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Research Article

Antenatal Education on Pregnant Adolescents in Turkey: Prenatal Adaptation, Postpartum Adaptation, and Newborn Perceptions

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SUMMARY

Purpose: This clinical trial study was planned in order to evaluate the effect of antenatal education on antenatal and postpartum adaptation and newborn perceptions among adolescent pregnant women.

Methods: A research assistant met with pregnant adolescents in a Family Health Center and at the participants' homes. The sample included 70 pregnant adolescents (35 in experimental group, 35 in control group) chosen through simple random sampling. The experimental group received antenatal education, whereas the control group merely had routine surveillance. As for data collection tools, the Prenatal Self Evaluation Questionnaire (PSEQ), the Postpartum Self Evaluation Questionnaire (PPSEQ) and the Newborn Perception Scale (NPI) was used.

Results: We found that the experimental group who received antenatal education had a lower mean total PSEQ score (133.94 ± 15.62) compared to the control group did (159.86 ± 17.83). In the comparison of the two groups, we found that the experimental group had lower mean total PPSEQ scores on the first postpartum day, first postpartum week and second postpartum week compared to the control group did, indicating higher levels of postpartum adaptation ($p = .017, p = .009, p = .029$).

Conclusion: We determined that the level of prenatal adaptation was higher in the experimental group, which received antenatal education, than in the control group and that levels of postpartum adaptation was significantly higher in the experimental group on the first postpartum day and the first and second postpartum weeks but not on the fourth postpartum week. There were no significant differences between the experiment and control groups in terms of NPI results.

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Introduction

Adolescent pregnancies are among the most important health and social issues of the 21st century. The World Health Organization defines adolescent pregnancy as pregnancies occurring in girls aged between 10 years old and 19 years old [1]. The rate of women who become mothers prior to the age of 20 is a measure of adolescent fertility, which is accepted to be an important health and social issue in numerous countries [2,3]. Throughout the world, 16 million adolescents aged between 15 years and 19 years give birth per year, while 3 million adolescent pregnancies end with unsafe miscarriages and approximately 60.0% of babies of

adolescents die [4]. Additionally, 200 girls die worldwide every day due to early pregnancies that occur during adolescence [5].

The worldwide incidence of adolescent pregnancies is 5.3% and is related to various social, cultural, and economic factors such as age at marriage, traditional attitudes, family structure, education, economic status, and family planning [6]. One of the most important problems of Turkey, which is mainly populated by young people, is early marriages. Early marriages has strong cultural and social norms including having children straightforward. Due to such reasons, pregnancies occur at an early age. Getting pregnant at an early age negatively affects one's educational level and social life as well as one's physical health [7]. In Turkey, the rate of fertility is 30.5 in 1,000 in the 15–19 years age group [8].

Due to the natural processes that occur during pregnancy, various structural and functional changes take place in a woman's body. Both the mother and the infant are negatively affected by pregnancies that occur before the mother reaches physical,

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psychological, and social maturation [9]. The adolescent, who struggles to achieve development, tries to adapt to the changes that occur in her body on one hand, and faces the psychology of motherhood on the other hand; the exposure to such processes puts the individual at risk [10–14]. The impact of pregnancy increases as the age of the adolescent decreases [7]. During adolescent pregnancies, provision of special care that is different from that in adult pregnancies is required. However, when such needs are met, one can adapt to pregnancy and childbirth, and provide support and care for the baby. Therefore, antenatal care services should be provided for pregnant adolescents in order to protect and promote maternal and infant health.

In Turkey, where the prevention of adolescent marriages and pregnancies seem improbable in the near future, one of the main roles of nurses is to protect and maximize maternal and infant health in the context of public health services. It is of crucial importance that pregnant women who are in this risk group receive support during the antenatal period so that they go through a healthy pregnancy process, avoid complications during childbirth and give birth to a healthy child, and during the postpartum period, establish a positive mother–infant relationship.

The purpose of the present study is to evaluate the effect of antenatal education on antenatal adaptation, postpartum adaptation and newborn perceptions among adolescent pregnant women.

Method

Study design and participants

This clinical trial study was planned in order to evaluate the effect of antenatal education on antenatal adaptation, postpartum adaptation and newborn perceptions among adolescent pregnant women.

