Nabil NATAFGI¹, Miriam SALIBA², Rami DAYA³, Fadi EL-JARDALI¹


ABSTRACT • PURPOSE : Hospital accreditation places emphasis on the role of health professionals in quality of patient care. Training physicians in quality and patient safety influences quality improvement efforts in healthcare. Little is known about the attitudes and knowledge of medical students towards the concepts of quality of care, patient safety and accreditation. The objective of this study was to determine the extent to which Lebanese medical students are aware of and familiar with these aforementioned concepts.

METHODS : The study adopted a cross-sectional research design on a sample of (148 participants) graduating medical students from four major universities in Lebanon. A semi-structured self-completion questionnaire was developed to assess students’ knowledge towards : A) Quality concepts ; B) Quality tools ; C) Patient safety & Risk management ; D) Accreditation ; and E) Policies & Procedures/Guidelines. Two statistical tests, MANOVA (parametric) and Kruskal-Wallis (nonparametric) were used to analyze the data.

RESULTS : Study results showed that 85% of medical students did not receive any course about quality and patient safety, although 93% considered them to be important and called for their integration into curricula. Lowest mean scores were recorded for the theme on quality concepts and tools (1.60 ± 0.81 and 1.49 ± 0.71 respectively). Respondents from sampled universities showed a general lack of knowledge of the themes studied.

CONCLUSIONS : Quality, patient safety and accreditation are important disciplines that need to be incorporated into medical curricula. This would be a positive step towards enabling future physicians to meet the changing needs of the constantly evolving healthcare system.

INTRODUCTION

The Institute of Medicine (IOM) revealed in 2000 that in the United States alone there were up to 98,000 mortalities per year due to medication errors [1]. This appalling figure incited a significant amount of changes to meet the new challenges of healthcare systems. The changes taking place in healthcare, however, are rarely aligned with similar changes and redesigns in medical education and academic environment [2]. In fact, the main focus of medical education, especially among undergraduate students, is disease diagnosis and management; whereas little attention is given to the proper management of healthcare systems and quality improvement [3]. Medical students learn and train in highly complex...

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healthcare organizations. However, they lack adequate competencies and skills to help them deal with complexities and barriers, analyze and assess managerial problems, and improve the system in place [2]. The notion of involving medical students in ensuring patient safety has been rather frail, although these students are members of the healthcare team and are qualified to recognize medical errors [4].

When trying to achieve quality in healthcare, it is prudent to tackle the way healthcare professionals are educated [2]. From that perspective, the World Health Organization (WHO) has augmented its efforts to improve human resources for health through actively advocating reform and improved medical education [5]. These efforts were expanded to improve education in quality measures and accordingly the WHO’s World Alliance for Patient Safety has published in 2009 the ‘WHO Patient Safety Curriculum Guide for Medical Schools’ in response to the findings that showed that medical students themselves have identified quality and safety of care as an important area of instruction [6].

Regional and Lebanese context

The concepts of accreditation, quality and performance improvement are the interest and focus of many healthcare services and organizations globally. In 2003, the WHO published a review indicating the scarcity of accreditation programs in the Eastern Mediterranean Region (EMR) [7], which opened the door for a major reform in this sector in the region. Thus, quality of care was transformed to one of the priorities of health policy agendas of governments in the EMR [8]. In the Arab Region, numerous attempts were made to establish national and/or regional accreditation schemes. Lebanon was a pioneer in this area by developing and updating a national accreditation scheme for hospitals that was shaped and implemented by the Ministry of Public Health (MoPH) [9]. The most recent update of this scheme was the addition of two new chapters to the standards: (i) Patient Safety and (ii) Evaluation of Professional Practice [10]. The successful implementation of the latter chapter entails a direct cooperation and coordination from the physicians who are the primary care providers to patients. The literature attests, however, that physicians constitute a major obstacle to the process of implementation of standards especially those linked to quality and patient safety [11]. A study to assess the patient safety culture in Lebanese hospitals revealed that almost 60% of the participants, including physicians, did not report any adverse event within a year [12]. Moreover, physicians reported less adverse events than nurses and had a poorer perception of safety [13]. This could be attributed to the lack of emphasis on quality concepts in the curricula of the medical schools [11] and calls for empowering physicians to enhance their patient safety culture.

