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Original Article

Proposing a syllabus for the operation room B.S. courses in Iran

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Abstract

BACKGROUND: Education is based upon the knowledge, skills, and attitudes that are required for an occupation, and the changes occurring in the occupations and duties as well as in the ideals and values necessitate constant needs analysis. Furthermore, owing to the transformations in sciences, especially medical sciences, the current syllabus for the operation room courses at associate level will not meet the requirements for operation room personnel in future. Therefore, the syllabus for operation room B.S. was developed and proposed in a research project entitled "Study of the international syllabus for the operation room courses and proposing an appropriate syllabus for the courses in Iran." Since the operation room courses at B.S. level are supposed to be introduced in Iranian universities, we intended to learn about the opinions of other people related to this subject in Iran.

METHODS: In this research, a questionnaire was used that contained the syllabus proposed for the operation room B.S. courses, which was the result of a research project entitled "Study of the international syllabus for the operation room courses and proposing an appropriate syllabus for the courses in Iran." To develop this syllabus, 12 heads of the operation room departments in universities across Iran in which the subject matter was being taught at associate level were consulted.

RESULTS: The study showed that 14 out of the 53 courses proposed in the syllabus had a desirability level of 100%, 22 courses were desirable at levels of 91-100%, 19 were 75-90% desirable, and no courses had a desirability level less than 75%. After carrying out some modifications to the syllabus, the problems were resolved and the opinions were again asked. When a consensus of greater than 70% was reached, the syllabus for the operation room courses at B.S. level was finalized and proposed. The regulations from the Development, Planning, and Evaluation Office of the Ministry of Health were also followed.

CONCLUSIONS: Although all the courses showed a desirability level of greater than 70%, receiving appropriate suggestions about some courses led the research team to carry out major or minor modifications to some of the courses.

KEY WORDS: Syllabus; surgery technologist; Delphi technique.

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Educational system is a subset of social system whose goals are inputs from environment and society and its outputs are returned to the environment and society. Therefore, goals of educational system are based upon society needs and are directed towards economic, social, and cultural development, such that educational planning as a part of development planning has attracted the attention of the educational officials in different countries.[1]

In addition, as the goal has a fundamental and determining role in planning, the main principles for choice of educational goals which are consistent with the needs of society and learners are as follows:

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- The goal of educational program must be to train students for an occupation;
- The respective occupation determines what to be learnt by the students, since topics related to future role of learners in society and preparing them to meet their occupational and professional needs are among the society needs which are allocated a great deal of educational activities in different countries.[2]

Certainly, university is the major foundation for sustaining and providing efficient human force for more progress, meeting the demands and advancement of technology, promotion of knowledge and research, and therefore preparing the infrastructure for national development. In this regard, as medical education is a part of higher education system which deals with humans' life, responsibility of medical universities is of much importance in developing the professional role of graduated students and in considering the related qualitative aspects.[3,4]

Currently, the role of trained surgery personnel has been increasingly specified in hygienic-medical system. Indeed, quality in medical education will be reached only if students have gained the desirable competencies of the goals determined in educational programs. In other words, education and educational programs should educate professionals who, considering the increasing growth of this science, are equipped with sufficient knowledge, experience, and skills.[5]

Operation room nurses are a group of medical sciences students whose activities are in surgery wards of hospitals, urgency units and clinics, in close relation with candidates of surgery operation, family members of patients, and other members of hygienic-medical team.[6] As the surgery operation room is a much complex environment, individual and team work of members as well as familiarity with specific surgical procedures and team policies are critical to resolve the existing disorders in the patient's status, surgery process, and effective and safe care during surgery operation.[7,8]

In Iran, students start the operation room program at associate level, and then if they tend to make scientific and practical promotion, they participate in B.S. entrance exam; if they pass this exam, they will be e engaged in operation room as nurse. Nevertheless, through analysis of the mentioned nursing B.S. discontinuous program, it is observed that specialized courses of operation room are not presented in this program. In addition, no considerable difference exists between the task list of operation room nurse and that of operation room at associate level, when they are compared. Do our medical universities spend great costs to train operation room professionals at B.S. level while the performance role of operation room professionals at B.S. level and associate level are not much different and no change occurs in quality of patient care?

