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Skills in National Core Curriculum: National Survey of Primary Care Physicians in Turkey

ABSTRACT
Objective: Core curriculum describes the basic standard of medical education. In this study, we aimed to investigate primary care physicians' views on the minimum level of competency required in a general practitioner about skills listed in the National Core Curriculum for Undergraduate Medical Education-2014 (NCC-2014) and whether they feel competent in these skills.
Methods: Between October 1, 2017 and September 1, 2018, 27652 primary care physicians who work in Turkey were surveyed about the skills listed in the NCC-2014. The participants rated the minimum competency for every skill on 0–4 level, and also stated whether they felt that the primary care physicians were competent.
Results: 4117 (14.9%) participants answered entire questions. Out of 136 skills, "Level3— Should be able to do the skill in cases which are frequent and not complex" was the most selected category for 123 (90.4%) skills, "Level2—Should be able to do the skill according to the guidelines in a state of emergency" was the most selected category for 10 (8.1%) skills, and "Level4—Should be able to do the skill even in complex cases" was the most selected category for 3 (2.2%) skills by participants.
Conclusions: The participants are generally willing to perform skills, but according to them, some of the skills are complex. There are differences between the required competency levels in the NCC-2014 and the opinions of participants. Since physicians' views are important for curriculum development, medical curriculum developers around the world would benefit from findings of this study.
Keywords: Primary Care Physicians, Core Curriculum, National Survey, Skills

Ulusal Çekirdek Eğitim Programındaki Klinik Beceriler: Türkiye'deki Birinci Basamak Hekimlerinin Ulusal Çapta Araştırılması

ÖZET
Amaç: Çekirdek eğitim programı, tıp eğitiminin temel standartlarını ifade eder. Bu çalışmada; birinci basamak hekimlerinin Ulusal Çekirdek Eğitim Programı-2014'teki (UÇEP-2014) beceriler hakkında bir pratisyenin sahip olması gereken asgari yeterlilik seviyesi hakkındaki görüşlerinin ve kendilerini bu becerilerde yeterli hissedip hissetmediklerinin araştırılması amaçlanmıştır.
Gereç ve Yöntem: Türkiye'de çalışan 27652 birinci basamak hekimine 1 Ekim 2017 ile 1 Eylül 2018 arasında, UÇEP-2014'teki beceriler hakkında anket gönderildi. Katılımcılar, her bir beceriyi, olması gereken asgari yeterlilik düzeyini belirtmek için 0-4 arasında puanladı. Ayrıca bu becerilerde kendilerini yeterli görüp görmediklerini de belirttiler.
Bulgular: 4117 (%14.9) katılımcı bütün soruları cevapladı. 136 beceriden 123'ünde katılımcıların en çok seçtiği kategori "Seviye3— Karmaşık olmayan, sık görülen, durumlarda/olgularda uygulamayı yapar." iken, 10 (%8.1) beceride "Seviye2— Acil bir durumda kılavuz/yönergeye uygun biçimde uygulamayı yapar.", 3 (%2.2) beceride ise "Seviye4— Karmaşık durumlar/olgular da dahil uygulamayı yapar." en çok seçilen kategoriydi.
Sonuç: Birinci basamak hekimleri becerileri gerçekleştirmekte genel olarak isteklidir. Fakat onlara göre bazı beceriler karmaşıktır. UÇEP-2014 ile hekimlerin görüşleri arasında farklılıklar vardır. Hekimlerin görüşleri program geliştirme açısından önemli olduğundan, dünyanın dört bir yanındaki tıp eğitimi programı geliştiricileri bu çalışmanın bulgularından yararlanabilir.
Anahtar Kelimeler: Birinci Basamak Hekimleri, Çekirdek Eğitim Programı, Ulusal Anket, Beceriler

INTRODUCTION

The development of core curriculum is a wise solution to overcome the problem of content overload. After the World Summit on Medical Education in Edinburgh in August 1993, many medical schools around the world embarked on developing their core curricula (1). One of them, which is also on a national level, is in Turkey. Developing a National Core Curriculum (NCC) is an important step in describing the basic standard of the undergraduate medical education in Turkey. The attempts in this direction started in 2001. After a solid effort, the first NCC in Turkey was released in 2002 (NCC-2002). Since then, so many changes have occurred about the issues related to the health system in years that the core curriculum needed an overhauling. As a result, an attempt to develop a new NCC started in 2013. The last NCC was declared in 2014 based on the contributions from academic members of medical faculties and other stakeholders. Also, the Council of Higher Education (YÖK) declared that every medical school should structure its programs in line with the NCC-2014 to strengthen the standardization across the country (2,3).

The four primary factors of NCC-2014 included: (a) the frame of national competencies, (b) symptoms and conditions, (c) core illnesses/clinical problems, and (d) basic skills. In the list of basic skills in NCC, there are 136 items that include a wide range of skills ranging from taking a psychiatric history to performing a lumbar puncture and from conducting a neurological examination to performing a gastric lavage. These 136 skills are grouped under six titles. These titles include: (a) history taking; (b) general and local physical examination; (c) recording, reporting, and notifying; (d) laboratory tests; (e) invasive and non-invasive procedures; and (f) preventive and community medicine (3).

