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The knowledge of Polish medical students about digital rectal examination

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Abstract: **Background:** The digital rectal examination (DRE) is a part of the standard physical examination and a useful diagnostic tool for detecting various lower gastrointestinal tract abnormalities. However nowadays it has been observed that medical students might not be properly prepared for performing and interpreting of DRE. The purpose of the study was to evaluate the knowledge and experience of Polish medical students about DRE.

Material and Methods: A prospective study was carried out using a questionnaire accessible via internet platform. The survey consisted of 12 questions and considered experience as well as practical and theoretical knowledge about DRE. 976 responses from nine Polish medical universities were included in the study.

Results: 38.68% of students have never performed DRE with “lack of opportunity during courses” (71.09%) as the most common reason. Among responders who performed this examination only 12.72% had done it more than two times. Usefulness of DRE was mostly assessed as high and very high (55.63%). Students in the self-assessment part indicated low and very low (18.72% and 39.61%) technical abilities and also low (25.34%) interpretation skills.

Conclusion: The knowledge of Polish medical students about DRE is insufficient. Medical universities should pay particular attention to this field of examination to improve theoretical as well as practical skills of future doctors.

Key words: digital rectal examination, medical education, clinical skills.

Introduction

The digital rectal examination (DRE) is one of the standard elements of physical examination which should be performed on every patient. Nevertheless, nowadays DRE is reluctantly performed due to development of the modern techniques of imaging [1], as well as a low comfort level both for the patient and the doctor [2]. William Mayo said: “The examining physician often hesitates to make the necessary examination, because it involves soiling the finger”. Further Talley explains that doctor can fail to perform DRE only when he has lost all of his fingers or because of occurrence of strong contraindication [3].

DRE is a useful diagnostic tool for different fields of medicine, as it may be used to detect pathological lesions in the anus or the rectum, abnormalities in prostate gland or some sphincter or neurological defects [3]. In case of suspected gastrointestinal bleeding DRE may reduce the need of hospital admissions, endoscopies and medical therapy [4]. For these reasons it should be considered as very important to acquire this skill hence it should be properly taught during medical curriculum. However, a lot of medical researchers over the world show that knowledge about DRE and practical skills among students are poor and should be enhanced. Therefore the medical universities should pay particular attention to this issue. Turner *et al.* demonstrated that 44% of final year students have never felt a clinically malignant prostate during their studies [5], this suggests that they might not be able to interpret such a finding in the future correctly. This problem concerns not only DRE, but also other intimate-areas examinations or sexual history-taking [6]. Lack of knowledge and skills needed to perform DRE during medical curriculum may contribute lack of this procedure in the future medical practice [7].

Many authors have undertaken this topic, however we do not have any statistical data from Polish medical universities and since this issue might be system or culture specific, it seems to be important to investigate this matter. To explore mentioned topic we have used special digital survey. In our opinion, this form was appropriate due to anonymity and wide range of accessibility. The aim of this study was to assess knowledge of Polish medical students about digital rectal examination and experience they have acquired during studies.

Materials and Methods

A prospective study was carried out from November to December 2016 using a questionnaire accessible via internet platform. The survey was distributed among polish-speaking medical students. It was accessible for all students, from all medical faculties in Poland. The first-year students were excluded from the study as they had not undergone any clinical courses prior to the assessment. Students from universities

with less than 30 answers in total were also excluded. Responses from 9 Polish medical universities including: Krakow, Warszawa, Poznan, Bydgoszcz, Bialystok, Katowice, Lodz and Lublin were taken into consideration.

To our knowledge, there is no validated external questionnaire for assessing the students' knowledge of DRE, thus special questionnaire was designed especially for this purpose. The electronic survey was accessible via an internet platform "Google Forms". Anonymity of the survey was ensured to encourage the honesty while answering questions.

