

**EVALUATION OF THE EFFECT OF INTERNET-BASED PARENTING EDUCATION BASED ON  
KNOWLEDGE-MOTIVATION-BEHAVIORAL SKILLS (IMB) MODEL ON MATERNAL AND PATERNAL  
ATTACHMENT**

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**Dear Editor,**

I am sending you the paper titled “Evaluation Of The Effects Of Internet-Based Parenting Education Based On The Knowledge-Motivation-Behavioral Skills (IMB) Model On Maternal And Paternal Attachment”. I am hoping that it suits your publication policy and is found worthy of publication. The authors declare that I do not have any conflicts of interest. The article has not been published anywhere else and it is not under any review process. The authors take full responsibility for the content of the article. The authors have contributed to, seen and approved the final manuscript.

Contact details of the responsible for correspondence is below.

Yours sincerely

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**EVALUATION OF THE EFFECT OF INTERNET-BASED PARENTING EDUCATION BASED ON KNOWLEDGE-MOTIVATION-BEHAVIORAL SKILLS (IMB) MODEL ON MATERNAL AND PATERNAL ATTACHMENT**

**A. STUDY PROTOL**

**METHOD**

**A1. Objective and Design of Research:** This work; It was conducted as a randomized controlled intervention study to Evaluation the Effect of Internet-based Parenting Education based on the Knowledge-Motivation-Behavioral Skills (IMB) Model on Maternal and Paternal Attachment

**A2. Location and General Characteristics** of the Research: It was held at the Ankara City Hospital Maternity Hospital between 01 March 2021 and 01 December 2021.

**A3. Population and Sample of the Research:** The population of the study consisted of primiparous pregnant women and their spouses who applied to Ankara City Hospital Gynecology and Obstetrics antenatal clinic. The sample of the study was calculated based on the Atalay and Saydam (2014) study results (Maternal Attachment Scale (MBI): Experimental Group  $\bar{X}+SD$ :  $101.24 \pm 4.60$  and Control Group  $\bar{X}+SD$ :  $96.00 \pm 9.09$ ) (124). Analysis In Gpower version 3.1.9.7, the effect size (0.727) was calculated according to the power analysis using "t tests-Means: Difference between two independent means (two groups)" statistic, with  $\alpha= 0.05$  error level and 95% power. its size; 51 couples in the intervention group and 51 couples in the control group, a total of at least 102 couples (Annex-1). Since the dropout rate in the reference study was 20%, in accordance with this rate, it was planned to carry out the study with a total of 120 couples by adding a total of 18 couples, 9 couples to each group.

Randomization of the intervention and control groups and the couples to be assigned to these groups were determined using the Random Allocation Soft Program

**A4. Sample Selection Criteria for the Study:**

Selection criteria for pregnant women for intervention and control groups

- Those between the ages of 18 – 35,
- At least primary school graduate,
- First pregnancy and 28 th- 30th gestational week,
- Not having a chronic health problem before pregnancy (diabetes mellitus, hypertension, kidney failure, liver failure, epilepsy, etc.),

Those who do not have a risky pregnancy (gestational diabetes, preeclampsia,

multiple pregnancy, etc.) and continue their antenatal followup,

- No diagnosed psychiatric problem (Anxiety, anxiety disorder, depression, bipolar etc.),
- Speaking Turkish and not having any communication barriers,
- Not a member of health sciences,
- Those who have not participated in parenting education before,
- Having a healthy spouse/partner,
- Having access to the Internet, computer and smart phone,

#### **Selection criteria for fathers intervention and control groups**

- Those between the ages of 18 – 35,
- At least primary school graduate,
- No diagnosed psychiatric problem (Anxiety, anxiety disorder, depression, bipolar etc.),
- Speaking Turkish and not having any communication barriers,
- Not a member of health sciences,
- Those who have not participated in parenting education before,
- Having a healthy spouse/partner,
- Having access to the Internet, computer and smart phone,

#### **Exclusion Criteria for all groups mothers and fathers**

- Inclusion of the mother in the risky pregnancies group (bleeding, preeclampsia, premature birth, etc.),
- Taking the newborn to the intensive care unit,
- Incomplete filling of data collection forms,
- If one or any of the parents has stopped participating in the study; both individuals will be excluded from the study

