

# Self-confidence of medical students in performing clinical skills acquired during their surgical rotation

## *Assessing clinical skills education in Kuwait*

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### ABSTRACT

**الأهداف:** تقييم الثقة بالنفس في أداء وممارسة المهارات السريرية لدى طلبة الطب في مجال الرعاية السريرية.

**الطريقة:** أُجريت هذه الدراسة المقطعية في أبريل 2011م في قسم الجراحة، كلية الطب، مركز العلوم الصحية، جامعة الكويت، الكويت. لقد تم استخدام استبيان لجمع البيانات من الطلبة الذين انتهوا من مناوبة الجراحة لسنة السريرية الأولى. قيم الطلبة مستوى ثقتهم بأنفسهم في أداء المهارات السريرية المخصص إتقانها خلال تلك المناوبة. عرضت النتائج باستخدام الترددات والنسب، كما تم حساب المجموع الإجمالي لمستوى الثقة لكل طالب. وباستخدام اختبارات مان ويتني وكروسكال واليس تم تحديد العلاقة بين خصائص الطالب الديموغرافية وإجمالي الثقة بالنفس.

**النتائج:** من بين 122 طالباً دعوا للمشاركة بالدراسة رفض 15 طالباً فقط (12.3%) المشاركة. وسجل أغلبية الطلبة مستوى ثقة بالنفس عال (>75%) في ممارسة 7 من أصل 13 مهارة خاصة بطريقة أخذ التاريخ المرضي، وأداء الفحص السريري، و2 من أصل 39 مهارة تخص التشخيص والعلاج. فيما تم تسجيل أعلى مستوى ثقة بالنفس في أداء فحص البطن، بينما كان أقل مستوى ثقة بالنفس في العناية بأداة جاكسون برات لتفريغ السوائل. كما اتضح أن المجموع الإجمالي للثقة عال بين الذكور ( $p=0.021$ )، والطلبة الحاصلين على مدخول أسري أكبر ( $p=0.002$ ).

**خاتمة:** أظهرت الدراسة أن طلبة الطب يعانون من ضعف في مستوى الثقة بالنفس في أداء المهارات السريرية. ويجب على المسؤولين عن تطوير المناهج التعليمية البحث عن أسباب هذا الضعف، وطرق تحسين مستوى الثقة بالنفس لدى طلبة الطب لممارسة المهارات السريرية المفترض تعلمها خلال مناوبة الجراحة.

**Objective:** To assess the self-confidence of clinical years' medical students in performing clinical skills/procedures.

**Methods:** A cross-sectional study was conducted in April 2011 at the Department of Surgery, Faculty of

Medicine, Health Sciences Center, Kuwait University, Safat, Kuwait. A questionnaire was used to collect data from students who had completed their surgical rotation of their first clinical year. The students reported their level of self-confidence in performing specific skills/procedures related to that rotation. Data were presented using frequencies and percentages. A total score of confidence was calculated for each student. The Mann-Whitney and Kruskal-Wallis tests were used to assess the association between the students' sociodemographic characteristics and confidence score.

**Results:** Of the 122 students invited to participate in the study, only 15 (12.3%) declined to comply. Most students reported high confidence level (>75%) in performing 7 of the 13 history taking/physical examination skills, and 2 of the 39 diagnostic/treatment procedure skills. The highest confidence level was in performing abdominal examination, while the lowest level was in care of Jackson-Pratt drain site and emptying the drain bulb. The total confidence score was significantly higher among males ( $p=0.021$ ), and students with higher monthly income ( $p=0.002$ ).

**Conclusion:** Medical students appeared to have poor self-confidence in performing clinical skills/procedures. Curriculum planners should explore potential reasons, and methods for the improvement of confidence level among medical students in performing skills/procedures they were expected to learn during their surgical rotation.

