

# Effectiveness of Learning Package on Knowledge about Cardio-Respiratory Assessment among Under Graduate Student Nurses

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**Abstract:** Cardiovascular disease (CVD) is a critical global health issue, and cardiovascular nurses play a vital role in decreasing the global burden and contributing to improving outcomes in individuals and communities. Cardiovascular nurses require the knowledge, skills, and resources that will enable them to function as leaders in CVD prevention and management. **Objectives :** 1) To assess the knowledge of under-graduate student nurses about Cardio-Respiratory assessment before and after administering the Learning Package. 2) To assess the effectiveness of learning package on Cardio-Respiratory assessment among under-graduate student nurses. To find out an association of Knowledge about Cardio-Respiratory assessment among under-graduate student nurses and selected Socio-demographic Variables. **Methods:** An evaluative approach adopted. The Quasi-experimental one group pre-test post-test design used. The sample size for the present study was 70 under-graduate student nurses in 2nd year Basic B.Sc. nursing class; Non probability convenient sampling technique was used to select the respondents. A structured knowledge questionnaire was administered to assess the pre-post test existing knowledge on Cardio-Respiratory assessment. **Results:** The Pre-test mean knowledge score and S.D. of the U.G. student nurse regarding Cardio-Respiratory assessment was  $11.18 \pm 2.657$ , which was increased in Post-test to  $25.30 \pm 2.940$ . The paired “t” test was calculated to find the effectiveness of Learning package, the “t” value was obtained as 30.212 and “p” value was  $<0.001$  at the level of 5% (0.005) Significance which is considered extremely significant. It indicates significant improvement in knowledge regarding Cardio-Respiratory assessment after administering Learning package.

**Keywords:** Learning package, Cardio-vascular system, Assessment, Respiratory system, Knowledge.

## 1. Introduction

Learning is the addition of new knowledge and experience Interpreted in the light of past knowledge and experience. Teaching and learning is an integral part of nursing. Nurses have the responsibility to educate patients related to various aspects and keep themselves updated. Various teaching strategies are used to increase knowledge, such as lecturing, demonstration, discussion and self-education. These methods of self-education has an advantage over the others as the learner can educate himself at his own pace and it also stresses on rereading [1]

The human heart, through rhythmic contraction, provides the pressure necessary to provide blood through body. Blood is essential to deliver nutrients to the tissues of the body & to transport metabolic wastes; functionally the heart is actually two pumps (systemic circulation & pulmonary circulation) working simultaneously. [9] Comprises of mainly right atrium & left atrium, right ventricle & left ventricle, the cardiac valves, & blood vessels (arterial & venous) to transport blood & other nutrients. Cardiovascular assessment is an evaluation of the condition, function, and abnormalities of the heart and circulatory system. The nurse usually obtains the patient's history, records the external observations, checks the vital signs, auscultates the chest, and assembles the pertinent background information and reports on diagnostic tests.[10] The respiratory system brings oxygen through the airways of the lungs into the alveoli, when it diffuses into the blood for transport to the tissues. It comprises of upper airway (nasal cavity, mouth, pharynx, and larynx), lower airway (Trachea, Bronchi & bronchioles)

and Lungs & alveoli. The skeletal muscle required for breathing is other muscles assist in breathing. Accessory inspiratory muscles include the trapezius, the sternocleidomastoid, and the scalenes, which combine to elevate the scapula, clavicle, sternum, and upper ribs [11].

Respiratory assessment is an evaluation of the condition and function of a person's respiratory system. An accurate and thorough assessment of cardiovascular & respiratory functions is an essential component of the physical examination and is vital to the diagnosis or on-going care of a patient[10]. Cardiovascular disease (CVD) is a critical global health issue, and cardiovascular nurses play a vital role in decreasing the global burden and contributing to improving outcomes in individuals and communities. Cardiovascular nurses require the knowledge, skills, and resources that will enable them to function as leaders in CVD prevention and management [12].

