

Araştırma Makalesi / Research Article



Paramedik Öğrencilerinin Obstetrik Acillere Yönelik Algıları

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ÖZET

Amaç: Bu çalışma, paramedik öğrencilerinin obstetrik acillere yönelik yeterliliklerini ve algılarını belirlemek amacıyla yürütülmüştür.

Gereç ve Yöntem: Bu kesitsel çalışma, bir üniversitenin Paramedik Programına kayıtlı 81 öğrenci ile sayım (census) yaklaşımı kullanılarak yürütülmüştür. Veriler, 06.01.2025 ile 27.01.2025 tarihleri arasında öğrencilerin final ve bütünleme sınavları sırasında toplanmıştır. Anket formu literatüre dayalı olarak araştırmacılar tarafından geliştirilmiş olup, iç tutarlılığının yüksek olduğu belirlenmiştir (Cronbach's $\alpha = 0.89$). Çalışma için İzmir Bakırçay Üniversitesi Girişimsel Olmayan Etik Kurulu'ndan izin alınmış ve tüm katılımcılardan yazılı onam alınmıştır. Veriler SPSS 21 programı kullanılarak analiz edilmiş; sayı ve yüzde dağılımları, ki-kare testi ve ilişkilerin gücünü değerlendirmek amacıyla Cramer's V kullanılmıştır. İstatistiksel anlamlılık düzeyi $p < 0.05$ olarak kabul edilmiştir.

Bulgular: Paramedik öğrencilerinin büyük çoğunluğunun obstetrik acillere yönelik teorik eğitim aldığı, ancak bu eğitim kapsamında klinik uygulama yapma oranının oldukça düşük olduğu belirlenmiştir. Öğrencilerin yaklaşık yarısının doğum sürecinin izlenmesi, vajinal muayene, doğuma yardımcı olma ve göbük kordonunun kesilmesi gibi temel klinik uygulamaları hiç gerçekleştirmediği saptanmıştır. Obstetrik acillerde uygulama yapma sıklığı ile öğrencilerin mesleki yeterlilik algıları arasında istatistiksel olarak anlamlı bir ilişki bulunmuştur ($p < 0,05$).

Sonuç: Paramedik öğrencilerin obstetrik aciller konusunda teorik bilgi düzeylerinin yüksek olmasına rağmen, pratik deneyimlerinin sınırlı olduğu görülmektedir. Çalışmanın yürütüldüğü bağlamda, bu durumun mevcut staj uygulama alanlarının yalnızca acil sağlık istasyonları ile sınırlı olmasından kaynaklanabileceği düşünülmektedir. Öğrencilerin mesleki yeterlilik kazanımlarını artırmak amacıyla, staj rotasyonlarına obstetri kliniklerinin dahil edilmesi, doğum simülasyon modelleri ile uygulamalı eğitimlerin yaygınlaştırılması ve simülasyon destekli öğretim modellerinin entegre edilmesi önerilmektedir.

Anahtar kelimeler: Paramedik Öğrencileri, Obstetrik Aciller, Mesleki Uygulama, Yeterlilik Algısı.

Perceptions of Paramedic Students towards Obstetric Emergencies

ABSTRACT

Objective: The study was conducted to determine the competence and perceptions of paramedic students towards obstetric emergencies.


Material and Methods: This cross-sectional study was conducted with 81 students enrolled in the Paramedic Program at a university using a census approach. Data were collected between 06.01.2025 and 27.01.2025 during final and make-up examinations. The questionnaire form was developed by the researchers based on the literature, and its internal consistency was found to be high (Cronbach's $\alpha = 0.89$). Ethical approval was obtained from the Non-Interventional Ethics Committee of İzmir Bakırçay University, and written informed consent was obtained from all participants. Data were analyzed using SPSS 21, with number and percentage distributions, chi-square test, and Cramer's V to assess the strength of associations. The significance level was accepted as $p < 0.05$.


Results: It was determined that the majority of the paramedic students received theoretical training on obstetric emergencies, but the rate of performing clinical practices within the scope of this training was quite low. Approximately half of the paramedic students had never performed basic clinical practices such as monitoring the labor process, vaginal examination, assisting with delivery, and cutting the umbilical cord. A statistically significant relationship was found between the frequency of practicing in obstetric emergencies and the paramedic students' perceptions of their professional competence ($p < 0.05$).

Conclusion: Although paramedic students have a high level of theoretical knowledge about obstetric emergencies, their practical experience appears to be limited. In the study setting, this may be related to the fact that current internship practice areas are limited to emergency health stations. It is recommended that obstetrics clinics be included in internship rotations, that practical training using birth simulation models be expanded, and that simulation-supported teaching models be integrated to enhance students' professional competence.

Keywords: Paramedic Students, Obstetric Emergencies, Professional Practice, Perception of Competence.

