

Two approaches to teaching/learning nursing psychomotor skills: self directed/paced learning and lecture/demonstration-based instruction

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Abstract

Purpose: The present study aims at comparing the impact of two teaching/learning approaches - self-directed/paced learning and lecture/demonstration-based instruction - on mastering psychomotor skills among nursing students.

Material & Method: Thirty nursing students were selected for the study. They filled out questionnaires indicating the demographic factors, and mean exam scores achieved in the previous academic years. They were then randomly divided into two groups and assigned to the following groups: self directed/paced learning group and lecture/demonstration-based instruction group.

The selection of the students was based on the following criteria: their successful completion of the physiology and anatomy courses, a pre-test score of less than

40/100 assessing their competence in performing cardio-pulmonary resuscitation (CPR).

The self-directed/paced learning group had no formal instruction. They received two sets of handouts and one video tape each. The first set of handouts indicated what the learning aims were. The second set demonstrated step by step instructions for performing CPR and the video tape was a complete demonstration of CPR. The students had access to a practice room to practice on a manikin. The lecture/demonstration centered group received two sessions of instruction, each lasting two hours. The lectures were on the objective of the course and the basic concepts of CPR. The lecturer gave a step by step demonstration of CPR. The students practised on the manikin and a tutor monitored their progress.

Finding: The findings of the study indicated that there were no significant

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differences between the two groups. All students in both groups performed significantly better in the post-tests. There was a positive correlation between age and the post-test scores of the self directed/paced learning group. There was also a positive correlation between the previous mean exam scores and the post-test results of the lecture/demonstration based instruction group.

Conclusion: Both methods were successful in changing students' psychomotor skills in performing CPR. However, there is evidence that self-directed learning is effective with more students, unlike the lecture demonstration method which seems to work better with good learners. Based on the lack of correlation between past exam scores and post-test results, the performance of the students in self directed/paced learning indicates that they were probably more motivated than the other group. The older students also gained from this method of learning.

Keywords: Teacher-directed learning model, self-directed learning, psychomotor skills and Nursing.

Introduction

The traditional teacher-centred method of teaching is still dominant in many educational systems. In this method, teaching the subject matter to students is the main objective and individual differences among learners are neglected. The teacher is considered to be the active participant in the learning process overshadowing the other factors involved in the learning process. The teacher lectures the learners and the learners listen

to him/her passively (Mirani 1975, Rassaian 2001).

Nursing Education is still based on demonstrating the skills to the learners in practising classrooms through a unidirectional method of teaching in that the tutor is the core and the learners are marginal to education (Tuazon 1992). The flow of information is through the teacher to the learner.

Self-directed learning has increasingly attracted the attention of nursing educators as people have come to realise that constant learning and change is necessary for functioning effectively in society. Enrolment in formal courses is not a practical method of keeping abreast of new developments in nursing. Therefore, nurses have increasingly become self-directed learners (Wasiw 1987).

Frisen and Stotts (1984) compared the effects of two methods of teaching - Lecture-demonstration (teacher centred method) and self-paced instruction method (student-centred method) - on the acquisition and recall of the subject matter, Basic Life Support Resuscitation, at the levels of knowledge and skills. The research was conducted with 63 nursing students enrolled in a Canadian university. The results indicated that there were no significant differences in the recall of the psychomotor skills and knowledge acquisition between the two teaching methods.

Love et al (1989) conducted a controlled random clinical trial research at MacMaster University aimed at comparing the effects of two methods of teaching - student-centred and teacher-centred - on the extent to which psychomotor skills were learned by the second year nursing

students. Their findings indicated no significant differences between the two teaching methods but Brunner and Suddarth (1996) argue that demographic variables may affect education positively or negatively.

While the above research studies indicate that learning at the level of psychomotor skills may not be dependent on different teaching methods, Rassaian (2001), in a comparison between two methods of teaching - customary lecturing and research-centred teaching - concluded that subject matters taught through research-centred teaching were recalled significantly better than the same subject matters taught through customary lecturing. It should, however, be noted that Rassaian's study compared the two methods at the level of knowledge acquisition rather than psychomotor skill mastering.

This study examines and compares the extent to which nursing skills are mastered under two different learning methods: self directed/paced learning and lecture/demonstration-based instruction; and whether individual differences among the learners in the two groups such as age, gender, marital status, mean exam scores and financial status may result in different learning outcomes.

Material and method

Nursing students enrolled in the second and third semesters of their BSc. studies at Shaheed Beheshti University of Medical Sciences and Health Services were selected for the study. Since the topic selected for learning was cardiopulmonary resuscitation, only the students who had passed the courses in physiology and the anatomy of the cardiopulmonary system

were considered for the study. All of them filled out questionnaires indicating gender, age, marital status, number of children, place of residence, number of family members, family's monthly income, employment, number of hours spent at work per month, previous experiences, educational background regarding cardiopulmonary topics, the grades acquired in the exams of the courses in physiology and anatomy of the cardiopulmonary system.

An even behavioural checklist was used to assess the extent to which students were successful in performing CPR. The students' performances were assessed through pre-test and post-test exams using the checklist. The students whose marks were below 40/100 in the pre-test exam were regarded as unfamiliar with the topic and were selected for the study. They were randomly divided into two groups of 15 students each and were assigned to one of the teaching approaches: self directed/paced learning and lecture/demonstration-based instruction.

The task for both groups was to perform CPR on a manikin manufactured by Ambu.

