

## RESEARCH / ARAŞTIRMA

### DETERMINATION OF MIDWIVES AND NURSES' KNOWLEDGE LEVEL WHO WERE GIVEN PARTOGRAPH TRAINING

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#### ABSTRACT

**Aim:** The aim of this study is to assess midwives and nurses' knowledge and skills of the partograph before and after the training.

**Methods:** This cross-sectional study was conducted in Balıkesir in Turkey. This study was 45 midwives and nurses who were given partograph training. A scale measuring the partograph knowledge before and after the training was administered and participants were asked to mark on the partograph by giving a case sample to measure skills of using partograph. The questions prepared to measure knowledge of the partograph were multi-item propositions. Correct answers to the partograph knowledge questions were scored "2", missing answers were scored "1" and wrong answers or unanswered questions were scored "0".

**Results:** Partograph knowledge score averages were meaningfully higher in midwives and nurses who worked in obstetrics clinics, who used partograph and who received partograph training previously ( $p<0.05$ ). Partograph recording skill score averages were meaningfully higher in midwives and nurses who worked less than 10 years, who had university education, who used partograph previously, and who received partograph training ( $p<0.05$ ). Post-training score average of total knowledge was meaningfully higher ( $p<0.0001$ ).

**Conclusions:** There was a meaningful increase in knowledge and skill score averages in midwives and nurses after the training. Since use of current partograph is a new thing, knowledge of midwives and nurses in working obstetrics clinics should be updated and deficiencies should be made up.

**Keywords:** Knowledge; midwifery; nurse; partograph.

#### ÖZ

#### Partograf Eğitimi Verilen Ebe ve Hemşirelerde Bilgi Seviyesinin Belirlenmesi

**Amaç:** Bu çalışmanın amacı partograf eğitimi alan ebe ve hemşirelerin eğitim öncesi ve sonrası partograf konusundaki bilgi ve becerilerini değerlendirmektir.

**Yöntem:** Kesitsel olarak planlanan bu araştırma Balıkesir ilinde partograf eğitimi alan 45 ebe ve hemşirede gerçekleştirilmiştir. Araştırmanın yürütülmesi için etik kuruldan ve kişilerden onam alınmıştır. Yetişkin eğitim ilkelerine göre partograf eğitimi verilmiştir. Eğitimden önce ve sonra partograf bilgisini ölçen anket uygulanmış ve katılımcılardan partograf kullanma becerilerini ölçmek için olgu örneği verilerek partograf üzerinde işaretlemesi istenmiştir. Araştırmanın verileri partograf konusundaki bilgiyi ölçmeye yönelik hazırlanan sorular çok maddeli önermeler şeklinde hazırlanmıştır. Partograf bilgi sorularına ve kaydetme bölümlerine; doğru yanıt veren ya da işaretleyenlere "2" puan, eksik olanlara "1" puan, yanlış yanıt veren ya da boş bırakanlara "0" puan verilmiştir.

**Bulgular:** Partograf Bilgi puan ortalamaları doğum kliniklerinde çalışan, daha önce partograf kullanan ve partograf eğitimi alan ebe ve hemşirelerde anlamlı olarak yüksektir ( $p<0.05$ ). Partografa kaydetme beceri puan ortalamaları çalışma yılı 10 yılın altında olan, üniversite eğitimi alan, daha önce partograf kullanan ve partograf eğitimi alan ebe ve hemşirelerde anlamlı olarak yüksektir ( $p<0.05$ ). Eğitim öncesi toplam partograf bilgi puan ortalaması ile eğitim sonrası toplam bilgi puan ortalaması karşılaştırıldığında, eğitim sonrası toplam bilgi puan ortalaması anlamlı olarak daha yüksek bulunmuştur ( $p<0.0001$ ).

**Sonuç:** Ebe ve hemşirelerin partograf eğitim öncesi düşük olan bilgi ve beceri puan ortalamaları eğitimden sonra puan ortalarında anlamlı bir artış olmuştur. Türkiye'de güncel partografin kullanılması yeni olduğu için bu konuda doğumla ilgili kliniklerde çalışan ebe ve hemşirelerin bilgileri güncellenmeli ve eksiklikleri giderilmelidir.

