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A study to assess the effectiveness of computer-assisted teaching on knowledge regarding high-risk pregnancy among BSc Nursing 4th year students of R.D. memorial college of Nursing, Bhopal (M.P.)

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Abstract
This study was carried out to assess the effectiveness of computer-assisted teaching on knowledge regarding high-risk pregnancy among BSc Nursing 4th year students of R.D. Memorial College of Nursing, bhopal. All the 4th year BSc. Nursing students were enrolled in the study.
Study participants filled the pre-teaching assessment using the study tool (containing 30 objective questions) and then received a 1-hour session on High-risk pregnancy. Post-teaching assessment was done using the same study tool. Data were analyzed using MS Excel and Google Sheets. There was a 16% increase in the average scores after the teaching sessions (pre-teaching average score 11/30 and post-teaching 16/30). Almost all the Knowledge subcategories showed an increase in the level of knowledge of the study population. None of the demographic variables were correlated with the pre-teaching scores of the study population.

Keywords: Computer-assisted teaching, high-risk pregnancy, BSc Nursing Students

Introduction
In India about 20-30% pregnancies belong to the high-risk category, which is responsible for 75% of perinatal morbidity. Early detection and effective management of high-risk pregnancy can contribute substantially to a reduction in maternal mortality. Every year nearly 529000 women die globally due to pregnancy-related causes. For each death, nearly 118 women suffer from life-threatening events or severe acute morbidity.

All pregnancies should, therefore, be evaluated to know whether there are or will be risk factors. Age, parity, social class, mothers who have a history of chronic disease (diabetes, hypertension, heart disease etc.) or those with a history of previous pregnancy problems (abortion and stillbirth) and also multiple pregnancies, gestational age under 18 or over 35 years, pregnancy more than 4 times are some of the factors that should be taken into account while assessing the risk for any pregnant women.

Need for study
High-risk conditions form a very important part of the Antenatal assessment. Training the nurses of the medical profession at an early stage will not only have a stronger impact on reducing morbidity and mortality but also boost the nurse's confidence to face critical situations and act immediately and appropriately. To achieve this goal there should be an adequate improvement in the education system so that students are kept abreast and master the knowledge and skills for the identification and management of high-risk pregnant women.

Training must include theoretical understanding of the concepts as well as the practical application of the knowledge acquired. Special emphasis is required on relating the theoretical concepts during the practical application with pregnant women. These concepts are often taught in a scattered manner in the present curriculum leading to difficulty in recollection during the clinical application of knowledge. Thus, a composite teaching program would go a long way on improving knowledge and practices regarding timely identification and management of high-risk pregnant women.

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Statement of the problem
A study to assess the effectiveness of computer-assisted teaching on knowledge regarding the high-risk pregnancy among BSc nursing 4th year students of R.D. Memorial College of Nursing, Bhopal.

The objective of the study
1. To assess the pre-teaching level of knowledge regarding high-risk pregnancy among BSc nursing 4th-year students.
2. To assess the effectiveness of computer-assisted teaching on knowledge regarding high-risk pregnancy among Bsc Nursing 4th year students.
3. To find out the association of pre-teaching scores of knowledge regarding high-risk pregnancy with selected demographic variables.

Hypothesis
H1:- There will be a significant difference between pre and post-test assessment scores of knowledge regarding high-risk pregnancy.
H2:- There will be a significant difference in the association of pre-test knowledge of score regarding high-risk pregnancy with selected demographic variables.

Methodology
All the 4th year BSc. Nursing students of R.D. Memorial College of Nursing, Bhopal were enrolled in the study. The study tool was designed by the researcher and validated by the guide and faculty of the college. The study tool included 5 demographic questions and 30 Objective type questions.

A study capsule on high-risk pregnancy was developed by the researcher.

Study participants filled the pre-teaching assessment using the study tool and then received a 1-hour session on High-risk pregnancy. Post-teaching assessment was done using the same study tool.

After conducting the study, data were analyzed using MS Excel and Google Sheets.

Results
60 BSc. Nursing students of R.D. Memorial College of Nursing, Bhopal participated in the study. The baseline pre-teaching scores showed an average score of 11 out of 30, which is 37%. This shows a poor level of knowledge on this topic. The scores range from 7 to 15, the standard deviation is 1.

Table 1: Pre-test level of knowledge of BSc. 4th year nursing students regarding high risk pregnancy