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Medical doctors routinely practice their clinical skills. Worldwide, both undergraduate and postgraduate medical curriculum planners value the importance of teaching clinical skills to their students, and continuously aim to improve this part of the teaching curriculum to ensure high competency of medical doctors in performing these skills.<sup>1-13</sup> They developed new bedside teaching curricula, utilized nurses and residents as clinical tutors, used emergency departments, in addition to wards and outpatient clinics for teaching, utilized simulation and standardization methods, and implemented formative assessments, in an attempt to improve clinical skills teaching, and continued to assess the effectiveness of such methods of teaching. In the new medical curriculum of the Faculty of Medicine of Kuwait University (FOMKU), clinical skills teaching starts during the early years of the curriculum in order to improve bedside skills of the students. During the 3 years of preclinical studies, medical students spend one day per week, either learning clinical skills on simulated patients and mannequins in the faculty's laboratories, or practicing the acquired skills on real patients in teaching hospitals. These skills are mainly history taking, physical examination and communication skills. Once the students start their clinical years, they learn and practice clinical skills on real patients regularly in teaching hospitals. Simulation is also used to teach some procedures during the clinical years, such as insertion of a nasogastric tube or a urinary bladder catheter. This plan of teaching clinical skills applies to all clinical departments of FOMKU, however, each department has its own curriculum and list of clinical skills and procedures to be learnt by medical students. The Department of Surgery provides the students with a list of skills/procedures to be acquired during their rotation. Each skill/procedure has a ranked competence level (Appendix 1). This revised curriculum of teaching clinical skills/procedures was implemented recently, and has not been evaluated so far. This study aimed to assess the self-reported confidence in performing clinical skills/procedures learned by medical students during their surgical rotation.

**Methods.** A self-administered questionnaire was developed in English consisting of 61 questions under 2

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main sections. Section I has a set of 9 questions regarding the sociodemographic characteristics including age, gender, nationality, marital status, monthly family income, governorate, year of study in medical school, grade point average (GPA) and the desired future career specialty. Section II included questions assessing the self-confidence level of medical students in performing 52 clinical skills/procedures acquired during their surgical rotation of the first clinical (fifth) year. Reporting the level of self-confidence was on a scale as follows: 0% (no confidence at all); 0-25% (very low confidence); >25-50% (low confidence); >50-75% (acceptable confidence); >75-<100% (good confidence); and 100% (full confidence). The skills/procedures that were included in section II have a competency level of 3 or 4 according to the list provided to the students (Appendix 1). The medical students, 11 weeks after their surgical rotation, should be able to perform procedures with the mentioned competence levels independently. This cross-sectional study was conducted in April 2011. Our study sample comprised of students who completed at least an 11 weeks rotation of surgery. Thus, all of the sixth year (second clinical year; n=69) students, and some of the fifth year (first clinical year; n=68) students were eligible for inclusion in the study. Of the 137 eligible students, we were able to contact 122 (89%). Students were invited to participate in the study without considering their grades, or any other factor. Only 15 (12.3%) students declined to participate in the study without citing any reason. The third clinical year (final year) medical students were not included in our sample as they had different/old teaching curriculum, FOMKU was still in a transition from a traditional lecture-based teaching curriculum into a problem-based teaching curriculum during the academic year 2010-2011. We collected data from the students during their problem-based learning (PBL) sessions, as the students' attendance is usually high in these sessions. After explaining the study objectives, a written informed consent was obtained from each participant. Also, the participants were assured of the confidentiality of the collected information, and that they were free to decline participation in the study. The study protocol and data collection instrument was approved by the Joint Ethics Committee of the Ministry of Health in Kuwait and FOMKU. Permission to administer the questionnaire to the study sample was obtained from the administration of the FOMKU.

Data were analyzed using the Statistical Package for Social Sciences (SPSS Inc, Chicago, IL, USA) version 17. We computed frequencies and percentages

of sociodemographic and skills/procedures variables. Each confidence level was given a score from 0-5 (that is: 0% = 0; >0-25% = 1; >25-50% = 2; >50-75% = 3; >75-<100% = 4; 100% = 5). For each participant, the score of every skill were added together to obtain a total confidence score. The minimum possible score was 0, and the maximum possible score was 260. The association between the total confidence score and the sociodemographic characteristics was measured using the Mann-Whitney and Kruskal-Wallis tests according to the number of groups in the sociodemographic variables. A  $p < 0.05$  was considered as the cut-off value for significance.

