Clinical and Experimental Obstetrics & Gynecology

Clin. Exp. Obstet. Gynecol. **2025**; 52(3): 27160
https://doi.org/10.31083/CEOG27160

Original Research

Relationships between Suicidality and Perceived Social Support in Pregnant Adolescents—A Prospective Case-Control Study

Yasin Caliskan[1,*], Meltem Caliskan[2], Yavuz Meral[3], Abas Hasimoglu[1], Tuncay Sandikci[4], Burak Dogangun[5], Muhammed T. Kadak[5]

[1]Department of Child and Adolescent Psychiatry, Istanbul Basaksehir Cam and Sakura City Hospital, 34480 Istanbul, Turkey
[2]Department of Gynecology and Obstetrics, Istanbul Haseki Training and Research Hospital, 34096 Istanbul, Turkey
[3]Department of Child and Adolescent Psychiatry, Medeniyet University-Faculty of Medicine, 34700 Istanbul, Turkey
[4]Department of Child and Adolescent Psychiatry, Erenkoy Mental and Nervous Diseases Training and Research Hospital, 34736 Istanbul, Turkey
[5]Department of Child and Adolescent Psychiatry, Istanbul University-Cerrahpasa Cerrahpasa Faculty of Medicine, 34098 Istanbul, Turkey
*Correspondence: yasin.caliskan1@sbu.edu.tr (Yasin Caliskan)

Academic Editor: Michael H. Dahan
Submitted: 28 October 2024 Revised: 7 February 2025 Accepted: 24 February 2025 Published: 20 March 2025

Abstract

Background: Adolescent pregnancy is a critical issue that affects both mental health and social well-being, increasing the risk of challenges such as depression, anxiety, and suicidal behaviors. The availability of support systems can play a vital role in mitigating these risks. However, the relationship between social support and mental health outcomes in pregnant adolescents (PAs) remains underexplored in Turkey. This prospective case-control study aims to investigate the relationships between perceived social support, suicidality, and psychopathology in PAs compared to a healthy non-PAs (NPAs) control group, while identifying key risk factors for suicidality within the Turkish context. **Methods**: This study included 50 PAs and 50 NPAs, aged 13–19 years. Data were collected between June 2018 and December 2018 using the Multidimensional Scale of Perceived Social Support (MSPSS), Suicide Probability Scale (SPS), Revised Children's Anxiety and Depression Scale (RCADS), and the Schedule for Affective Disorders and Schizophrenia for School-Age Children—Present and Lifetime Version (K-SADS-PL-DSM-5). **Results**: Suicide attempts were reported by 18% of PAs and 6% of NPAs ($p = 0.065$). Suicidal thoughts were noted in 10% of both groups ($p = 1.000$). Past psychiatric disorders were significantly more common in PAs compared to NPAs ($p = 0.005$). A history of physical and sexual trauma was also significantly higher in PAs ($p < 0.05$). No significant differences were observed in the total SPS or RCADS scores between the groups ($p > 0.05$). Stepwise regression analysis identified depressive symptoms ($\beta = 1.619$, $p < 0.001$), lack of school attendance ($\beta = 19.213$, $p = 0.010$), illicit drug use ($\beta = 13.583$, $p = 0.026$), and a history of suicide attempts ($\beta = 11.815$, $p = 0.005$) as predictors of suicide probability in PAs. Family support was identified as a protective factor ($\beta = –2.431$, $p = 0.009$). **Conclusions**: PAs are at increased risk for suicidality, particularly those with depressive symptoms, histories of abuse, or delinquent behaviors. Family support emerges as a crucial protective factor. Interventions focused on mental health, social support, and access to education are essential for mitigating these risks.

Keywords: adolescent pregnancy; social support; suicidal behavior

1. Introduction

The World Health Organization (WHO) defines adolescent pregnancy as the pregnancy of women ages 10–19 years [1]. Each year, roughly 21 million girls between the ages of 15 and 19 years and 2 million girls under the age of 15 years become pregnant in developing regions [2]. Even though developing countries report 95% of adolescent pregnancies, it is a significant public health concern for both developing and developed countries [3]. In Turkey, there are no direct statistics on adolescent pregnancy. However, the adolescent fertility rate, defined as the number of births per 1000 women aged 15–19 years, provides an estimate. According to data from the Turkish Statistical Institute (TUIK), the adolescent fertility rate in Turkey was 17 per 1000 in 2019, which is higher than the European Union average of 9 per 1000 [4].

These statistics highlight not only the prevalence of adolescent pregnancies, but also the magnitude and diversity of the challenges adolescents face during this period. Adolescent pregnancies are not merely a physical or biological issue; they represent a complex public health problem influenced by social, cultural, and economic factors [5]. From a socio-cultural perspective, structural factors like poverty, limited educational opportunities, and cultural norms, including early marriage, are the major contributors [6]. Alongside these structural elements, individual-level factors such as lack of knowledge and physical immaturity further exacerbate the issue [5]. Adolescents often lack the necessary knowledge and sense of responsibility to care for a child, and their physical development is typically not yet complete for pregnancy and childbirth [7]. Unstable home settings, having one's first sexual experience at a young age, sexual abuse, and a lack of knowl-

edge about or difficulties getting adolescent contraception [3] can make adolescents more likely to get pregnant [8]. In addition to individual vulnerabilities, societal norms and expectations play a significant role. The pressure to marry young and have children at a young age, the lack of educational and employment opportunities for adolescents, the value placed on motherhood in some societies, and marriage or childbearing being the best among the few options available to adolescent girls are just examples of the many factors that contribute to adolescent pregnancy and births [3]. In Turkey, marriage is often seen as the societal starting point for childbearing, and in rural and traditional communities, early marriage remains common despite legal regulations setting the minimum marriage age at 17 years [9]. These cultural norms further contribute to adolescent pregnancies, as early marriages often carry implicit or explicit expectations of early childbearing. According to United Nations Children's Fund (UNICEF) data, in the Republic of Turkey, 4.8% of girls aged 15–19 years are currently married or in a union. Additionally, 14.7% of women aged 20–24 years were married or in a union before the age of 18 years [10]. Strong familial and cultural ties in Turkey often influence the experiences of pregnant adolescents, particularly in rural areas [11]. These ties are shaped by traditional family structures and societal norms, which play a significant role in shaping adolescent pregnancies. While these cultural dynamics may provide stability in some contexts, they also reinforce expectations around early marriage and childbearing. This highlights the complex interaction between societal expectations and public health challenges, emphasizing the need for culturally sensitive interventions to address adolescent pregnancies.

