

International internship experience for emergency medical service paramedic students

ABSTRACT

Introduction: The purpose of this study is to delineate the training activities in the internship program, describe students' clinical and emergency medical service field hours and skills performance, and compare between internship students groups in their skills performance.

Methods: This is a retrospective, descriptive, and analytical study based on an interpretive observational documentary review of internship reports received on internship students.

Results: Three groups of internship students participated in various training activities in 3 years. Students in Group A (2015) completed 4610 h and contact 1600 patients. They completed the following clinical skills: 712 medication administrations, 652 intravenous (IV) access, 174 team leads (TLs), 4 live patient endotracheal intubations, and 13 ventilations. Students in Group B (2016) completed 2424 h and contact 797 patients. They completed several clinical skills including 256 medication administrations, 249 IV access, 16 TLs, 1 live patient endotracheal intubation, and 8 ventilations. Students in Group C (2017) completed 5700 h and contact 1200 patients. They completed several skills including 673 medication administrations, 650 IV access, 198 TLs, 11 live patient endotracheal intubations, and 27 ventilations. The study revealed significant differences and superiority in skills performance in Groups A (2015) and C (2017) over Group B (2016).


Conclusion: Internship students have exposure opportunities to patients and have more opportunities to perform medication administration, IV activities, and serve as TLs. As expected, internship students have few opportunities to perform live tube insertions and ventilation. There are statistical significant differences in skills performance within the group of students in each year and among the three groups of internship students.

Key words: Clinical skills; emergency medical service; emergency medical service field skills and skills performance; internship; paramedic

Introduction

The internship program for paramedic students is intended to help them practice medical interventions through exposure to patients in prehospital or hospital settings. It provides opportunities to paramedic students to learn

skills, ensuring their competency. Prince Sultan Bin Abdulaziz College for Emergency Medical Service (PSCEMS) realized that some objectives of its paramedic program curriculum were not being achieved through local internship placement.

Access this article online	
Website: www.saudija.org	Quick Response Code 
DOI: 10.4103/sja.SJA_146_18	

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

How to cite this article: Alrazeeni D. International internship experience for emergency medical service paramedic students. Saudi J Anaesth 2018;12:540-7.

DAIFALLAH ALRAZEENI^{1,2}

¹EMS Department, Prince Sultan Bin Abdulaziz College for EMS, King Saud University, ²Chair of Saudi Association for Emergency Medical Services, Riyadh, Saudi Arabia

Address for correspondence: Dr. Daifallah Alrazeeni, Prince Sultan Bin Abdulaziz College for EMS, King Saud University, Riyadh, Saudi Arabia. E-mail: dalrazeeni@ksu.edu.sa

PSCEMS was established in 2010 at King Saud University (KSU), Riyadh, Saudi Arabia. The EMS Bachelor program curriculum and its objectives and learning outcomes were developed based on the United States (US) national standards curriculum for paramedics while considering Saudi market needs. The course objectives and syllabus were extracted from the main three teaching tools for paramedics (textbooks by Mosby, Brady, and Nancy Coralline). These teaching tools are in harmony with the principles and requirements of the American Ministry of Transportation presented in the EMS ACT published in 1973. Officials at PSCEMS recognized the gap between EMS practice in Saudi Arabia and the themes presented in the paramedic textbooks that needed to be addressed. The gap appears in the clinical practice in which the EMS setting and ideal practice described in textbooks varies from the Saudi EMS system, which confuses students.

Therefore, the idea of a 6-month internship program for PSCEMS students in the US was initiated, which takes place in the second half of students' internship year. KSU approved financial support of 2 million Saudi Riyals (equivalent to 500,000.00 USD) a year for the annual internship program. This covers students' tuition fees, medical insurance, airfare, and living expenses.

KSU and Creighton University (CU) entered into a collaboration to start the internship program by signing a mutual memorandum of understanding. An internship training program was designed to provide paramedic students at PSCEMS with EMS internship experience at US EMS agencies and hospitals in Omaha city, NE. Accordingly, students had the opportunity to gain clinical practicum experiences, a paramedic psychomotor skills review and assessment.

