Res Dev Med Educ, 2022, 11, 15
doi: 10.34172/rdme.2022.015
https://rdme.tbzmed.ac.ir

Original Research

A needs assessment for designing and establishing a Center for Clinical Skills Center

Hamidreza Morteza Bagi[1], Fariba Abdollahi[2*], Hamideh Noriasl[2]

[1]Emergency Medicine Department, Faculty of Medicine, Tabriz University of Medical Sciences, Tabriz, Iran
[2]Clinical Skills Laboratory, Faculty of Medicine, Tabriz University of Medical Sciences, Tabriz, Iran

Article info

Article History:
Received: 9 Apr. 2022
Accepted: 18 June 2022
epublished: 1 Aug. 2022

Keywords:
Clinical skill, Clinical competence, Clinical Skills Learning Center, CLSC

Abstract

Background: Due to the limitations of clinical learning and the consideration of patients' rights, the emphasis on educating clinical and communication skills and creating attitudes in students has received much attention, which requires an appropriate educational environment.

Methods: In a descriptive study, we examined challenges and proposed solutions in a clinical skills center in 2017. The study participants were 60 medical students and 29 faculty members at the Tabriz University of Medical Sciences who were selected randomly and followed for 12 months, from October 2016 to October 2017. The classical modified Delphi technique was used to collect data and study execution in three rounds.

Results: From the perspectives of academic board members, the most critical weaknesses included "small and limited educational environment of workshops" (weight of consensus = 212.5), "severe lack of educational facilities such as simulators" (weight of consensus = 158.9), and "lack of adequate facilities for assessing students' skills" (weight of consensus = 140.9) based on the results. From the perspectives of academic board members, the most crucial weaknesses in the field of management and execution were "lack of adequate constructional infrastructure" (weight of consensus = 239.2), "lack of adequate funding for the clinical skills center" (weight of consensus = 200.1) and "lack of approved organizational chart for clinical skills center" (weight of consensus = 200.1).

Conclusion: The main challenges of the Clinical Skills Center of Tabriz University of Medical Sciences included the lack of definition of an organizational chart, lack of sufficient funding to provide educational facilities, lack of standard educational space, and clinical skills evaluation, which the Center for Clinical Skills developed. Most of the center's problems were resolved by allocating sufficient funds to provide educational facilities and cultivate a culture of interdisciplinary collaboration supported by university authorities.

Introduction

Universities are responsible for educating a large number of practical and communication skills along with their knowledge and theoretical domains to a large number of students of medical sciences and paramedical disciplines.[1] Due to the limitations of clinical learning and consideration of patients' rights, educating clinical and communication skills and creating attitudes in students have received much attention.[2,3] A Clinical Skills Learning Center (CLSC) allows medical students to use a variety of teaching aids and medical moulage to improve clinical and communication skills in a controlled environment.[4,5] A study conducted in various CLSCs of the world in person or through Internet research and a review of CLSC articles showed that a CLSC can establish a link between theoretical content and practical skills, reduce stressing students' stress in their initial encounter with a patient, and teach them communication and practical skills in dealing better with patients. A successful CLSC must be flexible in the planning of the educational program. Moreover, it should be in accordance with a university's educational goals. Achieving these goals requires proper planning, organization, and educational environment and facilities.[6] Yet, due to the development of medical education, CLSC is faced with challenges such as rapid growth and high admission of students to the course, lack of adequate resources and infrastructure, inadequate quality of education, and particularly, lack of structural and educational facilities. Considering these issues, the rapid growth of educational technology, and the increasing importance of the values in medical ethics around the world, the necessity and importance