**A 5. Ethical Dimension of Research:** Written permission was obtained from Yıldırım Beyazıt University Social and Human Sciences Ethics Committee to conduct the study (Approval Number: 16.02.2021-45). The institution where the research was conducted; Permission was obtained from Ankara

City Hospital. After the ethics committee approval, women and their spouses who agreed to participate in the study were informed about the research, and "Intervention Group Maternal Consent Form" for intervention group mothers, "Intervention Group Father Consent Form" for intervention group fathers, For the mothers in the control group, they were asked to read and approve the "Control Group Maternal Consent Form" and the fathers in the control group to read and approve the "Control Group Paternal Consent Form". Participants were informed that they could withdraw from the study at any time, stating that the confidentiality of all information they would provide would be taken into account. The permissions to use the scales used in the study were obtained from the scale owners via e-mail.

**A6. Data Collection Tools:** Data Collection Tools: 1.Individual Information Form/ Mother, 2. Prental Attachment Inventory, 3. Individual Information Form/ Father , 4. Intrauterine Father Attachment Scale 5. Maternal Attachment Inventory, 6. Paternal Infant Attachment

**A7. Parameters to Look For:** In this study, it is aimed to Evaluate the Effect of Internet-based Parenting Education based on the Information-Motivation-Behavioral Skills (IMB) Model on Maternal and Paternal Attachment. Within the scope of the study, Prental Attachment Inventory scores of the pregnant women in the intervention and control groups were compared before and after the education. In addition, Maternal Attachment Inventory scores of mothers in the intervention and control groups in the postpartum period were compared. The intrauterine Father Attachment Scale scores of the fathers in the intervention and control groups were compared before and after the education. Paternal Infant Attachment Scale score in the 3nd month after birth were compared between fathers in the intervention and control groups.

## **A8. Outcome Measures**

Primary Outcome Measure:

**1. Maternal Attachment:** maternal attachment level measured by Maternal Attachment Inventory .It is a 4-point Likert-type scale with 26 items. Each item directly. It is always (a) = 4 points, often (b) = 3 points, sometimes (c) = 2 points, and never (d) = 1 point.Test scored between 26-104. Ahigh score indicates high maternal attachment .Time Frame: 2nd month after birth.

**2. Paternal Infant Attachment Scale:** Paternal attachment level measured by Paternal Infant Attachment Scale. The scale has three sub-dimensions and 19 items. The sub-dimensions of the scale include "Patience and Tolerance", "Pleasure in Interaction", "Love and Pride". Each item of the scale is scored between one and five points, and the score that can be obtained from the scale varies between 19

and 95.

Time Frame: 3rd month after birth.

**Secondary Outcome Measure:**

1. Prenatal Attachment: Prenatal attachment level measured by Prenatal Attachment Inventory. The scale is applied in the prenatal period from the 28th gestational week until the birth. The PCI consists of 21 items in total and the items in the scale are scored on a four-point Likert scale that can range from 1 to 4. A minimum of 21 and a maximum of 84 points can be obtained from the scale.

