

## The Relationship Between Prenatal Attachment And Spiritual Well-Being in High-Risk Pregnant Women in Turkey: A Cross-Sectional Study

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### ABSTRACT:

**Purpose:** This cross-sectional study aimed to examine the relationship between prenatal attachment and spiritual well-being in high-risk pregnant women in Turkey.

**Material and Methods:** Data were collected between May 1 and June 1, 2025 from 123 participants at the obstetrics outpatient clinic and wards of a training and research hospital. Participants completed a Personal Information Form, the Prenatal Attachment Inventory (PAI), and the Three-Factor Spiritual Well-Being Scale (3F-SWB).

**Results:** High levels of prenatal attachment and spiritual well-being were observed among participants. Prenatal attachment was significantly associated with age, planned pregnancy, and psychological status, while spiritual well-being was significantly related to family structure and psychological status. Moreover, a moderate, positive, and statistically significant correlation was found between prenatal attachment and spiritual well-being.

**Conclusion:** These findings highlight the importance of integrating spiritual and emotional support services into midwifery care for high-risk pregnancies.

**Keywords:** Midwifery; spiritual well-being; prenatal attachment; high-risk pregnancy

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### INTRODUCTION

Pregnancy represents a unique and transformative phase in a woman's life. In addition to physiological and psychological changes, pregnancy brings biochemical and anatomical transformations. Beyond being a physical experience, pregnancy is also a profound spiritual journey. This period offers expectant mothers the opportunity to witness and engage with the miracle of life. Fostering spiritual well-being during pregnancy can help women experience this phase more peacefully and meaningfully, thereby strengthening maternal identity and laying the foundation for a secure parent-child bond (Okanlı et al., 2003).

Maternal mental health during pregnancy significantly influences both pregnancy outcomes and the quality of the bond between the mother and fetus. It is widely accepted that prenatal attachment defined by Muller (1993) as the emotional connection an expectant mother develops with her unborn child emerges during the prenatal period and is shaped by various psychological and physical factors (Muller and Ferketich, 1993; Ben Taleb et al., 2015; Elkin, 2015).

In some cases, the natural course of pregnancy may be disrupted by complications. A high-risk pregnancy refers to any condition involving physiological or psychosocial risks that may threaten the life and

health of the mother, fetus, or newborn. Although the incidence of high-risk pregnancies in Turkey has declined, nearly one in three pregnancies is still considered high-risk. Women in this category often face heightened emotional, physical, and social stressors, which may negatively affect prenatal attachment. Studies have reported that mothers with high-risk pregnancies tend to have lower levels of prenatal attachment compared to those with low-risk pregnancies (Atasever and Çelik, 2018).

The term *spirituality* originates from the Latin word *spiritus*, meaning “to breathe” and “to be alive.” Broadly, spirituality refers to the process of making sense of life and finding meaning (Surbone and Baider, 2010). It is a multidimensional concept that offers individuals a sense of purpose, trust, and guidance, especially during difficult and sensitive periods. Spirituality is recognized as a critical factor in maintaining overall health and coping with life-threatening situations (Davison and Jhangri, 2013). Research indicates that individuals with high levels of spirituality tend to demonstrate greater emotional stability, awareness, and adaptability when faced with life challenges (Abdollahpour and Khosravi, 2018; Emmons, 2000). Moreover, spiritual well-being has been associated with happiness, life satisfaction, mental health, and psychological resilience (George, 2006; Göcen, 2013). According to Smith et al. (2013), spiritual well-being enhances healthy behaviors, positive emotions, family connections, and social support, all of which contribute to improved psychological resilience (Smith et al., 2013).

Given this context, the current study aims to examine the relationship between spiritual well-being and prenatal attachment in women with high-risk pregnancies. To the best of our knowledge, this is one of the first studies in Turkey to investigate the intersection of spirituality and maternal-fetal attachment in this population.

## MATERIAL and METHODS

### Purpose and Type of the Study

This study employed a descriptive, cross-sectional design to examine the relationship between spiritual well-being and prenatal attachment in women with high-risk pregnancies.

### Sampling and participant

The research was conducted between May 1 and June 1, 2025 in the obstetrics outpatient clinic and inpatient wards of a training and research hospital in Turkey. A non-probability sampling method was preferred because the exact number of women with high-risk pregnancies presenting to the clinic during the study period could not be predicted in advance. The sample size was calculated using G\*Power 3.1.9.7 software (Faul et al., 2007). Based on Cohen’s (1988) recommendation for a medium effect size ( $r = 0.3$ ) and informed by data from Dağlar et al. (2022), a sample size of 112 was determined to achieve a statistical power of 0.90 with a 5% margin of error (Cohen, 1988; Kurnaz and Türkmen Çevik, 2019). Considering a possible 10% data loss, the final sample consisted of 123 women diagnosed with high-risk pregnancy.

In this study, high-risk pregnancy was defined as the presence of maternal or fetal conditions that may endanger the health or life of the mother, fetus, or newborn. This included women diagnosed by an obstetrician with conditions such as gestational diabetes, preeclampsia, multiple pregnancy, placenta previa, preterm labor risk, or other complications documented in the medical records.

*Inclusion criteria* were: being diagnosed with high-risk pregnancy by a physician, being  $\geq 18$  years old, being able to speak and understand Turkish, and volunteering to participate.

*Exclusion criteria* were: having a pre-existing psychiatric disorder, being unable to communicate effectively due to cognitive or language barriers, and declining to participate in the study.

### Data Collection Tools

**Personal Information Form:** Developed by the researchers based on the existing literature (Gözen, 2013; Atasever and Çelik, 2018), this form contains 32 questions regarding the participants’ sociodemographic and obstetric characteristics.