The minimum competency levels, which a graduate is supposed to have, are determined for these 136 skills. There are four competency levels of these skills (3):

Level 1: A graduate should be able to know how the skill is supposed to be done and explain the procedure to the patient.

Level 2: A graduate should be able to do the skill according to the guidelines in a state of emergency.

Level 3: A graduate should be able to do the skill in cases that are frequent and not complex.

Level 4: A graduate should be able to do the skill, even in complex cases.

According to the NCC-2014, a newly graduated student (undergraduate years) should have the ability to perform skills in one of four competency levels. For example, in accordance with the criteria of the NCC-2014, a graduate should be able to perform pleural puncture according to the guidelines in a state of emergency

(Level 2). But the NCC-2014 requires students to possess a higher level of competency (Level 4) for providing the basic life support. (3)

Even if the NCC-2014 determined it, the primary care physicians actively working in the field could think differently according to their personal experience because individuals "internally make sense of what they have experienced" (4) Hence, we believe that it is important to reveal a general tendency of their opinions about these competency levels and identify their self-perceptions about their competency in these skills.

There are two studies that investigate the skills in the NCC. One of them aims to explore the views of primary care physicians about skills in the NCC-2014. However, the participants in this study were limited to 55 family physicians (5). The other study's participants are residents, not primary care physicians, and the skills are from the NCC-2002 (6).

There are studies that investigate primary care physicians' self-perception of competency in some skills. These studies are about skills that are limited to just one field such as dermatology (7) and life-threatening emergencies (8). Besides, the numbers of the participants in these studies were 40 and 213, respectively. There is a study that is not limited to just one field. This study is based on the skills from the national list for the training of family physicians; however, this study surveyed only 170 primary care physicians (9). Moreover, there are studies that investigate what primary care the physicians want to know. One of them is a content analysis of the questions asked by 88 primary care practitioners (10) and the other one aims to compare primary care physicians' learning needs regarding 71 clinical skills useful in private and public sectors and includes 129 participants (11).

To our knowledge, no study examines all the skills that are listed in the NCC for undergraduate medical education. So, there is a gap to fill in this field in terms of the skills (all skills in the NCC) and the sample size (the number of the participants).

In this study, we aimed to investigate the following:

1. What are the primary care physicians' views on the minimum required level of competency at undergraduate level in a primary care physician in terms of the skills listed in the NCC-2014?

2. Do primary care physicians feel competent in these skills?

3. Is there a significant difference in self-perceived competency levels between 0-5 years' graduates and 5+ years' graduates?

Since core curriculum in medical education is a global issue—it cannot be limited by countries' borders—and physicians' views are important for

every medical curriculum developer (12), the readers from outside Turkey can benefit from our results when they attempt to develop their national core curricula. We hope our study enlightens the way for development of medical curriculum.

MATERIAL AND METHODS

We conducted this descriptive study in Turkey. We prepared a form containing demographical questions and the list of medical skills specified in the National Core Curriculum (NCC-2014) for undergraduate medical education. In this questionnaire, we asked primary care physicians about the minimum required level of competency in primary care physicians and their current competency levels in these skills.

We provided the participants five options to rate every skill listed in the NCC-2014:

Level 0: It is not necessary.

Level 1: A primary care physician should be able to know how the skill is supposed to be done and explain the procedure to the patient

Level 2: A primary care physician should be able to do the skill according to the guidelines in a state of emergency

Level 3: A primary care physician should be able to do the skill in cases that are frequent and not complex

Level 4: A primary care physician should be able to do the skill, even in complex cases

Levels 1-4 have been extracted from the NCC-2014 as a copy. Level 0 was not in the NCC-2014 but we have added as an option because primary care physicians could think that a skill is totally redundant.

For the same skills, to learn the physicians' self-evaluation, we provided three options to the participants. The options were: (a) I feel competent, (b) I do not feel competent, and (c) I cannot decide whether I feel competent or not.

Some of the replies that the participants can give in response to the questions are as follows:

1. A primary care physician should be able to know how a lumbar puncture is supposed to be practiced and explain the procedure to the patient. I do not feel competent in performing a lumbar puncture.

2. I think a primary care physician should be able to provide the basic life support even in complex cases. I feel competent in basic life support.

We sent a web-based questionnaire to all primary care physicians who work for the Health Ministry in Turkey (N=27652). The participation was voluntary; the physicians who did not provide the informed consent were excluded. We collected the data between October 1, 2017 and September 1, 2018. We analyzed the data by using the Statistical Package for Social Sciences (SPSS) v.22.0 for Windows (Chicago, IL, USA). Descriptive statistics and Pearson's Chi-Squared Test were used. Significance level is accepted as 0.05.

Gazi University Ethical Board approved the study on September 11, 2017.

RESULTS

4,117 (14.9%) of the primary care physicians surveyed answered all the questions of the questionnaire. Of them, 1,364 (33.1%) were female participants, 3,741 (90.1%) general practitioners, and 376 (9.1%) specialists. In Table 1, we have provided the descriptive data of the participants.

Table 1. Demographic characteristics of participants.