As a result, since the appropriate performance of care professions requires a wide range of knowledge and skills, like other members of hygienic-medical system, the operation room personnel should follow the educational standard. On the other hand, the remarkable changes in surgical techniques necessitate the balance of surgery technologists with their new roles and responsibilities, and the current educational program will not be sufficient to meet the future needs of operation room personnel. Hence, Association of Surgery Technologists (AST) which has been founded by American College of Surgeons (ACS), American Hospital Association (AHA), and Association of Operation Room Nurses (AORN) has declared in its suggestions that for surgery technologists in elementary programs at least the associate level certificate and for first assistant the B.S. certificate is obligatory.

By comparison of the program and syllabus of courses for associate level program of operation room in Iran with those of the mentioned associations, it seems that this educational plan is not sufficient for training the professionals for attending the patients before, during, and after operation, since surgical techniques are increasingly advance and surgeons develop their knowledge according to them while patient care is always as past!

Additionally, due to change in sciences including medical sciences, the operation room

associate-level personnel have not enough knowledge, skills, and competency and they have no further special training at B.S. level. However, it is necessary for the operation room associate-level personnel to be trained according to remarkable changes in surgical techniques as well as educational needs and specific skills for operation room. Since constant revision of programs according to the advances and changes and proposing these programs to the respective officials is among the responsibilities of head of department,[9] therefore in a research study entitled "Study of the international syllabus for the operation room courses and proposing an appropriate syllabus for the courses in Iran"[9] the syllabus of operation room B.S. courses was prepared and the final program was suggested after employing Delphi technique in faculty of nursing and midwifery in Isfahan University of Medical Sciences.

As it is intended that B.S. program of operation room will be established nationally and educational policy in Iran is centralized, we hence intended to we intended to learn about the opinions of other people related to this subject in Iran. Accordingly the prepared syllabus was sent to heads of the operation room departments in medical universities across Iran in which the subject matter was being taught at associate level and the syllabus was finalized after some modification. It is hoped that the results of this study will be useful in proper educational planning so as to increase the quality of educational planning for operation room students, and to alleviate the existing deficiencies and problems.

Method

This is a survey study in which we used Delphi method to prepare the syllabus of operation room B.S. courses. The essential data were collected by a questionnaire which included the syllabus of the suggested courses for operation room B.S. program and was the result of another research entitled "Study of the international syllabus for the operation room courses and proposing an appropriate syllabus for the courses in Iran." First, the syllabus was prepared and then we called 12 heads of the operation room departments in universities across Iran in which the subject matter was being taught at associate level (including the cities Mashhad, Shiraz, Uremia, Zahedan, Kermanshah, Hamedan, Ahvaz, Bandar Abbas, Tabriz, and Iran University). After giving necessary explanations regarding the study goals, questionnaires were sent to them by express mail and they were requested to express their opinions about the suggested syllabus.

Finally after finishing Delphi technique, when a consensus of greater than 70% was reached, the syllabus for the operation room courses at B.S. level was finalized. Since the operation room courses at B.S. level were supposed to be introduced in Iranian universities, the regulations from the Development, Planning, and Evaluation Office of the Ministry of Health were also followed.

It should be noted that purposeful sampling was used in this study, and we made use of descriptive statistics for analysis of quantitative data yielded from the study. Scientific validity of the data collection tool in this study was examined by face validity. To test and confirm this validity, opinions of experts were utilized. Also, frequently referring to questionnaires for prioritization both determines the consensus and provides an opportunity to evaluate the inner validity of data[10] which was accomplished by Delphi technique.

Results

As mentioned earlier, this research study is devoted to develop a syllabus for operation room technologists at B.S. level in Iran. The findings are tabulated as follows:

After reading the opinions and responses of research units, the items which needed modification were revised and we informed the participant who suggested it. Subsequent to considering the proposed modifications, several meetings were held in which the syllabus of courses for operation room B.S. program was approved.