**Prenatal Attachment Inventory (PAI):** The Turkish version of the PAI was developed by Türkmen Çevik and Kurnaz (2019) to measure prenatal attachment levels (Ekşi and Kaardaş, 2017). The inventory includes 33 items rated on a 3-point Likert scale: (1 = strongly disagree, 2 = partially agree, 3 = strongly

agree). The scale includes three sub-dimensions: *Curiosity and Excitement* (Items 1–13), *Acceptance and Enthusiasm* (Items 14–22), and *Hope* (Items 23–33). (see Appendix A). Total scores range from 33 to 99, with higher scores indicating stronger prenatal attachment. The original internal consistency of the PAI was reported as  $\alpha = .94$ . In the current study, Cronbach's alpha was .80 for the total scale and ranged from .80 to .82 for the subscales, indicating good reliability (see Table 1).

**Three-Factor Spiritual Well-Being Scale (3F-SWB):** Originally developed by Ekşi and Kardaş (2017), and

renamed in 2019, this 29-item scale assesses spiritual well-being across three dimensions: *Transcendence*, *Harmony with Nature*, and *Anomie* (Baş Durdu, 2025). Items are rated on a 5-point Likert scale, with higher scores indicating greater spiritual well-being. (see Appendix B). Total scores range from 29 to 145. In the original study, the scale's internal consistency was  $\alpha = .88$ . In the current sample, the Cronbach's alpha value for the total scale was .80. Subscale alphas were as follows: Transcendence = .77, Harmony with Nature = .80, and Anomie = .80. (see Table 1).

**Table 1.** Mean Scores and Cronbach's Alpha Reliability Coefficients for the PAI and the 3F-SWB Subscales and Total Scores among Pregnant Women

| Scales                    | $\bar{X} \pm SD$ (min-max)         | Cronbach's Alpha |
|---------------------------|------------------------------------|------------------|
| <b>Total PAI</b>          | <b>93.53<math>\pm</math>7.16</b>   | <b>0.80</b>      |
| Curiosity and Excitement  | 36.22 $\pm$ 3.36                   | 0.81             |
| Acceptance and Enthusiasm | 25.93 $\pm$ 1.88                   | 0.82             |
| Hope                      | 31.37 $\pm$ 2.73                   | 0.80             |
| <b>Total 3F-SWB</b>       | <b>122.33<math>\pm</math>13.18</b> | <b>0.80</b>      |
| Transcendence             | 66.07 $\pm$ 7.61                   | 0.77             |
| Harmony with Nature       | 31.18 $\pm$ 3.49                   | 0.80             |
| Anomie                    | 25.08 $\pm$ 5.41                   | 0.80             |

### Statistical Analysis

Statistical analyses were performed using IBM SPSS Statistics for Windows, version 24.0. Descriptive statistics, including means, standard deviations, minimum and maximum values, and percentages, were used to summarize the data. For group comparisons, the Kruskal–Wallis and Mann–Whitney U tests were applied to non-normally distributed data, whereas independent samples t-tests and one-way ANOVA were used for normally distributed variables. The relationship between prenatal attachment and spiritual well-being scores was analyzed using Spearman's rank-order correlation coefficient. A p-value less than .05 was considered statistically significant.

### Ethical Approval

Ethical approval for the study was obtained from the Social and Human Sciences Ethics Committee of a university hospital (Approval Date: March 5, 2025; Decision No: 01-72). Additionally, institutional

permission was granted by a training and research hospital in the Black Sea Region (Approval Date: April 24, 2025; Decision No: 563600). Participants were informed about the purpose of the study, assured of confidentiality, and informed that data would be used solely for scientific purposes. Written informed consent was obtained from all participants. All procedures were conducted in accordance with the ethical principles of the Declaration of Helsinki, and particular care was taken to uphold the principle of individual autonomy.

### RESULTS

In the comparison of total PAI scores with the sociodemographic and obstetric characteristics of the pregnant women, significant differences were identified in terms of age, pregnancy planning status, and psychological condition ( $p < 0.05$ ). Regarding the "Curiosity and Excitement" subscale of the PAI, significant differences were observed for age, pregnancy planning status, psychological condition,

and pregnancy risk status ( $p < 0.05$ ). Significant differences in the "Acceptance and Enthusiasm" subscale scores were found in relation to age, smoking during pregnancy, pregnancy planning status, and psychological condition ( $p < 0.05$ ).

Lastly, the "Hope" subscale scores showed significant differences based on age, pregnancy planning status, and psychological condition ( $p < 0.05$ ) (see Table 2).

In the comparison of the total scores of the 3F-SWB with the sociodemographic and obstetric characteristics of the pregnant women, significant differences were found in terms of family structure and psychological condition ( $p < 0.05$ ). Additionally, a significant difference was observed between the

"Harmony with Nature" subscale and family structure ( $p < 0.05$ ). Furthermore, the "Anomie" subscale showed significant differences related to both family structure and psychological condition ( $p < 0.05$ ) (see Table 3).

A positive, statistically significant, and moderate correlation was found between the total scores of the PAI and the 3F-SWB among the pregnant women ( $r = 0.329$ ,  $p < 0.001$ ). Additionally, positive and statistically significant correlations were observed between the total scores of the 3F-SWB and the PAI subscales: "Hope" ( $r = 0.230$ ,  $p < 0.001$ ), "Acceptance and Enthusiasm" ( $r = 0.314$ ,  $p < 0.001$ ), and "Curiosity and Excitement" ( $r = 0.330$ ,  $p < 0.001$ ) (see Table 4).