Sample size was calculated with the G-Power program (version 3.1.7) using data from a previous study [15], where α is .05, and effect size is 0.77. The power analysis method determined a minimum sample size of 28 people with 80% power. Taking into consideration that the participants may discontinue the study due to various reasons since they belong to a risk group. Therefore, the sample of the study consisted of 35 pregnant women in the experimental group and 35 pregnant women in the control group who were selected with simple random sampling. At the end of the study, we found that the effect size for the Prenatal Self Evaluation Questionnaire (PSEQ) in each group with a sample of 35 people was 1.55 and that power was 0.99.

Sample inclusion criteria were as follows: pregnant women aged 15–19 years, being between 12th and 17th gestational weeks (because miscarriages are more common during the first trimester), being registered to a family health center, being at least literate, not having a communication problem, having a healthy newborn (Apgar score of ≥ 7 , weighing $\geq 2,500$ g), not having developed any antenatal or postpartum complications that require hospitalization, having mothers that were still alive (because there were subscales that measure one's relationship status with her mother in both instruments), living with one's husband (because there were subscales that measure one's relationship status with her husband in both instruments), not having participated in other antenatal education programs, and giving oral and written consent to participate in the study. Nine adolescent pregnant women in the sample were excluded from the study since they did not meet the inclusion criterion regarding complications.

Because of complications including premature birth ($n = 3$), abortus ($n = 3$), Down syndrome ($n = 1$) and neonatal asphyxia ($n = 2$) occurring during the process, instead of nine adolescent

pregnant, who dropped out, nine women had been selected according to the sample selection criteria.

Data collection

The study was carried out between August 10th, 2011 and October 24th, 2013. Among all pregnant women aged 15–19 years and were registered to 12 Family Health Centers (FHC) located in Usak, Turkey, those who agreed to participate in the study and met the inclusion criteria were assigned to the experimental group or the control group.

A simple random numbers table was used for randomization and pregnant women who were registered to FHC with odd numbers (1, 3, 5, 7, 9, 11) were assigned to the experimental group, whereas those who were registered with even numbers (2, 4, 6, 8, 10, 12) were assigned to the control group. The inclusion of different FHC in the experimental and control groups ensured that the participants could not interact with each other.

Ethical consideration

In order to conduct the study, ethical board approval (dated and numbered 03.08.2011-4) was obtained from the MU Institute of Health Sciences Clinical Research Preliminary Evaluation Commission Headship. For the FHC where the study was conducted, an approval (dated and numbered 14.11.2011-34340) was obtained from the Family Doctorship Education and Logistics Branch Office, which is affiliated with the Turkish Ministry of Health Basic Health Services Directorate. In addition, the identity of the researcher, researcher's institution, aim of the study, how acquired data will be used, and the right to reject answering questions were explained in detail to the participants. The reason for selecting the participants was also explained. The study began after taking oral and written consent from the participants. Consent was obtained from the husbands of married participants under the age of 18 and from the legal guardians of single participants.

Measurements

Data was collected using the information form on sociodemographic and childbirth- and newborn-related characteristics, the PSEQ, the Postpartum Self Evaluation Questionnaire (PPSEQ), and the Neonatal Perception Inventory (NPI).

The PSEQ was developed by Lederman in 1979 in order to evaluate adaptation to motherhood in antenatal women, and was adapted into Turkish by Beydag and Mete. The PSEQ has a 4-point Likert scale with 79 items and 7 subscales that evaluate adaptation to pregnancy. Each subscale contains 10–15 items. The subscales are acceptance of pregnancy, identification of a motherhood role, relationship with her mother, relationship with her husband, preparation for labor, fear of helplessness, and concern for the well-being of self and baby. Total scores range from 79 to 316. Lower scores indicate that adaptation to pregnancy is better compared to higher scores [16].

The PPSEQ was developed by Lederman and Weingarten in 1981 in order to evaluate adaptation to motherhood in postpartum women, and was adapted into Turkish by Beydag and Mete. The PPSEQ uses a 4-point Likert scale, and contains 82 items and 7 subscales that evaluate a mother's postpartum adaptation. Each subscale includes 10–13 items. The subscales are quality of partner relationship, perception of partner's participation in child care, gratification from labor and delivery experience, satisfaction with life circumstances, confidence in ability to cope with tasks of motherhood, satisfaction with motherhood and infant care, and support for maternal role from family and friends. Total scores

range from 82 to 328. Lower scores indicate that postpartum adaptation is better than higher scores [17].