***Corresponding author:** Fariba Abdollahi, Email: abdollahi138@gmail.com

of developing CLSCs becomes more apparent. Hence, a needs assessment and review of the challenges were required in the current study. Needs assessment is an integral part of strategic planning, during which the needs are identified and acted upon according to their priority.[7] One of the most reliable needs assessment methods is the Delphi technique, through which individuals' opinions are examined in several stages[8] as a consensus-based method.[9] Through this technique, groups' opinions are examined remotely and in a specific location without the simultaneous presence of individuals; what is agreed upon by all constitutes the need.[10,11] The Delphi technique is managed with some questions that are progressively given to individuals, analyzed by a needs assessment instrument, and used in the design of subsequent questions. This is done in several successive steps so that individuals might reach an agreement on their needs.[12,13] Therefore, since the development of clinical skills is a basic element of medical education and an essential part of the core program of medical schools,[14] this study evaluated the educational, directorial, and execution challenges of the clinical skills center of Tabriz University of Medical Sciences from the perspectives of the academic board members and medical students using the Delphi technique to identify strengths and weaknesses, determine opportunities and threats, and provide appropriate strategies.

Materials and Methods

This is a descriptive study using the Delphi technique to examine the challenges and propose solutions in the clinical skills center of Tabriz University of Medical Sciences in 2017. The study participants were students of medical undergraduate and residency courses who had passed clinical skills in the skill lab, as well as members of the academic board of various clinical education departments, the dean of the faculty, and senior educational and executive directors at the Tabriz University of Medical Sciences who were selected randomly over 12 months, from October 2016 to October 2017. The inclusion criteria were medical undergraduate and residency students who had passed clinical skills in the skill lab, instructional faculty members of the clinical skill workshops, and educational and executive directors who were somehow related to the current processes of the clinical skills center. Based on the number of students and faculty members of 17 educational departments and using the Morgan table, the sample size was estimated to be 60 students and 29 instructing faculty members and directors.. The study units' refusal to participate was considered a criterion for exclusion.

The classical modified Delphi technique was used for data collection and study execution in three rounds. In the first round, an unstructured questionnaire, in the form of open-ended questions concerning problems in the current processes of the clinical skills center (strengths and weaknesses) and suggested solutions, was developed for the members of the expert group who had already been selected. This provided a relatively wide range further to explore subject matter to the study participants. A qualitative analysis was performed in the first round, and similar opinions expressed on a single topic were classified into two areas: education and management. Thus, the initially unstructured questionnaire became a structured one, forming the basis of later rounds. In the second round, experts participating in the first round were given the questionnaire obtained from the first round. While expressing their opinions, the individuals were invited to express their critique toward each of the stated sentences and add possible proposals to the end of each section. The third-round quantitative data were analyzed by descriptive statistics techniques. Participants were asked to rate the mentioned variables in each section from 0 (no executability and no priority) to 10 (full executability and high priority). After receiving the participants' answers, the average of the opinions was calculated, and the prioritization of each of the mentioned variables was conducted so that fewer and higher numbers of agreements indicated lower and higher priorities, respectively. Researchers distributed questionnaires to participants in each round; they were asked to complete the questionnaires within 15 days. Afterward, the researchers collected the questionnaires.

Ten professors specializing in relevant fields were surveyed to test the validity of the questionnaire.

To test the reliability of the questionnaire, 30 medical students, faculty members, and medical school administrators were selected using the test-retest method two weeks apart.

Finally, the data of the current Delphi study were analyzed in two stages. The qualitative content analysis with a conventional approach was used to identify the main variables and extract the items of the initially unstructured questionnaire in the first and second stages. The third stage was the beginning of using quantitative methods in which the data were analyzed using descriptive statistics (mean, standard deviation) by SPSS 20.

Results

Eighty-nine participants of the study (60 students and 29 academic board members of various clinical education departments, dean of the faculty, and educational and executive directors of Tabriz University of Medical Sciences) completed data collection in all three rounds. Among the 29 academic board members who participated in the study, 9 were professors, 10 were associate professors, and 10 were assistant professors. Of 60 participating students, 40 were undergraduate medical students, and 20 were residency medical students. Cronbach's alpha coefficient of the researcher-made questionnaire was 0.85; 0.70 is considered acceptable for social sciences research. All information obtained from qualitative content analysis in the first two rounds was

placed in educational, directorial, and execution areas and three categories: weaknesses, strengths, and suggestions. In the third round (quantitative method), the results were approved or rejected as executable, non-executable, and consensus grades. The educational challenges of the clinical skills center are presented in Table 1.