The purpose of respiratory assessment is to ascertain the respiratory status of the patient and to provide information related to other systems such as the cardiovascular and neurological systems. Breathing is usually the first vital sign to alter in the deteriorating patient. The presence of respiratory dysfunction is a known antecedent to adverse events with an associated increase in mortality (Considine 2005, National Institute for Health and Clinical Excellence 2007). It is, therefore, imperative that nurses are able to undertake a basic respiratory assessment and to interpret the result [13].

Evidence suggests that clinical staff may lack the required knowledge and skills to perform a comprehensive respiratory

assessment which ultimately has a deleterious effect on the potential to minimize adverse patient events[14]. (Harrison et al 2006, Considine 2005, Kause et al 2004, Massey et al, 2008). Physical examination is a systematic investigation by a physician or other health care provider of the body to identify evidence of disease. (McGraw-Hill Concise Dictionary of Modern Medicine, 2002) comprises of Head to toe assessment as well as systemic assessment. Physical assessment, or the physical examination, is an integral part of nursing assessment. In clinical practice, all relevant body systems are tested throughout the physical examination, not necessarily in the sequence described (Weber & Kelley, 2003). It is an investigation of the body to determine its state of health, using any or all of the techniques of inspection, palpation, percussion, auscultation, and smell. The physical examination, history, and initial laboratory tests constitute the data base on which a diagnosis is made and on which a plan of treatment is developed [15].

The basic tools of the physical examination are vision, hearing, touch, and smell. These human senses may be augmented by special tools (e.g., stethoscope, ophthalmoscope, and reflex hammer) that are extensions of the human senses; they are simple tools that anyone can learn to use well. Expertise comes with practice, and sophistication comes with the interpretation of what is seen and heard. Physical examination or clinical examination is the process by which a health care provider investigates the body of a patient for signs of disease. It generally follows the taking of the medical history an account of the symptoms as experienced by the patient. Together with the medical history, the physical examination aids in determining the correct diagnosis and devising the treatment plan. This data then becomes part of the medical record. The Cardio-respiratory assessment is a detailed systemic examination under physical examination which uses techniques of inspection, palpation, percussion, and auscultation. The techniques are used in sequence, except when performing an abdominal assessment. Because palpation and percussion can alter bowel sounds, the sequence for assessing the abdomen is: inspection, auscultation, percussion, and palpation [11].

## 2. Need for the Study

Our experience as a nursing professionals and Nurse Educator have revealed that some students find it difficult to evaluate a client physically. This confirmation led to observations and questions about teaching and to the search for ways that could make it possible for students to deepen their capability of observing and understanding significant findings in a client's physical examination[16] The physical examination requires "knowledge, attitude, ability, and practice to recognize signs and symptoms that are relevant to nursing and that express changes in the patients' condition". Therefore, it is a challenge for the nurse since it implies numerous technical-scientific aspects like establishing an interpersonal relationship with the client. Brunner and Suddarth consider that inspection, palpation, percussion, and auscultation are basic instruments for the physical examination, complemented by special equipment for a better definition of details. Therefore, there has been insufficient systematic observation when performing the

physical examination in nursing care as well as in nursing education. Federal Nursing Council Resolution (COFEN) no 272/2002 Art.1 says that The physical examination should be performed to identify signs and symptoms of the patient using inspection, percussion, auscultation, and palpation techniques. About 25 per cent of deaths in the age group of 25- 69 years occur because of heart diseases. In urban areas, 32.8 % deaths occur because of heart ailments, while this percentage in rural areas is 22.9 %. Other causes of deaths in the 25- 69 years age group - urban and rural areas taken together are respiratory diseases such as asthma 10.2%, tuberculosis, 10.1% [17].

