

The educational standard indication of family planning and population clinical skill training times based on the learning curve flattening of health worker students in 2011- 2012

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Abstract: Clinical training is a dynamic process, in which the students convert theoretical information to practice directly. This study has been done with the aim of indicating the standard times for skill performances of family planning and population regulation clinical skills based on flattening the learning curve of health worker students. This is a time-series study. 54 first year health worker students of paramedical schools of Mashhad, Nishaboor and Torbatejam were included in this study in 2011-2012 academic years with non-probability convenient sampling method. The tool was a check list of clinical skills evaluation of family planning skills. The analysis has been done by SPSS (version 16) software and descriptive and analytical statistics tests. The significance factor has been considered as 0.05. The learning curve of clinical skills in this study illustrated that 11-20 practicing times are enough (competency more than 75 percent) for health workers to achieve proper competency. Moreover, the level of competency did not change significantly due to repeating and practicing the skills in 15 weeks. The findings showed that we can determine clinical skills' standards for health workers by learning curve based on frequency of the skills implementation and achieving competency level in order to have enough practicing and develop learning process and also save time and money.

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Introduction

Clinical education is a dynamic and unique process, in which various conditions and resources come together to combine theoretical learning and practical learning in real situations [1]. Lowenstein (2004) mentions the clinical education help the students convert theoretical information to practice directly [2]. In confrontation with reality, the students use their theoretical and practical information at the same time. Clinical environment is a place for learning how to combine the theoretical science with practice and professional role [4, 3]. Ideal clinical education is unquestionable in individual, professional and clinical skills development [4]. Achieving enough clinical skills and so satisfying feeling about it makes the student do the duties and roles more efficiently [5]. Clinical education is one of the important ways for the students to achieve clinical competence; however, Donald (2001) mentioned that have been paid less attention to clinical education rather than other educational fields (6, 7). Salehi (2001) also believes that although the

emphasis on the clinical education is increasing, its effectiveness criterions are not defined yet [8]. Due to the fact that the number of skills implementation is related directly to the clinical competence increases [9], it is crucial to be sure about the enough skills practicing [10].

The theory of the learning curve in nineteenth century has been proposed as one of the important learning concepts. In fact, the variations, created in the individual's competency by the effect of the skill's implementation frequency are considered as learning curve [11]. This curve is sketched in coordinate system. The horizontal line shows the frequency of the skill's implementation and the vertical line is the level of competence. With this, the learning level of the students is investigated [12].

Standardization is defined as creating rules with the aim of achieving the desired situation in a special field. Standard causes being sure of the desired quality and is the factor of efficiency increment [13].

The usual population covered by a health worker is about 1000 persons [14].

The duties of the health workers in health houses are connecting with people and teaching health in various fields, take care of pregnant mothers, take care of children, family planning, immunization, collection and recording the statistics, and sending their activities' report to the health and treatment center of their town or village [14].

The education period of the health workers is one of the apprenticeship periods, which should be exactly according to behavioral educational objectives [15].

In order to convert theoretical learning to practice fast, we can use training in apprenticeship periods [16]. Supervision and evaluation are the last steps of the educational activities and complete the education [17].

With these wide and important duties of the health workers in health houses and their key role in health network servicing in their working period, the researchers motivated to do this study in order to find out how and with what level of activity the health worker students achieve enough skill competency and works efficiently to do the family health services, which have all the properties of ordination priority in implementation and research programs.

Materials and methods

This is a time series study. The population was all of the first year health worker trainees of junior paramedical schools of Mashhad, Nishaboor and Torbatejam. Sampling has been done by non-probability convenient method which was accessible. 54 of the first year health worker trainees (30 persons from Mashhad, 12 from Nishaboor, and 12 from Torbatejam) who had the included criterions have been studied in 2011-2012 academic year. The criterions of the eligibility criteria were: passing the theoretical course of immunization, not having any defections or illnesses, and satisfaction to cooperate in the study. The exclusion criterions were: being absent more than three days during the training, not having mental problem (specified by the trainer or the health worker's coworker), and discouraging to participate the study. The tools were the questionnaire of demographic data of health worker instructors and trainees, and researcher made check list of clinical skills that seeks competency of 5 main family planning skills. Each of these skills had some sub skills and the observer for each of the sub skills considered a score between zero and twenty. In the next step, the average of the sub skills scores taken as the skill's score (between zero and twenty). The validation of the study tool was confirmed by the content validity and stability by Interrater reliability ($r=0.83$).

Data has been analyzed by the SPSS (16) software and descriptive statistical tests such as frequency, mean and SD, and analytical statistical tests like Kruskal Wallis, Pierson correlation coefficient. The level of significance considered as 0.05.

