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ACİL DOĞUM EYLEMİ EĞİTİMİ ALAN PARAMEDİK VE ACİL TIP TEKNİSYENLERİNİN KAYGI VE BİLGİ DÜZEYLERİ

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Öz

Bu çalışmanın amacı, acil tıp teknisyenleri ve paramediklere verilen acil doğum eğitiminin bilgi düzeyleri ve kaygı durumları üzerindeki etkisini belirlemektir. Çalışma, tek gruplu ön test-son test yarı deneysel tipte yürütülmüştür. Çalışmanın örneklemi, bir ilde çalışan 231 acil tıp teknisyeni ve paramedikten oluşmuştur. Araştırma verileri Kişisel Bilgi Formu, Görsel Karşılaştırma Ölçeği ve Acil Doğum Bilgi Sorgulama Formu kullanılarak toplanmıştır. Veriler SPSS 26.0 programı ile analiz edilmiştir. Acil doğum eğitimi öncesinde katılımcıların ortalama kaygı ve bilgi düzeyleri sırasıyla 3.98±2.49 ve 7.04±1.48 iken, eğitim sonrasında ortalama kaygı ve bilgi düzeyleri sırasıyla 3.46±2.43 ve 9.29±1.41 olarak bulunmuştur. Bu sonuçlara göre, katılımcıların kaygı düzeylerinde azalma görülürken, bilgi düzeylerinde artış tespit edilmiştir ($t=4.335$, $p<0.001$; $t=17.708$, $p<0.001$, sırasıyla). Sonuç olarak, acil sağlık çalışanlarına düzenli olarak bu tür içeriklerle dolu, kaliteli ve simülasyon modelleriyle desteklenen hizmet içi eğitimler verilmesi, anne ve yenidoğan sağlığına önemli katkılar sağlayacaktır.

Anahtar Kelimeler: Doğum, Acil Durum, Kaygı, Bilgi.

ANXIETY AND KNOWLEDGE LEVELS OF PARAMEDICS AND EMERGENCY MEDICAL TECHNICIANS TRAINED IN EMERGENCY BIRTH

Abstract

The aim of this study is to determine the effect of emergency birth training given to emergency medical technicians and paramedics on their knowledge levels and anxiety status. This study employed a single-group pretest–posttest quasi-experimental design. The study sample consisted of 231 emergency medical technicians and paramedics working in one province. The research data were collected using the Personal Information Form, the Visual Comparison Scale, and the Emergency Birth Information Inquiry Form. The data were analyzed using SPSS 26.0. The mean anxiety and knowledge levels of the participants before the emergency birth training were 3.98±2.49 and 7.04±1.48, respectively, while those after the emergency birth training were 3.46±2.43 and 9.29±1.41, respectively. According to these results, while participants' anxiety levels decreased, their knowledge levels increased ($t=4.335$, $p<0.001$; $t=17.708$, $p<0.001$, respectively). As a result, regularly providing in-service training for emergency health workers with such content, supported by quality and simulation models, will make a significant contribution to maternal and newborn health.

Keywords: Birth, Emergency, Anxiety, Knowledg.

1. INTRODUCTION

Despite significant advances in medical technology, maternal mortality continues to remain a major concern on the global health agenda. Pregnancy-related complications lead many women to experience long-term morbidity and functional limitations each year (1,2). Globally, an estimated 600,000 women aged between 15 and 49 years lose their lives annually due to conditions associated with pregnancy and childbirth, with the vast majority of these deaths attributed to preventable obstetric complications (3).

Evidence indicates that maternal mortality is most frequent in the early postpartum period, with nearly half of maternal deaths occurring within the first 24 hours following delivery and approximately two-thirds within the first week after birth. Hemorrhage, hypertensive disorders of pregnancy, puerperal infections, uterine rupture, anemia, and obstructed labor constitute the leading direct causes of maternal death. These conditions are often exacerbated by underlying socioeconomic factors, such as poor nutrition and poverty, particularly in low- and middle-income countries (4).

Since the implementation of the Health Transformation Program in Türkiye in 2003, maternal and child health have been identified as a central priority within national health policies. Interventions carried out under this program have led to a substantial decline in maternal and infant mortality rates over time. Specifically, the maternal mortality rate decreased from 64 per 100,000 live births in 2002 to 28.5 in 2005, 14.9 in 2016, and further to 13.1 in 2019. Similarly, the infant mortality rate declined from 31.5 per 1,000 live births in 2002 to 7.3 in 2016 and reached 9.2 in 2022 following a rate of 9.3 in 2021 (5–7).