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INTRODUCTION

Although out-of-hospital births are relatively rare, their associated risks make them clinically significant. The frequency of out-of-hospital births varies in the literature. For example, in the United States, approximately 0.61% of all births occur in the pre-hospital setting (Girsen et al., 2018), while two different studies in France reported these rates as 0.19% (Remense et al., 2013) and 0.49% (Nguyen et al., 2016) respectively, and in Finland, the rate was reported as 0.10% (Murphy and Strong, 2018).

Childbirth is a significant event in a woman's life, expected to be a positive and empowering experience in terms of physical, emotional, and psychosocial aspects (Murphy and Strong, 2018). However, births outside of hospitals carry significant risks for both mother and newborn, including perineal tears, postpartum hemorrhage, placental retention, hypothermia, hypoglycemia, and neonatal jaundice (McLelland et al., 2014; McLelland et al., 2018). Early diagnosis and prompt intervention are critical to reducing morbidity, minimizing the need for blood transfusions, and preventing maternal and neonatal deaths (Leonardsen et al., 2021). Effective coordination among healthcare professionals in managing emergency labor plays a crucial role in ensuring the safety of both mother and newborn (Jenkins and Vans, 2023). At this point, the role of paramedics, who are often the first point of contact for healthcare professionals in out-of-hospital emergencies, becomes critical.

Paramedics are healthcare professionals who provide initial medical intervention in pre-hospital emergencies and play a vital role in protecting the health of both mother and baby. Out-of-hospital births mostly occur when the mother cannot reach a hospital or healthcare facility in time, or when emergency assistance is needed during planned home births (Findlay et al., 2024; Hill et al., 2022; WHO, 2018). Although the professional knowledge, skills, and competencies that paramedics should possess are defined by legislation and structured by algorithms, studies show that there are significant gaps between knowledge and practical

skills in the management of obstetric emergencies (Wilkinson et al., 2025).

Competency development in paramedic education is largely enhanced through simulation-based and practice-oriented learning approaches. Simulation offers a controlled and safe environment that enables students to build clinical decision-making abilities, psychomotor competencies, and professional confidence without exposing real patients to risk. Research indicates that simulation-based instruction leads to greater improvements in knowledge, skill acquisition, and clinical performance compared with traditional educational methods (Cook et al., 2011). Its effectiveness is particularly evident in the management of high-risk and infrequent clinical events such as obstetric emergencies (INACSL, 2016; Cook et al., 2011). Moreover, international guidelines highlight that structured simulation activities supported by feedback and repetitive practice strengthen clinical judgment and increase learner confidence (INACSL, 2016). Accordingly, the incorporation of simulation and structured clinical training into paramedic education is regarded as a key strategy for reducing the gap between theoretical instruction and clinical practice.

Studies investigating pre-hospital obstetric emergencies indicate that paramedics frequently encounter unplanned out-of-hospital births and play a critical role in initial management. However, evidence suggests that limited clinical exposure during training may affect the quality of care provided in such situations. Although the professional knowledge, skills, and competencies that paramedics should possess are defined by legislation and structured by algorithms, studies show that there are significant gaps between knowledge and practical skills in the management of obstetric emergencies. Evidence from studies examining out-of-hospital childbirth experiences indicates that paramedics frequently face challenges in providing timely and effective obstetric care, particularly in emergency delivery management, neonatal assessment, and maternal complication control, highlighting the practical implications of this knowledge–skill gap (Wilkinson et al., 2025). Research

has also shown that paramedics often experience challenges in managing obstetric emergencies, particularly in procedures such as delivery assistance, postpartum hemorrhage control, and neonatal care, where insufficient experience may lead to increased anxiety and reduced confidence in practice (Hill et al., 23; Özcan et al., 2021; Martin and Betts, 2025). Despite being relatively rare, these cases require rapid and accurate clinical decision-making, and inadequate preparation has been associated with difficulties in ensuring optimal maternal and neonatal outcomes in pre-hospital settings (Hill et al., 2024). Therefore, strengthening both theoretical and practical training is essential to improve preparedness for real-life obstetric emergencies.

Evidence shows that patients value paramedics' professionalism, effective communication, empathy, and sensitivity, in addition to their technical knowledge (Flanagan et al., 2019; Hartley, 2012). Studies by Flanagan and Withanarachchie found that paramedics frequently experience difficulties and anxiety during emergency deliveries and lack the competence to manage these situations safely (Wilkinson et al., 2025; Flanagan et al., 2019). Furthermore, emergency department records show that complication management errors, such as incorrect fundus massage and umbilical cord management, can occur due to insufficient training and experience (Javaudin et al., 2019; Marconi et al., 2019).

Given the limited number of studies in the literature investigating paramedic students' perceptions of competence and educational levels related to obstetric emergencies, this study was conducted to determine the competence and professional perceptions of paramedic students regarding obstetric emergencies and to examine the impact of relevant training on their perceived competence and confidence.

