RESEARCH ARTICLE

Evaluation of the knowledge level and practices of family physicians about newborn follow-up: survey-based observation and comparison of 220 physicians in Ankara, Turkey

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Abstract

Objective: To compare the management-related practices and knowledge levels of family physicians about newborns, and to identify the factors that affected their practices and knowledge levels.

Method: The descriptive study was conducted at Ankara Yıldırım Beyazıt University Yenimahalle Training and Research Hospital, Ankara, Turkiye from August to November 2021, and comprised general practitioner family physicians, family medicine specialists and family medicine residents. Data was collected using a 26-item e-survey prepared on Google Forms that covered demographic and occupational information, including neonatal practices and knowledge regarding newborn follow-up. Data was analysed using SPSS 25.

Results: Of the 220 subjects, 112(50.91%) were males and 108(49.09%) were females. The overall medium age was 37 years (interquartile range: 32-43 years). There were 114(51.82%) specialists, 74(33.64%) general practitioners and 32(14.55%) residents. Professional experience was >10 years in 113(51.36%) cases. Knowledge scores were not significantly different among the healthcare providers (p>0.05). The residents had higher scores for re-lactation knowledge compared to the general practitioners (p=0.009). The specialists and residents were more likely to recommend attending breastfeeding polyclinics, to completely undress the baby during examination, and to perform depression screening in mothers compared to the general practitioners (p<0.05).

Conclusion: Despite having largely similar knowledge scores, family medicine specials and residents appeared to demonstrate relatively better practices compared to the general practitioners.

Key Words: Newborn management, Breastfeeding, Family physicians, Knowledge level.

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Introduction

The neonatal and infant mortality rate is one of the most important indicators of overall health, welfare and socioeconomic development.[1] Many variables, especially social and economic factors, education, health practices and breastfeeding success, are seen as the main determinants of these rates.[2-4]

Breast milk has the most ideal nutritional composition for babies.[5] It has proven efficacy in preventing gastrointestinal, respiratory, metabolic, allergic, endocrine and psychiatric diseases[5], reducing neonatal and infant mortality rates[4,6], decreasing risks for hypertension (HTN), dyslipidaemia, diabetes mellitus (DM) and obesity, and supporting cognitive development.[7] The World Health Organisation (WHO) and the United Nations Children's Fund (UNICEF) recommend initiation of breastfeeding within 1 hour of birth, exclusive breastfeeding during the first 6 months of life, and continued breastfeeding until at least 2 years of age.[7-9] According to the 2018 Turkiye Demographic and Health Survey[10], 71% of children aged <2 years were breastfed within 1 hour of birth, but only 41% of infants aged <6 months were exclusively breastfed, with a median 1.8-month duration of exclusive breastfeeding. According to UNICEF data, the neonatal mortality rate for Turkiye was 4.724 per 1,000 livebirths in 2023.[11] These rates may be associated with incorrect beliefs and/or inadequate and incorrect knowledge about neonatal management and breastfeeding. There may be an inadequacy in the education of healthcare providers (HCPs) on the subject, and limitations with respect to health service policies.[12]

Family Health Centres (FHCs) in Turkiye are primary healthcare institutions where vaccination, screening and basic follow-up of newborns and mothers are carried out. Therefore, family physicians (FPs) have to have the sufficient knowledge about newborn management.

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However, unfortunately, studies show that general practitioners (GPs) and even family medicine specialists (FMSs) in Turkiye do not have sufficient knowledge about newborn management, especially breastfeeding, and have low rates of acquiring training for breastfeeding counselling.[12]

The current study was planned to investigate the knowledge levels of FPs about newborn management, and to investigate the factors affecting their knowledge levels and practices

Subjects and Methods

The cross-sectional descriptive study was conducted at Ankara Yıldırım Beyazıt University Yenimahalle Training and Research Hospital, Ankara, Turkiye from August to November 2021. After approval from the institutional ethics review committee, the sample was raised using non-probability consecutive sampling technique from among the FPs working in FHCs in Ankara (n=1,750). All the FPs whose e-mail addresses were available were invited by sending e-mails about the study and the e-survey questionnaire that was prepared on Google Forms (n=1,046). These e-mails were sent once a month from August 1 to October 1, 2021. From among those who responded, those having worked as an FP for at least 3 months and volunteering to participate were included. Those excluded were the ones not completing all the survey questions, not actively working during the study period, working without a family health worker during the study period, working in a family medicine unit located in a prison or hospital, and having worked as an FP for <3 months.

Based on the final sample strength (n=220) and population size (1,750), the margin of error for the survey was calculated to be 0.0618 (6.18%) for 50% population proportion (P).