Table 1. The finalized items found in this research

No.	Course name	Number of units	Desirable (%)	Relatively desirable (%)	Not desirable (%)
1	Anatomy 1, 2	4	91.6	8.4	-
2	Physiology 1,2	3	91.6	8.4	-
3	Organic Chemistry and Biochemistry	2	100	-	-
4	Microbiology and Parasitology	3	100	-	-
5	Introduction to Pathology and Wound Healing	1	91.6	8.4	-
6	Immunology	1	91.6	8.4	-
7	Biostatistics	2	75	25	-
8	Research Methodology	1	100	-	-
9	Computer Skills	2	83.3	16.7	-
10	Medical Physics, Electricity, and Robotics, and Applications in the Operation Room	2	100	-	-
11	General Psychology	2	100	-	-
12	Pharmacology	4	91.6	8.4	-
13	Medical Terminology	1	100	-	-
14	English for Specific Purposes	4	91.6	8.4	-
15	Mental health in the Operation Room	2	100	-	-
16	Hygiene	2	100	-	-
17	Principles and Function of Surgery Technician as Circulator	3	83.3	16.7	-
18	Principles and Function of Surgery Technician as Scrub	2	91.6	8.4	-
19	Principles of Sterilization and Disinfection	1	100	-	-
20	Operation Room Equipment	2	100	-	-
21	Introduction to surgery technology	2	75	25	-
22	Internal medicine diseases	3.5	83.3	16.7	-
23	GI and endocrinology surgery diseases	3.5	75	25	-
24	Gynecology and urology diseases	2.5	75	25	-
25	Cardiovascular surgery and hematology and respiratory diseases	2	75	25	-
26	Neurosurgery and orthopedics	3.5	75	25	-
27	ENT, craniofacial, and ophthalmology diseases	3	75	25	-
28	Pediatric surgery diseases	1	75	25	-
29	Skin diseases, burn, and graft	2	75	25	-
30	Anesthesiology	2	100	-	-

Table 1. The finalized items found in this research

No.	Course name	Number of units	Desirable (%)	Relatively desirable (%)	Not desirable (%)
31	Cardiopulmonary resuscitation and principles of intensive care	1.5	83.3	16.7	-
32	Principles of recovery care	1	83.3	16.7	-
33	Emergencies	2	75	25	-
34	Management in the operation room	2	100	-	-
35	Apprenticeship of principles	1	75	25	-
36	Apprenticeship of principles and function of surgery technician as a circulator and observer	1	83.3	16.7	-
37	Apprenticeship of central sterilization unit	1	100	-	-
38	Primary apprenticeship of principles and function of surgery technician as a scrub and circulator (in general and pediatric surgery)	2	83.3	16.7	-
39	Apprenticeship of principles and function of surgery technician as a scrub and circulator (in general and pediatric surgery)	4	75	25	-
40	Methods of cardiopulmonary resuscitation and principles of intensive care (practical)	2	91.6	8.4	-
41	Principles of care in the recovery room (practical)	1	91.6	8.4	-
42	Principles of management in the operation room	1	100	-	-
43	Field apprenticeship in orthopedics	2.5	91.6	8.4	-
44	Field apprenticeship in neurology	2.5	91.6	8.4	-
45	Field apprenticeship in burns and reconstructive surgery	1.5	91.6	8.4	-
46	Field apprenticeship in gynecology	1	91.6	8.4	-
47	Field apprenticeship in urology	1.5	91.6	8.4	-
48	Field apprenticeship in cardiology	1.5	91.6	8.4	-
49	Field apprenticeship in ophthalmology	1	91.6	8.4	-
50	Field apprenticeship in craniofacial surgery	1.5	91.6	8.4	-
51	Field apprenticeship in thorax surgery	1.5	91.6	8.4	-
52	Field apprenticeship in ENT	1.5	91.6	8.4	-
53	Field apprenticeship in a surgery field (elective)	2	91.6	8.4	-

Discussion

It was initially intended to remove the courses with desirability level of 70% or lower and be designed again according to suggestions; however in the present study in the first round no course was assigned desirability level of less than 70%, so the syllabus of courses with desirability percentage of 90-100 is provided in following, unless typing mistake or grammatical error has been modified. Furthermore, list of courses with desirability level of 70-90% was modified or revised based upon the suggestions of the units under study as well as the opinions of research team experts; otherwise if the change was not possible, the reason is mentioned.

