Medical Students Who Do Not Practice Prior to Taking Clinical Skill Examinations

- Sex Differences in Students’ Practical Examinations Scores -

YUICHI TOMIKI*1) 2), TAKASHI DAMBARA*2) 3), TAKAO OKADA*2) 4), MASAKO NISHIZUKA*2), KAZUO KEMPE*2) 5), TSUTOMU SUZUKI*2) 6), MAKINO WATANABE*2) 4), MIWA SEKINE*2) 7), YUKO ISHII*2), TOSHIKI SHIMIZU*8) 9)

*1) Department of Coloproctological Surgery, Juntendo University Faculty of Medicine, Tokyo, Japan, *2) Division of Medical Education, Juntendo University Faculty of Medicine, Tokyo, Japan, *3) Department of General Medicine, Juntendo University Faculty of Medicine, Tokyo, Japan, *4) Department of Organ and Cell Physiology, Juntendo University Faculty of Medicine, Tokyo, Japan, *5) Department of Internal Medicine and Rheumatology, Juntendo University Faculty of Medicine, Tokyo, Japan, *6) Department of Respiratory Medicine, Juntendo University Faculty of Medicine, Tokyo, Japan, *7) Department of Bacteriology, Juntendo University Faculty of Medicine, Tokyo, Japan, *8) Department of Pediatrics and Adolescent Medicine, Juntendo University Faculty of Medicine, Tokyo, Japan, *9) Chairperson of Curriculum Committee, Juntendo University Faculty of Medicine, Tokyo, Japan

Objective: A few students fail the medical practical examinations every year, due to a lack of practice and academic dishonesty. The present report analyzed practical examination scores received by male and female students, and investigated score differences between the sexes and possible underlying causes, to support development of improvement measures.

Materials: The subjects were 351 second-year (248 males and 103 females), 346 third-year (248 males and 98 females), and 289 fourth-year (197 males and 92 females) year students of the Juntendo University Faculty of Medicine as of 2011 to 2013.

Methods: Students were assessed using their practical examination performance scores. Students’ grades were expressed as the mean accuracy rate, and the mean comprehensive score. The grades of the male and female students were compared and analyzed.

Results: The rate of male students who failed the examination was higher in all school years. The mean accuracy rate and comprehensive score among female students in all school years were significantly higher compared with male students.

Conclusions: Female students received higher scores on preclinical phase-practical examinations conducted by the university than male students, because some male students did not sufficiently practice prior to taking the tests. Therefore, as a future challenge, it will be necessary to establish stricter standards for advancement to the next grade, and to develop and implement education methods to increase the motivation of students whose behaviors are unprofessional.

Key words: clinical skill examination, sex differences, attitude, professionalism, unprofessional behavior

Medical students of Juntendo University begin practical training after advancing to the second year to learn “suture techniques”, “emergency cardiopulmonary resuscitation”, and “venipuncture techniques”. Following practical training, second-year students take a practical examination on “suture techniques” and “emergency cardiopulmonary resuscitation”. Third-year students also take a practical examination on these subjects after practicing their skills by themselves. In addition, third-year students undergo practical training on “medical interviews” and “physical diagnosis techniques”, and take practical examination on these subjects. Fourth-year students take the Objective
Structured Clinical Examination (OSCE), one of the Common Achievement Tests, which is designed to determine "whether or not medical students have developed the minimal level of clinical skills and attitudes required to participate in clinical clerkship".  

A practical examination is conducted not only to determine the accuracy of students' techniques; in practical examinations, the attitudes of medical students, including their "appearance", "greetings", "use of language", "consideration to patients", and "manners in communication", are also comprehensively assessed. Because students are required to frequently practice to master techniques and skills, practical examinations are essential to assess the results of their self-learning as well as their practical skills.  

A few students, males students in particular, fail the practical examinations every year, due to a lack of practice and academic dishonesty when conducting procedures of some students. In addition to practical examinations, these students' behaviors are also concerning in that they show unprofessional behavior in other stages of the medical learning process, including the rate of lecture attendance, attitudes in lecture and training classes, and submission of reports. Therefore, the attitudes of these students must be improved in the early preclinical phase. It is necessary to encourage students to learn and implement professionalism as health care specialists while they are still in their early schooling years.  

In the present study, preclinical phase–practical examination scores received by second–to-fourth–year male and female students were analyzed to discuss possible causes of any differences between the sexes, and to support development of improvement measures.

Materials and methods

The subjects were 351 second– (248 males and 103 females), 346 third– (248 males and 98 females), and 289 fourth– (197 males and 92 females) year students of the Juntendo University Faculty of Medicine as of 2011 to 2013.  

Second– and third–year students were assessed using their performance scores of two examination components: "suture techniques" and "cardiopulmonary resuscitation". Fourth–year students were assessed using their performance scores of eight examination components: six basic OSCE–related components for (1) medical interview, (2) cranio-cervical examination, (3) chest examination and vital signs, (4) abdominal examination, (5) neuro examination, and (6) suture techniques, and two other stations for (7) cardiopulmonary resuscitation and (8) gown techniques.  

The examiners participated in a workshop organized by the Common Achievement Tests Organization (CATO) to become certified examiners.  

Students' grades were expressed as the mean accuracy rate (%) (mean ± SD), calculated by assessing the techniques they used to perform the tasks of the above–mentioned examination components on a checklist, and utilizing the mean comprehensive score (mean ± SD) on a global rating scale (from 1 to 6 points: 1 to 2 = fail, 3 to 4 = pass, 5 = high pass, 6 = honor). The criteria for failure was an accuracy rate lower than the mean minus 2 SD or a comprehensive score of 2 or lower for at least one technique.  