Omaha is the largest city in the state of Nebraska. According to the 2010 census, the population was 408,958 and estimated to increase to 446,970 by 2016.^[1] The (2015) National Run Survey revealed that the volume of 911 calls in the city was 48,712, most of which were EMS calls.^[2]

Three groups of students completed the internship program. They were groups of 13, 12, and 13 students, respectively. This year (2018), 17 students are currently in the program. For better outcomes of the internship program, PSCEMS implements strict measures to select the best internship student applicants. For instance, a grade point average of 4.0 and International English Language Testing System of 5.5 are required. Furthermore, internship committee interviews are conducted and an academic and behavioral report on the student was prepared. In addition, students must be certified as a provider by the American Heart Association in several courses.

The purpose of this study is to delineate the training activities in the internship program, describe students' clinical and EMS field hours and skills performance, and compare between internship students' groups in their skills performance.

Literature review

A limited literature review addressed the undergraduate paramedics internship.^[3,4] O'Brien *et al.*^[5] contended that a 4-year bachelor paramedic program could provide students with a strong educational foundation and sufficient hands-on practical experience. Boyle *et al.*^[6] noted that paramedic programs incorporate theoretical knowledge taught alongside experiential clinical practice in emergency and nonemergency ambulances and hospital departments.

In paramedic programs, clinical placement enables the integration of theoretical knowledge gained with real-life exposure to patients (Lord *et al.*, 2009).^[6-9] It enables paramedic graduates with the means to develop their communication skills as well as professional socialization, an interdisciplinary work environment, professional methodology, and an environment in which to practice psychomotor skills.^[8] Yorke and Mantz^[10] described work-integrated learning (WIL) as an essential component of paramedic education. It provides opportunities for a learning experience to paramedic students and enables the integration of theory and practice.^[11]

However, paramedic programs were criticized as having a limited scope or capacity in terms of the duration of clinical education.^[6] The literature implies that insufficient preparation of and support for new paramedics may induce poor outcomes and inadequate preparation for the transition into the workplace.^[3] Therefore, studies concluded that most paramedic graduates do not feel they have accumulated adequate experience before beginning their employment in an ambulance.^[6,8,12]

Michau *et al.*^[8] identified a theory-practice gap in paramedic education by investigating the types of cases students were exposed to during clinical placements. The study concluded that paramedic students were able to practice only 50% of the skills they learnt during their clinical internship placements. This gap between knowledge attainment and practical application may hinder professional competence.^[13] Factors promoting deficiencies in clinical placement for paramedic students stem from a shortage of training funds, shortage of monitoring staff, limited access to patients, and an increasing number of students at the required sites (Cooper, 2005).^[14]

The shortcomings in clinical practice are largely due to scheduling constraints and a high demand for clinical placements.^[15] Further shortcomings include inadequate exposure to critically ill or injured patients,^[6] a lack of advanced clinical skills among practicing paramedics,^[15] and the short duration of clinical experience. Therefore, Boyle *et al.*^[6] reported that many students were not satisfied with their learning experiences during the clinical placement period, which resulted in wasted learning opportunities.

In general, clinical placement for paramedic internship students is completed locally. However, international WIL is becoming increasingly common as it provides students with adequate experience.^[16] This study adds to the EMS research knowledge and insights by presenting the experience of PSCEMS in its student internship initiative.

Methods

This is a retrospective, descriptive, and analytical study based on interpretive observational documentary review of internship reports received from EMS team at CU (the host of internship program led by Dr. Mike Miller) about the internship students. PSCEMS receives regular progress and summary report attached to supplementary Excel sheet data of the students' clinical and field performance. For interpretation and explanation, data were reviewed, analyzed, and presented for each group as it is categorized based on various variables. Moreover, statistics of the anonymous students' skills performance was presented. For data analysis, mean count (X), standard deviation (std. dev.), and standard error (std. error) were calculated. In addition, one-way analysis of variance (ANOVA) is used to examine if there is a statistical significant difference within each group of students and comparison between the groups. To obtain this *P* value, multiple comparisons and *t*-test were used using Statistical Package for the Social Sciences (SPSS) Version 11.0 software package.

