypothesis for evaluation of self-instructional module.

Table 4: Mean difference, and paired 't' value of knowledge score of subjects on management of neonatal asphyxia, n=60

Mean difference	Paired 't' value	
	Calculated	Tabulated
14.23	31.38	1.96

Table no 4: reveal that the calculated paired 't' value (tcal=31.38) is greater than the tabulated value (ttab=3.551) at 0.001 level of significance. Therefore, it is highly significant and H1 is accepted. This indicates that the gain in knowledge score was statistically significant at 0.05 level of significance was effectively in terms of gain in knowledge scores of the subjects.

Discussion
The finding of the present study had revealed the level of knowledge regarding management of neonatal asphyxia, in pre-test 19 (37%) subjects had average knowledge, 41(69%) subjects had poor knowledge and in post-test 43 (71.7%) subjects had good knowledge, 17 (27.3%) subjects had average knowledge. The calculated paired 't' value (tcal=31.38) is greater than the tabulated value (ttab=3.551) at 0.001 level of significance. Therefore, it is highly significant and H1 is accepted. This indicates that the gain in knowledge score was statistically significant at 0.05 level of significance was effectively in terms of gain in knowledge scores of the subjects.

Conclusion
Base on the findings of the study, the following conclusions were drawn.

Result proved that SIM was effective in improving the knowledge of the staff nurses regarding the management of neonatal asphyxia. There was significant difference between the pre-test and post-test knowledge. These scores were demonstrated by using paired _t 'test. The analysis of mean pre-test knowledge was 10.80 with SD of 5.06 where mean post-test knowledge was 25.03 with SD of 3.55. This high mean difference shows the effectiveness of self-instructional module. Overall area wise findings also revealed the effectiveness of self-instructional module.

Conflict of interest: Not available

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