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Bridging Knowledge Gaps: Primary Healthcare Workers' Understanding of Breastfeeding During Pregnancy and Tandem Breastfeeding

Bilgi Eksikliklerinin Giderilmesi: Birinci Basamak Sağlık Çalışanlarının Gebelikte Emzirme ve Tandem Emzirme Hakkındaki Bilgi ve Görüşleri

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ABSTRACT

Background: Breastfeeding during pregnancy and tandem breastfeeding are challenging for both mothers and healthcare professionals, because societal taboos and lack of information often create uncertainty about whether to continue breastfeeding. This study aims to evaluate the knowledge and attitudes of primary healthcare workers, who play a key role in health counseling, regarding breastfeeding during pregnancy and tandem breastfeeding.

Materials and Methods: A among 209 primary care providers (family physicians, nurses, midwives, and paramedics). A 36-question survey was administered to participants. The questionnaire included items on demographic data, knowledge of and attitudes toward breastfeeding during pregnancy and tandem breastfeeding.

Results: The participants' mean age was 34.9 ± 6.4 years, and 60.3% were female. The majority (68.9%, n = 144) reported being knowledgeable about breastfeeding during pregnancy and tandem breastfeeding; most of this knowledge was acquired through in-service training (66.7%, n = 96). Approximately half of the participants (52.6%, n = 110) considered themselves sufficiently informed about breastfeeding during pregnancy, while only 28.2% (n = 59) felt knowledgeable about tandem breastfeeding. On the knowledge test, the highest rates of correct responses were observed for statements known to be false in the literature—namely, "Breastfeeding during pregnancy increases the risk of miscarriage" (74.2%, n = 155) and "Continuing breastfeeding during pregnancy causes low birth weight" (69.9%, n = 146). However, 45% (n = 95) of participants most frequently answered incorrectly to the statement known to be true in the literature: "The composition of breast milk changes in women who become pregnant while breastfeeding." Knowledge scores ranged from 0 to 9 (mean: 4.62 ± 2.14). Knowledge scores increased significantly with age (p = 0.027) and prior breastfeeding training (p = 0.003), but were not significantly associated with gender, marital status, professional role, or experience in family medicine.

Conclusion: Knowledge and attitudes regarding pregnancy and tandem breastfeeding vary among primary care workers. Targeted educational interventions and curriculum development are needed to strengthen competence in this area.

Keywords: Breastfeeding, child health, maternal health, pregnancy, family practice

ÖZ

Amaç: Gebelikte emzirme ve tandem emzirme, hem anneler hem de sağlık profesyonelleri için zorlu süreçlerdir; toplumsal tabular ve bilgi eksikliği, emzirmenin devamı konusunda çoğunlukla belirsizliğe yol açmaktadır. Bu çalışma, sağlık danışmanlığında kilit rol oynayan birinci basamak sağlık çalışanlarının gebelikte emzirme ve tandem emzirme konusundaki bilgi ve tutumlarını değerlendirmeyi amaçlamaktadır.

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ÖZ

Gereç ve Yöntemler: Kesitsel tipteki bu çalışma, 209 birinci basamak sağlık çalışanı (aile hekimi, hemşire, ebe, paramedik) ile gerçekleştirilmiştir. Katılımcılara 36 sorudan oluşan bir anket uygulanmıştır. Anket; demografik veriler ile gebelikte emzirme ve tandem emzirme konusundaki bilgi ve tutuma yönelik maddeleri içermektedir.