From the perspectives of the academic board members, senior directors, and students, the most critical weaknesses of the directorial and executive fields are presented in Table 2.

Finally, the suggestions were classified in Table 3 in terms of executability and priority after collecting

Table 1. Challenges in the educational field of the clinical skills center in 2017

Educational field	Items	Faculty members			Students		
		Percentage of consensus	Mean consensus grade	Weight of consensus	Percentage of consensus	Mean consensus grade	Weight of consensus
Weaknesses	The small and limited educational environment of workshops	28	7.59	212.52	52	7.30	379.6
	Lack of medical manikins and adequate facilities	23	6.91	158.93	53	8.96	472.2
	Lack of a specialized course for clinical skills	11	6	66	19	10.13	425.6
	Lack of cooperation of professors and educational departments in clinical skills education	15	5.8	87	36	9.35	336.7
	Using traditional methods of clinical skills education	16	6.5	104	29	11.01	385.4
	Lack of adequate environment for evaluating clinical skills	20	7.25	145	21	8.78	184.3
	Lack of appropriately simulated environment to implement group training scenarios	21	6.71	140.91	48	4.74	227.6
	Lack of virtual educational content	18	5.89	106.2	55	5.36	295.1
	Lack of students' motivation to learn	17	6.53	111.01	15	7.57	113.6
Strengths	The potential of the center to provide various educational and research activities	19	7.16	136.04	36	3.07	110.6
	Optimistic belief in the officials and a high sense of responsibility in the staff of the center to achieve the educational and research goals of the center	23	7.3	161.04	38	4.11	156.3
	Having a brilliant national record in clinical skills education	23	7.86	172.92	49	6.18	302.6
	Experienced professors interested in clinical skills education	22	7.26	166.98	51	5.86	298.9
	The successful holding of national clinical skills workshops	17	7.35	124.95	41	6.24	255.9
	The successful holding of OSCE using the total capacity of the center	19	7.47	141.93	52	5.10	265.1
Suggestions	Expanding the physical environment of the clinical skills center	29	10	290	57	7.87	448.6
	Providing up-to-date medical manikin and educational facilities based on educational goals	28	9.5	275.5	59	7.68	453.2
	Inviting professors and students interested in holding workshops and educational scenarios	18	7.2	129.6	46	5.21	239.6
	Allocation of educational and executive points for professors cooperating with the center	25	8.2	205	12	5.41	184.1
	Establishing purposeful educational environment	21	7.9	165.9	43	4.70	202.3
	Establishing a reward system for the presence of learners		8.1	186.3	26	7.29	189.6
	Establishing a dedicated environment for OSCE	26	8.4	218.4	48	5.19	248.9
	Using modern educational methods	21	7.8	163.8	56	7.12	398.6

Abbreviation: OSCE, objective structured clinical examination.

Table 2. directorial and executive challenges of the clinical skills center in 2017