Characteristics	n (%)
Gender	
Female	1364 (33.1)
Male	2753 (66.9)
Age (years)	
18-30	740 (18.0)
31-40	1078 (26.2)
41-50	1443 (35.0)
51≤	856 (20.8)
Years have passed after graduation from medical faculty	
0-5	708 (17.2)
More than 5	3409 (82,8)
Status	
General Practitioner	3741 (90.9)
Specialist	376 (9.1)
Specialties	
Family Medicine	278 (6.8)
Public Health	63 (1.5)
Microbiology	10 (0.2)
Other	25 (0.6)

Level 3 was the most selected category for 123 (90.4%) skills. Level 1 and Level 0 were not the most selected categories for any skill. Level 2 was the most selected category for 10 (8.1%) skills. The participants mostly selected Level 4 for just 3 (2.2%) skills.

"Level 2—Should be able to do the skill according to guidelines in a state of emergency" was the most selected category for these skills (The numbers placed next to skill names show competency levels, which are determined in the NCC-2014.):

- Performing pericardiocentesis-1
- Performing lumbar puncture-1
- Performing and repairing episiotomy-2
- Performing paracentesis-2
- Performing pleural puncture-2
- Performing blood transfusions-2
- Performing suprapubic bladder puncture-2
- Assisting with normal spontaneous delivery-2
- Stabilizing emergency psychiatric patients-3
- Using Galveston orientation scale-3.

"Level 4—Should be able to do the skill even in complex cases" was the most selected category for these skills (The numbers placed next to skills show competency levels in the NCC-2014.):

- Hand washing-4
- Providing basic life support-4
- Taking blood pressure-4

Table 2 contains the top ten skills that were classified as "Level 0—It is not necessary". Table 3 contains the top ten skills in which the participants felt the most competent and the least competent and the top five skills in which they did not decide whether they feel competent.

The following data help in analyzing the results when the participants who could not decide their competency were excluded:

- For 28 skills, the percentage of the 0-5 years' graduates who did not feel competent is significantly higher than 5+ years' graduates.
- For 47 skills, the percentage of the 0-5 years' graduates who did not feel competent is significantly lower than 5+ years' graduates.
- For 61 skills, there is no significant difference in the percentage between 0-5 years and 5+ years' graduates who do not feel competent.

The detailed data about all these skills are provided in the Appendix. We also reported all percentages on the minimum competency levels that primary care physicians selected for 136 skills require and the current competency levels that they perceive themselves. (See the Appendix.)

Table 2. Top ten skills which were classified as "Level 0- It is not necessary" by participants.

Skills	Participant numbers (%)	Competency Levels in NCC-2014
Performing pericardiocentesis	1041 (25.3%)	1
Performing pleural puncture	990 (24.0%)	2
Performing lumbar puncture	970 (23.6%)	1
Determining and evaluating the chlorine level in water	950 (23.1%)	3
Workplace visits and conducting workplace inspection	950 (23.1%)	3
Building a genetic tree and referring the patient to genetic counseling when it is necessary	900 (21.9%)	3
Preparing faecal smear and evaluating it under microscope	876 (21.3%)	3
Obtaining water sample	859 (20.9%)	4
Preparing dry-wet slide for microscopic evaluation and evaluating it under microscope	855 (20.8%)	3
Performing suprapubic bladder puncture	846 (20.5%)	2

DISCUSSION

In our study, Level 3 was the most common answer (123/136) received from the participants for skills. Moreover, the most selected category was Level 3 for 49 skills that were classified as Level 4 in the NCC-2014. This could mean that primary care physicians perceived their role as being just a first-step or coordinator of providing the patient care.

A research, which was conducted in Israel, found that 95.7% of primary care physicians

considered that coordination of all patient care would be a very appropriate role for them (13).

Table 3. Top ten skills which were felt most competent and less competent and top five skills which were not decided whether feel competent by participants.

Skills	Participant numbers (%)	Competency Levels in NCC-2014
Felt most competent by participants, top ten.		
Taking blood pressure	3506 (85.2%)	4
Hand washing	3458 (84.0%)	4
Writing a prescription	3419 (83.0%)	4
Evaluating general condition and vital signs	3337 (81.1%)	4
Measuring blood sugar using a glucometer and evaluating its result	3307 (80.3%)	4
Teaching breast-feeding techniques	3277 (79.6%)	4
Teaching how to do breast examinaton by oneself	3254 (79.0%)	4
Abdominal examination	3235 (78.6%)	4
Conducting immunization services	3198 (77.7%)	4
Respiratory system examination	3184 (77.3%)	4
Felt least competent by participants, top ten.		
Performing pericardiocentesis	476 (11.6%)	1
Performing pleural puncture	557 (13.5%)	2
Performing lumbar puncture	674 (16.4%)	1
Using Galveston orientation scale	825 (20.0%)	3
Preparing faecal smear and evaluating it under microscope	856 (20.8%)	3
Evaluating vaginal samples	862 (20.9%)	3
Performing suprapubic bladder puncture	870 (21.1%)	2
Performing paracentesis	880 (21.4%)	2
Preparing dry-wet slide for microscopic evaluation and evaluating it under microscope	911 (22.1%)	3
Performing and repairing episiotomy	919 (22.3%)	2
Not decided whether felt competent, top five.		
Managing suicide attempt	1651 (40.1%)	2
Evaluating suicide risk	1607 (39.0%)	2
Identifying, protecting and transporting of forensic evidence	1517 (36.8%)	3
Following principles of working with a biological material	1509 (36.7%)	4
Identifying problems related to health in community by using epidemiologic methods and offering solutions for these problems	1491 (36.2%)	3

This finding supports our "primary care physician as a coordinator" argument. Our findings also indicate that primary care physicians are willing to do most of the skills until the skills become complex, and they know that there are others after them who would handle these complex cases. But the meaning and extent of complexity are uncertain because the NCC-2014 does not provide any further explanation about this.