Results

Results of the study are organized based on the study objectives stated and are as follows:

Clinical and Emergency Medical Service field training activities

The highlights regarding internship student activities are provided as follows:

Training hours

Table 1 show that the areas of patient care engaged in for internship included field internship-ambulance, emergency room (ER), Children's ER, respiratory therapy (Resp.), catheterization laboratory (Cath. Lab), and Critical care unit (CCU). Some departments were excluded in certain year based on CU requirements. Students in Group A (2015) completed more than 2372 and 2238 clinical and field internship practicum hours, respectively, with more than 4610 of total hours completed. The mean count (X) for each student was 354.6 h. Students in Group B (2016) completed over 1458.7 and 965 clinical and field internship practicum hours, respectively, with total hours completed of more than 2424 (X = 202). Students in Group C (2017) completed over 2,200 and 3,400 clinical and field internship practicum hours, respectively, with total number of hours completed of more than 5700 (X = 476).

Table 1 illustrates that field hours audit for each internship student was at its highest level in Group C (2017) and Group A (2015); however, in Group B (2016), it was at the lowest level. On the other hand, Figure 1 shows that it is obvious that the time duration consumed for the ER hours audit in each internship student, i.e., in Group A (2015), Group B (2016), and Group C (2017) is high. It shows that the highest number of Intensive Care Unit (ICU)/CCU hours audit and Resp. hours audit was completed at the highest by students in Group C (2017) then Group A (2015) following

Table 1: The combined clinical and field hours, patient contacts, and skills performed for the three internship groups

Internship/year (students)	Clinical and field hours			Patient contacts		Skills					
	Clinical hours audit	Field hours completed	Total clinical and field hours	Patient contacts clinical	Patient contacts field	Meds	Intravenous	Team leads	Live tubes	Ventilations	Total
Group A (2015) (13 students)	2372	2238.15	4610.15	1048	548	712	652	174	4	13	1555
Mean (X)	182.4	172.1	354.6	80.6	42.1	54.7	50.1	13.3	0.30	1	119.4
Group B (2016) (12 students)	1458.75	965.5	2424.25	494	303	256	249	16	1	8	530
Mean (X)	121.5	80.45	202	41.1	25.2	21.3	20.7	1.33	0.08	0.6	43.6
Group C (2017) (13 students)	2256.25	3457	5713.25	351	863	673	650	198	11	27	1559
Mean (X)	188	288	476.12	27	66.3	51.7	50	15.2	0.8	2.0	119.7

Group B (2016). This indicates the duration required to spend by students in these department is much less. Cath. Lab audit and Children’s ER audit were applied in only 1 year and stopped later.

Patients contact

Table 1 and Figure 2 show that students had contact with patients in the clinical and in the EMS field. Students of Group A (2015) had contact with nearly 1600 patients (X = 122), 1048 in the clinical arena and 548 in the EMS field. Students in Group B (2016) had contact with nearly 797 patients (X = 66), 494 in the clinical arena and 303 in the EMS field. Students in Group C (2017) had contact with over 1200 patients (X = 93), 351 in the clinical arena and 863 in the field. It appears that for Group A (2015), the focus was clearly on the patient contact clinical as well as in Group B (2016); however, students in Group C (2017) were more likely to be directed to patient contact in the EMS field work.

Skills performance

Tables 1-3 and Figures 3 and 4 present descriptive statistics for the skills performance variables of the three internship student groups. 5 skills studied are medication administration (M), intravenous (IV) access, live patient endotracheal intubations Life tube (LT), ventilation (V) and EMS call team lead (TL) mean count (X), std. dev. and std. error were calculated.

Students in Group A(2015) completed the following clinical skills: 712 medication administrations (X = 54.77, std. dev. = 39.42, and std. error = 10.93), 652 IV access (X = 50.15, std. dev. = 17.96 and std. error = 4.98), 174 TLs (X = 13, std. dev. = 14.63 and std. error = 4.05), 4 live patient endotracheal intubations (X = 0.3, std. dev. = 0.75 and std. error = 0.20), and 13 ventilations (X = 1, std. dev. = 1.52 and std. error = 0.42). The total number of skills practiced by Group A was 1555. Among this Group A, 3 students administered medications more than 100 times, while 3 demonstrated this skill <20 times.