These improvements have been largely attributed to the strengthening of antenatal, intrapartum, and postnatal care services, the promotion of hospital-based deliveries, the expansion of healthcare workforce capacity in socioeconomically disadvantaged regions—particularly in eastern and southeastern parts of the country—and advancements in adult and neonatal intensive care services, as well as in the national 112 emergency medical service system (5).

Although pregnancy is generally considered a physiological process, it may rapidly evolve into a life-threatening condition for both the mother and the fetus. Paramedics, as frontline providers in the emergency medical system, frequently encounter obstetric emergencies and are responsible for initiating timely and appropriate interventions outside the hospital setting (8). Their scope of practice includes establishing vascular access, managing airway and oxygenation, administering approved emergency medications and fluids, performing cardiopulmonary resuscitation and defibrillation when indicated, stabilizing trauma patients for transport, controlling bleeding, managing fractures and dislocations, and assisting with childbirth in emergency circumstances (9,10).

Given the rarity of births occurring in prehospital environments, the primary objective is typically the rapid transfer of the mother to a healthcare facility equipped for obstetric and gynecological care. However, in situations where immediate transport is not feasible, emergency healthcare professionals must be prepared to manage delivery and potential complications under limited conditions (11). Evidence suggests that unplanned prehospital births are associated with increased maternal and neonatal morbidity and mortality, many of which are considered preventable with appropriate training and preparedness (12,13).

Accordingly, this study aims to evaluate changes in anxiety and knowledge levels among paramedics and emergency medical technicians before and after receiving simulation-based emergency birth training, identify existing challenges, and propose evidence-based recommendations to improve emergency obstetric care in prehospital settings.

2. METHODS

2.1. Study Design

This study was planned as a "Pretest-Posttest Model in a Single Group", which is one of the quasi-experimental methods, in order to determine the knowledge and anxiety levels of paramedics and emergency medical technicians before and after emergency birth training for performing births in ambulances.

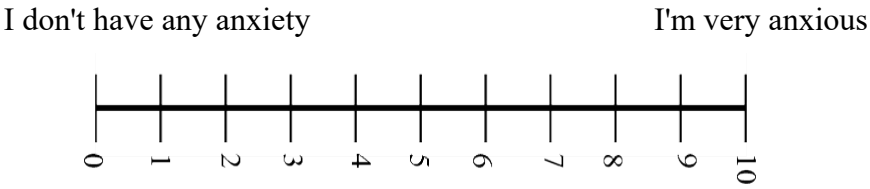
2.2. Setting and Sample

The study population consisted of 450 emergency medical technicians and paramedics working in a province in Turkey. Emergency medical technicians and paramedics who did not participate in emergency birth training or volunteer for the study were excluded. The sample selection technique was not used, and the study sample consisted of 231 emergency medical technicians and paramedics who participated in emergency birth training. Participants were informed about the study verbally and in writing.

2.3. Data collection tools

Individual Diagnostic Form: This form was developed by researchers based on a review of the relevant literature (11-13). The form consisted of 8 items: 4 questions on participants' demographic characteristics and 4 on their concerns about delivering a baby in an ambulance.

Visual comparison scale (VCS): The Visual Comparison Scale was used to assess participants' anxiety levels before and after the emergency birth training. This scale enables the quantification of subjective states that cannot be directly measured numerically by allowing individuals to mark their perceived level on a 100-mm line defined by opposite descriptors. The VCS is easy to administer, does not rely on language, and has been shown to produce consistent results regardless of scale orientation or short-term repeated measurements. Scores are calculated by measuring and averaging the marked distances on the line, and the scale is widely accepted in the literature as a reliable and valid assessment tool (14). Scores ranged from 0 to 10, with higher scores indicating greater anxiety.



Emergency birth information inquiry form (EBIIF): The Emergency Birth Information Inquiry Form was developed by the researchers based on a review of the relevant literature (11–13) to evaluate participants' knowledge levels regarding emergency childbirth before and after the training program. The form consists of 12 true–false questions, with 1 point awarded for each correct answer and 0 points for incorrect responses, yielding a total score of 0-12. The questionnaire was administered to participants as a pretest prior to the training and repeated as a posttest following one week of theoretical and practical instruction.

