Survey of students of the degree course in obstetrics, on learning using case based learning (CBL) method in the area of professional teachings

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Abstract

Background. Case Based Learning (CBL) is a teaching methodology that, starting from a case associated with real life situations, it is able to stimulate students to investigate, reflect and compare themselves to find the solution of the cases. It is a method focused on the learner with interaction between the group of participants and the tutor or teacher who takes on the role of facilitator. In professional health education, learning activities are based on patient cases (1).

In 1912 professor James Lorrain Smith, at the University of Edinburgh, introduced what he called the “method of teaching pathology” to help medical students to connect science and clinical practice (2).

The Harvard Business School (HBS), in 1920, was the first institution to adopt the appropriate method, still used today. A case was presented to a group of students, they read, reflect on the situation and identify the problem by considering alternative routes. The case method is a profound educational innovation, the professor assumes the role of guide, places the student in the role of the decision maker. Through the dynamic process of exchange of points of view, students become experts in analyzing problems, exercising judgment and making difficult decisions as distinctive features of a skilled leadership (3).

The Center for Teaching and Learning at Queen’s University (Ontario, Canada) has a description of the generic CBL. The use of a case-based approach involves students in the discussion of specific situations, usually real examples, which implies an intense interaction among the participants, focuses on the construction of knowledge, strive to solve the questions that do not have a right answer (Queen’s University 2011) (4).

According to the National Center for Case Study Teaching in Science, cases should be based on real patient stories, involve common scenarios aligned with defined learning outcomes, have educational value, stimulate interest, create empathy with the characters, promote decision-making. Cases can be used not only to teach concepts and scientific content, but also to develop skills and critical thinking (5).

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Case-based learning (CBL) is an active pedagogical learning method used in various disciplines to teach specific aspects of clinical diagnoses. (6)

**Objective:** The aim of this study is to investigate the satisfaction and the educational impact on the students of the Obstetrics Degree Course on Learning Case Based Learning CBL (on real clinical cases).

**Materials and methods**

The CBL methodology was applied during the II semester of the academic year 2016/2017 to the students of the 2nd and 3rd year of the Degree Course in Obstetrics of the University of Modena and Reggio Emilia, on the occasion of a laboratory concerning professional training. The sample is represented by 43 students, which were divided into two groups for each academic year and with the presence of a teacher playing the role of facilitator.

During the first meeting a clinical case was submitted to the students of each group in order to apply the CBL methodology in a time slot of 3 hours. Afterward, the students had a week for the study in groups with the facilitator to summarize, evaluate, discuss the acquired information and find the appropriate solutions.

As an investigative tool, two questionnaires were distributed during the last meeting: a satisfaction questionnaire related to the didactic activity consisting of eight items and a questionnaire for the assessment of the training effect consisting of four items. All items were Likert-type scales, ranging from 1 (very bad) to 5 (excellent). A total of 86 questionnaires were distributed, 46 to 2nd year students and 40 to 3rd year students of the course.

For the preparation of the questionnaire, several studies were consulted that used the method of administering questionnaires in various fields. In particular, questionnaires finalized to: assessing the training of first aid medical staff (7), detecting side effects in patients receiving chemotherapy (8), comparing the outcomes of a laparoscopic intervention between two hospitals (9) and investigating the skills obtained by students of the Master’s Degree in Nursing and Obstetrics (10-11). Furthermore, the research protocol relating to a teaching modality called “Hackathon Public Health (HPH)” characterized by meetings of the healthcare staff team with the presence of a mentor aimed at modifying the reactive to pro-reactive approach of the health worker (12) was analyzed.

**Statistical analysis**

For each item and each questionnaire, median and interquartile ranges (i.e. first and third quartiles) were calculated for the 2nd year 3rd year students.

Comparison of the level of satisfaction between 2nd year 3rd year students was carried out by means of a Wilcoxon rank-sum test. Data were analyzed with R 3.4.3 statistical software (The R Foundation for Statistical Computing, Wien), at 95% confidence level (p < 0.05)” with “Data were analyzed with R 3.4.3 statistical software (The R Foundation for Statistical Computing, Wien), and the significance level was put at p < 0.05”.

