



A study to assess the effectiveness of structured teaching program on level of knowledge regarding technological breakthrough and emerging nursing among nursing students in selected nursing college of Aurangabad city

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Abstract

Technology has been brought dynamic changes in worldwide, where health industry places a crucial role among public. Technology provides an ample of ways to render nursing care people in fraction of seconds hence a study to assess the effectiveness of Structured Teaching Program on level of Knowledge regarding Technological breakthrough and Emerging nursing among nursing students in selected nursing College of Aurangabad City was undertaken with an.

Objectives: to assess the level of Knowledge regarding Technological breakthrough and Emerging Nursing among Nursing Students, to assess the Effectiveness of Structured Teaching Program on level of Knowledge regarding Technological breakthrough and Emerging Nursing among Nursing Students, and to find out the association of post-test level of knowledge with selected demographic variables. The conceptual frame work was based on General Systems Model by Ludwig von Bertalanffy.

Hypothesis: H₁: There is a significant difference in the level of knowledge regarding Technological breakthrough and Emerging Nursing after Structured Teaching Program, H₂: There is a significant association of post test level of knowledge with selected demographic variables.

Methodology: pre experimental one group pre-test post-test design was used. 30 samples were selected by non-probability purposive sampling technique. Data was collected by using structured questionnaire on Knowledge, the knowledge scores classified into 4 categories: excellent, good, average and poor. Descriptive and inferential statistics were used for analyzation and interpretation. Mean value at pre-test was 13.4 which increased to 27.4 in post-test.

Result: In pre-test 22(73%) had poor knowledge, 3(10%) had average knowledge, 3 (10%) had good knowledge, 2(7%) had excellent knowledge whereas in post- test 21(70%) had excellent knowledge, 2(7%) had good knowledge, 2 (7%) had average knowledge, 5(17%) had poor knowledge regarding emerging nursing and technology.

Conclusion: The study depicted that Structured Teaching Programme is very effective in increasing Knowledge regarding Technological breakthrough and Emerging among nursing students in selected nursing college of Aurangabad City.

Keywords: structured teaching program, technological breakthrough and emerging nursing, nursing students, nursing college

Introduction

Technology is changing the world at warp speed and nowhere is this more evident than in healthcare settings. There are many emerging technologies that will change the practice of nursing in the coming decade. Nursing today isn't the same as it was 30 years ago. Nursing technology includes an array of devices, systems and software designed to reduce the amount of time nurses must spend on tasks such as tracking down equipment, locating and collaborating with other staff members and updating patient charts. Other technology serves to improve accuracy and patient safety by reducing medical errors and preventing unauthorized people from entering a facility or accessing sensitive patient records. In addition to improved accuracy, efficiency and safety, technology also allows nurses to spend more time on direct patient care. Let's take a look at the emerging technologies that are already having or will soon have a profound impact on our healthcare and nursing professionals.

1. Genetics and Genomics

Genetic testing is already being used for many reasons. Its

advances are likely to eliminate the need for organ transplants since new organs will be able to be grown from a patient's own tissues. Some of these reasons include: Its predictive value (identification of gene mutations that might put a person at risk of developing a disease such as cancer, cystic fibrosis, sickle-cell anemia, or Tay-Sachs disease, its ability to determine carrier status or whether a person has a gene mutation which could be passed on to a child, prenatal screening to diagnose some conditions in utero also newborn screening (to determine the existence of a variety of inherited conditions such as phenylketonuria, cystic fibrosis, or sickle cell disease), finally as a means for checking cancer cells to determine prognosis or potential benefits of certain types of treatment.

2. Less Invasive and More Accurate Tools for Diagnosis and Treatment

Less invasive and more accurate tools for diagnostics and treatment will also change nursing practice in the future. For example, heart disease is likely to be diagnosed by a new blood test that eliminates the need for risky diagnostic

angiograms. A new 23-gene blood test checks for certain blood proteins linked to heart disease, in a recent trial, the blood test was 85% accurate in detecting potentially harmful blockages among patients. Tattoos have been developed that can monitor blood glucose without a finger prick. The miniature tattoo, which is only a few millimeters in size, is made up of nano sensors that contain a yellow-orange dye. The dye lights up when glucose levels are high and become darker when the levels drop and these tattoos are applied only once in a week.