**Table 2.** Comparison of Pregnant Women's Sociodemographic and Obstetric Characteristics with Total and Subscale Scores of the PAI

| Pregnant Women's Characteristics     | Mean Total Scores<br>of PAI<br>$\bar{X} \pm SD$ | Mean<br>Curiosity/Excitement<br>$\bar{X} \pm SD$ | Mean<br>Acceptance/Joy<br>$\bar{X} \pm SD$ | Mean Hope<br>$\bar{X} \pm SD$ |
|--------------------------------------|-------------------------------------------------|--------------------------------------------------|--------------------------------------------|-------------------------------|
| <b>Age</b>                           |                                                 |                                                  |                                            |                               |
| 18-22                                | 95.85 $\pm$ 2.44                                | 36.92 $\pm$ 1.97                                 | 26.62 $\pm$ 0.50                           | 32.31 $\pm$ 0.94              |
| 23-27                                | 95.56 $\pm$ 4.63                                | 37.17 $\pm$ 2.24                                 | 26.32 $\pm$ 1.19                           | 32.07 $\pm$ 2.18              |
| 28-35                                | 93.56 $\pm$ 7.53                                | 36.31 $\pm$ 3.47                                 | 25.87 $\pm$ 2.09                           | 31.37 $\pm$ 2.65              |
| 36 +                                 | 85.87 $\pm$ 9.28                                | 32.67 $\pm$ 4.30                                 | 24.53 $\pm$ 2.69                           | 28.67 $\pm$ 3.73              |
| <b>p</b>                             | <b>14.564/0.002**</b>                           | <b>8.065/0&lt;001***</b>                         | <b>7.801/0.049**</b>                       | <b>15.132/0.002**</b>         |
| <b>Education Level</b>               |                                                 |                                                  |                                            |                               |
| Literate                             | 93.14 $\pm$ 7.10                                | 36.29 $\pm$ 3.03                                 | 26.57 $\pm$ 0.78                           | 30.29 $\pm$ 3.77              |
| Primary Education                    | 92.57 $\pm$ 8.30                                | 35.69 $\pm$ 4.04                                 | 25.74 $\pm$ 1.94                           | 31.14 $\pm$ 3.20              |
| High School                          | 93.98 $\pm$ 6.68                                | 36.44 $\pm$ 0.07                                 | 25.96 $\pm$ 1.93                           | 31.57 $\pm$ 2.41              |
| <b>p</b>                             | -0.715/0.474*                                   | 0.619/0.540***                                   | 1.686/0.430**                              | 2.747/0.253*                  |
| <b>Working Status</b>                |                                                 |                                                  |                                            |                               |
| Yes                                  | 94.08 $\pm$ 6.82                                | 36.31 $\pm$ 3.46                                 | 26.15 $\pm$ 1.69                           | 31.62 $\pm$ 2.45              |
| No                                   | 93.13 $\pm$ 7.43                                | 36.15 $\pm$ 3.31                                 | 25.77 $\pm$ 2.01                           | 31.20 $\pm$ 2.93              |
| <b>p</b>                             | -1.017/0.309*                                   | 0.813/0.805***                                   | -1.123/0.261*                              | -0.813/0.416*                 |
| <b>Perception of Ekonomic Status</b> |                                                 |                                                  |                                            |                               |
| Income is less than expenses         | 92.79 $\pm$ 5.98                                | 36.00 $\pm$ 2.93                                 | 25.79 $\pm$ 1.36                           | 31.00 $\pm$ 3.03              |
| Income equals expenses               | 94.16 $\pm$ 6.13                                | 36.28 $\pm$ 3.05                                 | 26.14 $\pm$ 1.73                           | 31.73 $\pm$ 2.16              |
| Income is more than expenses         | 92.87 $\pm$ 8.76                                | 36.20 $\pm$ 3.93                                 | 25.69 $\pm$ 2.21                           | 30.98 $\pm$ 3.29              |
| <b>p</b>                             | 2.264/0.322**                                   | 0.041/0.960***                                   | 3.340/0.188**                              | 0.963/0.618**                 |
| <b>Place of Residence</b>            |                                                 |                                                  |                                            |                               |
| Village                              | 95.33 $\pm$ 2.69                                | 36.22 $\pm$ 1.92                                 | 26.67 $\pm$ 0.70                           | 32.44 $\pm$ 1.13              |
| District                             | 95.09 $\pm$ 6.24                                | 36.97 $\pm$ 2.90                                 | 26.38 $\pm$ 1.43                           | 31.74 $\pm$ 2.59              |
| City                                 | 92.66 $\pm$ 7.75                                | 35.90 $\pm$ 3.63                                 | 25.66 $\pm$ 2.09                           | 31.10 $\pm$ 2.88              |
| <b>p</b>                             | 2.256/0.324**                                   | 1.212/0.301***                                   | 5.666/0.059**                              | 2.877/0.237**                 |
| <b>Family Structure</b>              |                                                 |                                                  |                                            |                               |
| Nuclear Family                       | 93.60 $\pm$ 7.12                                | 36.22 $\pm$ 3.34                                 | 25.96 $\pm$ 1.86                           | 31.41 $\pm$ 2.73              |
| Extended Family                      | 92.82 $\pm$ 7.93                                | 36.18 $\pm$ 3.71                                 | 25.64 $\pm$ 2.15                           | 31.00 $\pm$ 2.89              |
| <b>p</b>                             | -0.492/0.623*                                   | -0.244/0.807*                                    | -0.309/0.757*                              | -0.818/0.413*                 |
| <b>Smoking During Pregnancy</b>      |                                                 |                                                  |                                            |                               |
| Yes                                  | 93.83 $\pm$ 5.42                                | 36.35 $\pm$ 2.60                                 | 25.78 $\pm$ 1.41                           | 31.70 $\pm$ 2.67              |
| No                                   | 93.46 $\pm$ 7.53                                | 36.19 $\pm$ 3.52                                 | 25.97 $\pm$ 1.98                           | 31.30 $\pm$ 2.75              |
| <b>p</b>                             | -0.899/0.368*                                   | 1.586/0.840****                                  | <b>-2.285/0.022*</b>                       | -1.166/0.244*                 |

\*Man Whitney U test, \*\* Kruskal Wallis Test, \*\*\*One Way ANOVA, \*\*\*\*Independent T Test