Educational field	Items	Faculty members			Students		
		Percentage of consensus	Mean consensus grade	Weight of consensus	Percentage of consensus	Mean consensus grade	Weight of consensus
Weaknesses	Lack of approved organizational chart for clinical skills center	20	9.9	198	14	9.3	130.2
	Lack of specialized human resources	23	8.6	197.8	36	9.5	342
	Lack of opportunity for interdisciplinary cooperation to solve the center's problems	19	9.8	186.2	18	9.5	171
	Lack of adequate funding for the clinical skills center	23	8.7	200.1	42	7.4	310.8
	Lack of adequate constructional infrastructure	26	9.2	239.2	41	9.9	405.9
	Lack of approved regulations in the revenue generation of the center	16	9.2	147.2	11	9.6	105.6
	Monetization potential of the clinical skills center	18	9.9	178.2	9	9.9	89.1
Strengths	Recognition of the center as an educational hub in the province and northwest of the country due to the history of providing practical training to health care personnel and students	24	7.6	182.4	41	9.7	397.7
	Allocating the educational environment in proportion to the volume of students	26	9.3	241.8	57	9.4	535.8
	Allocating appropriate funds to provide educational facilities	28	9.6	268.8	51	9.3	474.3
	Establishing production departments and educational innovations in the form of knowledge-based projects and student dissertations	21	7.6	199.5	38	8.3	315.4
Suggestions	Proposing approved organizational chart	26	9.3	111.8	14	10.0	133
	Establishing unit of research in education	19	9.6	182.4	9	10.0	90
	Establishing unit of model hospital	18	9.5	171	42	8.9	373.8
	Establishing unit of model pharmacy	17	9.6	163.2	41	9.7	397.7
	Using the capacities of the center to provide practical education to all audiences, including students, staff, and the general public	23	8.2	188.6	15	8.9	133.5
	Providing specialized nursing staff to meet the challenges of lack of skilled and experienced staff	24	9.1	218.4	36	8.8	316.8
	Reducing the costs of the center by providing outdated materials such as syringes, sutures, etc. to be used in workshops	17	9.2	156.4	24	8.9	213.6

information.

Based on the results, establishing a center for education, research, and assessment of clinical skills was prioritized and decided in the meetings of deputies and was implemented as follows.

Discussion

Advances in medical science and changes in the provision of health services have necessitated improvements in student education.[15] Establishing CLSCs in medical universities is a response to educational needs and consideration of patients' rights. Due to the type of educational chart and the facilities, CLSCs have a relatively different scope of activities, target groups, and educational resources around the world; they all share the goal of instructing and practicing clinical and communication skills for medical students should be organized and done as soon as possible.[6]

According to members of the academic board, senior directors, and students participating in this study, the most critical weaknesses of the clinical skills center of the medical school in the field of education, which was located in an area of about 400 square meters, were the "small and limited educational environment of workshops", "severe lack of educational facilities such as simulators", "lack of adequate facilities for assessing students' skills", "lack of clinical skills course", and "using traditional methods of clinical skills education". Weaknesses in the directorial and executive field were "lack of adequate constructional infrastructure", "lack of adequate funding for the clinical

Table 3. Classification of suggestions in terms of executability and priority

Suggestions	Items	Executability based on current conditions	Priority
Educational Field	Expanding the physical environment of the clinical skills center	9	1
	Providing up-to-date medical manikins and educational facilities based on educational goals	8	2
	Inviting professors and students interested in holding workshops and educational scenarios	8	6
	Allocating educational and executive points for professors cooperating with the center	5	7
	Establishing purposeful educational environments	9	3
	Establishing a reward system for the presence of learners	4	8
	Establishing a dedicated environment for OSCE	8	4
	Using modern educational methods	8	5
	Allocating the educational environment in proportion to the volume of students	9	2
Directorial Field	Allocating appropriate funds to provide educational facilities	9	1
	Establishing production departments and educational innovations in the form of knowledge-based projects and student dissertations	9	3
	Proposing an approved organizational chart	4	9
	Establishing a unit of research in education	7	7
	Establishing a unit of a model hospital	9	6
	Establishing a unit of model pharmacy	9	5
	Using the capacities of the center to provide practical education to all audiences, including students, staff, and the general public	8	10
	Providing specialized nursing staff to meet the challenges of lack of skilled and experienced staff	7	4
	Reducing the costs of the center by providing outdated materials such as syringes, sutures, etc. to be used in workshops	7	8

Abbreviation: OSCE, objective structured clinical examination.

skills center", "lack of approved organizational chart for clinical skills center", and "lack of specialized human resources". Establishing the educational, research, and assessment center of clinical skills was one of the main priorities of this study. Therefore, we became more steadfast in achieving the center's new mission by conducting surveys through an internet search and telephone contacts or physical visits to various clinical skills centers inside and outside the country (Tbilisi, Georgia, Georgia Aci Badem, and Turkey).

