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Benchmarking, a new method for developing an educational curriculum for respiratory therapy courses in medical schools

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ABSTRACT

Introduction: "Develop a curriculum (DACUM)" describes all the ways in training organization plans and guides teaching. Benchmarking has been employed form 1970s to search for "best practices" in business operations and its application to the process of teaching design, is a new concept. The aim of this study was using DACUM and benchmarking method in order to present useful and unified method for producing the best practice curriculum for educating respiratory therapists in our country. **Methods:** A five step benchmarking method was used to establish curriculums of well-known universities. Following this, 219 relevant health care professionals from United Arab Emirates and Iran were interviewed. Finally, all data was merged to DACUM. **Results:** Our results showed: Respiratory therapists are working in all hospitals (100%) in UAE, While none of the hospitals in Iran have these professionals. Eighty-seven percentage of volunteers were agree that the nature of work in hospitals need to use these professionals, and their abilities will improve the quality of care. Ninety-two percentage of nurses said: They will be able to take care of ventilators and other respiratory equipment, but all of them (100%) were agree that they need advanced trainings. **Discussion:** Respiratory therapists in different countries are getting different levels of education and responsibility. It is very important to customize the curriculum and the professional scope of practice according to the requirements of health care facilities. **Conclusion:** Using DACUM and benchmarking method helped us to produce a comprehensive and relevant educational curriculum for respiratory therapists in our medical university.

KEY WORDS: Benchmarking, curriculum, develop a curriculum, education, respiratory therapy

INTRODUCTION

"Develop a curriculum (DACUM)" describes all the ways in which the training or teaching organization plans and guides teaching [1]. The idea of DACUM is based on the assumption that skilled workers and professionals are best able to describe the competencies needed to perform their individual work, and involving them for developing the best educational syllabuses for a training purpose [2]. So far, they could be the main source of information for defining, analyzing and developing lists of job-specific skills needed. This could include information outlining required knowledge, skills, behavior, tools, equipment and materials, as well as discussing the future of their specific job trends and concerns that are the expected output of the teaching and learning process [3].

Benchmarking is a tool that has been employed for many years (1970s) to search for "best practices" in business operations, customer relations, product design and manufacturing but its application to the process of teaching design, in a university setting [4-6], is a new concept. It relies on reviewing established curriculums of well-known universities from different countries and using their experiences to design a feasible curriculum for students in medical university [7,8].

At the moment, there is no unified method for developing or reviewing the educational curriculums in our medical universities, and different departments are using their own pathway for this purpose.

As part of the Medical Education Department, we decided to use this tool for developing educational curriculum for training a new group of health care providers called "respiratory therapists" for the 1st time ever in our country. A respiratory therapist is a specialized healthcare practitioner who has graduated from a college or university. Respiratory therapists often collaborate with and work under supervision of an intensivist or pulmonologist.

The most crucial factor of using benchmarking was designing the most relevant and integrated educational curriculum, coupled with introducing an integrated sequence of courses and

experiences [9-11]. We believe using a standardized content as a draft model for curriculum and benchmarking with available best practices integrated with regional experiences will assist in developing the most relevant and comprehensive local curricula and establishing high quality learning expectations in our medical universities and hospital setting.

Respiratory therapists are a group of health care professionals who are able to work in different fields of health care system according to their education and training. After reviewing educational curriculums of this group in different universities, we found different levels of educations and consequently they were appointed to different positions after graduation according to the country and their assigned hospitals or clinics.

This study was carried out in two main parts: First, benchmarking and then, providing a workshop with a focused group of stakeholders based on DACUM model.

METHODS

The following five-steps benchmarking method [12-15] was used for our purpose:

1. Determining the importance and objectives of the study
2. Identifying the target curriculums and participants
3. Collecting the required data
4. Contacting each expert people
5. Analyzing data and report.

We reviewed the established curriculums of well-known universities from different countries such as: USA, Canada, France, India, Philippines, Saudi Arabia, Egypt and Pakistan. In Iran, we didn't find any training course or curriculum for training a category of students as a respiratory therapist, but we gathered the educational curriculum for anesthesia technicians, BS of anesthesia and BS of nursing.

All curriculums were compared in details to reveal the similarities and differences and in order to define the requirements for new customized curriculum with specific syllabuses and training modules for a respiratory therapy course in Iran. However, at the same time we drafted a prototype curriculum with basic but important educational topics [16-18].

The next step involved different categories of relevant health care professionals. Face to face semi-structured interviews were carried out during DACUM analysis workshops with expert professionals from different specialties in order to collect the required data from their experiences [19,20]. The main objective of this workshop was to describe and define the best curriculum for training a respiratory therapist in Iran.