There are other differences in competency levels between NCC-2014 and the opinions of primary care physicians. Although some skills classified as Level 2 by the NCC-2014, for 7 of these skills, the most selected category by the participants was Level 3. There is the same condition for Level 1 skills in NCC; the participants classified all of them as Level 2. These findings show that primary care physicians believe they should do more than what the NCC-2014 expects from them.

The participants encountered difficulties in two main topics: surgical procedures and microscopic evaluation.

Of the top 10 skills that were classified as Level 0, four (pericardiocentesis, pleural puncture, lumbar puncture, suprapubic bladder puncture) were surgical procedural skills. We also see that these four skills along with "performing paracentesis" and "performing and repairing episiotomy" are grouped in the list of top 10 skills in which the participants felt the least competent. A study that examines the self-perceived surgical skills of novice doctors (interns) supports our findings; the study revealed that the "interns did not feel adequately prepared to perform independent surgical skills" (14). Another study that states similar findings as ours states: thoracentesis is one of the skills in which the physicians perceive limitations to perform (8).

However, we can conclude that some primary care physicians have problems with performing some of the surgical procedures, which are listed in the NCC. Also, they do not think that these skills are necessary. The reason why they think these skills to be unnecessary could be a result of seeking an excuse for their incompetence. On the other hand, it is possible that they do not improve themselves on these skills because they consider them to be unnecessary.

The same possibilities are valid for skills related to the microscopic evaluation because there is the same situation. "Preparing fecal smear and evaluating it under a microscope" and "preparing dry-wet slide for microscopic evaluation and evaluating it under a microscope" are listed as unnecessary skills. Besides, both of them and "evaluating vaginal samples" are at the list of the top 10 skills in which the participants felt the least competent.

Our findings are similar to the research that was conducted on internal medicine residents. In this research, the researchers found that 37.0% of the internal medicine residents did not correctly prepare the specimen for a microscopic urinalysis, and many residents were not proficient in performing this (15). In our study, 41.6% of the primary care physicians perceive themselves as competent in performing the complete urinalysis (including microscopic evaluation).

The top five skills in which it was not decided whether primary care physicians felt themselves competent are discouraging. Approximately two out of five primary care physicians could not decide whether they felt competent in managing the suicide attempt and evaluating the suicide risk. Although the awareness of one's own performance is essential for improving clinical performance (16), they were not able to reflect even on these kinds of vital skills.

Another discouraging finding is about global diseases. Although "every medical student should carry a basic understanding of the major diseases that affect humans worldwide" (17), just 36.2% of the primary care physicians perceive themselves as able to identify the problems related to health in the community by using epidemiologic methods and offering solutions for these problems.

"Determining and evaluating the chlorine level in water," "obtaining water sample" and "workplace visits and conducting workplace inspection" are placed in the list of the top 10 skills that were classified as of Level 0. It should be noted that all these skills are obliged to be performed away from the institution's building. Besides, the technicians can contribute to this kind of skills. The primary care physicians consider these skills unnecessary because they might think that health service is confined to health institution's building walls, or these skills should be performed by technicians. However, the studies that were conducted in Canada support the first of these arguments. These studies show that the "proportion of 'office-only' general practitioners and family physicians rose from 14% in 1989 – 90 to 24% in 1999 – 2000" (18), and the billing outside office hours of family physicians decreased by 38.5% from 1991 to 2010 (19).

The significance of the differences on feeling not competent in some skills between 0-5 years' graduates and more than 5 years' graduates could mean that compared to junior primary care physicians, the experienced (more than 5 years after graduation) primary care physicians feel less incompetent in skills that they frequently perform in their professional life. The significantly lower rates of incompetence in pregnancy follow-ups and conducting immunization services can be seen as an indicator of this. It also could mean that experienced physicians become incompetent if they do not perform some skills for a long time. The significantly higher rates of incompetence in experienced primary care physicians, in comparison

with juniors' competence levels, on digital rectal examination and Rinne-Weber test can support this argument. Because physicians who actively work in the field rarely perform these skills and it could bring about lose their competence.

This study has some limitations. Although 27,652 primary care physicians who work for the Health Ministry in Turkey, just 4117 (14.9%) of them answered all the questions. Our findings may not be generalizable to Turkey because 23,535 (85.1%) primary care physicians were not taken into consideration. Another limitation of this study is the uncertainty of "complexity" classification. Since complexity of a case is relative and not determined by a consensus, every participant pictured a different "complex case" in his or her mind. They answered the questions according to their self-classification; hence this limitation might affect our findings.

CONCLUSION

To our best effort, this is the first study to investigate the opinions and self-perceived competencies of primary care physicians about all the skills listed in the NCC. We found that the participants are generally willing to perform skills, but they find some of them to be complex. Their self-perceived competency levels vary from skill to skill, but surgical procedures and microscopic evaluation are two of the weakest parts. Even if some opinions of primary care physicians are consistent with the NCC-2014, there are differences regarding the most selected categories by primary care physicians and the categories determined by the NCC-2014. Since primary care constitutes the basis of the healthcare system and a curriculum must consider the views of primary care physicians, curriculum developers around the world would benefit from the findings of our study.