Indeed, it was found that one of the main concerns of policy-makers in the EMR is the lack of updates in curricula and educational programs for health human resources, especially with concerns about the quality of nurses’ and physicians’ education and its consequent effect on patient care – which renders the quality and efficiency of such programs highly questionable [14]. An exception was found in Lebanon, where in 2008, the Syndicate of Private Hospitals and in collaboration with the Ministry of Education (MoE) succeeded in incorporating a mandatory course on quality management and accreditation in the curricula of Nursing Schools in Lebanon [15]. Despite this fact, Lebanese Medical Schools are still lacking such courses in their curriculum. To specifically examine the curricula of Lebanese Medical Schools, the Academic Catalogues published on the internet were investigated.** Our review revealed a lack of a dedicated course for quality and/or patient safety in all medical schools, with the exception of one. Extensive research is required to analyze the current situation and to identify key areas for improvement. Many worldwide studies are calling for reform in medical curricula and investigating different strategies that help medical students acquire the appropriate quality and patient safety education necessary to meet the changes in the healthcare system [16-21]. However, to our knowledge, studies concerning the incorporation of quality care and patient safety concepts into the curricula of medical schools in the EMR are deficient. Moreover, very little is known about the attitudes of medical students towards the concepts of quality of care, patient safety and accreditation.

Study objectives

The main objective of this cross-sectional research study is to conduct a baseline assessment in Lebanon to determine the extent to which graduating medical students are aware of and familiar with the concepts of quality care and patient safety in healthcare. This study also attempts to sense the importance of those concepts for the medical students.

METHODS

Study design, population and sampling

This research study adopted a cross-sectional design. The selected approach enabled us to understand the current familiarity of the future physicians entering the market with the concepts of quality, patient safety, and accreditation in healthcare.

The targeted population included all Lebanese graduating medical students from four universities in Lebanon in their final two years. These students perform regular clinical rounds and are in direct contact with patients. They also resemble the future generation of physicians practicing in the medical field.

In Lebanon, seven medical schools exist. Our sampling frame (Figure 1) included a list of four medical schools that represent the oldest and most developed American,
French and Egyptian medical teaching systems in Lebanon. We randomly sampled 50% of the total number of medical students in their final two years of general medical education from the following universities: the American University of Beirut (AUB) [American System]; Saint Joseph University (USJ) and the Lebanese University (LU) [French System]; and Beirut Arab University (BAU) [Egyptian System]. This sampling frame allowed the representation of diverse student bodies from different educational backgrounds with diverse medical curricula. This, in turn, allowed for appropriate analysis to evaluate and compare different teaching systems. The target sample size was 284 participants. Upon the completion of the data collection process, a total of 148 surveys were collected with a response rate of 52.1%.

**Measures**

In this research study, a semi-structured self-completion questionnaire was developed to assess the knowledge of medical students towards the concepts of quality, patient safety and accreditation (See Appendix). The questionnaire was designed based on the competencies of the WHO curriculum guide, the ACGME and the GMC [22-24]. It was mainly composed of quantitative close-ended questions with a single qualitative open-ended question.

The quantitative part included several conceptual variables divided into five themes:

[A] Quality concepts
[B] Quality tools
[C] Patient safety and Risk management (RM)

[D] Accreditation

The conceptual variables were measured using a five-point Likert scale:

1: Strongly disagree
2: Disagree
3: Neutral
4: Agree
5: Strongly agree.

Thus, each participant was asked to choose the most suitable score according to his/her level of knowledge of the studied concepts. Such questions boosted the comparability of responses, facilitated the data-coding operation and were easy for respondents to complete. On the other hand, the inclusion of an open-ended question allowed for the emergence of responses that were not encompassed in the fixed alternative close-ended questions.