METHODS

Design

This cross-sectional study was conducted with 81 students enrolled in the Paramedic Program at a single

public university. The data of the study were collected between 06 January 2025 and 27 January 2025 by administering a questionnaire to the students after the final and make-up examinations. The questionnaire was developed by the researchers based on a comprehensive review of the literature (Topçu et al., 2025; Flagnan et al., 2024; Can and Bayar, 2020; Yüksel, 2020; Akbaba et al., 2019; Beji, 2019; Gürbüz et al., 2019). All students who were actively enrolled in the Paramedic Program during the study period were invited to participate, and 81 students who agreed voluntarily constituted the study group. Therefore, the study was conducted using a census approach rather than probabilistic sampling. The inclusion criteria were being an actively enrolled paramedic student and providing voluntary written informed consent. The study was conducted in a single public university, which may limit the generalizability of the findings.

Hypothesis

H₀: There is no statistically significant relationship between obstetric emergency education (theoretical training and practical application experience) and students' perceived competence.

H_{1a}: There is a statistically significant relationship between theoretical obstetric emergency training and students' perceived competence.

H_{1b}: There is a statistically significant relationship between the number of practical applications in obstetric emergencies and students' perceived competence.

Data Collection Tools

The data collection tools consisted of an individual information form, a questionnaire regarding exposure to obstetric emergency course content, and a researcher-developed Self-Sufficiency Questionnaire assessing students' perceived adequacy in obstetric emergencies.

The Self-Sufficiency Questionnaire was developed based on a comprehensive review of the relevant literature. Content validity was ensured through expert evaluation by two emergency medicine specialists, two obstetrics and gynecology specialists, and eight faculty members in the field of obstetrics and gynecology nursing. Revisions were made in line with expert feedback. Since the instrument was structured as a non-scale questionnaire rather than a standardized psychometric scale, factor analysis for construct validity was not performed.

The internal consistency reliability of the Self-Sufficiency Questionnaire was evaluated using Cronbach's alpha coefficient, and the reliability level was found to be $\alpha = 0.89$ indicating high internal consistency. Although the questionnaire consisted of three categorical response options ("agree," "disagree," and "undecided"), Cronbach's alpha was used as a commonly accepted reliability measure for internal consistency in non-Likert structured instruments.

Individual Introduction Form

The data collection instruments were developed by the researchers based on a comprehensive review of the relevant literature (Hill et al., 2024; Can and Bayar, 2020; Flagnan et al., 2019; Javaudin et al., 2019; Marconi, 2019; Hartley, 2012). The cited studies were not used as validated instruments to be directly adopted; rather, they served as a theoretical framework and content guide for determining the scope, dimensions, and item content of the questionnaires.

Accordingly, the items were originally generated by the researchers to reflect the objectives of the present study. None of the questionnaires were adapted from an existing standardized scale. Therefore, the instruments used in this study should be considered researcher-developed original questionnaires based on literature guidance.

Obstetrics and Gynaecological Emergencies Course Content Status of Receiving Training Subjects Question Form

This form was prepared in line with the literature and considering the topics in the students' blog and consisted of 30 questions including normal labour, process, follow-up, examination and clinical practice skills (Topçu et al., 2025; Flagnan et al., 2024; Yüksel, 2020; Beji, 2019).

Questionnaire on Students' Practice in Gynaecological Emergencies

This form consisted of 17 question items including the status of never, 1 time, 2-5 times and 6 or more applications of professional practice skills determined in the course content (Topçu et al., 2025; Can and Bayar, 2020; Yüksel, 2020; Akbaba et al., 2019; Beji, 2019).

Questionnaire on Students' Self-Sufficiency in the Subject Content of the Gynaecological Emergencies Curriculum

The Self-Sufficiency Questionnaire consisted of 16 items with three categorical response options ("agree," "disagree," and "undecided") and was not designed as a Likert-type scale. This three-option format was preferred to obtain clear and easily interpretable judgments of students' perceived adequacy without forcing graded intensity levels. The inclusion of an "undecided" option was intended to capture uncertainty in responses, particularly in cases where students had limited or no clinical experience, and to avoid forcing dichotomous (yes/no) decisions.

The development of the questionnaire was supported by expert evaluation, and content validity was ensured through feedback obtained from specialists in emergency medicine, obstetrics and gynecology, and obstetric nursing. In line with the expert recommendations, necessary revisions were made to improve clarity and relevance of the items.

In addition, a pilot application was conducted with 8 students (approximately 10% of the study sample) prior to the main study in order to evaluate the comprehensibility, clarity, and applicability of the questionnaire. Based on the feedback obtained from the pilot group, minor revisions were made, and the final version of the questionnaire was deemed suitable for use in the main study.

No numerical scoring or total scale score was calculated for this questionnaire. All items were analyzed using frequency and percentage distributions only. Responses marked as “undecided” were treated as a separate categorical option and were not merged with either “agree” or “disagree” categories.