Student in Group B (2016) completed several clinical skills including 256 medication administrations (X = 21.33, Std Dev. = 16.68 and std. error = 4.81), 249 IV access (X = 20.75, std. dev. = 11.15 and std. error = 3.22),16 TLs (X = 1.3, std. dev. = 1.77 and std. error = 0.51), 1 live patient endotracheal intubation (X = 0.08, std. dev. = 0.28 and std. error = 0.08), and 8 ventilations (X = 0.67, std. dev. = 1.07 and std. error = 0.31). The total number of skills practiced by Group B was 530. Among this Group B, the performance of students was low overall. For this Group B, 3 students administered medications <3 times, while the rest varied between 11 and 46 times.

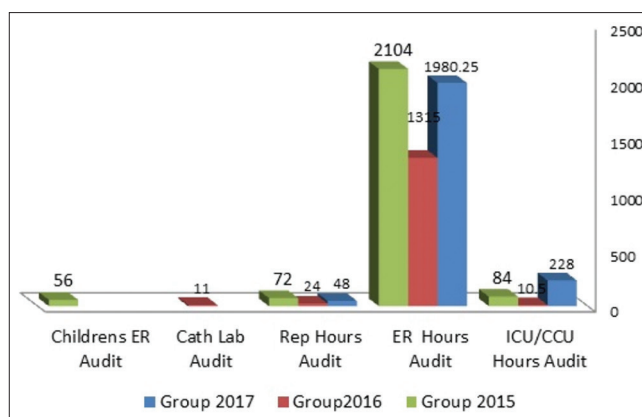


Figure 1: Field hours audit for each internship student

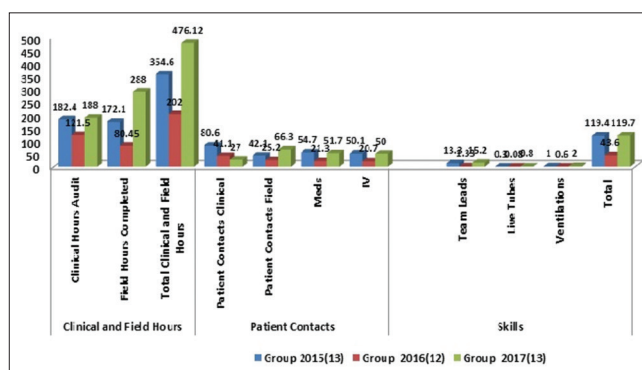


Figure 2: Patient contacts

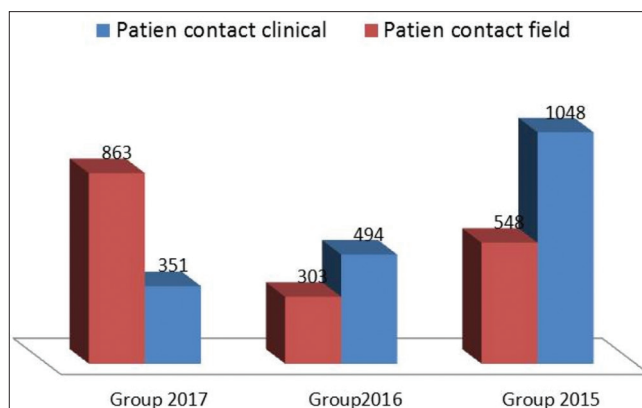


Figure 3: Mean distribution of clinical practicum groupwise

Students in Group C (2017) completed several skills including 673 medication administrations (X = 51.7, std. dev. = 25.51 and std. error = 7.07), 650 IV access (X = 50, std. dev. = 26.39 and std. error = 7.32), 198 TLs (X = 9.92, std. dev. = 11.56 and std. error = 3.20), 11 live patient endotracheal intubations (X = 0.8, std. dev. = 18.99 and std. error = 5.26), and 27 ventilations (X = 2.2, std. dev. = 2.42 and std. error = 0.64). The total number of skills practiced by this Group C was 1,559. Among this Group B, only 1 student administered medications more than 100 times, while two students demonstrated this skill