It's important to note that adolescent pregnancy has been linked to a higher risk of a variety of negative perinatal outcomes, including preterm birth, low birth weight, stillbirth, intrapartum mortality, and miscarriage [12]. In addition to adverse perinatal outcomes, mental health problems such as depression, anxiety, childhood trauma, and both physical and sexual child abuse have been associated with adolescent pregnancy [13–16]. Females are more likely to attempt suicide, and being pregnant makes this risk considerably higher [17]. Adolescent pregnancy was shown to be a significant predictor of suicide and suicide attempts in a cohort research assessing obstetric, neonatal, and maternal risks for suicide and suicide attempts in young people in Sweden [18]. Some studies have found a consistent link between adolescent pregnancy and suicidal behavior, sociocultural factors such as the justification of adolescent marriage without legal acts, religious beliefs permitting or prohibiting adolescent marriage and pregnancy, normalization of adolescent pregnancy and family support, low female attendance to school and poverty, all may have an impact on suicidal behavior [19–21]. However, there are a limited number of studies in Turkey examining the association between adolescent pregnancy and suicidal behavior.

Adolescents have different cognitive, communication, and social skills as compared to adults. This difference affects not only mothering skills but also providing social support skills. Young mothers may be more vulnerable to less social and economic support than adult mothers, because they have weaker abilities to establish and maintain relationships with others. Studies of pregnant adolescents have shown that high levels of social support protect against anxiety disorders [22], while low social support is associated with suicidal behavior [23] while an increase in social support is associated with a decrease in depressive symptoms. Most of the previous works evaluating suicide risk in adolescent pregnant women is based on their behaviors (suicidal ideation and suicide attempt). Suicidality and its expressions among adolescents are sometimes "hidden". A study evaluating why young people do not disclose their suicidal thoughts to a mental health professional revealed that 39% of young people did not disclose their suicidal ideation to a mental health professional despite having access to a mental health professional [24]. This demonstrates that every year, a significant number of young people at risk of suicide are unable to receive clinical care due to their suicidal thoughts. This highlights the need for healthcare professionals to adopt proactive and sensitive approaches when addressing mental health concerns, including the evaluation of suicide risk, in adolescent pregnant women.

Adolescent pregnancies remain a significant public health issue in Turkey, with notable cultural and regional factors influencing their prevalence. Despite the increasing recognition of the mental health challenges faced by pregnant adolescents, there is a lack of studies specifically evaluating suicidality in this population within the Turkish context. This study aimed to examine the perceived social support, suicidality (suicidal behavior and suicide probability), and psychopathology of pregnant adolescent women by comparing them with a healthy non-pregnant control group and assessing risk factors for suicidality in pregnant adolescents. By incorporating a sociocultural perspective, this study also explores how cultural norms and societal structures influence the experiences of pregnant adolescents. We hypothesized that pregnant adolescents will have a higher rate of suicidal behavior and a lower level of perceived social support compared to non-pregnant adolescents.

2. Materials and Methods

2.1 Participants and Procedure

This prospective case-control study included 50 pregnant adolescents (PAs) and 50 non-pregnant adolescents (NPAs), aged 13–19 years, who attended the Child and Adolescent Psychiatry Outpatient Service at the Istanbul University-Cerrahpasa Hospital. The clinic is part of a public university hospital in Istanbul, Turkey, and provides services to children and families from various socioeconomic backgrounds, including those who refer themselves or are referred by other professionals. The study was con-

ducted in accordance with the Declaration of Helsinki and was approved by the Human Ethics Committee of Istanbul University-Cerrahpasa Cerrahpasa Faculty of Medicine (Registry No.: 3972, date: June 2018). The sample size was determined through an a priori power analysis using the G*Power software (version 3.1.9.2, Heinrich-Heine-Universität Düsseldorf, Düsseldorf, Germany). The analysis was based on a one-tailed *t*-test to compare the means of two independent groups. The following parameters were used: a medium to large effect size (Cohen's d = 0.7), a significance level (α = 0.05), a power (1–β = 0.95), and an allocation ratio of 1:1 between the groups. Based on these parameters, the required sample size was calculated as 45 participants per group, resulting in a total sample size of 90 participants. To account for potential dropouts, an additional 10% was added, yielding a final target sample size of approximately 100 participants.

To be included in the case group, participants had to be aged 13 to 19 years, currently pregnant and receiving follow-up services at the clinic or first-time applicants during the study period. The control group consisted of females aged 13 to 19 years who were not pregnant, had never been pregnant before, and had no previous psychiatric consultations. These participants were volunteers who responded to a hospital announcement. For both groups, individuals with conditions impairing cognitive functions—such as intellectual disabilities, autism spectrum disorder, head trauma, or neurological diseases—that could prevent completion of the questionnaire were excluded. The PAs group reflects the regular patient population of the clinic, including individuals who were either receiving follow-up care or visiting the clinic for the first time during the study period. In contrast, the NPAs group was made up of volunteers who responded to a hospital announcement, forming a convenience sample.

The study data were collected between June 2018 and December 2018. Through face-to-face consultations, both participants and their legal guardians received detailed information regarding the study's objectives, procedures, potential benefits, and associated risks. Adolescents aged 13–17 years gave their written assent along with both written and verbal consent from their guardians, while participants aged 18–19 years provided both written and verbal consent independently. Following the provision of consent, data collection proceeded through standardized face-to-face interviews conducted in private consultation rooms. The assessment protocol included self-report questionnaires administered under researcher supervision and a comprehensive psychiatric evaluation using the Schedule for Affective Disorders and Schizophrenia for School-Age Children—Present and Lifetime Version, DSM-5 (K-SADS-PL-DSM-5), conducted by a certified child and adolescent psychiatrist. This structured approach ensured standardized assessment conditions while maintaining data quality and participant comfort throughout the evaluation process.

