Araújo Pedrosa, A. , Pires, R., Carvalho, P., Canavarro, M.C., & Dattilio, F. (2011). Ecological contexts in adolescent pregnancy: the role of individual, sociodemographic, familial and relational variables in understanding risk of occurrence and adjustment patterns. *Contemporary Family Therapy, 33*(2), 107-127, doi: 10.1007/s10591-011-9148-4

Published online: 8 April 2011

Springer Link: http://www.springerlink.com/content/4l035364k8126556/ .

ECOLOGICAL CONTEXTS IN ADOLESCENT PREGNANCY: THE ROLE OF INDIVIDUAL, SOCIODEMOGRAPHIC, FAMILIAL AND RELATIONAL VARIABLES IN UNDERSTANDING RISK OF OCCURRENCE AND ADJUSTMENT PATTERNS

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Abstract

Adolescent pregnancy appears today as an intricate tapestry where different dimensions interact. In our study we examined the associations between individual, sociodemographic, familial, and

relational variables and their impact in the occurrence of pregnancy and adolescents' adjustment to it. Participants were Portuguese pregnant and non-pregnant adolescents (N = 833). Ecological contexts were characterized, and individual and relational adjustment (depressive symptoms and quality of life; perceived quality of relationship with significant others – parents, romantic partner and friends) were evaluated. Differences between the ecologies of adolescents in both groups were identified. Familial and relational variables were significantly associated with both the risk of pregnancy and more difficulties in adjustment. Implications for preventive intervention are discussed.

Key-words (3-5): Adolescent pregnancy, ecological systems, risk factors, adjustment, family context

INTRODUCTION

Portugal is one of the European Union countries with higher rates of adolescent pregnancy (Eurostat, 2010), which, until very recently, were only surpassed by those of the United Kingdom (Eurostat, 2004). This phenomenon has long been a topic of concern worldwide, but its visibility has been increasing in developed countries over the past few decades. Social changes in traditional gender roles and family structures (Singh & Darroch, 2000) along with the negative outcomes relative to adolescent mothers, their children, and families, have contributed to the conceptualization of adolescent pregnancy as a social and a public health problem (Holgate, Evans, & Yuen, 2006; McClanahan, 2009). As such, a growing body of research has focused on its occurrence and its impact on adolescents' life trajectories. The present study was part of a wider project aimed at addressing some limitations of previous national and international research in this field. We utilized a holistic and multidimensional perspective of adolescent pregnancy, considering the associations between individual, sociodemographic, familial, and relational variables and their impact on the occurrence of pregnancy and adolescents' adjustment to it. The role of the family system in these processes was addressed in order to provide some guidelines for intervention with families that are specifically designed to prevent adolescent pregnancy and promote adjusted developmental trajectories for those who experience it.

AN ECOLOGICAL PERSPECTIVE OF ADOLESCENT PREGNANCY

Over the past few decades, empirical research has portrayed adolescent pregnancy as a complex and multidimensional process where individual, sociodemographic, familial and relational dimensions interact. Thus, the bioecological model of Bronfrenbrenner (1979) is valuable when approaching adolescent pregnancy, facilitating its conceptualization as a multifactorial phenomenon in its etiology and consequences. Accordingly, the study of adolescent pregnancy should consider the different ecological levels of adolescents' lives and the interactions between them (Chase-Lansdale, Brooks-Gunn, & Paikoff, 1991; Logsdon, Hertweck, Zieler, & Pinto-Fold, 2008). However, despite the growing awareness of the utility of ecological approaches in understanding

adolescent pregnancy, the implementation of these models in empirical works is less common. As noted by Corcoran (1999) and Logsdon et al. (2008), most studies carried out in this area have tended to be atheoretical.

Several studies have addressed the occurrence of adolescent pregnancy and the adjustment of those who experience it, examining the role of factors from different ecological levels, including individual, relational, and/or social influences. Some of these studies are consistent with the bioecological model, as risk factors are organized according to ecological levels so that they can be targeted both separately and simultaneously (Van Horne, Wiemann, Berenson, Horwitz, & Volk, 2009). Nevertheless, fewer studies (Araújo Pedrosa, 2009; Logsdon et al., 2008; Van Horne et al., 2009) have addressed adolescent pregnancy with an integrated ecological approach that simultaneously focuses on the three main ecological levels of influence and their interactions.

THE ETIOLOGY OF ADOLESCENT PREGNANCY

Most studies in Portugal and in other Western countries have provided consistent results concerning the etiology of adolescent pregnancy. In spite of being descriptive (e.g., Nebot, Borrell, & Villalb, 1997; Padin et al., 2009) or of only considering factors from one or two ecological levels, in general they support the conclusion that individual, relational, and social ecological levels influence the occurrence of this phenomenon.

At the individual level, empirical research has demonstrated that factors such as sexual maturity (Dunbar, Sheeder, Lezotte, Dabelea, & Stevens-Simon, 2006; Holgate & Evans, 2006), emotional instability (Abrahamse, Morrison, & Waite, 1988), belief system, personal values and expectations favorable to premarital sexual activity and adolescent parenthood (Miller, Sage, & Winward, 2005), lower educational levels (Fergusson & Woodward, 2000; Manlove, Ryan, & Frazetta, 2006), dislike of school (Bonell et al., 2003; Haldre, Rahu, Rahu, & Karro, 2009), and less involvement in religious activities (Whitehead, Wilcox, & Rostosky, 2001) are associated with higher individual vulnerability to the occurrence of adolescent pregnancy.

Recently, Jordahl and Lohman (2009) used the bioecological model in order to identify risk and protective mechanisms associated with early sexual intercourse, one of the proximal factors associated with greater risk of adolescent pregnancy (Davis & Friel, 2001; Miller et al., 2005). Although this study was guided by the bioecological model, similar to other investigations on adolescent pregnancy, it only addressed the role of individual and familial factors, excluding community and social dimensions.

