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## Quality of Interpersonal Relationships and Depression in Adolescence: Psychosocial Functioning Moderating Effect

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### Abstract

Adolescent depression has a devastating nature and affects different areas of functioning resulting in significant psychosocial limitations. Poor interpersonal relations have been increasingly associated with depressive symptoms. Negative familial interactions are a vulnerability factor to depression but more research is needed. This study aimed to test the moderating effect of psychosocial functioning in the relationship between the quality of interpersonal relationships and depressive symptoms. The sample consisted of 433 adolescents and the following instruments were used: Children's Depression Inventory (CDI - Kovacs, 1985; Portuguese version: Marujo, 1994), Quality of Relationships Inventory (QRI - versions father and mother - Pierce, Sarason & Sarason, 1991; Portuguese version: Neves & Pinheiro, 2006) and the semi-structured interview *Adolescent-Longitudinal Interval Follow-up (A-LIFE - Keller et al., 1993; Portuguese version: Matos & Costa, 2011)*. A relation between poor relationships with parents and depressive symptomatology was found. The dimension of father support/depth was found as a protective factor against the development of depression in adolescence but the conflict with the mother was associated with higher levels of depressive symptoms. Lower levels of psychosocial functioning were predictive of depressive symptoms in the domains of academic achievement and relationships with family and friends. The results also showed a moderating

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effect of school performance and satisfaction with functioning on the relationship between the perception of conflict with the father and depressive symptoms. These findings suggest that intervention programs designed to improve the quality of familial relationships will be beneficial to adolescents' psychosocial functioning and to the prevention of depressive symptoms.

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**Keywords:** Psychosocial functioning; quality of interpersonal relationships; depression; adolescence; moderation.

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## 1. Introduction

Depression has been associated with adverse situations, deficits in social skills and psychosocial malfunction, such as low school performance, little involvement in recreational activities and with poor interpersonal relationships (Lewinsohn, Gotlib & Seeley, 1995; Nilsen, Karevold, RØysamb, Gustavson, & Mathiesen, 2013; Singh, Bassi, Junnarkar & Negri 2015). In a longitudinal study that took place during a period of about 10 years, in which patients' functioning was evaluated and variations in levels of symptomatology were considered, it was concluded that increasing levels of severity of depressive symptoms were significantly associated with an increase in restrictions in general functioning and in the work and interpersonal relationship domains (Judd, Akiskal, Zeller et al., 2000).

The emergence and persistence of depressive symptoms (Moos & Cronkite, 1999), their association with other disturbances in associated comorbidity (Lewinsohn, Gotlib & Seeley, 1995), poor response to treatment (Hirschfeld, Russell, Delgado, Fawcett, Friedman & Harrison, 1998), as well as relapses and frequent recurrences (Vittengl, Clark & Jarrett, 2009), affect individuals' performance, interpersonal relationships and leisure activities (e.g. Dunn & Jarrett, 2009; Ro & Clark, 2009), consequently limiting psychosocial functioning of patients. It is also recognized by several authors that relations among peers in adolescence have a very important contribution to psychosocial functioning (La Greca & Harrison, 2005).

Studies have suggested that formation and maintenance of stable interpersonal relationships are fundamental to adolescents' quality of life (Baumeister & Leary, 1995). On the contrary, poor quality relationships and low levels of support from family and friends have been associated with negative results in adolescents' mental health (Allen, Porter, McFarland, McElhaney, & Marsh, 2007; Branje, Hale, Frijns, & Meeus, 2010; Jenkins, Goodness, & Buhrmester, 2002; La Greca & Harrison, 2005; Sheeber, Davis, Leve, Hops, & Tildesley, 2007; Stice, Ragan & Randall, 2004), also being predictors of an increase in depressive symptoms in adolescence (Bogard, 2005; Hankin, 2006; Hauenstein, 2003; Kendler, Kuhn, Vittum, Prescott & Riley, 2005; Nilsen, Karevold, RØysamb, Gustavson & Mathiesen, 2013). The existence of occasional conflicts in the family environment is normative during adolescence (Levpušček, 2006), but prolonged, intense and repeated conflict has been associated with poor psychological adjustment (Kenny, Dooley & Fitzgerald, 2013). It has been found that negative family interactions may be relatively stable over time and can make children and adolescents more vulnerable to depression (Hauenstein, 2003).