Almost all clinical skills centers expanded their educational activities for different groups of students and assistants. Meanwhile, the Tabriz University of Medical Sciences has considered the need to improve the physical environment and add experienced human resources as its short-term goals. By the end of the study phase, an educational, research, and assessment center of clinical skills based on new educational and directorial approaches was established in the following executive phases:

1. Estimating the cost of equipment to establish the center based on the new plan and required equipment.
2. Designing a new clinical skills center in an area of 1800 m^2 on two floors with three critical units of education, research, and assessment of clinical skills.

✓ The educational unit was designed and established, consisting of workshops on trauma care, basic and advanced cardiopulmonary resuscitation, airway management, nursing skills, examination and obtaining medical history, communication skills, diagnostic procedures, model pharmacy, simulated hospital, and electronic library.

✓ The assessment unit was designed and established, which consists of 30 stations in two halls: A and B (equipped with CCTV camera, test protection room, and quarantine room before and after the test) to hold OSCE, clinical competency tests at the end of general medicine, and other tests and exams.

✓ The research in education unit was designed and established, which consists of a content production studio (for making distance and multimedia learning software and production of educational content), designing laboratory, manufacturing and repairing educational and medical moulages (designing and manufacturing models, moulages, and teaching aids in the form of knowledge-based projects and student dissertations, the basic maintenance of existing moulages in the center, which leads to increasing their lifespan, self-sufficiency in providing a variety of teaching aids and as a result, currency savings and sales of educational products of the center in long-term), and a unit of research in education (for quantitative and qualitative evaluations of the provided educations in the center and the use of new educational methods such as flipped classrooms).

✓ The administrative and office unit was designed and established, consisting of the presidency room, think tank (R&D room), management room, educational planning room, certification room, informatics

room, and experts' room.
3. Using nurses working at the university as staff to establish a related organizational position (due to the nature of skill lab activities and equipment in the center, nurses were most efficient in performing educational and research activities).
4. Proposing an organizational chart for the educational, research, and assessment center of clinical skills.
5. Public information about using healthy medical equipment in this center for economic savings (such as syringes, angiocath, gloves, etc).
6. Establishing a simulated hospital in an independent environment with wards (triage, resuscitation room, outpatient examination room, laboratory, imaging room, neonatal and pediatric intensive care unit, adult intensive care unit, obstetrics and gynecology ward, and internal ward) to hold educational scenarios and conducting teamwork exercises.
7. Establishing the first model pharmacy in the clinical skills center of the Medical School.
8. Preparation of medical moulages and equipment required for education and holding clinical competency tests (more than 100 types of educational medical moulages).

Considering the potential of the educational, research, and assessment center of clinical skills, this center can be used in the following cases:

Educating clinical skills to various audiences
- Educating skills related to physical examinations and practical semiology to medical students in different courses as well as students of dentistry, pharmacy, midwifery, nursing, health, and other fields of medical sciences.
- Educating clinical skills such as suturing, catheterization, cardiopulmonary resuscitation workshop(CPR), etc., to medical students and other disciplines, e.g., performing CPR courses for pharmacy and dentistry students.
- Holding practical education to prepare students for the clinical competency exams.

Educating interdisciplinary skills
- Holding skill workshops based on an educational scenario for a group of students of different medical and paramedical disciplines (e.g., a physician, nurse, ward secretary, supervisor, etc., can simultaneously be present in the resuscitation team through an advanced resuscitation workshop).
- Using a model pharmacy environment to educate students in medical, pharmaceutical, paramedical, and non-medical departments.
- Establishing an exhibition of new pharmacopoeia drugs for educating medical pharmacology and other fields
- Establishing an exhibition of various hospital equipment for educating medical and paramedical students
- Interdisciplinary skills assessment
- Holding interdisciplinary workshops at the beginning of the residency course

Educating communication skills
- Interpersonal communication
- Physician-patient communication
- Physician-staff communication

Consecutive education of physicians and staff of health centers

Due to a large number of educational requests from various private and governmental centers, the educational unit is also used in the following cases:
- Usability of all facilities and environment of the center in the afternoon and on holidays
- Holding empowerment workshops for physicians and paramedics
- Holding workshops for the empowerment of Red Crescent members.