The family appears to have a main role in the etiology of adolescent pregnancy, since it exerts a central influence on other relational contexts and environmental factors (East, Khoo, & Reyes, 2006; Smith & Elander, 2006). Most studies have found that adolescent pregnancy rates are higher among families with socioeconomic problems (Coley & Chase-Lansdale, 1998; Garrett & Tidwell, 1999), a non-nuclear, single parent or reconstructed structure (Ellis et al., 2003; Miller et al., 2005), low educational levels (Miller, Benson, & Galbraith, 2001; Pereira, Canavarro, Cardoso, & Mendonça, 2005), and a history of alcohol abuse (Haldre et al., 2009) or adolescent parenthood (East et al., 2006; Seamark & Gray, 1997). Some studies also highlight the influence of early and current family interactions and dynamics, such as a family environment characterized by poor quality in parent-daughter relationships (Miller, 2002); a lack of communication and/or family instability; and inadequacy or lack of family supervision, support, affection and involvement (Kapungu, Holmbeck, & Paikoff, 2006; Miller, 2002; Scaramella, Conger, Simons, & Whitbeck, 1998).

Social aspects of the etiology of this phenomenon also have been addressed. Areas with higher levels of social, economic, and cultural deprivation were found to have higher adolescent conception rates (Bradshaw, Finch, & Miles, 2005; Paton, 2002), especially when deprivation included poverty, low literacy levels (Bonell et al., 2005), school dropout, exclusion from education, and unemployment (Araújo Pedrosa, 2009; Bonell et al., 2003). Living in communities with low valuation of a professional feminine role (Canavarro, 2009) also seems to raise the risk of occurrence of this phenomenon.

Adolescents who become pregnant and decide for motherhood have been seen, along with their children, as a risk group for adverse outcomes (Holgate et al., 2006), including individual and relational difficulties (Black et al., 2002). However, recent research found no differences between the adjustment levels of these adolescents and those of their peers who had the same socioeconomic conditions (Milan et al., 2004; Troutman & Cutrona, 1990). Additionally, some studies reported nonclinical levels of emotional maladjustment (Sieger & Renk, 2007) for pregnant adolescents, who in some cases, presented better results when compared with their peers without a pregnancy history (Pires, 2009), as well as similar results in relational adjustment (Araújo Pedrosa, 2009).

Consequently, adolescent pregnancy should not be regarded as a universally adverse life event. Empirical research shows, moreover, that the adjustment of pregnant adolescents is largely dependent on the contexts in which pregnancy occurs and on the available support (Beers & Hollo, 2009; Logsdon et al., 2008). Despite the lower amount of available studies examining factors associated with the adjustment of pregnant adolescents, once again it is possible to assess the contribution of risk factors by considering the individual, sociodemographic, relational, and ecological levels.

At the individual level, studies have shown that factors such as low self-esteem (Logsdon et al., 2008; Samuels, Stockdale, & Crase, 1994), high emotional lability (Blinn-Pike, Stenberg, & Thompson, 1994), and low aspirations towards education and career (Camarena, Minor, Melmer, & Ferrier, 1998) are associated with poorer general adjustment of these adolescents.

There is a growing recognition of the influence of relational factors on the short- and long-term well-being of pregnant adolescents and adolescent mothers, namely in terms of their socioemotional adjustment. This is particularly true for the nuclear family, as it is the family system in which adolescent mothers typically live currently, even when cohabiting with a partner (Araújo Pedrosa, 2009; Moore & Brooks-Gunn, 2002). Several studies conclude that factors such as early familial experiences characterized by negativity or ambivalence (Sherman & Donovan, 1991), low

supervision, high rejection, and low emotional support from the mother in particular (Pires, 2009), less social support (Bogat, Guzmán, Galasso, & Davidson, 1998; Milan et al., 2004; Sieger & Renk, 2007), and poor quality of current relationships (Milan et al., 2004), particularly with the romantic partner and friends, influence the socioemotional adjustment of adolescents who become pregnant.

Finally, regarding social factors, low socioeconomic levels (Jaffe et al., 2001; Milan et al., 2004) appear to be associated with poor socioemotional adjustment. However, the results of recent national and international investigations (Araújo Pedrosa, 2009; Longsdon et al., 2009; Van Horne et al., 2009) grounded on the bioecological model of development (Bronfenbrenner & Ceci, 1994) revealed that factors from multiple ecological levels interact and affect different areas of adolescents' adjustment after pregnancy, reinforcing the importance of theory-based research to capture the maximum variability in the dependent variables studied.

When considering adjustment facing adolescent pregnancy, some authors mention that the patterns found result from a complex interplay of factors that predicted their entry into adolescent motherhood, as well as additional effects arising from being an adolescent mother (Milan et al., 2004; Mollborn & Morningstar, 2009; SmithBattle, 2007). This suggests the utility of research efforts aimed at examining the risk factors involved in the etiology of adolescent pregnancy and, simultaneously, in their subsequent adjustment, using the same sample of participants.

Empirical research on the adjustment of adolescents during pregnancy is less extensive compared with research focusing on the post-birth period or long-term outcomes. However, some studies suggest that adolescents who experience high stress during pregnancy are at increased risk for difficult maternal adjustment and high postpartum emotional distress, suggesting that a higher quality of adjustment during pregnancy increases the likelihood of better adjustment after birth (Holub et al., 2007. These findings support the need for early interventions that will increase adjustment during pregnancy and facilitate optimal maternal and child health outcomes. It is essential to work towards the examination of factors that may exert some effect on adolescents' adjustment during the pregnancy period.

THE ROLE OF FAMILY SYSTEM: PREVENTION AND INTERVENTION

Given its importance relative to adolescent pregnancy occurrence and subsequent adjustment, the family system has emerged as a crucial context to understand and in which to intervene (Benson, 2004; East et al., 2006). As part of other spheres of the ecosystem (Bronfenbrenner, 1979), family members influence and interact with each other in a circular and multidimensional process. The family has an internal function of protection and promotion of the development of its members and an external function of socialization and transmission of a particular culture. Although in adolescent pregnancy family variables do not constitute by themselves elements that predominate over any others, they stand out given their potential to be worked with, transformed, and adjusted (Afonso, 2009). Some studies have suggested that the family system is an indispensable resource in the primary prevention of adolescent pregnancy (Casper, 1990; Olson, Wallace, & Miller, 1984; Quinlivan, Tan, Steele, & Black, 2003) and a preferable focus for promoting more adjusted developmental trajectories for adolescents who become pregnant and opt for motherhood (Shanok & Miller, 2007).