3. 3-D Printing

3D printing, also known as additive manufacturing, it is a method of building objects layer by microscopic layer, fusing each cross section of molecules until a complete object is formed. Typically, this requires scanning an existing object with a 3D scanner which gathers the data necessary to print on a 3D bioprinter. The bioprinter prints the object by adding layer after layer of materials such as plastics, glass, metal, or ceramics. Thus, three dimensional solid objects can be created from a digital model. The application of 3D printing in healthcare literally makes the body into a system of interchangeable parts.

In addition, human organs can be “bioprinted” for transplant by 3D printing. This technology involves the creation of replacement tissues and organs that are printed layer-by-layer into a 3-dimensional structure. The parts are made from the organ recipient's own genetic matter, and precisely match the tissue or organ they replace. To date, 3D printers are able to print simpler tissues like skin, heart muscle patches, and blood vessels, although the printing of solid organs like hearts and livers is expected within a generation. But noting that printing off a kidney or another human organ may sound like something out of a science fiction novel, but with the advancements in 3D printing technology, the idea may not be so far-fetched.

4. Robotics

Robotics, as an emerging field in healthcare, will also greatly impact how nursing is practiced in the future. Growth in robotics is expected due to workforce shortages, a growing elder population, and a call for higher quality care not subject to human limitations. Areas of projected robotic growth include nano-medicine, bio-mechatronics, and the use of robots as direct care providers. Microbots and nanodevices, which will circulate in the bloodstream, should be able to identify and repair systems early in disease processes to greatly reduce or eliminate the risk of cancer.

5. Biometrics

Biometrics, or the science of identifying people through physical characteristics such as fingerprints, handprints, retinal scans, palm vein prints, voice recognition, facial structure, and dynamic signatures, is often suggested as a solution to the information access problem. Biometric signatures will become common place in most healthcare organizations since they will provide the needed security for medical records. Fingerprint biometrics is still the most common type of biometrics in healthcare, primarily because of its ease of use, small size, and affordable price. Detection of

facial geometry through facial landmarks such as approach angles; eyebrow and mouth contours; skin texture analysis; and hairstyles, however, is also beginning to make inroads into healthcare as a biometric measure.

6. Electronic Health Records

Soon, the days of endless paperwork, filling out patient charts, and having doctors fax over medical records will be gone for good as more and more hospitals and facilities convert to EHR, which allows healthcare providers to access patient information with a few keystrokes. With an extensive patient history easily accessible and all in one place, it cuts down on human error, alerts nursing staff to possible drug interactions, and keeps track of diagnostic test results.

7. Real Time Locating Systems

Just as GPS tracking has revolutionized the way we travel, a system of tagging and tracking medical equipment can increase hospital efficiency. Using radiofrequency identification tags, ultrasound, and/or infrared, the system helps nursing staff locate the nearest blood pressure machine, for example. While this seems simple enough, being able to centrally monitor equipment helps tremendously with bed management and patient care routines, a big nurse's responsibility

8. Smart alarms

Walk into any hospital, and you'll hear the constant beeps and alarms coming from various patient rooms, keeping nurses constantly walking the floors to respond. Oftentimes, the alarms are false, which ends up causing “alarm fatigue,” as this article refers to it. It also takes the nursing staff's attention away from more pressing patient matters. To combat this problem, smart alarm technology can better monitor a variety of patient vital signs all through one system, including blood pressure, pulse rate, etc. By having one single integrated system to measure physiological indicators, the alarm system will be more streamlined and efficient.

9. Patient lifting technology

More than 2,400 of its nursing staff suffer debilitating injuries every year from lifting patients. Patient lifting technology that takes the back-breaking task of moving patients out of nurses' hands. Although ever-evolving technology requires RNs to stay up-to-date with the latest innovations, doing so will not only make their jobs more efficient, but also help them maintain a competitive edge for career advancement.