## 3. Literature Survey

### 3.1 Review of literature related to structured education programme

Zagade, T. (2006). Concluded in their study learning package (c.d.rom) was effective in practice of staff nurses in neurological assessment.[2] Kadam,A.(2014) found that Structured education programme was highly effective to improve the knowledge score and to improve the attitude score of subjects/ caregiver towards colostomy care of patient [3]. Anjum,S.(2014)conducted study to assess knowledge of contraceptives methods and appraisal of health education among married women and concluded After the health education married women knowledge was improved to 100% about female sterilization followed by condom 99%, skin implants 86%, oral pills 85% and emergency contraceptives 85%. Sociodemographic variable were significantly associated with existing knowledge and level of married women specially age at marriage, age at first child, occupation,, income ,education [4][5]. Babu, R. L. (2014) The findings of the study concluded that care takers had inadequate knowledge regarding non-curative care of terminally ill cancer patients. The planned education programme on non-curative care of terminally ill cancer patients was highly effective in improving the knowledge of care takers regarding non-curative care of terminally ill cancer patients.[6] Shinde,M.(2014) concluded that demonstration regarding feeding of hemiplegic patient among caregivers was effective in increasing the skill of the caregivers regarding feeding of hemiplegic patient [7].

Cooper V. (2003) conducted a study on the efficacy of three computer based learning packages for health sciences student. Study revealed that "streamed video" has potential to provide students with greater real life situations & can enhance the effective learning, which was enjoyable.[18] Anecdotal evidence from the researcher's personal experience of working in an acute general hospital setting has seen general nurses rely on pulse oximetry readings to assess respiratory status and forgets to document respiratory rate on nursing observation charts frequently left blank, same with cardiac assessment as it is limited only till measuring the heart rate & blood pressure through cardiac monitors or manually. A study was carried out in japan to assess correlation between work experiences and physical assessment skills which shows results as "The group with more clinical practice experience had more knowledge of physical assessment skills, used the skills more frequently and had less difficulty in using them. The results of this

study indicated that Japanese nurses learn physical assessment skills 'on the job' [19].

Fougnie, D., Marois, R., in 2006 stated that learners, including healthcare providers, may have limited retention of key knowledge taught in traditional classroom settings due to the severe capacity limit of attention and memory. Cognitive overload is when the "learner's intended cognitive processing exceeds the learner's intended cognitive capacity" [20].

Learning and retention is deeply enhanced and augmented as students use well designed combinations of visuals, auditory and texts through such avenues as animations, interactive illustrations, narration, charts, or video. Today's in-depth understanding of cognitive science describes the limitations of traditional learning methods that are still used in colleges and universities throughout the world. These findings also challenge universities and faculty to redesign their teaching strategies based on the principles of differentiated learning and incorporating multimodal techniques [21].

Traditional strategies to teach psychomotor skills in healthcare education include lecture, textbooks, self-instruction, and live demonstration. Some recently employed multimedia technologies, including video, film, DVD/CD-ROM, computer simulations, slide presentations, audio recordings, and web based content, have been utilized to present lectures, supplement classroom activities, and demonstrate psychomotor skills [22].

In multimedia learning, the student uses the three cognitive processes of selecting, organizing and integrating the incoming information, and then makes connections between the verbal and visual models. This concept is further influenced by Paivio's dual coding theory in which visual and verbal information processing systems have two separate channels for processing information [20]. In 1998 the Committee for University Teaching and Staff Development (CUTSD) awarded a grant of \$47,975 to develop an interactive CD-ROM tutorial program to facilitate teaching the process of physical examination of the abdomen, lungs and thorax, to students of nursing. This program was developed to complement current teaching methods and make it possible for tutors to use the available class time to further address students' individual learning needs. Through providing the opportunity to elicit inspection, palpation, percussion and auscultation examination findings in the context of 10 case studies of patients with health problems, it is also expected to facilitate recognition of abnormalities and their significance for health care students who have little clinical experience. Overall, 92% (n=38) of the students considered that the program assisted them to learn physical examination of the abdomen, thorax and lungs and 95% were satisfied with the quality of the product and found that the sounds and images helped their understanding. The content of the program was considered to be logically sequenced, to have assisted understanding, and the case studies were a valuable learning aid. The evaluation data from this trial also indicates that students would like to learn about physical examination of other body systems using this medium [23].