The data-collection tool was a 26-item e-survey (in the Turkish language) which was generated based on international guidelines[7,8] and, specifically, by Baby, Child and Adolescent Monitoring Protocols circulated by the Turkish Ministry of Health.[13] The first part of the questionnaire included 2 questions (Q1-2) about age and gender information, 3 questions (Q3-5) about profession and education status, 5 questions (Q6-10) about the population for which the physicians were responsible and the number of patients they attended to daily, 8 questions (Q11-18) about pregnancy and breastfeeding interventions for mothers, and 3 questions (Q19-21) about newborn examination practices. The second part measured the knowledge level of the participants about newborn management. There were 3 multiple-choice questions (MCQs) (Q22-24) related to neonatal weight follow-up. Correct answers were scored 1 and incorrect ones as 0. Thus, a sub-category score was created for weight follow-up knowledge, ranging 0-3 points. The next question (Q25) contained 4 True/False statements about newborn screening. A sub-category score for screening test knowledge was created, ranging 0-4 points. Similarly, the last question (Q26) consisted of 6 information sentences about re-lactation, with a sub-category score for re-lactation knowledge ranging 0-6 points. By adding up the scores of these three sub-groups, a total newborn knowledge score was formed, ranging 0-13 points.

In Turkey, family medicine services are provided by either centres led by general practitioner family physicians (GPFPs) or by centres led by family medicine specialists (FMSs). The current participants were divided into three groups according to their education/training status into GPFP, FMS and family medicine residents (FMRs) groups. Additionally, a second categorisation with two separate groups was utilised during data analysis. The first group comprised responses from GPFPs who worked in FHCs in which breastfeeding training was administered by non-physician health personnel (NPHP), while the second group comprised responses from FPs who provided training together with NPHPs.

Data was analysed using SPSS 25. The Kolmogorov-Smirnov test was used to check data normality. Non-parametric tests were applied because data was found to be non-normally distributed. Continuous variables were reported as median and interquartile range (IQR), while categorical variables were reported as frequencies and percentages. Depending on the number of groups, continuous variables were analysed using Mann-Whitney U test or Kruskal-Wallis test, while categorical variables were analysed using chi-square test or Fisher-Freeman-Halton test, as appropriate. Pairwise comparisons were adjusted using Bonferroni correction. Raw p values were multiplied by 3 (the number of possible pairwise combinations) and the results were interpreted according to the adjusted values. P<0.05 was considered statistically significant.

Results

Of the 1,046 subjects approached, 220(21%) were included; 112(50.91%) males and 108(49.09%) females. The overall media age was 37 years (IQR: 32-43 years). There were 114(51.82%) FMSs, 74(33.64%) FPGPs and 32(14.55%) FMRs. Professional experience was >10 years in 113(51.36%) cases. The age difference between GPFP and FMS groups was significant (p=0.006) (Table 1).

Table-1: Characteristics of the respondents and their answers to survey questions.

Q1 Age (years)	37 (32 - 43)
Q2 Gender	
Female	108 (49.09%)
Male	112 (50.91%)
Q3 Working status	
GPFP	74 (33.64%)
FMS	114 (51.82%)
FMR	32 (14.55%)
Q4 Experience	
<5 years	25 (11.36%)
5-10 years	82 (37.27%)
>10 years	113 (51.36%)
Q5 Number of physicians participating in breastfeeding counseling training	192 (87.27%)
Q6 Number of people for whom physicians are responsible	
<2000	22 (10.00%)
2000-3000	47 (21.36%)
3000-3500	83 (37.73%)
3500-4000	68 (30.91%)
Q7 Number of children (0-59 months) for whom physicians are responsible	160 (100 - 212)
Q8 Number of newborns (0-3 months) for whom physicians are responsible	7.5 (4 - 12)
Q9 The number of patients that physicians see per day	
<40	33 (15.00%)
40-50	51 (23.18%)
>50	136 (61.82%)
Q10 Number of pregnant women followed by physicians per month	
5-10	109 (49.55%)
10-15	63 (28.64%)
>15	48 (21.82%)
Q11 Number of physicians who provide training on breast milk and breastfeeding for pregnant women	188 (85.45%)
Q12 Number of physicians recommending pregnancy school to pregnant women	91 (41.36%)
Q13 Number of physicians that mothers applied to their unit with breastfeeding problems	202 (91.82%)
Q14 Health personnel providing breastfeeding education for mothers	
Family healthcare personnel	82 (37.27%)
Physician	0 (0.00%)
Family healthcare personnel + Physician	138 (62.73%)
Q15 Duration of breastfeeding education	
5 minutes	96 (43.64%)
6-10 minutes	80 (36.36%)
11-15 minutes	36 (16.36%)
16-20 minutes	8 (3.64%)
Q16 Parameters used in assessing breastfeeding success	
Number of diapers with urine *	163 (74.09%)
Number of diapers with stool *	129 (58.64%)
Weight increase *	195 (88.64%)
Sleep *	95 (43.18%)
Uneasiness of baby *	96 (43.64%)
Q17 Number of physicians who referred mothers to breastfeeding outpatient clinic	70 (31.82%)
Q18 Routinely screened mothers for depression during pregnancy and postpartum period	
Yes	56 (25.45%)
No	51 (23.18%)
Sometimes	113 (51.36%)
Q19 Weighing the newborn at every checkup	
Yes	173 (78.64%)
No	3.64%)