The findings discussed above are consistent with the recent general health research evidence suggesting the need for multilevel intervention approaches to elicit behavioral changes (Glanz, Rimer, & Lewis, 2002). Hence our awareness of a need for psychosocial interventions that are specifically designed to prevent adolescent pregnancy and later maladjustment, and that address different life contexts, rather than focusing only on the individual (Quinlivan et al., 2003).

Although information is still scarce regarding family counseling or therapy in the prevention of and intervention in the area of adolescent pregnancy, as well as in the general context of adolescent sexual health, some studies point to its usefulness when working with multiproblem families such as those currently associated with adolescent pregnancy (Micucci, 1998): the behaviors of individual family members are highly interdependent, so focusing in the family system as a whole may maximize the impact of intervention (Cherniss & Herzog, 1996). While this approach may be potentially effective in

the context of adolescent pregnancy. Additional research is needed to clarify the role of family variables and to better support effective guidelines for specific interventions with families.

Therefore, the general purpose of our study was to examine the associations between individual, sociodemographic, familial, and relational variables and their impact as risk or protective factors concerning the occurrence of adolescent pregnancy and the adolescents' adjustment to pregnancy, particularly taking into account the role of the family system. Specific objectives included the following: 1) to identify variables from different contexts that interact and contribute to explain the occurrence of adolescent pregnancy and influence adolescents' adjustment; and 2) to clarify the role of family variables in these processes.

METHOD

Participants

The sample consisted of 405 pregnant adolescents (PREG_AD) and 428 non-pregnant adolescents from the general population (CONT_AD) who were used as a comparison group. The age of both groups was equivalent, but they differed in other sociodemographic characteristics, as depicted in Table 1.

(Table 1 about here)

Procedures

Pregnant adolescents were recruited in Public Health Services among all the regional areas of Portugal's Mainland (Nuts II - 2002) and the Azores islands. Eligibility criteria for inclusion in the study were: 1) being pregnant; 2) being 19 years old or less[1] and 3) having the ability to understand and answer the interview questions and the self-report questionnaires (no cognitive impairment/disability). Adolescents were invited to participate during their obstetric appointments[2]. Those who agreed to participate were directed to an assessment session with a psychologist.

[1] Age limit established according to the World Health Organization (1975) definition of adolescence.
[2] In Portugal, health services such as obstetric appointments, ultrasounds, clinical tests, etc., are universally free to all pregnant women.

Participants took part in a 30-minute semi-structured interview and completed several self-report measures in the presence of the interviewer. Clinical data were obtained from the patients' medical records.

Non-pregnant adolescents were recruited in Public Educational Services of all the regional areas of Portugal's Mainland (Nuts II - 2002) and Azores islands. Eligibility criteria for inclusion in the study were the same as for the pregnancy group, except for the absence of a pregnancy history. Participants completed the assessment protocol by themselves, in class, in the presence of a psychologist.

When recruiting participants, a full explanation of the research objectives, the participants' role, and the researcher's obligations was given, and confidentiality was assured. All participants who agreed to participate signed an informed consent prior to the completion of the questionnaires (when participants were under 18 years old, the consent form was also signed by their legal tutor).

This study was approved and carried out in compliance with ethical standards from all the Public Health and Educational Services Research Ethics Committees involved, and ethical principles for psychological research also were observed.

Measures

Individual and Familial Characterization and Evaluation of Psychological Dimensions of Pregnancy

Data regarding sociodemographics (age, marital status, participation in religious activities, school frequency and educational attainment), family characteristics (e.g. structure and members' characteristics), and health and reproductive history were obtained via a semi-structured interview with open- and close-answered questions (Araújo Pedrosa, Canavarro, & Pereira, 2003). Additional questions on the course, monitoring, and impact of pregnancy in adolescent life were exclusive to the pregnant adolescents. Socioeconomic status (SES), assessed by considering the family's main provider, was coded according to Portuguese standard procedures (Simões, 1994).

Parental Rearing Style

Parental rearing style was assessed with the Portuguese version of *EMBU - Egna Minnen av Barndoms Uppfostram* (Arrindell et al., 1999; Portuguese short version by Canavarro, 1996). It is a 23-item instrument according to which participants are asked to rate, separately for their mothers and their fathers, the frequency of several parental behaviours during their childhood and adolescence. Responses are given on a 5-point scale ranging from 1 (*No, never*) to 4 (*Yes, most of the time*). Paternal and maternal behaviors are retrospectively assessed in terms of three factors: Rejection, Emotional Warmth, and Overprotection. In the present sample, Cronbach's alpha ranged from .75 (Mother Rejection for CONT_AD) to .90 (Father Emotional Warmth for PREG_AD) for Rejection and Emotional Warmth factors. As the Overprotection factor had Cronbach's alphas ranging from .43 to .58, it was excluded from this study. Emotional Warmth relates to parental behaviors that make the individual feel comfortable and approved in their presence (including behaviors of approval, encouragement, assistance, compensation, verbal and physical expressions of love, affection and attention). Rejection refers to parental behaviors such as punishment, rejection of the person as an individual, hostility, depreciation, and lack of consideration for points of view and needs of the person.

Perception of Relationship Quality and Satisfaction with Social Support

The perceived quality of relationships with parents, romantic partner/boyfriend, and friends was evaluated through the question: "*Globally, how do you classify your present relationship with…*" which respondents answered using a 7-point scale ranging from 1 (*Extremely poor)* to 7 (*Extremely good*). Similarly, the perception of satisfaction with social support received from parents and boyfriend was evaluated through the question "*To what extent do you feel satisfied with the support you get from…*", answered using a 5-point scale ranging from 1 (*Not at all satisfied*) to 5 (*Extremely satisfied*).