Results

All of the participants in this study were women. Age of them was between 18-26 years and the average age of them was 20.6 ± 1.7 year. Half of the participants (27 ones) were single and another half was married. The high school diploma field of most of them was natural sciences (36 people), and then human sciences (12 persons) and their total average was 13.7-19.5 with the mean of 16.5 ± 1.8 .

Kruskal wallis test illustrated that:

The mean competency of 1) completing the family planning chart for target group (Table 1), 2) Performing the required proceedings for the mixed pills' users (table 2), performing the required proceedings for the IUD users (Table 3), performing the required proceedings for the tube ligation (Table 4), target women education for Pap Smear test (Table 5), based on the score between zero to twenty, in sequential times of performing skills, did not have significant differences ($P_1=0.7$, $P_2=0.5$, $P_3=0.1$, $P_4=0.7$, $P_5=0.7$).

The learning curve of mean competency level of family planning skills shows that the variation of the curve during its length was less than 5 percent. So the curve assumed as a flat line. Since the average level of competency in all skills was more than 75 percent, 11-20 times practicing of these skills are considered enough for performing family planning skills (Figure 1).

In order to investigate the correlation between the each score of the family planning skill and population and the total score of the skill, because of the normal distribution of the variables, the Pierson correlation coefficient has been calculated. The results revealed that the score of all of the skills has direct relation with the total score. The least level of correlation ($p=0.000$, $r=0.7$) was between the first skill (completing the family planning chart for target groups) and the most level of correlation was between the second skill (The required proceedings for the mixed pills' users) and the total score ($p=0.000$, $r=0.9$).

The results of the Pierson correlation coefficient showed that there is a direct relation between the theoretical and clinical scores (the total score of the family skill) of the students in family and population planning skill ($p=0.000$, $r=0.5$). This means that the more the score is in the theoretical test, the more is in clinical test.

Table 1: Health worker students' mean competency level of completing family planning chart for target group based on the implementation times.

| competency percent | competency level | Number of persons | Skill implementation times |
|--|------------------|-------------------|----------------------------|
| | mean± SD | | |
| 95.0 | 1.3±19.0 | 11 | 11-20 |
| 95.0 | 1.0±19.0 | 4 | 21-30 |
| 94.3 | 0.8±18.8 | 11 | 31-40 |
| 92.8 | 0.7±18.5 | 12 | 41-50 |
| 95.3 | 1.0±19.0 | 7 | 51-60 |
| 93.1 | 1.4±18.6 | 9 | More than 60 |
| 94.1 | 1.0±18.8 | 54 | summation |
| Results of the Kruskalwallis test | | | df=5 P=0/7 |
| Chi-square= 2/7 | | | |

Table 2: Health worker students' mean competency level of performing required proceedings for mixed pills' users based on the implementation

| competency percent | competency level | Number of persons | Skill implementation times |
|------------------------|------------------|--|----------------------------|
| | mean± SD | | |
| 92.6 | 18.5±1.1 | 11 | 11-20 |
| 91.6 | 18.3±0.7 | 4 | 21-30 |
| 90.3 | 18.0±0.8 | 11 | 31-40 |
| 91 | 18.2±0.8 | 12 | 41-50 |
| 90.2 | 18.0±0.2 | 7 | 51-60 |
| 88.5 | 17.7±1.0 | 9 | More than 60 |
| 90.7 | 18.1±0.8 | 54 | summation |
| df=5 | P=0.5 | Results of the Kruskalwallis test | |
| Chi-square= 4/2 | | | |

Table 3: Health worker students' mean competency level of performing required proceedings for IUD users based on the implementation times.

| competency percent | competency level | Number of persons | Skill implementation times |
|------------------------|------------------|---|----------------------------|
| | mean± SD | | |
| 90.4 | 18.09±1.4 | 11 | 11-20 |
| 92.2 | 18.4±0.6 | 4 | 21-30 |
| 92.3 | 18.4±0.8 | 11 | 31-40 |
| 93.5 | 18.7±0.6 | 12 | 41-50 |
| 91.2 | 18.2±0.4 | 7 | 51-60 |
| 88.0 | 17.6±1.0 | 9 | More than 60 |
| 91.3 | 18.2±0.9 | 54 | summation |
| df=5 | P= 0.1 | Results of the Kruskal wallis test | |
| Chi-square= 7/3 | | | |

Table 4: Health worker students' mean competency level of performing the required proceedings for tube ligation based on the implementation times

| competency percent | competency level | Number of persons | Skill implementation times |
|--------------------|------------------|-------------------|----------------------------|
| | mean± SD | | |
| 91.0 | 18.2±1.5 | 11 | 11-20 |
| 92.9 | 18.5±0.5 | 4 | 21-30 |
| 91.9 | 18.3±0.9 | 11 | 31-40 |

| | | | |
|-----------------|----------|-----------------------------------|--------------|
| 93.3 | 18.6±0.8 | 12 | 41-50 |
| 96.1 | 18.2±0.6 | 7 | 51-60 |
| 90.0 | 18.0±0.9 | 9 | More than 60 |
| 91.7 | 18.3±1.0 | 54 | summation |
| df=5 | P= 0.7 | Results of the Kruskalwallis test | |
| Chi-square=12/5 | | | |