**Procedures**

After securing the administrative approval from the deans, or their designees, of the four involved medical schools, we started the process of data collection. We utilized different methods to approach the participants based upon the request of individual universities. At the American University of Beirut (AUB), and since the targeted students do not have academic classes at their faculty, three ways were utilized in parallel to approach the participants: (i) send the consent and the survey to all Med III and Med IV students by email, (ii) keep some enveloped hard copies for the participants at the Saab Medical Library...
(SML) and assign the librarian the responsibility of providing Med III and Med IV students with the surveys, (iii) personally seek them at their rotation departments at the American University of Beirut Medical Center (AUBMC) and at SML. The results of the first and second methods were almost negligible; hence, the researchers opted to personally reach the targeted students at AUBMC and SML and inform them orally about the study and their rights before providing them with the surveys. At the Lebanese University (LU), the researchers approached participants at their clinical rotation sites since LU medical students also do not have academic classes on campus. The following sites, covering in total 50% of the students, were chosen: Sahel Hospital, Rizk Hospital, Hospital of Lebanon and Rafik Hariri University Hospital (RHUH). Surveys approached the participants directly in their respective departments. At the Beirut Arab University (BAU), and since medical students in their final two years of general medicine continue to attend classes in their faculty at BAU, the most suitable way for data collection was to orally inform the targeted students of the study objectives, their rights and provide them with the surveys directly after their class. At Saint Joseph University (USJ), the researchers reached medical students at ‘Hôtel-Dieu de France’ Hospital to survey the participants during two gatherings managed by the students’ representatives.

Ethical considerations

The proposal of this research study secured the AUB Institutional Review Board (IRB) approval prior to data collection. Since the nature of the research required collaboration of different medical schools, contact was established with those schools to ensure their consent to carry out this research among their medical students. After we obtained this administrative consent, we orally informed all students participating in the survey about the research topic, its objectives and their rights as participants prior to survey administration. Both consents of the school and participants ensured the basic elements of completeness, disclosure, understanding, voluntariness and consent. The nature of data collection ensured that all gathered data was confidential and did not allow the identification of the respondents, since we did not record the names of the participants and the names did not appear on the survey.

Data analysis

After the completion of the data collection process, we coded the data, entered it, cleaned and analyzed it using SPSS 18.0. In addition, we carried out all analyses at a level of significance of 0.05.

Analysis of the demographic information

We performed a descriptive analysis to summarize the demographic information presented in the study. We computed the overall sample size, as well as the sample sizes and percentages of the different subgroups (universities, gender, age groups, medical education years and weekly hours involved in medical care) using SPSS 18.0.

Analysis of the bivariate variables

To assess the importance of quality and patient safety concepts from the perspective of medical students and whether or not they call for integrating a quality course into their curriculum, two ‘Yes/No’ questions were included in the questionnaire. Cross tables were used to analyze the difference in responses of medical students to each of the scale items. Pearson $\chi^2$ was used to examine the association between survey items, that is, to test whether the ‘Yes/No’ answers were independent or not of the universities.

Analysis of the multivariate variables

We analyzed the 5-point Likert Scale questions using both descriptive and inferential statistics. The descriptive analysis represented, for each university, the means corresponding to the five themes studied in the questionnaire. The inferential analysis allowed making conclusions from the presented data through examining whether significant differences exist between the four universities studied, in relation to each of the five themes. Thus, we utilized two statistical tests: parametric One-way Multivariate Analysis of Variance (MANOVA) test and non-parametric Kruskal-Wallis. MANOVA and Kruskal-Wallis met the same purpose: comparing the universities in relation to the five studied themes. Kruskal-Wallis test, however, is specifically suitable for small size samples and when MANOVA assumptions are not met. As for the multiple comparisons test, we chose the Bonferroni procedure.

Analysis of the open-ended question

We interpreted qualitatively the open-ended question presented at the end of the survey through a thematic...
We entered the responses of participants in a table and analyzed them qualitatively. Responses were broken down into related concepts and then coded into themes.

**RESULTS**

As observed in Table I, the sample was equally distributed between Medicine III (53.4%) and Medicine IV (46.6%) students and between males (52.7%) and females (47.3%). Also, more than 50% of the surveyed medical students were involved in direct patient medical care for more than 40 hours per week.