In this stage, we tried to include all stakeholders, and In order to expand our data, we select 219 volunteer professionals from governmental hospitals in Iran and United Arab Emirates (UAE).

Inclusion criteria for enrolment in the research were:

1. To be graduated from an accredited medical university (the university should be recognized by an appropriate authority and ministry of higher education or ministry of health in the same country and the performance of this particular institution has satisfied a pre-stated set of criteria as per their authorities) major academic institutions that award either the Doctor of Medicine or Doctor of Osteopathic Medicine degrees, either of which is required to become a physician or surgeon in the United States.
2. At least 5 years experience in critical care unit.
3. Licensed to work as an Intensivist, Anesthesiologist, Pulmonologist, Respiratory Therapist PhD, Registered Nurse, Respiratory Therapist Technician, Anesthesia Technician.

Exclusion criteria were:

1. No clinical experience (e.g., professionals who work only in administration or in research)
2. Unfamiliar with critical care unit and critical care activities.

During our face to face semi-structured interviews the following questions were discussed:

1. Are you aware of a category of professionals known as respiratory therapists?
2. Do you have a respiratory therapist in your hospital?
3. Do you work with respiratory therapists in your department at any time?
4. Does your organization have a program or opportunity for training respiratory therapy professionals?
5. Will the program impact organizational performance?
6. Do you have any replacement professionals for this position?
7. Do you have any curriculum for this training program?
8. Does the nature of work in hospitals need the abilities of these professionals?
9. Do you think the work of respiratory therapists will improve patient care?
10. Are the nurses able and well trained to take care of ventilators and other respiratory equipment like: Bronchoscope, airway management devices?
11. Do the training syllabuses of nursing education cover all subjects and trainings about respiratory equipment?
12. Do you think there is a desire to implement this training course?
13. Do you think the need for implementing this course is urgent?
14. Do you expect a good result after proper implementation of this course?
15. Have you ever seen other hospitals with respiratory therapists handling respiratory equipment?
16. What were your theoretical syllables in your educational curriculum?
17. What were your practical training sections during your study?
18. Do you think some syllables or practical training sections should be replace by some other syllables or trainings?
19. Do you think you got enough education and training during your study, and you were totally ready to accept your responsibilities after graduation?

We analyzed and categorized opinions from different professional groups to be able to merge the important issues in our final curriculum.

As our third step, after identifying strengths and weaknesses of the current programs for respiratory therapy in medical and nursing education in different countries, we analyzed and categorized data from DACUM workshops and merged all data to our prototype curriculum to develop the final version of a customized curriculum for a respiratory therapy course in our university. It took 10 months to carry out this activity.

RESULTS

Respiratory therapists are receiving different education and consequently their responsibilities and abilities are different according to the country and their universities.

A total number of 98 participants in this study were from Iran, and 121 number of them were from UAE. The distribution of participants were: 40 nurses, 36 anesthesiologists, 17 intensivists, 15 pulmonologists, 95 registered nurses, 2 respiratory therapists (PhD), 23 aesthesia technicians and 11 respiratory therapists (MS) participated in this study [Table 1].

The contributors from UAE were graduated from different countries including: USA, UK, India, Ireland, Australia, New Zealand, South Africa, France, Pakistan, Egypt, Saudi Arabia, Cuba, Argentina, Canada, Philippines, Austria and Iranian contributors were graduated from different medical universities of Iran although some of them also had attended training courses abroad.

All intensivists and pulmonologists were aware of a category of health care professionals as a respiratory therapist (100%) while only 42% of anesthesiologists, 60% of nurses and 25% of anesthesia technicians were familiar with these professionals.

According to the information from UAE volunteers, respiratory therapists are working in all hospitals (100%), while none of the hospitals in Iran have position for these professionals, and their responsibilities are shared between nurse and other health care staff.

There was no opportunity for official training or educating a respiratory therapist in hospitals and universities either in Iran or UAE.

Table 1: The number and average of work experience of interviewed professionals

Graduated as	Number (Iran)	Number (UAE)	Average years of work experience
Intensivist	7	20	5
Pulmonologist	5	10	5
Anesthesiologist	21	15	8
Registered Nurse	50	55	6
Respiratory Therapy PhD	0	2	10
Anesthesia Technician	15	8	7
Respiratory Therapy Technician	0	11	3

UAE: United Arab Emirates

Eighty-seven percentage of volunteers were agree that the nature of work in hospitals need to use these professionals and their abilities will improve the quality of care.