2.4. Data Collection

Research data were collected face-to-face from emergency medical technicians and paramedics participating in an emergency childbirth training program. The data collection process began with pretests administered before the start of the training program. Participants were first given

a Personal Information Form, a Visual Comparison Scale, and an Emergency Childbirth Knowledge Questionnaire.

The emergency childbirth training was conducted as a one-week program comprising theoretical lectures and simulation-based applications. The training program lasted five consecutive days and consisted of 12 hours of theoretical instruction and 16 hours of simulation-based practice. Theoretical sessions covered normal birth physiology, recognition of obstetric emergencies, neonatal resuscitation, and infection control. Simulation training was conducted using high-fidelity birth simulators and included hands-on practice of delivery techniques, management of complications, and teamwork scenarios. Following the completion of the training program, the same assessment tools were administered again to obtain posttest data. All participants were informed about the data collection process, and participation was voluntary.

2.5. Data Analysis

Statistical analysis of the study data was performed using SPSS (version 26.0). Descriptive statistical methods, including frequencies, percentages, means, and standard deviations, were used to summarize participants' demographic characteristics and main study variables. The distribution of quantitative data was examined for normality using the Kolmogorov–Smirnov test and graphical methods. Comparisons between pre- and post-training measurements were conducted using a paired-samples t-test. All statistical analyses were performed at the 95% confidence level, and p-values less than 0.05 were considered statistically significant.

2.6. Ethical Aspects of Research

Prior to the commencement of the study, all necessary institutional approvals were obtained. The research protocol was reviewed and approved by the XXX University Non-Invasive Clinical Research Ethics Committee (approval number: GO 2022/483; Burdur, Türkiye; 02 February 2022). Participants were fully informed about the aim and importance of the study, and written and verbal informed consent was obtained from all participants before data collection. The study was conducted in accordance with the principles of the Declaration of Helsinki and in compliance with the ethical standards of the country of origin.

3. RESULTS

43.3% (n=100) of the participants worked as paramedics and 56.7% (n=131) worked as emergency medical technicians. The mean age of the participants was 30.6667±5.73370, and the average number of years of professional experience was 9.1775±5.40198. It was determined that 91.3% (n=211) of the participants were university graduates and only 8.7% (n=20) were high school graduates.

39.8% (n=92) of the participants reported having given birth in the ambulance before, and 60.2% (n=139) had never given birth in the ambulance. Five people who had previously given birth in the ambulance stated that they faced different complications during birth. These complications are: cord entanglement-meconium birth (n=1), twin baby-breech presentation-infant loss (n=2), compression of the fetus on the roof-difficult birth (n=1), breech presentation-cord prolapse-arrest in the baby (n=1).

While 76.6% (n=177) of participants believed they could deliver a baby in the ambulance before the emergency birth training, this rate increased to 88.7% (n=205) after the training. When asked, "Does it worry you to come across a birth in an ambulance?", the rate of participants who said "no, it does not worry" was 42.4% (n=98) before the training, while this rate increased to 51.1% (n=118) after the training (Table 1).

Table 1. Changes in Participants' Self-Efficacy and Anxiety Regarding Emergency Birth in Ambulance Before and After Training

States of belief and anxiety		Pre-training		Post-training	
		n	%	n	%
Do you believe you can carry out a birth in an ambulance?	Yes	177	76.6	205	88.7
	No	13	5.6	4	1.7
	I do not know	41	17.8	22	9.6
Would you be worried about going into labor in an ambulance?	Yes	90	39.0	73	31.6
	No	98	42.4	118	51.1
	I do not know	43	18.6	40	17.3
TOTAL		231	100.0	231	100.0

When Table 2 is examined, it is found that the EBIIF item difficulty indices ranged from 0.18 to 0.89, and the item discrimination power indices ranged from 0.15 to 0.41. Since these findings showed that the questions in the Emergency Birth Inquiry Form had a discriminating power of 0.15 or higher, the item was not removed from the form. After it was determined that the reliability and item discrimination of EBIIF were acceptable, it was administered to the group as a pretest and posttest.