Data regarding students' grades were processed so that individual students could not be identified. The study was conducted with the approval of Juntendo University Faculty of Medicine. Prior written consent to the use of the data was obtained from the students.  

The grades of the male and female students were compared and analyzed. The results of reexaminations were also analyzed. The rate of students who did not pass the examination was calculated using the $\chi^2$ test. The rates of technique accuracy and comprehensive score were calculated using the Welch test. Statistical analyses were conducted using JMP 9.0 (SAS institute Inc., Cary, NC, USA). The significance level was set to 0.05 in all tests and analyses.

Results

1. Students who failed the examination

The rate of male students who failed the examination was higher in all school years. The number of third–year students who failed the examination was smaller compared with that of second–year students. All second– and third–year students who failed the examination due to low technique accuracy received a low comprehensive score and were rejected.
The OSCE for fourth-year students was conducted with eight components, and an increase in the number of students who failed the examination was observed. A significantly higher number of male students (63 male students (32%)) failed the examination compared with female students (15 female students (16.3%)) \( (p < 0.01) \) (Table-1).

2. Accuracy rate in the clinical skill examination and comprehensive assessment

The mean accuracy rates and comprehensive scores among female students in all school years were significantly higher compared with male students (Table-2).

3. Students who failed the reexamination

There were no fourth-year students who failed the OSCE reexamination. However, eight male (17.0%) and two female (14.3%) students in the second and third years failed reexamination (Table-3). Reasons for failure in male students included receiving lower scores on the reexaminations, arriving late for the exam, or absence without prior notice. All students who failed the reexamination successfully passed the second reexamination and advanced to the next grade, although they...
received a strong warning. Students who did not take the second reexamination were also allowed to advance to the next grade with academic probation after receiving a strong warning.

Discussion

The present results suggested that students fail the practical skill examination for the following three reasons:

1. Some students become too nervous to apply what they have learned during practice.
2. Others cannot recognize their mistakes and continue conducting incorrect procedures.
3. Some students do not sufficiently practice prior to taking the examination.

It is expected that students’ techniques are poor to some extent. Students may make mistakes during the practical skill examination because of the time restriction and their nervousness. However, this situation can be improved by repeated practicing of their skills. Although the second problem, being unable to recognize their mistakes, may be due to a lack of practice, this can be improved if students are provided with appropriate feedback. The third problem, a complete lack of practice, is the most serious.

Academic staff prepare rooms for practice approximately one week before practical skill examinations, and encourage students to practice and study. The poor techniques of these students clearly suggest that they did not practice at all. It is speculated that fewer male students practice prior to examination than female students.

The rate of male students who failed the preclinical phase–practical examination was higher. It was pointed out that these male students received low comprehensive scores and their attitudes "were inappropriate." Furthermore, the accuracy rate among female students and their comprehensive scores were higher compared with male students. Fewer third-year students failed the examination compared with second-year students who took the same examination, presumably due to the effects of repeated practice.

In general, female students are said to study harder than male students. According to a study conducted by Doshisha University, female students show a higher rate of outstanding academic results. The study suggested that student attitudes toward learning in classes were associated with such grade differences; whereas more female students attend classes to study hard, male students tend to place more emphasis on sports and activities other than classes (http://ssgp.doshisha.ac.jp/attach/page/GP-PAGE-JA-89/17314/file/41_chapter01.pdf). Our university students also tend to place more emphasis on extracurricular activities than classes.

Regarding the field of medicine, male students' surgical skills have been reported to be higher than those of female students. However, the practical examination of the present study was conducted to assess basic skills rather than surgical skills. Thus, the higher accuracy rate and comprehensive scores among the female students may be due to more studying than male students.

Male students may receive lower scores because they do not take such practical examinations seriously, and do not sufficiently study for them. Furthermore, some male students may not sufficiently concentrate in lectures prior to practical training, or spend time learning from such training sessions. Although they may read textbooks prior to taking the examinations, some students do not practice using the simulators provided in training rooms. Furthermore, there are some students who do not practice prior to reexamination, which determines whether or not students are able to advance to the next grade. In other words, these students may believe that they will be able to advance to the next grade even if they fail the practical examinations. Being late for or absent from reexaminations are both unforgivable and unprofessional behaviors. Such students should be advised to change their career plans due to the lack of qualities considered to be required for physicians. It is thought that these unprofessional behaviors of students may improve as the students advance from the preclinical to clinical phase. However, serious attitudes are essential for the profession, and it is necessary to encourage students to learn and implement professionalism as health care specialists while they are still in their early schooling years. It is also necessary to advise students to improve their attitudes and sufficiently practice prior to taking their practical reexaminations. At present, no students have failed to advance to the next grade, despite failing their practical reexamination, although these students received a strong warning from their supervisor. Further-
more, students who were absent from reexaminations without prior notice were also advanced to the next grade, with academic probation. It may be necessary to establish a new rule that prevents advancement of students who did not sufficiently practice and failed their reexamination, regardless of their performance on other examinations.

Conclusions

Female students received higher scores in preclinical phase-practical examinations conducted by the university than male students, due to insufficient preparation prior to examination of some male students. Thus, it may be necessary in the future to establish stricter standards for advancement to the next grade, and to develop and implement education methods to increase the motivation of students whose behaviors are unprofessional.

The present study has no conflict of interest.

References