Bulgular: Katılımcıların yaş ortalaması 34,9 ± 6,4 yıl olup %60,3'ü kadındır. Çoğunluğu (%68,9, n = 144) gebelikte emzirme ve tandem emzirme konusunda bilgi sahibi olduğunu belirtmiş; bu bilgi çoğunlukla hizmet içi eğitim yoluyla (%66,7, n = 96) edinilmiştir. Katılımcıların yaklaşık yarısı (%52,6, n = 110) gebelikte emzirme hakkında yeterince bilgi sahibi olduğunu düşünürken, yalnızca %28,2'si (n = 59) tandem emzirme konusunda bilgili olduğunu düşünmektedir. Bilgi testinde, literatürde yanlış olduğu bilinen ifadeler—"Gebelikte emzirme düşük riskini artırır" (%74,2, n = 155) ve "Gebelikte emzirmeye devam etmek düşük doğum ağırlığına neden olur" (%69,9, n = 146)—ifadeleri için en yüksek doğru cevap oranları bulunmuştur ancak katılımcıların %45'i (n = 95) literatürde doğru olduğu bilinen "Emzirme döneminde gebe kalan kadınlarda anne sütünün bileşenleri değişir" ifadesini en yüksek oranda yanlış cevaplamıştır. Bilgi puanları 0 ile 9 arasında değişmektedir (ortalama: 4,62 ± 2,14). Bilgi puanları yaşın yükselmesi (p = 0,027) ve daha önce emzirme eğitimi almış olma ile (p = 0,003) anlamlı olarak artarken, cinsiyet, medeni durum, görev veya aile hekimliği deneyimiyle anlamlı ilişki göstermemiştir.

Sonuç: Birinci basamak sağlık çalışanlarının gebelikte ve tandem emzirme konusundaki bilgi ve tutumlarında değişkenlik gözlenmiştir. Bu alanda yetkinliği artırmak için hedefe yönelik eğitim müdahaleleri ve müfredat geliştirilmesine ihtiyaç vardır.

Anahtar Kelimeler: Emzirme, çocuk sağlığı, anne sağlığı, gebelik, aile hekimliği

Introduction

Breast milk is the optimal source of nutrition for newborns and plays a crucial role in strengthening the immune system, protecting against infections, and supporting healthy growth and development. The World Health Organization and other international pediatric organizations recommend exclusive breastfeeding for the first six months of life and continued breastfeeding alongside complementary foods for at least two years or beyond (1,2). In this context, breastfeeding during pregnancy and tandem breastfeeding—the practice of breastfeeding two children of different ages simultaneously—have gained increasing attention in recent years (3,4).

Despite these well-established benefits, breastfeeding during pregnancy and tandem breastfeeding are often surrounded by misconceptions and cultural taboos rather than evidence-based guidance. These practices are frequently perceived as unsafe, leading to uncertainty among both mothers and healthcare professionals. Such concerns may result in premature weaning and inconsistent counseling practices, ultimately affecting maternal and child health outcomes (3,4).

Recent studies have demonstrated that breastfeeding during an uncomplicated pregnancy is generally safe and not associated with an increased risk of spontaneous abortion, preterm birth, or low birth weight, provided that the mother is healthy and adequately nourished (3,5,6). However, in high-risk pregnancies or cases of maternal malnutrition, individualized assessment and monitoring are advised, with clinical decisions guided by a careful evaluation of potential risks and benefits. Studies examining tandem breastfeeding further indicate that the macronutrient composition and immunological quality of human milk remain appropriate for both the newborn and the older child, suggesting that breastfeeding can safely continue with adequate maternal support (7,8).

Although the clinical evidence regarding the safety of breastfeeding during pregnancy and of tandem breastfeeding has expanded in recent years, research focusing on healthcare workers' knowledge and attitudes toward these practices remains limited and heterogeneous, both nationally and internationally. Existing studies suggest that gaps in knowledge and persistent misconceptions among physicians and other healthcare providers may lead to inaccurate or misleading counselling practices (9,10).

Given that healthcare providers play a central role in providing evidence-based counseling, their knowledge and attitudes directly affect breastfeeding continuation and maternal confidence. Qualitative research indicates that mothers who receive supportive, evidence-based counseling from healthcare providers are more likely to continue tandem breastfeeding without anxiety, whereas misinformation or discouragement remains a leading cause of premature weaning (9-11).

