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Awareness and attitudes of pregnant women regarding endocrine disruptors

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Abstract

This study aims assessment of the level of knowledge and attitudes of pregnant women regarding endocrine disruptors. This cross-sectional, descriptive study was carried out in the antenatal clinic of a hospital in Istanbul between January 25, 2023, and March 3, 2023. The study sample consisted of 350 pregnant women. The data collection tools were a Personal Data Form, an Endocrine Disruptors Awareness Test, and an Endocrine Disruptors Attitude Scale. The rate of women reporting that they received no education on endocrine disruptors is 99.7%. The average score for the Endocrine Disruptors Awareness Test was 9.15±3.19, and for the Endocrine Disruptors Attitude Scale was 73.26±8.51. There was a moderate positive correlation between the scores of the Endocrine Disruptors Awareness Test and the Endocrine Disruptors Attitude Scale (r= .52, p< .01). In conclusion, it is believed that pregnant women may be aware of toxic substances in their environment but may not recognise them as endocrine disruptors. It is recommended that the topic of endocrine disruptors be added to antenatal education. *(Afr J Reprod Health 2025; 29 [1]: 59-69).*

Keywords: Attitude; endocrine disruptors; pregnant; knowledge

Résumé

Cette étude vise à évaluer le niveau de connaissances et les attitudes des femmes enceintes concernant les perturbateurs endocriniens. Cette étude transversale et descriptive a été réalisée dans la clinique prénatale d'un hôpital d'Istanbul entre le 25 janvier 2023 et le 3 mars 2023. L'étude L'échantillon était composé de 350 femmes enceintes. Les outils de collecte de données étaient un formulaire de données personnelles, un test de sensibilisation aux perturbateurs endocriniens et une échelle d'attitude à l'égard des perturbateurs endocriniens. Le taux de femmes déclarant n'avoir reçu aucune éducation sur les perturbateurs endocriniens est de 99,7 %. Le score moyen pour le test de sensibilisation aux perturbateurs endocriniens était de 9,15 ± 3,19 et pour l'échelle d'attitude envers les perturbateurs endocriniens, de 73,26 ± 8,51. Il y avait une corrélation positive modérée entre les scores du test de sensibilisation aux perturbateurs endocriniens et de l'échelle d'attitude envers les perturbateurs endocriniens (r = 0,52 p< .01). En conclusion, on pense que les femmes enceintes peuvent être conscientes de la présence de substances toxiques dans leur environnement mais ne pas les reconnaître comme des perturbateurs endocriniens. Il est recommandé que le thème des perturbateurs endocriniens soit ajouté à l'éducation prénatale. *(Afr J Reprod Health 2025; 29 [1]: 59-69).*

Mots-clés: Attitude les; perturbateurs endocriniens; enceinte; connaissance

Introduction

Endocrine disruptors (EDs) are exogenous substances or mixtures of substances that affect the functions of the endocrine system, resulting in adverse health effects in individuals and future generations[1].

Phthalates, parabens, insecticides, bisphenol A, and lead can be cited as examples of endocrine-disrupting substances. These substances are present in numerous consumer products such as food, containers, cleaning products, cosmetics, furniture, electronic devices, home furnishings, construction materials, automobiles, and more. EDs can enter the body through inhalation, oral ingestion, and dermal exposure, as well as pass from the placenta to the fetus and from the mother's milk to the infant[2-4]. Exposure to EDs begins during the fetal period and continues throughout life, with the fetal period being one of the most sensitive periods[5]. EDs can contribute to various health problems, including preeclampsia, gestational diabetes, stillbirth, congenital anomalies, preterm birth, behavioural disorders, autism, hyperactivity, asthma, diabetes, obesity, cancer, infertility, testicular abnormalities, and many more[2-4,6-9]

For example, Bisphenol A (BPA), which is found in many products from plastic bottles to lotions, causes behavioral problems, infertility, polycystic ovary syndrome, endometriosis, obesity, glucose intolerance, type 2 diabetes[4,8,10,11]. Phthalate, which is found in many products from plastic products to cosmetics, has been reported to cause low birth weight, intrauterine growth retardation, premature birth, eclampsia, pre-eclampsia, abortion, insulin resistance, neurological developmental disorders, reproductive system anomalies, immune and respiratory system problems, cardiovascular diseases, cryptorchidism and cancer[3,8,11]. Polybrominated diphenyl ethers (PBDEs) used in many products from textiles to automobiles are associated with neurobehavioral effects, puberty problems, and neurodevelopmental problems[4,11]. Organochlorine pesticides (OCP), which are used to eliminate insects and weeds, can cause premature births, infertility, and low IQ scores[3,11]. The risk of autism increases by 60% in those exposed to organophosphates during pregnancy[10]. Intrauterine exposure to EDs not only lays the foundation for the future health of the baby but also has intergenerational effects through epigenetic mechanisms[4,12]