The questionnaire consisted of two parts. The first part involved information about the year of the study, gender, and student's university of origin. The second part of the questionnaire contained 12 items: questions 1–5 were multiple choice answer evaluating general students' experience with DRE, questions 6–8 included a five-step scale for a self-assessment of abilities and attitude for DRE, question 9–12 were a multiple-choice questions focused on the theoretical knowledge. Questions 1 and 4 were to evaluate if and how many times students have carried out DRE. Question 2 and 3 asked about the year of the study and the clinical course on which knowledge about DRE was obtained for the first time. Question 5 was supposed to review the causes of non-performing of DRE. In the self-assessment questions with number 6–8 students evaluated their practical knowledge about DRE, the ability to interpret DRE results and the usefulness of DRE in everyday practice, respectively. In the part concerning theoretical knowledge in question 9 students were asked about the anatomical structures palpable during DRE examination, in question 10 about the equipment necessary for performing DRE and in question 11 about the contraindications for the examination. The last question was supposed to check if students are aware that DRE can be performed by every doctor regardless specialization. The full questionnaire is attached as Appendix 1.

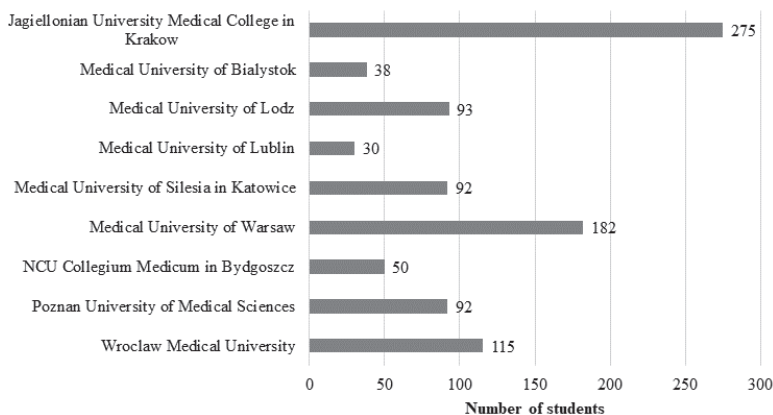


Fig. 1. Distribution of students from each university.

967 students completed the survey and met the inclusion criteria. A group was composed of 629 (65%) of females and 338 (35%) of men. Students from second (174), third (184), fourth (318), fifth (153) and sixth (138) year of studies filled the survey in. Among study group, additional subgroup of the sixth-year students was distinguished for additional comparisons. Figure 1 presents the distribution of students from each university.

Results

Out of 967 students who responded to the survey, 374 (38.68%) had never performed DRE neither on a patient nor on a teaching mannequin. Among those who had performed the examination before, 229 (23.68%) had done it only on a teaching mannequin, 175 (18.10%) only on the patient and the rest of surveyed (189, 19.54%) both on the patient and the mannequin. Figure 2 presents the number of performed DREs. Among students who had performed the examination on the patient, 241 (24.92%) had done it one or two times and 123 (12.72%) of them — more than two times. Considering only 6-year students, 92 (66.67%) of them had had an opportunity to perform DRE on the patient while 17 (12.32%) of them had not had such opportunity neither on the mannequin nor the patient.

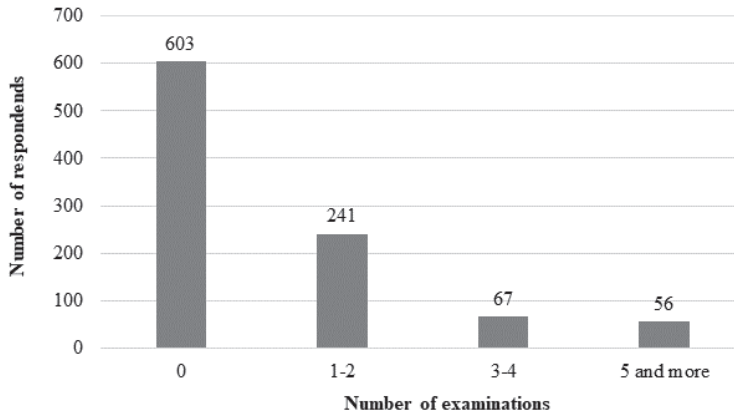


Fig. 2. The number of DRE performed on patients by students.