Holding annual congress and national meetings in the field of medical education

Holding national courses for designing specialized board questions, clinical reasoning questions, and OSCE of clinical competence

Self-study programs
- Establishing opportunities for students to learn independently through educational videos and software
- Using medical moulages and equipment by different audiences as self-guided learning
- Using a computer room for self-study and computer-assisted learning
- Providing clinical skills education packages and booklets for different groups

Research in education
- Evaluating new educational methods, particularly student-centered, problem-oriented, and e-learning methods
- Evaluating new teaching aids such as media, simulators, etc.
- Strengthening the education skills of interns and assistants (strengthening cascade training)

Producing various teaching aids (medical moulages, software, and distance learning videos) and achieving self-sufficiency in meeting the needs of the center
- Establishing a laboratory for designing, manufacturing, repairing, and maintaining a medical moulage
- Establishing a studio to produce videos and distance learning software
- Preparing educational videos, photos, and slides

- Preparing educational booklets and guidelines
- Preparing clinical education software in the form of multimedia
- Transferring in-hospital and operating room education cases to the workshops of the center through fiber optic technologies
- Transferring workshop education and scenarios into theoretical classes through networking facilities

Holding standardized clinical competency tests

- Designing and holding OSCE for specialized and sub-specialized assistants
- Designing and holding OSCE for students of various medical courses (Medical Assistant Degree, undergraduate, etc)
- Holding the OSCE at the end of the undergraduate course for students of medical universities in the northwest of the country (Urmia, Ardebil, Maragheh)
- Video recording of test stations to be used in grading and indirect supervision of professors on stations.

Using student capabilities

- The goal is to employ and get the students to participate actively (target groups) in various educational programs and research. Decentralized planning, activating students to discover their educational problems, and participating in solving them leads to better and deeper learning.
- Through active student organizations, critical educational scenarios will be collected from natural clinical environments, and problem-oriented education will be provided based on the daily needs of the target groups.
- Collecting clinical and skill problems in hospital educational settings from students' perspectives and trying to solve them in the form of dissertations and applied research.

Establishing a simulated patient bank

This center has the potential to implement first aid training programs to the public through virtual and physical education, concluding training contracts with private and governmental centers, cooperating with pharmaceutical companies and hospital medical equipment stores (educational cooperation and introduction of new medicines and equipment to target groups of programs), creating a bank of clinical test questions at a regional scale, employing members of the academic board and instructors to teach workshops, communication and continuing learning on medical moulages and learning, expanding training to cyberspace, expanding the education center to the universities in neighboring countries, considering the records of the center in holding workshops, holding a student clinical skills Olympiad in order to create healthy competition for students for learning purposes, using corridors to install bulletins of medicines and new equipment for educational purposes, introducing pharmaceutical products and new equipment from private companies, educating clinical skills for specialized and sub-specialized assistants such as ERCP training, endoscopy, or colonoscopy and laparoscopy, and holding education workshops for other audiences even outside the university, such as endoscopy education courses for internal medicine and surgery physicians or prescription and pharmacotherapy workshops for different groups.

Conclusion

The main challenges of the Clinical Skills Center of Tabriz University of Medical Sciences included the lack of definition of an organizational chart, lack of sufficient funding to provide educational facilities, lack of standard educational space, and clinical skills evaluation, which the Center for Clinical Skills developed., Most of the center's problems were resolved by allocating sufficient funds to provide educational facilities and cultivate a culture of interdisciplinary collaboration along with setting up a laboratory for producing educational products supported by university authorities. The following suggestions are presented for improving the educational quality of clinical centers. Therefore, medical universities can take a big step toward improving the educational quality of their clinical skills centers by taking advantage of the results and suggestions of this study.

Suggestions

The following items are suggested to improve the quality of the education provided in the clinical skills center and attract the maximum participation of interested individuals.