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Sometimes	39 (17.73%)
Q20 Completely undress the baby for newborn examination	
Yes	100 (45.45%)
No	21 (9.55%)
Sometimes	99 (45.00%)
Q21 Weight to be subtracted when weighing a newborn with diaper	
10 g	7 (3.18%)
20 g	15 (6.82%)
30 g	65 (29.55%)
40 g	24 (10.91%)
50 g	34 (15.45%)
100 g	40 (18.18%)
Must weigh without diaper *	35 (15.91%)
Q22 What is the maximum percentage of weight a term newborn can lose in the first week after birth?	
<5%	22 (10.00%)
5-10% *	118 (53.64%)
10-15%	76 (34.55%)
15-20%	4 (1.82%)
Q23 When is a term newborn expected to reach their birth weight?	
First 5 days	3 (1.36%)
7-10 days *	92 (41.82%)
11-15 days	117 (53.18%)
16-20 days	8 (3.64%)
Q24 How many grams per day should a term healthy newborn gain?	
10-20 g	41 (18.64%)
20-30 g *	133 (60.45%)
30-40 g	40 (18.18%)
40-50 g	6 (2.73%)
Q25 Which of the following is/are true?	
Hearing screening test must be performed in the first month *	192 (87.27%)
Developmental dysplasia of the hip is most common in the right hip #	93 (42.27%)
An ophthalmoscope must be used for the red reflex test *	188 (85.45%)
The baby should be fed for 48 hours in order to take a sample of heel blood *	174 (79.09%)
Q26 Which one(s) of the followings about re-lactation is/are true?	
Re-lactation is the re-establishment of breast milk production of the woman who has stopped breastfeeding *	176 (80.00%)
Re-lactation is the resumption of reduced milk production *	122 (55.45%)
Re-lactation is the resumption of completely stopped milk production *	125 (56.82%)
Re-lactation is easier in women who have not experienced the lactation process before #	58 (26.36%)
Re-lactation success does not depend on the baby's age #	81 (36.82%)
Re-lactation success depends on the length of time breastfeeding is interrupted *	141 (64.09%)
Newborn knowledge level	
Weight follow-up knowledge score	2 (1 - 2)
Screening tests knowledge score	3 (3 - 4)
Re-lactation knowledge score	4 (3 - 5)
Total knowledge score	9 (8 - 10

Data is given as median (1st quartile - 3rd quartile) for continuous variables due to non-normality of distribution, and as frequencies and percentages for categorical variables.
FMR: Family medicine resident, FMS: Family medicine specialist, GPFP: General practitioners/family physicians, *: Correct answer, #: Wrong answer.

There were more subjects with >10 years of experience in the GPFP group compared to FMS group (p<0.001). FMS group was more likely to recommend a pregnancy school (p=0.040) and to remove diapers during newborn weighing (p=0.022) than the GPFP group. NPHP-administered training was significantly more frequent in GPFP-led centres compared to FMS-led centres (p<0.001). The FMS group recommended attending breastfeeding polyclinics (p<0.001), undressed the baby completely during examination (p<0.001), and screened mothers for depression during pregnancy and the postpartum period (p=0.001) significantly more than the other groups. In terms of knowledge scoring, there was only a difference in re-lactation score between the FMR and GPFP groups, with higher scores obtained by the FMRs (p=0.009) (Table 2).

Table-2: Intergroup comparison related to the occupational status of the respondents.