**Bivariate analysis**

- **Course on quality in healthcare**

  The vast majority (85%) of the medical students indicated having never taken a course or covered material on quality in healthcare during their previous or current year of medical education. Responses to this question were significantly different across surveyed universities ($p$-value < 0.001). Results show that 85.7% of all the medical students who indicated taking a course were from USJ (Table II).

- **Importance of quality concepts and their integration in the existing curriculum**

  The vast majority of the participants (93%) acknowledged the importance of quality and patient safety; 88% of whom called its incorporation of such concepts in their existing curriculum. However, results also showed that results were independent from the four participating universities for both questions ($p$-value of 0.454 and 0.161 respectively) (Table III).

**Multivariate analysis**

- **Knowledge of specific quality and patient safety concepts**

  To assess the knowledge of medical students on quality and patient safety concepts, we performed aggregate descriptive analyses (Table IV) for the four universities on the five main themes studied.
The comparison of the mean scores highlighted that the knowledge of students was the lowest in the themes of Quality Tools [B] and Quality Concepts [A], with a mean score of 1.49 (± 0.71) and 1.60 (± 0.81) respectively. The highest mean score was observed for the knowledge of Policies and Procedures/Guidelines [E] (Mean: 3.32, SD: 1.39).

These results showed that medical students at the four universities surveyed were not introduced to the concepts and tools of quality. However, medical students have been introduced to concepts of policies and procedures and clinical-based guidelines. Concerning patient safety, risk management and accreditation, it seemed that the medical students were hesitant whether they were introduced to these concepts during their education.

Comparing knowledge towards quality and patient safety concepts among different universities

The results of Kruskal-Wallis test showed a significant difference in knowledge of concepts of Accreditation [D] and Policies and Procedures/Guidelines [E] among the medical schools of the four universities (Table V). Indeed, MANOVA results (Table IV) validate these results of Kruskal-Wallis. The Post-Hoc test of Bonferroni identified that in theme [D] Accreditation, the knowledge of USJ medical students on accreditation concepts (mean score of 2.97) was significantly higher than that of BAU (mean score of 2.03) and LU (mean score of 2.00). Moreover, for the theme [E] Policies and Procedures/Guidelines, the knowledge of AUB medical students (mean score of 4.03) was significantly higher than that of LU (mean score of 2.88) and BAU (mean score of 2.75).

Qualitative analysis

Analysis of the answers of the open-ended question, asking the students to share any further information or notes regarding the research topic or survey questions, revealed common themes.

On one hand, few students confirmed their unfamiliarity with the ‘names’ of the concepts and tools studied in the survey. Furthermore, they stated that during their medical practice, they perform their duties with a high sense of quality of care and patient safety. This could imply that some of the students may actually be familiar with the concepts raised but not the terms used in the questionnaire per se. In their opinions, such concepts should not constitute a priority for medical students because of time shortage, the presence of clinical guidelines, and minimal involvement of physicians in administrative or institutional roles.

On the other hand, a significant group of medical students expressed a different opinion. They revealed that the concepts and tools studied in the questionnaire were unfamiliar and were not included in any previous course. The majority of students agreed that the five themes of the survey were of great importance. In addition, they highlighted that these themes must be incorporated in the medical curricula. The same group of students emphasized the dire necessity to inform the Deans of the medical schools about the results so they can act accordingly.

DISCUSSION

The findings of our study conformed to previous studies [25] showing that medical residents admitted the need for better patient safety, although they declared their lack of knowledge on how to undertake such improvements.

As per the results mentioned above, it was evident that the majority of medical students did not receive any course about quality in healthcare, and this validated the curriculum review conducted for each university. We noted the only exception in the study sample in USJ, where 39% of the medical students attested taking a course about quality of care. Although it was the highest observed, this percentage is still considered low despite the partial coverage of some of the tackled themes as part of a course at USJ. This might be attributed mainly to three items: (i) not all USJ medical students recalled taking such a course or its competencies, or (ii) they may not consider it related to quality, or (iii) because these themes were only part of a course and they did not consider it enough. Thus, these findings suggest that the vast majority of the imminent physicians of the future may lack the satisfactory level of knowledge about quality and patient safety concepts, which might in turn reflect negatively on their patient outcomes at some instances.