Depressive Symptoms

Depressive symptoms were assessed with the Portuguese version of *EPDS - Edinburgh Postnatal Depression Scale* (Cox, Holden, & Sagovsky, 1987; Portuguese version by Figueiredo, 1997). It comprises 10-items answered on a 4-point Likert scale, ranging from 0 (*No, never*) to 3 (*Yes, almost always*), concerning the intensity of depressive symptoms within the seven days prior to its completion; a global score is obtained from the sum of all items. According to Figueiredo, a cut-off point of 9 allows for the discrimination between clinical and non-clinical symptoms. Higher scores indicate more depressive symptoms. In the present sample, the scale Cronbach's alpha 82 and .83 for PREG_AD and CONT_AD, respectively.

Quality of Life (QoL)

Quality of life was assessed with the Portuguese version of WHOQOL-Bref (World Health Organization Quality Of Life Group, 1998; Portuguese version by Vaz Serra, et al., 2006). It is composed of 26 items on a 5-point scale ranging from 1 to 5, and covering four domains: Physical, Psychological, Social Relationships, and Environment. Furthermore, a general facet is evaluated by two questions, one concerning the global quality of life and the other the general perception of health status. High scores for the general facet and domains indicate a better perception of QoL. In the present sample Cronbach's alpha ranged from .58 (Social Relationships for CONT_AD) to .82 (Environment for CONT_AD) across domains. The Cronbach's alpha for Social Relationships in CONT_AD was the only one below .60. We decided to use this domain considering that this low Cronbach's alpha is consistent with previous studies given the small number of items that comprise this dimension (Vaz Serra et al.).

Data Analysis

To characterize participants in both the pregnant adolescent group and the non-pregnant adolescent group, descriptive statistics (frequencies, means, and standard deviations) were calculated for sociodemographic, individual, and relational variables. Differences between the groups in categorical variables were tested using chi-square. For testing mean differences concerning individual and relational adjustment, we performed univariate tests (ANOVA) and

multivariate analysis of variance (MANOVA). The risk and/or protective factors for the event of pregnancy were examined through logistic regression models.

To investigate possible within-groups differences in the adjustment profile shown by participants, a cluster analysis was first used to classify pregnant adolescents according to their scores on measures of individual and relational adjustment. The cluster variables were standardized to Z-scores ($M = 0$, $SD = 1$) to equalize the contribution of each variable in the cluster analysis. A two-step clustering procedure was used, as recommended by Hair and Black (2000): First, agglomerative hierarchical cluster analysis was performed to obtain the initial cluster groupings and the starting points (cluster means) for each of the clusters. Squared Euclidean distance was used to measure the distance between the individual observations on the clustering variables, and Wards minimum variance method was used to form the clusters. The observation of the rescaled distances in the hierarchical cluster dendograms and conceptual considerations lead to the selection of a 2-cluster solution that generated distinct profiles. In the second step of the cluster analysis, the cluster means (centroids) from the hierarchical 2-cluster solution were submitted to a nonhierarchical, k-means cluster analysis to refine the initial cluster solution, and to reduce the risk of cluster misassignment common with hierarchical cluster methods (Blashfield & Aldenderfer, 1988). The two clusters were labelled “better adjustment” and “more difficulty in adjustment,” according to the profile obtained. Finally, logistic regression models were used again to estimate the outcome of belonging to each of the adjustment profiles. Post hoc power calculations made for statistical analyses performed with a significance level of .05 and power >= .80 indicated that small to medium effects could be detected (Faul, Erdfelder, Lang, & Buchner, 2007). Analyses were conducted with *IBM SPSS*, *version 19.0.*

RESULTS

Differences Between Groups in Individual, Sociodemographic, Familial and Relational Contexts

Individual and Sociodemographic Contexts

Differences in sociodemographic characteristics between the pregnant and non-pregnant adolescents are presented in Table 1. Other individual variables on which the two groups differed were *having begun sexual intercourse* [49.8% (n = 213) of non-pregnant adolescents, and the total of participants in PREG_AD (n = 405) had begun sexual intercourse at the time of the study;: $\chi^2_{(1, N = 833)} = 274.224$, $p < .001$], and the *mean age for beginning sexual intercourse* [PREG_AD: M = 14.78, SD = 1.26; CONT_AD: M = 15.58, SD = 1.28; $F_{(1,610)} = 55.595$, $p < .001$]. When considering only the participants with an active sex life, the groups differed in practices concerning safe sex and contraception, with 42.7% (n = 173) of the pregnant adolescents mentioning no contraceptive use (before pregnancy), against 7% (n = 15) in the comparison group [$\chi^2_{(1, N = 618)} = 83.926$, $p < .001$]. The groups also were not equivalent concerning regular participation in religious activities [$\chi^2_{(1, N = 655)} = 29.577$, $p < .001$], with fewer pregnant adolescents (42.3%, n = 120) acknowledging that participation, as compared to 63.6% (n = 236) in the comparison group.

Familial and Relational Contexts

Family structure and composition during childhood differed between groups, as did parental characteristics such as educational attainment and current professional status. The pregnant adolescents had lived more frequently in single parent families (15.2%, n = 61; CONT_AD: 6.1%, n = 25), with members of the extended family (36%, n = 136; CONT_AD: 15.9%, n = 68), or in foster care (1.7%, n = 7; CONT_AD: 0.5%, n = 2): $\chi^2_{(3, N = 833)} = 83.171$, $p < .001$. Divorce was higher among PREG_AD parents (40.7%, n = 165; CONT_AD parents: 23.4%, n = 113) [$\chi^2_{(1, N = 833)} = 19.241$, $p < .001$]. The number of family members living together during childhood also differed between groups [$F_{(1,691)} = 15.135$, $p < .001$], with pregnant adolescents mentioning living with an average of five family members (SD = 1.98), and non-pregnant adolescents with four family members (SD = 1.72). The number of siblings was greater in PREG_AD (M = 3.08, SD = 2.44; CONT_AD: M = 1.87, SD = 1.69), with significant differences between groups [$F_{(1,822)} = 68.644$, $p < .001$].

