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Examining the Links between Perceived Impact of Pregnancy, Depressive Symptoms, and Quality of Life during Adolescent Pregnancy: The Buffering Role of Social Support

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Abstract

Objectives: The aims of the current study were to examine the indirect effect of the perceived impact of pregnancy on quality of life (QoL) through the severity of depressive symptoms among a sample of pregnant adolescents, and to explore whether adolescents' satisfaction with support from their mothers (SM) or partners (SP) was a buffer of this effect. **Methods:** Demographic and pregnancy-related data were collected for 395 pregnant adolescents age 12-19 and were controlled for testing the proposed indirect effect. SM and SP were tested as moderators of the links between perceived impact of pregnancy and depressive symptoms and between depressive symptoms and QoL. A computational tool for path analysis-based moderation and mediation analysis as well as their combination was used to test indirect and interaction effects (PROCESS). **Results:** A significant indirect effect of the perceived impact of pregnancy on QoL through the severity of depressive symptoms was found (0.51, CI = 0.29/0.78). There was no significant direct effect of the perceived impact of pregnancy on QoL after controlling for the severity of depressive symptoms. SM and SP buffered the indirect effect by weakening the association between a negative perception of the impact of pregnancy and higher severity of depressive symptoms. **Conclusions:** Identifying adolescents with a negative perception of the impact of pregnancy, improving the quality of their relations with their mothers and partners, and promoting satisfactory support from these figures may be extremely important to prevent and treat depressive symptoms and, in so doing, improve adolescents' QoL during pregnancy.

Keywords: adolescent pregnancy, depressive symptoms, perceived impact of pregnancy, quality of life, social support.

Introduction

Traditionally, pregnant adolescents have been considered a risk group for depressive symptoms (1) and poor quality of life (QoL; 2). However, recent research has indicated that adolescents' adjustment is largely dependent on the socioeconomic (3,4) and cultural contexts in which pregnancy occurs (5-7), the support available to pregnant adolescents (8-11), and pregnant adolescents' perception of the impact that the pregnancy has on their lives (12,13). While socioeconomic, cultural, and relational variables have been analyzed in several studies as risk and protective factors for maladjustment during adolescent pregnancy, less is known about the influence of adolescents' perceptions about the impact that pregnancy has on their lives (14). Further, the association between depressive symptoms and poor QoL, which research has consistently demonstrated among pregnant adults (15-17), remains unexplored among pregnant adolescents. As such, the first aim of the current study was to analyze the links between perceived impact of pregnancy, depressive symptoms, and QoL in a sample of pregnant adolescents. As support from adolescent's mother and partner have been suggested as some of the most important protective factors against maladjustment during adolescent pregnancy (7,18-21), we also aimed to explore whether these factors were buffers of such links.

Adolescents' QoL during Pregnancy

The concept of QoL refers to the person's perceptions of well-being in various life domains, including the physical, social, and psychological domains (22), and has become an increasingly valued outcome in evaluations of adults' global adjustment to pregnancy and transition to motherhood (15-17,23,24).

However, studies about QoL among pregnant adolescents are scarce and contradictory. While some authors found a negative influence of pregnancy on adolescents' QoL (2), other recent findings have shown no significant effects (25,26) or have shown positive effects, with pregnant adolescents showing higher QoL compared to peers with no pregnancy history (27).

Most studies have focused on life circumstances as predictors of QoL and other similar concepts (e.g., life satisfaction) among pregnant adolescents, identifying several demographic (e.g., socioeconomic status, educational level; 20), pregnancy-related (e.g., pregnancy intention, gestational age; 28,29), and relational variables (e.g., support from mother and partner; 18,20) as important predictors of QoL. However, given that QoL comprises a subjective evaluation of several life domains (22), it is likely to be both cognitively determined and emotionally mediated (30). As such, it seems reasonable to hypothesize that a better understanding of the influence of pregnancy on adolescents' QoL could be gained by examining adolescents' cognitive evaluations of the impact that pregnancy has on their lives and the emotional state that could result from such evaluations.

The Role of the Perceived Impact of Pregnancy in Depressive Symptoms and QoL

According to several authors, a woman's view of her situation is a potential cognitive predictor of maladjustment during pregnancy, particularly when pregnancy occurs during adolescence (12,13). In fact, compared to adults, adolescents are expected to have a more negative perception of the impact of pregnancy in several life domains (e.g., body image, family and romantic relationships, school/work projects, instrumental/emotional autonomy, leisure opportunities), due to the additional developmental challenges involved in adolescents' transition to motherhood (5,31,32). Consequently, adolescents often feel often ill prepared, perceive few resources, display stress, and are at risk for emotional and behavioral problems (33-35).