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Appendix: Percentages of opinions of 4117 primary care physicians about competency levels on skills and their answers about self-perceived competencies, from National Survey about National Core Curriculum-2014 in Turkey, 2017-2018. (Cells with grey backround show competency levels determined by National Core Curriculum-2014 for each skill)

	All participants					All participants			Participants who cannot decide her/his competency were excluded		
	Level 4- Should be able to do the skill even in complex cases	Level 3- Should be able to do the skill in cases which are frequent and not complex	Level 2- Should be able to do the skill according to guidelines in a state of emergency	Level 1- Should be able to know how the skill is supposed to be done and explain the procedure to patient	Level 0- It is not necessary	I feel competent	I do not feel competent	I cannot decide whether I feel competent	Proportion of who do not feel competent, 0-5 years graduates	Proportion of who do not feel competent, 5+ years graduates	Significance of the difference between 0-5 and more than 5 years graduates (p)
A- History Taking											
History taking	31.2	42.9	13.0	11.6	1.2	76.2	6.6	17.1	9.0	7.8	0.33
Obtaining a psychiatric history	16.2	43.5	19.9	17.9	2.4	47.5	19.4	33.1	15.5	16.6	0.56
Evaluating mental status	21.1	43.8	19.5	13.7	1.8	62.4	12.2	25.3	62.8	72.6	<0.001*
B- General and Local Physical Examination											
Examination of a forensic case	14.5	37.9	26.8	14.6	6.1	39.3	31.1	29.6	44.3	44.1	0.95
Antropometric measurements	14.2	37.4	20.3	19.6	8.5	45.8	23.7	30.4	28.9	35.2	0.007*
Head and neck, ENT examination	20.2	56.1	13.6	9.0	1.0	77.0	6.3	16.8	8.4	7.3	0.37
Abdominal examination	23.3	53.3	14.3	8.1	1.0	78.6	5.5	15.9	6.9	6.5	0.74
Evaluating consciousness and mood examination	20.1	48.8	19.5	10.3	1.3	62.0	12.4	25.6	15.8	16.9	0.55
Child and newborn examination	18.3	52.6	17.8	10.3	1.1	54.8	17.9	27.3	42.1	21.3	<0.001*
Skin examination	17.5	55.2	14.9	11.1	1.3	64.1	13.1	22.8	26.1	15.2	<0.001*
Digital rectal examination	11.6	37.8	21.4	18.6	10.5	38.3	32.4	29.3	26.4	50.1	<0.001*
Examination of a pregnant	14.6	49.6	20.8	13.2	1.8	46.2	23.4	30.3	51.2	30.0	<0.001*
Evaluating general condition and vital signs	33.7	44.4	13.0	8.0	0.9	81.1	5.1	13.8	4.6	6.2	0.11
Eye and fundus examination	11.6	38.8	25.9	18.0	5.7	27.6	40.9	31.4	59.5	59.7	0.93
Gynaecological examination	10.0	36.2	26.0	20.0	7.7	30.7	38.9	30.5	62.8	54.4	0.001*
Cardiovascular system examination	17.8	49.5	21.4	10.1	1.2	55.1	16.1	28.8	17.5	23.7	0.002*
Musculoskeletal examination	16.9	54.4	16.9	10.7	1.1	71.1	8.4	20.5	9.8	10.7	0.54
Breast and auxiliary region examination	16.0	52.0	17.3	13.0	1.7	65.8	11.0	23.2	16.4	13.9	0.14
Neurological examination	17.3	49.2	21.1	10.9	1.5	51.6	18.6	29.8	15.0	29.1	<0.001*