Data Analysis

The data were analysed with SPSS 21 statistical package programme. Frequencies and percentages were calculated. Associations between the number of applications in vocational courses and perceived adequacy were examined using the Chi-square test. The assumptions of the Chi-square test were checked, and all expected cell counts were greater than 5; therefore, the Chi-square test was considered appropriate. No Fisher’s exact test or Monte Carlo correction was required. A Bonferroni correction was applied to adjust for multiple comparisons, and the significance level was set at $p < 0.0031$. To quantify the strength of the association, Cramer’s V was also calculated. The post-hoc power analysis indicated that the statistical power of the study ranged approximately between 0.90 and 0.99 depending on the observed effect sizes (Cramer’s $V = 0.38-0.53$), suggesting adequate to high power for the detected associations. The strongest associations were observed in procedures such as vaginal examination and patient transfer (Cramer’s $V \geq 0.50$), indicating strong relationships between practical exposure and perceived competence.

Ethics

The ethical approval required for the study was obtained from XXX University Non-Interventional Clinical Research Ethics Committee on 23.10.2024 (Decision No: 1820). Written informed consent was obtained from all participants prior to data collection. Participants were informed about the purpose of the study and were asked to read and sign the consent form at the beginning of the questionnaire. The data collection tool was administered only after written informed consent had been obtained.

RESULTS

When the mean age of the paramedic students participating in the study was analysed, it was determined that the mean age of the students was 20.46 and the age range was between 18 and 30 years. The students constitute a homogenous sample in terms of class levels since their class sizes are close to each other. When the high school graduated from was analysed, it was found that 49.4% of the students were graduates of vocational high school. In terms of the employment status of the students, 80.2% of them stated that they were not employed, while 12.4% of the employed students stated that they were engaged in self-employment. In terms of family type, 81.5% of the students lived in a large family structure. In terms of income status, 61.7% of the students stated that their income was equivalent to their expenses. It was determined that 23.5% of the students did not have health insurance (Table 1).

Table 1. Distribution of paramedic students according to sociodemographic characteristics

Age	20.46±2.08 (min: 18, max:30)	
	n	%
Classroom		
1st class	40	49.4
2nd class	41	50.6
Graduated high school		
Anatolian high school	32	39.5
Open high school	8	9.9
Imam Hatip high school	1	1.2
Vocational high school	40	49.4
Employment status		
Employed	16	19.8
Not employed	65	80.2
Occupation		
Not working	65	80.2
Civil servant	1	1.2
Self-employed	10	12.4
Labourer	5	6.2
Income perception		
Income less than expense	19	23.5
Income equal to expense	50	61.7
Income more than expense	12	14.8
Family type		
Extended family	66	81.5
Nuclear family	15	18.5
Marital status		
Married	6	7.4
Single	75	92.6
Social Security		
Yes	62	76.5
No	19	23.5
Total	81	100.0

When the students' taking courses on obstetric emergencies was examined, it was determined that approximately half of them took obstetric emergencies courses included in the curriculum of emergency patient care course content. It was found that most of the students were educated about the number of weeks of normal labour, while primiparous and multiparous women had no information about the duration of trauma (Table 2).

Table 2. Students Course Taking Status Regarding Gynaecological Emergencies

	Yes		No	
	n	%	n	%
1. Have you received training on the number of weeks of normal labour?	46	56.8	35	43.2
2. Have you received training on how to perform a vaginal examination to monitor the progress of a normal labour?	40	49.4	41	50.6
3. Have you received training on how to monitor dilatation and effacement?	37	45.7	44	54.3
4. Have you been trained in Leopold maneuvers?	33	40.7	48	59.3
5. Have you received training on the initial amount of simpitane used to accelerate the labour process during labour?	31	38.3	50	61.7
6. Have you received training on how to assess the duration, frequency and severity of contractions during labour?	40	49.4	41	50.6
7. Has training been given on how to detect deviations from normal during labour?	43	53.1	38	46.9
8. Have you received training on how to perform Leopold manoeuvres?	36	44.4	45	55.6
9. Have you received training on pet follow-up in cases of haemorrhage during labour?	36	44.4	45	55.6
10. Have you received training on the pushing sensation that occurs in the mother as the baby's head settles during labour?	29	35.8	52	64.2
11. Have you received training about the total trauma times of primiparous and multiparous pregnant women?	27	33.3	54	66.7
12. Have you received training on the difference between false and real labour pain?	31	38.3	50	61.7
13. Have you received information about the application of episiotomy opening during labour?	30	37.0	51	63.0
14. Have you received training on the instruments in the birth set and their use?	31	38.3	50	61.7
15. Have you been trained on how to perform episiotomy repair?	28	34.6	53	65.4
16. Have you been educated about the signs of placental separation?	37	45.7	44	54.3
17. Have you been informed about how the placenta should be removed?	38	46.9	43	53.1
18. Have you been informed about how to cut the umbilical cord and the timing of the cut?	35	43.2	46	56.8
19. Has the child learnt to listen to heart sounds and been informed about normal value ranges?	35	43.2	46	56.8
20. Have you been educated about twin pregnancies and the birth of a twin pregnancy?	29	35.8	52	64.2
21. Have you been educated about anomalies of presentation and position?	35	43.2	46	56.8
22. Has training been given about breech birth and manoeuvres to be applied in breech birth?	36	44.4	45	55.6
23. Have you been trained about stillbirth and the emergency care required?	32	39.5	49	60.5
24. Have you been informed about early membrane rupture and emergency care?	33	40.7	48	59.3
25. Have you been informed about preeclampsia/eclampsia and the emergency care to be provided?	35	43.2	46	56.8
26. Have you received training on mother and baby care in the postnatal period?	39	48.1	42	51.9
27. Have you received training on how to follow up bleeding in the postnatal period?	35	43.2	46	56.8
28. Have you been educated about the uterine message that should be applied to prevent bleeding in a loose uterus in the postpartum period?	41	50.6	40	49.4
29. Have you been informed about which positions should be used during labour to relax the mother and reduce blood flow to the uterus?	40	49.4	41	50.6
30. Was training given on how to perform amniotomy during labour?	38	46.9	43	53.1