**Anahtar Kelimeler:** Bilgi; ebe, hemşire; partograf.

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## INTRODUCTION

Maternal mortality was estimated that in 2017, roughly 295 000 women died during and following pregnancy and childbirth related complications (1). Abnormal labour incidence is approximately 11%. These deaths are preventable thanks to early diagnosis and timely interventions (2). In the world, it is estimated that obstructed labour occurs in 5% of pregnancies and accounts for an estimated 8% of maternal deaths (3-5). World Health Organisation (WHO) (2014 and 2018) recommends using the partograph to improve labour management and to support decision making in terms of interventions in terms of maternal and newborn health (6,7).

Partograph is a universal tool that can be used to monitor and evaluate labour and diagnose and interpret abnormal conditions (3,8-11). For midwives partograph is an "early warning system" (3,7). A midwife with insufficient knowledge and skill to use the partograph cannot evaluate the labour process actively.

Using the partograph during the labour process has a number of positive effects on maternal and newborn health. Partograph is reported to reduce unnecessary interventions and rate of caesarean, decreases perinatal morbidity and mortality, to help diagnose labour-related problems in advance, and to help predict time of labour (3,7,9,12).

Infant mortality rate in Sweden is 3 per thousand, which is reported to stem from regular use of the partograph (13). By a decree of Turkish Ministry of Health, partograph is to be used in all health institutions where labour service is provided to observe normal labour (9,14). In this study midwives knowledge of partograph use was questioned. Midwives evaluate normal labour process most effectively using the partograph. When the factors regarding health service providers according to national maternal morbidity study carried out in 2005 are examined, it is seen that the statements "The midwife could not diagnose, the midwife could not handle the problem." ranked second and third among the causes of maternal morbidity.

This study shows the importance of partograph use in labour action of midwives. In our country the current partograph was started to be used from 2015 (14).

Literature reviews reveals the necessity of training midwives for correct use of the partograph (15). Midwives acquire knowledge regarding the partograph via guidelines, pre-graduation training or in-service training. In the

conditions of our country, midwives and nurses work together in obstetrics clinics. The aim of this study is to assess midwives and nurses' knowledge and skills of partograph before and after the training.

### Hypothesis

The hypothesis of this study; given partograph training affects the knowledge and skills of using partographs.

## METHODS

### Desing

This cross-sectional research was carried out in Balıkesir province with a group of midwives and nurses (n = 45) who were given partograph training. The midwives and nurses working in the delivery room, pregnant and puerperal ward were included in the training. Pre- and post-evaluation forms were used to assess the efficiency of the training. Participants were informed and oral approval was obtained.

### Study Population

The sample size was determined using power calculations G\*Power 3 with taking into account previous studie in which an Partograph training. Estimates of effects were derived from the findings of Andarieh, Abhari, Shabani and Mirabi (2014) who reported mean partograph knowledge pre-training=2.4±1.07, post-training=10.26±0.92 (16). We aimed at detecting a similar difference. The number of samples was considered 45. Power analysis demonstrated that the sample size of the study had a power of  $\alpha = 0.05$  to 100%. The increase in the knowledge level of the partograph after the intervention had an effect size of 4.12.

Inclusion criteria were as follows; midwives and nurses who are willing to participate in the study. The exclusion criterion is as follows; midwives and nurses who aren't willing to participate in the study.

### Data collection method

Before the training, the participants were given a questionnaire form to determine socio-demographical characteristics of the participants and a questionnaire form developed by the researchers composed of 13 questions in line with the guidelines for partograph use prepared by Turkish Ministry of Health was used to measure participants' level of knowledge regarding the partograph (14). Also, participants were asked to mark on the partograph giving a case sample to measure skills of using partograph. 35 people who had no knowledge of the partograph did not fill in the questionnaire form and the partograph.

After the training the questionnaire measuring knowledge of the partograph was administered and the participants were asked to re-mark on the partograph giving a case sample to measure skills of using partograph.

#### **Measurement**

A questionnaire form developed by the researchers composed of 13 questions in line with the guidelines for partograph use prepared by Turkish Ministry of Health was used to measure participants' level of knowledge regarding the partograph.

The questions prepared to measure knowledge of partograph were multi-item propositions. Correct answers to the partograph knowledge questions were scored "2", missing answers were scored "1" and wrong answers or unanswered questions were scored "0". Correct answers given to the case sample were scored "2", missing answers were scored "1" and wrong answers or unanswered questions were scored "0". Maximum partograph knowledge score was assessed over 32, maximum partograph recording score was assessed over 10, and total skill and knowledge score was assessed over 42. The hypothesis of this study; given partograph training affects the knowledge and skills of using partographs.