However, research has shown that some adolescents have positive views of motherhood, positive perceptions of the impact of pregnancy on their lives, and optimistic beliefs about their future (13,36-38). These adolescents tend to be less depressed than those who have a more negative perception of the impact of pregnancy, even after controlling for educational level, socioeconomic status (12), age (39), and place of residence (40). Although it is probable that these adolescents also evaluate their QoL differently compared to those who perceive high costs of pregnancy in several life domains, to our knowledge, there are no studies regarding this topic.

The Association between Depressive Symptoms and QoL

The negative impact of depressive symptoms during pregnancy is well documented in adults and adolescents. In both populations, higher severity of depressive symptoms during pregnancy has been linked to worse obstetric outcomes, and higher risk of depression and poor mother-infant interactions in the postpartum period (6,17,41).

In several recent studies, depressive symptoms have also been associated with poor functioning and lower health-related QoL among pregnant adults, even when controlling for age, race/ethnicity, educational level (17), marital status, gestational age (16,17), pregnancy intention (16), number of previous pregnancies (15,42), obstetric complications, and social support (15,17). Among pregnant adolescents, the prevalence of clinically relevant depressive symptoms has been estimated to be almost twice as high compared to pregnant adults (1,43). Several Portuguese studies have also shown significantly higher severity of depressive symptoms among pregnant adolescents than among pregnant adults (41,44). However, to our knowledge, there are no studies regarding the association between depressive symptoms and QoL among pregnant adolescents.

The Buffering Role of Social Support

The stress-buffering theory asserts that social support may protect individuals facing stressful events from experiencing negative affect, such as depression and anxiety (45-47). However, evidence for the buffering role of social support has been found only when support measures assess interpersonal resources that are responsive to the needs

elicited by stressful events; furthermore, only the support that is perceived as adequate would be expected to operate as a buffer (45-49).

Accordingly, the satisfaction with social support has consistently emerged as one of the most important protective factors for both depressive symptoms (7,9,49) and poor QoL during adolescent pregnancy (18,20). Although several sources of support have been linked to adolescents' adjustment, adolescents' mothers, followed by adolescents' partners, have been identified as those who exert the most influence in adolescents' adjustment during transition to motherhood (7,9,18-21,27).

However, none of the previous studies has taken into account the adolescents' perceptions about the impact of pregnancy or tested the protective role of social support during adolescent pregnancy using interaction effects or more than one adjustment outcome. According to the stress-buffering theory, social support may intervene between the experience of stress and the onset of the pathological outcome, namely by reducing the reactivity to the perceived stress (45). As such, knowing the influence that social support has on the association between the perceived impact of pregnancy and the severity of depressive symptoms during adolescent pregnancy may be particularly useful to clarify whether the protective role of social support may be due to the reduction of the adolescents' emotional reactivity to the perceived stress event. Given research indicating that social support is an important protective factor for health-related QoL among depressed pregnant adults (17), knowing the influence that social support has on the association between the severity of depressive symptoms and the adolescents' QoL during pregnancy may also be important.

Study Overview

Although a better understanding of adolescents' QoL during pregnancy could be achieved by examining the role of their subjective evaluations of the impact that pregnancy has on their lives and their emotional adjustment during pregnancy, to our knowledge, there are no studies in this field. However, literature suggests that adolescents' subjective evaluations of the impact of pregnancy may be associated with the severity of depressive symptoms during pregnancy (12,39); in turn, depressive symptoms may be used as a basis for making judgments of how happy and satisfied women are with their lives (22,30,50). Previous research also suggests that the satisfaction with social support may intervene on the association between the perceived stress event and the adolescents' emotional reactivity (9,7,49), and between women's emotional adjustment during pregnancy and their QoL (17).

As depicted in Figure 1, these associations suggest a moderated mediational model in which: 1) the perceived impact of pregnancy is linked to the severity of depressive symptoms, which in turn is linked to QoL, and 2) the satisfaction with social support influences the links between the perceived impact of pregnancy and the adjustment outcomes. As such, the first aim of the current study was to explore the effect of adolescents' perception of the impact of pregnancy on their QoL during pregnancy and examine whether this effect could be identified through the severity of

depressive symptoms. It was hypothesized that a negative perception of the impact of pregnancy would decrease QoL by increasing the severity of depressive symptoms. The second aim of the current study was to explore the buffering role of social support on the links between the perceived impact of pregnancy, the severity of depressive symptoms, and QoL. It was hypothesized that higher levels of satisfaction with social support would buffer the indirect effect of the perceived impact of pregnancy on QoL through the severity of depressive symptoms, by weakening both the negative association between perceived impact of pregnancy and severity of depressive symptoms, and the negative association between severity of depressive symptoms and QoL. As it is important to consider each source of support separately when studying its relation with adolescents' well-being during pregnancy (51), we analyzed the buffering role of support from the adolescent's mother and partner independently.