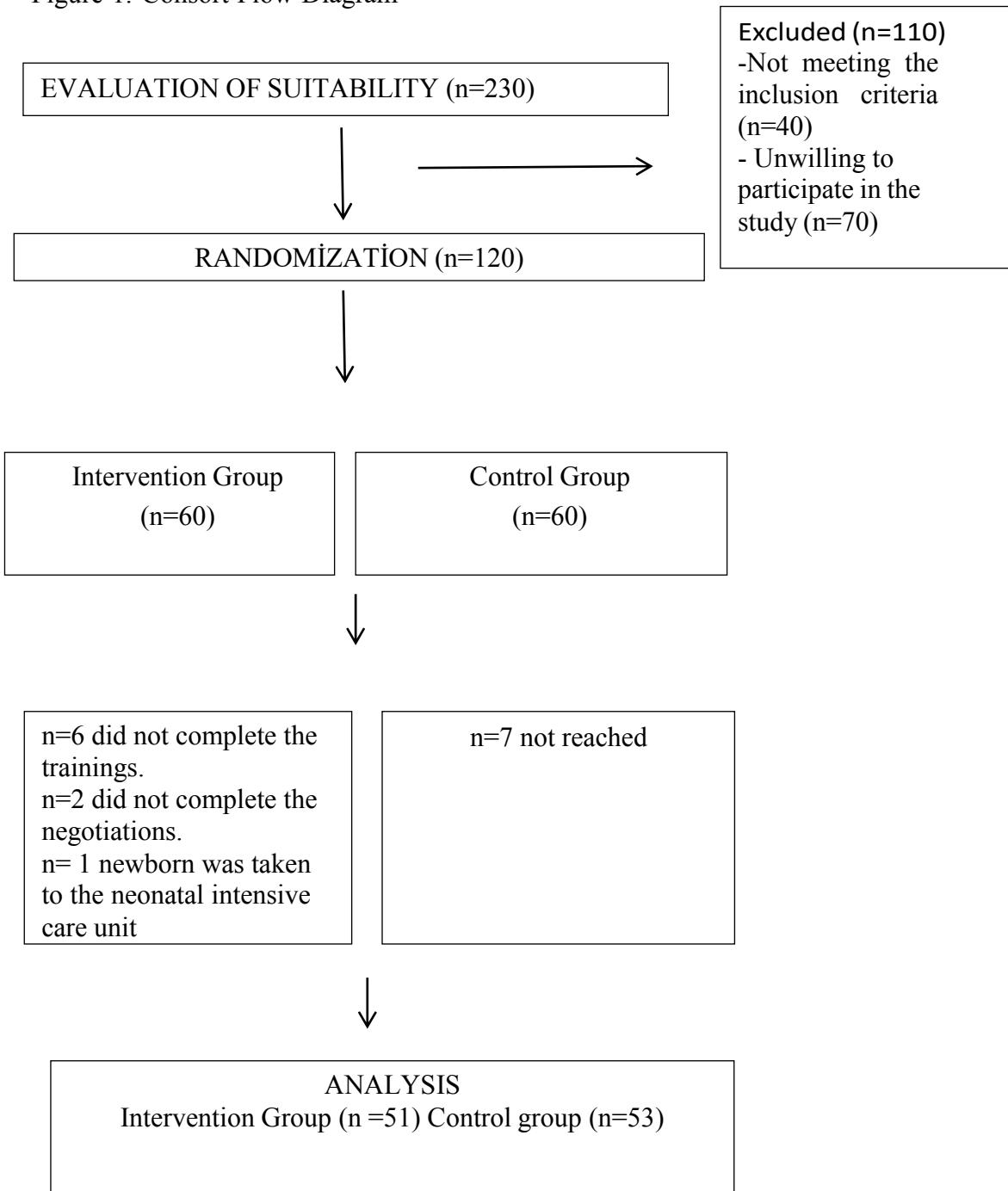
Test scored between 21-84. Time Frame: after education 35th-36 th pregnancy week .

2. Intrauterine Father Attachment Scale Intrauterine Father Attachment level measured by Intrauterine Father Attachment Scale . The scale consists of 23 items and is a four-point Likert scale. The scale does not have a cutoff point. The higher the mean score obtained from the scale, the higher the level of attachment of fathers to their babies Test scored between 23-92. Time Frame: After the 4th training session education.