The NPI I and II were developed by Broussard and Hartner in 1971 in order to evaluate mothers' perceptions of their babies. The validity and reliability studies of the Turkish versions of NPI I and II were carried out by Balci in 1997. The inventory aims to measure mothers' perceptions of their babies and includes two parts: the NPI I is administered within a few days after childbirth, while the NPI II is administered 1 month after childbirth. The NPI I involves mothers' perceptions of what type of behaviors her baby or any baby would exhibit, while the NPI II includes mothers' perceptions of experiences with the baby within the first month following birth and the actual behaviors of the baby. In NPI I and II, two forms, "any baby" and "your baby", includes 6 items (crying, feeding, sleep, vomiting/dribbling, defecating, developing feeding and sleeping habits). There are a total of 24 items. Each item is scored on a 5-point Likert scale. The mother's perception score is obtained by subtracting the total Your Baby score from the total Any Baby score [18,19]. A resulting value of zero indicates that the mother has equivalent (average) perceptions of her baby and other babies, while scores higher than 0 show that the mother has positive perceptions of her baby and scores lower than 0 indicate negative perceptions [19].

The study sample consisted of 70 pregnant women who were selected out of pregnant women aged between 15 years and 19 years, and registered to one of the 12 FHCs located in Usak, Turkey, using the simple random sampling method. Half of the women, that is, 35 pregnant women were assigned to the experimental group, and 35 were assigned to the control group.

Adolescent pregnant women in the experimental group received antenatal counseling services using a face-to-face/individual education method. An education manual, brochures, and other visual materials (slides, models, CDs) were also used.

In order to help adolescent pregnant women adapt to the antenatal and postpartum periods and develop positive perceptions of their babies, the researcher prepared an education manual, which covered the antenatal and postpartum periods, and infant care for adolescent pregnant women. An education program which had a changing time frame due to the scope of the topic but allocated the same amount of time for the same topics was planned. The length of education showed a 35–45 minute variation per week according to content. Antenatal education appropriate for different gestational weeks were provided (Table 1).

Pregnant women in the experimental group received six education sessions which started on the 12th week with 5-week intervals (on the 12th, 17th, 22nd, 27th, 32nd, 37th weeks). During the antenatal period, the Personal Information Form was administered. The PSEQ was administered on the 12th and 37th weeks. Before the mother was discharged from hospital on the first postpartum day, the information form for childbirth and the newborn, the NPI I, and the PPSEQ were administered. During the first and second postpartum weeks, the PPSEQ was administered at home. On the fourth postpartum week, the NPI II and the PPSEQ were administered either at home or at the FHC during follow-up. A total of nine interviews were conducted with the experimental group.

As for the pregnant women in the control group, the Personal Information Form was administered during the antenatal period and the PSEQ was administered on the 12th and 37th weeks. Standard follow-up was provided for the pregnant women in the control group at the FHC (4 follow ups at least). Before the mother was discharged from hospital on the first postpartum day, the information form for childbirth and the newborn, the NPI I, and the PPSEQ were applied. During the first and second postpartum weeks, the PPSEQ was administered at home. On the fourth postpartum week, the NPI II and the PPSEQ were administered either at

Table 1 Timing and Duration of Education Given to Adolescent Pregnant Women.

Educational content	Gestational weeks at instruction (week)	Education duration (min)
Female & male reproductive system anatomy & physiology, & pregnancy physiology	12th	15
Fetal growth & development	12th	15
Necessary tests and follow-up in pregnancy	12th	15
Changes that occur in the mother during pregnancy & suggestions	17th	25
Nutrition in pregnant adolescent	17th	15
Necessary exercise in pregnancy	22th	25
Labor	22th	15
Postpartum term	27th	15
Nutrition in postpartum term	27th	15
Exercise in the postpartum term	27th	15
Family planning methods	32th	20
Postpartum term & sexuality	32th	15
Importance of mother milk, lactation & breastfeeding	37th	20
Neonatal infant care	37th	25

home or at the FHC during follow-up. A total of six interviews were conducted with the control group (Figure 1).