	Working status			
	GPFP (n=74)	**FMS (n=114)**	**FMR (n=32)**	**p**
Q1 Age	41 (34 - 47)a	34 (32 - 42) b	36.5 (32.5 - 42.5) ab	0.006
Q2 Sex				
Female	32 (43.24%)	64 (56.14%)	12 (37.50%)	0.082
Male	42 (56.76%)	50 (43.86%)	20 (62.50%)	
Q4 Experience				
<5 years	15 (20.27%)	9 (7.89%)	1 (3.13%)	<0.001
5-10 years	12 (16.22%)	55 (48.25%)	15 (46.88%)	
>10 years	47 (63.51%) a	50 (43.86%) b	16 (50.00%) ab	
Q5 Number of physicians participating in breastfeeding counseling training	60 (81.08%)	104 (91.23%)	28 (87.50%)	0.125
Q6 Number of people for whom physicians are responsible				
<2000	9 (12.16%)	12 (10.53%)	1 (3.13%)	0.476
2000-3000	17 (22.97%)	21 (18.42%)	9 (28.13%)	
3000-3500	23 (31.08%)	49 (42.98%)	11 (34.38%)	
3500-4000	25 (33.78%)	32 (28.07%)	11 (34.38%)	
Q7 Number of children (0-59 months) for whom physicians are responsible	168 (116 - 210)	156.5 (100 - 215)	156.5 (63 - 207)	0.677
Q8 Number of newborn (0-3 months) for whom physicians are responsible	5 (3 - 12)	8 (4 - 12)	8.5 (5 - 10)	0.303
Q9 The number of patients that physicians see per day				
<40	11 (14.86%)	21 (18.42%)	1 (3.13%)	0.244
40-50	16 (21.62%)	28 (24.56%)	7 (21.88%)	
>50	47 (63.51%)	65 (57.02%)	24 (75.00%)	
Q10 Number of pregnant women followed by physicians per month				
5-10	41 (55.41%)	53 (46.49%)	15 (46.88%)	0.056
10-15	12 (16.22%)	39 (34.21%)	12 (37.50%)	
>15	21 (28.38%)	22 (19.30%)	5 (15.63%)	
Q11 Number of physicians who provide training on breast milk and breastfeeding for pregnant women	62 (83.78%)	101 (88.60%)	25 (78.13%)	0.293
Q12 Number of physicians recommending pregnancy school to pregnant women	22 (29.73%) a	55 (48.25%) b	14 (43.75%) ab	0.040a,b
Q13 Number of physicians that mothers applied to their unit with breastfeeding problems	64 (86.49%)	108 (94.74%)	30 (93.75%)	0.119
Q14 Health personnel providing breastfeeding education for mothers				
Family healthcare personnel	41 (55.41%) a	30 (26.32%) b	11 (34.38%) ab	<0.001
Physician	0 (0.00%)	0 (0.00%)	0 (0.00%)	
Family healthcare personnel + Physician	33 (44.59%)	84 (73.68%)	21 (65.63%)	
Q15 Duration of breastfeeding education				
5 minutes	37 (50.00%)	43 (37.72%)	16 (50.00%)	0.426
6-10 minutes	22 (29.73%)	45 (39.47%)	13 (40.63%)	
11-15 minutes	13 (17.57%)	20 (17.54%)	3 (9.38%)	
16-20 minutes	2 (2.70%)	6 (5.26%)	0 (0.00%)	
Q16 Parameters used in assessing breastfeeding success				
Number of diapers with urine	40 (54.05%) a	94 (82.46%) b	29 (90.63%) b	<0.001
Number of diapers with stool	34 (45.95%) a	72 (63.16%) ab	23 (71.88%) b	0.017
Weight increase	61 (82.43%) a	107 (93.86%) b	27 (84.38%) ab	0.039
Sleep	27 (36.49%) a	46 (40.35%) a	22 (68.75%) b	0.006
Uneasiness of baby	31 (41.89%)	45 (39.47%)	20 (62.50%)	0.063
Q17 Number of physicians who referred mothers to breastfeeding outpatient clinic	10 (13.51%) a	46 (40.35%) b	14 (43.75%) b	<0.001
Q18 Routinely screened mothers for depression during pregnancy and the postpartum period				
Yes	11 (14.86%) a	35 (30.70%) b	10 (31.25%) b	0.001
No	29 (39.19%)	18 (15.79%)	4 (12.50%)	
Sometimes	34 (45.95%)	61 (53.51%)	18 (56.25%)	
Q19 Weighing the newborn at every checkup				
Yes	59 (79.73%)	91 (79.82%)	23 (71.88%)	0.836
No	3 (4.05%)	4 (3.51%)	1 (3.13%)	
Sometimes	12 (16.22%)	19 (16.67%)	8 (25.00%)	