Item 1, Anatomy 1&2

The suggested course name was "anatomy 1&2" with desirability of 91.6%. The main point mentioned for it was that this course is better to be changed into distinct courses or related numbers. So this course was modified as: No. 01: Anatomy 1; No. 02: Anatomy 2.

Item 2, Physiology 1&2

The suggested course name was "physiology 1&2" with desirability of 91.6%. The main point mentioned for it was that this course is better to be changed into distinct courses or related numbers. So this course was modified as: No. 03: Physiology 1; No. 04: Physiology 2.

Item 5, Introduction to pathology and wound healing

The suggested course name was "Introduction to pathology and wound healing" with desirability of 91.6%. The main point mentioned for it was to change its name. After consulting with the members of research team, it was changed into "pathology".

Item 6, Immunology

In the previous project, consensus was made on number of units of this course to be 1, so it was initially suggested to be 1 unit. However in the current project, the topics and contents of this course were modified and so it was increased from 1 unit to 2 units.

Item 7, Biostatistics

After collecting the opinions, it was found out that 3 participants were against being the number of units of this course to be 2. After consulting with members of the research team, the contents of this course were decreased and it was decreased to a one-unit course.

Item 9, Computer skills

Considering the opinions of two participants, since this course is presented for some B.S. majors under the name of "information technology" as 1 unit, the research team intended to change the course name into "Information technology in operation room" as 1 unit, and this course was modified.

Item 12, Pharmacology

Considering the opinion of a participant, since this course is presented for nursing as 3 units, the research team intended to modify this course from 4 units to 3 units.

Item 14, English for specific purposes

Considering the opinion of a participant that this course is 2 units in most B.S. majors and after consulting with education team of the fa culty of nursing and midwifery in Isfahan University of Medical Sciences, this course was modified and its number of units was decreased from 4 to 2.

Item 17, Principles and function of surgery technician as circulator

After collecting the opinions, we found out that two participants are in favor of decreasing the number of units of this course from 3 to 2. They believed that it is better to add one unit to apprenticeship. Also, they suggested changing the course name since it was too long. After consulting, the research team therefore intended to decrease the contents and topics of the course and its number of units was decreased from 3 to

Table 2. Suggestions and opinions being considered in syllabus of operation room B.S. program

No.	Suggested Course name	Suggested units	Final name of the course	Final number of units
1	Anatomy 1, 2	4	Anatomy 1	2
2			Anatomy 2	2
3	Physiology 1,2	3	Physiology 1	2
4			Physiology 2	1
5	Organic Chemistry and Biochemistry	2	Organic Chemistry and Biochemistry	2
6	Microbiology and Parasitology	3	Microbiology and Parasitology	3
7	Introduction to Pathology and Wound Healing	1	Pathology	1
8			Hematology and blood transfusion	2
9	Immunology	1	Immunology	2
10	Biostatistics	2	Biostatistics	1
11	Research Methodology	1	Research Methodology in operation room	1
12	Computer Skills	2	Information technology in operation room	1
13	Medical Physics, Electricity, and Robotics, and Applications in the Operation Room	2	Medical Physics, Electricity, and Robotics, and Applications in the Operation Room	2
14	General Psychology	2	General Psychology	2
15	Pharmacology	4	Pharmacology	3
16	Medical Terminology	1	Medical Terminology	1
17	English for Specific Purposes	4	Specialized English	2
18	Mental health in the Operation Room	2	Mental health in the Operation Room	2
19	Hygiene	2	Hygiene	2
20	Principles and Function of Surgery Technician as Circulator	3	Principles and techniques of the circulator	2
21	Principles and Function of Surgery Technician as Scrub	2	Principles and techniques of the scrub	2
22	Principles of Sterilization and Disinfection	1	Principles of Sterilization and Disinfection	1
23	Operation Room Equipment	2	Operation Room Equipment	2
24	Introduction to surgery technology	2	Introduction to surgery technology	3
25	Internal medicine diseases	3.5	Internal medicine diseases	2
26	GI and endocrinology surgery diseases	3.5	Surgery technology in GI and endocrinology surgeries	3
27	Gynecology and urology diseases	2.5	Surgery technology in gynecology and urology	2
28	Cardiovascular surgery and hematology and respiratory diseases	2	Surgery technology in cardiovascular and respiratory surgery	2