**Results.** Most of the students were aged 23 years or more (n=64; 59.8%). Only 16 (15%) students were non-Kuwaiti, and 17 (15.9%) were married. Over 50% of the students were females, and had a family income of more than 2000 Kuwait Dinars (KD) per month (1 KD equals approximately 3.5 United States Dollars). Most of the students lived in Hawalli (n=45; 42.1%), while only 1.9% (n=2) lived in both Al-Ahmadi and Al-Jahra. Regarding the year of study, 65 (60.7%) students were sixth (second clinical) year medical students, while 42 (39.3%) were fifth (first clinical) year medical students. Most of the students (n=69; 64.5%) had a GPA ranging from 2.5 and 3.0 out of 4.0. Only 20 (18.7%) students reported preference of surgical specialties as their future career goal, while most (n=51; 47.7%) reported non-surgical specialties (Table 1). Most students reported high confidence level in performing 7 of 13 history taking and physical examination skills (Table 2). High confidence level (>75% confidence level) was reported

**Table 1 -** Distribution of the sociodemographic characteristics of medical students of Kuwait University for the academic year 2010/2011 (N=107).

| Characteristic                  | n              | (%)    |
|---------------------------------|----------------|--------|
| <b>Age, years</b>               |                |        |
| Mean $\pm$ SD                   | 22.6 $\pm$ 0.8 |        |
| Range                           | 20-25          |        |
| <b>Nationality</b>              |                |        |
| Kuwaiti                         | 91             | (85.0) |
| Non-Kuwaiti                     | 16             | (15.0) |
| <b>Gender</b>                   |                |        |
| Male                            | 47             | (43.9) |
| Female                          | 60             | (56.1) |
| <b>Marital status</b>           |                |        |
| Married                         | 17             | (15.9) |
| Not married                     | 90             | (84.1) |
| <b>Monthly family income</b>    |                |        |
| $\leq$ 2000 KD                  | 48             | (44.9) |
| >2000 KD                        | 59             | (55.1) |
| <b>Governorate</b>              |                |        |
| Al-Ahmadi                       | 2              | (1.9)  |
| Al-Asimah                       | 32             | (29.9) |
| Al-Farwaniya                    | 12             | (11.2) |
| Al-Jahra                        | 2              | (1.9)  |
| Hawalli                         | 45             | (42.1) |
| Mubarak Al-Kabeer               | 14             | (13.1) |
| <b>Year of study</b>            |                |        |
| Fifth                           | 42             | (39.3) |
| Sixth                           | 65             | (60.7) |
| <b>GPA (out of 4)</b>           |                |        |
| <2.5                            | 23             | (21.5) |
| 2.5-3.0                         | 69             | (64.5) |
| >3.0                            | 15             | (14.0) |
| <b>Aim for future specialty</b> |                |        |
| Did not decide yet              | 36             | (33.6) |
| Surgical*                       | 20             | (18.7) |
| Non-surgical                    | 51             | (47.7) |

\*Surgical specialties include Obstetrics and Gynecology, SD - standard deviation, KD - Kuwait Dinars, GPA - Grade Point Average

**Table 2 -** Self-confidence of Kuwait University's medical students in performing history taking and physical examination skills acquired during their surgical rotation for the academic year 2010/2011.