Data analysis

For statistical analysis, the Number Cruncher Statistical System 2007 and the Power Analysis and Sample Size 2008 statistical software (NCSS LLC, Kaysville, Utah, USA) were used. In data evaluation, student *t* test (for comparing normally distributed parameters between two groups) and Mann-Whitney *U* test (for comparing nonnormally distributed parameters between two groups) were used as well as descriptive statistical methods (mean, standard deviation, median, frequency, ratio, minimum, maximum). Paired samples *t* test and repeated measures analysis of variance were used in within group comparisons of normally distributed parameters, while the Bonferroni test was conducted for making pairwise comparisons. For within group comparisons of nonnormally distributed parameters, the Wilcoxon signed-rank test was used. Finally, Fisher's exact test, Yate's continuity correction test, and Fisher-Freeman-Halton exact test were conducted in comparing qualitative data. Statistical significance was evaluated using $p < .01$ and $p < .05$.

Results

Participant characteristics

In the study, the sociodemographic distribution of pregnant women were examined. We found that mean age was 18.11 years \pm 0.94 years (experimental group, 18.20 years \pm 0.99 years, control group, 18.03 years \pm 0.89 years) and that age at marriage ranged between 13 and 19, with a mean age of marriage at 17.24 years \pm 1.10 years (experimental group 17.49 \pm 0.98, control group, 17.00 \pm 1.16). Educational level of participants in the experiment and control groups was not significantly different; however, most participants in both groups were educated until the second grade of elementary school (experimental group, 88.6%; control group, 91.4%). Data showed that 61 (87.1%) of adolescent pregnant women