Moreover, a high percentage of medical students con-

<table>
<thead>
<tr>
<th>TABLE V</th>
<th>KRUSKAL-WALLIS TEST</th>
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<tr>
<td><strong>MEAN RANKS</strong></td>
<td><strong>[A]</strong> Quality Concepts</td>
</tr>
<tr>
<td>AUB</td>
<td>87.76</td>
</tr>
<tr>
<td>BAU</td>
<td>71.51</td>
</tr>
<tr>
<td>LU</td>
<td>64.58</td>
</tr>
<tr>
<td>USJ</td>
<td>70.72</td>
</tr>
<tr>
<td><strong>p-value</strong></td>
<td>0.105</td>
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</table>

AUB: American University of Beirut  BAU: Beirut Arab University  LU: Lebanese University  USJ: Saint Joseph University
sidered quality concepts to be important. This could be attributed to a multitude of reasons. First, they were never acquainted with such issues or concepts before which enticed them to discover – especially that they deal with patient safety and performance improvement which are attracting increasing attention. It could be hypothesized, as well, that physicians are perceived to have a comprehensive understanding about virtually everything related to the practice of medicine and patients. This in turn calls on them to consider these concepts important to be learned since they lack sufficient knowledge about it. Similar results were found in a study conducted at Li Ka Shing Faculty of Medicine in Hong Kong to assess the perception of undergraduate medical students towards patient safety. Although 25% of students argued that ‘errors can never be made by competent physicians,’ more than 80% of students showed positive attitudes regarding the introduction of a new patient safety curriculum [26]. Additionally, medical students like to contribute to the healthcare team and be more involved in the patient care process. But several factors may hinder and discourage them from error identification and communication. These factors may be represented by the students lack of sufficient experience, the fact that they are not licensed to practice yet, hesitancy to speak up, and the medical hierarchy. Another explanation to this finding is possibly the fact that medical students witness and sometimes are directly involved in unsafe care, errors, or adverse events [17] which might drive them to consider such concepts important to be studied and incorporated in their curricula.

Among all four universities, the lowest means recorded were for quality concepts and quality tools. In fact, this finding conforms to evidence from the literature that physicians usually strive for providing highest quality of care while they lack knowledge about it; and do not know how to define ‘quality’ or even measure it [27]. One reason could be that most of these concepts are theoretical in nature. But the only way to duly understand such concepts is by direct application. This implies that medical students ought to be included in quality improvement initiatives and apply quality improvement tools and concepts.

As per the results of the multivariate analysis, all the universities showed a general lack of knowledge of the themes with an average of less than three; the only exception was the theme related to Policies & Procedures/Guidelines, found to be highest in USJ followed by AUB. MANOVA further validated this finding and proved that AUB and USJ scored significantly higher means in the section of Policies & Procedures/Guidelines compared to other universities. This could be attributed to the fact that the students conducted their clinical clerkships in teaching medical centers which emphasized the importance of evidence-based guidelines and practices based on established clinical protocols. Another intriguing finding in the MANOVA was that although the scores of AUB and USJ were relatively low on knowledge about accreditation, they were still higher compared to other universities. This could be justified by the presence of a course that included principles about accreditation at USJ and the implementation of the Joint Commission International (JCI) accreditation standards at AUBMC.

Limitations
Two limitations for this study should be recognized. One basic limitation in the study was the relatively small sample size. We were not able to achieve more than 52% of the target number of participants due to the difficulty in reaching medical students – who were in most cases dispersed in different hospitals. Nevertheless, this is comparable to the average US medical student’s response rate of 50% [28] and somehow represented the different medical schools involved. Another significant limitation in the study was the absence of other universities in the study. One of which had an established course about quality given to medical students. It would have been interesting to compare the findings of this university with other universities. The strength of this study, however, is that it assessed the oldest and most developed medical curricula in Lebanon.

Implications
At a national level, the results of this study will help provide evidence for stakeholders and policy makers about the scope of coverage of quality concepts in medical education. Consequently, policies and interventions shall be implemented to promote amendments of the current medical curricula. A recent article published in the Lancet called for a transforming education to achieve more equitable and better performing health systems with consequent benefits for patients and populations [29]. Though, this reform calls for pooling of efforts and expertise from more than one stakeholder. Therefore, our recommendations are at three levels: micro, meso and macro.

