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Commentary: Case-based learning and multiple choice questioning methods favored by students

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The study "Case-based learning and multiple choice questioning methods favored by students"[1] aimed to better understand the way medical students are learning by analyzing the way they dealt with case-related questions they had to create. Through the analysis of 426 multiple choice case-based questions made by 79 medical students at the end of their fourth year at the Medical University of Vienna (MUV), it showed that they were much more confident with items related to diagnosis than with those related to therapy. Furthermore, this study underlined that the students' questions matched the United States Medical Licensing Examination (USMLE) Step 1 level and that they preferred handling with right facts, while keeping wrong content to a minimum.

We discussed these results offering several possible rational and emotional explanations and stressed the necessity to encourage the development of clinical reasoning and therapy-oriented thinking during medical education by introducing more bedside teaching, case-based questioning exercises and internships.

In order to underline the importance of considering these results for positive developments in medical education, we would like to put them in perspective with the feelings of young doctors when they begin to work immediately after finishing medical education. A small preliminary study was performed in February 2017, by questioning 11 voluntary colleagues who began to work as doctors after finishing the newly introduced "Klinisch Praktisches Jahr" (KPJ) at the MUV. Ten out of eleven evaluated the challenge of decision-making about drugs prescription in the first month they worked as a doctor as "difficult / stressful" or "very difficult / stressful". On a scale from 1 (easy) to 5 (very difficult / stressful), we found a mean value of 4,18 ±0,60. As one of the tasks of the doctors from day one is to prescribe medications – including in emergency situations – every colleague expressed that the medical education was too theoretical and that they had not enough training about prescription in concrete situations. If 100% of the eleven surveyed colleagues considered the KPJ as a positive evolution of the medical education curriculum in Vienna, nine of them (81,8%) expressed the wish of transmission of more clinical and practical knowledge during medical education through more case-based learning and/or bedside teaching, including more advices and algorithms in concrete and real situations, and one-to-one supervision during the KPJ. Six subjects (54,5%) also wished for longer internships. If this small preliminary study can only give a foretaste of the feelings of young doctors, this situation fits with the results of the above-mentioned study: students

finishing year four of medical education had offered 92,7% of questions matching the USMLE Step 1 level, defined by the National Board of Medical Examiners as testing basic science knowledge[2], and only 7,3% matched the Step 2 level, testing the application of clinical knowledge through elaborated patient vignettes. As Step 2 USMLE questions encourage examinees to make clinical decision[2], the uncertainty of the students with this level of clinical thinking in our former study translates into the insecurity of young doctors two years later. This situation highlights the necessity to continue working on better ways of assessment – as the way of assessment influences the way of learning[3] – and on medical education programs in order to promote clinical reasoning, therapy-oriented thinking and decision-making for positive outcomes for patients and clinicians.

In Austria, Kornhäusl also found that young doctors wished more bed-side-teaching during the first months of residency[4]. Furthermore, a more supportive collaboration between residents and seniors should be promoted, as some colleagues feel stressed or shy of asking questions when they were not confident because of lacking experience and knowledge. This could also show a parallel with a recent study showing that the prevalence of depression or depressive symptoms among medical students was 27,2% and that of suicidal ideation 11,1%[5].

One of the main result of our former study was that students preferred handling with true facts and offered significantly more right answers to positively than to negatively worded questions[1]. We suggested that this observation is consistent with a positive approach favorable to learning processes from the childhood on. Furthermore, this positive way of learning by offering more than one right answer is consistent with the recent proposition from Cooke et al. that "respecting the possibility of the existence of "more than one correct answer" reflects *clinical reality* [...]"[6]. Cooke stressed the necessity of making efforts to improve clinical reasoning assessment, especially by integrating uncertainty and the possibility for several acceptable clinical paths to improve patient care.

In accordance to the necessity of innovation to support effective training for the fostering of procedural knowledge, the MUV proposed an interactive way of asking for right answer(s) in multiple-choice questions (MCQ) in Block 20: for each main domain of psychiatric disease (for example anxiety disorder) a detailed real patient's case was presented online to the students. MCQ concerning diagnosis and therapy were following and each time the student did not give the right answer, the explanation why the answer was wrong appeared and the student could try again. This interactive case-based questioning made it possible to learn from mistakes in a positive and non-punishing way and fosters decision-making by necessitating declarative and associative knowledge. In this direction, efforts to improve assessment and medical education remain necessary to stimulate earlier patient-centered and therapy-orientated thinking of the students, and promote clinical care decisions and the well being of young residents. We tried to highlight the necessity to focus medical education on the practical needs of patients and physicians' clinical reality.

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