2.2 Measurements

2.2.1 Multidimensional Scale of Perceived Social Support (MSPSS)

MSPSS is a self-assessment scale consisting of 12 items that measure support in the areas of family, friends, and significant others [25]. Each item is rated on a 7-point Likert scale ranging from 1 ("Very Strongly Disagree") to 7 ("Very Strongly Agree"). The scale is divided into three subscales: family, friends, and significant others, each consisting of four items. Subscale scores are calculated by summing the scores for the relevant items and dividing by four. The total score is obtained by summing all 12 items and dividing by 12. Higher scores indicate greater perceived social support. A study of its validity and reliability in a clinical sample in Turkey was conducted in 1997 by Çakır *et al*. [26]. In Çakır's study [26], the reliability analysis showed that the Cronbach's Alpha Coefficient for the subscales ranged between 0.87 and 0.95, while the whole scale had a Cronbach's Alpha Coefficient of 0.96 for the frequency section and 0.95 for the importance section.

2.2.2 Suicide Probability Scale (SPS)

SPS is a 4-point Likert-type scale with 36 items developed by Cull and Gill (1982) [27]. Higher SPS scores indicate higher probabilities of suicide. A study of its validity and reliability in a clinical sample in Turkey was conducted in 2009 by Atlı *et al*. [28]. It was identified that the internal consistency coefficient for the total score of the scale was 0.87, the test-retest reliability was 0.98, and the validity compared with similar scales was 0.84, demonstrating the scale's strong psychometric properties in the Turkish context [28].

2.2.3 Revised Children's Anxiety and Depression Scale (RCADS)

RCADS is a 47-item scale that evaluates anxiety and depressive disorder symptoms [29]. It has 5 subdimensions. There are 7 items addressing separation anxiety disorder, 9 items addressing social phobia, 6 items addressing generalized anxiety disorder, 6 items addressing obsessive-compulsive disorder, 9 items addressing panic disorder and 10 items addressing major depression. Questions are scored using 4 points (0 = never, 1 = sometimes, 2 = often, 3 = always). A study of its validity and reliability in a clinical sample in Turkey was conducted in 2017 by Gormez *et al*. [30]. Inter-scale reliability was strong/excellent, with a Cronbach's α of 0.95 and coefficients for the RCADS subscales ranging from 0.75 to 0.86, demonstrating good internal consistency [30].

2.3 K-SADS-PL-DSM-5

The K-SADS-PL-DSM-5 is a semi-structured diagnostic interview form used to determine the past and current psychopathologies of children and adolescents [31]. In the first part of the form, which consists of 3 parts, general in-

formation such as the child's demographic characteristics, general health status, previous psychiatric applications, and treatments, if any, family and peer relations, school status, and other education-related information are evaluated. The second part includes screening questions and evaluation criteria in which specific psychiatric symptoms are evaluated. If positive symptoms are detected in the screening interview, individuals respond to an additional symptom list to evaluate the psychopathology in more detail. A study of the validity and reliability of the K-SADS-PL-DSM-5 was carried out by Ünal *et al*. [32]. In our study, the second part of the K-SADS-PL-DSM-5 was used to screen for past and current psychiatric disorders.

In our study, the presence of current suicidal ideation was evaluated with the subsection "Suicidal Ideas" in the screening interview. If the threshold criteria were met, it was accepted as the presence of suicidal ideation in individuals.

2.4 Statistical Analysis

Data were analyzed using IBM SPSS Statistics for Windows, version 22.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics were presented as numbers, percentages, medians, minimum and maximum values. Normality and homogeneity were assessed using the Kolmogorov-Smirnov and Shapiro-Wilk tests, and histogram graphs were plotted. It was determined that the data did not show a normal distribution. A Chi-squared test was used to compare categorical (countable) data, and the Mann-Whitney U test was used to compare the means of the groups since the data series did not follow a normal distribution. Normality for SPS was also assessed via skewness and kurtosis between –1.5 and +1.5 [33]. A stepwise regression analysis was conducted to identify predictors of suicide probability (SPS scores) among pregnant adolescents. A p-value < 0.05 was considered statistically significant.

3. Results

The socio-demographic and clinical characteristics of the adolescents are presented in Table 1. There was no significant age difference between the PAs and NPAs groups ($Z = –1.718$, $p = 0.086$). School attendance and educational status were significantly higher in the NPAs group ($p < 0.001$), with 100% of NPAs continuing their education compared to only 4% of PAs. Smoking was significantly more common in the pregnant group (32% *vs.* 2%, $p < 0.001$), while no significant differences were found in alcohol or illicit drug use ($p > 0.05$). A history of physical or sexual abuse was reported by 24% of the PAs, compared to none in the NPAs ($p < 0.001$). Physical abuse was reported by 22% ($p < 0.001$), and sexual abuse by 12% ($p = 0.035$) of the pregnant group. Additionally, involvement in crime (10% *vs.* 0%, $p = 0.066$) and running away from home (26% *vs.* 0%, $p < 0.001$) were more common in the pregnant group. It was determined that 58% (n = 29) of adolescent pregnancies were unplanned, and 32% of pregnant adolescents (n = 16) did not want to carry on the pregnancy.

A history of suicide attempts was found in 18% (n = 9) of the PAs group and 6% (n = 3) of the NPAs group ($p = 0.065$). The presence of suicidal ideation was found in 10% (n = 5) of the PAs group and 10% (n = 5) of the NPAs group ($p = 1.000$).

Semi-structured evaluation with the K-SADS-PL-DSM-5 showed that the presence of current psychiatric disorder was 10% (n = 5) in the PAs group (major depressive disorder, n = 4; panic disorder, n = 1) and 2% (n = 1) in the NPAs group (generalized anxiety disorder, n = 1) ($p = 0.204$). The presence of any past psychiatric disorder diagnoses was higher in the PAs group than in the NPAs group ($p = 0.005$). In the pregnant adolescent group, 18% (n = 9) indicated past psychiatric disorders, and 4 of these individuals had comorbid mental illnesses (major depressive disorder, n = 6; bipolar disorder, n = 1; conduct disorder, n = 3; tobacco use, n = 1; substance use, n = 1; generalized anxiety disorder, n = 1). The findings are summarized in Table 2.