The pregnant woman's perception of EDs as a threat and her belief in the effectiveness of the behavioural changes she will make may lead to protective behavioural changes against EDs. Ensuring awareness of EDs and the development of protective attitudes among pregnant women can protect them, their babies, and future generations from the harmful effects of Eds[13]. However, EDs are not included in the content of antenatal education programs in Türkiye. In addition, there is no study evaluating the knowledge and attitudes of pregnant women towards EDs in Türkiye. The current study aims assessment of the level of awareness and attitudes of pregnant women regarding EDs. This study sought to answer the research questions "What are the awareness levels of pregnant women about endocrine disruptors? What are the attitude levels of pregnant women toward endocrine disruptors? What is the relationship between the awareness levels of pregnant women about endocrine disruptors and their attitudes toward endocrine disruptors? What are the factors affecting the awareness of pregnant women about endocrine disruptors and their attitudes toward endocrine disruptors?".

Methods

Design

The study was conducted as a descriptive cross-sectional study between January 25, 2023, and March 3, 2023, at a Teaching and Research Hospital's antenatal clinic in Istanbul. In this study, strobe reporting guideline was used.

Setting

The study population was 1,200 pregnant women who applied at the antenatal clinic within one year. Antenatal follow-up is performed by two obstetrician who are not researchers in this study. The required sample size to reach a 95% confidence interval with a 5% margin of error was determined as 341 pregnant women.

Participants

The sample consisted of pregnant women who came to the prenatal clinic for routine antenatal follow-ups, could communicate in Turkish, were literate, and volunteered to participate in the research. During the research period, the number of pregnant women visiting the hospital for antenatal examinations decreased due to clinic renovation work. Further, the majority of women attending the prenatal clinic did not meet the sample criteria (able to communicate in Turkish). 700 pregnant women who met the sample criteria during the research dates were invited to participate, and 350 pregnant women completed the forms.

Data collection process

The data collection tools were a Personal Data Form, an Endocrine Disruptors Awareness Test, and an Endocrine Disruptors Attitude Scale. The introductory section of the data forms included the World Health Organization's definition of EDs.

The personal data form; The form is prepared by the researchers in line with the literature consisting of 12 questions. The form includes six questions related to sociodemographic information, such as age, income level, and educational level. There are also six questions about EDs, including the.

Endocrine disruptors awareness test; At the initial study stage, researchers created this test consisting

of 20 questions in accordance with the literature consisting. The questions were corrected on the basis of recommendations of ten experts (in the fields of obstetrics and gynecology nursing, midwifery, pediatric endocrinology, toxicology, and the Turkish language). Some examples of questions in the Endocrine Disruptors Awareness Test; "I can give examples of baby and children's products that contain EDs" "Personal care products do not contain endocrine disrupting chemicals" "Endocrine disrupting chemicals can cause cancer". Following exploratory factor analysis and reliability analysis, items 11, 13, 15, 17, and 20 were removed from the form, reducing it to 15 items. Questions 3, 11, and 13 are reverse-scored. The form used a three-point Likert scale with options “Yes,” “No,” and “I don’t know,” scored as Yes=1, No=0, and I don’t know=0. The highest score from the test can be 15 and the lowest score can be zero. The Cronbach’s alpha value for the Endocrine Disruptors Awareness Test is 0.84.

Endocrine disruptors attitude scale (EDAS); The EDAS, developed by Turan Miral *et al*. consists of 21 questions[14]. The scale includes two subscales: consumer behaviours and nutrition and hygiene. The consumer behaviours subscale comprises 11 items, while the nutrition and hygiene subscale comprises 10 items. There are no reverse-scored items in the EDAS. The EDAS uses a five-point Likert scale with options “Strongly Agree,” “Agree,” “Undecided,” “Disagree,” and “Strongly Disagree.” The lowest score to be obtained from the scale, which has no cut-off value, is 21 and the highest score is 105, and high scores indicate that adults have a positive attitude towards protection from EDs. The Cronbach’s alpha reliability coefficient for the EDAS is $\propto$=0.85, $\propto$=0.81 for the consumer behaviours subscale, and $\propto$=0.80 for the nutrition and hygiene subscale. For this study, the Cronbach’s alpha reliability coefficient was found to be $\propto$=0.70 for the EDAS, $\propto$=0.81 for the consumer behaviours subscale, and 0.81 for the nutrition and hygiene subscale.