From a micro-level, it is critically important to include the medical students themselves in this change. If students do not comprehend the importance of this reform and endorse it, it would not have a significant impact. In that sense, the Lebanese Medical Students’ International Committee (LeMSIC) can play an active role in advocating medical schools to incorporate these materials. It also has an important role in delivering the voice of medical students to the stakeholders.

At the meso-level, it is advised that medical schools, hospitals, the Order of Physicians and the Syndicate of Hospitals combine efforts to achieve a unified aim through different approaches. First, it is recommended that medical schools establish an additional course to the existing curriculum, dedicated to quality and patient safety in healthcare. The course should be given prior to commencing clinical rotations so the students would be already knowledgeable about the essential concepts before being in direct patient care. Knowing that medical students are overwhelmed with tremendous amounts of courses and medical material, a good approach is to enhance the existing medical curriculum by integrating quality care learning objectives into the pre-existing medical courses. This
would be in direct conformity with the ‘WHO curriculum guide for medical schools’ (Figure 2) which is highly encouraged to be contextualized and applied in the Lebanese culture. In fact, the literature highlights several success stories related to incorporating quality into medical curricula. At the University of Connecticut Medical School, the administration incorporated quality improvement into the curriculum of medical students [30]. Students reported gaining more appreciation towards Continuous Quality Improvement (CQI) and its favourable outcomes on patient care after attending seminars and patients’ chart-abstraction sessions [31].

It is meaningful to transfer the learning to the workplace so that theories and education would result in practice. Thus it is advised to encourage medical students to apply the concepts and tools learned into their medical practice. This is achievable through including a rotation in the quality department as part of the clinical clerkship. This step is intended to acquaint students about the importance of quality and show them when and how quality and patient safety knowledge can be applied. Yet, the quality department is not the only place where students can apply their acquired knowledge and skills. In fact, medical students have to be motivated to practice safe and high quality medicine in any clinical environment and patients interactions. Also at a meso-level, the Order of Physicians and the Syndicate of Hospitals can organize seminars or conferences for medical students to deliver continuous and up to date knowledge on the different quality and patient safety themes. Indeed, the number of physicians and medical students reporting errors increases by integrating quality care conferences in the hospital’s quality improvement plan [31].

Finally, at a macro-level, policy makers are encouraged to reform and improve the medical education process with the aim of enhancing future quality and patient safety practices, thus reflecting positively on patients’ health and wellbeing. This is critically important since several Ministries of Health in the region are mandating the implementation of national and international accreditation standards in healthcare organizations. The Ministry of Education (MoEd) and the Ministry of Public Health (MoPH) have the jurisdiction to enforce minimum educational requirements on these concepts that all universities should incorporate in their curricula. Such ministries can play a role in unifying the course that can be compiled with the help of professionals in the field and given to all students. They can also play an important role in enhancing the hospitals’ environments to encourage safe practices.

At a regional level, this study constitutes an initiative for other countries in the EMR to further assess existing medical curricula. Extensive research in this field is inevitable especially that review of published literature has exposed the scarcity of information and research about health professional education [29].

CONCLUSIONS

On a concluding note, this study proved that medical students across the three different medical teaching systems in Lebanon (the French, American and Egyptian) did not present a well established and sufficient knowledge about Quality, Patient Safety and Accreditation. These disciplines are important and need to be incorporated in the medical curricula to graduate well-rounded and competent physicians. Extensive efforts from all stakeholders need to take place across the three medical education systems to achieve a meaningful theoretical as well as practical change.