| Skills/Procedures                            | Confidence level |           |           |           |           |           |
|--|------------------|-----------|-----------|-----------|-----------|-----------|
|  | 0%               | >0-25%    | >25-50%   | >50-75%   | >75-<100% | 100%      |
| History taking                               | 0 (0.0)          | 2 (1.9)   | 7 (6.5)   | 19 (17.8) | 57 (53.3) | 22 (20.6) |
| General physical examination and vital signs | 0 (0.0)          | 5 (4.7)   | 11 (10.3) | 26 (24.3) | 45 (42.1) | 20 (18.7) |
| Examination of masses                        | 1 (0.9)          | 4 (3.7)   | 21 (19.6) | 30 (28.0) | 39 (36.4) | 12 (11.2) |
| Examination of ulcers                        | 5 (4.7)          | 16 (15.0) | 29 (27.1) | 27 (25.2) | 22 (20.6) | 8 (7.5)   |
| Examination of cardiovascular system         | 3 (2.8)          | 3 (2.8)   | 13 (12.1) | 26 (24.3) | 49 (45.8) | 13 (12.1) |
| Examination of respiratory system            | 0 (0.0)          | 8 (7.5)   | 10 (9.3)  | 21 (19.6) | 50 (46.7) | 18 (16.8) |
| Examination of abdomen                       | 1 (0.9)          | 0 (0.0)   | 4 (3.7)   | 18 (16.8) | 46 (43.0) | 38 (35.5) |
| Rectal examination                           | 12 (11.2)        | 23 (21.5) | 16 (15.0) | 23 (21.5) | 18 (16.8) | 15 (14.0) |
| Examination of genitourinary system          | 11 (10.3)        | 23 (21.5) | 22 (20.6) | 20 (18.7) | 23 (21.5) | 8 (7.5)   |
| Examination of neurological system           | 5 (4.7)          | 14 (13.1) | 20 (18.7) | 20 (18.7) | 38 (35.5) | 10 (9.3)  |
| Examination of musculoskeletal system        | 9 (8.4)          | 13 (12.1) | 25 (23.4) | 24 (22.4) | 28 (26.2) | 8 (7.5)   |
| Breast examination                           | 2 (1.9)          | 7 (6.5)   | 17 (15.9) | 22 (20.6) | 32 (29.9) | 27 (25.2) |
| Thyroid examination                          | 1 (0.9)          | 0 (0.0)   | 7 (6.5)   | 19 (17.8) | 43 (40.2) | 37 (34.6) |

**Table 3** - Self-confidence of Kuwait University's medical students in performing diagnostic and treatment procedural skills acquired during their surgical rotation for the academic year 2010/2011.