#### **Intervention**

A planned schedule was prepared to assess knowledge regarding partograph. Partograph training was given in accordance with adult education principles and the guidelines for partograph use prepared by Turkish Ministry of Health (14). Partograph training was given by the first author who had previously received partograph training, graduated from a doctorate program in midwifery and worked as an academician. Partography training was given in single session, for 2 hours and classroom. All participants was included in the training as a single group. Training was delivered outside of working hours. On the day of the training, midwives and nurses were on leave. The training program includes 6 topic titles: describing the partograph, aim of using the partograph, parameters recorded on the partograph (fetal cardiac rhythms, amnion liquid, cervical dilation, head level and uterus contractions), the labour step to start the partograph, recording the changes occurring during the labour, the meaning of intervention line and warning line, deciding the necessary interventions in case of a deviation from normal. Aim, target behaviours, and training

methods for each topic title were identified, and training activities were arranged.

#### **Type of Statistical Analysis**

The statistical analysis of the data was done using SPSS 20.0 statistical package program. Arithmetic average, standard deviation, number, and percentage distributions of the data were used. The Kolmogorov Simirnov test was used to assess the normality of the data. Mann Whitney U and Wilcoxon Signed Rank Test were implemented to assess knowledge and skill scores before and after the training. The p value smaller than 0.05 was showed the difference was meaningful.

#### **Ethics Consideration**

Official permission was obtained from Balikesir University Medicine Faculty Clinical Research Ethical Board to conduct the study (reference number: 2015-124).

### **RESULTS AND DISCUSSION**

60% of the participants were midwives and 40% of them were nurses. Mean age was  $33.66 \pm 11.07$  (min. 19, max. 64) and 62.2% of them were married. Mean working years of the midwives and nurses was  $11.07 \pm 11.37$  (min. 6 months, max.38 years), 33.3% of them worked in delivery room previously and 71.1% still work in delivery room and maternity ward. 33.3% of the participants received partograph training whereas 53.3% of them did not use partograph before.

Partograph knowledge score averages were meaningfully higher in midwives and nurses who worked in obstetrics clinics, who used partograph and who received partograph training previously ( $p < 0.05$ ).

Partograph recording skill score averages were meaningfully higher in midwives and nurses who worked less than 10 years, who had university education, who used partograph previously, and who received partograph training. Partograph total knowledge score averages were higher in midwives and nurses who had university education, who used partograph previously, and who received partograph training.

Post-training score average of total knowledge was meaningfully higher (Table 1).

The distribution of midwife/nurses' answers to use of the partograph are given in Table 2. The statements with the most correct answers were "M designates meconium stained mai" and "C designates clear mai". It was also found in the study of Mandiwa and Zamawe (2017), of the total 1070 partographs reviewed, status of membranes was recorded in 77.1% of the partographs (3).

**Table 1.** Comparison of Participants' Knowledge Scores

Occupational variables	Partograph Knowledge Score (Total Score: 32)		Knowledge of Partograph Recording Skill (Total Score:10)		Total Score (Total Score:42 )	
	Ave. ±SS	p*	Ave. ±SS	p*	Ave. ±SS	p*
<b>Working year</b>						
10 years and less (n=27)	6.55±3.17	0.375	33.07±5.29	<b>0.045</b>	26.51±3.53	0.058
11 years and more (n=18)	4.61±2.78		30.05±5.17		25.44±4.51	
<b>Working Place</b>						
Obstetrics Clinic (n=32)	6.03±3.28	<b>0.043</b>	32.90±5.10	0.364	26.87±3.48	<b>0.047</b>
Other services (n=13)	5.15±2.79		29.30±5.45		24.15±4.45	
<b>Education Status</b>						
Medical Vocational High School (n=18)	4.38±2.81	0.199	29.61±5.59	<b>0.014</b>	25.22±4.33	<b>0.025</b>
University (n=27)	6.70±3.06		33.3±4.79		26.66±3.62	
<b>Use of Partograph Previously</b>						
Used (n=21)	7.23±2.87	<b>0.007</b>	35.04±4.40	<b>0.003</b>	27.80±2.61	<b>&lt;0.0001</b>
Did not use (n=24)	4.50±2.84		29.08±4.64		24.58±4.32	
<b>Receiving Partograph Training</b>						
Received (n=15)	7.53±2.53	<b>0.037</b>	35.40±3.18	<b>0.009</b>	27.86±2.13	<b>0.002</b>
Did not receive (n=30)	4.90±3.08		30.10±5.44		25.20±4.35	

\*Mann-Whitney U test was used.