ACKNOWLEDGMENTS AND DISCLOSURES

The authors would like to thank all the universities represented by the Deans and their delegates that facilitated the access to their student body to partake in this research study. The American University of Beirut (AUB), Beirut Arab University (BAU), Lebanese University (LU) and Saint Joseph University (USJ) identified to be leading universities that took a daring step to assess the knowledge of the students and showed interest for the study, its findings and its recommendations. The authors also are heartily thankful to Mrs. Diana Jamal for her generous assistance.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Description</th>
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<tbody>
<tr>
<td>Topic 1</td>
<td>What is patient safety?</td>
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<tr>
<td>Topic 2</td>
<td>What is human safety and why is it important to patient safety?</td>
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<td>Topic 3</td>
<td>Understanding systems and the impact of complexity on patient care</td>
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<td>Topic 4</td>
<td>Being an effective team player</td>
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<td>Topic 5</td>
<td>Understanding and learning from errors</td>
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<td>Topic 6</td>
<td>Understanding and managing clinical risk</td>
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<td>Topic 7</td>
<td>Introduction to quality improvement methods</td>
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<td>Topic 8</td>
<td>Engaging with patients and carers</td>
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<td>Topic 9</td>
<td>Minimizing infection through improved infection control</td>
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<td>Topic 10</td>
<td>Patient safety and invasive procedures</td>
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<td>Topic 11</td>
<td>Improving medication safety</td>
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FIGURE 2
REFERENCES


**APPENDIX**

**SURVEY TOOL • Semi-structured self-completion questionnaire**

**Research Title:** Integrating Quality and Safety Concepts in Medical Curricula: Baseline Assessment

**Instructions:** This questionnaire is designed to assess the level of knowledge towards concepts of quality and patient safety in healthcare among medical students from different universities in Lebanon. All information collected in this survey is anonymous and confidential, and it will be used for research purposes only. This survey in no form is intended to evaluate your own personal knowledge and will not reflect your personal abilities. Your full honesty is very much appreciated. This survey is anticipated to take only 10 minutes of your time. Please read each statement carefully and tick the best answer. Thank you in advance for your time and kind cooperation.

**Important:** You need to agree on this statement and tick the adjacent box, before you fill in the survey:

*I have been informed about my rights as a participant and I have consented to participate in this study.*

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1. Age: ________  Gender: □ Male  □ Female  Date: ______________
2. Medical Education Year: □ M-III  □ M-IV
3. Weekly hours involved in patient care: ______________________
4. During your previous or current year of medical education, have you taken a course on quality in healthcare? □ YES (please specify) ______________________ □ NO
5. Throughout the courses that you have taken so far during your medical education, you were introduced to the following concepts:

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<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Nor Agree, Nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
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**A. Quality Concepts**

1. Swiss Cheese Model of Patient Safety
2. Donabedian’s Quality Model (Structure – Process – Outcome)
3. Continuous Quality Management (CQI)
4. Total Quality Management (TQM)

**B. Quality Tools**

1. Fishbone/Ishikawa
2. FOCUS/PDCA
3. Quality Improvement Plan (QIP)
4. Performance indicators/Key Quality indicators
5. Root Cause Analysis (RCA)
6. Failure Mode and Effect Analysis (FMEA)

**C. Patient Safety and Risk Management**

1. Patient safety Solutions (the six international patient safety goals)
2. The importance of multidisciplinary teams in providing patient care
3. The methods of detection and prevention of medical error
4. Risk Management components (identify, assess, control, evaluate)
5. System error vs. Individual error
6. Prevention strategy to reduce patient harm
7. Identifying the types and causes of patients’ infections in order to prevent them

**D. Accreditation**
1. National (Ministry of Health) accreditation standards
2. Evaluation of Professional Practices (EPP accreditation chapter)
3. International accreditation standards (e.g. JCI or Accreditation Canada)

**E. Policies and Procedures/Guidelines**
1. Evidence-based clinical practice guidelines
2. Importance of policies and procedures
3. Importance of standardized clinical pathways

6. Are there any other quality concepts that you have encountered during your medical education and were not presented in this questionnaire?
   - [ ] YES
   - [ ] NO
   (If answered YES please specify: ____________________________)

7. Do you believe that the concepts of quality and patients safety are important and need to be incorporated in the medical curriculum?
   - [ ] YES (go to question 8)
   - [ ] NO (go directly to question 9)

8. Do you need to have specific courses or concepts dedicated for quality integrated into your existing curriculum?
   - [ ] YES
   - [ ] NO

9. Would you like to share any further information or notes regarding the research topic or survey questions?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

________________________________________________________________________

______________________________________________________________

**END OF QUESTIONNAIRE**