Major reason behind not performing any DRE on patient 71.09% indicated “lack of opportunity” whilst other responses including “deficiency of knowledge” (9.72%), “lack of doctor’s supervision” (6.70%), “lack of patient’s consent” (3.81%), “unpleasant feeling” (3.81%) and “other” were chosen less often.

370 (38.26%) students declare that they were not taught the technique of DRE during curriculum. Considering only sixth-year-students the number was lower with

the value of 15.94% (22). Among those who were taught it happened mostly during the second (264, 27.3%), followed by third (183, 18.92%), fourth (88, 9.10%), first (34, 3.52%), fifth (18, 1.86%) and sixth (10, 1.03%) year of studies. The most frequent courses in which DRE was taught included Laboratory Training of Clinical Skills (284, 29.37%), summer practices (119, 12.30%), surgery (89, 9.20%) and internal medicine (39, 4.03%), urology (31, 3.20%), oncology (21, 2.17%).

Majority of students assessed usefulness of DRE in routine examination of the patient with abdominal pain as “very high” or “high” (182, 18.82% and 356, 36.81% respectively). The moderate usefulness indicated 262 (27.09%) of students, while the rest of surveyed determined it as “very low” or “low” (53, 4.48% and 114, 11.79%, respectively).

In the part of the survey containing self-assessment questions, responders most often evaluated their technical abilities in DRE as “low” and “very low” (181, 18.72% and 383, 39.61%, respectively), while 109 (11.27%) and 33 (3.41%) estimated it as “high” or “very high”, respectively. Similar results were obtained in the second self-assessment question about DRE interpretation skills: 381 (39.40%) — “very low”, 264 (27.30%) — “low”, 245 (25.34%) — “moderate”, 66 (6.83%) — “high” and 11 (1.14%) — “very high”.

In the last part of the survey, which was supposed to determine students’ theoretical knowledge about DRE 765 (79.11%) responders could not correctly recognize which anatomical structures can be palpated in DRE. 41.47% (401) of students answered incorrectly a multiple-choice question regarding contraindications for DRE. Most often students wrongly indicated “anorectal varices” (224, 23.16%), “severe constipation” (203, 20.99%) or “lack of bowel preparation” (108, 11.17%). Benign prostate hyperplasia was identified as contraindication for DRE by 4 (0.41%) surveyed. 31.95% (309) of surveyed correctly identified equipment necessary to perform the DRE. 359 (37.13%) students did not know that the DRE could be carried out by every doctor, regardless of their specialization.

Discussion

To our knowledge this study is the first Polish national survey concerning the evaluation of students’ knowledge and skills related to DRE. Our results show some weaknesses of medical education, particularly in the field of abdominal examination, which is DRE. Majority of students assessed their abilities in performing and interpreting DRE as very low. Also knowledge turned out to be at a low level. Furthermore, one third of Polish 6th-year students have not performed the DRE on the patient.

DRE is considered as a core examination in clinical medicine [8], however some researches support an opinion that DRE has become useless and should be

abandoned, as newer diagnostic methods appear. As an example authors pointed out patients undergoing prostate cancer screening with PSA level, where DRE due to low sensitivity and poor positive predictive value should be discarded [1]. However many practitioners still underline indispensable role of DRE, for instance during an early diagnosis of anal cancer in high risk group [9].

There are a few studies concerning surveys of students about DRE. Turner *et al.* surveyed 100 final year medical students at Oxford Medical School. The study could be considered as outdated, but presented results are very similar to current studies. 88% of Oxford's students were taught how to perform DRE and all of the students have performed at least one examination before ending exams. In the similar study carried out by Lawrentschuk *et al.* on 222 sixth-year medical students from University of Melbourne, 92% of surveyed have been taught how to perform DRE and 81% had an opportunity to practice on the teaching mannequins. Only 17% of surveyed hadn't performed DRE prior to the assessment [10], which is similar to our study group in Poland. Fitzgerald *et al.* surveyed 396 final year medical students of Ireland. 70% of them positively reported, that they had been taught how to perform DRE, while 44% of them had not perform DRE on the patient [11].