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Q20 Completely undress the baby for newborn examination				
Yes	17 (22.97%) a	66 (57.89%) b	17 (53.13%) b	<0.001
No	15 (20.27%)	6 (5.26%)	0 (0.00%)	
Sometimes	42 (56.76%)	42 (36.84%)	15 (46.88%)	
Q21 Weight to be subtracted when weighing a newborn with diaper				
10 g	4 (5.41%)	1 (0.88%)	2 (6.25%)	0.022
20 g	4 (5.41%)	9 (7.89%)	2 (6.25%)	
30 g	22 (29.73%)	30 (26.32%)	13 (40.63%)	
40 g	8 (10.81%)	13 (11.40%)	3 (9.38%)	
50 g	14 (18.92%)	14 (12.28%)	6 (18.75%)	
100 g	18 (24.32%)	18 (15.79%)	4 (12.50%)	
Must weigh without diaper*	4 (5.41%) a	29 (25.44%) b	2 (6.25%) ab	
Q22 What is the maximum percentage of weight a term newborn can lose in the first week after birth?				
<5%	9 (12.16%)	12 (10.53%)	1 (3.13%)	0.006
5-10% *	49 (66.22%) a	48 (42.11%) b	21 (65.63%) ab	
10-15%	15 (20.27%)	51 (44.74%)	10 (31.25%)	
15-20%	1 (1.35%)	3 (2.63%)	0 (0.00%)	
Q23 When is a term newborn expected to reach their birth weight?				
First 5 days	2 (2.70%)	1 (0.88%)	0 (0.00%)	<0.001
7-10 days *	29 (39.19%) a	60 (52.63%) a	3 (9.38%) b	
11-15 days	40 (54.05%)	51 (44.74%)	26 (81.25%)	
16-20 days	3 (4.05%)	2 (1.75%)	3 (9.38%)	
Q24 How many grams per day should a term healthy newborn gain?				
10-20 g	19 (25.68%)	20 (17.54%)	2 (6.25%)	0.144
20-30 g *	40 (54.05%)	69 (60.53%)	24 (75.00%)	
30-40 g	13 (17.57%)	23 (20.18%)	4 (12.50%)	
40-50 g	2 (2.70%)	2 (1.75%)	2 (6.25%)	
Q25 Which of the following is/are true?				
Hearing screening test must be performed in the first month *	62 (83.78%)	100 (87.72%)	30 (93.75%)	0.361
Developmental dysplasia of the hip is most common in the right hip #	27 (36.49%) a	43 (37.72%) a	23 (71.88%) b	0.001
An ophthalmoscope must be used for the red reflex test *	63 (85.14%)	94 (82.46%)	31 (96.88%)	0.123
The baby should be fed for 48 hours in order to take a sample of heel blood *	48 (64.86%) a	94 (82.46%) b	32 (100.00%) c	<0.001
Q26 Which of the following about re-lactation is/are true?				
Re-lactation is the re-establishment of breast milk production of the woman who has stopped breastfeeding *	55 (74.32%) a	90 (78.95%) ab	31 (96.88%)	0.026
Re-lactation is the resumption of reduced milk production *	37 (50.00%)	64 (56.14%)	21 (65.63%)	0.324
Re-lactation is the resumption of completely stopped milk production *	34 (45.95%) a	64 (56.14%) a	27 (84.38%) b	0.001
Re-lactation is easier in women who have not experienced the lactation process before #	24 (32.43%)	22 (19.30%)	12 (37.50%)	0.051
Re-lactation success does not depend on the baby's age #	27 (36.49%) ab	36 (31.58%) a	18 (56.25%) b	0.038
Re-lactation success depends on the length of time breastfeeding is interrupted *	44 (59.46%)	74 (64.91%)	23 (71.88%)	0.457
Newborn knowledge level				
Weight follow-up knowledge score	2 (1 - 2)	2 (1 - 2)	1.5 (1 - 2)	0.803
Screening tests knowledge score	3 (3 - 4)	3 (3 - 4)	3 (3 - 3)	0.501
Re-lactation knowledge score	4 (3 - 4) a	4 (3 - 5) ab	4 (4 - 5) b	0.009
Total knowledge score	8 (7 - 10)	9 (8 - 10)	9 (8 - 9.5)	0.097

Data is given as median (1st quartile - 3rd quartile) for continuous variables due to non-normality of distribution, and as frequencies and percentages for categorical variables. a: Significantly different from b and c, b: Significantly different from a and c, c: Significantly different from a and b, ab: No significant difference.
FMR: Family medicine resident, FMS: Family medicine specialist, GPFP: General practitioners/family physicians, *: Correct answer, #: Wrong answer.

For the second categorisation, the differences between the NPHP group and FP+NPHP group were noted (Table 3). Physicians in the FP+NPHP group had a greater frequency of receiving training for breastmilk counselling (p=0.011) and they were also more likely to allocate >5 minutes for breastfeeding training to each patient (p=0.002) compared to the NPHP group. More physicians in the FP+NPHP group provided breastfeeding education (p<0.001), pregnancy school advice (p<0.001) and referral to the breastfeeding polyclinic (p=0.023) compared to the other group. They were also more likely to remove all of the baby's clothes during examination (p<0.001), weigh the baby without diapers (p<0.001), and routinely screen for depression during pregnancy and postpartum period

Table-3: Intergroup comparison related to the practice of educating mothers regarding breastfeeding.