As shown in Table 3, the mean maternal ages ($Z = –2.762$, $p = 0.006$) and paternal ages ($Z = –2.976$, $p = 0.003$) were significantly higher in the pregnant group compared to the non-pregnant group. No significant differences were observed in familial status, education level, or familial income between the groups ($p > 0.05$).

The RCADS, MSPSS, and SPS scores for both groups are summarized in Table 4. No significant differences were observed in total RCADS ($Z = –0.914$, $p = 0.361$) or SPS scores ($Z = –0.341$, $p = 0.733$) between the groups. However, MSPSS significant other subscale scores were higher in the pregnant group compared to the non-pregnant group ($p < 0.05$).

Stepwise regression analysis identified significant predictors of suicide probability in the PAs group, accounting for 78% of the variance (adjusted $R^2 = 0.78$) (Table 5). RCADS major depressive disorder subscale ($\beta = 1.619$, $p < 0.001$), MSPSS family subscale ($\beta = –2.431$, $p = 0.009$), suicide attempt status ($\beta = 11.815$, $p = 0.005$), lack of school attendance ($\beta = 19.213$, $p = 0.010$), and illicit drug use ($\beta = 13.583$, $p = 0.026$) were significant predictors.

4. Discussion

The present study aimed to evaluate perceived social support, suicidality (suicidal behavior and suicide probability), and psychopathology among PAs by comparing them with a healthy, non-pregnant control group. Additionally, the study sought to identify risk factors for suicidality in PAs. We hypothesized that PAs would exhibit higher rates of suicidal behavior and lower levels of perceived social support compared to their non-pregnant counterparts. Our findings partially supported this hypothesis. While no significant differences were observed in perceived social support or suicidal behaviours between the groups, regression

Table 1. Socio-demographic and clinical characteristics among pregnant adolescents and non-pregnant adolescents.

	Pregnant adolescents	Non-pregnant adolescents	χ^2/Z	*p*-value
	n = 50	n = 50		
Age, median (min; max), years	17 (16; 19)	17 (16; 18)	–1.718	0.086*
Marriage status			51.515	<0.001**
Single, n (%)	16 (32.0)	50 (100.0)		
Married, n (%)	34 (68.0)	0 (0.0)		
School attendance n (%)	2 (4.0)	50 (100.0)	92.308	<0.001**
Educational level			26.582	<0.001**
Primary school	15 (30.0)	0 (0.0)		
Middle school	29 (58.0)	50 (100.0)		
High school	6 (12.0)	0 (0.0)		
Cigarette smoking, n (%)			15.946	<0.001**
Yes	16 (32.0)	1 (2.0)		
No	34 (68.0)	49 (98.0)		
Alcohol use, n (%)			0.842	0.362**
Yes	4 (8.0)	1 (2.0)		
No	46 (92.0)	49 (98.0)		
Illicit drugs use, n (%)			1.375	0.242**
Yes	3 (6.0)	0 (0.0)		
No	47 (94.0)	50 (100.0)		
History of abuse				
Physical, n (%)			12.360	<0.001**
Yes	11 (22.0)	0 (0.0)		
No	39 (78.0)	50 (100.0)		
Sexual, n (%)			4.432	0.035**
Yes	6 (12.0)	0 (0.0)		
No	44 (88.0)	50 (100.0)		
Any physical or sexual, n (%)			13.636	<0.001**
Yes	12 (24.0)	0 (0.0)		
No	38 (76.0)	50 (100.0)		
History of being involved crime, n (%)			3.368	0.066**
Yes	5 (10.0)	0 (0.0)		
No	45 (90.0)	50 (100.0)		
History of running away, n (%)			14.943	<0.001**
Yes	13 (26.0)	0 (0.0)		
No	37 (74.0)	50 (100.0)		
Suicide attempted, n (%)			3.409	0.065**
Yes	9 (18.0)	3 (6.0)		
No	41 (82.0)	47 (94.0)		
Suicide thinking, now, n (%)			0.000	1.000**
Yes	5 (10.0)	5 (10.0)		
No	45 (95.0)	45 (95.0)		
Unplanned pregnancy, n (%)	29 (58)	-		
Unwanted pregnancy n (%)	16 (32)	-		

**Chi-squared test; *Mann-Whitney U test; significance $p < 0.05$.

analysis revealed significant predictors of suicide probability among pregnant adolescents. These included depressive symptoms, history of suicide attempts, lack of school attendance, and illicit drug use as positive predictors, while family support emerged as a significant negative predictor.

Our findings showed no statistically significant difference in suicidal behavior and suicide probability between PAs and NPAs groups. However, the regression analysis revealed that a history of suicide attempts significantly increased the probability of suicide among PAs. This aligns partially with a Bangladeshi study, which found that 6.5% of PAs reported suicide attempts, a higher prevalence than their non-pregnant peers [19]. Similarly, Brazilian research identified that 20% of PAs had previous suicide attempts

Table 2. Psychiatric disorders in pregnant adolescents and non-pregnant adolescents.

K-SADS-PL-DSM-5	Pregnant adolescents	Non-pregnant adolescents	χ^2	*p*-value
Current psychiatric disorders (n, %)	5 (10%) - Major depressive disorder (n = 4) - Panic disorder (n = 1)	1 (2%) - Generalized anxiety disorder (n = 1)	1.596	0.204**
Past psychiatric disorders (n, %)	9 (18%) - Major depressive disorder (n = 6) - Bipolar disorder (n = 1) - Conduct disorder (n = 3) - Tobacco use (n = 1) - Substance use (n = 1) - Generalized anxiety disorder (n = 1)	0 (0%)	7.814	0.005**

** Chi-squared test. K-SADS-PL-DSM-5, Schedule for Affective Disorders and Schizophrenia for School-Age Children—Present and Lifetime Version, DSM-5.

Table 3. Sociodemographic and clinical characteristics of families of pregnant and non-pregnant adolescents.