Data collection

Twenty pregnant volunteers who met the sampling criteria were asked to complete the data forms through face-to-face and indicate any questions not understood. Pregnant women said questions were understandable. For this reason, the questions weren't changed, and these pregnant women's data were included in the study as well.

All pregnant women in the waiting room of the antenatal clinic who met the sample criteria were invited to participate in the study after the purpose of the study was explained to them. The pregnant women were asked to participate voluntarily, and to complete data forms. Data were collected through face-to-face interviews by researchers, and it took approximately ten minutes to answer the questions.

Data analysis

SPSS Statistics 24 Package Software was used for data analysis. Descriptive statistics such as percentages, counts, and means were used to evaluate descriptive data. Parametric or non-parametric tests were employed for comparisons after assessing homogeneity. Homogeneity was determined by examining the skewness and kurtosis values of the variables, and values within ±1.5 were assumed to follow a normal distribution[15]. Factorial validity of the Endocrine Disruptors Awareness Test was assessed through exploratory factor analysis and confirmatory factor analysis using SPSS Amos. Pearson and Spearman correlation analyses were used to evaluate relationships between continuous variables. A significance level of $p<0.05$ was considered statistically significant.

Ethical consideration

Ethical approval for the research was received from the Istanbul Kültür University Ethics Committee (Approval No: 2022/134 date: 14.10.2022). The study was performed according to the Helsinki Declaration. Pregnant women were informed of the purpose of the research, and their voluntary consent was obtained

Results

The descriptive characteristics of the participating pregnant women are shown in Table 1. Mean age of pregnant women was 29.65±5.73 years (min: 18 - max: 43). Of the pregnant women, 31.4% were high school graduates, 51.7% had an income equal to their expenditure, and 66.9% were multiparous.

Only 6.9% of the participants had heard of EDs, with 50.0% of those hearing about it from social media. Furthermore, 99.7% of the

participants had received no EDs education. It was determined that 47.4% of pregnant women were influenced by the price of a product when making a purchase, and 98.0% of women did not do anything to protect themselves from EDs during pregnancy (Table 1).

The Endocrine Disruptors Awareness Test, EDAS, and subscale scores are shown in Table 2. The mean score for endocrine disruptors awareness was 9.15±3.19, and the mean EDAS score was 73.26±8.51 (Table 2).

The correlation analysis data between the Endocrine Disruptors Awareness Test score and the scores of EDAS and its subscales are provided in Table 2. The Endocrine Disruptors Awareness Test scores exhibited a moderate positive correlation with EDAS ($r= .52$, $p< .01$) and the consumer behaviors subscale ($r= .46$, $p< .01$). In addition, scores on the Endocrine Disruptors Awareness Test and the Nutrition and Hygiene Subscale were found to have a weak positive correlation. ($r= .39$, $p< .01$). (Table 2).

The comparison of pregnant women's descriptive information with Endocrine Disruptors Awareness Test scores is presented in Table 3. Participant with lower education levels (middle school or less), lower income levels, non-working status, multiparity, those who had never heard of EDs, and those most influenced by product prices had lower Endocrine Disruptors Awareness Test scores compared to others ($p< .05$) (Table 3).

Table 3 compares pregnant women's descriptive information with EDAS scores. Participants with lower education levels (middle school or less), lower income levels, non-working status, multiparity, those who had never heard of EDs, and those most influenced by product prices had lower EDAS and consumer behaviour subscale mean scores compared to other pregnant women ($p< .05$). Women most influenced by product prices had lower EDAS and subscale mean scores compared to those impacted by product content ($p< .05$) (Table 3).

Discussion

Awareness and protective attitudes regarding EDs in pregnant women are crucial for safeguarding the health of both the mother, the baby, and future generations.

This study revealed that almost all pregnant women were unaware of EDs and had taken no measures to protect themselves from ED exposure. Yet, their levels of ED awareness and attitudes were slightly above average.