	Breastfeeding training provided by		
	NPHP-G (n=82)	FP+NPHP-G (n=138)	p
Q1 Age	39.5 (32 - 47)	35 (32 - 42)	0.047
Q2 Sex			
Female	30 (36.59%)	78 (56.52%)	0.004
Male	52 (63.41%)	60 (43.48%)	
Q3 Working status			
GPFP	41 (50.00%)	33 (23.91%)	<0.001
FMS	30 (36.59%)	84 (60.87%)	
FMR	11 (13.41%)	21 (15.22%)	
Q4 Experience			
<5 years	9 (10.98%)	16 (11.59%)	0.367
5-10 years	26 (31.71%)	56 (40.58%)	
>10 years	47 (57.32%)	66 (47.83%)	
Q5 Number of physicians participating in breastfeeding counseling training	65 (79.27%)	127 (92.03%)	0.011
Q6 Number of people for whom physicians are responsible			
<2000	7 (8.54%)	15 (10.87%)	0.313
2000-3000	13 (15.85%)	34 (24.64%)	
3000-3500	32 (39.02%)	51 (36.96%)	
3500-4000	30 (36.59%)	38 (27.54%)	
Q7 Number of children (0-59 months) for whom physicians are responsible	148.5 (100 - 222)	160 (102 - 210)	0.824
Q8 Number of newborns (0-3 months) for whom physicians are responsible	9 (4 - 12)	7 (4 - 12)	0.590
Q9 The number of patients that physicians see per day			
<40	9 (10.98%)	24 (17.39%)	0.407
40-50	21 (25.61%)	30 (21.74%)	
>50	52 (63.41%)	84 (60.87%)	
Q10 Number of pregnant women followed by physicians per month			
5-10	36 (43.90%)	73 (52.90%)	0.116
10-15	22 (26.83%)	41 (29.71%)	
>15	24 (29.27%)	24 (17.39%)	
Q11 Number of physicians who provide training on breast milk and breastfeeding for pregnant women	57 (69.51%)	131 (94.93%)	<0.001
Q12 Number of physicians recommending pregnancy school to pregnant women	12 (14.63%)	79 (57.25%)	<0.001
Q13 Number of physicians that mothers applied to their unit with breastfeeding problems	76 (92.68%)	126 (91.30%)	0.915
Q15 Duration of breastfeeding education			
5 minutes	48 (58.54%)	48 (34.78%)	0.002
6-10 minutes	23 (28.05%)	57 (41.30%)	
11-15 minutes	7 (8.54%)	29 (21.01%)	
16-20 minutes	4 (4.88%)	4 (2.90%)	
Q16 Parameters used in assessing breastfeeding success			
Number of diapers with urine	59 (71.95%)	104 (75.36%)	0.690
Number of diapers with stool	46 (56.10%)	83 (60.14%)	0.556
Weight increase	68 (82.93%)	127 (92.03%)	0.066
Sleep	33 (40.24%)	62 (44.93%)	0.498
Uneasiness of baby	28 (34.15%)	68 (49.28%)	0.029
Q17 Number of physicians who referred mothers to breastfeeding outpatient clinic	18 (21.95%)	52 (37.68%)	0.023
Q18 Physicians who routinely screened mothers for depression during pregnancy and postpartum period			
Yes	8 (9.76%)	48 (34.78%)	<0.001
No	32 (39.02%)	19 (13.77%)	
Sometimes	42 (51.22%)	71 (51.45%)	
Q19 Physicians weighing the newborn at every checkup			
Yes	58 (70.73%)	115 (83.33%)	0.060
No	3 (3.66%)	5 (3.62%)	
Sometimes	21 (25.61%)	18 (13.04%)	
Q20 Physicians who completely undress the baby in the newborn examination			