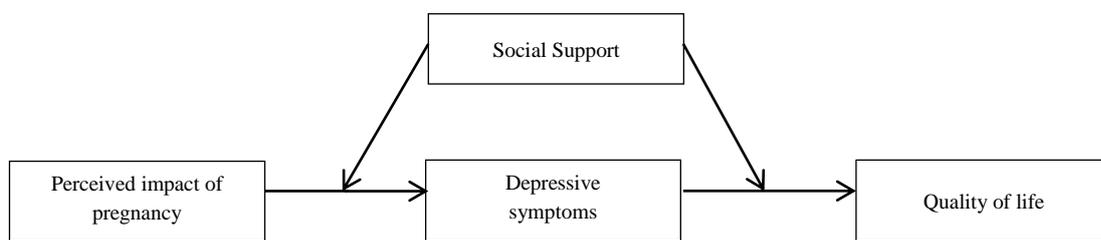


Figure 1. Proposed conceptual scheme of the association between perceived impact of pregnancy and quality of life: moderated mediation model.

Method

Procedures and Participants

The present cross-sectional study is part of a wider project, entitled “Adolescent pregnancy in Portugal: Etiology, reproductive decision, and adjustment”. This project was approved and carried out in compliance with ethical standards from all of the public health services research Ethics Committees where the adolescents were recruited. The sample of the current study was collected between May 2008 and May 2012 at 42 Portuguese public health services. The eligibility criteria for inclusion were as follows: (1) being between 10 and 19 years old, in accordance with the World Health Organization's definition of adolescence (52); (2) being pregnant; and (3) having the ability to understand and answer the interview questions and the self-report questionnaires (i.e., no cognitive impairment/disability). Using the non-probabilistic convenience sampling, 406 pregnant adolescents were recruited. Participants were informed about the study goals and provided written informed consent. When participants were under 18 years old, the consent form was also signed by their legal guardian. Then, adolescents answered a semi-structured interview and completed several self-report measures, in the order described below and in the presence of a psychologist. Participants with missing data in study variables were excluded ($n = 11$; 2.71%). The final sample was representative of the Portuguese population of pregnant adolescents for a margin error of 5% and a confidence level of 95% (53), and consisted of 395 females aged

12-19, with a mean gestational age of 24 weeks (range: 6-40). Demographic and pregnancy-related data for the sample are presented in Table 1.

Table 1

Demographic and Pregnancy-related Characteristics of the Study Sample

	<i>n</i> (%)	Mean (<i>SD</i>)	Observed range
Age		16.42 (1.27)	12-19
Ethnicity:			
European ethnic origin	355 (89.9)		
Non-European ethnic origin	40 (10.1)		
Marital status:			
Single	227 (57.5)		
Married/living with a partner	168 (42.5)		
Education (years in school)		7.81 (2.19)	0-12
Socioeconomic status:			
Low	364 (92.2)		
Medium/High	31 (7.8)		
Place of residence:			
Urban	266 (67.3)		
Rural/Suburban	129 (32.7)		
Gestational age (weeks)		24.13 (9.30)	6-40
Number of previous pregnancies		0.13 (0.36)	0-2
Obstetric complications:			
No	361 (91.4)		
Yes	34 (8.6)		
Pregnancy intention:			
No	311 (78.7)		
Yes	84 (21.3)		

Measures

Demographic data (age, ethnicity, marital status, socioeconomic status, place of residence, educational level), pregnancy-related variables (gestational age, obstetric complications, number of previous pregnancies, pregnancy intention), the perceived impact of pregnancy, and the satisfaction with social support were assessed through a semi-structured interview developed by the researchers. All the interview questions were selected from the clinical assessment interview for pregnant adolescent patients of the Psychological Intervention Unit of the Maternity Doctor Daniel de Matos, University of Coimbra Hospitals (54). This clinical assessment interview was developed based on exhaustive international literature reviews and Portuguese studies focusing the contexts in which adolescent pregnancy usually occurs and the impact that pregnancy has on adolescents' lives and relationships (e.g., 31,55). The final version (54) resulted from a pilot study with 52 pregnant adolescents recruited at the Maternity Doctor Daniel de Matos (56). Since then, the interview has been used in several studies using samples of Portuguese pregnant adolescents

(18,20,27,57-59). Questions assessing the perceived impact of pregnancy and the satisfaction with social support (described next) were shown to be easy to understand and quick to answer, and all the items have shown good variability among different samples of Portuguese pregnant adolescents (18,20,57).

The perceived impact of pregnancy on several life domains was assessed by nine items. Participants answered the questions “*To what extent do you feel that pregnancy has changed your life regarding your: 1) body image, 2) personal care, 3) emotional state, 4) school or work projects, 5) relationship with your boyfriend or husband, 6) relationship with your family, 7) relationship with your friends, 8) time for yourself, and 9) money.*” The questions were answered in a 3-point scale ranging from 0 (*Pregnancy has changed this for the worse*) to 2 (*Pregnancy has changed this for the better*). A global score was obtained from the sum of all items with scores ranging from 0 to 18. Higher scores indicate a more positive perception of the impact of pregnancy. In the present sample, the Cronbach’s alpha for all items was .66.