Table 2. Suggestions and opinions being considered in syllabus of operation room B.S. program

No.	Suggested Course name	Suggested units	Final name of the course	Final number of units
29	Neurosurgery and orthopedics	3.5	Surgery technology in neurosurgery and orthopedics	3
30	ENT, craniofacial, and ophthalmology diseases	3	Surgery technology in ENT, craniofacial, and ophthalmology surgeries	2
31	Pediatric surgery diseases	1	Surgery technology in pediatric surgery	1
32	Skin diseases, burn, and graft	2	Surgery technology in skin diseases, burn, and graft	1
33	Anesthesiology	2	Anesthesiology	2
34	Cardiopulmonary resuscitation and principles of intensive care	1.5	Cardiopulmonary resuscitation and principles of intensive care	3
35	Principles of recovery care	1	Principles of care in the recovery room	2
36	Emergencies	2	Emergencies	1
37	Management in the operation room	2	Management in the operation room	2
38	Apprenticeship of principles	1	Apprenticeship of nursing skills	
39	Apprenticeship of principles and function of surgery technician as a circulator and observer	1	Apprenticeship of behavior in the operation room	
40	Apprenticeship of central sterilization unit	1	Apprenticeship of central sterilization unit	
41	Primary apprenticeship of principles and function of surgery technician as a scrub and circulator (in general and pediatric surgery)	2	Apprenticeship of principles and techniques of functioning as a scrub and circulator	
42	Apprenticeship of principles and function of surgery technician as a scrub and circulator (in general and pediatric surgery)	4	Apprenticeship of techniques of the operation room	
43	Methods of cardiopulmonary resuscitation and principles of intensive care (practical)	2	Apprenticeship of methods of cardiopulmonary resuscitation	
44	Principles of care in the recovery room (practical)	1	Apprenticeship of principles of care in the recovery room	
45	Apprenticeship of management in the operation room	1	Apprenticeship of management in the operation room	
46			Apprenticeship of emergency operation room	
47	Field apprenticeship in orthopedics	2.5	Field apprenticeship in orthopedics	
48	Field apprenticeship in neurology	2.5	Field apprenticeship in neurology	
49	Field apprenticeship in burns and reconstructive surgery	1.5	Field apprenticeship in burns and reconstructive surgery	
50	Field apprenticeship in gynecology	1	Field apprenticeship in gynecology	

Table 2. Suggestions and opinions being considered in syllabus of operation room B.S. program

No.	Suggested Course name	Suggested units	Final name of the course	Final number of units
51	Field apprenticeship in urology	1.5	Field apprenticeship in urology	
52	Field apprenticeship in cardiology	1.5	Field apprenticeship in cardiology	
53	Field apprenticeship in ophthalmology	1	Field apprenticeship in ophthalmology	
54	Field apprenticeship in craniofacial surgery	1.5	Field apprenticeship in craniofacial surgery	
55	Field apprenticeship in thorax surgery	1.5	Field apprenticeship in thorax surgery	
56	Field apprenticeship in ENT	1.5	Field apprenticeship in ENT	
57			Field apprenticeship in pediatrics	
58			Field apprenticeship in gastroenterology and endocrinology	
59	Field apprenticeship in a surgery field (elective)	2	Field apprenticeship in a surgery field (elective)	