Crime scene investigation	10.1	29.3	26.0	16.9	17.7	25.7	42.1	32.1	64.5	61.6	0.23
Forensic examination of a dead	13.5	39.0	23.6	14.9	9.0	44.6	25.7	29.7	31.7	37.6	0.01*
Respiratory system examination	22.3	53.3	14.6	8.8	0.9	77.3	6.1	16.6	6.5	7.4	0.44
Urological examination	13.0	47.5	22.3	13.8	3.4	46.7	19.4	33.9	32.1	28.8	0.16
C- Recording, Reporting and Notifying											
Writing a forensic report	15.2	36.5	26.6	14.3	7.3	44.5	26.7	28.8	41.9	36.5	0.02*
Taking informed consent	20.8	41,3	19.2	15.9	2.8	60.1	14.9	24.9	13.3	21.3	<0.001*
Writing an epicrisis report	20.2	41.2	19.5	14.1	5.0	58.7	15.7	25.6	17.9	21.9	0.04*
Preparing a patient file	20.6	40.9	17.8	14.1	6.6	58.7	15.1	26.2	11.6	22.5	<0.001*
Appropriate referral of patients	27.0	42.1	17.1	12.0	1.8	70.1	10.0	19.9	18.3	11.3	<0.001*
Issuing a death certificate	21.3	42.0	18.7	12.1	5.9	65.4	13.2	21.4	17.4	16.7	0.68
Reporting and notifying	20.0	43.4	18.7	13.6	4.2	56.1	16.0	27.9	25.4	21.5	0.056
Writing a prescription	34.4	44.6	10.7	9.0	1.3	83.0	4.9	12.0	7.6	5.2	0.01*
Preparing refusal of treatment form	25.5	40.1	17.3	13,9	3.2	52.2	19.3	28.5	24.4	27.5	0.13
D- Laboratory Tests											
Following principles of working with a biological material	11.1	32.5	23.6	21.4	11.4	31.8	31.6	36.7	40.2	51.9	<0.001*
Performing decontamination, disinfection, sterilization, antisepsis	20.0	40.6	20.5	15.3	3.6	52.4	19.1	28.5	28.5	26.3	0.29
Preparing faecal smear and its evaluation under microscope	8.1	26.1	22.5	22.0	21.3	20.8	47.3	31.9	71.8	69.0	0.21
Evaluation of direct radiography	17.5	47.3	19.3	12.2	3.5	48.3	20.8	30.8	22.0	31.9	<0.001*
Performing electrocardiogram and its evaluation	22.0	45.7	19.0	11.0	2.3	49.7	20.2	30.1	17.6	31.4	<0.001*
Performing fecal occult blood test	15.2	37.1	19.8	18.2	9.7	52.8	22.0	25.2	42.7	26.7	<0.001*
Measuring blood sugar using a glucometer and evaluating its result	28.6	42.3	14.9	11.6	2.6	80.3	5.9	13.8	6.7	6.9	0.83
Evaluating bleeding and clotting times	15.0	33.6	23.2	16.7	11.5	38.6	29.0	32.4	35.6	44.5	<0.001*
Filling out request forms for laboratory requests	26.9	42.6	14.5	12.0	3.9	75.8	8.1	16.1	11.8	9.2	0.054
Taking and transferring laboratory specimens to a laboratory under appropriate conditions	21.0	38.7	19.1	14.7	6.5	59.8	14.1	26.0	19.5	19.0	0.80
Using a microscope	13.9	34.9	21.4	16.6	13.2	37.1	31.3	31.6	39.5	47.1	0.002*

Preparing dry-wet slide for microscopic evaluation and evaluating it under microscope	10.2	28.3	22.0	18.7	20.8	22.1	46.1	31.8	62.9	68.6	0.01*
Using a peak-flow meter and evaluating its result	12.1	34.2	23.2	17.4	13.1	30.0	37.3	32.6	62.8	53.8	<0.001*
Preparing and evaluating a peripheral smear	10.8	31.7	21.0	19.2	17.3	24.2	44.2	31.6	55.4	66.5	<0.001*
Performing water disinfection	11.6	28.5	23.7	18.6	17.6	27.5	40.0	32.5	64.7	58.1	0.007*
Obtaining water sample	11.2	26.9	22.5	18.5	20.9	34.9	35.6	29.6	55.9	49.4	0.007*
Determining and evaluating the chlorine level in water	9.8	25.7	22.5	18.8	23.1	26.0	42.3	31.7	62.0	61.9	0.95
Performing complete urinalysis (including microscopic evaluation)	14.9	35.9	21.4	16.4	11.4	41.6	29.1	29.3	35.6	42.4	0.004*
Evaluating results of screening and diagnostic tests	18.6	44.9	18.0	14.0	4.4	57.4	15.7	26.9	18.1	22.2	0.03*
Measuring and evaluating of transcutaneous bilirubin level	10.8	29.2	23.0	18.9	18.1	24.2	43.4	32.4	62.5	64.6	0.36
Evaluating vaginal samples	9.7	27.9	21.5	20.8	20.1	20.9	46.9	32.2	70.9	68.7	0.34
E- Invasive and Non-Invasive Procedures											
Stabilising emergency psychiatric patients	13.7	32.2	34.0	15.2	4.9	35.2	29.8	35.0	41.9	46.6	0.06
Identifying and managing forensic cases	17.0	38.2	27.4	13.0	4.4	45.3	22.6	32.1	30.7	33.8	0.17
Placing an oropharyngeal airway	31.1	34.3	25.4	8.2	2.0	61.4	16.4	22.2	15.9	22.2	0.001*
Rational drug use	31.4	43.6	14.3	9.3	1.4	74.7	7.0	18.2	11.1	8.1	0.01*
Preparing and applying splints	18.1	36.0	28.7	12.0	5.2	47.5	25.5	27.0	20.0	38.3	<0.001*
Applying bandaging and tourniquet	26.4	38.4	24.6	9.1	1.5	72.9	8.4	18.8	8.7	10.6	0.17
Applying and removing nasal tamponade	22.5	38.9	26.6	9.5	2.4	59.9	16.1	24.0	19.8	21.4	0.41
Following up child growth and development (percentile charts, Tanner stages)	26.1	45.3	15.6	11.6	1.3	74.6	8.1	17.3	13.0	9.2	0.006*
Establishing vascular access	28.0	38.8	22.4	8.7	2.1	63.2	14.2	22.6	21.6	17.7	0.03*
Performing defibrillation	30.4	34.9	24.5	8.2	1.9	50.8	21.3	27.9	25.3	30.4	0.02*
Identifying, protecting and transporting of forensic evidence	15.0	31.6	27.5	15.3	10.6	28.0	35.1	36.8	47.7	57.3	<0.001*
Draining soft tissue abscesses	17.8	41.0	25.5	11.5	4.3	56.5	17.5	26.0	30.8	22.2	<0.001*
Taking precautions to stop or limit external bleeding	30.1	38.1	22.0	8.2	1.7	71.5	8.4	20.1	13.1	10.0	0.02*
Providing maternal care following birth	19.0	41.9	22.7	13.1	3.4	51.8	17.3	30.8	40.4	22.1	<0.001*
Providing newborn care in the delivery room	19.7	42.4	22.1	12.6	3.3	53.0	16.9	30.1	39.7	21.3	<0.001*
Hand washing	43.3	34.2	12.0	9.1	1.5	84.0	4.4	11.6	4.9	5.0	0.91