Ninety-two percentage of nurses said: They will be able to take care of ventilators and other respiratory equipment but all of them (100%) were agree that they need advanced trainings about respiratory care and respiratory equipment.

Almost all of volunteers (100%) were not able to remember the details of their educational curriculum and they referred us to their university departments.

Sixty-five percentage of volunteers were believe that some of their educational syllables should be replaced, and 86% of them mentioned that they needed more practical training before graduation to be able to take all responsibilities in their position.

According to our results and reviewing article, we believe customizing the educational curriculums could be very helpful for training healthcare professionals like respiratory therapy.

DISCUSSION

We found that respiratory therapists in different countries not only received different levels of education, but also covered a variety of training subjects and practices within their courses. After graduation, they are often assigned in different professional positions playing different roles and subject to taking different responsibilities accordingly. The most common statement in defining respiratory therapists is that: "The respiratory therapists are specialists in airway management, able to establish and maintain the airway." Besides, they could be in charge of initiating and managing life support, stabilizing and monitoring high risk patients during surface or air transport, administering medications and medical gases (e.g. asthma medication), managing home oxygen needs of patients, providing around the clock support for home ventilators and other equipment for conditions like sleep apnea.

In the United States and Canada specialist respiratory therapists are clinicians who hold National Board for Respiratory Care specialty credentials, which may include neonatal/pediatric specialist, adult critical care specialist, sleep disorder specialist, and pulmonary function technologist. Nowadays, they are migrating toward a role with autonomy similar to the nurse practitioner, or as an extension of the physician like the physician assistant [21,22].

In France, respiratory therapy is a sub-specialty of physical therapy; in Germany, they attend along with delegated physicians on duty and respond to the observed increase in respiratory conditions and diseases. In Philippines, respiratory therapists are clinicians who have been awarded at minimum a bachelor of science degree in respiratory care and work either in the hospitals or clinics under supervision of physicians [23,24].

Respiratory therapy in the UK is not a recognized specific profession, but a specialization route available to physicians,

nurses, physiotherapists and occupational therapists and their common titles include respiratory nurse, clinical respiratory physiologist, cardio-respiratory physiotherapist and cardio-respiratory occupational therapist [25].

In our region, there are some countries like Egypt, Saudi Arabia, Pakistan and India who offer bachelor's degree in respiratory care. They are offering almost the same education as other aforementioned countries [26-29] and the graduates are known as respiratory therapists.

Using benchmarking as a tool in the process of comparing different curriculums helped us to get the benefit from strengths and reduce weaknesses during our effort to make the best practice curriculum for respiratory therapist training course in our universities. In this way, we were able to convince our decision makers how well the targets could perform and more importantly, that the education processes could be successful.

During a five-step benchmarking process, we found some curriculums are mainly focusing on theoretical subjects while others have more emphasis on practical training. It was also found that in some curriculums, some important subjects are not being included at all. Another finding was that the professional activities of respiratory therapists are getting shared between nurses, physicians and physical therapists in our hospitals or clinics [30].

Reviewing different curriculums and educational syllabuses of respiratory therapy curriculums in different universities helped us to explain the crucial reason and define the goals for designing a specific curriculum and training schedule for respiratory therapy professionals according to the educational requirements and their future responsibilities at work places. Meanwhile, involving experts in the field, and considering their opinion during workshops as part of DACUM process, gave us the opportunity to compare the details of educational subjects for nurses and anesthesia technicians in our universities with other available curriculums. It helped in merging the most relevant subjects for our educational purposes to give full coverage of all aspects of teaching and learning processes, including knowledge, skills, attitude and behavior. This empowers graduates, offering them enough scientific knowledge and practical experience to cover the required professional competencies.

CONCLUSION

Benchmarking can provide an overall reality check for institutions and gives them comparisons that can be helpful for providing greater justifications, while developing new or revising an existing curriculum for their educational activities. We believe medical schools need to look at the benchmarking and use this method not only for designing new curriculums but also for refining and improving the quality of existing curriculums in their departments. Using benchmarking as a framework for DACUM will set clear academic standards for students in a given school or institute, it will improve their performances in future and clarify what students should know or be able to do at certain points in their schooling to be proficient in specific academic areas after graduation.

The limitations of this study were limited available detailed curriculums, unavailability of instructors and mentors for face to face interview, unclear methodology for developing curriculums in some universities. Although our preliminary curriculum has been accepted by educational authorities in our university, but still we cannot apply our purposed curriculum to students, and our proposal needs final approval! So, we are not able to evaluate our curriculum.

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