**Results**

43 students out of 43 equivalent to 100% of the sample responded.

Results from satisfaction questionnaires are reported in Table 1.

It is possible to observe that the highest average score for 2nd year students was the one assigned to question 5 (concerning the tutor’s exhibition capacity). Likewise, the higher average score for 3rd year students was observed in question 6 (concerning integration between participants).

Differences in the level of satisfaction were observed between 2nd and 3rd year students, in particular regarding the relevance of the topics as satisfaction was higher in 2nd year students (p=0.021), and regarding work times as satisfaction was higher in 3rd year students (p=0.042).

Table 1. Satisfaction of 2nd and 3rd year teaching activities

<table>
<thead>
<tr>
<th>Question</th>
<th>2nd year median (IQR)</th>
<th>3rd year median (IQR)</th>
<th>Comparison p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>How do you evaluate the relevance of the topics dealt with regarding your need for updating?</td>
<td>4 (4 to 5)</td>
<td>4 (3 to 4)</td>
<td>0.0217</td>
</tr>
<tr>
<td>How do you rate the educational quality of update provided by this event?</td>
<td>4 (4 to 4)</td>
<td>4 (3 to 4)</td>
<td>0.4563</td>
</tr>
<tr>
<td>How do you evaluate the effectiveness of the event for your continuing education?</td>
<td>4 (3 to 4)</td>
<td>3 (3 to 4)</td>
<td>0.1103</td>
</tr>
<tr>
<td>How do you evaluate knowledge and mastery of who has exposed the case inherent the subject matter?</td>
<td>4 (4 to 5)</td>
<td>4 (4 to 5)</td>
<td>0.8182</td>
</tr>
<tr>
<td>How do you evaluate the didactic Exposure Capacity of the person who exposed the case, inherent the subject matter, especially the explanatory capacity (clarity, precision of the language, answer to the questions) and the teaching skills (effective management of classroom dynamics)?</td>
<td>4 (4 to 5)</td>
<td>5 (4 to 5)</td>
<td>0.7226</td>
</tr>
<tr>
<td>How do you judge the integration between the participants?</td>
<td>5 (4 to 5)</td>
<td>4 (4 to 5)</td>
<td>0.5824</td>
</tr>
<tr>
<td>Work times have been specified?</td>
<td>4 (3.5 to 5)</td>
<td>5 (4 to 5)</td>
<td>0.2522</td>
</tr>
<tr>
<td>If they have been explained, have they been respected?</td>
<td>4 (4 to 5)</td>
<td>5 (4 to 5)</td>
<td>0.0418</td>
</tr>
</tbody>
</table>
Survey of students about CBL method

Notes: IQR = interquartile range; * = p-values are calculated by Wilcoxon rank-sum test.

Results from assessment of the training effect questionnaire are reported in Table 2.

The highest average score was related to question 4 (concerning the effectiveness of the tutor facilitator), for both 2nd year and 3rd year students. No significant differences in the responses were observed between 2nd and 3rd year students.

Discussions

Several studies were examined to compare the effectiveness of Case Based Learning (CBL) compared to other teaching methods. European education and training guidelines are one of the pillars of the “Europe 2020” strategy, which aims to strive to raise quality standards and the level of learning outcomes to enable young people to successfully enter the world of work. To achieve these objectives it is essential to create: a dynamic group; a satisfactory relationship between students and teachers (13). The objectives of this study agree with the objectives expressed by Case Based Learning (CBL) method about the professionalising lessons as was experimented with the sample.

Some studies assessed the differences between Problem-based learning (PBL) and Case Based Learning (CBL). Case Based Learning (CBL) is often in contrast with problem-based learning (PBL) although the differences are not always clear. (1) An interesting randomized study compared the learning outcomes with CBL / PBL and Traditional lessons (TL) in large groups of students. The CBL helps to focus students on the key points of a clinical case and encourages a structured approach to solving clinical problems by allowing facilitators to correct any wrong student assumptions, which is not always the case with PBL *(1)*. A study was conducted on the students of a nursing course in an intensive care unit to compare the effects of PBL compared to traditional lessons. Significant changes were observed on critical thinking skills and metacognitive awareness of students after the PBL method was performed compared to the traditional lesson method (14).