When students' practical exposure to obstetric emergency procedures was examined, approximately half of the students reported no hands-on experience in most procedures. The proportion of students with no

practice ranged between 40.7% and 49.4% across different skills, indicating limited clinical exposure in obstetric emergency procedures (Table 3).

Table 3. Number of Applications in Gynaecology Emergency Department

	None		1		2-5		6 and above	
	n	%	n	%	n	%	n	%
Did you do a Birth Process Follow-up?	39	48.1	35	43.2	5	6.2	2	2.5
Have you listened to the child's heart sound?	33	40.7	39	48.1	3	3.7	6	7.5
Did you do a vaginal examination?	36	44.4	36	44.4	5	6.3	4	4.9
Did you go into labour?	37	45.7	43	53.1	0	0.0	1	1.2
Did you perform the Leopold manoeuvre?	40	49.4	39	48.2	1	1.2	1	1.2
Did you cut the umbilical cord?	39	48.1	39	48.1	1	1.2	2	2.6
Did you remove the placenta?	39	48.1	39	48.1	1	1.2	2	2.6
Have you monitored the bleeding?	39	48.2	36	44.4	3	3.7	3	3.7
Did you perform an amniotomy?	39	48.1	38	46.9	2	2.5	2	2.5
Did you apply simpitan?	39	48.1	38	46.9	1	1.3	3	3.7
Did you have a breech birth?	39	48.1	38	46.9	2	2.5	2	2.5
Did you transfer the pregnant patient?	39	48.1	38	46.9	2	2.5	2	2.5
Have you evaluated the involution of the uterus in the postnatal period?	40	49.4	38	46.9	1	1.2	2	2.5
Did you perform an episiotomy?	40	49.4	40	49.4	0	0.0	1	1.2
Have you repaired an episiotomy?	40	49.4	40	49.4	0	0.0	1	1.2
Did you have a stillbirth?	40	49.4	40	49.4	0	0.0	1	1.2
Have you done uterine massage?	40	49.4	38	46.9	1	1.2	2	2.5

In Table 4, paramedic students' self-perceived competence in obstetric emergency procedures varied considerably across specific skills. The highest perceived competence levels were reported for listening to the fetal heart sounds (51.9% agree), performing birth process follow-up (45.7%), monitoring bleeding (43.2%), and transferring a pregnant patient (43.2%). Competence perceptions were relatively lower for more advanced or less frequently practiced procedures such as performing the Leopold manoeuvre (35.8%), breech birth management (34.6%), and episiotomy procedures (34.6%). Across almost all items, a substantial proportion of students selected "undecided," indicating uncertainty about their competence, especially in procedures like the Leopold manoeuvre (38.3%) and amniotomy (33.4%). These results suggest that students feel partially competent in routine

obstetric tasks but remain unsure or less confident about complex or invasive procedures (Table 4).

Table 4. Distribution of paramedic students according to their self-perceived competence in obstetric emergency procedures

	Agree		Disagree		Undecided	
	n	%	n	%	n	%
Did you do a Birth Process Follow-up?	37	45.7	16	19.8	28	34.5
Have you listened to the child's heart sound?	42	51.9	17	21.0	22	27.1
Did you do a vaginal examination?	36	44.4	23	28.4	22	27.2
Did you go into labour?	33	40.7	25	30.9	23	28.4
Did you perform the Leopold manoeuvre?	29	35.8	21	25.9	31	38.3
Did you cut the umbilical cord?	34	42.0	22	27.2	25	30.8
Did you remove the placenta?	31	38.3	24	29.6	26	32.1
Have you monitored the bleeding?	35	43.2	26	32.1	20	24.7
Did you perform an amniotomy?	30	37.0	24	29.6	27	33.4
Did you apply simpitan?	31	38.3	24	29.6	26	32.1
Did you have a breech birth?	28	34.6	27	33.3	26	32.1
Did you transfer the pregnant patient?	35	43.2	25	30.9	21	25.9
Have you evaluated the involution of the uterus in the postnatal period?	32	39.5	24	29.6	25	30.9
Did you perform an episiotomy?	28	34.6	26	32.1	27	33.3
Did you have a stillbirth?	28	34.6	28	34.6	25	30.8
Have you done uterine massage?	32	39.5	26	32.1	23	28.4

When students' practical exposure to obstetric emergency procedures was compared with their perceived competence, statistically significant associations were observed for all examined procedures after Bonferroni correction ($p < 0.0031$), indicating that the observed relationships were not due to chance (Table 5).