Satisfaction with social support from the mother and from the partner was assessed with the questions, 1) “*To what extent do you feel satisfied with the support you get from your mother?*”, and 2) “*To what extent do you feel satisfied with the support you get from your partner?*”. Answers were based on a 6-point scale ranging from 0 (*Not at all satisfied*) to 5 (*Extremely satisfied*).

Depressive symptoms were assessed with the Portuguese version of the Edinburgh Postnatal Depression Scale (EPDS; 60; Portuguese version: 61,62). This measure includes 10 items assessing the frequency of depressive symptoms within the previous seven days, with items answered on a 4-point scale and response options ranging from 0 (*No, never*) to 3 (*Yes, almost always*). A global score is obtained from the sum of all items. EPDS has primarily been used for the screening of depressive symptoms in the postnatal period; however, because it contains no items specifically related to motherhood, it has also been used during the prenatal period (16,63), including in Portugal (18,27,41,44). The Portuguese version of the EPDS showed good internal consistency (Cronbach’s alpha = .85) and test-retest reliability ($r = .75$). A score higher than 9 indicates the possible presence of a major depressive episode. The correlation coefficient ($r = .86$) between the EPDS total score and the severity of depression evaluated by a clinical interview (according to the Research Diagnostic Criteria) indicated that the higher the EPDS total score, the higher the severity of the depressive symptoms (62). Similar results were found in validation studies using the EPDS total score during the prenatal period (64,65). As we were interested in the role of the severity of depressive symptoms on the association between the perceived impact of pregnancy and QoL, in the present study we used the EPDS total score. The scale Cronbach’s alpha was .82.

QoL was assessed with the Portuguese version of EUROHIS-QOL-8 (22; Portuguese version: 66). Derived from the WHOQOL-100 and the WHOQOL-BREF, the EUROHIS-QOL-8 is an 8-item measure of QoL answered on a

5-point scale ranging from 1 (*Not at all*) to 5 (*Completely*). The psychological, physical, social and environmental domains are each represented by two items. The overall QoL score is obtained from the sum of all items. Higher scores indicate a better QoL. In the present sample, the Cronbach's alpha was .79.

Data Analyses

All data analyses were carried out using the Statistical Package for the Social Sciences (SPSS), Version 17.0. Missing data that were random and low level (<5%) were handled by case mean substitution (67). Descriptive statistics (means, standard deviations and frequencies) were used for characterization purposes. Pearson's correlations were performed to test associations between study variables and QoL. Demographic and pregnancy-related variables that showed significant associations with QoL or the severity of depressive symptoms were included as covariates in further analyses. A computational tool for path analysis-based moderation and mediation analysis as well as their combination was used to test the proposed indirect and interaction effects (PROCESS). This computational tool was designed by Hayes (68) and, in addition to estimating the coefficients of the model using OLS regression, it generates direct and indirect effects in mediation models and conditional indirect effects in moderated mediation models. Specifically, the Hayes' SPSS Macro *PROCESS Model 4* was used to test the indirect effect of the perceived impact of pregnancy on QoL through the severity of depressive symptoms (mediation model). To test the buffering role of support from the mother and support from the partner on the indirect effect of the perceived impact of pregnancy on QoL through the severity of depressive symptoms, we used the SPSS Macro *PROCESS Model 58*. This SPSS Macro enabled us to test social support as a moderator of the link between the perceived impact of pregnancy and the severity of depressive symptoms and of the link between the severity of depressive symptoms and QoL (68). Support from the mother was tested as a moderator while controlling for support from the partner (moderated mediation model: mother); similarly, support from the partner was tested as a moderator while controlling for support from the mother (moderated mediation model: partner). To test the interactions, variables were centered (69). Bootstrapping ($N = 5000$ samples) with bias-corrected and accelerated confidence intervals for conditional and unconditional indirect effects was used. When the bootstrapped 95% confidence interval (CI) of the point estimate does not include zero, the effect is significant (68).

Results

Testing associations between study variables and QoL

Descriptive statistics and Pearson's correlations for the study variables are presented in Table 2. Pearson's correlations showed that QoL was negatively associated with depressive symptoms, non-European ethnic origin, obstetric complications, and pregnancy intention, and positively associated with support from the partner, support from

the mother and the perceived impact of pregnancy (Table 2). Depressive symptoms were negatively associated with support from the partner, support from the mother, and the perceived impact of pregnancy, and positively associated with obstetric complications. Age, marital status, education, socioeconomic status, place of residence, gestational age, and number of previous pregnancies were not significantly correlated with the severity of depressive symptoms or QoL.