Other studies investigated student satisfaction, on CBL learning methodologies and simulation activities using static manikins and high fidelity simulators, the results of which show less teaching satisfaction with clinical cases (15).

Most students are interested in learning in a secure environment to manage new experiences and coping with them. Their will is to benefit from the ability to make mistakes in a safe environment and to have a positive impact on their understanding (16). Studies have been reviewed in which the authors describe the effectiveness of team-based learning methodologies (TBL) and Inquiry Based Learning (EBL), similar methodologies to Case Based Learning (CBL). The Team Based Learning review based on a sample of nursing and midwifery students showed that the use of this methodology is very satisfactory for the students (17).

An Irish institution for midwife training achieved excellent results by adopting the Inquiry Based Learning (EBL) methodology to develop student reflexivity and create competent professionals (18). A study performed on a sample of nursing students, using Inquiry-based learning (EBL), showed that this method improves the ability of critical thinking in students (19).

Limits of the study

When assessing the efficacy and usefulness of the study, limits must be considered: the tool used is represented by invalidated questionnaires, reduced number of CBL meetings, numerically limited sample study and absence of a control group. To overcome these limits it is possible to hypothesize a control group that carries out a separate teaching methodology, possibly with a numerically enhanced sample, with an evaluation tool with better psychometric properties, this could give more interesting results to test the effectiveness of CBL. Despite the described limits, the results of the study could constitute a starting point for future studies.

Conclusion

The results of the study show positive opinions regarding the appreciation of the learning and teaching activity through the CBL. For the training effect, the knowledge and skills acquired were useful and applicable in the workplace. It can be observed that, as already demonstrated by the literature

### Table 2. Assessment of the training effect of 2nd and 3rd year students

<table>
<thead>
<tr>
<th>Question</th>
<th>2nd year (median IQR)</th>
<th>3rd year (median IQR)</th>
<th>p-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>If your expectations have been met, how useful do you think the knowledge and skills acquired during the laboratory are in relation to the development of your healthcare profession?</td>
<td>4 (4 to 5)</td>
<td>4 (3 to 5)</td>
<td>0.4442</td>
</tr>
<tr>
<td>If your expectations were met as far as this knowledge was applicable in your working reality?</td>
<td>4 (3.5 to 5)</td>
<td>4 (4 to 4.25)</td>
<td>0.8942</td>
</tr>
<tr>
<td>Are the environments chosen for the teaching activity adequate?</td>
<td>4 (3 to 4)</td>
<td>3 (3 to 4)</td>
<td>0.2332</td>
</tr>
<tr>
<td>How do you evaluate the efficiency of the facilitator tutor?</td>
<td>4 (4 to 5)</td>
<td>4 (4 to 5)</td>
<td>0.3454</td>
</tr>
</tbody>
</table>

Notes: IQR = interquartile range; * = p-values are calculated by Wilcoxon rank-sum test.
on the subject, the CBL is an effective teaching methodology within the Degree Courses of Health Professions and appreciated by the students, as it is considered very useful for clinical practice. Case-based learning helps standardize the patient assessment process, which can contribute to quality and consistency in clinical practice (20).

We can agree that the studies evaluating CBL as a form of structured and guided learning and teaching, aim to prepare students for clinical practice, through the use of authentic clinical cases. These cases link theory to practice, through the application of knowledge to cases, using survey-based learning methods. The data suggest that students in health professions appreciate CBL as a learning facilitator. In order to create competent professionals it would be useful to experiment with other learning and teaching training strategies with the students through simulations (with static mannequins and high fidelity simulators), to allow young people to successfully enter the world of work. New research will be conducted to verify the effectiveness of CBL with respect to the different learning and teaching methods.

References


5. National Center for Case Study Teaching in Science http://www.mydigitalchalkboard.org/go/groups/NCCSTS