Table 2: Skills performance of each internship student

Student #	Group A (2015) (13 students)					Group B (2016) (12 students)					Group C (2017) (13 students)						
	Meds	Intravenous	Team lead	Live tubes	Ventilations	Student #	Meds	Intravenous	Team lead	Live tubes	Ventilations	Student #	Meds	Intravenous	Team lead	Live tubes	Ventilations
ST1	51	40	31	2	3	ST1	43	18	2	0	0	ST1	23	38	0	3	2
ST2	46	26	9	0	1	ST2	0	4	0	0	0	ST2	47	52	1	1	3
ST3	60	51	2	0	2	ST3	46	25	0	0	0	ST3	48	38	26	1	0
ST4	102	73	8	0	0	ST4	2	6	0	0	0	ST4	36	16	12	0	3
ST5	51	36	14	0	0	ST5	29	39	5	0	0	ST5	39	43	1	0	0
ST6	54	60	17	0	0	ST6	24	24	3	1	0	ST6	45	48	5	0	9
ST7	58	52	15	2	0	ST7	42	31	3	0	2	ST7	43	114	34	0	2
ST8	13	31	1	0	0	ST8	27	36	3	0	3	ST8	35	42	8	0	2
ST9	7	40	0	0	1	ST9	1	14	0	0	0	ST9	56	29	27	1	4
ST10	107	85	31	0	1	ST10	11	20	0	0	1	ST10	23	33	2	1	0
ST11	134	66	46	0	5	ST11	11	10	0	0	0	ST11	82	37	6	0	1
ST12	15	32	0	0	0	ST12	20	22	0	0	2	ST12	105	81	7	0	1
ST13	14	60	0	0	0	ST13	0	0	0	0	0	ST13	91	79	69	4	0
Total	712	652	174	4	13	Total	256	249	16	1	8	Total	673	650	198	11	27

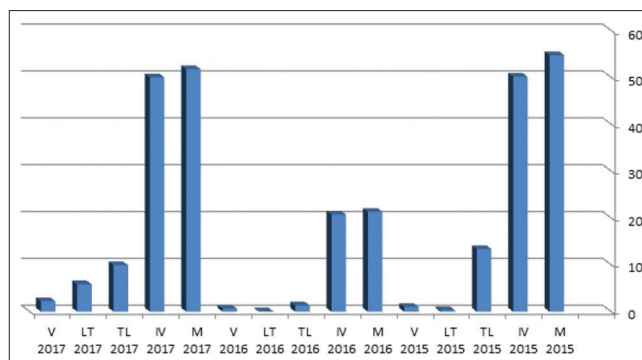


Figure 4: Mean average of skill performance

23 times. Most students in this Group B vary between these two figures.

It is apparent that the students in Groups A (2015) and C (2017) share highest level of skills performance while it was significantly decreased among students in Group B (2016). The variation continues between the students' groups regarding IV insertions. Only 1 student in Group C (2017) applied 114 IVs, while 2 students in Group B (2016) performed this skill < 10 times. The majority of students had opportunities to practice their IV skills. The opportunity for students to act as team leaders varied significantly and low overall in the three groups. Although 10 students did not have the opportunity to lead the crew in any EMS calls, most did so few times. Live intubation and ventilation skills seem rare since most students never perform these during their internships. However, one student in Group C (2017) performed an LT 4 times and another 3 times. Regarding ventilations, two students in Group C (2017) performed this skill 9 and 4 times (respectively), one student in Group A (2015) five times, and 4 students from all three groups 3 times. All levels of performance are close between Group A (2015) and Group C (2017) while it is significantly low among the Group B (2016) for the 5 skills.

Comparison analysis

For this study, the 0.05 levels of significance and $P > 0.05$ were applied to indicate no significant differences between students' skills performance within the groups and $P < 0.05$ to indicate a significant difference. Table 4 shows the value of F significance is <0.05 indicating statistical significant differences in the students' performance regarding the 5 skills in each group over the years.

In addition, a multiple comparisons in ANOVA were applied to compare between the students' skills performance between the Groups A (2015), B (2016), and C (2017). Table 5 illustrates that the value of F significance <0.05, meaning that there are statistically significant differences between students in the groups.

Moreover, a *t*-test at a significance level of 0.05 was used in order to determine which group was better performance. Table 6 and Figure 5 show that there are statistically significant differences and superiority in performance in Groups A (2015) and C (2017) over Group B (2016). However, there are no statistically significant differences between the performance of students in Groups A (2015) and C (2017).