So the researcher strongly feels that the nurses has not being taught or practicing skills in Physical examination or the techniques used in assessing patient's systemic examination at the undergraduate level. So there is a need to make an interesting teaching method in performing physical examination focussing mainly on cardiovascular and respiratory assessment through learning package. We noticed that there is a need for proposing teaching strategies to facilitate the teaching-learning developing, in the student, the ability to observe and recognize the phenomenon implied in the client's examination. Thus, we sought for an educational approach in which the evaluation is seen as an inclusion procedure, appraising the student's previous knowledge. Furthermore, as suggested by Luckesi, learning is not considered an end, but as a possibility for making decisions [22].

#### **4. Methodology**

Research methodology involves the systematic procedure by the researcher which starts from the initial identification of programme to its final conclusion [8]. An evaluative research approach was selected using one group pre-test-post-test design. It judges the effects of the treatment by the difference between the pre-test and posttest scores without comparing with a control group. One group pre-test post-test design with experimental approach was used to evaluate the effectiveness of the Learning package on knowledge about Cardio-Respiratory assessment.

As the present study involves the assessment of effectiveness of Learning Package (Instructional Audio-Visual CD-ROM) on Cardio-Respiratory assessment before and after administration, one group pre-test post-test design was adopted to assess the existing knowledge of under-graduate student nurses on Cardio-Respiratory assessment, and change in knowledge level after watching the Learning package (Instructional Audio-Visual CD-ROM) giving the measurement of effectiveness of Learning package.

#### **5. Setting of the Study**

The research setting of the present study was Krishna Institute of Nursing Sciences, Karad. The setting was selected because of availability of samples, feasibility of conducting study and ethical clearance.

##### **a) Independent variables**

In the present study the Learning package on knowledge about Cardio-Respiratory assessment was the independent variable.

##### **b) Dependent variables**

Knowledge of the Under-graduate student nurses on Cardio-Respiratory assessment was the dependent variable in the study.

##### **c) Extraneous variables**

The demographic variables in this study were Age, Gender, Religion, Academic performance in 1st year university exam, Occupation of Father, Occupation of Mother, and Previous training in Cardio-Respiratory assessment.

### 5.1 Sample and Sampling Technique

In the present study the sample consisted of 70 Under-graduate student nurses studying in 2nd year Basic B.Sc. nursing in KINS. For current study the non-probability convenient sampling was used.

#### a) Inclusion criteria

Student those who are:-

- i. Under-graduate student nurses, appearing in 2nd year Basic B.Sc. course.
- ii. Willing to participate in the study.
- iii. Able to have English as their 2nd language of communication.

#### b) Exclusion criteria

Student those who:-

- i. Are not present at the time of data collection.
- ii. Do not want to participate in the study

### 5.2 Development of the Tool

Based on the objectives of the study, demographic data and structured knowledge Questionnaire on Cardio-Respiratory assessment, to make these questionnaires, the investigator went through numerous primary data from books, journals, and after extensive and systemic review of literature.

### 5.3 Description of the Tool

Structured questionnaire:

Section "A": Deals with the Socio-demographic data of the samples, which includes, Age, Gender, Religion, Academic performance in 1st year university exam, Occupation of Father, Occupation of Mother, and Previous training in Cardio-Respiratory assessment.

Section B1: Containing the questions related to Cardio-vascular system assessment.

Section B2: Containing the questions related to Respiratory system assessment.

Scoring:

For 32 items of this structured questionnaire, every correct response had a score of '1' mark, whereas a score of '0' was given to every an incorrect response.

### 5.4 Development of Learning Package

The Learning Package (Instructional Audio-Visual CD-ROM) was developed based on the review of the related research/non-research literature, online as well as streaming media on the internet, and standardized Instructional videos on Physical assessment and Cardio-Respiratory assessment, as well as the objectives stated. The following steps were adopted to develop Learning package (Instructional Audio-Visual CD-ROM).