The checklist consisted of 17 skills and each skill was divided into several sub-skills, resulting in a checklist which contained 60 sub-skills. The performance of each student on each sub-skill was marked according to a three scale scoring system, where 0 stood for unsuccessful, 0.5 for semi-successful and 1 for successful. The scoring system was weighted so that the 16 main sub-skills were marked 3.5 each when performed successfully and marked 0 when performed semi-successfully or unsuccessfully. A successful student could receive up to 100 points.

The self directed/paced learning group had no formal classes. They received instead two sets of handouts and a video tape each. The first handouts specified the purpose and objectives of the course, and in those it was made clear what skills they were expected to master. The second set of handouts contained colour illustrations and step by step instructions of all the stages of CPR. The video-tapes also demonstrated all the stages clearly. The students were asked to watch the tapes and practice on the manikins in the practice rooms that were reserved for them at certain hours. After two hours of practice, all 15 students were asked to participate in a two hour meeting in the practice room to discuss with each other the objectives of the course and practice on the manikin in pairs. The researcher was present in the practice room and if the students could not perform well they were asked to read the handouts and watch the tape again. Thus the students monitored their learning behaviour by themselves

Lecture/demonstration-based instruction group had two sessions of two hours of formal classes in which a tutor lectured the students and demonstrated how to carry out CPR. Then the students performed the task and the lecturer helped them whenever they made a mistake. At all the stages of the learning, the teacher was present and monitored the learning process.

The post-test was conducted a week after the completion of the CPR course. One of the experienced lecturers of the Faculty of Nursing and Obstetrics who was completely unaware of the nature of the research (single blind) rated the students' performance of the task, using the checklist,

The content validity and the reliability of the checklist were tested. Two experienced lecturers used the checklist to rate 10 students' performances on CPR. Agreement between observers was used to assess the reliability of the checklist. The average interrater agreement coefficient between the two observers was 0.996.

Findings

The majority of the students in both self directed/paced learning and lecture/demonstration-based instruction groups were females (86.7%), between 19-20 years old (53.3%), and none of them was married. The mean exam scores for both groups were between 16-17.99 (53.3%). 60% of the students were living with their parents in the lecture/demonstration based instruction learning group and 66.7% in the self-directed/paced learning group. The majority of the students had more than 6 members in their family living with them and also the majority of them earned less than 800000 Rials (100\$) per month. None of the students was employed. According the above mentioned demographic variables, there were no significant differences between the two groups.

There was significant difference between the pre-test and post-test scores for both groups, indicating that both groups were successful in their learning. (Tables 1 and 2).

Fisherman's correlation was used to correlate the demographic variables and the scores obtained. The results indicated that there was no correlation between the scores obtained through the checklist and demographic variables such as: gender,

place of residence, number of family members, monthly income. There was, however, a significant linear correlation between the learning scores and the age of the students in the self-directed/paced learning group ($p = 0.49$ and $r = 0.52$). There was no such correlation between the learning scores and age of the students in

the lecture/demonstration-based instruction group. There was also a positive correlation between the post-test scores and the mean exam scores of the previous years for the lecture/demonstration-based instruction group. No such correlation was found in the self-directed/paced learning group.

Table 1. The comparison between the pre-test and post-test scores in lecture/demonstration based instruction group

Tests	Number	Mean	SD	P value
Pre-test	15	2.07	4.9	0.001
Post-test	15	86	9.8	

Table 2. The comparison between the pre-test and post-test scores in self-directed/paced learning group.

Tests	Number	Mean	SD	P value
Pre-test	15	1.8	2.7	0.001
Post-test	15	91	4.4	

Discussion

The presence of a significant difference between the scores obtained in the pre-test and the post-test for both groups suggests that both methods were successful in changing the students' behaviours. The findings regarding no significant differences between the two groups indicate that neither of the two methods was superior to the other. The present findings provide more support for Frison and Stotts who could not find any significant differences between the lecture based and student centred groups in mastering psychomotor skills and learning the information.

However, the positive correlation between the mean exam scores of the previous years and the post-test scores of the lecture/demonstration group suggest that

the students who were good learners learnt better in the traditional method and whereas those who were less successful learners still had low grades in the lecture/demonstration group. The fact that in the self-directed/paced learning group there was no such positive correlation may indicate that the students with low mean exam scores in the previous years were able to compensate for their poor performance and learning by taking advantage of the new method and performing better. What the findings suggest is that the new method motivated students to learn. This is borne out by Claire and Brillhart's (1990) study that emphasises the importance of motivation on learning behaviour.

Most of the demographic variables had little effect on performance. Since most students

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were living in the university student halls of residence, it can be concluded that residence, in this case, had no impact on students' learning behaviours.

What is significant is the positive correlation between age and the students' scores. This suggests that the older students were probably able to take advantage of their previous learning experience and could therefore monitor their learning process better. This may suggest that lecture/demonstration instruction might be more appropriate for younger learners rather than the more mature learners.

Conclusion

Both approaches to learning, self directed/paced learning and lecture/demonstration-based instruction, resulted in positive changes in psychomotor behaviours of students in the present study. However, poor learners who performed less successfully than the other students and older, more mature learners fared better in the self-directed/paced learning method. It is suggested that if the students are directed toward self learning behaviours, not only they will become independent learners with a greater learning capacity but also the lecturers' workload is reduced and as a result they can spend more time on other aspects of education in the universities.

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