**A 9. Application of Research**

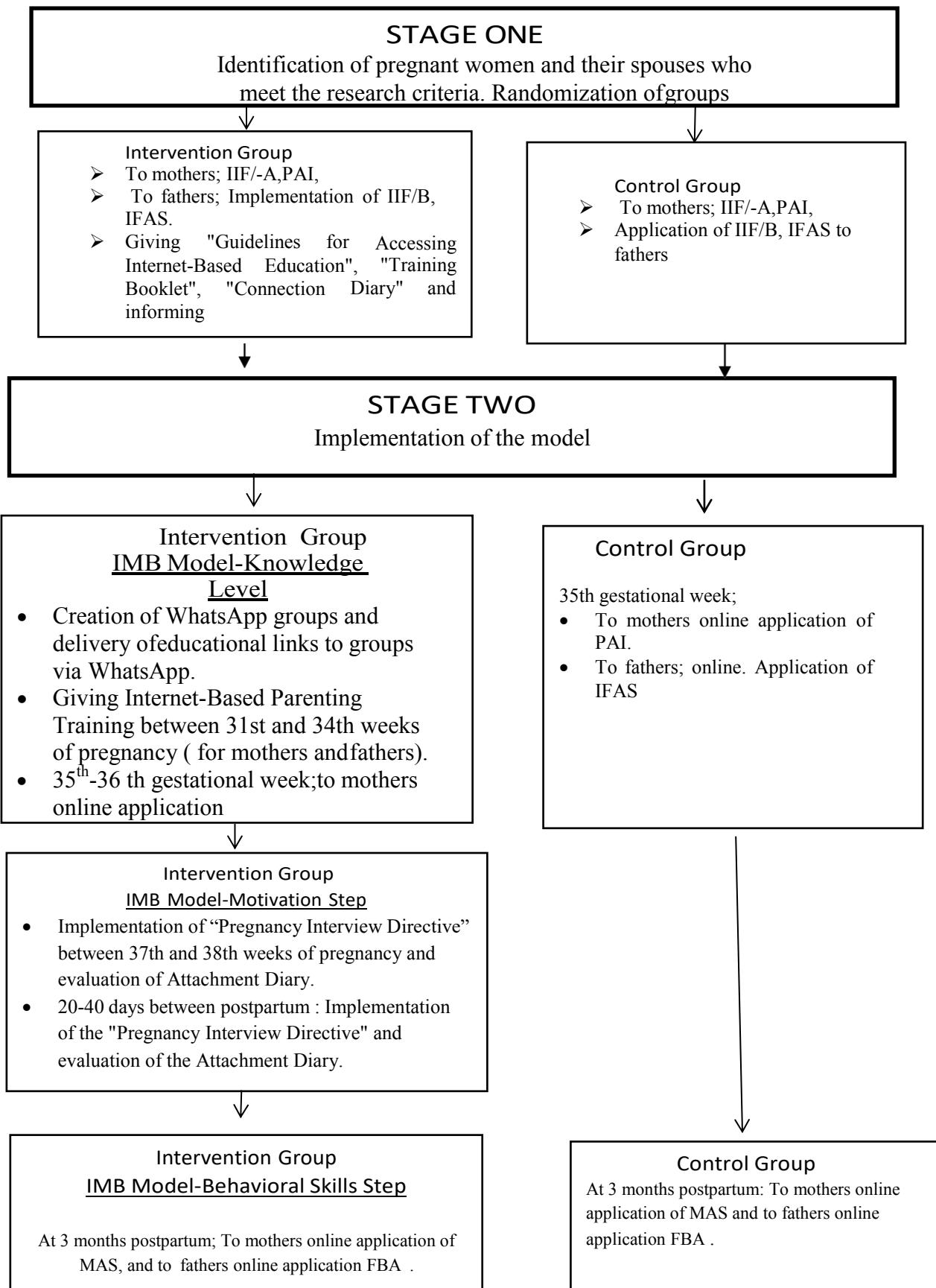
The study was carried out in accordance with the CONSORT Protocol ( Figure 1).

Figure 1. Consort Flow Diagram



In the study, 230 couples were reached but 110 couples were excluded ( Not meeting the inclusion criteria n=40, unwilling to participate in the study n=70 ). The remaining 120 couples were randomized. As a result of randomization, 60 couples were assigned to the control group and 60 couples to the intervention group. Ten of the couples in the intervention group were excluded (n=6 did not complete the trainings, n= 2 did not complete the negotiations, n= 1 newborn was admitted. In addition, 7 couples in the control group could not be reached. For these reasons, the study was completed with the participation of 51 couples in the intervention group and 53 couples in the control group. This study was carried out in two stages (Figure 2).

Figure 2. Flow chart of the study



IIF/A: Individual Information Form/ Mother, IIF/B: Individual Information Form/ Father, PAI: Prenatal Attachment Inventory, IFAS: Intrauterine Father Attachment Scale, MAS: Maternal Attachment Scale, FBA: Father-Baby Attachment Scale.