The mean age of both pregnant adolescents' fathers (M = 44.79, SD = 7.02) and mothers (M = 41.47, SD = 6.21) was lower [fathers: $F_{(1,740)} = 12.964$, $p < .001$; mothers: $F_{(1,802)} = 20.298$, $p < .001$] than non-pregnant adolescents' parents (fathers: M = 46.29; SD = 5.85; mothers: M = 43.37, SD = 5.75). Educational attainment was also lower among parents of pregnant adolescents, with 7.9% (n = 26) of fathers and 7.7% (n = 29) of mothers achieving high school (10th to 12th grade) or college/university level studies [fathers: $\chi^2_{(6,\ N\ =\ 721)} = 62.009$, $p < .001$; mothers: $\chi^2_{(6,\ N\ =\ 790)} = 112.945$, $p < .001$] – these educational levels were attained by 25.3% (n = 120) and by 32% (n = 131) of non-pregnant adolescents' fathers and mothers, respectively. Mothers of pregnant adolescents were also more frequently unemployed or inactive (47.7%; n = 193) than mothers of non-pregnant adolescents (33.2%; n = 142): [$\chi^2_{(1,\ N\ =\ 833)} = 18.139$, $p < .001$].

Table 2 presents descriptive statistics and differences between groups concerning adolescents' perception of their parents' rearing style.

The multivariate effect was significant [Pillai's Trace: v =.171, $F_{(6,657)} = 22.548$, $p < .001$, $\eta^2_p = .171$], and subsequent univariate tests showed differences in all dimensions assessed: pregnant adolescents perceived their parents rearing styles as less supportive, but also less rejective than non-pregnant adolescents.

As shown I in Table 1, a high number of pregnant adolescents (43%, n = 174) were already married or cohabiting with their romantic partner (in our sample, he was in all cases the father of the baby they were expecting); the two groups significantly differed in this status [$\chi^2_{(1,\ N\ =\ 833)} = 225.50$, $p < .001$].

(Table 2 about here)

Risk and Protective Factors Associated with the Occurrence of Adolescent Pregnancy

The possible contribution of the above-mentioned variables to the risk of occurrence of pregnancy was studied through binary logistic regression models (Table 3 presents the final model).

When the model included only the constant, -2Log-likelihood equaled 627.364; this statistic lowered to 560.374 in the final step of the model, which indicated that its predictive value increased when variables were included. The final model was significant [$\chi^2_{(6)} = 365.575$, $p < .001$]. As can be seen in Table 3, several variables significantly predicted the risk of getting pregnant during adolescence: the risk was greater for adolescents who did not have regular religious practices, had less educational attainment, had low SES, who did not live with family members other than parents during their childhood, and who, in terms of parental rearing styles, perceived their mothers as providing less emotional warmth, but also being less rejecting. The model correctly predicted 81.3% of the cases.

Differences Between Groups in Individual and Relational Adjustment

Depressive Symptoms and Perceived Quality of Life

Pregnant adolescents ($M = 6.98$, $SD = 4.86$) significantly differed from those in the non-pregnant group ($M = 10.03$, $SD = 5.37$), with the former presenting fewer depressive symptoms [$F_{(1,828)} = 73.417$, $p < .001$].

Both groups perceived a good QoL, with pregnant adolescents scoring higher in all domains (see Table 2). The multivariate effect was significant [Pillai's Trace: $v = .050$, $F_{(5,752)} = 7.990$, $p < .001$, $\eta^2_p = .050$]; and subsequent ANOVA showed that the groups differed significantly on the Psychological domain.

Perceived Relationship Quality with Parents, Friends and Romantic Partner

Quality of relationship with significant others was in general perceived as very good in both groups (see Table 2). The majority of participants classified the relationship with mothers (PREG_AD: 85%; CONT_AD: 83.6%), fathers (PREG_AD: 60.6%; CONT_AD: 65.7%), romantic partner (PREG_AD: 87.9%; CONT_AD: 43.6%) and friends (PREG_AD: 74.4%; CONT_AD: 91.6%) as being *good* to *extremely good*. The groups did not differ concerning quality of relationship with romantic partner [PREG_AD: $M = 7.01$, $SD = 1.10$; CONT_AD: $M = 7.03$, $SD = 1.09$; $F_{(1,555)} = .070$, $p = .792$]. There was a significant multivariate effect when considering relationship with

parents and friends [Pillai's Trace: v =.129, $F_{(3,817)}$ = 40.248, p < .001, η^2_p = .129], and follow-up univariate tests showed significant differences concerning relationship with fathers and friends, which were perceived as having higher quality by non-pregnant adolescents. Relationship with romantic partner was not considered when performing multivariate tests given that a high percentage of participants (n = 237) in the comparison group mentioned the lack of such a bond at the time of assessment and were therefore excluded from the current analysis.*Individual and Relational Adjustment among Pregnant Adolescents*

To explore within-group variability cluster analysis was performed, and a 2-cluster solution was selected. Means and standard deviations are presented in Table 4. The adjustment indicators that contributed the most to discriminate between clusters were, in decreasing order, Social, Psychological, Environment and Physical domains of QoL, and depressive symptoms (EPDS). All cases with missing values (n = 36) were excluded from the analysis. Cluster 1 included 38.8% of pregnant adolescents (n = 143) who scored lower in all variables, thus indicating "more difficulty in adjustment." Cluster 2 represented 61.2% of PREG_AD (n = 226), with scores obtained allowing the identification as a "better adjustment" group.

(Table 4 about here)

To identify which variables contributed the most to predict belonging to one or the other cluster, logistic regression models were conducted. Table 5 shows the results.

(Table 5 about here)

The final model was significant [$\chi^2_{(7)}$ = 79.172, p < .001] and correctly predicted 75% of the cases. Family variables were significant predictors: the adolescents with higher risk of presenting more difficulties in adjustment during pregnancy were those who perceived their fathers' rearing style as less warm and more distant, and who were less satisfied with the social support received from their mother and their romantic partner (this was the most significant predictor of adjustment profile).

DISCUSSION

Assuming an ecological perspective, addressing individual, sociodemographic, familial and relational contexts, we sought to clarify risk and protection factors associated with the occurrence of pregnancy during adolescence, and to explore variables associated with better or more difficult patterns of adjustment in a group of adolescents with a pregnancy history. Data from a comparison group comprising adolescents without a pregnancy history allowed the study of differences in the contexts mentioned, thus contributing to a more thorough understanding of the interactions that may influence the multiple developmental trajectories that translate into distinct profiles of adjustment.