Although adolescence is a time when young people distance themselves from their parents, the parent-child relationship is essential to their psychological health (Kenny, 2013; Schochet et al., 2015). Positive and satisfactory relations between adolescents and parents are associated with high levels of support, warmth, approval, and low emotional stress, contributing to the well-being of the relationship with the father and the mother and to less depressive symptomatology (Kenny, Dooley & Fitzgerald, 2013). A robust parental support can protect the onset of depressive symptomatology (Bogard, 2005; Duchesne & Ratelle, 2014). However, a bad relationship between parents and their

children, poor quality of family environment, high levels of family conflict and low levels of family support, may predict the appearance and development of depressive episodes (Duchesne & Ratelle, 2014; Hankin, 2006; McCauley, Myers, Mitchell, Calderon, Schloredt & Treder, 1993; Queen, Stewart, Ehrenreich-May & Pincus, 2012).

In addition to addressing the importance of the relationships established with parents in adolescence, authors have also investigated about friendship, stressing the role of adaptive variables like intimacy and support. These variables have been studied in relation to parents, friends and dating relationships (Marques, 2013; Matos, Pinheiro & Marques, 2013; Pinheiro, Matos & Marques, 2013; Neves & Pinheiro, 2006; Neves & Pinheiro, 2009; Pierce, Sarason & Sarason, 1991). Research points out that friendship throughout adolescence becomes more intimate and loving (Levpušček, 2006; Liu, 2006) and that the quality of friendships is associated with high levels of intimacy and support, positively influencing self-esteem and psychosocial adjustment in adolescents (Bogard, 2005). Thus, we can predict that friendships may have a protective function of mental health (Kenny, Dooley & Fitzgerald, 2013). However, despite the benefits that they undoubtedly entail, friendships may have negative features, such as: low levels of perceived intimacy, less support and companionship, increased levels of conflict, pressure and exclusion (La Greca & Harrison, 2005). Negative characteristics are associated with higher levels of depressive symptomatology, problems of self-esteem, low school performance, less social participation and more interpersonal issues (Kenny, Dooley & Fitzgerald, 2013; La Greca & Harrison, 2005).

According to some authors, the key to decreasing the risk of depression is the existence of significant sources of social support for the adolescent (in the family, group of friends and school context), since there is a strong association between poor social relationships (parents, colleagues and romantic partners) and the development of depressive symptoms in adolescence (Schenfelder, Sandler, Wolchik & MacKinnon, 2011). It should also be noted that, in adolescents with depressive symptomatology, the occurrence of positive events (e.g. recognition of school merit) and planning rewarding activities allow the improvement of depressive symptoms, self-esteem, interpersonal relations and, consequently, of psychosocial functioning (e.g. Gledhill & Garralda, 2010).

## **2. Material and methods**

### *2.1. Participants*

The sample consists of 433 adolescents, 149 males (34%) and 284 females (66%), between the ages of 13 and 17 years ( $M = 14.58$ ;  $SD = .807$ ) who were enrolled in a research project about prevention of adolescent depression (PTDC/MHC-PCL/4824/2012). Most students frequented the ninth grade ( $n = 256$ ; 59.1%), 55 were in the eighth grade (12.7%) and 122 were in tenth grade (28.2%). With regard to the socio-economic status, about 224 of the students belong to a low socio-economic group (51.7%), 190 are part of a middle group (43.9%) and 19 of the students belong to a high socio-economic group (4.4%).

### *2.2. Instruments*

**Children's Depression Inventory** – CDI (Kovacs, 1983; Portuguese version: Marujo, 1984): It is a self-report inventory with 27 items that allows the evaluation of depressive symptoms in children and adolescents (between the ages of 6 and 18). Total score is calculated from the sum of all items and can vary between 0 and 54 points (Kovacs, 1985). It includes the following dimensions: anhedonia, negative self-esteem, negative mood, ineffectiveness and interpersonal problems. In the original version of this inventory, good values of internal consistency were found, with Cronbach's alphas ( $\alpha$ ) between .83 and .94 (Kovacs, 1985). The Portuguese version presented

a unifactorial structure with good values of internal consistency ( $\alpha = .80$ ) (Marujo, 1994). In the sample of this study a Cronbach's alpha of .90 was obtained, also revealing a very good internal consistency.