Table 2

Descriptive Statistics and Pearson's Correlations for all the Study Variables

	<i>Study variables</i>				
	Support from the partner	Support from the mother	Perceived impact of pregnancy	Depressive symptoms	Quality of Life
Mean (<i>SD</i>)	4.38 (1.24)	4.23 (1.25)	9.77 (2.34)	7.00 (4.90)	73.13 (12.19)
Observed range (possible range)	0-5 (0-5)	0-5 (0-5)	0-18 (0-18)	0-29 (0-30)	31.25-100 (0-100)
<i>Demographic covariates</i>					
Age	.08	.03	-.05	.02	-.01
Ethnicity	-.08	-.03	-.02	-.05	-.16**
Marital status	.27***	-.04	.01	-.02	-.01
Education (years in school)	-.04	.01	.01	.10	.09
Socioeconomic status	-.09	.01	.01	.02	.06
Place of residence	.08	.01	-.05	.03	-.06
<i>Pregnancy-related covariates</i>					
Gestational age (weeks)	-.10*	.09	-.04	.01	.03
Number of previous pregnancies	.04	-.03	-.10*	.01	-.05
Obstetric complications	-.05	-.06	-.07	.13**	-.14**
Pregnancy intention	.08	.02	-.06	-.03	-.10*
<i>Study variables</i>					
Support from the partner	-	.05	.12*	-.20***	.19***
Support from the mother	-	-	.04	-.18***	.24***
Perceived impact of pregnancy	-	-	-	-.26***	.20***
Depressive symptoms	-	-	-	-	-.40***
Quality of life	-	-	-	-	-

Note. * $p < .05$. ** $p < .01$. *** $p < .001$.

Testing the Mediation Model

A significant indirect effect of the perceived impact of pregnancy on QoL through the severity of depressive symptoms was found (point estimate = 0.51, CI = 0.29/0.78). There was no significant direct effect of the perceived impact of pregnancy on QoL after controlling for the severity of depressive symptoms (point estimate = 0.45, CI = -

0.20/0.93). Ethnicity was also found to influence QoL (point estimate= -6.39, CI = -10.05/-2.72). The model predicting QoL was significant ($F_{5,398} = 21.26, p < .001$), and explained 21% of the variance in QoL. The mediation model is presented in Figure 2.

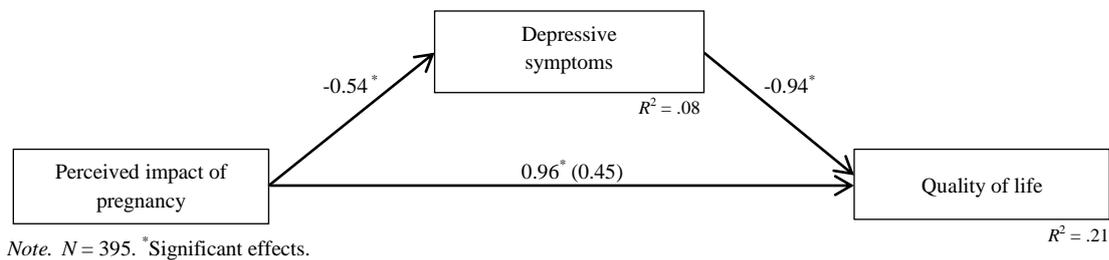


Figure 2. Mediation model. Unstandardized coefficients for the mediation model of the association between perceived impact of pregnancy and quality of life through the severity of depressive symptoms, while controlling for ethnicity, obstetric complications, and pregnancy intention. The value inside parentheses represents the direct effect of perceived impact of pregnancy on quality of life after controlling for the severity of depressive symptoms

Testing the Moderated Mediation Models

Support from the mother and support from the partner were found to be significant moderators of the indirect effect of the perceived impact of pregnancy on QoL through the severity of depressive symptoms. Only the interactions between the perceived impact of pregnancy and support from the mother ($b = 0.16, CI 0.01/0.30$) and between the perceived impact of pregnancy and support from the partner ($b = 0.18, CI 0.04/0.33$) were significant, indicating that the moderating effects exist only at the path from the perceived impact of pregnancy for the severity of depressive symptoms. The respective moderated mediation models are presented in Figures 3 and 4.