	Pregnant adolescents	Non-pregnant adolescents	χ^2/Z	*p*-value
	n = 50	n = 50		
Mother age, median (min; max), years	44.5 (34; 64)	40 (33; 60)	–2.762	0.006*
Father age, median (min; max)	48 (36; 64)	44.5 (36; 62)	–2.976	0.003*
Mother educational level			0.071	0.790**
<high school, n (%)	42 (84.0)	41 (82.0)		
≥high school, n (%)	8 (16.0)	9 (18.0)		
Father educational level			0.694	0.405**
<high school, n (%)	34 (68.0)	30 (60.0)		
≥high school, n (%)	16 (32.0)	20 (40.0)		
Family status			3.748	0.154**
Together, n (%)	37 (74.0)	44 (88.0)		
Divorced, n (%)	9 (18.0)	3 (6.0)		
Parental loss (father), n (%)	4 (8.0)	3 (6.0)		
Family income			0.480	0.488**
≤Minimum wage, n (%)	11 (22.0)	14 (28.0)		
>Minimum wage, n (%)	39 (78.0)	36 (72.0)		
Family history of mental health problem, n (%)			0.102	0.749**
Yes	5 (10.0)	6 (12.0)		
No	45 (90.0)	44 (88.0)		
Family cigarette smoking, n (%)			2.458	0.112**
Yes	6 (12.0)	1 (2.0)		
No	44 (88.0)	49 (98.0)		
Family alcohol use, n (%)			0.044	0.834**
Yes	33 (66.0)	32 (64.0)		
No	17 (34.0)	18 (36.0)		
Family illicit drugs use, n (%)			0.260	0.617**
Yes	3 (6.0)	1 (2.0)		
No	47 (94.0)	49 (98.0)		

* Mann-Whitney U test; ** Chi-squared test; significance $p < 0.05$.

[23]. In Turkey, limited data exist; however, a study comparing PAs aged 13–19 years to pregnant women over 20 years old found no significant differences in suicide attempts or ideation. Despite this, the same study revealed that 10.5% of pregnant adolescents had attempted suicide and 21% reported suicidal thoughts [34]. While our findings did not show a statistically significant difference in suicide attempts between PAs and NPAs, the higher prevalence of such attempts in the pregnant group supports the need for further investigation. The lack of significant differences in our study may stem from cultural and systemic factors, such as mandatory reporting of adolescent pregnan-

Table 4. Comparison of RCADS, MSPSS, SPS between pregnant adolescent and non-pregnant adolescent.

	Pregnant adolescents	Non-pregnant adolescents	χ^2/Z	*p*-value
	n = 50	n = 50		
RCADS, total score median (min; max)	43.5 (0; 141)	49.0 (8; 141)	–0.914	0.361*
SPS, total score median (min; max)	67.5 (40; 114)	69.5 (43; 130)	–0.341	0.733*
MSPSS				
MSPSS family, n (%)			2.129	0.345**
Poor	6 (12.0)	9 (18.0)		
Moderate	11 (22.0)	6 (12.0)		
Good	33 (66.0)	35 (70.0)		
MSPSS significant other, n (%)			6.301	0.043**
Poor	8 (16.0)	19 (38.0)		
Moderate	13 (26.0)	11 (22.0)		
Good	29 (58.0)	20 (40.0)		
MSPSS friends, n (%)			2.397	0.302**
Poor	11 (22.0)	14 (28.0)		
Moderate	18 (36.0)	11 (22.0)		
Good	21 (42.0)	25 (50.0)		
MSPSS total, n (%)			1.810	0.405**
Poor	4 (8.0)	7 (14.0)		
Moderate	20 (40.0)	23 (46.0)		
Good	26 (52.0)	20 (40.0)		

*Mann-Whitney U test; **Chi-squared test; RCADS, Revised Child Anxiety and Depression scales; MSPSS, Multidimensional Scale of Perceived Social Support Scale; SPS, Suicide Probability Scale.

Table 5. Stepwise regression analysis to investigate the significant relationships between the variables of interest and the SPS in the patient group.

Dependent SPS	Adjusted R square	β	SE	*t*	*p*-value
Step 1					
RCADS major depressive disorder	0.642	1.905	0.206	9.264	<0.001
Step 2					
RCADS major depressive disorder	0.704	1.905	0.206	9.264	<0.001
MSPSS family subscale		–3.189	0.964	–3.308	0.02
Step 3					
RCADS major depressive disorder	0.732	1.768	0.203	8.695	<0.001
MSPSS family subscale		–2.479	0.961	–2.580	0.013
Suicide attempt		10.626	4.333	2.452	0.018
Step 4					
RCADS major depressive disorder	0.759	1.683	0.196	8.952	<0.001
MSPSS family subscale		–2.731	0.917	–2.978	0.005
Suicide attempt status		11.709	4.134	2.832	0.007
School attedence status		18.333	7.417	2.472	0.017
Step 5					
RCADS major depressive disorder	0.780	1.619	0.189	8.952	<0.001
MSPSS family Subscale		–2.431	0.886	–2.744	0.009
Suicide attempt status		11.815	3.949	2.992	0.005
School attendance status		19.213	7.095	2.708	0.010
Illicit drug use		13.583	5.891	2.306	0.026

RCADS, Revised Child Anxiety and Depression scales; MSPSS, Multidimensional Scale of Perceived Social Support Scale; SPS, Suicide Probability Scale; β, unstandardized beta coefficients; SE, unstandardized coefficients standard error; *t*, *t*-statistic.

cies in Turkey, which could discourage adolescents from seeking help. Additionally, the small sample size in our study may have limited statistical power. These findings highlight the importance of considering sociocultural and

systemic factors when addressing suicidal behaviors among pregnant adolescents in Turkey. Culturally sensitive mental health interventions are crucial for addressing these unique challenges. Healthcare providers may consider integrating routine mental health screenings into prenatal care, while policymakers could explore strategies to reduce systemic barriers, such as the fear of mandatory reporting.

Our study revealed moderate to high levels of perceived social support among PAs, with significantly higher scores on the "significant other" subscale in this group. This finding aligns with Freitas *et al*. [23], who demonstrated that partner cohabitation plays a critical role in bolstering social support among PAs. Similarly, a Brazilian study revealed that PAs who did not live with their partners reported significantly lower levels of emotional and relational support [22]. Furthermore, family support emerged as a significant negative predictor of suicide probability in our study. This finding resonates with broader evidence linking family support to reduced risks of depression and suicidality in adolescents [35,36]. The elevated social support observed in our pregnant adolescent group likely reflects the high prevalence of marriage, which often provides emotional and financial stability. Early marriage, culturally accepted and even encouraged in some communities in Turkey, may further explain these findings [37]. While these cultural norms appear to enhance social support for pregnant adolescents, they may simultaneously mask underlying vulnerabilities, such as reduced autonomy or increased dependence on familial and spousal support. Our findings align with international evidence regarding the protective role of family and partner support in adolescent mental health but highlight unique sociocultural factors that shape these dynamics in the Turkish context. For instance, the intersection of early marriage, family cohesion, and societal expectations may explain why social support remains elevated in our PAs sample compared to findings from other regions.