10. Tech-driven drug delivery

Many hospitals are implementing drug delivery systems in the form of implantable devices that release medication into patients. This aids nurse since they can schedule complex dosing to ensure patients get the medications they need in the right amounts and at exactly the right moment. Not only does this reduce human error, but it allows nurses to focus on other aspects of patient care.

Problem Statement

Evaluate the Effectiveness of Structured Teaching Programme on level of Knowledge regarding Technological breakthrough

and Emerging Nursing among Nursing Students in Selected Nursing College in Aurangabad City.

Objectives

1. To assess the level of Knowledge regarding Technological breakthrough and Emerging Nursing among Nursing Students
2. To assess the Effectiveness of Structured Teaching Programme on level of Knowledge regarding Technological breakthrough and Emerging Nursing among Nursing Students
3. To find out the association of post-test level of knowledge with selected demographic variables

Hypothesis

- H₁:** There is a significant difference in the level of knowledge regarding Technological breakthrough and Emerging Nursing after Structured Teaching Programme
- H₂:** There is a significant association of post test level of knowledge with selected demographic variables.

Material and method

- Research Approach : Evaluatry Approach
- Research Design : Pre experimental one group pre-test post-test design
- Setting : ACON, Aurangabad
- Sample : Nursing students
- Sampling Technique : Non-probability Purposive Sampling
- Sample size : 30 nursing students who fulfilled the criteria

Inclusion Criteria

1. Nursing students (Fourth year B.Sc, First and Second P.B.B. Sc. & M. Sc.)
2. Available at the time of data collection

Exclusion Criteria

1. Who are not willing to participate

Tool and technique

Part-I

Demographic variables included age in years, gender, educational status, do you have previous Knowledge, Source

Result

Section-I

of Knowledge.

Part-II

Structured questionnaire on Knowledge regarding Technological breakthrough and Emerging Nursing

Intervention

Structured Teaching Program on Technological breakthrough and Emerging Nursing

Scoring Key

Level of Knowledge is divided into four categories

- Poor : 0-10 (Up to 25%)
- Average : 11-20 (26%-50%)
- Good : 21-30 (51%-75%)
- Excellent : 31-40 (Above 76%)

Structured teaching programme

Structured teaching programme on Knowledge regarding Technological breakthrough and Emerging Nursing divided into 10 sub topics. They are Genetics and Genomics, Less Invasive and More Accurate Tools for Diagnostics and Treatment, 3-D Printing, Robotics, Biometrics, Electronic Healthcare Records (EHR), Real Time Locating Systems, Smart alarms, Patient lifting technology and Drug delivery. Structured teaching program was administered to the group for four hours.

Data collection procedure

Permission had taken from the institutional head there after the brief self-introduction was given and the inform consent was obtained from the nursing students who met the inclusion criteria were selected by purposive sampling technique. After the collection of demographic data pre test was done by using structured questionnaire for assessing the level of knowledge regarding Technological breakthrough and Emerging Nursing. Thus, the post test was done by 8th day after structured teaching program.

Delimitations

1. The nursing students who are studying only in Aurangabad College of Nursing.
2. This study is only evaluating knowledge.

Table 1: Frequency and percentage distribution of socio-demographic variables of Nursing students N=30

Demographic variable	F	%
Age in Years		
21-23	14	46.6
24-26	10	33.3
27-30	4	13.33
Above 30	2	6.66
Gender		
Male	6	20
Female	24	80
Educational Status		
Final Year B.Sc	8	26.66
Final Year P B.B.Sc	6	20

First Year M.Sc	10	33.3
Final Year M.Sc	6	20
Do you have Previous Knowledge regarding Emerging Nursing \$ Technology		
Yes	8	26.6
No	22	73.33
Source of Knowledge		
No Sources	22	73.33
Health Personnel	1	3.33
Printed Aids	0	0
Mass Media	2	6.66
Previous Experience	5	16.66

Section-II

Table 2: Assess the level of Pre-test Knowledge among Nursing Students regarding Technological breakthrough and Emerging Nursing

Level of Knowledge	F	%	Mean
Excellent	2	7%	13.4
Good	3	10%	
Average	3	10%	
Poor	22	73%	