**Table 2.** (Continued) Comparison of Pregnant Women's Sociodemographic and Obstetric Characteristics with Total and Subscale Scores of the PAI

| Pregnant Women's Characteristics                       | Mean Total Scores of PAI<br>$\bar{X} \pm SD$ | Mean Curiosity/Excitement<br>$\bar{X} \pm SD$ | Mean Acceptance/Joy<br>$\bar{X} \pm SD$ | Mean Hope<br>$\bar{X} \pm SD$ |
|--------------------------------------------------------|----------------------------------------------|-----------------------------------------------|-----------------------------------------|-------------------------------|
| <b>Pregnancy Planning Status</b>                       |                                              |                                               |                                         |                               |
| Planned                                                | 95.06±5.09                                   | 36.80±2.70                                    | 26.28±1.38                              | 31.98±1.72                    |
| Unplanned                                              | 87.81±10.39                                  | 34.04±4.56                                    | 24.65±2.81                              | 29.12±4.29                    |
| <b>p</b>                                               | <b>-2.980/0.003*</b>                         | <b>17.520/0.001****</b>                       | <b>-2.958/0.003*</b>                    | <b>-2.796/0.005*</b>          |
| <b>Psychological Status</b>                            |                                              |                                               |                                         |                               |
| Good                                                   | 95.53±4.53                                   | 36.85±2.77                                    | 26.53±0.95                              | 32.15±1.38                    |
| Moderate                                               | 91.53±8.40                                   | 35.73±3.53                                    | 25.29±2.34                              | 30.51±3.51                    |
| Bad                                                    | 87.17±12.60                                  | 33.00±5.76                                    | 24.50±3.27                              | 29.57±4.36                    |
| <b>p</b>                                               | <b>10.996/0.004**</b>                        | <b>4.734/0.011***</b>                         | <b>17.775/0.001**</b>                   | <b>7.730/0.020**</b>          |
| <b>Risk Status of the Pregnancy</b>                    |                                              |                                               |                                         |                               |
| Risk of Preterm Labor                                  | 93.60±6.03                                   | 36.40±2.55                                    | 25.80±2.17                              | 31.40±1.92                    |
| Risk of Miscarriage                                    | 95.65±5.14                                   | 37.52±2.04                                    | 26.22±1.44                              | 31.91±2.53                    |
| Risk of Fetal Anomaly                                  | 93.25±6.73                                   | 35.38±3.99                                    | 26.13±1.35                              | 31.75±1.58                    |
| Gestational Diabetes                                   | 94.55±5.37                                   | 36.45±2.76                                    | 26.50±0.60                              | 31.60±2.58                    |
| Preeclampsia                                           | 92.92±0.38                                   | 35.15±4.18                                    | 26.31±0.85                              | 31.46±3.09                    |
| Advanced Maternal Age                                  | 85.13±11.55                                  | 32.50±5.60                                    | 24.13±3.22                              | 28.50±3.85                    |
| Other (Postterm Pregnancy, Adolescent Pregnancy, etc.) | 93.72±7.60                                   | 36.58±3.09                                    | 25.72±2.28                              | 31.42±2.83                    |
| <b>p</b>                                               | <b>7.495/0.278**</b>                         | <b>2.832/0.013***</b>                         | <b>3.879/0.693**</b>                    | <b>11.757/0.068**</b>         |
| <b>Current Trimester</b>                               |                                              |                                               |                                         |                               |
| First Trimester                                        | 92.91±7.13                                   | 36.03±3.50                                    | 25.91±1.57                              | 30.97±3.13                    |
| Second Trimester                                       | 94.50±7.08                                   | 36.59±3.19                                    | 26.16±1.96                              | 31.75±2.59                    |
| Third Trimester                                        | 93.34±7.29                                   | 36.12±3.41                                    | 25.83±2.01                              | 31.39±2.59                    |
| <b>p</b>                                               | <b>2.258/0.323**</b>                         | <b>0.271/0.763***</b>                         | <b>4.003/0.135**</b>                    | <b>2.640/0.267**</b>          |
| <b>Desire for Baby's Gender</b>                        |                                              |                                               |                                         |                               |
| Yes                                                    | 93.86±7.15                                   | 36.31±3.29                                    | 26.00±1.95                              | 31.55±2.61                    |
| No                                                     | 93.33±7.36                                   | 36.25±3.98                                    | 25.75±1.91                              | 31.33±1.96                    |
| Unknown                                                | 92.48±7.31                                   | 35.88±3.40                                    | 25.80±1.68                              | 30.80±3.41                    |
| <b>p</b>                                               | <b>-0.044/0.965**</b>                        | <b>0.159/0.853***</b>                         | <b>2.022/0.364**</b>                    | <b>1.056/0.590**</b>          |
| <b>Consanguinity with Spouse</b>                       |                                              |                                               |                                         |                               |
| Yes                                                    | 93.13±6.64                                   | 35.75±3.19                                    | 26.38±1.06                              | 31.00±3.29                    |
| No                                                     | 93.56±7.23                                   | 36.25±3.38                                    | 25.90±1.93                              | 31.40±2.70                    |
| <b>p</b>                                               | <b>-0.315/0.752*</b>                         | <b>-0.611/0.541*</b>                          | <b>-0.523/0.601*</b>                    | <b>-0.100/0.921*</b>          |
| <b>Childbirth Education Status</b>                     |                                              |                                               |                                         |                               |
| Yes                                                    | 93.40±7.45                                   | 36.31±3.68                                    | 25.80±1.80                              | 31.29±2.73                    |
| No                                                     | 93.60±7.04                                   | 36.17±3.18                                    | 26.01±1.94                              | 31.42±2.75                    |
| <b>p</b>                                               | <b>-0.262/0.793*</b>                         | <b>0.906/0.820****</b>                        | <b>-1.582/0.114*</b>                    | <b>-0.709/0.479*</b>          |
| <b>Planned Mode of Delivery</b>                        |                                              |                                               |                                         |                               |
| Vaginal Delivery                                       | 94.25±5.92                                   | 36.56±2.63                                    | 26.06±1.80                              | 31.63±2.48                    |
| Cesarean Delivery                                      | 92.75±8.29                                   | 35.85±4.00                                    | 25.80±1.98                              | 31.10±2.98                    |
| <b>p</b>                                               | <b>-0.174/0.862*</b>                         | <b>8.029/0.241****</b>                        | <b>-0.984/0.325*</b>                    | <b>-0.421/0.674*</b>          |