Primary healthcare workers—including family physicians, nurses, and midwives—are often the first point of contact for pregnant and lactating women, placing them in a key position to influence maternal decision-making. However, recent surveys across different settings, including Türkiye, reveal significant knowledge gaps concerning breastfeeding during pregnancy and tandem breastfeeding, with many healthcare workers relying on outdated beliefs rather than current scientific evidence (9,11,12). These findings highlight the need to better understand not only healthcare workers'

knowledge and attitudes, but also how these factors may shape counseling practices in primary care settings.

Given limited data addressing the knowledge, attitudes, and misconceptions of primary healthcare professionals regarding breastfeeding during pregnancy and tandem breastfeeding, it is important to clarify the current situation and identify areas requiring educational support. Therefore, this study aimed to assess primary healthcare workers' knowledge and attitudes regarding breastfeeding during pregnancy and tandem breastfeeding, and to identify gaps that may affect evidence-based counseling and educational needs in primary care.

Materials and Methods

Study Design and Participants

This cross-sectional, descriptive study was designed to assess the knowledge and attitudes of family physicians and family health workers regarding breastfeeding during pregnancy and tandem breastfeeding. The study was conducted in family health centers across Yozgat, with the study population comprising all family physicians and family health workers employed in the province. Yozgat has 145 family medicine units, staffed by 134 family physicians and 134 family health workers. This study employed census (whole-population) sampling to include all family physicians and family health workers employed in family health centers across Yozgat province. Family physicians and family health workers who volunteered for the study were included; those who declined or withdrew were excluded. The study involved 209 participants, accounting for 77.9% of all primary healthcare workers.

Participants were contacted by telephone through their family health centers, data were collected online at their convenience. Prior to the initiation of the study, informed consent was secured from all participants, thereby guaranteeing voluntary participation.

Ethical approval was obtained from the Non-Interventional Clinical Research Ethics Committee of Yozgat Bozok University prior to study initiation (protocol number: 2017-KAEK-189_2023.10.26_04, dated: 26.10.2023).

Data Collection Tools

The data collection tool was a 36-item questionnaire developed by the researchers following an extensive review of relevant national and international literature, including previous studies and guidelines on breastfeeding during pregnancy and on tandem breastfeeding (3,5,7-9). The initial draft of the questionnaire was reviewed by three academic experts (two family physicians and one pediatrician) for content validity, relevance, and clarity. Based on their feedback, minor revisions were made to ensure conceptual consistency and clarity of wording. A pilot test was then conducted with 20 family physicians and family health workers who were not included in the main study to assess the comprehensibility of the survey and the time required to complete it. Feedback from this pilot group led to slight modifications in the wording and sequencing of several items. The final version consisted of three sections: (1) sociodemographic and professional characteristics (fourteen questions); (2) knowledge statements (nine items) regarding breastfeeding during pregnancy and tandem breastfeeding; (3) attitude statements (thirteen items) regarding breastfeeding during pregnancy and tandem breastfeeding. The knowledge section of the questionnaire consisted of nine statements, with response options of "true," "false," and "no idea." Correct responses were scored 1 point; incorrect and "no idea" responses were scored 0 points. Total knowledge scores, therefore, ranged from 0 (no correct answers) to 9 (all correct). The attitude section included 13 statements that participants could respond to with "agree," "neutral," or "disagree. The internal consistency coefficient for the knowledge items was found to be 0.715, while for the attitude items, it was calculated as 0.721.

Statistical Analysis

Data analysis was performed using IBM SPSS Statistics for Windows, Version 20.0 (Armonk, NY: IBM Corp.). Data normality was assessed using skewness and kurtosis coefficients, Q-Q plots, and histograms. Descriptive statistics, including percentages and frequencies, were used to summarize participants' demographic information and questionnaire responses. Independent-samples t-tests, one-way analysis of variant, Kruskal–Wallis tests were used to compare continuous variables between groups. A p-value <0.05 was considered statistically significant. A post-hoc power analysis indicated that the study had 86% power ($n = 209$, $\alpha = 0.05$, two-tailed) to detect a medium effect size (Cohen's $d = 0.42$).