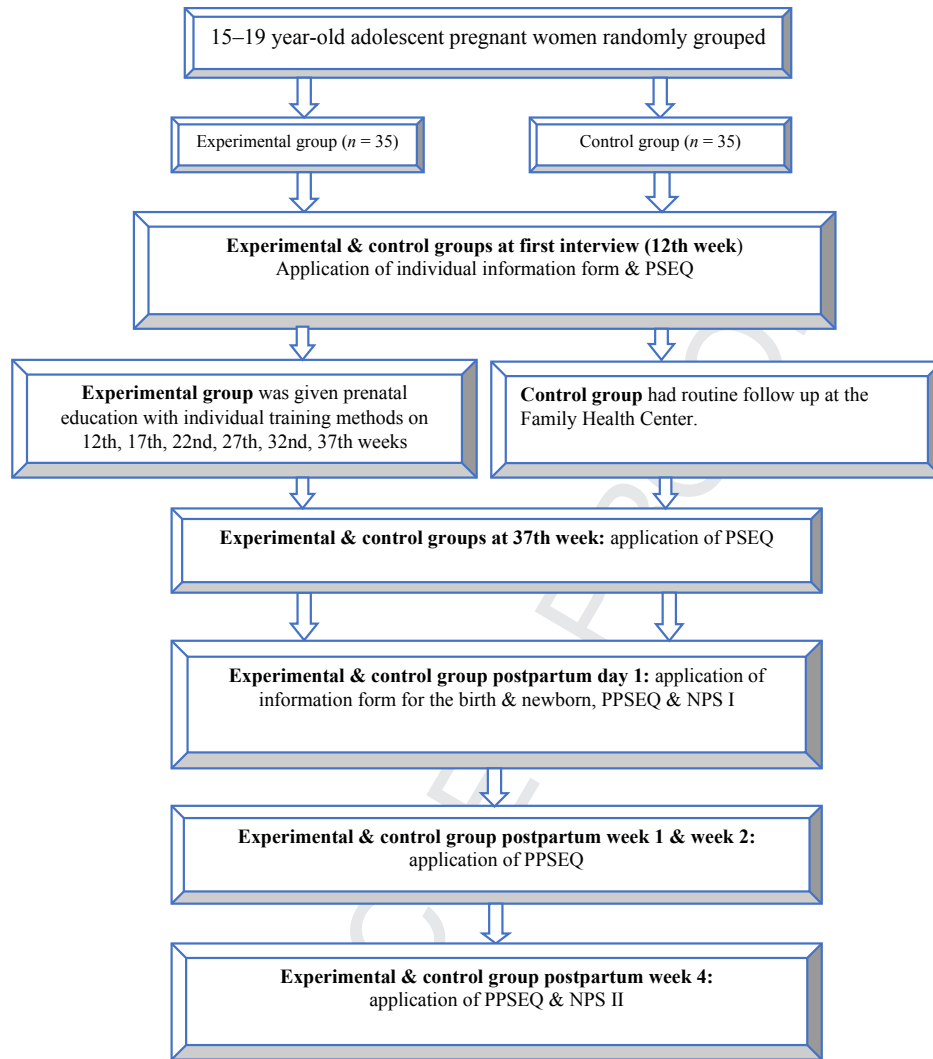


Figure 1. Consort diagram. Note. NPS = Neonatal Perception Scale; PSEQ = Prenatal Self Evaluation Questionnaire; PPSEQ = Postpartum Self Evaluation Questionnaire.

were nulliparous, 8 women (11.4%) were primiparous, and 1 woman (1.4%) was multiparous.

When the distribution of pregnancy complications was examined, it was found that the rate of complications were 9 (42.9%) and 23 (65.7%) in the experimental and control groups, respectively.

As shown in Table 2, the pregnant women in the experimental and control groups showed similar distributions in terms of age, age at marriage, number of pregnancies, number of live children, number of follow-ups prior to childbirth, marital status, and educational level ($p = .093$).

In Table 3, childbirth-related and newborn-related characteristics of adolescent mothers in the experimental and control groups were provided. The distribution of participants according to the number of postpartum follow ups showed significant differences between the experimental and control groups ($p = .019$); mean number of follow-ups was 2.74 ± 1.70 in the experimental group and was 1.77 ± 0.87 in the control group. Data showed that the majority of adolescent mothers had a cesarean delivery (experimental group, 54.3%; control group, 48.6%) at a public hospital (experimental group, 74.3%; control group, 80.0%). As for the distribution of postpartum complications, data showed that complications occurred at rates of 17 (48.6%) and 23 (65.7%) in the experimental and control groups, respectively.

Analysis of prenatal adaptation of adolescent pregnant

We found that the mean total PSEQ scores obtained from the experiment and control groups at the 12th week were not significantly different ($p = .862$). The 37th week mean total scores were significantly lower in the experimental group than in the control group ($p = .001$) (Table 4).

Analysis of postpartum adaptation of adolescent pregnant

As shown in Table 5, we observed that the mean total PPSEQ scores of the experimental group on the first postpartum day, and first and second postpartum weeks were significantly lower compared to the control group ($p = .017$, $p = .009$, $p = .029$; respectively). As for the mean total scores obtained on the fourth week, there was no statistically significant difference between the two groups ($p = .180$).

Analysis of newborn perceptions of pregnant adolescents

It was observed that the mean total NPI scores of the adolescent mothers ranged between -11.00 and 25.00 and that the mean total NPI scores were 1.51 ± 6.95 and 1.57 ± 6.24 in the experimental and

Table 2 Analysis of Sociodemographic Characteristics of Adolescent Pregnant Women.

Sociodemographic characteristics	Experiment group	Control group	<i>p</i>
	(<i>n</i> = 35)	(<i>n</i> = 35)	
	<i>M</i> ± <i>SD</i>	<i>M</i> ± <i>SD</i>	
Age	18.20 ± 0.99	18.03 ± 0.89	.450 ^a
Age at marriage	17.49 ± 0.98	17.00 ± 1.16	.063 ^a
No. of pregnancies (median)	1.23 ± 0.49 (1.00)	1.46 ± 0.78 (1.00)	.224 ^b
No. of live children (median)	0.06 ± 0.24 (0.00)	0.23 ± 0.49 (0.00)	.073 ^b
No. of antenatal follow ups (median)	7.46 ± 2.37 (8.00)	6.94 ± 2.88 (8.00)	.497 ^b
	<i>n</i> (%)	<i>n</i> (%)	
Marital status			1.000 ^c
Married	32 (91.4)	32 (91.4)	
Religious marriage	3 (8.6)	3 (8.6)	
Educational years			1.000 ^c
Elementary school	31 (88.6)	32 (91.4)	
Middle school	4 (11.4)	3 (8.6)	
Occupation			–
Unemployed	34 (97.1)	34 (97.1)	
Employed	1 (2.9)	1 (2.9)	
Status of wanting pregnancy			1.000 ^d
Wants	29 (82.9)	29 (82.9)	
Does not want	6 (17.1)	6 (17.1)	
Social security status			.751 ^d
Has social security	30 (85.7)	28 (80.0)	
Does not have	5 (14.3)	7 (20.0)	
Income status			.038 ^{d,*}
< 500 TL	8 (22.9)	18 (51.4)	
501–1,000 TL	21 (60.0)	12 (34.3)	
> 1,000 TL	6 (17.1)	5 (14.3)	
Status of being connected with husband			.765 ^d
Connected	6 (17.1)	8 (22.9)	
Not connected	29(82.9)	27 (77.1)	
Pregnancy complications			.093 ^d
Present	15 (42.9)	23 (65.7)	
Not present	20 (57.1)	12 (34.3)	