\*Man Whitney U test, \*\* Kruskal Wallis Test, \*\*\*One Way ANOVA, \*\*\*\*Independent T Test

**Table 3.** Comparison of Pregnant Women's Sociodemographic and Obstetric Characteristics with the Total and Subscale Scores of the 3F-SWB

| Pregnant Women's Characteristics | Mean Total Scores of the 3F-SWB<br>$\bar{X} \pm SD$ | Mean Score of the Transcendence<br>$\bar{X} \pm SD$ | Mean Score of the Harmony with Nature<br>$\bar{X} \pm SD$ | Mean Score of the Anomie<br>$\bar{X} \pm SD$ |
|----------------------------------|-----------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|----------------------------------------------|
| <b>Age</b>                       |                                                     |                                                     |                                                           |                                              |
| 18-22                            | 120.31±8.69                                         | 68.31±5.10                                          | 28.92±3.79                                                | 23.08±5.45                                   |
| 23-27                            | 124.37±11.32                                        | 66.78±6.71                                          | 31.46±3.21                                                | 26.12±5.03                                   |
| 28-35                            | 122.15±13.38                                        | 65.87±7.58                                          | 31.43±3.34                                                | 24.85±5.29                                   |
| 36 +                             | 119.13±19.45                                        | 62.87±10.91                                         | 31.47±4.12                                                | 24.80±6.67                                   |
| <b>p</b>                         | <b>0.720/0.542***</b>                               | <b>1.403/0.245***</b>                               | <b>2.073/0.107***</b>                                     | <b>1.147/0.333***</b>                        |

\*Man Whitney U test, \*\* Kruskal Wallis Test, \*\*\*One Way ANOVA, \*\*\*\*Independent T Test

**Table 3.** (Continued) Comparison of Pregnant Women's Sociodemographic and Obstetric Characteristics with the Total and Subscale Scores of the 3F-SWB