| Skills/Procedures  | 0%        | >0-25%    | Confidence level |           |           | 100%      |
|--|-----------|-----------|------------------|-----------|-----------|-----------|
|  |           |           | >25-50%          | >50-75%   | >75-<100% |           |
| Performing venipuncture (blood drawing)                            | 54 (50.5) | 22 (20.6) | 18 (16.8)        | 7 (6.5)   | 2 (1.9)   | 4 (3.7)   |
| Inserting a butterfly needle                                       | 58 (54.2) | 22 (20.6) | 15 (14.0)        | 6 (5.6)   | 3 (2.8)   | 3 (2.8)   |
| Assessing and maintaining an IV insertion site                     | 61 (57.0) | 18 (16.8) | 16 (15.0)        | 4 (3.7)   | 6 (5.6)   | 2 (1.9)   |
| Setting the IV flow rate   | 67 (62.6) | 22 (20.6) | 10 (9.3)         | 3 (2.8)   | 3 (2.8)   | 2 (1.9)   |
| Start injection IV bolus, or IV push via IV drip                   | 69 (64.5) | 21 (19.6) | 12 (11.2)        | 2 (1.9)   | 2 (1.9)   | 1 (0.9)   |
| Removing a nasogastric tube  | 70 (65.4) | 22 (20.6) | 7 (6.5)          | 2 (1.9)   | 6 (5.6)   | 0 (0.0)   |
| Inserting a urinary (Foley) catheter, male                         | 27 (25.2) | 16 (15.0) | 23 (21.5)        | 14 (13.1) | 19 (17.8) | 8 (7.5)   |
| Inserting a urinary (Foley) catheter, female                       | 43 (40.2) | 18 (16.8) | 15 (14.0)        | 7 (6.5)   | 17 (15.9) | 7 (6.5)   |
| Irrigating a urinary (Foley) catheter                              | 51 (47.7) | 14 (13.1) | 13 (12.1)        | 11 (10.3) | 15 (14.0) | 3 (2.8)   |
| Irrigating the bladder using a closed-system catheter              | 70 (65.4) | 11 (10.3) | 9 (8.4)          | 7 (6.5)   | 8 (7.5)   | 2 (1.9)   |
| Removing a urinary (Foley) catheter                                | 41 (38.3) | 17 (15.9) | 9 (8.4)          | 14 (13.1) | 14 (13.1) | 12 (11.2) |
| Administering oxygen therapy                                       | 41 (38.3) | 21 (19.6) | 16 (15.0)        | 10 (9.3)  | 11 (10.3) | 8 (7.5)   |
| Ventilating with an Ambu bag                                       | 52 (48.6) | 16 (15.0) | 15 (14.0)        | 10 (9.3)  | 10 (9.3)  | 4 (3.7)   |
| Drawing blood from a central venous catheter                       | 73 (68.2) | 16 (15.0) | 6 (5.6)          | 6 (5.6)   | 3 (2.8)   | 3 (2.8)   |
| Proper hand washing  | 2 (1.9)   | 5 (4.7)   | 8 (7.5)          | 14 (13.1) | 22 (20.6) | 56 (52.3) |
| Proper surgical scrubbing  | 6 (5.6)   | 9 (8.4)   | 13 (12.1)        | 17 (15.9) | 25 (23.4) | 37 (34.6) |
| Preparing a surgical site  | 41 (38.3) | 21 (19.6) | 12 (11.2)        | 13 (12.1) | 9 (8.4)   | 11 (10.3) |
| Applying a dry dressing  | 46 (43.0) | 22 (20.6) | 10 (9.3)         | 8 (7.5)   | 9 (8.4)   | 12 (11.2) |
| Applying a wet to damp dressing (wet to dry to moist dressing)     | 59 (55.1) | 20 (18.7) | 10 (9.3)         | 5 (4.7)   | 7 (6.5)   | 6 (5.6)   |
| Applying a transparent dressing                                    | 64 (59.8) | 16 (15.0) | 10 (9.3)         | 4 (3.7)   | 8 (7.5)   | 5 (4.7)   |
| Applying a pressure bandage  | 54 (50.5) | 24 (22.4) | 8 (7.5)          | 5 (4.7)   | 11 (10.3) | 5 (4.7)   |
| Applying an elastic bandage  | 61 (57.0) | 14 (13.1) | 11 (10.3)        | 8 (7.5)   | 8 (7.5)   | 5 (4.7)   |
| Changing dressing around therapeutic puncture sites                | 68 (63.6) | 13 (12.1) | 13 (12.1)        | 4 (3.7)   | 6 (5.6)   | 3 (2.8)   |
| Irrigating a wound   | 64 (59.8) | 18 (16.8) | 10 (9.3)         | 4 (3.7)   | 8 (7.5)   | 3 (2.8)   |
| Packing a wound  | 71 (66.4) | 14 (13.1) | 9 (8.4)          | 6 (5.6)   | 4 (3.7)   | 3 (2.8)   |
| Pouching a draining wound  | 78 (72.9) | 15 (14.0) | 9 (8.4)          | 3 (2.8)   | 2 (1.9)   | 0 (0.0)   |
| Cleaning and dressing a wound with an open drain                   | 73 (68.2) | 14 (13.1) | 9 (8.4)          | 5 (4.7)   | 4 (3.7)   | 2 (1.9)   |
| Obtaining a wound drainage specimen for culturing                  | 74 (69.2) | 16 (15.0) | 6 (5.6)          | 7 (6.5)   | 1 (0.9)   | 3 (2.8)   |
| Maintaining a closed wound drainage system                         | 73 (68.2) | 13 (12.1) | 11 (10.3)        | 8 (7.5)   | 2 (1.9)   | 0 (0.0)   |
| Care of JP drain site and emptying the drain bulb                  | 91 (85.0) | 7 (6.5)   | 6 (5.6)          | 3 (2.8)   | 0 (0.0)   | 0 (0.0)   |
| Removing skin sutures and staples                                  | 62 (57.9) | 20 (18.7) | 6 (5.6)          | 7 (6.5)   | 4 (3.7)   | 8 (7.5)   |
| Donning and removing clean and contaminated gloves, caps and masks | 41 (38.3) | 18 (16.8) | 14 (13.1)        | 12 (11.2) | 7 (6.5)   | 15 (14.0) |
| Applying sterile gloves via the open method                        | 32 (29.9) | 21 (19.6) | 15 (14.0)        | 13 (12.1) | 12 (11.2) | 14 (13.1) |
| Applying sterile gloves and gown via the closed method             | 31 (29.0) | 22 (20.6) | 9 (8.4)          | 13 (12.1) | 16 (15.0) | 16 (15.0) |
| Applying a splint  | 68 (63.6) | 16 (15.0) | 8 (7.5)          | 8 (7.5)   | 4 (3.7)   | 3 (2.8)   |
| Applying an arm sling  | 67 (62.6) | 14 (13.1) | 11 (10.3)        | 6 (5.6)   | 4 (3.7)   | 5 (4.7)   |
| Administering CPR  | 38 (35.5) | 31 (29.0) | 12 (11.2)        | 9 (8.4)   | 12 (11.2) | 5 (4.7)   |
| Applying a cervical spine (neck) collar                            | 58 (54.2) | 21 (19.6) | 11 (10.3)        | 6 (5.6)   | 6 (5.6)   | 5 (4.7)   |
| Removing a cervical spine (neck) collar                            | 60 (56.1) | 20 (18.7) | 9 (8.4)          | 8 (7.5)   | 6 (5.6)   | 4 (3.7)   |

