Pregnancy and child birth are special events in a woman’s life. A baby born healthy, with normal birth weight and after complete period of gestation brings joy in the family.

An estimated 37 million child births take place annually (WHO, 2008). Some of these new borns have low birth weight (LBW), either due to less intrauterine growth or due to shortened gestational period. In India one-third of infants weigh less than 2500 gm and 65 percent of the babies die in the neonatal period due to low birth weight, asphyxia, prematurity and infection (Ghai, 2005) because these premature and LBW infants are prone to biochemical, respiratory and other complications. Therefore efforts to achieve the UN Millennium Development Goal 4 [MDG-4] of reducing childhood mortality by 2015 is focused on reducing neonatal deaths in high mortality countries (Jehan, 2009).

Low birth weight is defined as birth weight below 2500 gm irrespective of gestational age. It can be moderate LBW (1500-2499 gm), very LBW (1500 gm or less) and extreme LBW (1000 gm or less).

Low birth weight infants can be pre-term when baby is born before 37 complete weeks of gestation, or intrauterine growth retarded (IUGR) when they will be small for date (SFD) or small for gestational age (SGA).

Pre-term labour and pre-term delivery are among the most challenging complications. The rate of infant morbidity can be reduced with the early and accurate diagnosis of pre-term labour (PTL) and intervention to delay pre-term delivery. Pre-term delivery affects, approximately one in 10 births and is the cause of at least 75 percent of neonatal deaths (Vonderpool, 2008). Pre-term labour is defined as labour that occurs before completion of the 37th week of gestation.

Low birth weight, whether result of prematurity or IUGR is an independent risk factor for neonatal deaths, because lower the weight at birth, higher the neonatal deaths (Hacker, 2004).

According to Health Scenario J&K-2009, the infant mortality rate (IMR) in J&K is 42.33 percent, the leading cause of which was found to be premature and LBW neonates. Studies conducted in Srinagar have underscored the relationship of maternal risk factors with prematurity and LBW. These maternal risk factors include maternal age, weight, height, Hb level, socioeconomic status, stress, smoking, associated medical and obstetrical disorders, high parity, short birth interval etc. According to Fanaroff (2002), these factors cause stunted growth due to mechanisms like low foetal oxygen delivery, placental insufficiency, effect of drugs, infections and poor diet.

Nurses can guide and counsel women about PTL, its warning symptoms and precautionary measures to be adopted while giving them antenatal care. This is to be made an important aspect of routine antenatal care. All women especially those under 18 or over 40 years of age should be offered education and/or intervention
for family planning, diet, smoking, substance abuse etc. There is also a need to screen and identify these high risk women, give them care and treatment of pre-existing medical condition so as to optimise their pregnancy outcome. This is possible when a nurse is well versed with causes, symptoms, treatment and prevention of PTL and LBW. In a study conducted by Banerjee et al (2009), pre-term delivery and low birth weight were more prevalent among teenagers, thus teaching by nurses would enhance family welfare measures to delay the age of first pregnancy. Thus, the investigator felt the need to prepare a computer-assisted teaching programme to update the knowledge of nursing personnel working in maternity areas and those who are yet to be posted in this area.

**Objectives**

The objectives of the study were:

(i) to assess the level of knowledge of nursing personnel about pre-term labour and low birth weight (pre-test);

(ii) to evaluate the effectiveness of computer-assisted teaching programme as measured by gain in knowledge of nursing personnel on post-test; and

(iii) to determine the association between pre-test knowledge score and the selected variables.

**Hypotheses**

**H1:** The mean post-test knowledge score of subjects exposed to computer-assisted teaching programme is higher than mean pre-test knowledge score at 0.05 level of significance.

**H2:** There is significant association between pre-test knowledge score and selected variables at 0.05 level of significance.

The conceptual framework adopted for the study was based on Stuffle Beam’s Model which involves context, input, process and product evaluation.

**Context evaluation:** Enhancement of knowledge and need for development of computer-assisted teaching programme which forms base for formulation of objectives of the study.

**Input evaluation:** Development of tool and computer-assisted teaching programme; establishment of their validity and reliability and deciding research design.

**Process evaluation:** Implementation of pre-test, computer-assisted teaching programme and post-test.

**Product evaluation:** Gain in knowledge.

**Methodology**

An experimental single group pre-test post-test design was adopted for conducting this study. The sample consisted of 50 nursing personnel selected randomly from different wards of selected hospital of J&K.