Results

A total of 209 primary healthcare workers participated in the study, of whom 60.3% (n = 126) were female. The mean age of the participants was 34.92 ± 6.36 years. Nearly half of the participants were family physicians (49.3%), followed by nurses (30.1%), midwives (13.7%), and paramedics (1.9%).

The majority of participants had more than one year of overall professional experience (n = 204, 97.6%), and most had at least one year of experience working in family medicine (n = 181, 86.6%).

Regarding awareness of breastfeeding during pregnancy and tandem breastfeeding, 68.9% (n = 144) of the participants reported being familiar with these concepts.

Among those who were aware, the majority had obtained this information through in-service breastfeeding training. While more than half of participants (52.6%) considered themselves sufficiently knowledgeable about breastfeeding during pregnancy, only 28.2% reported adequate knowledge of tandem breastfeeding. In addition, 27.8% reported that insufficient knowledge of these topics caused anxiety. A high proportion of participants expressed interest in further education, with 84.7% willing to attend scientific meetings and 88% supporting the inclusion of these topics in healthcare curricula.

Participants demonstrated varying levels of knowledge regarding specific statements related to breastfeeding during pregnancy and tandem breastfeeding. The statements "Breastfeeding during pregnancy increases the risk of miscarriage" and "Continuing breastfeeding during pregnancy causes low birth weight in newborns" were answered correctly by the majority of participants. In contrast, the statement "The chemical composition of breast milk changes in women who become pregnant while breastfeeding" was the most frequently answered incorrectly (Table 1).

Analysis of attitudes and knowledge revealed significant differences between groups for most statements ($p < 0.05$). The lowest levels of awareness were observed for the statements "The mother should decide whether to continue breastfeeding her older child during pregnancy" (27.8%) and "If intrauterine growth restriction is present, I would recommend that the mother stop breastfeeding" (26.8%) (Table 2).

Knowledge scores ranged from 0 to 9, with a mean score of 4.62 ± 2.14; only two participants achieved the maximum score (Table 3). No significant associations were found between knowledge scores and gender, marital status, years of experience in family medicine, or professional role ($p > 0.05$). However, knowledge scores were significantly higher among older participants ($p = 0.027$) and among those who had received breastfeeding training compared with those who had not ($p = 0.003$) (Table 4).

Discussion

This study assessed family physicians' and family health workers' knowledge and attitudes regarding breastfeeding during pregnancy and tandem breastfeeding. Although most participants were familiar with the general concept of breastfeeding during pregnancy, overall knowledge levels were moderate and misconceptions remained common, particularly regarding physiological changes in breast milk composition. While statements related to miscarriage and low birth weight were frequently answered correctly, misunderstandings about breast milk composition during pregnancy reflected persistent gaps in professional knowledge.

Previous studies have shown that breastfeeding during a healthy, low-risk pregnancy does not increase the risk of miscarriage, preterm labor or low birth weight, provided the mother is well-nourished and monitored (13-17). Oxytocin release during breastfeeding in healthy pregnancies is generally insufficient to trigger uterine contractions due to decreased receptor sensitivity (14-16).

Table 1. Distribution of participants according to their knowledge levels about breastfeeding during pregnancy and tandem breastfeeding.

Statements	True		False		No idea	
	n	%	n	%	n	%
Breastfeeding during pregnancy increases the risk of miscarriage in the mother.	20	9.6	155	74.2	34	16.2
The chemical composition of breast milk changes in women who become pregnant during the breastfeeding period.*	82	39.2	94	45	33	15.8
The amount of milk decreases at the beginning of pregnancy in women who become pregnant during the breastfeeding period.	99	47.4	77	36.8	33	15.8
Continuing breastfeeding during pregnancy may lead to low birth weight in the newborn.	25	12	146	69.9	38	18.2
Uterine contractions may occur more commonly in women who breastfeed during pregnancy.*	77	36.8	78	37.4	54	25.8
Preterm labor is more commonly observed in women who breastfeed during pregnancy.	53	25.3	113	54.1	43	20.6
Tandem breastfeeding may lead to the newborn not being adequately nourished.	89	42.5	104	49.8	16	7.7
The stool of the older child may be yellowish/mustard in color while tandem breastfeeding.*	89	42.6	11	5.2	109	52.2
The decision to wean from tandem breastfeeding should be made independently of the children's ages.*	122	58.4	31	14.8	56	26.8

*Symbol represents the information that is correct according to the literature.