Child maltreatment, including both physical and sexual abuse, has been consistently associated with adolescent pregnancy. A meta-analysis by Madigan *et al*. [38] demonstrated that both forms of abuse are significant risk factors for adolescent pregnancy. Our study supports this association, revealing that 24% of pregnant adolescents reported experiencing either physical or sexual abuse, compared to none in the non-pregnant group. These findings suggest that addressing child maltreatment could play a critical role in reducing adolescent pregnancies. Moreover, the psychological impacts of abuse, such as depressive symptoms, may further predispose adolescents to risky sexual behaviors and early pregnancy.

Our study revealed that the history of running away was significantly higher among PAs compared to their non-pregnant counterparts. These findings are consistent with prior research linking risky behaviors and unstable family dynamics to early pregnancies. For instance, studies have highlighted that adolescents with histories of running away or engaging in delinquent behavior often face greater challenges in establishing stable social and family relationships, which can increase their vulnerability to early pregnancies and related complications [39–41].

In our study, past psychiatric diagnoses were significantly more prevalent among PAs, although no differences were observed in current psychiatric disorders between the groups. This finding aligns with Abdul Rahim *et al*. (2024) [42], who emphasized the heightened vulnerability of PAs to mental health challenges, particularly depression. Moreover, our study emerged as a significant determinant of suicide probability, highlighting the critical role of depressive symptoms in this population. Targeted mental health interventions addressing depressive symptoms may reduce suicidality and improve outcomes for PAs.

Tobacco use was significantly higher in the PAs group compared to the non-pregnant group in our study. This finding aligns with previous research showing higher smoking rates among PAs and its association with adverse pregnancy outcomes, such as low birth weight infants and stillbirths [43]. Addressing smoking behavior in this population is critical for improving maternal and neonatal outcomes.

Similarly, illicit substance use emerged as a significant predictor of suicide probability among PAs in our study. This finding is consistent with evidence suggesting that substance use not only exacerbates mental health challenges but also increases the likelihood of self-harming behaviors [44]. Interventions targeting substance use in PAs could mitigate these risks while improving overall mental health and pregnancy outcomes.

Furthermore, our findings underscore the critical role of education, as school dropout was significantly associated with suicide probability in PAs. A previous study has established a bidirectional relationship between adolescent pregnancy and school dropout, with each serving as both a cause and a consequence of the other [45]. Recent evidence highlights the broader implications of school dropout, emphasizing its impact not only on mental health but also on long-term social and economic stability [46]. This underscores the importance of addressing structural and social barriers that impede PAs from continuing their education. Ensuring access to educational opportunities can mitigate mental health risks, enhance social mobility, and contribute to long-term socioeconomic stability for this vulnerable population.

The present study's findings should be interpreted within the context of its limitations. Its case-control design precludes the establishment of causal relationships among suicidality, social support and adolescent pregnancies, and these limitations of this study should be considered when interpreting its findings. The study's case-control design does not allow for the establishment of causal relationships between mental health, social support, and suicidality in pregnant adolescents. Self-reported measures for sensitive topics may introduce recall and social desirability biases. The

study's relatively small sample size and focus on a specific region, Istanbul, may limit the generalizability of the results to other cultural contexts. Additionally, self-reported substance use and abuse history may be subject to recall bias, and the lack of comprehensive clinical assessments for mental disorders could reduce diagnostic precision. Furthermore, unexplored factors such as cultural norms and religious beliefs may shape the complex associations studied. In conclusion, while this study provides insight into the relationships between mental health, social support, and suicidality, it is important to approach the findings with caution and to conduct further research using larger and more diverse samples with more robust designs.

5. Conclusions

This study highlights the intricate relationship between mental health, social support, and suicidality among pregnant adolescents. Depressive symptoms, school dropout, substance use, and a history of suicide attempts emerged as significant risk factors for suicidality, whereas family support proved to be a critical protective factor. These findings underscore the urgent need for targeted mental health interventions that incorporate family-focused strategies and school-based programs to reduce dropout rates and enhance emotional resilience. Furthermore, culturally sensitive, community-based initiatives leveraging familial networks, along with public awareness campaigns addressing the risks of early marriage and adolescent pregnancy, are essential for fostering a supportive societal environment. Future research should employ longitudinal designs to further explore these dynamics and develop comprehensive, context-specific strategies to address the unique challenges faced by pregnant adolescents.

Availability of Data and Materials

The datasets generated and analyzed during the current study are available from the corresponding author upon reasonable request.

Author Contributions

YC, BD, and MTK designed the research study. YC administered the project, performed data collection and data analysis, wrote the original draft, and contributed to reviewing and editing the manuscript. YM and MTK contributed to data analysis, writing, reviewing, and editing the manuscript. MC, TS, and AH contributed to data collection, provided resources, and secured funding. BD and MTK supervised the project. All authors contributed to editorial changes in the manuscript. All authors read and approved the final manuscript. All authors have participated sufficiently in the work and agreed to be accountable for all aspects of the study.

Ethics Approval and Consent to Participate

The study was conducted following the Declaration of Helsinki and was approved by the Ethics Committee of Istanbul University-Cerrahpasa Cerrahpasa Faculty of Medicine (Decision Number 3972). Informed consent to participate in the study was obtained in writing from all participants and their legal guardians.

Acknowledgment

Not applicable.

Funding

This research received no external funding.

Conflict of Interest

The authors declare no conflict of interest.

Declaration of AI and AI-assisted Technologies in the Writing Process

During the preparation of this manuscript, the author(s) used ChatGPT to refine the language. Following the use of this tool/service, the author(s) carefully reviewed and edited the content as necessary and take full responsibility for the accuracy and integrity of the final manuscript.