| Pregnant Women's Characteristics                       | Mean Total Scores of the 3F-SWB<br>$\bar{X} \pm SD$ | Mean Score of the Transcendence<br>$\bar{X} \pm SD$ | Mean Score of the Harmony with Nature<br>$\bar{X} \pm SD$ | Mean Score of the Anomie<br>$\bar{X} \pm SD$ |
|--------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|----------------------------------------------|
| <b>Education Level</b>                                 |                                                     |                                                     |                                                           |                                              |
| Literate                                               | 125.57±9.96                                         | 69.86±5.30                                          | 31.86±2.96                                                | 23.86±7.10                                   |
| Primary Education                                      | 122.40±12.68                                        | 66.86±6.85                                          | 30.77±4.18                                                | 24.77±5.85                                   |
| High School                                            | 122.01±13.71                                        | 65.40±8.02                                          | 31.30±3.22                                                | 25.32±5.11                                   |
| <b>p</b>                                               | 0.233/0.793***                                      | 1.379/0.256***                                      | 0.411/0.664***                                            | 0.312/0.733***                               |
| <b>Working Status</b>                                  |                                                     |                                                     |                                                           |                                              |
| Yes                                                    | 121.56±14.40                                        | 65.29±8.42                                          | 31.27±3.31                                                | 25.00±5.46                                   |
| N                                                      | 122.89±12.29                                        | 66.63±6.97                                          | 31.11±3.64                                                | 25.14±5.42                                   |
| <b>p</b>                                               | 1.276/0.583****                                     | 2.402/0.335****                                     | 0.255/0.807****                                           | 0.078/0.887****                              |
| <b>Perception of Economic Status</b>                   |                                                     |                                                     |                                                           |                                              |
| Income is less than expenses                           | 120.14±12.82                                        | 65.57±8.08                                          | 31.21±4.19                                                | 23.36±4.98                                   |
| Income equals expenses                                 | 123.47±11.18                                        | 66.64±6.46                                          | 31.22±3.21                                                | 25.61±5.12                                   |
| Income is more than expenses                           | 121.38±15.81                                        | 65.40±8.97                                          | 31.11±3.72                                                | 24.87±5.91                                   |
| <b>p</b>                                               | 0.545/0.581***                                      | 0.380/0.685***                                      | 0.013/0.987***                                            | 1.049/0.353***                               |
| <b>Place of Residence</b>                              |                                                     |                                                     |                                                           |                                              |
| Village                                                | 126.00±12.57                                        | 67.00±5.61                                          | 31.11±4.10                                                | 27.89±5.68                                   |
| District                                               | 123.65±13.86                                        | 67.65±7.76                                          | 31.38±3.86                                                | 24.62±5.78                                   |
| City                                                   | 121.35±12.99                                        | 65.29±7.71                                          | 31.10±3.30                                                | 24.96±5.20                                   |
| <b>p</b>                                               | 0.736/0.481***                                      | 1.223/0.298***                                      | 0.078/0.925***                                            | 1.360/0.261***                               |
| <b>Family Structure</b>                                |                                                     |                                                     |                                                           |                                              |
| Nuclear Family                                         | 123.16±13.04                                        | 66.24±7.38                                          | 31.39±3.36                                                | 25.53±5.32                                   |
| Extended Family                                        | 113.82±12.03                                        | 64.27±9.89                                          | 29.00±4.21                                                | 20.55±4.25                                   |
| <b>p</b>                                               | -2.337/0.019*                                       | -0.546/0.585*                                       | -2.017/0.044*                                             | -2.922/0.003*                                |
| <b>Smoking During Pregnancy</b>                        |                                                     |                                                     |                                                           |                                              |
| Yes                                                    | 119.22±13.63                                        | 65.22±8.91                                          | 30.87±3.13                                                | 23.13±4.78                                   |
| No                                                     | 123.04±13.04                                        | 66.26±7.32                                          | 31.25±3.58                                                | 25.53±5.47                                   |
| <b>p</b>                                               | 0.004/0.211****                                     | 1.285/0.556****                                     | 1.078/0.640****                                           | 0.381/0.055****                              |
| <b>Pregnancy Planning Status</b>                       |                                                     |                                                     |                                                           |                                              |
| Planned                                                | 122.47±12.76                                        | 66.03±7.44                                          | 31.08±3.32                                                | 25.36±5.32                                   |
| Unplanned                                              | 121.77±14.91                                        | 66.19±8.38                                          | 31.54±4.13                                                | 24.04±5.73                                   |
| <b>p</b>                                               | 1.283/0.810****                                     | 0.877/0.924***                                      | 1.623/0.557****                                           | 0.903/0.271****                              |
| <b>Psychological Status</b>                            |                                                     |                                                     |                                                           |                                              |
| Good                                                   | 125.13±11.18                                        | 66.82±6.58                                          | 31.37±3.41                                                | 26.94±4.51                                   |
| Moderate                                               | 120.20±13.60                                        | 65.88±8.02                                          | 31.02±3.66                                                | 23.31±5.20                                   |
| Bad                                                    | 107.83±19.63                                        | 59.00±12.18                                         | 30.33±3.38                                                | 18.50±7.28                                   |
| <b>p</b>                                               | 6.304/0.002***                                      | 3.031/0.052***                                      | 0.322/0.726***                                            | 13.293/0<001***                              |
| <b>Risk Status of the Pregnancy</b>                    |                                                     |                                                     |                                                           |                                              |
| Risk of Preterm Labor                                  | 118.80±12.01                                        | 65.60±7.70                                          | 30.47±4.32                                                | 22.73±5.39                                   |
| Risk of Miscarriage                                    | 123.22±11.89                                        | 66.74±6.26                                          | 30.78±3.87                                                | 25.70±6.47                                   |
| Risk of Fetal Anomaly                                  | 124.38±9.94                                         | 66.13±6.60                                          | 32.13±2.69                                                | 26.13±4.19                                   |
| Gestational Diabetes                                   | 117.20±13.14                                        | 62.75±8.71                                          | 30.30±3.21                                                | 24.15±4.98                                   |
| Preeclampsia                                           | 123.38±10.00                                        | 66.85±5.65                                          | 31.31±2.42                                                | 25.23±4.00                                   |
| Advanced Maternal Age                                  | 127.25±19.99                                        | 67.75±9.27                                          | 32.50±4.72                                                | 27.00±7.80                                   |
| Other (Postterm Pregnancy, Adolescent Pregnancy, etc.) | 124.14±14.14                                        | 67.00±8.19                                          | 31.67±3.24                                                | 25.47±5.02                                   |
| <b>p</b>                                               | 8.183/0.225**                                       | 5.675/0.461**                                       | 6.638/0.356**                                             | 5.005/0.543**                                |
| <b>Current Trimester</b>                               |                                                     |                                                     |                                                           |                                              |
| First                                                  | 118.75±13.66                                        | 64.19±8.23                                          | 30.28±3.34                                                | 24.28±5.64                                   |
| Second                                                 | 125.34±12.70                                        | 67.66±7.44                                          | 32.13±3.83                                                | 25.56±5.53                                   |
| Third                                                  | 122.63±12.93                                        | 66.22±7.26                                          | 31.15±3.30                                                | 25.25±5.27                                   |
| <b>p</b>                                               | 2.066/0.131***                                      | 1.702/0.187***                                      | 2.277/0.107***                                            | 0.501/0.607***                               |
| <b>Desire for Baby's Gender</b>                        |                                                     |                                                     |                                                           |                                              |
| Yes                                                    | 123.58±13.09                                        | 66.65±7.11                                          | 31.23±3.61                                                | 25.70±5.41                                   |
| No                                                     | 122.08±13.51                                        | 66.33±9.41                                          | 32.17±3.18                                                | 23.58±4.98                                   |
| Unknown                                                | 118.12±12.97                                        | 63.92±8.30                                          | 30.52±3.19                                                | 23.68±5.42                                   |
| <b>p</b>                                               | 1.683/0.190***                                      | 1.259/0.288***                                      | 0.933/0.396***                                            | 1.878/0.190***                               |

**Table 3.** (Continued) Comparison of Pregnant Women's Sociodemographic and Obstetric Characteristics with the Total and Subscale Scores of the 3F-SWB