Table 5: Health worker students' mean competency level of target women education for Pap smear test based on the implementation times

| competency percent | competency level | Number of persons | Skill implementation times |
|--------------------|------------------|-----------------------------------|----------------------------|
| | mean± SD | | |
| 91.0 | 18.2±1.5 | 11 | 11-20 |
| 92.9 | 18.5±0.5 | 4 | 21-30 |
| 91.9 | 18.3±0.9 | 11 | 31-40 |
| 93.3 | 18.6±0.8 | 12 | 41-50 |
| 91.1 | 18.2±0.6 | 7 | 51-60 |
| 90.0 | 18.0±0.9 | 9 | More than 60 |
| 91.7 | 18.3±1.0 | 54 | summation |
| df=5 | P= 0.7 | Results of the Kruskalwallis test | |
| Chi-square=2/4 | | | |

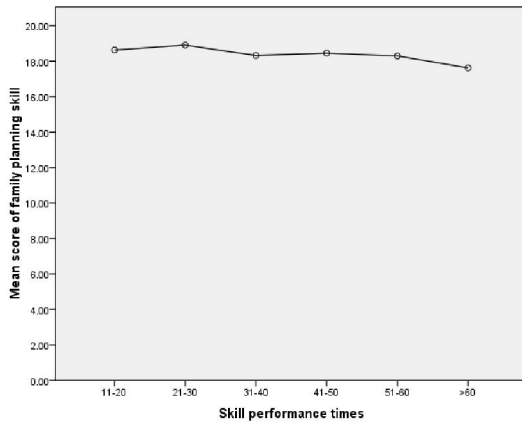


Figure 1: The health worker students' learning curve of competency level in family and population planning skill based on the implementation times

Table 6. Relationship between each family and population planning skill and total score

| P Value | Pierrson correlation coefficient | skill |
|---------|----------------------------------|-------|
| 0.0001 | 0.7 | 1 |
| 0.0001 | 0.9 | 2 |
| 0.0001 | 0.8 | 3 |
| 0.0001 | 0.8 | 4 |
| 0.0001 | 0.8 | 5 |

Discussion

Benner says that the theoretical education in the class does not determine the level of the progress; instead it is depend on the individual's clinical experiments. The base of the learning clinical skills is

the theoretical knowledge, which extends the clinical experiments and reforms the skills practically [18].

The learning curve in clinical skills of the family planning of this study illustrate that 11-20 times are enough to obtain the desired level of competency. Enough skills' clinical exercising results to accurate performances, In order to stabilize performing of one skill, the trainees require enough repeating and exercising [18]. Some of the simple skills, which more have the velocity and physical aspects may retain in the memory with repeating and exercising for a few times; however, the skills such as what the health controllers like health workers do and have cognitive aspect and require accuracy, should not be unused and must be exercised. In this way, they will be forgotten during the time [19]. The results of this study revealed that although there are some variations in the skill level during the 15 weeks of training, this level is not considerable. Therefore, this confirms the point that repeating exercising of a skill leads to retain the level of competency over the time. The results of Einspruch et al. (2007) and Oerman et al. (2011), which were about the medical students' skill of cardiac pulmonary resuscitation and Artur et. Al (2011) studies, which was about the humans' skills also showed that continuous performing of a skill, even in a short period of time (but repetitive) causes the learning retaining [18-20-21]. The results of the presented study are important because of revealing that the required times of family planning skill performance to gain enough competencies are much less than what is performed in routine clinical education of health worker

students. According to the high cost levels of the clinical education and faces with the high volume of the trainers' work, lack of human resources and the stuff for education [19], it is reasonable to organize the clinical education of the health workers in such a way that the equilibrium occur between achieving an acceptable level of competency, skill stability, and the present situation. Studying the differences between the levels of skill's stability in students, who have the chance to repeat and exercise a skill more, is helpful. In this way, we can use the learning curve and the standard skill implementation times to achieve efficient clinical education and save money. Also, instead of wasting time to implement the clinical skill, in which there are enough competencies, we can use the time to implement the skills, in which the level of competency is not enough (less than 75 percent).

One of the study's limitations is the differences between the self-ingenuity of the health workers, which could affect the results of the studies in codification of the standards. The attendance of the researcher during the skill implementation and also the clinical trainers' control on her was another limitation of the study.

Conclusions

This study has been shown the ability of standard codification by the learning curve for the clinical skills. Moreover, repeating and exercising after creation of enough competencies causes more stability of the skill. Standard codification based on the level of competency reveals the attention to the quality and performance in clinical education and also education based on the evidences.

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