Cramer's V values indicating effect sizes are presented in Table 5 alongside chi-square results. This allows a direct interpretation of both statistical significance and the magnitude of associations between practical exposure and perceived competence. The effect size values ranged from 0.38 to 0.53, demonstrating moderate to strong relationships across different obstetric emergency procedures.

The analysis showed that students who had performed at least one obstetric emergency procedure consistently reported higher perceived competence levels compared to those with no prior experience. The distribution of responses varied meaningfully between the two groups, with higher proportions of "agree" responses in the experienced group across all items.

Regarding effect sizes, Cramer's V values ranged from 0.38 to 0.53, indicating small-to-large effects depending on the procedure. According to conventional interpretation thresholds, values around 0.38–0.44 represent moderate effects, while values ≥ 0.50 indicate strong associations. The strongest associations were observed in vaginal examination ($V = 0.53$), patient transfer ($V = 0.53$), and birth process follow-up ($V = 0.53$), suggesting a substantial relationship between hands-on clinical exposure and perceived competence.

Although some procedures demonstrated comparatively lower effect sizes (e.g., labour experience, Leopold manoeuvre), all remained statistically significant under the adjusted alpha level, supporting the robustness of the findings even after controlling for multiple comparisons.

Overall, the findings confirm that practical exposure to obstetric emergency procedures is significantly associated with higher perceived competence among paramedic students, with effect sizes ranging from moderate to strong depending on the specific clinical skill assessed (Table 5).

Table 5. Comparison of students' perception of competence in obstetric emergencies and the number of applications

		Those who have never applied		1 or more applications		X ²	df	p	Cramer's V
		n	%	n	%				
Did you do a Birth Process Follow-up?	Agree	9	20.0	22	52.4	22.616	2	0.001*	0.53
	Disagree	18	40.0	9	21.1				
	Undecided	18	40.0	11	26.2				
Have you listened to the child's heart sound?	Agree	7	19.0	25	56.8	24.397	2	0.000**	0.51
	Disagree	15	40.5	8	18.2				
	Undecided	15	40.5	11	25.0				
Did you do a vaginal examination?	Agree	8	20.5	24	57.2	22.525	2	0.000**	0.53
	Disagree	14	35.9	9	21.4				
	Undecided	17	43.6	9	21.4				
Did you go into labour?	Agree	7	18.9	25	56.8	12.880	2	0.012*	0.38
	Disagree	14	37.8	9	20.5				
	Undecided	16	43.3	10	22.7				
Did you perform the Leopold manoeuvre?	Agree	10	23.8	23	57.5	17.440	2	0.008*	0.45
	Disagree	16	38.1	7	17.5				
	Undecided	16	38.1	10	25.0				
Did you cut the umbilical cord?	Agree	7	17.5	25	61.0	20.362	2	0.002*	0.50
	Disagree	16	40.0	7	17.0				
	Undecided	17	42.5	9	22.0				
Did you remove the placenta?	Agree	9	23.1	23	54.8	20.362	2	0.002*	0.50
	Disagree	14	35.9	9	21.4				
	Undecided	16	41.0	10	23.8				
Have you monitored the bleeding?	Agree	9	24.5	23	52.3	19.593	2	0.000**	0.49
	Disagree	13	35.1	10	22.7				
	Undecided	15	40.5	11	25.0				
Did you perform an amniotomy?	Agree	11	25.0	21	56.8	20.451	2	0.002*	0.50
	Disagree	16	36.4	7	18.9				
	Undecided	17	38.6	9	24.3				
Did you apply simpitan?	Agree	8	24.2	24	50.0	19.834	2	0.003*	0.49
	Disagree	15	45.5	8	16.7				
	Undecided	10	30.3	16	33.3				
Did you have a breech birth?	Agree	6	15.4	26	61.9	21.086	2	0.002*	0.51
	Disagree	16	41.0	7	16.7				
	Undecided	17	43.6	9	21.4				
Did you transfer the pregnant patient?	Agree	6	16.7	26	57.8	23.081	2	0.001*	0.53
	Disagree	13	36.1	10	22.2				
	Undecided	17	47.2	9	20.0				
Have you evaluated the involution of the uterus in the postnatal period?	Agree	7	18.4	25	58.1	20.242	2	0.003*	0.50
	Disagree	15	39.5	8	18.6				
	Undecided	16	42.1	10	23.3				
Did you perform an episiotomy?	Agree	10	25.0	22	53.7	20.242	2	0.003*	0.50
	Disagree	13	32.5	10	24.3				
	Undecided	17	42.5	9	22.0				
Did you have a stillbirth?	Agree	11	25.6	21	55.3	16.753	2	0.002*	0.46
	Disagree	15	34.9	8	21.1				
	Undecided	17	39.5	9	23.7				
Have you done uterine massage?	Agree	9	23.7	23	53.5	20.242	2	0.003*	0.50
	Disagree	12	31.6	11	25.6				
	Undecided	17	44.7	9	20.9				