| Pregnant Women's Characteristics   | Mean Total Scores of the 3F-SWB<br>$\bar{X} \pm SD$ | Mean Score of the Transcendence<br>$\bar{X} \pm SD$ | Mean Score of the Harmony with Nature<br>$\bar{X} \pm SD$ | Mean Score of the Anomie<br>$\bar{X} \pm SD$ |
|------------------------------------|-----------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|----------------------------------------------|
| <b>Consanguinity with Spouse</b>   |                                                     |                                                     |                                                           |                                              |
| Yes                                | 115.63±19.35                                        | 61.88±11.26                                         | 29.88±4.22                                                | 23.88±7.47                                   |
| No                                 | 122.79±12.63                                        | 66.36±7.27                                          | 31.27±3.44                                                | 25.17±5.28                                   |
| <b>p</b>                           | -1.190/0.234*                                       | -0.992/0.321*                                       | -1.020/0.308*                                             | -0.396/0.692*                                |
| <b>Childbirth Education Status</b> |                                                     |                                                     |                                                           |                                              |
| Yes                                | 124.71±12.78                                        | 66.98±6.79                                          | 31.73±3.61                                                | 26.00±5.19                                   |
| No                                 | 120.95±13.29                                        | 65.54±8.04                                          | 30.86±3.40                                                | 24.55±5.50                                   |
| <b>p</b>                           | 0.001/0.128****                                     | 0.886/0.315****                                     | 0.649/0.182****                                           | 0.478/0.154****                              |
| <b>Planned Mode of Delivery</b>    |                                                     |                                                     |                                                           |                                              |
| Vaginal Delivery                   | 121.97±11.86                                        | 65.67±7.12                                          | 31.11±3.45                                                | 25.19±5.04                                   |
| Cesarean Delivery                  | 122.71±14.57                                        | 66.49±8.15                                          | 31.25±3.56                                                | 24.97±5.83                                   |
| <b>p</b>                           | 2.252/0.756****                                     | 0.747/0.553****                                     | 0.460/0.819****                                           | 1.893/0.822****                              |

\*Man Whitney U test, \*\* Kruskal Wallis Test, \*\*\*One Way ANOVA, \*\*\*\*Independent T Test

**Table 4.** Relationship Between the Total and Subscale Scores of the PAI and the Total and Subscale Scores of the 3F-SWB

|                                               |   | Total Score of the 3F-SWB | Anomie Subscale of the 3F-SWB | Harmony with Nature Subscale of the 3F-SWB | Transcendence Subscale of the 3F-SWB | Total Score of PAI | Hope Subscale of the PAI | Acceptance and Enthusiasm Subscale of the PAI | Curiosity and Excitement Subscale of the PAI |
|-----------------------------------------------|---|---------------------------|-------------------------------|--------------------------------------------|--------------------------------------|--------------------|--------------------------|-----------------------------------------------|----------------------------------------------|
| Total Score of the 3F-SWB                     | r | 1                         | <b>0.657**</b>                | <b>0.803**</b>                             | <b>0.848**</b>                       | <b>0.329**</b>     | <b>0.230**</b>           | <b>0.314**</b>                                | <b>0.330**</b>                               |
|                                               | p |                           | <b>0.000</b>                  | <b>0.000</b>                               | <b>0.000</b>                         | <b>0.000</b>       | <b>0.000</b>             | <b>0.000</b>                                  | <b>0.000</b>                                 |
| Anomie Subscale of the 3F-SWB                 | r |                           | 1                             | <b>0.348**</b>                             | <b>0.268**</b>                       | <b>0.221*</b>      | <b>0.184*</b>            | <b>0.233**</b>                                | <b>0.192*</b>                                |
|                                               | p |                           |                               | <b>0.000</b>                               | <b>0.003</b>                         | <b>0.014</b>       | <b>0.042</b>             | <b>0.010</b>                                  | <b>0.034</b>                                 |
| Harmony with Nature Subscale of the 3F-SWB    | r |                           |                               | 1                                          | <b>0.659**</b>                       | <b>0.255**</b>     | 0.137                    | <b>0.215*</b>                                 | <b>0.297**</b>                               |
|                                               | p |                           |                               |                                            | <b>0.000</b>                         | <b>0.004</b>       | 0.130                    | <b>0.017</b>                                  | <b>0.001</b>                                 |
| Transcendence Subscale of the 3F-SWB          | r |                           |                               |                                            | 1                                    | <b>0.298**</b>     | <b>0.219*</b>            | <b>0.281**</b>                                | <b>0.320**</b>                               |
|                                               | p |                           |                               |                                            |                                      | <b>0.001</b>       | <b>0.015</b>             | <b>0.002</b>                                  | <b>0.000</b>                                 |
| Total Score of PAI                            | r |                           |                               |                                            |                                      | 1                  | <b>0.756**</b>           | <b>0.749**</b>                                | <b>0.897**</b>                               |
|                                               | p |                           |                               |                                            |                                      |                    | <b>0.000</b>             | <b>0.000</b>                                  | <b>0.000</b>                                 |
| Hope Subscale of the PAI                      | r |                           |                               |                                            |                                      |                    | 1                        | <b>0.610**</b>                                | <b>0.520**</b>                               |
|                                               | p |                           |                               |                                            |                                      |                    |                          | <b>0.000</b>                                  | <b>0.000</b>                                 |
| Acceptance and Enthusiasm Subscale of the PAI | r |                           |                               |                                            |                                      |                    |                          | 1                                             | <b>0.536**</b>                               |
|                                               | p |                           |                               |                                            |                                      |                    |                          |                                               | <b>0.000</b>                                 |
| Curiosity and Excitement Subscale of the PAI  | r |                           |                               |                                            |                                      |                    |                          |                                               | 1                                            |
|                                               | p |                           |                               |                                            |                                      |                    |                          |                                               |                                              |

## DISCUSSION

In our study, the mean total score of the PAI among pregnant women was found to be  $93.53 \pm 7.16$ , indicating a high level of attachment. Similar studies in the literature also report high prenatal attachment

levels among pregnant women. For example, Baş Durdu (2025) reported a total PAI score of  $94.53 \pm 8.43$  in her study (Alkaş and Varşoğlu, 2023). Likewise, Alkaş and Varşoğlu (2023), in their research examining the relationship between anxiety and

prenatal attachment, found a PAI score of  $91.51 \pm 11.32$ . However, some studies have reported lower mean PAI scores. Kartal and Karaman (2018), following participation in prenatal education programs, found a score of  $71.88 \pm 8.25$  (Kartal and Karaman, 2018; Küçükkaya et al., 2018). In the study by Küçükkaya et al. (2018), the PAI score was reported as  $64.89 \pm 21.15$ . Additionally, Potur et al. (2020) conducted a study in Istanbul and found the mean PAI score among pregnant women to be  $62.21 \pm 10.66$ ; they also reported that primiparous women had statistically significantly higher attachment scores compared to multiparous women (Yılmaz and Beji, 2010). These differences can be explained by factors such as sample characteristics, gestational weeks, risk status, education level, and psychological condition in the respective studies. Overall, however, the findings of our study align with the literature indicating a high level of prenatal attachment among pregnant women.