Note. TL = Turkish Lira.

^aStudent *t* test; ^bMann Whitney *U* test; ^cFisher exact test; ^dYates continuity correction.

**p* < .05. [†]*p* < .01.

control groups, respectively. As shown in this study, 19 (54.3%) of the adolescent mothers in the experimental group had positive perceptions of their babies, while 16 (45.7%) had negative perceptions, and 22 (62.9%) of the control group had positive and 13 (37.1%) had negative perceptions.

Discussion

In the study, we found that the difference between the 12th week and the 37th week mean total PSEQ scores in the experimental and control groups was statistically significant (*p* = .001). The average decrease was 18.34 ± 16.37 and 8.46 ± 18.95 points in the experiment and control groups, respectively. In Evrenol's study [20], which aimed to investigate adaptation to pregnancy, childbirth, and motherhood and effecting factors in adolescent pregnant women, they found that the mean total PSEQ score was 152.93 ± 28.78 in the 25th gestational week and subsequent weeks [20]. This finding is similar to the pre-education (12th week) mean total PSEQ scores of the experimental and control groups in the present study. However, our study showed that the experimental group obtained lower 37th week scores after the education (133.94 ± 15.62) and that the control group had higher scores (159.86 ± 17.83). We concluded that antenatal education provided for adolescent pregnant women increased prenatal adaptation. Schachman et al [21] investigated the efficacy of education provided prior to childbirth on antenatal and postpartum adaptation and administered the PSEQ from the 35th week to the 37th week

before childbirth. The authors found that level of adaptation in the education group was significantly higher. In a pilot study conducted by Hamilton-Dodd et al [22], which was carried out with adult pregnant women, they found that individual education provided for approximately 6 hours 1 month before childbirth had no effect on prenatal adaptation. Nevertheless, the participants reported to benefit from such education and stated that they recommended it to other mothers as well [22]. In our study, high levels of adaptation can be explained by the fact that the education started on the 12th week of pregnancy and that counseling appropriate for women's gestational weeks was provided. In Sercekus and Mete's study [15], which was conducted with 120 adult nulliparous women in order to determine the effect of antenatal education on prenatal and postpartum adaptation, the authors demonstrated that the education groups had higher levels of adaptation compared to the control group did. Previous research findings are in parallel with the results of the present study. It is noteworthy that antenatal education increases prenatal adaptation in both adolescent and adult pregnant women. In the present study, the posteducation mean total PSEQ score of the experimental group was found to be 133.94 ± 15.62, while Sercekus and Mete [15] found it to be 115.80 ± 18.40 in their study. According to these findings, it can be said that antenatal education increases prenatal adaptation, but adult pregnant women have better prenatal adaptation compared to adolescent pregnant women due to the difference in age at pregnancy. In Weis and Lederman's study [23], which was conducted with adult pregnant women, the PSEQ was administered

Table 3 Analysis of Childbirth and Newborn Data of Adolescent Mothers.