Table 2. Association between knowledge scores and attitudes regarding breastfeeding during pregnancy and tandem breastfeeding.

Statements	Agree		Neutral		Don't agree		p-value
	n	%	n	%	n	%	
I recommend that a mother without any additional risk factor to discontinue breastfeeding if she becomes pregnant.	41	19.6	28	13.4	140	67	<0.001 KW: 61.93
I conduct pregnancy follow-ups more frequently for mothers who breastfeed while pregnant.	103	49.3	42	20.1	64	30.6	<0.001 F(2, 98.77) = 14.10
I would schedule more frequent prenatal check-ups for a mother breastfeeding during pregnancy if she has additional risk factors.	171	81.8	17	8.1	21	10	0.055 KW: 5.80
I do not recommend breastfeeding during pregnancy for mothers with risk factors.	64	30.6	52	24.9	93	44.6	<0.001 F(2, 206) = 24.90
I recommend that the mother discontinue breastfeeding if the baby has intrauterine growth retardation.	80	38.3	56	26.8	73	34.9	<0.001 F(2, 124.17) = 19.46
I recommend that the mother discontinue breastfeeding if she has anemia.	31	14.8	39	18.7	139	66.5	<0.001 F(2, 60.74) = 14.39
I recommend that the mother to continue breastfeeding if her weight gain during pregnancy is adequate.	143	68.4	31	14.8	35	16.8	<0.001 F(2, 206) = 30.30
I recommend that the mother continue breastfeeding if she is motivated to feed her older child while pregnant.	27	12.9	31	14.9	151	72.2	<0.001 F(2, 206) = 42.87
I would closely monitor the newborn baby of a mother who is breastfeeding during pregnancy and practicing tandem breastfeeding.	41	19.6	15	7.2	153	73.2	<0.001 KW: 26.85
Healthcare professionals should encourage the mother to continue breastfeeding while pregnant.	32	15.3	43	20.6	134	64.1	<0.001 F(2, 206) = 49.78
Healthcare professionals should encourage the mother to continue tandem breastfeeding after birth.	23	11	45	21.5	141	67.5	<0.001 KW: 76.79
The mother should make her own decision regarding breastfeeeding during pregnancy.	60	28.7	58	27.8	91	43.5	<0.001 F(2, 109.55) = 9.90
The mother should make her own decision regarding tandem breastfeeding.	97	46.4	53	25.3	59	28.3	0.018 F(2, 113) = 9.90

KW, Kruskal–Wallis Test; F, one-way analysis of variance.

Table 3. Descriptive statistics for breastfeeding during pregnancy and tandem breasfeeding knowledge scores.

	Mean ± standard deviation	Median	Minimum–maximum
Knowledge scores	4.62 ± 2.14	5.0	0-9

Table 4. Evaluation of participants' knowledge scores with various variables.

		n	Mean ± SD	Min.-max.	p-value
Gender	Female Male	126 83	4.59 ± 1.99 4.67 ± 2.36	1–8 0–9	0.774[a]
Age	<35 years ≥35 years	108 102	4.31 ± 2.13 4.83 ± 2.21	0–8 0–9	**0.027[a]**
Experince in family medicine	≤5 years >5 years	106 103	4.42 ± 2.06 4.81 ± 2.21	0–8 0–9	0.158[a]
Profession	Family physician Family health worker	103 106	4.55 ± 2.24 4.69 ± 2.06	0–9 1–8	0.650[a]
Previously having education on breastfeeding during pregnancy and tandem breastfeeding	Yes	98	5.09 ± 1.95	0–8	**0.003[a]**
	No	111	4.21 ± 2.22	0–9	

[a]Independent samples t-test. Min-max, minimum-maximum; SD, standart deviation.