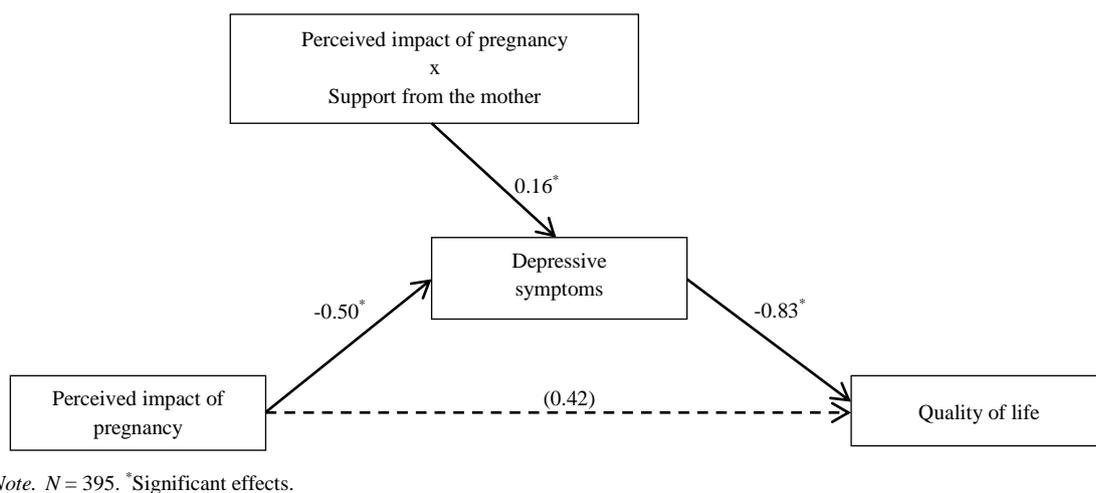
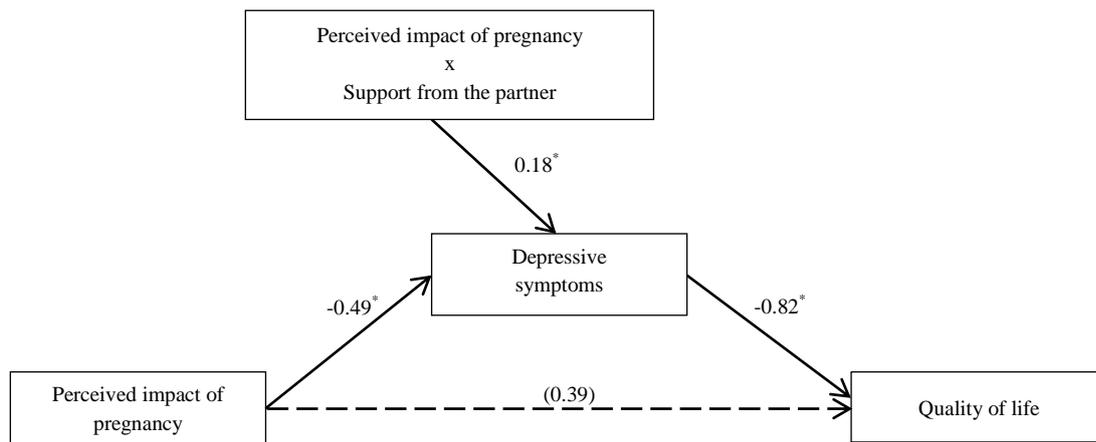


Figure 3. Moderated mediation model: mother. Unstandardized coefficients for the moderated mediation model of the association between perceived impact of pregnancy and quality of life through the severity of depressive symptoms, while controlling for ethnicity, obstetric complications, pregnancy intention, and support from the partner; moderator:

support from the mother. The value inside parentheses represents the direct effect of perceived impact of pregnancy on quality of life after controlling for the severity of depressive symptoms and for the proposed interaction effects.



Note. N = 395. *Significant effects.

Figure 4. Moderated mediation model: partner. Unstandardized coefficients for the moderated mediation model of the association between perceived impact of pregnancy and quality of life through the severity of depressive symptoms, while controlling for ethnicity, obstetric complications, pregnancy intention, and support from the mother; moderator: support from the partner. The value inside parentheses represents the direct effect of perceived impact of pregnancy on quality of life after controlling for the severity of depressive symptoms and for the proposed interaction effects.

With respect to the control variables, as Tables 3 and 4 show, ethnicity influenced QoL in both moderated mediation models. When testing the moderating role of support from the mother, support from the partner and support from the mother had significant direct effects on both depressive symptoms and QoL (see Table 3). When testing the moderating role of support from the partner, support from the mother had a significant direct effect on both depressive symptoms and QoL, and support from the partner did not have a significant direct effect on QoL, but significantly predicted depressive symptoms (see Table 4).