Differences were found among the groups, and results indicate that the risk of pregnancy occurrence may be influenced by variables from different ecologies. Individual, sociodemographic, familial, and relational characteristics may magnify vulnerability or protection when facing adolescent pregnancy, but this event did not necessarily lead to maladjustment in our sample. Nevertheless, the abundant research that points to deterioration of adjustment indicators and satisfaction over time within this population (Holgate et al., 2006), which may lead to negative developmental outcomes both for adolescent mothers and their children (Beers & Hollo, 2009), should not be overlooked. Indeed, there remains a demand for a consistent and time-prolonged effort to develop evidence-based preventive intervention programs.

Differences Between Groups in Individual, Sociodemographic, Familial, and Relational Contexts

The results of our study are consistent with prior work reviewed. That is the pregnant adolescents came from disadvantaged socioeconomic backgrounds (Garrett & Tidwell, 1999), were less involved in religious activities (Whitehead et al. 2001), had higher rates of school drop-out (Haldre et al., 2009; Kirby, 2001), and presented lower levels of educational attainment (Manlove et al., 2006) than the comparison group. They also started their active sex lives at an earlier age (Holgate & Evans, 2006), presented more sexual risk behaviors (Miller et al., 2005), and many were cohabiting with the father of the child.

Concerning family structure and parents' characteristics, our results also corroborate prior studies. The pregnant adolescents differed from the comparison group, in that they had larger families, their families were more frequently single parent, and they experienced higher rates of parental divorce (Ellis et al., 2003; Miller et al., 2005). In addition, their parents were less educated (Miller et al., 2001), and their mothers more frequently were unemployed or professionally inactive (Bonell et al., 2005). This latter aspect may shape female behavior models that the girls may assimilate throughout their development. Pregnant adolescents also perceived their parents' rearing style during childhood and adolescence as characterized by less emotional warmth, but also with less rejecting behaviors than those in the comparison group. This may indicate low levels of parental support and supervision, which is often associated with higher rates of risk-taking behaviors such as unprotected sex and pregnancy among adolescents (Kapungu et al., 2006).

Risk and Protective Factors Associated with the Occurrence of Adolescent Pregnancy

When studying the possible role of the variables as risk or protective factors in the occurrence of early pregnancy, our results indicated that several contexts of the adolescents' ecologies are significant predictors of such an event. Low educational attainment assumed particular relevance, and integrated with other significant variables points to questions frequently highlighted in the scientific literature: social economic disadvantage, accompanied by belonging to a family or community where recognition of scholarly education is low, and traditional feminine roles (such as motherhood and family and housekeeping) are encouraged, form an environment favorable to high adolescent pregnancy rates (Bradshaw et al., 2005; Canavarro, 2009). In such an environment, conjugality and motherhood seem to be central and favorably accepted life goals for girls, to the detriment of others such as pursuing an academic or professional career.

Individual and Relational Adjustment of Pregnant Adolescents

In our study, pregnancy among adolescents did not account for either high rates of emotional disturbance or of familial conflict and dissatisfaction, which was consistent with results stated by

authors such as Canavarro (2009) or Sieger and Renk (2007). Although the comparison group perceived higher quality in their relationships with fathers and friends, the pregnant adolescents showed an overall positive adjustment, which may be interpreted as an indicator of unproblematic acceptance of early pregnancy, both by adolescents and by their familial and relational contexts.

These results also corroborate findings by Davies et al. (2003), who state that adolescents who decide to continue the pregnancy and take care of their child usually belong to more disadvantaged social and familial environments, where attitudes towards parenthood are positive, and early entrance into motherhood is accepted and even recognized. Indeed, pregnancy and motherhood may be pathways to access adult benefits when academic and professional expectations are low, and other opportunities are perceived as unattainable (Frost & Oslak, 1999). Also, in a 1999 study, Vilar and Gaspar concluded that for some adolescents pregnancy may arise as a "social anchor" (p. 87) , that is, a way of building or strengthening social ties with family members, the father of the baby, and with the child. Further research and data from longitudinal studies are necessary to elucidate how persistent those ties are, and what consequences they convey to the future adjustment and development of both adolescents and their offspring.

Within the pregnant adolescents group, differences in adjustment emerged, and were predicted mostly by relational variables; once again, familial and relational aspects were important to the quality of adjustment shown by adolescents. Fathers' parenting style, specifically their emotional support and supervision, also played a significant role in their daughters' current adjustment, pointing to the importance of family interactions when trying to elucidate influences on possible adjustment paths. Mothers appeared as fundamental support figures. The fact that many of these women had children at a younger age than mothers of the comparison group, for the most part did not pursue high academic or professional goals, and accepted more traditional feminine roles, likely enhanced proximity with their daughters and made them more available to them when the pregnancy occurred. Again, these results are consistent with previous research (Gilson & Lancaster, 2008; Miller, 2002).

Our results showed better adjustment in this group to be very dependent on satisfaction with partner's support. This aspect, and the previously mentioned high rate of adolescents who were married or cohabiting with their baby's father, also may point toward the importance of conjugality, and to their will to early assume roles that currently are seen as normative at a later period in the life cycle (Canavarro, 2009). The analysis of other variables, such as the beginning of cohabitation (before or during pregnancy), and the investigation of these adolescents' life goals and expectations may help clarify such assumptions.

Since this study only considered the adolescents' perception and satisfaction with social support, we must emphasize the relevance of also studying the support actually received as well as dimensions of emotional and instrumental support assured by each of the significant figures; the way they influence how pregnant adolescents cope with complex and asynchronous transitions, and their impact on individual, parental, familial, and academic/professional paths.