In our study, when comparing the total PAI scores of pregnant women with their sociodemographic and obstetric characteristics, statistically significant differences were found between prenatal attachment levels and factors such as age, planned pregnancy, and psychological status ( $p < 0.05$ ). The literature indicates that education and socioeconomic status are among the important factors affecting prenatal attachment (Trombetta-Lima et al., 2021; Ataman et al., 2022). Similarly, Ataman et al. (2022) reported that planned pregnancy status, pregnancy intention, economic condition, and family structure influence prenatal attachment (Aykaç, 2021). However, another study conducted by Aykaç (2021) found no significant effect of age, education level, employment status, and income level on prenatal attachment (Bilgiç, 2019). This suggests that prenatal attachment may be influenced differently by individual, cultural, and environmental factors.

In our study, the mean total score on the 3F-SWB among pregnant women was found to be  $122.33 \pm 13.18$ , indicating a high level of spiritual well-being. Similarly, Bilgiç (2019) reported a mean spiritual well-being score of  $125.59 \pm 12.97$  in a study conducted with pregnant women (Dunn et al., 2007). Other studies in the literature also highlight

generally high levels of spiritual well-being among pregnant women. For instance, Abdollahpour and Khosravi (2018) found a spirituality score mean of  $64.43 \pm 16.51$  among pregnant participants (Abdollahpour and Khosravi, 2018). Dunn et al. (2007), in their study examining the relationship between anxiety, depression, and spiritual well-being in pregnant women, reported an average spiritual well-being score of 110.0 (Edis and Bal, 2024). Variations in mean scores across different studies largely arise from structural differences in the measurement instruments used and the diversity of cutoff points applied. However, overall, the finding of high spiritual well-being among pregnant women is consistent with existing literature. This suggests that pregnancy may represent a period of heightened spiritual awareness for women and that spiritual resources could play a significant role in supporting psychological resilience during this process.

In our study, a comparison of the total scores on the 3F-SWB with the sociodemographic and obstetric characteristics of pregnant women revealed significant differences in family structure and psychological status ( $p < 0.05$ ). Additionally, significant relationships were found between the “Harmony with Nature” subscale and family structure, as well as between the “Anomie” subscale and both family structure and psychological status ( $p < 0.05$ ) (Table 2). These results indicate that family support and parental mental health have a significant impact on the spiritual well-being levels of pregnant women. Similarly, the literature reports that factors such as income status and planned pregnancy influence spiritual well-being among pregnant women (Buldur and Göcen, 2021). Moreover, unplanned pregnancies have been reported to have negative effects on spiritual well-being (Izadi et al., 2020). These findings underscore the critical role of family support and psychological well-being in enhancing spiritual well-being during the pregnancy process.

In our study, a positive, statistically significant, and moderate correlation was found between the total scores of the PAI and the 3F-SWB ( $p < 0.05$ ). This finding indicates that higher levels of spiritual well-being strengthen prenatal attachment behaviors.

Similarly, a cross-sectional study conducted by Izadi et al. (2020) with 200 pregnant women in Qazvin, Iran, reported a positive and significant relationship between spiritual health and prenatal attachment scores ( $r = 0.40$ ,  $p < 0.001$ ) (Sidhu and Dhamania, 2025). This study demonstrated the supportive role of spiritual well-being in fostering emotional attachment during the preparation for motherhood. Likewise, Sidhu and Dhamania (2025) in their research in Jaipur identified a strong positive correlation between maternal-fetal attachment and spiritual health ( $r = 0.65$ ,  $p < 0.05$ ), emphasizing that spiritual orientation enhances the bonding process during pregnancy (Baltacı and Vatansever, 2022). In Turkey, Baltacı and Vatansever (2022) compared women with spontaneous pregnancies and those who conceived through assisted reproductive technologies, finding that women with higher spiritual well-being also had significantly stronger prenatal attachment. These findings align with our study results, supporting the notion that spiritual well-being positively influences the mother–infant bond by enhancing psychological resilience during pregnancy.

### Limitations

This study has some limitations that should be acknowledged. Firstly, the use of a non-probability sampling technique may limit the representativeness of the sample, which affects the generalizability of the findings to all high-risk pregnant women. Secondly, the cross-sectional design restricts the ability to infer causal relationships between spiritual well-being and prenatal attachment. Thirdly, data were collected using self-report questionnaires, which may be subject to social desirability and recall biases. Additionally, the study was conducted in a single hospital setting, which might not reflect experiences in other regions or healthcare environments. Future research with larger, more diverse populations and longitudinal designs is recommended to further explore and confirm these relationships.

### CONCLUSION

This study highlights the importance of spirituality as a supportive factor in the maternal–fetal

relationship during pregnancy. The findings suggest that fostering spiritual well-being may strengthen the emotional bond between mother and baby, contributing to a healthier pregnancy experience. Interventions that encourage spiritual well-being—such as counseling, supportive care, or holistic health practices—may help expectant mothers cope more effectively with the challenges of pregnancy and enhance maternal identity. Future studies could focus on developing and testing structured programs that integrate spirituality into prenatal care and exploring how such approaches affect long-term maternal and child outcomes. In practice, strengthening psychological well-being during pregnancy may support and enhance mother–baby bonding.

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### Conflict of Interest

The authors declare that there is no conflict of interest.

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