Level of meaningfulness was  $p < 0.05$ .

The statements given the less correct answers were about activity line and warning line. 64.4% of the participants answered "Cervical dilation reaching warning line in the partograph shows labour can be prolonged" correctly and 66.7% of the participants answered the question "Cervical dilation reaching activity line in partograph shows the need for intervention" correctly.

When recording skills of the participants were examined, it was seen that 51.1% recorded observing amnion liquid correctly, 60% recorded observing cervical dilation correctly, 35.6% recorded observing fetal head level, 37.8% recorded observing contractions correctly and 53.3% recorded on the partograph correctly (Table 2). In this study, it was determined that the participants in the study had deficiencies in their ability to record in the partograph. It was also

found in the study of Mandiwa and Zamawe (2017), of the total 1070 partographs reviewed, foetal heart rate was not recorded in 14.9% of the partographs, cervical dilation was not recorded 8.0% of the psrtographs, and descent of the foetal head was not recorded in 12.0% of the partographs (3). In studies conducted in Tanzania and Uganda, the fully record of cervical dilatation was 97% and 75% of the partographs, respectively (17,18).

Amnion liquid was the parameter that was recorded most insufficiently and cervical dilation was the most wrongly recorded parameter.

When pre-training total partograph knowledge scores and post-training partograph knowledge scores were compared, it was seen post-training partograph knowledge score average was meaningfully higher ( $p < 0.0001$ ) (Table 3).

**Table 2.** Midwife/Nurses' Answers to Partograph Knowledge Questions

<b>Partograph Knowledge</b>	<b>Correct (%)</b>	<b>Incorrect (%)</b>
Partograph should be used for all pregnant women in labour. (T)	88.9	11.1
Partograph recording should start from when dilation is 4 cm (T)	80.0	20.0
3 parameters are observed in Partograph (progress of labour, health state of the fetus, maternal health state) (T)	91.1	8.9
Cervical dilation being less than 1 cm shows active phase can be prolonged (T)	93.3	6.7
Cervical dilation reaching warning line in partograph shows labour can be prolonged (T)	66.7	33.3
Cervical dilation reaching activity line in partograph shows the need for intervention (T)	64.4	35.6
Fetus being at 0 point off the head level is the head being at ischial spine level (T)	84.4	15.6
Uterus contractions should be recorded for 10 minutes every 30 minutes (T)	71.1	28.9
Fetal heart rate should be recorded on the partograph every 30 minutes (T)	93.3	6.7
<b>Recording Information of Amnion Liquid</b>		
I designates intact membranes (T)	75.6	24.4
C designates clear mai (T)	95.6	4.4
M designates meconium stained mai (T)	100.0	0.0
A designates ruptured membranes + no liquor (T)	86.7	13.3

\*(T): True

**Table 3.** Recording the partograph by sections skill

<b>Partograph recording skill</b>	<b>Recording correctly (%)</b>	<b>Recording incorrectly (%)</b>	<b>Missing (%)</b>
Observing fetal heart rates	51.1	26.7	22.2
Observing amnion liquid	60.0	13.3	26.7
Observing cervical dilation	35.6	51.1	13.3
Observing fetal head level	37.8	40.0	22.2
Observing contractions	53.3	31.1	15.6

In this study midwives and nurses' knowledge and skills of partograph before and after the training was assessed. Partograph knowledge score averages, working years, working unit, education status, receiving partograph training previously, and use of partograph were compared. The most important finding of the study was that partograph knowledge score averages of the midwives working in obstetrics clinics were low.

Partograph was started to be used in obstetrics clinics in Turkey in 2001, and the new partograph was started to be used in 2015 when the partograph was updated. The meaningful difference between pre- and post-training score averages shows that the training program reached its target. Similarly, in the study carried out by Ahbari, Andarieh, Ledari and Ahmady pre- and post-training scores' averages were meaningfully high (15). Modares, Mirmolae, Mirmohammadalie, Valizadeh, Ziyace and

Hashemi (2009) and Masika, Katongole and Govule (2015) reported an increase in midwives' partograph knowledge scores after the training (13,19). In a study carried out in Iran with nursing students, an increase in partograph

knowledge scores and partograph total scores after the training was found (16). In one study conducted in Ethiopia knowledge levels of midwives and nurses receiving training were found to be higher (20).