- Assigning a course for educating clinical skills
- Considering adding educational points for cooperating professors to increase educational motivation to participate
- Utilizing volunteer assistants and instructors from other fields, including general practitioners, etc.
- Implementing basic and applied education-oriented research in the form of dissertations and contracts with knowledge-based centers.
- Providing facilities for transferring real experiences from clinical environments of hospitals to the workshops of the center using fiber optic technologies and also transferring scenario education within the workshops to theoretical classes through the network
- Training on animal tissues in the animal lab environment
- Integration of clinical skills center education in clinical wards and continuation of education provided in the center on patients as controlled by the instructors of the center
- Predicting observation room and debriefing room in designing a skills center

- Postgraduate education programs to generate revenue for the center

Acknowledgments
We would like to appreciate the cooperation of the Clinical Research Development Unit of Imam Reza General Hospital, Tabriz, Iran, in conducting this research.

Authors' contribution
HM, FA, and HN designed the experiments. FA collected data. H.N performed the statistical analyses. FA wrote the results section, interpreted the results, and wrote the initial manuscript. HM critically reviewed and modified the manuscript. All authors approved the final manuscript.

Ethical approval
The Education Development Office of the Tabriz University of Medical Sciences approved all procedures in this study (Issue Tracking;101750595059).

Competing interests
The authors declare that there is no conflict of interest.

References
1. Haghani F, Kamali F. Look at the clinical skills center and its applications. Iran J Med Educ. 2011;10(5):1068-76. [Persian].
2. Bligh J. The clinical skills unit. Postgrad Med J. 1995;71(842):730-2. doi: 10.1136/pgmj.71.842.730.
3. Elzubeir M, Sherman M. Nursing skills and practice. Br J Nurs. 1995;4(18):1087-92. doi: 10.12968/bjon.1995.4.18.1087.
4. du Boulay C, Medway C. The clinical skills resource: a review of current practice. Med Educ. 1999;33(3):185-91. doi: 10.1046/j.1365-2923.1999.00384.x.
5. The University of Newcastle. Clinical skills lab. Available from: http://www.ncl.ac.uk.
6. Jafari F, Hakimian MR, Saburi M. What is the clinical skills learning center (CSLC)? Iran J Med Educ. 2001;1(3):21-9. [Persian].
7. Kafman R, Herman J. Strategic Planning in Education. Translated by: Mashayekh F, Bazargan A. Tehran: Madraseh Press; 1995.
8. Aminorro'aya M, Yarmohammadian MH, Yousefi A. Educational needs of education experts in Isfahan University of Medical Sciences. Iran J Med Educ. 2002;2(2):5-13. [Persian].
9. Yarmohammadian MH, Bahrami S, Foroughi Abari AA. Health managers and prefer methods of needs assessment. Iran J Med Educ. 2003;3(1):71-8. [Persian].
10. Yazdankhah Fard MR, Kamali F, Sharifi S, Motamed N, Hajinejad f. Determining nursing research priorities according to viewpoints of nurses in Bushehr city using Delphi technique. Iran South Med J. 2008;10(2):182-9. [Persian].
11. Moreno-Casbas T, Martín-Arribas C, Orts-Cortés I, Comet-Cortés P. Identification of priorities for nursing research in Spain: a Delphi study. J Adv Nurs. 2001;35(6):857-63. doi: 10.1046/j.1365-2648.2001.01923.x.
12. Carroll L. Clinical skills for nurses in medical assessment units. Nurs Stand. 2004;18(42):33-40.
13. Löfmark A, Thorell-Ekstrand I. An assessment form for clinical nursing education: a Delphi study. J Adv Nurs. 2004;48(3):291-8. doi: 10.1111/j.1365-2648.2004.03198.x.
14. Jalili Z, Nouhi E, Nakhaee N. The opinions of medical interns about the acquired basic clinical skills. Stride Dev Med Educ. 2005;2(2):80-7. [Persian].
15. Dacre J, Nicol M, Holroyd D, Ingram D. The development of a clinical skills centre. J R Coll Physicians Lond. 1996;30(4):318-24.