Awareness of pregnant women regarding endocrine disruptors

The first step in developing a protective attitude towards ED is to be aware of its existence. However, in this study, nearly all (93.1%) participants reported being unaware of EDs. A similar finding was reported by Kelly *et al*. where a significant portion of the population was found to be unaware of EDs[16]. This study aligns with those findings, suggesting that EDs are a relatively new concept for pregnant women in Türkiye, possibly because EDs have only recently gained traction on social media.

This idea is supported by the study of Rouillon et al. where approximately half of the pregnant women had heard of EDs, with social media being their primary source of information[17]. In this study, although the number of participants who were aware of EDs was low, those who were primarily relied on social media for information. While social media may provide easy access to information, its accuracy and reliability can be questionable[17]. According to the same study, pregnant women tend to trust healthcare professionals more than social media as a source of information[17]. Therefore, it is crucial for nurses and midwives to educate pregnant women about EDs. However, only one participant in this study mentioned receiving ED education from a healthcare professional (a dietitian). Existing research also supports the notion that women do not receive ED education from healthcare professionals[16,17]. Incorporating EDs into the content of antenatal education programs would be a significant step towards safeguarding maternal and infant health.

Attitudes of pregnant women regarding endocrine disruptors

Raising awareness is one of the fundamental factors for developing protective behaviours. In this study, given the deficient number of participants who were aware of EDs, it is natural that almost all of them reported taking no preventive measures against ED exposure.

Table 1: Pregnant women's descriptive information (n= 350).

Descriptive Data		**n**	**%**
Educational Level	Illiterate	18	5.1
	Primary School	82	23.4
	Middle School	79	22.6
	High School	110	31.5
	University	61	17.4
Income Level	Income lower than expenditure	164	46.9
	Income equal to expenditure	181	51.7
	Income greater than expenditure	5	1.4
Employment Status	Yes	42	12.0
	No	308	88.0
Parity	Primiparous	116	33.1
	Multiparous	234	66.9
Status of hearing Endocrine	No	326	93.1
Disruptors	Yes	24	6.9
How did you hear about Endocrine	Social Media	12	50.0
Disruptors	Healthcare Professional	7	29.2
	Friends	5	20.8
Received Education on Endocrine	No	349	99.7
Disruptors	Yes (From a Dietitian)	1	0.3
The most influential factor in the	Price	166	47.4
decision to buy a product	Contents	97	27.7
	Brand	87	24.9
Precautions Taken for Endocrine	No	343	98.0
Disruptors Protection	Yes	7	2.0
Precautions Taken	Choosing Healthy Plastics	2	28.6
	Wearing a Mask	2	28.6
	Wearing Gloves	2	28.6
	Reduced Use of Chemical Cleaning Products	1	14.2

Table 2: Endocrine disruptors awareness test and endocrine disruptors attitude scale scores and correlation analysis between endocrine disruptors awareness test, endocrine disruptors attitude scale (n=350)

	Mean ±SD (Min-Max)	Endocrine Disruptors Awareness Test	Endocrine Disruptors Attitude Scale	Consumer Behaviour	Nutrition and Hygiene
		r	r	r	r
Endocrine Disruptors Awareness Test	9.15±3.19 (1-14)	1			
Endocrine Disruptors Attitude Scale	73.26±8.51 (52-95)	.52*	1		
Consumer Behaviour Subscale	30.02±6.61 (15-45)	.46*	.92*	1	
Nutrition and Hygiene Subscale	43.24±3.50 (29-50)	.39*	.69*	.36*	1

r: Pearson Correlation, Spearman Correlation *p< .01, **p< .05: Significant at Level

However, the study by Rouillon *et al*. indicated that most aware pregnant women were willing to change their habits and suggested at least one exposure-reducing measure[17]. Thus, it is recommended that awareness campaigns about EDs, especially targeting pregnant women, be conducted in Türkiye.