Discussion

This study presents the KSU-CU internship program experience for 3 groups over three consecutive years. Its focus of the study is to delineate the training activities in the internship program, describe students' clinical and EMS field hours and skills performance, and compare between internship student groups in their skills performance.

The KSU-CU internship program has benefited the EMS program at PSCEMS and has become another area of competition among students. New students join the EMS program and are motivated to work hard to have the opportunity to be one of the students completing their internship in the US. The internship program seems to have added value to PSCEMS students who completed the program.

During the internship program, students participate in various distinguished activities related to the EMS profession that enriches their experience. The results revealed that the internship program helped PSCEMS students accomplish several learning means mentioned in Michau *et al.*^[8] such as communication skills development, professional socialization, an interdisciplinary work environment, a professional methodology, and enables them to practice their psychomotor skills. Internship students integrated with the CU EMS Club, and EMS simulation team utilized the FISDAP software package to enter their training skills.

The literature review identified factors triggering skill deficiencies and a theory-practice gap in paramedic programs. These factors could be attributed to the shortage of training funds, shortage of monitoring staff, students scheduling constraints at required clinical sites, inadequate exposure to patients, and insufficient skills among paramedics. The PSCEMS EMS program regularly faces some of these challenges in local internship clinical placement. However, by implementing the KSU-CU internship program, most have been avoided.

The literature review indicated that a bachelor's paramedic program provides the opportunity to integrate theoretical knowledge and experimental clinical practice by enabling

Table 3: Descriptive statistics for the skills performance of each internship student

Year	<i>n</i>	Mean	SD	SE
Meds 2015	13	54.77	39.423	10.934
Intravenous 2015	13	50.15	17.962	4.982
Team lead 2015	13	13.38	14.632	4.058
Live tubes 2015	13	0.31	0.751	0.208
Ventilations 2015	13	1.00	1.528	0.424
Meds 2016	12	21.33	16.681	4.815
Intravenous 2016	12	20.75	11.153	3.220
Team lead 2016	12	1.33	1.775	0.512
Live tubes 2016	12	0.08	0.289	0.083
Ventilations 2016	12	0.67	1.073	0.310
Meds 2017	13	51.77	25.515	7.077
Intravenous 2017	13	50.00	26.398	7.321
Team lead 2017	13	9.92	11.565	3.207
Live tubes 2017	13	5.85	18.995	5.268
Ventilations 2017	13	2.21	2.424	0.648

SD: Standard deviation; SE: Standard error

Table 4: Analysis of variance for the skills performance of each internship student

	Sum of squares	df	Mean square	<i>F</i>	Significant
Between groups	84,305.529	14	6021.823	20.465	0.000
Within groups	51,788.293	176	294.252		
Total	136,093.822	190			

Table 5: Analysis of variance for the skills performance of each internship student years (2015-2017)

	Sum of squares	df	Mean square	<i>F</i>	Significant
Between groups	9185.343	2	4592.671	6.804	0.001
Within groups	126,908.479	188	675.045		
Total	136,093.822	190			

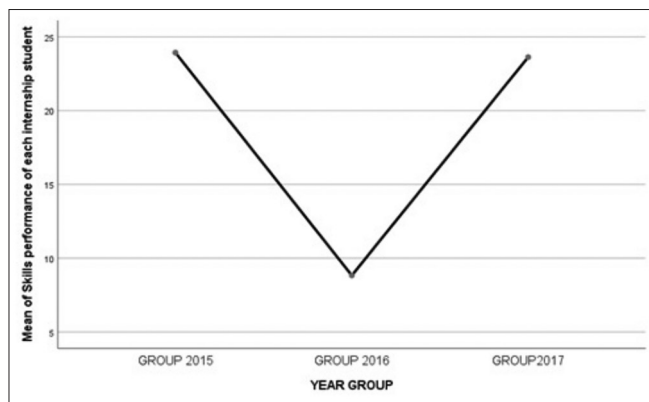
real-life exposure to patients in ambulances and hospitals. The KSU-CU internship program enabled PSCEMS students to practice their clinical skills on an academic level in hospitals and in the EMS field in Omaha, NE, where EMS is implemented in accordance with the procedures outlined in textbooks.