Table 3

Regression Results for the Moderated Mediation Model of the Association between Perceived Impact of Pregnancy and Quality of Life through Depressive Symptoms, and Conditional Indirect Effects at Different Values of Support from the Mother

Predictor	Mediator Variable Model (predicting depressive symptoms)			
	<i>b</i>	<i>SE</i>	Boot LLCI	Boot ULCI
Constant	2.91	0.87	1.21	4.62
Ethnicity ^a	-1.10	0.80	-2.68	0.47
Obstetric complications ^b	1.59	0.85	-0.08	3.26
Pregnancy intention ^b	-0.25	0.58	-1.38	0.89
Support from the partner	-0.66	0.19	-1.03	-0.29
Perceived impact of pregnancy (PIP)	-0.50	0.10	-0.69	-0.29
Support from the mother (SM)	-0.59	0.19	-0.96	-0.23
PIP x SM	0.16	0.07	0.01	0.30
$R^2 = .15$				

<i>Dependent Variable Model (predicting QoL)</i>				
<i>Predictor</i>	<i>b</i>	<i>SE</i>	<i>Boot LLCI</i>	<i>Boot ULCI</i>
Constant	70.44	2.06	66.39	74.49
Ethnicity ^a	-6.29	1.87	-9.97	-2.61
Obstetric complications ^b	-3.62	2.00	-7.55	0.31
Pregnancy intention ^b	-1.93	1.35	-4.58	0.72
Support from the partner	0.91	0.44	0.03	1.79
Perceived impact of pregnancy (PIP)	0.42	0.25	-0.69	0.90
Depressive symptoms (DS)	-0.83	0.12	-1.06	-0.60
Support from the mother (SM)	1.64	0.45	0.76	2.52
DS x SM	0.02	0.08	-0.13	0.17
<i>R</i> ² = .25				
<i>Conditional indirect effect at different values of the moderator</i>				
<i>Support from the mother</i> ^c	<i>Boot indirect effect</i>	<i>Boot SE</i>	<i>Boot LLCI</i>	<i>Boot ULCI</i>
3.00	0.59	0.19	0.27	1.00
4.00	0.44	0.12	0.23	0.72
5.00	0.30	0.12	0.12	0.59
5.00	0.30	0.12	0.12	0.59
5.00	0.30	0.12	0.12	0.59

Note. *N* = 395. Unstandardized regression coefficients are reported. LL = lower limited. CI = 95% Confidence interval. UL = Upper limited. ^a Reference group: 0 = European ethnic origin. ^b Reference group: 0 = No. ^c Conditional indirect effects for 10th, 25th, 50th, 75th, and 90th percentiles of support from the mother are reported.

Table 4

Regression Results for the Moderated Mediation Model of the Association between Perceived Impact of Pregnancy and Quality of Life through Depressive Symptoms, and Conditional Indirect Effects at Different Values of Support from the Partner

<i>Mediator Variable Model (predicting depressive symptoms)</i>				
<i>Predictor</i>	<i>b</i>	<i>SE</i>	<i>Boot LLCI</i>	<i>Boot ULCI</i>
Constant	2.52	0.83	0.88	4.16
Ethnicity ^a	-1.37	0.80	-2.95	0.20
Obstetric complications ^b	1.57	0.85	-0.10	3.23
Pregnancy intention ^b	-0.03	0.58	-1.16	1.11
Support from the mother	-0.61	0.18	-0.97	-0.24
Perceived impact of pregnancy (PIP)	-0.49	0.10	-0.69	-0.28
Support from the partner (SP)	-0.59	0.19	-0.96	-0.21
PIP x SP	0.18	0.07	0.04	0.33
<i>R</i> ² = .15				
<i>Dependent Variable Model (predicting QoL)</i>				
<i>Predictor</i>	<i>b</i>	<i>SE</i>	<i>Boot LLCI</i>	<i>Boot ULCI</i>
Constant	67.62	1.98	63.72	71.52
Ethnicity ^a	-6.06	1.88	-9.75	-2.37
Obstetric complications ^b	-3.58	2.00	-7.49	0.33
Pregnancy intention ^b	-2.07	1.35	-4.71	0.58
Support from the mother	1.63	0.44	0.77	2.49

Perceived impact of pregnancy (PIP)	0.39	0.25	-0.10	0.88
Depressive symptoms (DS)	-0.82	0.12	-1.06	-0.60
Support from the partner (SP)	0.79	0.46	-0.12	1.69
DS x SP	0.09	0.09	-0.08	0.27
$R^2 = .26$				

<i>Support from the partner</i> ^c	<i>Conditional indirect effect at different values of the moderator</i>			
	Boot indirect effect	Boot SE	Boot LLCI	Boot ULCI
3.00	0.70	0.21	0.34	1.18
4.00	0.48	0.13	0.25	0.77
5.00	0.28	0.11	0.11	0.55
5.00	0.28	0.11	0.11	0.55
5.00	0.28	0.11	0.11	0.55

Note. $N = 395$. Unstandardized regression coefficients are reported. LL = lower limited, CI = 95% Confidence interval. UL = Upper limited. ^a Reference group: 0 = European ethnic origin. ^b Reference group: 0 = No. ^c Conditional indirect effects for 10th, 25th, 50th, 75th, and 90th percentiles of support from the partner are reported.

Post-hoc analyses were used to determine the nature of the significant conditional indirect effects of the perceived impact of pregnancy on QoL via the severity of depressive symptoms at different values of the moderators. Analyses revealed buffering effects whereby the indirect effect decreased as support from the mother (see Table 3) or support from the partner (see Table 4) increased; depressive symptoms remained a significant mediator of the effect of the perceived impact of pregnancy on QoL for all values of support from the mother and support from the partner.