Considering the number of performed DREs, Turner *et al.* demonstrated that 42% of students from Oxford Medical School have performed five or less DREs — 7.04% performed one or two, while 35.21% three to five examinations [5]. In case of students from Melbourne, 34% of them have performed 3–4 DREs, when 34% only 1 or 2. Barely 12.6% had five or more opportunities [10]. Among Irish students who have performed DRE the median number of examinations was 2 [11]. Outcomes of those papers are comparable to results of our study, in which the most often, in 25.13%, students have examined patient once or twice in the course of curriculum prior to the assessment. Such small amount of practice cannot provide proficiency in DRE. Hennigan *et al.* pointed that only 28% of final year medical students routinely perform rectal examinations. He also proved that students who have done more than 10 DREs were significantly more confident with interpreting the findings [12]. That study is the only providing a suggestion towards the goal that teachers should have since confidence in performing DRE is linked to frequency of utilization of a particular skill.

41% of Oxford students were not confident in interpreting their findings, while 52% of them were reasonably confident, what suggests that their interpretation skills were not too high. In Lawrentschuk's study questions concerning confidence during DRE revealed similar results. 48% of students were not assured at all and 50% were reasonably certain they could interpret the examination properly [10]. In another study one third of students with an experience in DRE had no confidence in their ability to interpret findings [11], which is comparable to Polish students' results wherein students generally assessed their interpretation skills as low.

This data suggest that DRE should be performed more often to obtain proper experience, but the question is, which clinical course should provide that opportunity? In the Australian study, the most often students had opportunity to perform DRE during a course of general surgery (60%) and urology (31.5%) [10]. Similar results were presented in study by Fitzgerald *et al.* in which 43% of students had opportunity to perform it during general surgery, 22% — during urology and 12% — during foreign elective [11]. Contrary to other reports, our results show major importance of preclinical course Laboratory Training of Clinical Skills, during which many students had opportunity to learn how to perform DRE. Considering only clinical courses, majority of students had opportunity to perform it during summer practices or course of general surgery, but their importance in teaching DRE seems to be smaller in comparison to preclinical classes. The reasons of no performing DRE can be various. In our study the most often chosen answer was “lack of opportunity”. This limitation can be resolved by teachers through encouraging students to perform DRE and practicing this ability during clinical classes. It seems to be important, regarding the fact, that among surveyed students in Ireland, 44% of them haven’t performed DRE, because of not being permitted to do this examination on the patient in 55% of cases [11]. Similar reasons not to perform DRE were presented by Lawrentchuck: in 63% of surveyed the reason was lack of doctor’s supervision, in 41% — not feeling competent, in 39% — patient refusal, in 35% — bothersome to organize DRE, and fear about patient’s reaction in 15% of surveyed [10]. Hennigan’s study shows that major deterring factor was “being told no to do so by medical staff” in 30.7% of cases [12]. DRE is considered an intimate examination and that fact can cause more difficulties — embarrassment as reason of no performing DRE was pointed by 12% of students [13]. The problem of patient refusal was considered as frequent and its incidence varies from 39% [10] to 86% [13] depending on the study. In our study mentioned reasons were also pointed out.

After all, Polish students evaluated DRE as a useful examination. It is consistent with results collected from Melbourne medical students, who assessed rectal examination as essential for medical practice (97%) and the vast majority of them stated that they should obtain this skill during study [10].