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Yes	21 (25.61%)	79 (57.25%)	<0.001
No	14 (17.07%)	7 (5.07%)	
Sometimes	47 (57.32%)	52 (37.68%)	
Q21 Weight to be subtracted when weighing a newborn with diaper			
10 g	6 (7.32%)	1 (0.72%)	<0.001
20 g	6 (7.32%)	9 (6.52%)	
30 g	26 (31.71%)	39 (28.26%)	
40 g	16 (19.51%)	8 (5.80%)	
50 g	10 (12.20%)	24 (17.39%)	
100 g	13 (15.85%)	27 (19.57%)	
Must weigh without diaper	5 (6.10%)	30 (21.74%)	
Q22 What is the maximum percentage of weight a term newborn can lose in the first week after birth?			
<5%	11 (13.41%)	11 (7.97%)	0.111
5-10% *	49 (59.76%)	69 (50.00%)	
10-15%	21 (25.61%)	55 (39.86%)	
15-20%	1 (1.22%)	3 (2.17%)	
Q23 When is a term newborn expected to reach their birth weight?			
First 5 days	0 (0.00%)	3 (2.17%)	0.527
7-10 days *	36 (43.90%)	56 (40.58%)	
11-15 days	42 (51.22%)	75 (54.35%)	
16-20 days	4 (4.88%)	4 (2.90%)	
Q24 How many grams per day should a term healthy newborn gain?			
10-20 g	22 (26.83%)	19 (13.77%)	0.010
20-30 g *	39 (47.56%)	94 (68.12%)	
30-40 g	17 (20.73%)	23 (16.67%)	
40-50 g	4 (4.88%)	2 (1.45%)	
Q25 Which of the following is/are true?			
Hearing screening test must be performed in the first month *	62 (75.61%)	130 (94.20%)	<0.001
Developmental dysplasia of the hip is most common in the right hip #	40 (48.78%)	53 (38.41%)	0.132
An ophthalmoscope must be used for the red reflex test *	60 (73.17%)	128 (92.75%)	<0.001
The baby should be fed for 48 hours in order to take a sample of heel blood *	56 (68.29%)	118 (85.51%)	0.004
Q26 Which of the following about re-lactation is/are true?			
Re-lactation is the re-establishment of breast milk production of the woman who has stopped breastfeeding *	55 (67.07%)	121 (87.68%)	<0.001
Re-lactation is the resumption of reduced milk production *	45 (54.88%)	77 (55.80%)	0.894
Re-lactation is the resumption of completely stopped milk production *	40 (48.78%)	85 (61.59%)	0.064
Re-lactation is easier in women who have not experienced the lactation process before #	29 (35.37%)	29 (21.01%)	0.019
Re-lactation success does not depend on the baby's age #	24 (29.27%)	57 (41.30%)	0.100
Re-lactation success depends on the length of time breastfeeding is interrupted *	43 (52.44%)	98 (71.01%)	0.005
Newborn knowledge level			
Weight follow-up knowledge score	2 (1 - 2)	2 (1 - 2)	0.641
Screening tests knowledge score	3 (2 - 3)	3 (3 - 4)	<0.001
Re-lactation knowledge score	4 (3 - 4)	4 (3 - 5)	<0.001
Total knowledge score	8 (6 - 9)	9 (8 - 10)	<0.001

Data is given as median (1st quartile - 3rd quartile) for continuous variables due to non-normality of distribution, and as frequencies and percentages for categorical variables.

(p<0.001) compared to the NPHP group. Screening test knowledge (p<0.001), re-lactation knowledge (p<0.001) and total knowledge (p<0.001) scores of the FP+NPHP group were significantly higher than the NPHP group.

Discussion

The education and knowledge levels of mothers and HCPs about the pregnancy process, breastfeeding and newborn care affects neonatal and infant mortality rates.[3,12,14] In the current study, only the median re-lactation knowledge score of FMRs was significantly higher than that of GPFPs. Moreover, the percentage of recommending a pregnancy school, applying breastfeeding education and screening for depression during pregnancy and the postpartum period, the percentage of participation in breastfeeding education, the accuracy rate in the scales and physical examination practices used to evaluate breastfeeding success were significantly greater in the FMS group compared to the GPFP group. In a similar study done in Turkiye, the knowledge levels of specialists and resident doctors from many branches, including family medicine, midwife-

nurses and other health professionals regarding breast milk and breastfeeding were measured and it was seen that in general, 28.4% of the participants had poor, 43.1% average and 28.5% good knowledge level about breast milk and breastfeeding. Also, only 51.6% of FPs received training on breastfeeding at any stage of their professional life.[12] Another study reported that 64.3% of GPFPs and 66.8% of FMRs gave correct answers to questions about breast milk and breastfeeding.[14] All these results showed that the knowledge level of HCPs, including specialist physicians, about breastfeeding, breast milk and newborn management was not at the desired level, that training interventions about these issues should be included in both medical school education programmes and family medicine specialty training programmes, and that breast milk and breastfeeding training programmes organised by the government for health professionals should be carried out more frequently and all FPs should be covered.