References

[1] World Health Organization. Adolescent Pregnancy. World Health Organization. 2004.

[2] Darroch JE, Woog V, Bankole A, Ashford LS. Adding it up: costs and benefits of meeting the contraceptive needs of adolescents. Guttmacher Institute, New York. 2016.

[3] World Health Organization. Preventing Early Pregnancy and Poor Reproductive Outcomes among Adolescents in Developing Countries: What the Evidence Says. World Health Organization. 2012.

[4] Turkish Statistical Institute. Birth Statistics 2019. 2020. Available at: https://data.tuik.gov.tr/Bulten/Index?p=Birth-Statistics-2019-33706 (Accessed: 19 January 2025).

[5] World Health Organization. Adolescent pregnancy. 2024. Available at: https://www.who.int/news-room/fact-sheets/detail/adolescent-pregnancy (Accessed: 30 December 2024).

[6] Amoadu M, Ansah EW, Assopiah P, Acquah P, Ansah JE, Berchie E, *et al*. Socio-cultural factors influencing adolescent pregnancy in Ghana: a scoping review. BMC Pregnancy and Childbirth. 2022; 22: 834. https://doi.org/10.1186/s12884-022-05172-2.

[7] Mihciokur S, Akin A. Cocuk Yasta, Zorla Evlilikler ve Ergen Gebelikleri. Turkiye Klinikleri Public Health-Special Topic. 2015; 1: 22–31.

[8] Domenico DM, Jones KH. Adolescent pregnancy in America: Causes and responses. Journal for Vocational Special Needs Education. 2007; 30: 4–12.

[9] Aktepe E, Atay İM. Çocuk evlilikleri ve psikososyal sonuçları. Current Approaches in Psychiatry/Psikiyatride Guncel Yaklasimlar. 2017; 9: 410–420. (In Turkish) https://doi.org/10.18863/pgy.310791.

[10] Data Warehouse - UNICEF DATA. 2022. Available at: https://archive.is/epJPp (Accessed: 20 December 2024).