- Preparation of content that is to be included in the Video, which included four techniques used in performing physical assessment, Inspection, Palpation, Auscultation and Percussion. The 1st script for video and Making of Instructional Audio-visual CD-ROM. The script then thoroughly checked and modified with the guide.
- Content validity for the Learning package and tool.
- Preparation of the final script and Video.

### 5.5 Content validity of learning package and tool

The initial content draft of learning package was given to eight experts comprising of four Professors from the field of Medical Surgical Nursing, two Professors in the field of cardiology medicine, one from a statistician and one from assistant lecturer in language (English) along with criteria checklist. The experts were requested to validate the Learning package as well as the structured questionnaire based on the criteria checklist and to give suggestions, on the adequacy and relevance of content. There was 95% agreement on "Partially meets the criteria" of the content. A few corrections were made by the language expert to simplify the language. This suggestion was accepted and ensured the clarity and validity of Learning package and structured knowledge questionnaire.

### 5.6 Preparation of the final script and Video

Based on the expert's suggestion and correction the final content was finalised with the opinion from the guide and the final script was made. Changes were made in the raw footage and the final learning package (instructional Audio-Visual CD-ROM) was prepared.

### 5.7 Procedure for Data Collection

The researcher obtained the formal permission from the Principal, KINS, Karad, from the Course Co-ordinator, Basic B.Sc. Nursing and the Class Co-ordinator of 2nd year Basic B.Sc. Nursing class of KINS, Karad, to collect the data for the main study. The main study was conducted at Krishna Institute of Nursing Sciences,

### 5.8 Plan of Data Analysis

The data obtained was analysed in terms of objectives of the study by using descriptive and inferential statistics.

## 6. Findings

### Section-A

The data presented in table I depicts frequency and percentage analysis of demographic variables. 15 (21.4 %) were in the age group of 18 years followed by 39 (55.7 %) in the age group of 19 years, 12 (15.7 %) were in the age group

RI \ HDVDQG ZHH \ HDV DERYH  
ZHHP DQVDQG ZHHHP DQV  
belongs to Hindu religion, 4 (5.7 %) belongs to Muslim, 36 (51.4%) were Christians and 1 (1.4 %) belongs to other

UHDIRQ %XCGKIW IJ VVGHQVHFHUG  
distinction in the 1st year university exam, 32 (45.7 %) secured 1st class, 16 (22.9 %) secured 2nd class, and 13 (18.6 %) secured pass class and 3 (4.3 %) were allowed to keep term (fig.4). 1 (1.4 %) students father occupation was Doctor, 3 (4.3) was Engineer, 1 (1.4 %) was Nurse, and 65

KDG RWKHU WSH RI RFFXSDWRQ IJ  
students mother occupation was Nurse and 68 (97.1 %) had RWKHU WSH RI RFFXSDWRQ IJ 7KH HQWH JURXS RI  
participant in the study 70 (100 %) had not taken any priortraining regarding Cardio-Respiratory assessment.

**Section- B**

An analysis of pre-test and post-test knowledge level of nurses were made under:

- Pre-test knowledge assessment.
- Post-test knowledge assessment.

According to present tool used in study, the Pre-test and Post-test data on Knowledge about Cardio-Respiratory assessment was categorized in SECTION B1- Cardio-vascular system assessment. And SECTION B2- Respiratory system assessment. The frequencies were calculated by Mean, Median, Mode, Standard deviation and Range. The comparison was made in between knowledge scores obtained by Under-graduate student nurses regarding Cardio-vascular system assessment in Pre-test and Post-test, similarly regarding Respiratory system assessment in Pre-test and Post-test respectively. 00 00.00 % 39 55.71 % The above Depicts that in pre-test majority 56 (80.00 %) under-graduate student nurses had average knowledge, 12 (17.15 %) had poor knowledge regarding Cardio-Respiratory assessment; where as in post-test majority 39 (56.71 %) had excellent knowledge and 31 (44.29 %) had gained good knowledge regarding Cardio-Respiratory assessment. Paired <sup>3</sup>W ~~WWWDXHLV~~ 3 ~~UHYHDVWDXWKH3UHVMW~~ mean knowledge score and standard deviation of the Under-graduate student nurses regarding Cardio-Respiratory assessment was calculated as  $11.18 \pm 2.657$ , which was increased in Post-test to  $25.30 \pm 2.940$ . The paired "t"-test value was 30.312 giving "p" value  $<0.0001$  which is considered to be extremely significant, indicates significant improvement in knowledge regarding Cardio-Respiratory assessment. Data reveals that in pre-test majority **51 (72.86 %)** Under-graduate student nurses had Average knowledge, 4 (5.71 %) had Good and 15(21.43 %) had poor knowledge regarding Cardio-vascular system assessment; where as in post-test majority of **42(60.00 %)** had gained Excellent knowledge, 27 (38.57 %) had Good knowledge and 1(1.43 %) had an Average knowledge regarding Cardio-vascular system assessment.