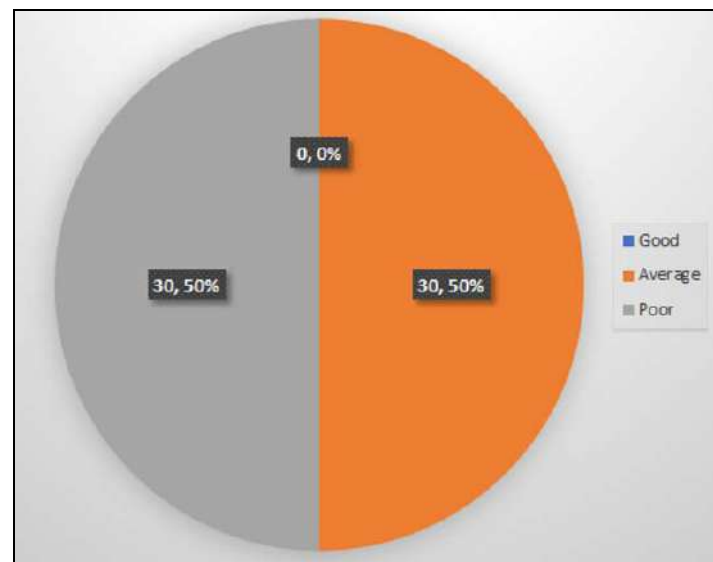| Level of Knowledge	Pre-test score	Frequency	Percentage	Pre-test Mean	Pre-test SD
Poor	0-10	30	50		
Average	11-20	30	50	11	1
Good	21-30	0	0		

Fig 1: Pre -test level of knowledge

After the 1-hour computer-assisted teaching session, conducted by the researcher, a post-teaching assessment was conducted using the same tool. The post-teaching assessment average score was 16 out of 30, which is 53%. The score ranges from 10 to 22, the standard deviation is 3.

Table 2: Post-test level of knowledge of BSc. 4th year nursing students regarding high risk pregnancy
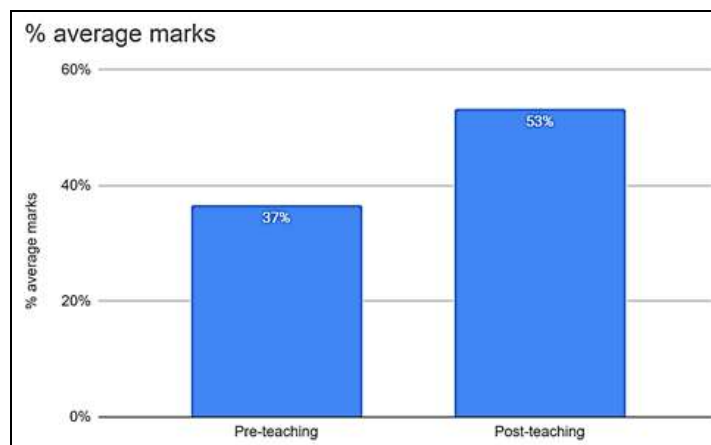
Level of Knowledge	Post-test score	Frequency	Percentage	Post-test Mean	Post-test SD
Good	21-30	6	10		
Average	11-20	51	85	16	3
Poor	0-10	3	5		
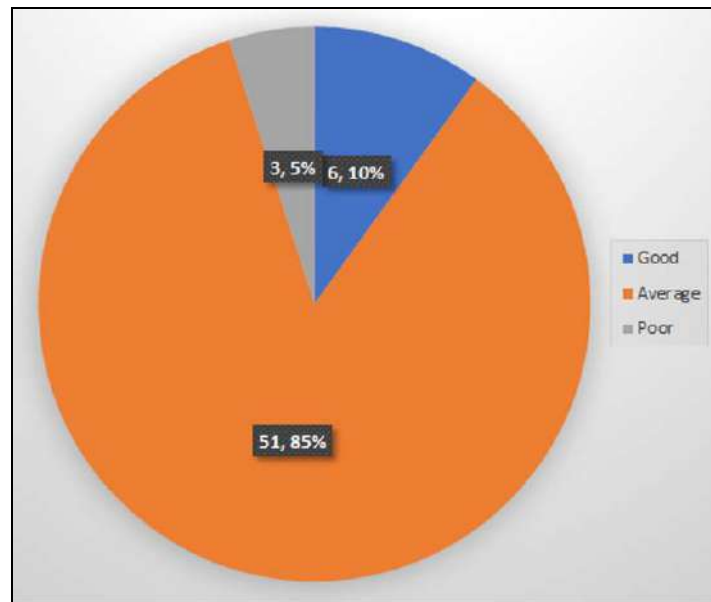
Fig 2: Post-test assessment scores

A comparative analysis revealed a 16% rise in the scores after the teaching session. All the knowledge areas showed improvement on the number of correct responses.

Table 3: Comparative Analysis of pre and post-test scores

	Mean	Percentage	Standard deviation	Mean difference
Pre-test	11	36.7	1	5
Post-test	16	53.3	3	

Fig 3: Comparative Analysis of pre and post-test scores

Table 4: Comparison of Level of knowledge of the research population in knowledge subcategories Pre and Post Test session