For Group A (2015) students, the CU arranged clinical placement in the departments, namely the ER, Children's ER, ICU and cardiac care units (CCU) and respiratory unit. Paramedic students spend more time in the ER to practice their clinical skills and observe the treatment and management of emergency cases. However, with the Group B (2016), the departments selected in the hospital for practice were modified. The Children's ER was replaced with the Cath. Lab. This change may have been related to the sensitivity of that department and cultural and language differences. Moreover, for Group C (2017), students were dispatched to only three departments for their internships, namely the ER, ICU/CCU,

Table 6: Analysis of variance for the skills performance of each internship student years

Year group (I)	Year group (J)	LSD multiple comparisons				
		Mean difference (I-J)	SE	Significant	95% CI	
					Lower bound	Upper bound
Group A (2015)	Group B (2016)	15.090*	4.651	0.001	5.91	24.27
	Group C (2017)	0.302	4.540	0.947	-8.65	9.26
Group B (2016)	Group A (2015)	-15.090*	4.651	0.001	-24.27	-5.91
	Group C (2017)	-14.788*	4.635	0.002	-23.93	-5.65
Group C (2017)	Group A (2015)	-0.302	4.540	0.947	-9.26	8.65
	Group B (2016)	14.788*	4.635	0.002	5.65	23.93

*The mean difference is significant at the 0.05 level. SE: Standard error; CI: Confidence interval; LSD: Least significant difference

**Figure 5: Comparison between group skill performance**

and Respiratory unit. The total number of hours worked by Group A (2015) and Group C (2017) internship groups exceeds 4,600 and 5,700, respectively, while Group B (2016) racked up <2400 h. The mean count of hours students spent at clinical sites was 354, 202, and 476, respectively. This indicates better performance and superiority of Groups A (2015) and C (2017) over Group B (2016).

It seems that internship students in Group B (2016) spent less time than the other two groups in the clinical arena and field. This might be because the educational program the CU prepared for them consumed a great deal of time of practice, which affected the number of skills performed by these students. Nevertheless, the total number of patients seen by Groups A (2015) and C (2017) internship groups exceeds 1,600 and 1,200 patients, while the Group B (2016) dealt with less than 800 patients. The mean count of patients that students were exposed to in the clinical placement was 122, 66, and 93, respectively. It is important to consider that Omaha, NE is not an overly large or crowded city. The volume of 911 calls and visits to the ER are normally low, which affected the exposure of internship students to patients.

The skills focused on included IV access, medication administration, TL, ventilation, and live patient endotracheal intubation. However, again, Group B (2016) completed only

one-third of the number of clinical skills completed by the other two groups. Furthermore, the performance of field and clinical skills varies significantly between students, and they are more likely to differ in their levels of confidence and aggressiveness in asking for opportunities. In addition, exposure likely depends on the preceptor at each EMS station or hospital setting and his/her confidence in the student. This might indicate cultural and language barriers and may correspond to the feeling of dissatisfaction paramedic students' feel toward field practice presented in the literature reviewed. Students may need to be educated on how valuable this opportunity for them to utilized successfully.

Furthermore, the number of students might lag and some may not have the encouragement, confidence, and enthusiasm needed to practice skills. This could indicate deficiencies in various skills among some students, shifting the responsibility to the PSCEMS leadership to review practical skills attainment, practice, and assessment for their graduates. An in-depth assessment of students' knowledge and skills is crucial in EMS paramedic education, and the assessment of skills should accurately reflect the achievement of learning outcomes. Moreover, tracking the attainment of practical skills should ensure that students have the opportunity to practice their psychomotor skills before being assessed in an examination. Stricter selection criteria should be set to reliably assess students' proficiency in paramedic skills. The insufficient preparation of paramedics leads to poor outcomes, a lack of confidence, and lack of preparation for the ambulance workplace which was raised in the literature review. Possibly, this is true, as Group B (2016) performed significantly fewer skills than the other two groups, necessitating a skills enhancement program for these students.

