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

ÖNARAYILMAŞ

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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 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 done 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.

| 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 |
|-----------------------------------------------------------------------|-------------------------|--------------------------------|
| Taking blood pressure                                                | 3506 (85.2%)            | 4                              |
| Hand washing                                                         | 3558 (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 examination 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                              |

| Skills                                                                 | Participant numbers (%) | Competency Levels in NCC-2014 |
|-----------------------------------------------------------------------|-------------------------|--------------------------------|
| 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 (pericardioceintesis, 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 |
| Anthropometric 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*  
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*  
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

| Procedure                                                                 | Percentages | 10.0 | 20.0 | 30.0 | 40.0 | 50.0 | 60.0 | 70.0 | 80.0 | 90.0 | 100.0 |
|----------------------------------------------------------------------------|-------------|------|------|------|------|------|------|------|------|------|--------|
| 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   |
| Procedure                                                                 | Konuralp | Medical Journal 2021;13(2) | Konuralp | Medical Journal 2021;13(2) | Konuralp | Medical Journal 2021;13(2) | Konuralp | Medical Journal 2021;13(2) | Konuralp | Medical Journal 2021;13(2) | Konuralp | Medical Journal 2021;13(2) | Konuralp | Medical Journal 2021;13(2) | Konuralp | Medical Journal 2021;13(2) | Konuralp | Medical Journal 2021;13(2) | Konuralp | Medical Journal 2021;13(2) | Konuralp | Medical Journal 2021;13(2) | Konuralp | Medical Journal 2021;13(2) | Konuralp | Medical Journal 2021;13(2) | Konuralp | Medical Journal 2021;13(2) | Konuralp | Medical Journal 2021;13(2) | Konuralp | Medical Journal 2021;13(2) | Konuralp | Medical Journal 2021;13(2) | Konuralp | Medical Journal 2021;13(2) |
|--------------------------------------------------------------------------|----------|-----------------------------|----------|-----------------------------|----------|-----------------------------|----------|-----------------------------|----------|-----------------------------|----------|-----------------------------|----------|-----------------------------|----------|-----------------------------|----------|-----------------------------|----------|-----------------------------|----------|-----------------------------|----------|-----------------------------|----------|-----------------------------|----------|-----------------------------|----------|-----------------------------|----------|-----------------------------|----------|-----------------------------|----------|-----------------------------|
| 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                                             |                                                           |
### F. Preventive and Community medicine

| Procedure                                                                 | Administration of medications in oral, rectal, vaginal or topical ways | Performing paracentesis | Performing pericardiocentesis | Performing pleural puncture | Administering PPD skin test | Using pulsoximeter | Evaluation of patient's capacity to consent | Administering Rinne-Weber and Schwalbach tests | Applying servical collar | Providing appropriate protection and transportation according to cold chain process | Evaluating respiratory function test | Using alcoholmeter | Building a genetic tree and referring the patient to genetic counseling when it is necessary | Performing suprapubic bladder puncture | Providing basic life support | Finding solution for the ethical problems in medical practices | Heel lance for blood sampling | Providing appropriate transportation of limbs which are amputated after trauma | Appropriate preparation of medications to be administered | Taking vaginal and servical samples | Performing wound-burn care | Neonatal resuscitation | Performing and removing superficial sutures | Organizing emergency aids | Family counseling |
|---------------------------------------------------------------------------|-----------------------------------------------------------------------|-------------------------|-------------------------------|-------------------------------|----------------------------|-------------------|---------------------------------------------|-------------------------------------------------|--------------------------|-----------------------------------------------------------|-------------------------------|--------------------|----------------------------------------------------------------------------------|----------------------------------|-------------------|---------------------------------------------------------------|-----------------------------|----------------------------------------------------|---------------------------------------------|-----------------------------|---------------------|------------------------------------------|----------------------------------|-------------------------|
| Service Description                                           | Value 1 | Value 2 | Value 3 | Value 4 | Value 5 | Value 6 | Value 7 | Value 8 | Value 9 | Value 10 | p-value |
|--------------------------------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-----------|---------|
| 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 examination 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*   |