Strengths and Limitations

This study has several strengths that allow its results to make a considerable contribution to the present state of the art. Its main asset is the attempt to address multiple contexts in the ecologies of adolescents who did and did not get pregnant, thus trying to elicit interactions that may contribute to clarify the multiple and multideterminated adjustment behaviors that lead to, and follow that event. The use of different types of measures (interview, self-rating scales, and adjective scales) and of an age-equivalent comparison group helped us to grasp the more subtle dimensions of selected indicators and of their mutual interactions and influences.

Some limitations must also be acknowledged. Since this study had a cross-sectional design, participants were only assessed once. A longitudinal design would more thoroughly clarify complex interactions between indicators from several contexts, and elucidate possible developmental paths and their outcomes either before and during pregnancy, or after delivery. This is particularly relevant when considering indicators of adjustment, since these are dynamic processes prone to change across pregnancy and after the transition to motherhood.

The fact that the comparison group only included adolescents who were still in school may have maximized disparities, although educational attainment was statistically controlled when relevant. In subsequent studies, efforts should be made to include adolescents with educational and even marital status similar to those of the adolescents with a pregnancy history. Another limitation was only having adolescents who decided to continue the pregnancy as participants, which may have biased the collected data, since these data were based mainly on their perceptions. Even though efforts were made to surpass this limitation by using different assessment measures, it would be advantageous to include other respondents in future studies, not only parents and romantic partners, but also teachers and health care providers. Data comprising adolescents who decide to terminate the pregnancy are currently being collected.

Implications for practice

In spite of the limitations mentioned above that imply caution when generalizing results, the findings of this study corroborate the perspective according to which the occurrence and adjustment to adolescent pregnancy are seen as complex and multidimensional processes. This points to the usefulness of adopting a systemic perspective and an ecological, multilevel approach when considering preventive intervention with this population.

As evident in most of the studies in this area, low educational attainment and school abandonment represent a risk not only to the occurrence of pregnancy, but also to poorer outcomes in terms of adjustment. Multidisciplinary efforts should be made at individual, family, and even community levels to promote longer school attendance. The advantages of staying in school and enhancing academic and professional skills have been mentioned in several research efforts (Bonell et al., 2004; Schvaneveldt, Miller, Berry, & Lee, 2001) as contributing to the prevention of adolescent pregnancy, since it may contribute to adolescents' sense of self-worth and competence and allow for more diverse life projects and expectations to surface.

Familial and relational contexts (namely the relationship with a romantic partner) also surfaced in our results as a central domain when considering the etiology and possible consequences

of adolescent pregnancy. Its inclusion in any intervention effort is therefore considered necessary and essential.

Our results showed that the romantic partners/fathers of the babies were perceived by adolescents as a significant source of satisfaction and social support. Although several studies have reported that adolescents who decide to continue their pregnancy frequently become single parents, the investment they put into conjugality makes evident the need to include their partners in actions aimed both at preventing the occurrence of pregnancy, and promoting positive developmental paths when pregnancy occurs (Wieman, Agurcia, Rickert, Berenson, & Volk, 2006).

This double purpose also needs to be the focus of working with families, mainly those where risk factors identified by this and other studies may be particularly relevant. Motivating families to preventive efforts may be the most difficult goal to address and achieve given that our results point to a non-problematic acceptance of adolescent pregnancy since perceived quality of relationships and satisfaction with social support received from parents remained high. A probable implication is the need to work to modify values and attitudes characterized by low recognition of feminine academic and professional achievements as well as parental styles marked by low involvement in their daughters' lives, either in terms of emotional proximity or supervision.

When pregnancy does occur, it is relevant to work with families to maximize and adequately mobilize resources that may be needed to provide necessary support to adolescents as they face demanding life transitions. Although economic resources may be an issue in an environment frequently marked by several disadvantages, multidisciplinary efforts should have a broader focus and be mainly directed towards promoting individual and familial skills as well as sense of cohesion and competence. All preventive intervention programs should be implemented not as sporadic measures, but as systematic and long-term actions, starting before the risk of pregnancy is higher (that is, before active sex life is initiated), and persisting beyond the birth of the child, should the pregnancy continue. It is recognized that the transition to motherhood may pose demands that

maximize adjustment difficulties and thus have a pernicious effect on the developmental paths of both adolescent mothers and their children (Beers & Hollo, 2009; Holgate et al., 2006).

In conclusion, our results globally indicate the existence of a social context that enhances the value of traditional feminine roles, conjugality, and motherhood as possible means of fulfillment for young women. Family models, adverse socioeconomic conditions, and high levels of school drop-out are other factors that may maximize the probability of adolescent pregnancy and motherhood. Although in general the participants revealed good adjustment indicators at the time of assessment, longitudinal studies are necessary to clarify whether this pattern prevails or deteriorates over time, particularly during and after the transition to parenthood. Preventive intervention in these processes should include not only the individual level, but also relational and social contexts, since our results are consistent with others that point to the relevance of considering a systemic perspective and multiple contexts when approaching the etiology and adjustment to adolescent pregnancy (Glazier, Elgar, Goel, & Holzapfel, 2004; Priel & Besser, 2002). Our findings indicate that family and relational variables, either connected to the structure and parental style or with adolescents' perception of relationship quality and social support provided by parents and partners, play a central role in the comprehension of patterns found.

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Table 1

Sociodemographic Characteristics of the Sample and General Obstetric Information for PREG_AD

	PREG_AD (*n* = 405)	CONT_AD (*n* = 428)	F/χ^2	*p*
	n (%)	*n* (%)		
Age				
Mean (*SD*)	16.45 (1.28)	16.39 (1.55)	0.420	0.517
Range	12 – 19	12 – 19		
Educational attainment (years in school)				
Mean (*SD*)	7.79 (2.22)	10.09 (1.73)	-16.97	< .001
Range	1 – 12	2 – 12		
Marital status				
Single	231 (57.0)	426 (99.5)	225.50	< .001
Married/Cohabiting with partner	174 (43.0)	2 (0.5)		
School frequency				
In school	147 (36.3)	428 (100)	380.428	< .001
School drop-out	244 (60.2)	0		
Missing	*14 (3.5)*	*0*		
Socioeconomic status (SES)				
Low	371 (91.6)	290 (67.8)	72.23	< .001
Medium	34 (8.4)	138 (32.2)		
Participation in religious activities				
Yes	123 (30.4)	240 (56.1)	55.005	< .001
No	262 (64.7)	173 (40.4)		
Missing	*20 (4.9)*	*15 (3.5)*		
Gestational age (Weeks)				
Mean (*SD*)	24 (9.6)			
Range	6 - 40			
Parity				
Primiparae	356 (87.8)			
Multiparae	49 (12.2)			