Childbirth & newborn data	Experiment group (n = 35)	Control group (n = 35)	p
	M ± SD	M ± SD	
No. of postpartum follow ups (median)	2.74 ± 1.70 (2.00)	1.77 ± 0.87 (1.50)	.019 ^a
	n (%)	n (%)	
Place of childbirth			.776 ^b
Public hospital	26 (74.3)	28 (80.0)	
Private hospital	9 (25.7)	7 (20.0)	
Type of delivery			.811 ^b
Vaginal delivery	16 (45.7)	18 (51.4)	
Cesarean	19 (54.3)	17 (48.6)	
Gender of baby			1.000 ^b
Girl	22 (62.9)	22 (62.9)	
Boy	13 (37.1)	13 (37.1)	
Birth weight			.306 ^c
< 2,500 g	5 (14.3)	3 (8.6)	
2,501–3,500 g	21 (60.0)	27 (77.1)	
> 3,501 g	9 (25.7)	5 (14.3)	
First time holding the baby			.469 ^b
Within the first 30 minutes	13 (37.1)	17 (48.6)	
After 30 minutes	22 (62.9)	18 (51.4)	
First time breastfeeding			.469 ^b
Within the first 30 minutes	13 (37.1)	17 (48.6)	
After 30 minutes	22 (62.9)	18 (51.4)	
Status of receiving assistance from relatives			.356 ^d
Yes	34 (97.1)	31 (88.6)	
No	1 (2.9)	4 (11.4)	
Postpartum complications			.227 ^b
Present	17 (48.6)	23 (65.7)	
Not present	18 (51.4)	12 (34.3)	

Note. ^aMann Whitney U test; ^bYates continuity correction; ^cFisher-Freeman-Halton exact test; ^dFisher exact test.
*p < .05. **p < .01.

during the first, second and third trimesters. The authors found that all seven subscale scores decreased on the third trimester, indicating increased levels of adaptation [23]. Previous findings are consistent with the results of the present study, but we also observe that antenatal education plays an important role in increasing prenatal adaptation.

In the present study, we found that the mean total PPSEQ scores of the experimental group on the first postpartum day and the first and second postpartum weeks were significantly lower compared to the control group, indicating better postpartum adaptation ($p = .017$; $p = .009$; $p = .029$; respectively). There was no significant difference between the groups in terms of mean total scores obtained on the fourth postpartum week ($p = .381$). In Sercekus and Mete's study [15], which was conducted with 120 adult nulliparous women in order to determine the effect of antenatal education on

Table 5 Analysis of Postpartum Day 1, Week 1, Week 2 and Week 4 Mean Total PPSEQ Scores of Experiment Group and Control Group.

PPSEQ time of administration (postpartum)	Experiment group (n = 35)	Control group (n = 35)	t ^a	p
	M ± SD	M ± SD		
Day 1	169.74 ± 18.72	181.51 ± 21.60	2.43	.017*
Week 1	160.29 ± 18.93	173.97 ± 23.29	2.69	.009**
Week 2	156.37 ± 22.14	169.03 ± 25.13	2.23	.029*
Week 4	157.09 ± 25.18	165.60 ± 27.30	1.35	.180
F ^b	18.74	18.66		
p	.001**	.001**		
Post hoc ^c				
Day 1 to week 1	.001**	.001**		
Day 1 to week 2	.001**	.001**		
Day 1 to week 4	.001**	.001**		
Week 1 to week 2	.003**	.020*		
Week 1 to week 4	.688	.001**		
Week 2 to week 4	1.000	.049*		
	Min/Max (median)	Min/Max (median)	z ^d	p
Difference (week 4 to day 1)	-35.00/19.00 (-13.00)	-15.91/12.74 (-18.00)	-0.88	.381

Note. ^aStudent t test; ^bRepeated measures analysis of variance; ^cBonferroni test; ^dMann Whitney U test.

*p < .05. **p < .01.

prenatal and postpartum adaptation, the authors found that there were no significant differences between women who received individual education and those in the control group in terms of the sixth week mean total PPSEQ scores and mean subscale scores [15]. In a study by Arcamone [24], which aimed to examine postpartum adaptation, one group that received an 8-hour education, another group that received a 2-hour infant care education in addition to the 8-hour education, and a third group that received no education were compared. The author found that the sixth week postpartum adaptation of women in the three groups were not significantly different [24]. Schachman et al [21] investigated the efficacy of antenatal education on prenatal and postpartum adaptation and administered the PPSEQ on the sixth postpartum week. The authors could not find a significant difference between the groups in terms of postpartum adaptation [21]. Hamilton-Dodd et al [22] found that there were no significant differences between the postpartum adaptation levels of women who received antenatal education and those who did not receive such education. Similarly, Lederman and Lederman [25] evaluated postpartum adaptation on the third day and the sixth week in multiparous women and found that postpartum adaptation increased from the third day to the sixth week and that the most important factor regarding adaptation was spousal support. As for the present study, we found that

Table 4 Analysis of 12th and 37th Week Mean Total PSEQ Scores of Experiment Group and Control Group.