[11] Orçan M, Kar M. Türkiye'de erken yaşta yapılan evlilikler ve

risk algısı: Bismil örneği. Sosyal Politika Çalışmaları Dergisi. 2008; 14: 97–112. (In Turkish)
[12] Fraser AM, Brockert JE, Ward RH. Association of young maternal age with adverse reproductive outcomes. The New England Journal of Medicine. 1995; 332: 1113–1117. https://doi.org/10.1056/NEJM199504273321701.
[13] Carpenter SC, Clyman RB, Davidson AJ, Steiner JF. The association of foster care or kinship care with adolescent sexual behavior and first pregnancy. Pediatrics. 2001; 108: E46. https://doi.org/10.1542/peds.108.3.e46.
[14] Herrenkohl EC, Herrenkohl RC, Egolf BP, Russo MJ. The relationship between early maltreatment and teenage parenthood. Journal of Adolescence. 1998; 21: 291–303. https://doi.org/10.1006/jado.1998.0154.
[15] Quinlivan JA, Tan LH, Steele A, Black K. Impact of demographic factors, early family relationships and depressive symptomatology in teenage pregnancy. The Australian and New Zealand Journal of Psychiatry. 2004; 38: 197–203. https://doi.org/10.1080/j.1440-1614.2004.01336.x.
[16] Woodward L, Fergusson DM, Horwood LJ. Risk factors and life processes associated with teenage pregnancy: Results of a prospective study from birth to 20 years. Journal of Marriage and Family. 2001; 63: 1170–1184. https://doi.org/10.1111/j.1741-3737.2001.01170.x.
[17] Bachmann S. Epidemiology of Suicide and the Psychiatric Perspective. International Journal of Environmental Research and Public Health. 2018; 15: 1425. https://doi.org/10.3390/ijerph15071425.
[18] Mittendorfer-Rutz E, Rasmussen F, Wasserman D. Restricted fetal growth and adverse maternal psychosocial and socioeconomic conditions as risk factors for suicidal behaviour of offspring: a cohort study. Lancet. 2004; 364: 1135–1140. https://doi.org/10.1016/S0140-6736(04)17099-2.
[19] Li J, Imam SZ, Jing Z, Wang Y, Zhou C. Suicide attempt and its associated factors amongst women who were pregnant as adolescents in Bangladesh: a cross-sectional study. Reproductive Health. 2021; 18: 71. https://doi.org/10.1186/s12978-021-01127-6.
[20] Musyimi CW, Mutiso VN, Nyamai DN, Ebuenyi I, Ndetei DM. Suicidal behavior risks during adolescent pregnancy in a low-resource setting: A qualitative study. PloS One. 2020; 15: e0236269. https://doi.org/10.1371/journal.pone.0236269.
[21] Sezgin AU, Punamäki RL. Impacts of early marriage and adolescent pregnancy on mental and somatic health: the role of partner violence. Archives of Women's Mental Health. 2020; 23: 155–166. https://doi.org/10.1007/s00737-019-00960-w.
[22] Peter PJ, de Mola CL, de Matos MB, Coelho FM, Pinheiro KA, da Silva RA, *et al*. Association between perceived social support and anxiety in pregnant adolescents. Revista Brasileira De Psiquiatria. 2017; 39: 21–27. https://doi.org/10.1590/1516-4446-2015-1806.
[23] Freitas GVS, Cais CFS, Stefanello S, Botega NJ. Psychosocial conditions and suicidal behavior in pregnant teenagers: a case-control study in Brazil. European Child & Adolescent Psychiatry. 2008; 17: 336–342. https://doi.org/10.1007/s00787-007-0668-2.
[24] McGillivray L, Rheinberger D, Wang J, Burnett A, Torok M. Non-disclosing youth: a cross sectional study to understand why young people do not disclose suicidal thoughts to their mental health professional. BMC Psychiatry. 2022; 22: 3. https://doi.org/10.1186/s12888-021-03636-x.
[25] Zimet GD, Dahlem NW, Zimet SG, Farley GK. The Multidimensional Scale of Perceived Social Support. Journal of Personality Assessment. 1988; 52: 30–41. https://doi.org/10.1207/s15327752jpa5201_2.
[26] Çakır Y, Palabıyıkoğlu R. Gençlerde sosyal destek-çok boyutlu algılanan sosyal destek ölçeğinin güvenirlik ve geçerlik çalışması. Kriz Dergisi. 1997; 5: 15–24. (In Turkish)
[27] Cull JG, Gill WS. Suicide probability scale. Journal of Consulting and Clinical Psychology. 1982. https://doi.org/10.1037/t01198-000.
[28] Atlı Z, Eskin M, Dereboy Ç. The validity and the reliliability of Suicide Probability Scale (SPS) in clinical sample. Journal of Clinical Psychiatry. 2009; 12: 111–124.
[29] Chorpita BF, Moffitt CE, Gray J. Psychometric properties of the Revised Child Anxiety and Depression Scale in a clinical sample. Behaviour Research and Therapy. 2005; 43: 309–322. https://doi.org/10.1016/j.brat.2004.02.004.
[30] Gormez V, Kilincaslan A, Ebesutani C, Orengul AC, Kaya I, Ceri V, *et al*. Psychometric Properties of the Parent Version of the Revised Child Anxiety and Depression Scale in a Clinical Sample of Turkish Children and Adolescents. Child Psychiatry and Human Development. 2017; 48: 922–933. https://doi.org/10.1007/s10578-017-0716-1.
[31] Kaufman J, Birmaher B, Axelson D, Perepletchikova F, Brent D, Ryan N. K-SADS-PL DSM-5. Pittsburgh: Western Psychiatric Institute and Clinic. 2016.
[32] Ünal F, Öktem F, Çetin Çuhadaroğlu F, Çengel Kültür SE, Akdemir D, Foto Özdemir D, *et al*. Reliability and Validity of the Schedule for Affective Disorders and Schizophrenia for School-Age Children-Present and Lifetime Version, DSM-5 November 2016-Turkish Adaptation (K-SADS-PL-DSM-5-T). Turkish Journal of Psychiatry. 2019; 30: 42–50. https://doi.org/10.5080/u23408.
[33] Tabachnick BG, Fidell LS, Ullman JB. Using Multivariate Statistics. Pearson: Boston, MA. 2013.
[34] Kara T, Doğan K, Alyanak B, Akaltun İ. An evaluation of sociodemographic characteristics and pregnancy-related psychological problems in pregnant adolescents. Ankara Medical Journal. 2017; 17: 151–159. https://doi.org/10.17098/amj.340100.
[35] Scardera S, Perret LC, Ouellet-Morin I, Gariépy G, Juster RP, Boivin M, *et al*. Association of Social Support During Adolescence With Depression, Anxiety, and Suicidal Ideation in Young Adults. JAMA Network Open. 2020; 3: e2027491. https://doi.org/10.1001/jamanetworkopen.2020.27491.
[36] Cosquer M, Jousselme C, Falissard B, Lefebvre A. The experience of adolescence process among French teenager pregnancies: a mixed-methods study. International Journal of Qualitative Studies on Health and Well-being. 2024; 19: 2386715. https://doi.org/10.1080/17482631.2024.2386715.
[37] UNICEF. Analysis of the Situation of Children and Young People in Turkey 2011. 2011. Available at: https://www.unicef.org/turkiye/media/5246/file/Analysis%20of%20the%20Situation%20of%20Children%20and%20Young%20People%20in%20Turkey%202011.pdf (Accessed: 14 March 2023).
[38] Madigan S, Wade M, Tarabulsy G, Jenkins JM, Shouldice M. Association between abuse history and adolescent pregnancy: a meta-analysis. The Journal of Adolescent Health: Official Publication of the Society for Adolescent Medicine. 2014; 55: 151–159. https://doi.org/10.1016/j.jadohealth.2014.05.002.
[39] Dahl RE, Gunnar MR. Heightened stress responsiveness and emotional reactivity during pubertal maturation: implications for psychopathology. Development and Psychopathology. 2009; 21: 1–6. https://doi.org/10.1017/S0954579409000017.
[40] Steinberg L, Albert D, Cauffman E, Banich M, Graham S, Woolard J. Age differences in sensation seeking and impulsivity as indexed by behavior and self-report: evidence for a dual systems model. Developmental Psychology. 2008; 44: 1764–1778. https://doi.org/10.1037/a0012955.
[41] Garwood SK, Gerassi L, Jonson-Reid M, Plax K, Drake B. More Than Poverty: The Effect of Child Abuse and Neglect on Teen

Pregnancy Risk. The Journal of Adolescent Health. 2015; 57: 164–168. https://doi.org/10.1016/j.jadohealth.2015.05.004.

[42] Abdul Rahim K, Egglestone NJ, Tsagareli IG, Usmani W, Meherali S, Lassi ZS. Mental health outcomes beyond the postpartum period among adolescent mothers: a systematic review and meta-analysis. Health Psychology and Behavioral Medicine. 2024; 12: 2305741. https://doi.org/10.1080/21642850.2024.2305741.

[43] Bottorff JL, Poole N, Kelly MT, Greaves L, Marcellus L, Jung M. Tobacco and alcohol use in the context of adolescent pregnancy and postpartum: a scoping review of the literature. Health & Social Care in the Community. 2014; 22: 561–574. https://doi.org/10.1111/hsc.12091.

[44] Mars B, Heron J, Klonsky ED, Moran P, O'Connor RC, Tilling K, *et al*. Predictors of future suicide attempt among adolescents with suicidal thoughts or non-suicidal self-harm: a population-based birth cohort study. The Lancet. Psychiatry. 2019; 6: 327–337. https://doi.org/10.1016/S2215-0366(19)30030-6.

[45] Kassa GM, Arowojolu AO, Odukogbe AA, Yalew AW. Prevalence and determinants of adolescent pregnancy in Africa: a systematic review and Meta-analysis. Reproductive Health. 2018; 15: 195. https://doi.org/10.1186/s12978-018-0640-2.

[46] Naranjo JA, Arevalo DE, Naranjo-Vinueza JD, Vacas BA, Salcedo M, Borja SM, *et al*. Assessing Biomedical and Psychosocial Factors in a Cross-Sectional Study of School Dropouts Among Pregnant Adolescents and Young Mothers in Quito, Ecuador. Cureus. 2024; 16: e55958. https://doi.org/10.7759/cureus.55958.