Performing intubation	29.2	34.2	25.9	8.3	2.4	45.1	26.1	28.7	33.9	37.2	0.15
Performing and repairing episiotomy	13.4	27.4	30.3	15.7	13.2	22.3	49.2	28.5	71.2	68.3	0.18
Using Galveston orientation scale	11.5	27.3	29.4	17.9	13.9	20.0	45.7	34.2	66.7	70.1	0.13
Pregnancy and puerperal follow-ups	21.8	43.7	19.3	12.8	2.4	65.4	12.8	21.8	32.5	13.4	<0.001*
Using Glasgow coma scale	28.5	35.3	23.5	9.7	3.1	55.4	17.4	27.2	12.4	26.5	<0.001*
Collecting biological sample	14.8	33.3	26.5	15.3	10.1	35.9	28.7	35.3	33.8	46.8	<0.001*
Evaluating illness / trauma severity score	19.3	34.3	29.4	12.4	4.6	36.9	27.1	36.0	29.7	45.1	<0.001*
Providing appropriate transportation of a patient	29.1	36.9	22.5	9.4	2.0	67.5	10.0	22.5	12.3	13.0	0.67
Putting patient in recovery position	30.7	34.7	23.6	9.0	2.1	62.3	13.1	24.7	19.4	16.9	0.17
Removing foreign body from respiratory tract	29.1	33.2	28.2	7.9	1.7	52.0	17.2	30.8	22.0	25.4	0.11
Determining legal competence	15.0	34.7	25.8	16.6	7.9	34.1	30.8	35.1	49.7	47.1	0.30
Performing IM, IV, SC, ID injection	31.3	38.0	20.5	8.3	1.9	72.4	8.9	18.8	11.0	10.9	0.95
Inserting a urinary catheter	28.4	39.5	20.9	8.6	2.6	76.8	7.6	15.6	5.7	9.8	0.001*
Providing advanced life support	25.6	33.6	26.5	10.0	4.4	45.1	23.1	31.8	26.8	35.4	<0.001*
Evaluating suicide risk	15.9	35.5	30.3	14.1	4.2	30.4	30.6	39.0	44.4	51.3	0.009*
Managing suicide attempt	17.1	32.5	32.2	13.2	4.9	27.3	32.6	40.1	49.3	55.5	0.01*
Taking blood pressure	43.0	34.9	13.1	7.7	1.3	85.2	4.7	10.1	5.0	5.3	0.76
Performing blood transfusions	12.8	24.7	29.1	16.9	16.6	24.0	46.3	29.7	59.8	67.2	0.001*
Capillary blood sampling	21.1	32.3	23.8	13.2	9.6	54.7	21.1	24.3	22.8	28.9	0.004*
Removing tick (insect)	26.5	36.4	25.3	9.3	2.5	61.2	15.7	23.1	28.3	18.8	<0.001*
Delivering bad news	28.4	36.0	21.1	11.5	3.1	56.2	14.2	29.6	18.1	20.6	0.20
Taking sample for culture	19.7	36.1	23.3	13.3	7.7	50.1	20.5	29.4	20.5	31.0	<0.001*
Performing enema	20.3	33.5	23.5	13.6	9.2	58.7	16.3	25.0	16.8	22.9	0.002*
Performing lumbar puncture	9.2	21.1	25.5	20.7	23.6	16.4	59.8	23.8	75.4	79.2	0.04*
Performing gastric lavage	18.0	31.6	29.8	11.6	9.0	50.2	24.4	25.3	25.7	34.2	<0.001*
Mini mental state examination	19.5	39.1	24.4	12.7	4.3	55.0	16.7	28.4	19.3	24.1	0.02*
Inserting nasogastric tube	22.6	35.9	27.1	9.4	5.1	62.3	15.5	22.1	10.4	22.1	<0.001*
Assisting with normal vaginal spontaneous delivery	15.7	31.2	33.6	12.0	7.4	27.6	39.6	32.8	62.9	58.1	0.05
Oxygen and nebulizer-inhalation treatment	27.7	39.2	21.9	9.1	2.1	75.6	7.9	16.5	10.2	9.3	0.50