Nevertheless, in pregnancies complicated by malnutrition, bleeding or preterm contractions, breastfeeding should be evaluated on an individual basis. The present study supports these findings, suggesting that healthcare professionals' understanding aligns partially with current scientific evidence.

Misconceptions regarding changes in breast milk composition during pregnancy appear to be widespread among both healthcare workers and mothers. Although compositional changes occur, breast milk continues to meet the nutritional and immunological needs of both the newborn and the older child during tandem breastfeeding (5,18). Inaccurate counseling may contribute to unnecessary early weaning, underscoring the need for clearer differentiation between normal physiological changes and clinical risk factors requiring intervention (16,19,20).

Another important finding was that a substantial proportion of participants expressed uncertainty regarding maternal decision-making about breastfeeding during pregnancy. This suggests limited awareness of the importance of maternal autonomy in breastfeeding counseling. Healthcare professionals should provide individualized, evidence-based guidance while supporting mothers in making informed decisions based on their own circumstances, consistent with mother-centered counseling principles (7,11,21,22).

Consistent with previous research, counseling about breastfeeding during pregnancy and tandem breastfeeding was perceived as challenging, and many participants reported anxiety due to insufficient knowledge. Participants who had received prior training demonstrated significantly higher knowledge levels, emphasizing the role of structured education in improving counseling confidence and accuracy. Although breastfeeding is included in undergraduate curricula, complex scenarios such as tandem breastfeeding are often insufficiently addressed, highlighting the need for enhanced coverage in both undergraduate and continuing professional education (7,9,11,23).

In this study, age was significantly associated with knowledge levels. This finding contrasts with several previous studies (24,25). The fact that this association is not commonly observed in the literature may be explained by differences in sample characteristics and the measurement tools used.

Given the limited number of studies focusing on healthcare providers rather than maternal experiences, this study contributes valuable insights from a primary healthcare perspective and highlights the need for standardized, evidence-based guidance. Future research should prioritize evaluating the effectiveness of targeted educational interventions and exploring counseling practices using qualitative approaches.

Study Limitations

Due to the cross-sectional design of the study, the results are applicable only to the study population, and causality cannot be established. Another limitation is that the study relied on self-reported survey data, which may have led to social desirability bias. In addition, the questionnaire used in the study was developed by the researchers, although content validity and internal consistency were evaluated, more advanced psychometric validation was not performed. Finally, as the study was conducted in a single province, the generalizability of the findings to other regions and healthcare settings may be limited.

Although descriptive and group comparison analyses were appropriate for the study objectives, the absence of multivariable analyses may limit the ability to conduct a more comprehensive assessment of factors associated with healthcare workers' knowledge and attitudes.

Conclusion

Healthcare workers who had received prior breastfeeding training demonstrated higher knowledge levels regarding breastfeeding during pregnancy and tandem breastfeeding. This finding highlights the need for targeted, evidence-based educational programs for primary healthcare workers to address misconceptions and improve counselling practices. Improving healthcare workers' knowledge may enhance maternal confidence and support the continuation of breastfeeding through informed decision-making.

Ethics

Ethics Committee Approval: Ethical approval was obtained from the Non-Interventional Clinical Research Ethics Committee of Yozgat Bozok University prior to study initiation (protocol number: 2017-KAEK-189_2023.10.26_04, dated: 26.10.2023).

Informed Consent: Prior to the initiation of the study, informed consent was secured from all participants, thereby guaranteeing voluntary participation.

Footnotes

Authorship Contributions

Surgical and Medical Practices: K.U.Z., F.S.Z., Concept: K.U.Z., F.S.Z., Design: K.U.Z., F.S.Z., Data Collection or Processing: F.S.Z., Analysis or Interpretation: K.U.Z., Literature Search: K.U.Z., F.S.Z., Writing: K.U.Z., F.S.Z.

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