Further data reveals that in pre-test majority **45 (64.28 %)** Under-graduate student nurses had Average knowledge, 6 (8.57 %) had Good and 19 (27.15 %) had poor knowledge regarding Respiratory system assessment; where as in post-test majority of **41(58.57 %)** had gained Excellent knowledge, 27 (38.57 %) had Good knowledge and 2(2.86 %) had an Average knowledge regarding Respiratory system assessment. the association between socio-demographic variables and Pretest knowledge scores obtained by undergraduate student nurses. If the calculated Chisquare (x<sup>2</sup>) value is more than the Table "p"-value the variable it suggest that there is a significant association the socio-demographic variable "academic performance in 1st year university exam" and its related chi-square (X<sup>2</sup>) value is more than that of table "p"-value, suggest that there is a significant association between Variable and Pre-test knowledge score at 5 %(0.005) level of significance. However calculated Chi-square (x<sup>2</sup>) value is of the Socio-demographic variables Age, Gender, Religion, Occupation of Father and Mother rand Previous training in Cardio-Respiratory assessment, is less than the table "p"-value suggesting that the variables and pre-test scores are not

significantly associated with each other at the 5 % (0.005) level of significance.

**Section-C**

Effectiveness of Learning Package on Cardio-Respiratory assessment is assessed by using Statistical software I.B.M. SPSS (v.20), which gives following results. The above table depicts that the Standard deviation after administering the learning package has increased than that of before administering the Learning package. The difference in S.D. is 0.283. The difference in Mean is 13.83. The paired "t"-test value was 30.312 giving "p"-value  $<0.0001$  which is considered to be extremely significant, indicates significant improvement in knowledge regarding Cardio-Respiratory assessment.

**7. Conclusion**

70 U.G. student nurses participated in the study, the results of Pre-test indicated that majority of participants 56(80.00 %) had average knowledge before administering the Learning package (Instructional Audio-Visual CD-ROM). After the administration of learning package, Post-test data analysis revealed that, majority 39(55.71 %) students had excellent (76-100 %) gain in knowledge. There was significant association found between pre-test knowledge scores and socio-demographic variables like Age, Religion, and Academic performance in 1st year university exam, Occupation of both Father and Mother. However there was no significant association found between Gender, previous training on Cardio-Respiratory assessment. The paired "t" test was calculated to find the effectiveness of Learning package, the "t" value was obtained as 30.212 and "p" value was  $<0.001$  at the level of 5% (0.005) significance, which is considered extremely significant.

The Learning Package on Cardio-Respiratory assessment was considered as an effective method for providing standardized, systematic step-by-step & adequate knowledge on How to conduct Cardio-Respiratory assessment and help the under-graduate student nurses to gain confidence while performing it on client.

**8. Future Scope**

An alternative method of teaching students about Cardio-Respiratory assessment can be considered along with traditional demonstration method, which can be easily available to each student. The Quasi experimental research design can be used to compare the effectiveness of Learning Package among Control group & Experimental group. The learning package same as used in present study can be developed on various system of Human body & can be used as a source of information in library.

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