2. Furthermore, its name was modified into "principles and function of circulator".

Item 40, Methods of cardiopulmonary resuscitation and principles of intensive care (practical)

A participant believed that this course is better to be changed from a practical course into apprenticeship. Though this course had desirability level of 91.6%, the research team concluded that it can be presented as practical together with theoretical course for several hours. So consensus in the second round was made to present this course under the name "field apprenticeship in methods of cardiopulmonary resuscitation" as 1 unit. So the name and number of units of this course were modified.

Item 41, Principles of care in the recovery room (practical)

Although this course had desirability level of 91.6%, those participants who were against it believed that it is better to be presented as apprenticeship as 2 units, instead of as a practical course. Therefore the research team decided to change the course name into "field apprenticeship in the recovery room" and increase its number of units from 1 to 2. This was approved by consensus and this course was modified by change of its name and its number of units.

Items 43-53, Field apprenticeship

Though all field apprenticeship courses had desirability level of 91.6%, considering the regulations of the Development, Planning, and Evaluation Office of the Ministry of Health to avoid assigning courses a non-integer (0.5) number of units as much as possible, the number of units of the courses "field apprenticeship in orthopedics" and "field apprenticeship in neurology" were decreased from 2.5 to 2. Also, number of units of the courses "field apprenticeship in burns and reconstructive surgery", "field apprenticeship in urology", "field apprenticeship in cardiology", "field apprenticeship in craniofacial surgery", "field apprenticeship in thorax surgery" and "field apprenticeship in ENT" was increased from 1.5 to 2.

Furthermore, to coordinate the field apprenticeship courses and avoid shortage or excess in number of units (i.e. more than 24 units), the number of units of some courses was changed as follows: "field apprenticeship in gynecology" from 1 unit to 2 units; "field apprenticeship in ophthalmology" from 1 unit to 2 units; and "field apprenticeship in a surgery field (elective)" from 2 units to 1 unit, and then two other courses were added to field apprenticeship courses, including "field apprenticeship in pediatrics" as 1 unit and "field apprenticeship in GI and endocrinology" as 2 units. Finally, 24 units of field apprenticeship were approved by consensus and modified as mentioned.

Item 18, Principles and function of surgery technician as scrub

To make this course consistent with item 17 and to consider the opinion of one participant, the

course name was changed into "principles and techniques of the scrub", so the course was modified.

Item 21, Introduction to surgery technology

According to the suggested content, number of units for this course was 2. Considering the opinions of three participants that it is better to increase the contents and topics of this course, the research team decided to change its number of units from 2 to 3. So this course was also modified.

Item 22, Internal medicine diseases

Since two participants were against the presentation of this course as more than 2 units, and also it was suggested that the course is better to be changed into a field apprenticeship course, and because the regulations of the Development, Planning, and Evaluation Office of the Ministry of Health recommend to avoid assigning courses a non-integer (0.5) number of units as much as possible, the research team lessened the contents of the course and decreased its number of units from 3.5 to 2. So this course was modified as well.

Items 23 (GI and endocrinology surgery), 24 (Gynecology and urology), 25 (Cardiovascular and pulmonary surgery), 26 (Neurosurgery and orthopedics), 27 (ENT, craniofacial, and ophthalmology surgery), 28 (Pediatric surgery), and 29 (Skin diseases, burn, and graft)

It should be mentioned that the courses on surgical diseases had the lowest level of desirability (75%). Considering the ideas of three of the participants as well as the regulations of the Development, Programming, and Evaluation Office of the Ministry of Health on avoiding the use of half units for courses, all surgical courses with half units were rounded to the lower limit. These courses included GI and endocrinology surgery (rounded from 3.5 to 3 units), gynecology and urology (rounded from 2.5 to 2 units), and neurosurgery and orthopedics (rounded from 3.5 to 3 units).