Table 3: Comparison of descriptive data with Endocrine Disruptors Awareness Test and Endocrine Disruptors Attitude Scale in pregnant women (n=350)

Descriptive Data			**Endocrine Disruptors Awareness Test**		**Endocrine Disruptors Attitude Scale**		**Consumer Behaviours**		**Nutrition and Hygiene**	
		n	Mean±SD	Difference	Mean±SD	Difference	Mean±SD	Difference	Mean±SD	Difference
Educational Level	a. Illiterate	18	5.00±3.31	a<c, d, e b<d, e	67.11±8.78		25.33±5.51		41.78±4.78	
	b. Primary School	82	7.68±3.18	c<d, e	69.71±7.97	a<d, e b<d, e	26.55±5.97	a<d, e b<d, e	43.16±3.35	c<d, e
	c. Middle School	79	8.80±3.28		70.91±8.01	c<d, e	28.94±6.24	c<d, e	41.97±3.73	
	d. High School	110	10.32±2.38		76.06±7.23		32.05±5.98		44.02±2.75	
	e. University	61	10.70±2.23		77.84±7.97		33.84±8.89		44.00±3.67	
	F		24.818		17.660		17.660		5.742	
	p		.00*		.00*		.00*		.00*	
Income Level	Income less than expenses	164	8.16±3.39		70.34±8.48		27.42±6.30		42.92±3.59	
	Income equals/exceeds expenses	186	10.03±2.73		75.83±7.68		32.32±6.01		43.52±3.41	
	T		-5.709		-.6.357		-7.437		-.1590	
	p		.00*		.00*		.00*		.11	
Employment Status	Yes	42	10.14±9.02		77.52±9.04		34.07±6.94		43.45±4.07	
	No	308	9.02±3.24		72.68±8.28		29.47±6.38		43.21±3.43	
	T		2.158		3.518		4.340		.424	
	p		.03*		.00*		.00*		.67	
Parity	Primiparous	116	9.91±2.89		75.96±8.13		75.96±6.19		43.01±3.61	
	Multiparous	234	8.77±3.24		71.92±8.39		71.92±6.33		43.35±3.43	
	T		3.188		4.278		6.130		-859	
	p		.00*		.00*		.00*		.39	

Awareness of Endocrine Disruptors	No	236	8.96±3.20		72.81±8.46		29.67±6.57		43.14±3.51	
	Yes	24	11.71±1.60		79.42±6.61		34.88±5.09		44.54±3.23	
	T		-4.162		-3.741		-3.799		-1.897	
	p		.00*		.00*		.00*		.06	
The Most Influential Factor When Deciding to Purchase a Product	Brand	87	10.15±2.51	c<a, b	75.41±8.07	c<a, b	32.02±5.88	c<a, b	43.39±3.51	c<b
	Content	97	10.88±1.87		77.42±7.83		33.19±6.42		44.24±2.98	
	Price	166	7.62±3.40		69.70±7.62		27.13±5.82		42.57±3.65	
	F		47.553		34.496		37.546		7.277	
	p		.00*		.00*		.00*		.00*	

F: One-Way Analysis of Variance (ANOVA), T: Independent Samples T-Test, *p< .05: Significant at Level

However, the study by Rouillon *et al*. indicated that most aware pregnant women were willing to change their habits and suggested at least one exposure reducing measure[17]. Thus, it is ecommended that awareness campaigns about EDs, specially targeting pregnant women, be conducted in Türkiye.

The relationship between awareness and attitudes of pregnant women regarding endocrine disruptors

Pregnant women's awareness and attitudes towards ED were found to be slightly above average in this study. This finding is consistent with the study by Rouillon et al. where pregnant women's knowledge (scored 42.9 ± 9.8 out of 100) and attitude scores (scored 56.9 ± 22.5 out of 100) were at a moderate level[17]. Surprisingly, despite a much higher rate of awareness of EDs in the study by Rouillon et al. the awareness and attitude scores in this study were similar and, in some cases, slightly higher[17]. It is believed that pregnant women in Türkiye may be aware harmful substances in their environment but may not recognise them as EDs. What is more, it is hypothesised that topics such as nutrition during pregnancy and hygiene in antenatal education may affect ED awareness and attitudes.

This study found a moderate significant relationship between pregnant women's awareness of EDs and their attitudes towards EDs. Considering that pregnant women are a sensitive group regarding EDs, increasing awareness of EDs is likely to influence their attitudes positively. There is a lack of research evaluating the relationship between ED awareness and attitudes in pregnant women, making it challenging to discuss this finding. Hence, it is recommended that further studies be conducted on this topic.

Factors affecting awareness and attitudes of pregnant women regarding endocrine disruptors

Women with higher educational levels had higher scores for both ED awareness and attitudes, in this study. This finding is supported by studies that reported that mothers with higher education levels have more knowledge and attitudes about food additives (18) and are more likely to question the CE (Conformité Européenné; The CE marking indicates that the product meets EU safety, health and environmental protection requirements.) label when choosing toys[19]. Therefore, it is important to prioritise ED awareness and education programs for pregnant women with lower educational levels, considering them as a disadvantaged group.