DISCUSSION

It is of great importance for paramedics working in the pre-hospital field to protect and maintain maternal and infant health by performing appropriate professional practices during patient transport in obstetric emergency cases. To adequately prepare paramedic students to make rapid and accurate decisions in such situations, the educational content delivered to them must be comprehensive, sufficient, and up to date.

In this study, the students reported that although they possessed theoretical knowledge regarding obstetric emergencies, they felt inadequate in practical application. The findings showed that students were primarily educated at a theoretical level, while opportunities to reinforce this knowledge through practical experience were considerably limited. Therefore, the term “educational background” refers mainly to access to theoretical knowledge through coursework but simultaneously highlights the lack of practice-based learning. This limited practice exposure is associated with students’ feelings of professional inadequacy. Hence, theoretical instruction alone does not compensate for insufficient hands-on experience and does not fully support the development of professional competence.

The study results also demonstrated that although students displayed adequate knowledge in some areas of obstetric emergency management, substantial limitations remained in managing advanced stages of labor and postpartum complications. Thus, describing the overall educational level as “good” should be reconsidered in view of these practical shortcomings. These findings underscore the need to strengthen skills-based training to better prepare students for clinical practice and improve maternal and neonatal outcomes. Similar results have been reported in the literature. Can and Bayar found that only half of the students took the courses included in the curriculum (Can and Bayar, 2020). Flanagan et al. reported that most students perceived themselves as inadequate (Flanagan et al., 2024). Gürbüz et al. also found that the majority of students did not consider themselves competent in practice (Gürbüz et al., 2019). Hill et al.

reported that patients’ anxiety increased when paramedics appeared inexperienced or insecure during labor interventions (Hill et al., 2025).

It should also be noted that paramedic education varies significantly across countries in terms of duration, structure, and clinical exposure opportunities. For example, while some countries offer 2-year associate degree programs, others implement 3–4-year bachelor-level training with more extensive clinical placements (O’Meara et al., 2014; Williams et al., 2010). Therefore, direct comparisons between studies should be interpreted cautiously due to these structural differences in paramedic education systems.

When the students’ practice status regarding obstetric emergencies was examined, it was observed that most students had never practiced or had practiced only once. Procedures that constitute the foundation of obstetric emergency care such as labor follow-up, vaginal examination, and conducting deliveries were largely not performed by students during their education. Students were found to be insufficiently experienced in interventional procedures and active participation in labor, which is consistent with findings by Gürbüz et al., who reported that 89.3% of students lacked the skills required to assist labor (Gürbüz et al., 2019). Likewise, Dincer and Alemdar noted that students had fears related to assisting labor (Dincer et al., 2025), and Yildirim identified a strong and significant relationship between assisting labor and perceived professional difficulty (Yildirim, 2017). Hill et al. also reported that paramedics had minimal experience during their undergraduate education, with even the most experienced paramedic having assisted in only six births (Hill et al., 2024). These findings collectively highlight the necessity of improving simulation-supported and clinical practice opportunities within the curriculum.

In this context, simulation-based education has been shown to significantly improve clinical competence and confidence in managing obstetric emergencies. A meta-analysis by Cook et al. (2011) demonstrated that simulation training is associated with large positive effects on knowledge and skill acquisition compared to

traditional teaching methods (13). Similarly, the International Nursing Association for Clinical Simulation and Learning (INACSL) Standards of Best Practice emphasize that structured simulation experiences enhance clinical judgment, skill performance, and learner confidence, particularly in high-risk and low-frequency clinical situations such as obstetric emergencies (INACSL, 2016).

In our study, a significant association was found between students' engagement in professional practice and their perception of professional competence. This association was examined using the Chi-square test, as reported in the Results section, and its strength was evaluated using Cramer's V effect size analysis. As shown in Table 5, the Chi-square test indicated statistically significant associations after Bonferroni correction ($p < 0.0031$). In addition, Cramer's V values ranged between 0.38 and 0.53, indicating moderate to strong effect sizes depending on the clinical procedure. These findings suggest that the relationship is not only statistically significant but also practically meaningful, with higher levels of clinical exposure being associated with increased perceived competence among students. Parallel findings were reported by Ozcan et al., who noted that paramedics considered themselves inadequate due to limited training during their education (Özcan et al., 2021). Martin and Betts similarly found that paramedics lacked confidence and experienced increased stress in emergency labor cases because of inadequate training (Martin and Betts, 2025). Hill et al. also noted low confidence and increased stress in paramedics responding to obstetric cases (Hill et al., 2024). Importantly, beyond statistical significance, the effect size analysis (Cramer's V) added in the revised results section provides further insight into the practical relevance of the findings. Many associations observed in this study, such as those related to labor process follow-up, listening to fetal heart sounds, vaginal examinations, performing labor, umbilical cord cutting, amniotomy, and postpartum procedures, showed moderate to strong effect sizes (Cramer's V = 0.45–0.53). These values indicate that the relationships between practice frequency and students' responses