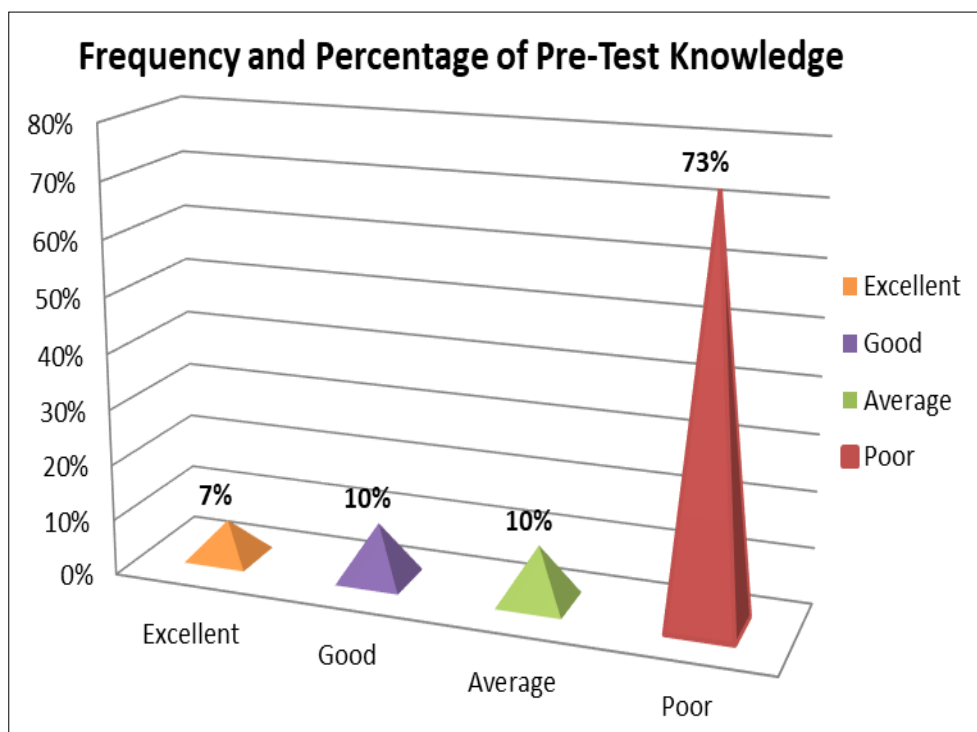


Fig 1: Clustered Pyramid depicts the distribution of nursing students according to level of Knowledge before administration of STP

Section III

To find out the effectiveness of structured teaching program on Level of Knowledge among Nursing Students.

Table 3: Part-Frequency and Percentage distribution of Post-test level of Knowledge after administration of Structured Teaching Programme

Level of Knowledge	F	%	Mean
Excellent	21	70%	27.4
Good	2	7%	
Average	2	7%	
Poor	5	17%	