IV - intravenous, JP - Jackson-Pratt, CPR -cardiopulmonary resuscitation

by most students in performing abdominal examination (n=84; 78.5%), and thyroid gland examination (n=80; 74.8%). On the other hand, a large number of students reported low confidence level ( $\leq 75\%$ ) in performing examination of ulcers (n=77; 72%) and examination of the genitourinary system (n=76; 71.1%). More than half of our participants reported self-confidence level of more than 75% in performing only 2 of 39 diagnostic and treatment procedures' skills (Table 3).

These skills were proper hand washing (n=78; 72.9%) and proper surgical scrubbing (n=62; 58%). On the other hand, an overwhelming number of students reported 0% confidence in caring of Jackson-Pratt (JP) drain site and emptying the drain bulb (n=91; 85%), and pouching a draining wound (n=78; 72.9%). Also, for some critically important skills used in multiple trauma management (for example; applying a neck collar, inserting a urinary catheter and administering

**Table 4** - The association between the students' sociodemographic characteristics and the total confidence score using Mann-Whitney and Kruskal-Wallis tests for the academic year 2010/2011.

| Characteristic                  | Total confidence score |     |                    |
|---------------------------------|------------------------|-----|--------------------|
|                                 | Median                 | IQR | P-value            |
| <i>Age, years</i>               |                        |     | 0.620 <sup>†</sup> |
| <23                             | 83.00                  | 62  |                    |
| ≥23                             | 77.00                  | 59  |                    |
| <i>Nationality</i>              |                        |     | 0.927 <sup>†</sup> |
| Kuwaiti                         | 77.00                  | 60  |                    |
| Non-Kuwaiti                     | 89.00                  | 71  |                    |
| <i>Gender</i>                   |                        |     | 0.021 <sup>†</sup> |
| Male                            | 98.00                  | 69  |                    |
| Female                          | 70.00                  | 57  |                    |
| <i>Marital status</i>           |                        |     | 0.451 <sup>†</sup> |
| Married                         | 74.00                  | 38  |                    |
| Not married                     | 80.00                  | 62  |                    |
| <i>Monthly family income</i>    |                        |     | 0.002 <sup>†</sup> |
| ≤2000 Kuwaiti Dinars            | 66.50                  | 47  |                    |
| >2000 Kuwaiti Dinars            | 98.00                  | 67  |                    |
| <i>Governorate</i>              |                        |     | 0.163 <sup>‡</sup> |
| Al-Ahmadi                       | 127.00                 | 0   |                    |
| Al-Asimah                       | 76.50                  | 67  |                    |
| Al-Farwaniya                    | 83.00                  | 65  |                    |
| Al-Jahra                        | 38.00                  | 0   |                    |
| Hawalli                         | 77.00                  | 58  |                    |
| Mubarak Al-Kabeer               | 78.00                  | 60  |                    |
| <i>Year of study</i>            |                        |     | 0.610 <sup>‡</sup> |
| Fifth                           | 77.00                  | 63  |                    |
| Sixth                           | 77.00                  | 62  |                    |
| <i>GPA (out of 4)</i>           |                        |     | 0.613 <sup>‡</sup> |
| <2.5                            | 77.00                  | 56  |                    |
| 2.5-3.0                         | 77.00                  | 61  |                    |
| >3.0                            | 78.00                  | 87  |                    |
| <i>Aim for future specialty</i> |                        |     | 0.062 <sup>‡</sup> |
| Did not decide yet              | 72.50                  | 57  |                    |
| Surgical*                       | 110.50                 | 54  |                    |
| Non-surgical                    | 76.00                  | 59  |                    |