are not only statistically significant but also practically meaningful. Although these findings do not imply causality due to the cross-sectional design of the study, they suggest that limited hands-on experience is associated with lower perceived competence and higher levels of uncertainty among students.

Overall, the findings of the present study support the need for strengthening simulation-based education, increasing clinical exposure in obstetric units, and enhancing skills laboratory training for paramedic students. These recommendations are consistent with previous research indicating that simulation-based learning significantly improves clinical competence and confidence in obstetric emergency management (INACSL, 2016; Cook et al., 2011). In addition, studies have shown that limited clinical exposure during undergraduate education is associated with reduced confidence and increased anxiety in real obstetric emergencies (Martin and Betts, 2025; Hill et al., 2023). Therefore, integrating structured simulation programs such as high-fidelity obstetric simulators and ensuring systematic clinical placements in maternity units may bridge the gap between theoretical knowledge and practical competence identified in this study.

In this context, these improvements may be operationalized through structured educational interventions. Specifically, simulation-based training using high-fidelity obstetric simulators (e.g., SimMom-type mannequins) can be integrated into the curriculum to allow students to practice rare but critical obstetric emergencies such as shoulder dystocia, postpartum hemorrhage, and breech delivery in a safe environment. In addition, scheduled clinical rotations in maternity and obstetric units (e.g., at least 1–2 weeks per semester) may provide students with direct exposure to labor monitoring and delivery assistance under supervision. Furthermore, skills laboratory sessions should be systematically reinforced with repeated hands-on practice of essential procedures such as fetal heart monitoring, vaginal examination, neonatal care, and postpartum hemorrhage management. Combining these structured simulation and clinical placement strategies

may help bridge the gap between theoretical knowledge and practical competence identified in this study.

CONCLUSION

In our study, although most students reported receiving theoretical education on obstetric emergencies, their level of practical experience was found to be limited. The restriction of internship placements primarily to emergency health stations appears to reduce students' opportunities for hands-on practice in obstetric emergencies.

To address this gap, it is recommended that obstetrics units be incorporated into internship programs, with a minimum clinical rotation period of at least 2 weeks in obstetric settings. During this period, students should be provided with opportunities to observe and actively participate in a minimum number of supervised obstetric procedures, including labor follow-up and basic delivery practices.

In addition, simulation-based training should be systematically integrated into the curriculum. It is recommended that simulation sessions be conducted regularly (e.g., at least 2–3 sessions per semester) using high-fidelity simulators (such as SimMom or equivalent models) to enhance students' clinical decision-making skills and procedural competence in obstetric emergencies.

Furthermore, skills laboratories should be strengthened with obstetric training models, and structured practice sessions should be included to reinforce psychomotor skills. These improvements are expected to better prepare students for real-life obstetric emergencies and contribute to improved maternal and neonatal outcomes in pre-hospital care settings.

Limitations of the Study

This study has several limitations that should be considered when interpreting the findings. First, the

study was conducted at a single public university with a relatively small sample size, which limits the generalizability of the results to paramedic students in other institutions or regions.

Second, data were collected after final and make-up examinations, which may have influenced students' responses due to fatigue, stress, or the immediate effects of the examination environment. This timing may have introduced response bias, particularly in self-reported measures of competence and confidence.

Third, the use of self-reported data may have led to social desirability bias, as students might have overestimated or underestimated their perceived competence.

In addition, perceived competence was assessed through self-evaluation rather than objective performance measures. It is known that self-assessed competence may not always correspond to actual competence levels, and this discrepancy may be influenced by cognitive biases such as the Dunning-Kruger effect.

Furthermore, the cross-sectional design of the study limits the ability to draw causal inferences, as the data were collected at a single point in time.

Since the questionnaire was not a standardized scale, no total score was calculated and comparative analyses based on scale scores could not be performed; therefore, the study remained at a descriptive analytical level.

Finally, since the data collection tool was a researcher-developed structured questionnaire rather than a standardized scale, advanced psychometric validation procedures such as construct validity analysis could not be performed. This may limit the methodological robustness of the measurement tool.

Future studies with larger, multi-center samples, objective performance assessments, and longitudinal designs are recommended to enhance generalizability and strengthen the validity of the findings.

Conflict of interest

The author declares that there is no conflict of interest.

Financial support

There was no funding for this study.

Acknowledgments

The authors would like to thank all the participants.

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