Moreover, considering the opinions of three of the participants as well as to develop a consistency between surgical courses on the one hand, and other courses on the other hand, the number of the units of items 27 and 29 (ENT, craniofacial, and ophthalmology surgery, and Skin diseases, burn, and graft) decreased one unit after modifying the syllabus, such that 2 and 1 units were assigned to items 27 and 29, respectively. The research team finally decided to match the courses with corresponding courses in nursing and changed their names into "surgery technology in different fields of surgery", according to the courses of Association of Surgery Technologists.

Thus, the name of the courses 23 to 29 finally changed into surgery technology in GI and endocrinology surgeries (3 units), surgery technology in gynecology and urology (2 units), surgery technology in cardiovascular and respiratory surgery (2 units), surgery technology in neurosurgery and orthopedics (3 units), surgery technology in ENT, craniofacial, and ophthalmology surgeries (2 units), surgery technology in pediatric surgery (1 unit), and surgery technology in skin diseases, burn, and graft (1 unit).

Item 31, Cardiopulmonary resuscitation and principles of intensive care

Two participants believed that the units of the course should be increased from 1.5 to 2 or even more. Moreover, considering the above-mentioned regulation of the Ministry of Health, the research team concluded to increase the number of units of the course, and finally with regard to the content and topics of the course, the units increased from 1.5 units to 3.

Item 32: Principles of care in the recovery room

Two participants believed that if the course units are to be 1, just similar to the B.A. course, it is not appropriate for the B. Sc. course. Furthermore, as some specialized cares of the recovery room were included in the syllabus, including the manual and regulations of ventilators, the unit number of the course increased to 3.

Item 33, Emergencies

In spite of the desirability level of 75%, since the course has 1 unit in nursing, it was agreed to assign 1 unit to the course.

Item 35, Apprenticeship of principles and techniques

After carrying out the opinion poll, some participants asked for the increase of the course units. Therefore, after re-evaluation of the contents and syllabus of the course, it was concluded

that the units should be extended because of the extensive content of the course. Moreover, the course name was suggested to change into "Apprenticeship of nursing skills". The name change and the decrease in the number of the units from 2 to 1 was finally done after an ultimate opinion poll and achieving the 75% desirability level.

Item 36, Apprenticeship of principles and function of surgery technician as a circulator and observer

The course had the desirability level of 83.3%, and thus did not undergo any changes. However, considering the long name of the course, it was suggested to modify the name into "apprenticeship of behavior in the operating room", which was accepted after the ultimate opinion poll.

Item 38, Primary apprenticeship of principles and function of surgery technician as a scrub and circulator (in general and pediatric surgery)

The course had the desirability level of 83.3%, and was accepted without modifications. However, considering the long name of the course and according to recommendations of some participants, after changing some topics and the final opinion poll, the course name was changed into "Apprenticeship of principles and techniques of functioning as a scrub and circulator".

Item 39, Apprenticeship of principles and function of surgery technician as a scrub and circulator (in general and pediatric surgery)

The course achieved the desirability level of 75%, but the cons persuaded others to shorten the name of the course, decrease the number of units, and then adding the units to the field apprenticeship. After evaluation and modification of syllabus and contents of the course, the research team decreased the number of units from 4 to 2 in the final opinion poll, and changed its name into "Apprenticeship of techniques of the operation room".

Other courses that were added to the final syllabus were: 1- Hematology and blood transfusion (2 units), and 2- Apprenticeship of emergency operation room (2 units).

After careful assessment of the syllabus and considering the number of units, 4 units (other than field apprenticeship) were added to the syllabus, and again the participants were asked about the modification. After achieving 100% desirability, the two courses were added to the final syllabus.

It should be noted that field apprenticeship in pediatrics and field apprenticeship in gastroenterology and endocrinology were added to the syllabus, and after obtaining 91.6% and 100% desirability, respectively, were added to the final syllabus.

The authors declare no conflict of interest in this study.

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