Administration of medications in oral, rectal, vaginal or topical ways	26.7	38.5	20.8	10.2	3.8	73.0	8.9	18.1	12.1	10.6	0.27
Performing paracentesis	10.0	23.1	28.3	19.2	19.5	21.4	51.1	27.5	59.0	73.0	<0.001*
Performing pericardiocentesis	8.1	18.5	26.2	22.0	25.3	11.6	64.7	23.7	84.0	85.0	0.54
Performing pleural puncture	8.5	18.8	26.9	21.7	24.0	13.5	62.5	24.0	82.2	82.2	0.98
Administering PPD skin test	14.6	31.8	24.5	17.8	11.3	40.4	29.9	29.7	41.2	42.8	0.51
Using puls oximeter	29.5	36.3	20.7	9.9	3.6	72.7	10.1	17.2	5.6	13.6	<0.001*
Evaluation of patient's capacity to consent	16.3	33.3	24.7	16.7	8.9	39.1	26.2	34.7	36.2	40.9	0.06
Administering Rinne-Weber and Schwabach tests	11.7	30.5	24.5	19.4	14.0	28.3	36.6	35.1	38.5	60.4	<0.001*
Applying servical collar	28.4	34.4	24.7	9.3	3.3	66.2	12.7	21.2	14.5	16.4	0.27
Providing appropriate protection and transportation according to cold chain process	30.1	38.6	18.4	10.7	2.3	74.3	8.8	16.9	18.6	9.1	<0.001*
Evaluating respiratory function test	17.2	39.3	24.4	14.0	5.1	40.0	28.1	31.9	25.6	44.7	<0.001*
Using alcoholmeter	15.4	31.2	26.1	15.0	12.3	43.5	29.5	27.0	43.6	39.8	0.11
Building a genetic tree and referring the patient to genetic counseling when it is necessary	10.8	25.5	19.3	22.5	21.9	29.1	38.8	32.1	42.1	60.6	<0.001*
Performing suprapubic bladder puncture	10.1	21.7	27.7	20.0	20.5	21.1	51.3	27.6	69.4	71.1	0.43
Providing basic life support	33.2	32.2	23.8	8.2	2.6	60.8	15.2	24.0	13.2	21.4	<0.001*
Finding solution for the ethical problems in medical practices	23.0	38.6	20.3	14.1	4.0	49.6	16.4	34.0	24.0	25.1	0.62
Heel lance for blood sampling	24.3	37.5	20.1	13.7	4.5	70.8	11.1	18.1	20.8	12.1	<0.001*
Providing appropriate transportation of limbs which are amputed after trauma	26.4	31.9	27.9	10.3	3.5	47.3	23.2	29.5	26.3	34.3	<0.001*
Appropriate preparation of medications to be administred	25.9	37.8	21.5	10.8	4.0	64.3	11.8	23.9	19.9	14.7	0.003*
Taking vaginal and servical samples	16.3	34.8	23.5	16.1	9.3	45.4	26.2	28.5	39.2	36.0	0.17
Performing wound-burn care	24.7	42.0	21.3	9.8	2.3	70.1	10.0	19.9	13.0	12.4	0.67
Neonatal resuscitation	23.9	32.5	29.5	10.3	3.8	33.9	33.9	32.2	53.4	49.3	0.09
Performing and removing superficial sutures	29.7	39.3	20.5	8.3	2.2	75.5	8.6	15.9	7.5	10.8	0.01*
F- Preventive and Community medicine											
Organizing emergency aids	27.8	34.1	25.5	10.2	2.4	59.0	12.8	28.3	18.0	17.7	0.86
Family counseling	22.4	41.0	18.0	15.8	2.7	63.7	12.0	24.4	19.6	15.0	0.009*

Family planning counseling	24.3	43.3	15.9	14.5	2.0	73.0	8.2	18.8	18.4	8.5	<0.001*
Conducting immunization services	28.0	44.4	14.4	12.0	1.3	77.7	6.5	15.9	13.3	6.6	<0.001*
Teaching breast-feeding techniques	29.9	42.0	13.6	12.8	1.7	79.6	6.1	14.3	12.7	6.0	<0.001*
Workplace visits and conducting workplace inspection	13.7	26.5	19.5	17.3	23.1	39.7	29.6	30.7	37.5	43.8	0.009*
Teaching how to do breast examinaton by oneself	28.1	42.5	14.2	13.4	1.8	79.0	5.9	15.1	8.0	6.7	0.26
Applying contraception techniques	24.8	42.3	15.6	14.6	2.6	69.0	10.0	21.0	18.6	11.5	<0.001*
Providing health service in unusual situations	23.4	36.7	25.7	11.4	2.7	49.5	15.4	35.1	25.9	23.4	0.24
Periodic examination and control (Cardiac risk calculation, adolescent counseling, smoke counseling, cancer screening)	21.9	41.7	18.7	14.8	2.9	57.0	15.0	28.0	19.4	21.2	0.37
Taking precautions for preventing infections acquired from health service	24.9	42.8	18.3	12.3	1.7	62.4	11.4	26.3	16.0	15.3	0.69
Taking precautions for preventing infections at public places	23.8	41.5	19.2	13.0	2.5	59.9	12.2	27.8	6.0	5.5	0.82
Providing health education to community	25.9	41.5	16.1	13.9	2.6	66.9	10.1	23.0	4.3	5.0	0.79
Fighting infectious disease in community	25.4	42.2	17.9	12.6	1.9	60.4	12.1	27.5	16.8	16.7	0.99
Identifying problems related to health in community by using epidemiologic methods and offering solutions for these problems	19.5	37.8	21.3	15.8	5.6	42.2	21.6	36.2	29.6	34.8	0.03*