Discussion

The aims of the current study were to examine the indirect effect of the perceived impact of pregnancy on QoL through the severity of depressive symptoms in a sample of pregnant adolescents, and to explore whether adolescents' satisfaction with social support from their mothers or from their partners served as a buffer of this effect. Overall, our results supported our two main hypotheses. First, adolescents' perception that their pregnancy has a negative impact in their lives predicted a lower QoL during pregnancy by increasing the severity of their depressive symptoms. Second, this indirect effect was buffered by adolescents' satisfaction with their social support. Specifically, support from the mother and support from the partner served as protective factors against maladjustment by weakening the association between a negative perception of the impact of pregnancy and higher severity of depressive symptoms. These findings provide more specific knowledge about the nature of the relationship between adolescents' perception of pregnancy and QoL and help to clarify some inconsistent results of previous research.

Our results are consistent with previous research that suggests higher levels of depressive symptoms among adolescents who perceive a more negative impact of pregnancy in several life domains, compared to their pregnant peers who perceive lower costs of pregnancy (12,39,40). Our findings were also similar to associations that have been found between depressive symptoms and poor QoL reported in studies using samples of pregnant adults (15,17).

Moreover, the current study takes into account Frisch (30) and Power's (22) comprehensive definitions of QoL and adds to previous research indicating that adolescents' evaluations of the impact of pregnancy may influence their current emotional state, which in turn may be indicative of how happy and satisfied they are with their lives. As such, adolescent pregnancy should not be regarded as a universally adverse event, as adolescents' adjustment during pregnancy depends somewhat on their subjective perceptions about the impact of pregnancy on several life domains, even after controlling for demographic and pregnancy-related variables. However, it is important to identify adolescents with a negative perception of the impact of pregnancy to help prevent depression and increase QoL. It may also be useful to incorporate screening tools for depressive symptoms into current clinical history questionnaires to identify and refer depressed adolescents for early psychological intervention.

Our findings also suggest important directions for interventions aimed at preventing and reducing depressive symptoms and improving QoL among adolescents with negative perceptions of the impact of pregnancy on their lives. According to the stress-buffering theory (45-47), in our sample adolescents' satisfaction with support from their mothers buffered the indirect effect of the perceived impact of pregnancy on adolescents' QoL by weakening the association between a negative perception of the impact of pregnancy and higher severity of depressive symptoms. This finding remained stable after controlling for support from adolescents' partners. Similar results were found for support from adolescents' partners while controlling for support from adolescents' mothers, highlighting the independent protective role of both sources of support during adolescent pregnancy (51). As such, improving the quality of adolescents' relations with their mothers and/or their partners, and promoting satisfactory support from these figures according to the idiosyncratic needs of the pregnant adolescent may be extremely important. These actions can not only contribute to reducing the risk for depression among adolescents with a negative perception of the impact of pregnancy but also help to treat symptoms among those who are already depressed and, in so doing, improve adolescents' QoL during pregnancy. However, further research is needed to assess the effect of interventions targeting the prevention and treatment of depression on adolescents' overall QoL. Studies that prospectively measure the effect of such interventions on both changes in depressive symptoms and perceptions of QoL are required.

In addition to the findings discussed above, we also found unexpected results. Although previous studies have suggested social support as an important protective factor for health-related QoL among depressed pregnant adults (17), in the present study social support did not weaken the association between depressive symptoms and QoL. This finding highlights the importance of interventions aimed to prevent and treat depressive symptoms among pregnant adolescents with a negative perception of the impact of pregnancy, as the association between depressive symptoms and poor QoL did not depend from the satisfaction with support from their mothers or from their partners when we were testing the indirect effect of the perceived impact of pregnancy on QoL through the levels of depressive symptoms.

Some limitations of our study must be acknowledged. First, it had a cross-sectional design, and therefore does not allow us to draw causal inferences. It is possible that the links between study variables are bidirectional (e.g., depressive symptoms may also lead to a more negative perception of the impact of pregnancy, poor QoL may also lead to higher depressive symptoms). Longitudinal designs are preferable for establishing a timeline that allows causal inferences (70) and should be used in future research in this field. Second, we did not control for adolescents' depressive symptoms and QoL before pregnancy occurred. According to some authors (e.g., 11,71,72), these are important variables to consider when assessing adjustment during adolescent pregnancy.

Despite these limitations, our study provides a number of important contributions to our understanding of the links between the perceived impact of pregnancy, depressive symptoms and QoL during adolescent pregnancy. It also contributes to a better understanding of the protective role of social support on these links; specifically, it shows how social support should be targeted in interventions aimed at reducing the risk of maladjustment in the transition to motherhood during adolescence.

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