\*Surgical specialties include Obstetrics and Gynecology, <sup>†</sup>Mann-Whitney test, <sup>‡</sup>Kruskal-Wallis test, IQR - Interquartile Range, KD - Kuwait Dinars, GPA - Grade Point Average

cardiopulmonary resuscitation), more than 50% of the students reported confidence level of 50% or less. The median was 77.00, and the interquartile range (IQR) was 60 of the total confidence score of the participants, and the range was from 14-212 out of 260. The Mann-Whitney analysis revealed that the confidence score was significantly associated with the gender ( $p=0.21$ ), and monthly family income of the students ( $p=0.002$ ) (Table 4). The median rank was higher among male students and among students with a monthly family income of >2000 KD. Other sociodemographic characteristics were not significantly associated with the total confidence score.

**Discussion.** In this study, the overall self-confidence of medical students in performing clinical skills was sub-optimal. Our analysis showed medical students in FOMKU appear to be more confident in performing history taking and physical examination skills than in performing diagnostic and treatment procedures' skills. These results are similar to those of an earlier study conducted at the University of Göttingen, Germany, where medical students reported higher competence level in performing history taking and physical examination compared to technical skills such as arterial blood sampling, IV cannulation, bladder catheterization and other procedures.<sup>14</sup> Similar to our students, the average self-confidence in performing physical examination by medical students of the Warren Alpert Medical School of Brown University, USA, was found to be slightly above the neutral level.<sup>15</sup> The higher self-confidence level in performing history taking and physical examination skills compared to performing diagnostic and treatment procedures' skills found among students in this study may be due to the fact that they start practicing these skills early in their preclinical years on simulated patients, mannequins and standardized patients; however, similar teaching is not carried out for diagnostic and treatment procedures. Allowing medical students to practice their skills using simulated and standardized patients provides adequate learning experience.<sup>16,17</sup> Simulation provide an opportunity to learn new skills and to practice previously acquired ones,<sup>18</sup> and to learn from mistakes in a safe, non-threatening teaching environment.<sup>19</sup> It also increases the students' confidence in performing physical examination skills.<sup>20</sup> As well, the use of standardized patients in teaching clinical skills was shown to be useful, and improved the performance of medical students in the OSCE.<sup>21</sup> To improve teaching clinical skills in FOMKU, simulation and standardization may be helpful if used properly. Integrating standardized patients with bedside teaching is also a suggested method for improving learning clinical skills.<sup>22,23</sup>

A large number of students appeared to have no confidence (0%) in performing many skills, which is likely to mean that students did not learn or practiced the required skills. On the other hand, some of our participants took surgical electives in non-teaching hospitals in Kuwait and hospitals outside Kuwait. This might have resulted in some students having high self-confidence compared to their colleagues.