| S. No.	Topic	Number of pre-test correct responses	Number of post-test correct responses
1	Severe Anemia	30	41
2	Hypertensive disorders in pregnancy	16	32
3	HIV & Syphilis	16	28
4	Hypothyroidism	21	38
5	GDM	40	42
6	Twin/Multiple pregnancy	25	29
7	Previous LSCS	19	15
8	Younger Primi or elderly gravida	36	46
9	Malpresentation and Bad Obstetric history	13	29
10	Rh Incompatibility	20	33
11	Low lying placenta or Placenta previa	28	25
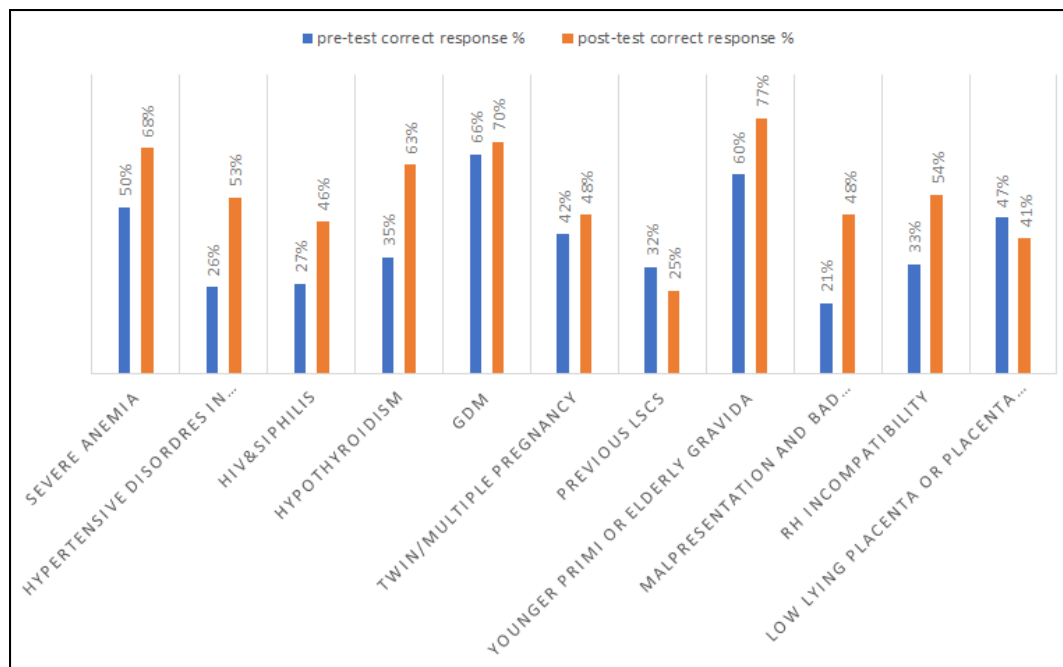
Fig 4: Comparison of Level of knowledge of the research population in knowledge subcategories Pre and Post Test session

The baseline pre-teaching assessments were analyzed with respect to the selected demographic variables, the results are as follows:

Age
All the respondents were aged from 20 yrs to 26 yrs. The Scatter plot does not indicate any significant correlation between age and pre-teaching scores. Pearson's correlation coefficient was -0.08.

Gender
97% of the respondents were females and only 3% being males. The average marks scored by males were 27% and by females was 37%. But, due to the very small number of male participants, no generalizable comparative inference could be drawn from this data set.

Religion
About 83% of the participants belonged to the Hindu religion. Participants belonged to two other religions namely Chritiantinity and Buddhism. The average marks scored in the pre-teaching assessment by Christians and Hindus were 37%, while Buddhist students scored 27%. But, again due to the very small number of participants from other religion, no generalizable comparative inference could be drawn from this data set

Educational Qualification at the time of admission to BSc. Nursing
77% of the respondents had intermediate qualification while 20% were graduates and 3% were postgraduates. Students with intermediate qualification scored 37%, graduate qualification scored 33%, and with post-graduate qualification scored 27%

Whether attended any workshop/seminar on High-risk pregnancy
Almost 50% of the respondents attended some workshops/seminars on high-risk pregnancies. People who

attended scored 33% while those who have not attended scored 37% in the pre-teaching assessment.
There was an increase in the number of correct responses in all knowledge subcategories except for Knowledge on Previous LSCS and "Low lying placenta or placenta previa".

Conclusion
The study concludes that computer-assisted teaching on high-risk pregnancy leads to a 16% increase in the average scores. Almost all the Knowledge subcategories showed an increase in the level of knowledge of the study population. Age was not significantly correlated to the pre-teaching scores of the study population. Relationship with other demographic variables cannot be established due to the skewed nature of the data set.

Implications
1. In absence of class-room teaching computer-assisted teaching can be used to augment the knowledge of the students. This method cannot be used as an alternative to class-room teaching, as it shows only a 16% increase in knowledge.
2. Preparation of the computer-assisted class in terms of the following components helps in its successful implementation
   a. Power-point presentation
   b. Creating Zoom meetings and sharing the meeting link in advance to all the participants.

Limitations
1. The study population was small, thus it was difficult to draw many statistically significant inferences.
2. The tool was developed for the purpose of this study. While it was validated, a pre-existing standardized tool would have been better.
3. It is limited to BSc Nursing 4th year students of one college. A diverse sample would have been better.

Recommendations

1. During times of Lockdown or any such situation in the future, computer-assisted teaching should be used to fill the knowledge gap. It is important to take care of the preparations for the session.
2. Computer-assisted teaching is a useful method for updating the knowledge of Nurses who are posted in far off regions. A regular knowledge update program will keep them updated and boost their morale.

Ethical Clearance: Obtained from Institutional ethics committee of R.D. Memorial College of Nursing, Bhopal.

Source of funding: Self

Conflict of Interest: None

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