Table 2

Group Comparison Concerning Perception of Parental Rearing Practices, Adjustment and Relationship Quality

	PREG_AD (n = 405)	CONT_AD (n = 423)	F	p
	M (SD)	M (SD)		
Parental rearing practices				
Father				
Emotional support (EMBU)	17.09 (5.67)	19.48 (5.46)	31.831	< .001
Rejection/criticism (EMBU)	9.64 (2.74)	10.40 (3.30)	10.437	.001
Mother				
Emotional support (EMBU)	18.60 (5.22)	21.11 (5.79)	43.443	< .001
Rejection/criticism (EMBU)	10.57 (2.61)	11.97 (3.38)	36.256	< .001
Quality of life domains				
General (WHOQOL)	76.49 (14.04)	74.34 (15.82)	3.900	.050
Physical (WHOQOL)	74.53 (12.54)	72.94 (13.78)	2.749	.098
Psychological (WHOQOL)	73.31 (13.91)	67.89 (14.38)	27.786	< .001
Social Relationships (WHOQOL)	73.52 (16.95)	71.73 (16.99)	2.109	.147
Environment (WHOQOL)	69.79 (13.33)	60.00 (14.38)	0.622	.430
Perceived quality of relationships with				
Mother	6.47 (1.51)	6.60 (1.45)	1.699	.193
Father	5.22 (2.37)	5.76 (1.94)	12.491	< .001
Friends	5.95 (1.64)	6.95 (1.01)	111.048	< .011

Table 3

Binary Logistic Regression Model Predicting Occurrence of Adolescent Pregnancy

	B (*SE*)	Wald's test	*p*	*Odds ratio*	95% CI
Constant	-8.691 (1.443)				
Religious practice[a]	-1.189 (0.251)	22.368	< .001	0.304	[0.186, 0.498]
Educational attainment	0.651 (0.073)	80.330	< .001	1.918	[1.664, 2.212]
SES[b]	-1.200 (0.329)	13.308	< .001	0.301	[0.158, 0.574]
Living with family members other than parents during childhood[c]	1.720 (0.193)	34.365	< .001	5.585	[3.142, 9.225]
Mother: Emotional warmth (EMBU)	0.117 (0.045)	6.715	.010	1.124	[1.209, 1.228]
Mother: Rejection (EMBU)	0.238 (0.068)	12.110	.001	1.268	[1.109, 1.450]

Note. Pregnancy occurred = 0; Pregnancy did not occur = 1. Number of observations: 668. -2Log-Likelihood = 560.364, Pseudo R^2= .421 (Cox & Snell), .562 (Nagelkerke), $R^2_{L\ (8)}$ (Hosmer & Lemeshow) = 13.475, p = .097. Model: $\chi^2_{(6)} = 365.575$, $p < .001$.
[a]Religious practice: 0 = No, 1 = Yes. [b]SES: 0 = Low, 1 = Medium and High. [c]Living with family members other than parents: 0 = No, 1 = Yes.

Table 4

Cluster Analysis Regarding Adjustment to Pregnancy: Descriptive Statistics and ANOVA of Cluster Variables

	Cluster 1 More difficulties in adjustment (n = 143)	Cluster 2 Better adjustment (n = 226)	F	p
Adjustment indicators	M (SD)	M (SD)		
Depressive symptoms (EPDS)	10.31 (5.03)	5.06 (3.60)	135.772	< .001
General QoL (WHOQOL)	67.48 (13.36)	82.13 (11.46)	125.596	< .001
Physical QoL (WHOQOL)	66.05 (12.68)	79.88 (9.58)	141.134	< .001
Psychological QoL (WHOQOL)	62.35 (13.12)	80.23 (9.21)	234.927	< .001
Social Rel. QoL (WHOQOL)	59.90 (14.70)	82.26 (12.06)	253.353	< .001
Environment Qol (WHOQOL)	59.81 (11.79)	76.06 (10.22)	196.171	< .001
Quality of rel.: Mother	5.85 (1.68)	6.88 (1.20)	47.021	< .001
Quality of rel.: Father	4.44 (2.35)	5.74 (2.24)	28.439	< .001
Quality of rel.: Romantic partner	6.26 (1.77)	7.03 (1.33)	22.545	< .001
Quality of rel.: Friends	5.01 (1.96)	6.48 (1.13)	82.459	< .001

Table 5

Binary Logistic Regression Model Predicting Cluster Membership

	B (*SE*)	Wald's test	*p*	*Odds ratio*	95% CI
Constant	-3.377 (1.473)	5.255			
Educational attainment	0.089 (0.066)	1.807	.179	1.093	[0.960, 1.246]
Father: Emotional warmth (EMBU)	0.080 (0.040)	4.143	.042	1.084	[1.003, 1.171]
Father: Rejection (EMBU)	-0.173 (0.082)	4.452	.035	0.841	[0.716, 0.988]
Mother: Emotional warmth (EMBU)	0.024 (0.044)	0.308	.579	1.025	[0.940, 1.118]
Mother: Rejection (EMBU)	-0.042 (0.088)	0.234	.629	0.959	[0.807, 1.138]
Satisfaction with social support: Mother	0.416 (0.165)	6.390	.011	1.516	[1.098, 2.094]
Satisfaction with social support: Romantic partner	0.395 (0.126)	9.900	.002	1.484	[1.161, 1.898]

Note. More difficulty in adjustment = 0; Better adjustment = 1. Number of observations: 292. -2Log-Likelihood = 304.535, Pseudo R^2= .237 (Cox & Snell), .325 (Nagelkerke), $R^2_{L\,(8)}$ (Hosmer & Lemeshow) = 11.636, p = .168. Model: $\chi^2_{(7)} = 79.172$, $p <$ .001.