PSEQ	Experiment group (n = 35)	Control group (n = 35)	t ^a	p
	M ± SD	M ± SD		
12th week	152.29 ± 23.66	151.40 ± 18.32	0.17	.862
37th week	133.94 ± 15.62	159.86 ± 17.83	6.46	.001**
t ^b	6.63	2.64		
p	.001**	.012*		
	Min/max (median)	Min/max (median)	z ^c	p
Difference (37th week–12th week)	-51.00/12.00 (-16.00)	-49.00/31.00 (15.00)	-5.30	.001**

Note. PSEQ = Prenatal Self Evaluation Questionnaire.

^aStudent t test; ^bpaired samples t test; ^cMann Whitney U test.

*p < .05. **p < .01.

postpartum adaptation increased from the first day to the sixth week and that antenatal education increased adaptation during the early postpartum period (day 1, week 1, week 2) but not after the fourth week. This finding can be explained by the fact that postpartum problems such as pain, discomfort, fatigue, and difficulty in breastfeeding are generally more intense during the first days and first weeks and that antenatal education is effective in extenuating such problems.

As for the newborn perceptions of the adolescent mothers in the experimental group, we found that 54.3% had positive perceptions of their babies, while 45.7% had negative perceptions; in the control group, 62.9% of the mothers had positive perceptions and 37.1% had negative perceptions. There were no significant differences between the experimental and control groups in terms of NPI results ($p = .627$). In studies by Altun [26] and Porter and Sobong [27], the effect of family raising education on perceptions of the newborn among adolescent pregnant women was investigated. These studies revealed that education provided during the prenatal period did not create a positive difference in newborn perceptions between groups [26,27]. In a study by Seker [28], which examined the effect of birth preparation classes on mothers' postpartum functional status and perceptions of their babies, they found that 73.3% of the adult mothers in the experimental group and 60.6% of the control group had positive newborn perceptions and that there were no significant differences between groups [28]. It is thought that pregnant women focusing on the upcoming birth and not being able to focus on newborn topics are the reasons for not finding a difference between perceptions of experiment and control groups despite the provision of antenatal education in previous studies.

Nursing implications

Pregnancy causes many difficulties in a woman's lifetime throughout the life span. During adolescence, in particular, pregnancy has strong negative physical and psychological effects. Among adolescents, insufficient levels of knowledge and experience regarding pregnancy, incomplete psychological development, and lability of emotions ever increase the importance of antenatal care and education. Therefore, adolescent pregnant women need physical care and support. They can adapt to pregnancy and childbirth, and take care of their babies when they receive such assistance.

In this context, perinatal nurses, nurse practitioners and midwives should systematically provide health services which include the provision of appropriate health services after determining counseling topics for adolescent pregnant women before and after childbirth and referral to appropriate treatment services after the early detection of possible complications.

Limitations and suggestions for future research

During the determination of the sample size of the survey process, some complications occurred such as "to be not able to reach the number of the population by following not permitted to perform the research as well as lack of training rooms in FHC". In addition, researching the 15–19 years old age group increased the incidence of pregnancy complications. Therefore, nine adolescent pregnant dropped out of the research and because of this issue, data collection time was extended. In this case, taking a long time for data collection was one of the difficulties of this type of study.

Infant care education has been arranged and recommended by making home visits to adolescent mothers so as to develop a positive perception of the baby, especially in the postpartum term. In addition, information of effective methods has been suggested during the visits to prevent pregnancy again in early period.

Conclusion

We determined that the level of prenatal adaptation was higher in the experimental group, which received antenatal education, than in the control group and that levels of postpartum adaptation was significantly higher in the experimental group on the first postpartum day and the first and second postpartum weeks but not on the fourth postpartum week. There were no significant differences between the experiment and control groups in terms of NPI results.

Conflict of interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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