Previous studies demonstrated that the practitioner's gender could affect the self-confidence in performing clinical skills.<sup>12</sup> This was similar to our results; however,

no explanation for this association can be found. Moreover, a higher monthly family income revealed positive association with the confidence score. This might be due to the fact that with a higher income, students can register in private clinical skills simulation courses and abroad electives giving more experience in bedside teaching compared to their colleagues, which had less income. The relation between self-confidence and competence in performing a skill/procedure was demonstrated in previous studies, where confidence can be used as a marker for competence but with weak correlation.<sup>24-26</sup> However, procedural confidence is of intrinsic importance, as it influences the practitioners' willingness to undertake procedures, accurate self-assessment of their skills, and willingness to ask for support.<sup>27</sup> Thus, confidence in performing procedures is an important target for maintaining competency, because confidence affects the performance of the practitioner.<sup>28</sup>

Although this study was able to demonstrate a problem in clinical skills education, it has some limitations. The students enrolled in the study did not share the same clinical exposure. Some students were more seniors and were exposed to more clinical teaching in Surgery and other disciplines, while others completed a surgical elective before participating in the study. This difference in clinical experience might have improved the self-confidence of some students. Moreover, the association between self-confidence and OSCE scores or other clinical examinations were not assessed in this study, so that, the students might be able to perform the skills properly but they are not confident in doing so. In addition, we did not know how confident the students were in performing the skills before starting their surgical rotation, so that, we were not able to identify if this rotation did improve their confidence or not. The self-confidence could also be affected by the type of personality of the students, which was not assessed in this study. Also, the nature of this study and its questionnaire, which was self-reporting, made this study vulnerable for systematic bias due to self-selection. Ahmed<sup>29</sup> categorized the factors that may affect bedside/clinical teaching into 4 groups. These factors are related to teachers, students, patients and teaching curricula. Therefore, curriculum planners in FOMKU may explore these factors to identify possible reasons for inadequate clinical skills teaching in their school. The student-patient interactions in teaching hospitals in Kuwait were assessed recently by Marwan et al,<sup>30</sup> and they concluded that patients usually refuse to allow medical students to practice their skills on them. However, other factors that may affect bedside teaching should be explored in

Kuwait to ensure proper development of the medical curriculum. As future directions, the FOMKU should aim to identify these factors to improve clinical skills education.

In conclusion, self-confidence of medical students of FOMKU in performing clinical skills/procedures acquired during their surgical rotation was sub-optimal. This emphasizes the need to evaluate the teaching curriculum continuously in order to ensure high quality teaching. Curriculum planners in FOMKU should look for possible reasons for the poor confidence level in performing clinical skills/procedures in order to implement new methods to improve clinical skills education. We also recommend the evaluation of self-confidence of medical students in performing clinical skills to evaluate bedside teaching in other disciplines (for example; Medicine, Pediatrics, and so forth), and in other institutes.

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**Appendix 1** - The clinical skills in the Faculty of Medicine of Kuwait University are ranked as follows:

|        |  |
|--------|--|
| Rank 1 | The graduating doctor shall have a theoretical knowledge of the prescribed procedure such that he/she can demonstrate a satisfactory knowledge level in the area concerned. Importantly, the graduating doctor can prepare any patient/relative who is likely to undergo such a procedure with informative details and in particular the potential adverse effects. This theoretical base shall be assessed with tests of knowledge.   |
| Rank 2 | The graduating doctor shall have seen and become familiar with the prescribed procedure (usually on more than one occasion) and offer proof of this with stamped and signed evidence from a competent teacher in a logbook which he/she may be asked to produce as evidence before any practical examination, and be tested with either test of knowledge or as part of the logbook entry.   |
| Rank 3 | During the course of their training, a graduating doctor shall have performed the skill/procedure usually under supervision by a qualified doctor or member of the Health Care Team, which a satisfactory record made in a logbook or during mini-clinical evaluation exercise (mini-CEX).   |
| Rank 4 | The graduating doctor should perform with confidence the complete procedure/skill on a patient whom he/she has properly prepared and deliver an accuracy which is in accord with that of the procedure/skill result. Where the procedure shall give a result, this shall be interpreted correctly and any subsequent action shall be done appropriately. When asked to do so, the graduating doctor shall be able to satisfy stringent assessment criteria used in an Objective Structured Clinical Examination (OSCE) station |