In the first stage, pregnant women and their spouses who met the study criteria were determined and assigned to the intervention and control groups by randomization method. In the second stage of the study, "Knowledge Level", "Motivation Level", "Behavioral Skills" steps were applied.

In the first stage of the study, pregnant women and their spouses who applied to the pregnancy outpatient clinic between the 28th and 30th gestational weeks, meeting the research criteria, were randomly assigned to the intervention and control groups. Detailed information about the study was given to the pregnant women and their spouses in the intervention and control group, and a voluntary consent form was obtained. Pregnant women in both groups filled in the Individual Information Form/ Mother and Prenatal Attachment Inventory. Spouses in both groups filled in the Individual Information Form/ Father and Intrauterine Father Attachment Scale. In addition, they were asked to write their own nicknames on each form and mark them on the forms. A mobile phone number that could be contacted was obtained from the pregnant women and their spouses in both groups. Parents in the intervention group were told how to participate in the parenting preparation training that will be given on the internet, and they were given a "Guide for Accessing Internet-Based Education", "Training Booklet" and "Attachment Diary". On the other hand, "Guide for Accessing Internet-Based Education", "Training Booklet" and "Attachment Diary" was not given to the pregnant women and their spouses in the control group.

In the second stage of the study, the information step of the model was carried out. In this context, a WhatsApp group was created, including the pregnant women and their spouses in the intervention group. For intervention group trainings; The announcement of the training was informed by the whatsapp group. Each pregnant woman or her spouse was contacted and a time was determined when they were suitable for internet-based parenting training. The training hours are adjusted according to the day and time that the parents are available.

The Parenting Preparation Training consisted of 4 sessions and lasted a total of 4 weeks. The training was given by the researcher who has a "Parenting and Family Coaching" certificate. Each session consisted of 40 minutes and the training consisted of a total of 200 minutes. The training to be given to the intervention group was carried out at 31, 32, 33 and 34 weeks of pregnancy after the 30th week of pregnancy.

Parenting Preparation Training Content: The training program consisted of four sessions (Figure 3). Before the training, meeting, expectations, aims and objectives of the training were determined. In the first session, "Parenting and Attachment Concept", "Attachment Styles in Infancy and Childhood", "Securely Attached Babies", "Insecurely Avoidant Attachment Babies", "Insecurely Anxious Attachment Babies" were discussed. In the second session, training was given on "Parenting and Attachment During Pregnancy" and "Applications Increasing Attachment During Pregnancy". In the third session, training will be given on "Attachment in Birth" and "Applications that Increase Attachment in Birth". In the fourth session, training was given on "Parenting in the Postpartum Period" and "Applications that Increase Attachment in the Postpartum Period". In the fourth session, parents were taught how to keep records in their attachment diaries. Parents between 36-38 weeks of gestation and 20-40 postpartum. In the login logs, information is given on which pages and when they will record. They were also asked to bring their records in the parenting counseling interview. Internet-based parenting training was carried out using powerpoint presentation and interactive teaching methods (Demonstrations, mockups, videos, playing cards, etc.)

Figure 3. Parenting Preparation Training Content

| Session        | Contents   | Duration |
|----------------|--|----------|
| Login          | Acquaintance, expectations, aims and objectives of education.  | 20 min   |
| First Session  | <ul style="list-style-type: none"> <li>• Parenting and Attachment concept.</li> <li>• Attachment Styles in Infancy and Childhood.</li> <li>• Securely Attached Babies.</li> <li>• Insecure Avoidant Attachment Babies.</li> <li>• Insecure Anxious Attachment Babies.</li> </ul> | 40min    |
| Second Session | <ul style="list-style-type: none"> <li>• Pregnancy Parenting and Attachment.</li> <li>• Applications that Increase Attachment During Pregnancy.</li> </ul>   | 40 min.  |
| Third Session  | <ul style="list-style-type: none"> <li>• Attachment in Birth.</li> <li>• Applications that Increase Attachment in Birth</li> </ul>   | 40 min   |
| Fourth Session | <ul style="list-style-type: none"> <li>• Postpartum Parenting.</li> <li>• Applications that Increase Attachment in the</li> </ul>  | 40 min   |

|       |   |         |
|-------|---|---------|
|       | <p>Postpartum Period.</p> <ul style="list-style-type: none"> <li>• Disclosure of login logs.</li> <li>• General evaluation</li> </ul> |         |
| Total |   | 200 min |

Prenatal Attachment Inventory was applied online to the pregnant women in both groups at 35th - 36th gestational week. The intrauterine Father Attachment Scale was applied online to the spouses in both groups at the 35th gestational week.