In 2017, there were 2.5 million neonatal deaths globally, accounting for 46% of all under-5 deaths.[15] This substantial number of neonatal mortalities was mostly due to preventable causes.[16] Exclusive breastfeeding is the most efficient intervention to decrease neonatal and infant mortality, as demonstrated by data showing that it prevents 13% of under-5 deaths in low-income countries (LICs).[4,6] A study argued that, when universally scaled, exclusive breastfeeding could prevent an estimated 823,000 annual deaths in children under-5, 87% of whom would be infants.[17] Similarly, early initiation of breastfeeding also contributes significantly to reducing neonatal mortality rates.[18] It has been shown that prenatal and postnatal breastfeeding education provides significant improvements in early breastfeeding initiation and exclusive breastfeeding rates.[16,19] All this emphasises the importance of pre- and post-natal breastfeeding education, concluding that interventions to protect, promote and support breastfeeding should be among the key strategies to achieve neonatal health goals.[17]

NPHPs have a very important place in neonatal management. However, they often have less knowledge than physicians about certain breastfeeding and neonatal management strategies.[12,20] Also valid for Turkiye, training of NPHPs does not guarantee that graduates receive up-to-date and evidence-based information on neonatal management.[20] The current study showed that FMSs, particularly females and younger physicians, were more inclined to participate in breastfeeding education with NPHPs. Percentages of providing breastfeeding education and recommending pregnancy school, and screening for prenatal and postnatal depression, duration of breastfeeding education, frequency of receiving breast milk counselling education, and knowledge scores (screening, re-lactation and total) were significantly higher among physicians in the FP+NPHP group compared to the NPHP group. In a study, 60.7% of HCPs, including obstetrics, paediatrics FMSs, FMRs and NPHPs, stated that they actively guided mothers in daily practice about breast milk and breastfeeding.[12] Similar studies in Turkiye have reported similar rates[21,22], but to our knowledge, there has been no specific study for FPs from Turkiye. In the current study, although there was no relationship between physicians' newborn knowledge scores and their participation in breastfeeding training, it was evident that FMSs, female physicians and young doctors were more willing to participate in breastfeeding training. Considering the current conditions in Turkiye, it can be said that the education given to mothers in breastfeeding should be administered with standardised, routine programmes in which trained physicians play a primary role.

The current study also planned to investigate whether or not the population burden of FPs had an effect on whether FPs participated in breastfeeding education and the duration of breastfeeding education given to mothers. However, the study could not obtain enough data to support or negate the notion. There was no significant difference between the NPHP and FP+NPHG groups in terms of the total number of patients assigned to their care, the number of pregnant women followed, and the number of patients cared for daily. Also, the duration of breastfeeding education provided by the respondents was not associated with their assigned patient count, newborn count, pregnant women count, and the number of patients they cared for daily. Previous studies have shown that physician-to-population ratios are associated with child mortality rates.[23] However, for Turkiye, the relationship between the number of people for whom FPs are responsible and the duration of providing breastfeeding education is not yet known.

In the current study, there were notable deficiencies in the knowledge and practices of FPs in areas, such as maternal depression, re-lactation, and developmental dysplasia of the hip in newborns. Their knowledge levels related to hearing screenings and vision examinations were relatively better. It was observed that GPFPs did not focus on sufficient management of maternal depression, while developmental dysplasia of the hip and re-lactation might be underestimated by both GPFPs and FMSs. To address these deficiencies, FPs need to receive more education and practical training in these areas. Updating training programmes and guidelines may enable the FPs

to play a more effective role in these critical areas.

The current study has limitations as the sample represented only 12.57% of the total study universe of 1,750 physicians. The sampling technique involved including every eligible participant who met the inclusion criteria during the study period. While the approach ensured that all available and willing participants were included, it had its limitations. Since the sample was not selected randomly, the findings may not be generalisable to the broader population of FPs. Also, it may have introduced selection bias, as it relied on the availability and willingness of the participants, which may not represent the entire population of interest. Although every effort was made to include all eligible participants, the sample can be considered a convenience sample, limiting the generalisability of the findings. The questions of the survey contain limited information about the management of neonates, and the collected data was based on a self-reporting questionnaire. Conducting the survey via the internet can also be considered a limitation. However, according to a report[24], internet, social media and mobile user statistics regarding Turkiye indicated that 70.8% of the total population are social media users. Also, the Web 2.0 tool reported that the completion rate of surveys that start with open-ended questions in Turkiye is 83%[25], suggesting that internet-based surveys can provide homogenous and successful results in Turkiye.

Conclusion

Although there was no significant difference across GPFP, FMS and FMR groups in terms of newborn management-related knowledge levels, FMSs had relatively better results compared to FMRs, who, in turn, had relatively better results compared to GPFPs, particularly with respect to the participation of mothers in breastfeeding education, directing pregnant women to pregnancy school, and correct practices in newborn follow-up. However, a higher priority should be given to newborn management and breastfeeding education in both medical schools and family medicine specialty programmes.

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TGS, EUT: Concept, design, data collection, processing, analysis, interpretation, literature search and writing.
MBB: Concept, data analysis, interpretation, literature search and writing.
NA: Concept, design, data collection and processing.