Table 2. Item Difficulty and Item Discrimination Index Values of the Emergency Birth Information Inquiry Form

Question No	Correct number	Difficulty Index (pj)	Separation Index (rjx)
Question 1	161	0.70	0.24
Question 2	206	0.89	0.29
Question 3	123	0.53	0.41
Question 4	192	0.83	0.34
Question 5	148	0.64	0.35
Question 6	56	0.24	0.24
Question 7	64	0.28	0.30
Question 8	102	0.44	0.37
Question 9	165	0.71	0.20
Question 10	148	0.64	0.35
Question 11	220	0.95	0.15
Question 12	41	0.18	0.19

When the self-anxiety levels of the participants' anxiety about encountering a birth in an ambulance were evaluated through the Visual Comparison Scale before and after the emergency birth training, while the mean anxiety levels were 3.98±2.49 before the training, the mean anxiety levels after the training were 3.46±2.43. Accordingly, the posttest mean score was significantly lower than the pretest mean score, indicating a decrease in anxiety levels ($t=4.335$; $p<0.001$) (Table 3).

Table 3. Comparison of Pre-Training and Post-Training Knowledge and Anxiety Scores of Paramedics and Emergency Medical Technicians

Emergency Birth Knowledge Level	X±SS	t	p
Pretest Score	7.04±1.48	17.708	<0.001
Posttest Score	9.29±1.41		
Emergency Birth Anxiety Level	X±SS	t	p
Pretest Score	3.98±2.49	4.335	<0.001
Posttest Score	3.46±2.43		

Note, X = Mean; SD = Standard deviation; t = Paired-samples t-test; $p<0.001$

When the results of the 12-question Emergency Birth Information Inquiry form, in which the participants' knowledge levels about birth were questioned, were examined, while the mean score of the pre-training knowledge levels was 7.04±1.48, the mean score of the post-training knowledge

levels was 9.29±1.41. Accordingly, the posttest mean score was significantly higher than the pretest mean score, indicating an increase in knowledge (t=17.708; p<0.001). (Table 3).

As a result, in this study, it was observed that when emergency medical technicians and paramedics feel inadequate and anxious about emergency birth, significant improvements in their knowledge and anxiety levels regarding this subject can be achieved through a simulation-supported training program. In this direction, regularly providing in-service training to emergency health workers with such content, high quality, and supported by simulation models will make significant contributions to maternal and newborn health.

4. DISCUSSION

Birth simulators are developed for two different purposes. The first is to obtain a model of childbirth for educational purposes only. The other is to analyze the stresses and constraints in the pelvic system during childbirth. At the same time, research simulators are useful in clinical practice. Simulation may have implications for public health, aiming to reduce maternal and neonatal morbidity and mortality (15). In this study, the aim was to determine the effect of emergency birth training provided to emergency medical technicians and paramedics on participants' knowledge and anxiety levels during the simulation.

This study showed that participants were frequently exposed to cases involving emergency birth and neonatal care, and that staff were concerned about this issue; their knowledge was insufficient. Our second important result is that participants' knowledge of emergency birth and newborn care can be significantly increased through a structured training program using a simulation model.

Unplanned births outside the hospital are very rare in the ambulance service, and there is evidence that emergency medics are disturbed by this operational picture. At the same time, there was an increase in morbidity and mortality for both mother and newborn (16). In this study population, although the complications associated with the care of women who gave birth were numerically low, there were serious cases, including arrest in the newborn. In addition, during emergency birth simulation training, the participants stated that it can be very difficult to manage such serious complications.

In studies of changes in knowledge and skills, evaluations often compare pre-training and post-training test scores, as in our study. Most studies report that knowledge and skills improve immediately after training (17-20).

In a large-scale pretest-posttest study by Conroy et al. (5939 healthcare workers in seven countries), their scores were evaluated before emergency obstetrics and neonatal care training (17). In addition, in a systematic review by Ameh et al. evaluating studies on emergency obstetrics and neonatal care, it was observed that those who received this training at any time prior to training had higher pre-training scores. In this study, 99.7% of participants showed improvement in their scores (18). In several studies, participants who received training immediately after the training showed a significant increase in knowledge and skills (21-23). Similar to these results, in our study, when participants' mean scores in emergency birth training were examined, posttest scores were significantly higher than pretest scores, indicating an increase in their knowledge.