Within the scope of the motivation step of the model, the parents in the intervention group wanted to share their experiences and problems as mothers and fathers during pregnancy and between 36-38 weeks of gestation and 20-40 postpartum. Between these days, a total of two internet-based face-to-face interviews were made for the family and counseling was provided. In addition, reminders, videos and stories about mother and baby bonding were shared by the researcher regularly in the 36th, 37th and 38th weeks to the whatsapp groups in the intervention groups. In the internet-based motivational interview held between 36-38 weeks of gestation with the parents in the intervention group, an interview on "Being a Parent" was conducted. In these interviews, the parents; They were asked to read their diaries, which included their thoughts on "What I Felt When I Learned to Become a Mother" and "What I Did for My Baby This Week" that they recorded in their attachment diaries. In this interview, the parents were interviewed about what being a parent means to them and their concerns and anxieties about being a parent. This interview took approximately 40 minutes. At the same time, an interview on "Being the Parent of a New Baby" was held between the 20-40 days postpartum with the parents and the intervention group. It was talked about the experiences of the parents as parents during this process. At the same time, in these interviews, from the parents; They were asked to read the diaries containing their thoughts on "What Did I Feel When I Became a Mother?" and "What I Do When I Come Home With My Baby" in their attachment diaries. Within the scope of the interview, counseling was provided about how the mothers and fathers felt and experienced as parents and how to deal with their concerns and concerns. This interview took approximately 40 minutes.

In the behavior step of the model. Within the scope of the study, with the mothers in the intervention and control groups in the postpartum 3rd month; The Mother Attachment Inventory was

filled by the mothers in both groups via the WhatsApp application. In addition, the Father-Baby Attachment Scale was filled in for the fathers in both groups via the WhatsApp application. At the same time, the participants were asked to indicate their nicknames again on the questionnaire forms.

## **B. STATİSTİCAL ANALYSIS PLAN**

Research data were evaluated in computer environment with appropriate statistical methods. IBM SPSS Statistics 23.0 program was used for statistical analysis and calculations. G\*Power 3.1.9.7 program was used for the power analysis in this study. Statistical significance level was accepted as  $p<0.05$ . The conformity of the numerical variables to the normal distribution was evaluated with the Shapiro-Wilk test. The difference between the two independent groups was assessed t test and the Mann-Whitney U test. The relationship between two independent categorical variables was assessed via chi-square analysis

## **1. Informed Consent Form for Mothers in the Intervention Group**

Dear Participant;

This study you are participating in is scientific research. In this study, it was aimed to "Evaluate the Effect of Internet-based Parenting Education based on the Knowledge-Motivation-Behavioral Skills (IMB) Model on Maternal and Paternal Attachment". You applied to Ankara City Hospital Gynecology Hospital Pregnancy Polyclinic and you were found suitable for research. determined. In this study, you will be asked to fill in the data collection forms given to you by the researcher and participate in training and consultancy. Participation in this research is entirely at your own discretion. You can refuse to participate in the research or leave the research at any stage. This will not result in any penalties or impediments to your benefits. No payment will be made to you for taking part in this research. No fee will be charged from you or the social security institution you are affiliated with for all training and materials provided within the scope of this research. All your medical and identity information will be kept confidential and your identity information will not be disclosed even if the research is published. For additional information about the research, you can contact Semra TUNCAY YILMAZ on 0546 564 45 30.