Independent variable was computer-assisted teaching programme and dependent variable was knowledge of nursing personnel about pre-term labour and low birth weight. Tool used for the study was structured knowledge questionnaire that comprised of two parts.

**Part I:** Background information like age, professional qualification and experience in maternity area.

**Part II:** Knowledge items like concept and causes of LBW and pre-term birth, pre-term labour, problems of LBW and pre-term baby and prevention of LBW and pre-term birth of baby. Reliability of tool was established by Spearman Brown Prophecy formula and was found to be 0.86.

**Data collection**

Data was collected by selecting 50 nursing personnel from different hospitals of selected area. Staff of the hospital is routinely posted in rotation in all the clinical areas and some of the selected staff were yet to be posted in the maternity area. These subjects were selected randomly from duty. Consent was taken from the selected staff to participate in the study. Background information was collected by administering structured knowledge questionnaire while conducting pre-test. All subjects were informed to attend teaching programme on third day of pre-test. There was drop out of two subjects, thus remaining 48 subjects attended the teaching programme. The post-test was conducted within a week of teaching programme, using same structured knowledge questionnaire. The collected data was analysed according to the objectives of the study, then tabulated and interpreted using descriptive and inferential statistics.

**Results and Discussion**

The findings of the present study indicated that there was inadequate knowledge among the respondents regarding pre-term labour and low birth weight (Table 1).
It is evident from Table 1 that majority of the respondents were in the age group of 36-50 years and had no experience in the maternity area. Regarding professional qualification 58.33 percent were with BSc or Post Basic BSc degree and rest were GNMs.

Table 2 depicts area-wise pre-test and post-test cumulative scores and mean knowledge scores of respondents. Findings of pre-test revealed that there was maximum knowledge deficit in the area of pre-term labour though knowledge was equally inadequate in other areas like concept and causes, problems and prevention of LBW and pre-term birth of baby. The mean post-test knowledge of the respondents was found to be significantly higher than their mean pre-test knowledge scores in all the areas. The t-value was 8.47, 4.26, 3.79 and 8.25 for the areas of concept/causes of LBW/pre-term birth, knowledge about pre-term labour, problems of LBW/pre-term baby and prevention of LBW and pre-term birth of baby respectively and was found to be significant at 0.05 and 0.01 level of significance.

As t-value was found significant in all the areas of pre-term labour and LBW, it clearly indicates the effectiveness of computer-assisted teaching programme in improving knowledge of nursing personnel about pre-term labour and LBW.

It was also found that the mean knowledge score was highest (35.25) in the area of prevention of pre-term birth/LBW and lowest (5.5) in the area of concept/causes of pre-term birth and low birth weight as shown in the bar graph (Fig. 1).

The findings are supported by Leveno et al, Heater, Peggy, Goldstein, Bull and other pre-term birth prevention studies. These researchers have indicated gain in knowledge with teaching programme and information booklets offered by midwives during antenatal care. Similarly pregnant women also gain knowledge after offering them verbal and written information as found by Claesson (2007). The birth outcome of pregnant women at risk of pre-term labour was improved and there was reduction of pre-term births in America with health care programme offered by nurses as revealed by O’Sullivan (1992).

It is evident from Table 3 that the personal characteristics like age, professional qualification and maternity experience had no impact on the pre-test knowledge score of the respondents as t-value was found to be non-significant at 0.05 level of significance.

**Conclusion**

Computer-assisted teaching programme was found effective in improving knowledge of nursing personnel regarding pre-term labour and low birth weight. The knowledge would be utilised during routine antenatal care so that pregnant women would take precautionary measures till they complete their gestation period and deliver a full term, healthy and normal weight baby.

**Recommendations**

On the basis of study findings, the following recommendations are made:

- The study can be replicated on a large sample for making wider generalisations.
- An experimental study
can be conducted using control group in comparison.

A study can be conducted on pregnant women who are at risk of pre-term labour to increase their awareness about preventive measures.

Another study can be conducted in community settings for public health nurses and health workers.

**Implications**

The study shows that the computer-assisted teaching programme is effective in updating knowledge of nursing personnel. There should be provision of in-service continuing education programme to refresh their knowledge so that they can impart it to pregnant women routinely in antenatal clinic.

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