To address the problems caused by personnel stress in emergency health services, the qualifications of the in-service training they receive upon entering the profession should be carefully defined. Subjecting health personnel working in situations such as emergency birth to special training on this subject is one of the most important factors that will increase their success in coping with stress and anxiety and therefore performing their profession, in short, in saving human life (24). In this direction, in our study, the anxiety levels of emergency medical technicians and paramedics were

discussed and it was observed that the average of the posttest anxiety levels was significantly lower than the average of the pretest anxiety levels after the emergency birth training based on the simulation model received by the participants, and as a result, there was a decrease in anxiety levels. At the same time, some of the participants participated in emergency birth training as educators; They stated that they were very worried and anxious due to the complications that occurred during birth, and that such simulation model-based training was very effective in reducing their anxiety in this regard.

5. LIMITATIONS OF THE STUDY

This study has some limitations. First, the use of a single-group pretest–posttest quasi-experimental design without a control group limits the ability to establish a causal relationship between the training and the observed improvements. The study was conducted in only one province, which restricts the external validity and generalizability of the findings to other regions or healthcare settings. Furthermore, participants' anxiety and knowledge levels were assessed using self-report-based measurement tools, which may have introduced response bias, including social desirability effects. The short timeframe for post-training assessments prevented evaluation of the sustainability of knowledge retention and anxiety reduction over time. In addition, repeated exposure to the same assessment tools may have produced a testing or learning effect, potentially inflating posttest scores. Finally, participants might have modified their responses due to awareness of being observed, indicating a possible Hawthorne effect.

6. CONCLUSIONS AND RECOMMENDATIONS

This study determined that simulation-assisted emergency childbirth training significantly increased the knowledge levels and decreased the anxiety levels of emergency medical technicians and paramedics. The findings highlight the importance of structured training programs for enhancing healthcare professionals' competencies in rare but high-risk situations, such as emergency childbirth.

Therefore, it is recommended that simulation-assisted in-service training programs be planned and implemented regularly for personnel in emergency medical services. In future studies, using a control group and a long-term follow-up design would be beneficial for evaluating the retention of the training and its impact on clinical practice.

“ACİL DOĞUM EYLEMİ EĞİTİMİ ALAN PARAMEDİK VE ACİL TIP TEKNİSYENLERİNİN KAYGI VE BİLGİ DÜZEYLERİ” **Başlıklı Makalenin Araştırma ve Etik Beyanı Bilgileri**

Bu çalışma “Araştırma ve Yayın Etiği” değerlerine uygun olarak hazırlanmış ve intihal kontrol programında kontrol edilmiştir. Çalışmanın tüm sorumluluğu yazar(lar)a aittir.

Bilgilendirme	-
Yazar Çıkar Çatışması Beyanı	Yazarlar arasında çıkar çatışması yoktur.
Finansal Destek	Bu araştırma, kamu, ticari veya kar amacı gütmeyen sektörlerdeki fon kuruluşlarından herhangi bir özel hibe almamıştır.
Yazar Katkı Oranı Beyanı	Yazarlar eşit oranda katkıda bulunmuşlardır. Çalışma konsepti ve tasarımı: Ucan Yamac S., Çetinkaya Ak E.; veri toplama: Ucan Yamac S., Çetinkaya Ak E.; sonuçların analizi ve yorumlanması: Ucan Yamac S., Çetinkaya Ak E.; taslak makale hazırlığı: Ucan Yamac S., Çetinkaya Ak E. Tüm yazarlar sonuçları incelemiş ve makalenin son halini onaylamıştır.

Teşekkür	Yazarlar, bu araştırmaya katkıda bulunan tüm katılımcılara son derece minnettardır ve içtenlikle teşekkür ederler.
Etik Kurul Onay Belgesi	Çalışma için gerekli etik onaylar alınmıştır. Bu çalışma, Burdur Mehmet Akif Ersoy Üniversitesi Girişimsel Olmayan Klinik Araştırmalar Etik Kurulu tarafından onaylanmıştır (Rapor numarası, yeri ve tarihi: GO 2022/483, Burdur-Türkiye, 02.02.2022). Çalışmanın amacı ve önemi anlatıldıktan sonra katılımcılardan yazılı ve sözlü olarak bilgilendirilmiş onam alınmıştır. Çalışma, Helsinki Bildirgesi ve menşe ülkenin etik standartlarına uygun olarak yürütülmüştür.
Ölçek İzni	Veri toplama formu yazarlar tarafından literatür taraması yapılarak oluşturulmuştur. Doğrudan hazır bir ölçek formu kullanılmamıştır.

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