The study acknowledges the importance of the impressions, feedback, and perspectives of internship students on their experience as well as the individuals in the EMS team at CU. They will be good source of information to spot the factors associated with the internship experience. Moreover, an in-depth analysis of the cases responded to by each internship

student, and their competencies management need to be conducted.

Conclusion

The study revealed that international cooperation between EMS schools provides many promising educational opportunities to paramedic education. During the internship, students participated in various distinguished activities related to the EMS profession to enrich their experience. Internship students have opportunity to have exposure to patients and have more opportunities to perform medication administration, IV activities, and serve as TLs. There are distinguished differences in skills performance within the group of students in each year and among the three groups of internship students. As expected, internship students have few opportunities to perform live tube insertions and ventilation.

Acknowledgment

I extend my acknowledgements that this work was supported by PSCEMS, Deanship of Scientific Research, KSU, Riyadh, Saudi Arabia. Moreover, all help received from the data and information prepared by the CU EMS team led by Dr. Miller, Mike G, and the team comprising Jensen, Gail M, AHMED AOJ Chavez, Jairo, Leggio Jr, William J Carritt, Kevin S Cota, Jacqueline S Oviatt, Sheryl L Madvig, Evie Y Renner, and Tami M is appreciated. Thanks are also due to Dr. Mohammed Sami Al Sufi, PSCEMS for scientific assistance in this study. In addition, appreciation should be dedicated to Mr. Alromaih A and Mr. Alenazi F, as well as internship student Alshahrani B for their help during the study. Also, an appreciation for Dr. M. Hakim's effort in data manipulation, interpretation, and analysis.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Omaha Visitors Center: Visit Omaha; 2018. Available from: <https://www.visitomaha.com/about-omaha/>. [Last accessed on 2018 Feb 02].
2. National Run Survey; 2015. Available from: http://www.media.cygnus.com/files/base/FHC/document/2016/06/NRS_Part_2.pdf. [Last accessed on 2018 Feb 02].
3. Kennedy S, Kenny A, O'Meara P. Student paramedic experience of transition into the workforce: A scoping review. *Nurse Educ Today* 2015;35:1037-43.
4. Waxman A, Williams B. Paramedic pre-employment education and the concerns for our future: What are our expectations? *J Prim Emerg Health Care* 2006;4:1-10.
5. O'Brien K, Moore A, Dawson D, Hartley P. An Australian story: Paramedic education and practice in transition. *Austral J Paramed* 2014;11:3.
6. Boyle MJ, Williams B, Cooper J, Adams B, Alford K. Ambulance clinical placements – A pilot study of students' experience. *BMC Med Educ* 2008;8:19.
7. Lord B, McCall L, Wray N. Factors affecting the education of pre-employment paramedic students during the clinical practicum. *J Emerg Prim Health Care* 2009;7:4.
8. Michau R, Roberts S, Williams B, Boyle M. An investigation of theory-practice gap in undergraduate paramedic education. *BMC Med Educ* 2009;9:23.
9. Wallin K, Fridlund B, Thorén AB. Pre-hospital emergency nursing students' experiences of learning during pre-hospital clinical placements. *Int Emerg Nurs* 2013;21:197-203.
10. Yorke K, Mantz Y. *Learning, Curriculum and Employability in Higher Education*. London, UK: Routledge Farmer; 2004. p. 241.
11. Simpson P, Thyer L. Reflections and experiences of student paramedics undertaking international work-integrated learning placements. *J Coop Educ* 2016;17:187-98.
12. Lazarsfeld-Jensen A, Bridges D, Lofus S. *Transitions: Command Culture and Autonomous Paramedic Practice: The Transitions Project Report*, Charles Sturt University; 2011.
13. Clements R, Mackenzie R. Competence in pre-hospital care: Evolving concepts. *Emerg Med J* 2005;22:516-9.
14. Cooper S. Contemporary UK paramedical training and education. How do we train? How should we educate? *Emerg Med J* 2005;22:375-9.
15. Boyle M, Williams B, Burgess S. Contemporary simulation education for undergraduate paramedic students. *Emerg Med J* 2007;24:854-7.
16. Tan BK. Good practice for international WIL. In: Ferns S, editor. *Work-Integrated Learning in the Curriculum*. Sydney, NSW, Australia: Higher Education Research & Development Society Australasia; 2014.