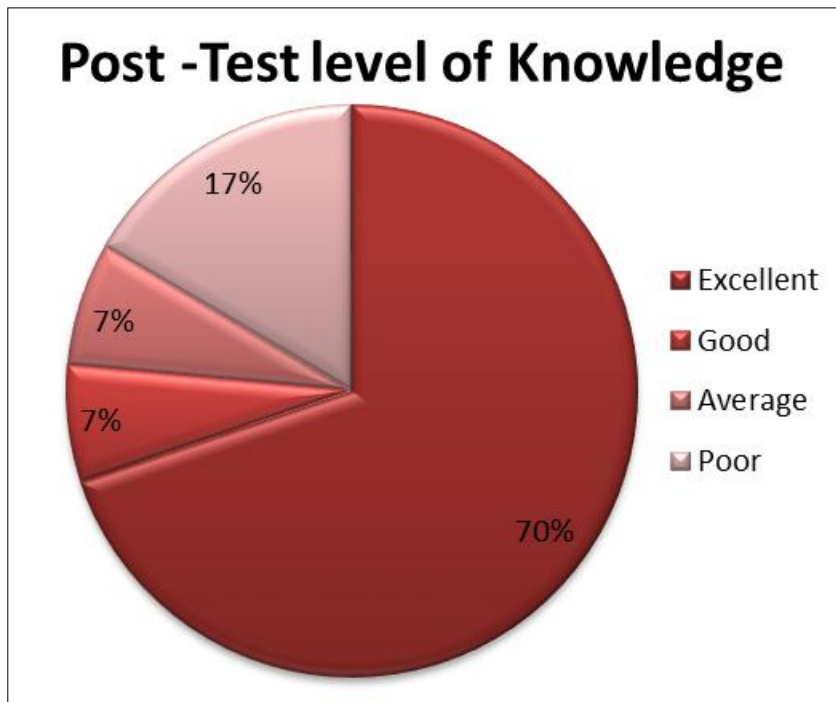


Fig 2: Pie depicts the distribution to level of Knowledge after administration of Structured Teaching Program

Table 4: Evaluating the effectiveness of Structured Teaching Program among Nursing Students.

Sr. No.	Mean	SD	P < 0.05
Pre-Test	13.4	24.69	2.67
Post-Test	27.4		
Enhancement	14		

The reported mean post test knowledge 27.4 was higher than the mean pretest knowledge 13.4 (SD=24.69) on emerging

nursing and technology among nursing students. The obtained 't' value=2.67(P < 0.05) was significant.

Section IV

Table 5: To find out the association of post-test level of knowledge with selected demographic variables

Demographic variable	F	P Value	Chi-Square(X ²)
Age in Years			
21-23	14	9.49	11.35 (S)
24-26	10		
27-30	4		
Above 30	2		
Gender			
Male	6	4.99	4.26 NS
Female	24		
Educational Status			
Final Year B.Sc	8	9.49	12.32 (S)
Final Year P B.B.Sc	6		
First Year M.Sc	10		
Final Year M.Sc	6		
Do you have Previous Knowledge regarding Emerging Nursing \$ Technology			
Yes	8	4.99	1.14 (NS)
No	22		
Source of Knowledge			
No Sources	22	9.49	10.22 (S)
Health Personnel	1		
Printed Aids	0		
Mass Media	2		
Previous Experience	5		

Discussion

The findings were discussed on the Basis of Objectives

In the first part of the study result revealed that the demographic variables of nursing students. According to age among the nursing students the majorities 46.6% were in the age group of 21-23. According to gender 80% participants were females. According to educational status majorities 33.33 were in first year M.Sc. nursing students. And 22% nursing students had no previous knowledge regarding emerging nursing and technology and 73.33% nursing students had no source of knowledge.

In the second part of Analysis

Pre-test knowledge score: - Out of 30 samples, majority, 22(73%) had poor knowledge, 3(10%) had average knowledge, 3 (10%) had good knowledge, 2(7%) had excellent knowledge regarding emerging nursing and technology. Pre-test mean knowledge score of nursing students was 13.4.

In the Third part of Analysis

Post-test knowledge score: - Out of 30 samples, majority, 21(70%) had excellent knowledge, 2(7%) had good knowledge, 2 (7%) had average knowledge, 5(17%) had poor knowledge regarding emerging nursing and technology. Post-test mean knowledge score of nursing students was 27.4.

Effectiveness- The reported mean post test knowledge 27.4 was higher than the mean pretest knowledge 13.4 (SD=24.69) on emerging nursing and technology among nursing students. The obtained 't' value=2.67(P < 0.05) was significant. Therefore the research hypothesis (H₁) was accepted. The study revealed that the knowledge of nursing students regarding emerging nursing and technology was significantly increased after the implementation of structured Teaching program.

In the Fourth part of Analysis

Among 5 demographic variables, 3 demographic variables were found to be significant (at 0.05 level). According to calculated X² value of age (X²- 11.35), educational status (X²- 12.32) and source of knowledge (X²- 10.22) was found to be significant. The remaining three demographic variables were no significant association of post test knowledge with selected demographic variables and the level of knowledge as calculated value X² was smaller than the table value. Hence, H₂ (alternative Hypothesis) was accepted.

Conclusion

In the present study, the effectiveness of the structured teaching program was significant. The mean post-test knowledge scores 27.4 was apparently higher than the mean pre-test knowledge scores 13.4 and the difference between mean is 14.

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