Existing studies suggest that ED awareness alone is not sufficient for improving protective behaviour change; other factors such as cost, perception of ED exposure risk, and the effort required also play a significant role[20-22]. In this study, pregnant women with higher income levels also had higher scores for ED awareness and consumer behaviours. Consistent with existing studies, the price was a significant factor in consumers' decisions. Che *et al*. reported that women perceived the additional cost as a barrier to behaviour change for ED protection[23]. Products without EDs can be sold at a higher price compared to those containing EDs. This price difference can lead low-income pregnant women to choose products based on price rather than content. This thought is in line with the study's finding that the most influential factor in pregnant women's decision-making when purchasing a product was its price. Marie *et al*. also found that the price of a product was one of the key criteria influencing women's decisions when buying makeup products[13]. Chung et al. reported that students tended to check the price of a product more frequently than its content[21]. Roullion et al. also noted that the product's price was one of the main reasons why pregnant women did not prefer organic products[17]. Considering that income level and price can influence a woman's product preference, it is recommended to ensure accessibility to ED-free products suitable for every income level.

In this study, the awareness and consumer behaviours related to EDs among working participants were found to be better than non-working participants, and this is believed to be associated with income levels and economic freedom. No study on this subject has been found in the current literature.

In this study, primiparous pregnant women demonstrated higher awareness of EDs and better consumer behaviours. The idea that primiparous women, due to their lack of experience, may be more open to information may explain this situation. Supporting this notion, Slomian *et al*. reported that primiparous women expressed a greater need for information compared to multiparous women[24]. Akkaş and Ege found that primiparous pregnant

women scored higher in terms of a healthy lifestyle compared to multiparous women[25]. In ED awareness and education efforts, it is recommended to consider the receptivity of primiparous women to information and healthy lifestyle behaviours and to plan more comprehensive activities aimed at multiparous women.

In this study, participants who had heard of EDs demonstrated higher awareness and better consumer behaviours related to EDs. Considering the low rate of participants who had heard of EDs, it is recommended to increase ED awareness campaigns and conduct studies on this topic with larger samples.

In this study, income status, employment status, parity, and awareness of EDs did not affect nutrition and hygiene attitudes. This situation may be related to societal gender roles. Maintaining cleanliness and providing nutrition constitute one of the societal role perceptions for women. Research by Ergin and Güzel found that approximately 95% of women pay attention to hygiene in the kitchen[26]. Kavlak *et al*. reported that one of the most researched topics by pregnant women on the internet was prenatal nutrition[27]. ED awareness and education activities are believed to benefit from the sensitivity of pregnant women regarding nutrition and hygiene topics.

Strengths and limitations

This is considered a strength of the study, as it is the first study in Türkiye to assess the awareness and attitudes of pregnant women regarding EDs. The study data are limited to women attending antenatal care

Conclusion

This study has shown that almost all the pregnant women have not received any training in EDs awareness and have not taken any precautions to protect themselves from EDs. Yet, their levels of ED awareness and attitudes are above average. The relationship between awareness and attitudes of pregnant women regarding EDs was moderately significant. Accordingly, income level, employment status, educational level, parity, awareness of EDs, and decision-making based on product price while shopping was found to influence ED awareness and attitudes.

Based on the results obtained, the following recommendations are made:

- Increase awareness and education programs on EDs targeting pregnant women.
- Include EDs in antenatal education programs.
- Ensure accessibility of ED awareness and education programs, as well as ED-free products, for multiparous, lower education and income levels, and non-working pregnant women.

It is recommended to carry out randomised controlled trials to evaluate the effects of interventions aimed at increasing the awareness of pregnant women regarding EDs on attitudes towards EDs..

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Conflict of interests

The authors report no actual or potential conflicts of interest.

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Author contributions

Conception, design, material preparation, data collection and analysis were performed by Mukaddes Turan Miral, and Elif Koç. The manuscript was written by Mukaddes Turan Miral. The final manuscript was read and approved by all authors.

Ethical approval

The Istanbul Kültür University Ethics Committee approved the study. (ethics approval number: 2022/134, date: 14.10.2022).

Data availability statement

Data available upon reasonable request to the corresponding author.

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