**Consent to Participate in the Study:** I have read and verbally listened to the above information that must be given to the volunteer before starting the research. All the questions that come to my mind I asked the researcher. I have fully understood all the written and verbal explanations made to me. I was given sufficient time to decide whether I wanted to participate in the study. Under these circumstances, research on the review, transfer and processing of my medical information and I voluntarily accept the invitation to participate in the research in question without any coercion or pressure. A signed copy of this form was given to me.

Volunteer:

Name and surname:

Address:

Date:

Phone

Signature

The researcher who made the explanations

Name-Surname: Semra TUNCAY YILMAZ

Address: Ankara Yıldırım Beyazıt University,  
Department of Nursing

Tel: 0546 564 45 30

Date and Signature:

## **2.Informed Consent Form for Fathers in the Intervention Group**

Dear Participant;

This study you are participating in is scientific research. In this study, it was aimed to "Evaluate the Effect of Internet-based Parenting Education based on the Knowledge-Motivation-Behavioral Skills (IMB) Model on Maternal and Paternal Attachment". You applied to Ankara City Hospital Gynecology Hospital Pregnancy Polyclinic and you were found suitable for research. determined. In this study, you will be asked to fill in the data collection forms given to you by the researcher and participate in training and consultancy. Participation in this research is entirely at your own discretion. You can refuse to participate in the research or leave the research at any stage. This will not result in any penalties or impediments to your benefits. No payment will be made to you for taking part in this research. No fee will be charged from you or the social security institution you are affiliated with for all training and materials provided within the scope of this research. All your medical and identity information will be kept confidential and your identity information will not be disclosed even if the research is published. For additional information about the research, you can contact Semra TUNCAY YILMAZ on 0546 564 45 30.

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Volunteer:

Name and surname:

Address:

Date:

Phone

**Signature**

The researcher who made the explanations

Name-Surname: Semra TUNCAY YILMAZ

Address: Ankara Yıldırım Beyazıt University,  
Department of Nursing

Tel: 0546 564 45 30

Date and Signature:

### 3. Informed Consent Form for Mothers in the Control Group

Dear Participant

This study you are participating in is scientific research. In this study, it was aimed to "Evaluate the Effect of Internet-based Parenting Education based on the Knowledge-Motivation-Behavioral Skills (IMB) Model on Maternal and Paternal Attachment". You applied to Ankara City Hospital Gynecology Hospital Pregnancy Polyclinic and you were found suitable for research. determined. In this study, you will be asked to fill in the data collection forms given to you by the researcher and participate in training and consultancy. Participation in this research is entirely at your own discretion. You can refuse to participate in the research or leave the research at any stage. This will not result in any penalties or impediments to your benefits. No payment will be made to you for taking part in this research. No fee will be charged from you or the social security institution you are affiliated with for all training and materials provided within the scope of this research. All your medical and identity information will be kept confidential and your identity information will not be disclosed even if the research is published. For additional information about the research, you can contact Semra TUNCAY YILMAZ on 0546 564 45 30.

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Volunteer:

Name and surname:

Address:

Date:

Phone

**Signature**

The researcher who made the explanations

Name-Surname: Semra TUNCAY YILMAZ

Address: Ankara Yıldırım Beyazıt University,  
Department of Nursing

Tel: 0546 564 45 30

Date and Signature:

#### 4. Informed Consent Form for Fathers in the Control Group

Dear Participant;

This study you are participating in is scientific research. In this study, it was aimed to "Evaluate the Effect of Internet-based Parenting Education based on the Knowledge-Motivation-Behavioral Skills (IMB) Model on Maternal and Paternal Attachment". You applied to Ankara City Hospital Gynecology Hospital Pregnancy Polyclinic and you were found suitable for research. determined. In this study, you will be asked to fill in the data collection forms given to you by the researcher and participate in training and consultancy. Participation in this research is entirely at your own discretion. You can refuse to participate in the research or leave the research at any stage. This will not result in any penalties or impediments to your benefits. No payment will be made to you for taking part in this research. No fee will be charged from you or the social security institution you are affiliated with for all training and materials provided within the scope of this research. All your medical and identity information will be kept confidential and your identity information will not be disclosed even if the research is published. For additional information about the research, you can contact Semra TUNCAY YILMAZ on 0546 564 45 30.

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