**Table 4.** Comparison of Pre- and Post-Training Knowledge Scores

Pre- and Post-Training Knowledge Scores	Min-max	Ave. ±SS	p*
Pre-training (n=45)	0-28	3.78±7.65	<0.0001
Post-training (n=45)	21-40	31.86±5.40	

\*Wilcoxon Signed Rank Test was used.

Meaningfulness level was  $p < 0.05$ .

Mandiwa and Zamawe (2017) found in their study that the partograph recording skills of the participants were insufficient. For this reason, the study suggests that in-service training on partographs should be carried out regularly for healthcare professionals (3).

Score average of partograph recording skill was found to be meaningfully higher in the ones whose working years were less than 10 years. 90% of these midwives stated to have worked in a labour room for 3 years. Because midwives working in a labour room for three years actively within the first 10 years of their professional lives used the partograph more, their recording skills might have been developed. Unlike our findings, Opiah, Ofi, Essien and Monjok (2012) found that midwives whose work experience was more had more knowledge of partograph and partograph use (21). In the study done by Yisma, Dessalegn, Astatkie and Fesseha (2013), a relationship between working year and partograph knowledge of the health staff was not found (22). In the study carried out by Agan, Akpan, Okokon, Oku, Asibong and Opiah (2014), the ones who had working experience of 5 years or less had higher knowledge scores (67.7%) (23). The Turkish Ministry of Health required the partograph to be used in every labour from 2011. With this policy, partograph has been included in curricula of recently-graduated midwives; therefore this situation can explain why the scores are higher (9,10).

The study carried out in India supports our findings. Not receiving partograph training affects both use and knowledge scores. The shortcomings in education show that there is a critical problem in recordings. Lack of proficiency within the service and necessity of in-service training are emphasized (24).

Partograph knowledge scores and total knowledge score of the midwives working in obstetrics clinics were meaningfully high and the

study carried out in Ethiopia supports our findings (20). Although partograph recording scores were higher compared to the ones working in other services, there was not a meaningful difference. Because partograph should be used to follow labour, score averages of the midwives working in this service was higher. It is thought that the necessity to record the partograph and high levels of knowledge of midwives working in this service stems from the presence of young midwives working in labour rooms and their having more knowledge. The lack of midwives in obstetrics clinics, lack of in-service training, and not using the partograph are among the reasons for low scores of the midwives working in this service (24). In terms of education status, university graduate midwives had meaningfully higher partograph recording and total partograph scores. Partograph recording skill scores of university graduate midwives is a result that supports working year and their being newly graduates. All the midwives using partograph before and receiving training had meaningfully higher knowledge scores. In the study conducted by Opiah, Ofi, Essien and Monjok (2012) partograph knowledge scores of the midwives were higher compared to the scores found in our study (21). Because rate of maternal and infant mortality is high in Nigeria, use of the partograph in labour service is more important. In this study 78.2% of the midwives used the partograph before and 86.8% of them had partograph training before graduation. In the study carried out in Ethiopia the participants receiving training had higher partograph knowledge scores (20). In the study carried out by Yisma, Dessalegn, Astatkie and Fesseha (2013), the participants who used the partograph previously had higher levels of knowledge (22). In the study of Agan, Akpan, Okokon, Oku, Asibong and Opiah (2014) participants who used the partograph previously had higher partograph knowledge scores (23).

As a result of the evaluations, it was found that general score averaged were higher in the participants whose working year was less than 10 years, who worked in labour room, who received partograph training and who felt competent.

### CONCLUSION

Pre-training knowledge and skill score averages of midwives/nurses were low, but after the training a meaningful increase took place. In this study the results of an assessment carried out after a training including self-assessment and feedback were used. In adult education, the views of the midwife/nurse, a positive approach to the training method creates motivation regarding knowledge and skill development and contributes to develop positive behaviour. Within the training program, training assessment forms were collected from the midwives and the program was

assessed. It is thought that this study will contribute to increase and update midwives/nurses' knowledge regarding partograph via in-service trainings and to satisfy their insufficient knowledge.

Midwives should be prepared a partograph training program based on adult education principles and Ministry of Health Partograph Guidelines 2015 should be used.

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**Author Contributions:** H.T. undertook the data collection and prepared the manuscript; S.Y. prepared the manuscript and data analysis. All authors read and approved the final manuscript.

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