We haven’t found any studies assessing the theoretical knowledge about DRE. Our results indicate that majority of students couldn’t properly recognize which anatomical structures are palpable during examination. This knowledge seems to be basal and should be obtained during first years of the studies. Furthermore, appropriate preparation for this maneuver should be discussed with undergraduates, since many of them couldn’t point the necessary equipment. Talley *et al.* unambiguously indicated only non-sterile gloves and gel with local anesthetic as sufficient [3], what was not very clear for our students. Moreover awareness of contraindications should be enhanced. Some students marked external hemorrhoids and constipation

as conditions where DRE is prohibited, while in the fact, those are indications for rectal examination [14, 3]. Our study proved that teaching in this field should be also improved. Students at Polish universities seem to be insufficiently prepared to performing DRE on the patient. Clinical courses often skip this part of physical examination. Appropriate solution for medical school might include an indication of particular course, during which all of the students have to perform DRE on the patient. Preclinical classes like Laboratory Training of Clinical Skills could fulfill this function, however only with possibility to perform DRE on the mannequin, not a real patient. The theoretical knowledge should be taught from the beginning of the study course. Students should be encouraged to perform DRE under doctor's supervision. Ensuring appropriate number of examinations during education will build the confidence of future doctors, which then makes them more prone to perform and interpret this examination, when necessary.

Medical schools should pay particular attention to improve teaching of the DRE, not only in theoretical, but also in practical field. There are variety of teaching methods with proved effectiveness. Popadiuk *et al.* compared few methods and as a result indicated that combination of lectures and teaching-assistant instructions was the most efficient [15]. Due to high percentage of patient refusal, some simulators like finger movement simulators including video feedback may help to obtain necessary experience in DRE [8]. Training with a standardized patient is also considered as very efficient and was indicated by students as the most useful method [16]. This method has the advantage of contact with the real person, which cannot be ensured by any simulator.

We found some disturbances in teaching of DRE during medical curriculum in Poland. Many of the students haven't performed rectal examination on the patient nor on the teaching mannequin. The main cause was lack of opportunity to perform it, what should be a strong message to clinical teachers, who should take particular note to this problem. Students notice that usefulness of DRE is high, but most often assess their ability to perform and interpret it as low or very low.

Conflict of interest

None declared.

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Appendix 1.

1. *Have you ever performed a DRE?*
 - A. Yes, on a teaching mannequin
 - B. Yes, on a patient
 - C. Yes, on a teaching mannequin and a patient
 - D. No, I have never performed
2. *In which year of the study have you been taught how to perform a DRE?*
 - A. I
 - B. II
 - C. III
 - D. IV
 - E. V
 - F. VI
 - G. I have not been taught
3. *During which clinical course were you taught how to perform a DRE?*
 - A. Surgery
 - B. Internal Medicine
 - C. Urology
 - D. Oncology
 - E. Summer Practices
 - F. Laboratory Training of Clinical Skills
 - G. Volunteering/science group
 - H. Others
 - I. I were not taught
4. *How many times have you performed a DRE on a patient?*
 - A. 0
 - B. 1 – 2
 - C. 3 – 4
 - D. 5 and more
5. *What was the cause of not performing a DRE?*
 - A. Deficiency of knowledge
 - B. Lack of patient's consent
 - C. Lack of doctor's supervision
 - D. Lack of opportunity
 - E. Unpleasant feelings
 - F. Others
6. *How would you rate your practical knowledge about performing a DRE?*
1 — very low, 5 — very high

7. How would you rate your interpretation skills about performing a DRE?

1 — very low, 5 — very high

8. How would you rate usefulness of performing a DRE on patient with abdominal pain?

1 — unnecessary, 5 — absolutely necessary

9. Which of the following structures can be palpated during DRE?

- A. Prostate gland
- B. Adnexa
- C. Pubic bone
- D. Ampulla recti
- E. Coccygeal bone

10. What is necessary to perform a DRE?

- A. Non-sterile gloves
- B. Sterile gloves
- C. Gel with local anesthetic
- D. Antispasmodic drug
- E. Bowel preparation

11. What can be a contraindication to perform a DRE?

- A. Benign prostate hyperplasia
- B. Severe constipation
- C. Lack of bowel preparation
- D. Lack of patient consent
- E. Anorectal varices

12. Doctors of which specialization could perform a DRE?

- A. Surgery
- B. Orthopedist
- C. Gynecologist
- D. Dermatology
- E. General practitioner