**Inventory of the quality of Interpersonal Relations - IQRI** (Pierce, Sarason, Sarason & 1991; Portuguese version: Neves & Pinheiro, 2006). This inventory is intended to assess the perception of support and depth in relation to a particular source of support (father, mother, friend), as well as the perception of that relationship as a source of conflict and ambivalence (Pierce, Sarason & Sarason, 1991). It is a self-report survey, consisting of 25 items. In the original version of the inventory, authors obtained a trifactorial version (support, depth and conflict) and good values of Cronbach's alpha for the mother (.83, .83 and .88), father (.88, .86 e .88.) and friend (.85, .84 and .91). In the Portuguese version of Neves & Pinheiro (2006), good Cronbach's alpha coefficients were also found (mother: .84, .80 and .87; father: .91, .89 and .89; friend: .84, .84 and .88; boyfriend: .78, .74 and .84) and the structure also proved to be trifactorial. Posterior studies conducted in Portugal also obtained 3 factors in versions for the father and mother (Marques, Matos, & Pinheiro, 2014; Marques, Pinheiro, Matos, & Marques, 2015). However, more recently, Matos, Pinheiro, Marques and Mónico (2015), in the sample of this study, carried out an exploratory analysis, followed by a confirmatory factor analysis. Bifactorial structures were obtained (support/depth and conflict) for the father and mother versions, which explained, respectively, 52.94% and 50.39% of the total variance and in which items 2 and 25 were removed. This bifactorial structure, in the present study, showed very good internal consistency for the father (support/depth:  $\alpha = .94$ ; conflict:  $\alpha = .89$ ) and the mother version (support/depth:  $\alpha = .91$ ; conflict:  $\alpha = .88$ ).

**Adolescents Longitudinal Interval Follow-up Evaluation - A-LIFE** (Keller et al., 1993; translation and adaptation: Matos & Costa, 2011). It is a semi-structured interview that allows evaluation of the longitudinal course of psychiatric disorders. It is divided into several sections. For the present investigation, evaluations of psychosocial functioning and satisfaction with functioning were used. Psychosocial functioning is evaluated in four areas: (1) school performance; (2) family relationships (parents, siblings, boyfriend, stepfather/stepmother and other significant family members); (3) relationships with friends; (4) recreational activities. Classification is assigned taking into account the worst week of each month for the last six months. Scores range from 1 to 5, being 1) very good, 2) good, 3) fair/slightly impaired, 4) poor/moderately impaired and 5) very poor/severely impaired (Martins, 2014). The total score of psychosocial functioning is determined from the sum of the means of the 4 dimensions, divided by 4. The score of each dimension resulted from the means of the adolescents' functioning during the evaluation period. The same procedure was taken to assess satisfaction with functioning in various areas of life. Keller et al. (1987) found good inter-evaluator reliability in most areas of psychosocial functioning (correlations between .52 and .98).

### 2.3. Procedure

Portuguese authorities that regulate scientific research authorized the present investigation. Adolescents participated anonymously and voluntarily in the study. Adolescents and parents signed an informed consent. The instruments were filled in the context of the classroom during school hours in a collective way. The interview was conducted on an individual basis. The incomplete fulfillment of the questionnaires, which were part of the assessment protocol, was considered exclusive criteria.

### 2.4. Analytical Strategy

Data analysis was performed using the *Statistical Package for Social Sciences* (SPSS), version 22.0 for Windows.

In the present sample ( $N = 433$ ), descriptive analyses were undertaken to explore the characteristics of the variables in study (mean and standard deviation). The analysis of the existence of gender differences with regard to means and frequencies was evaluated through student's t-tests and chi-square.  $p$  values less than or equal to .05 were considered to be statistically significant (Marôco, 2010).

With the aim of verifying if the total score of *psychosocial functioning* (PF) and/or its domains have a moderating effect on the relationship between the *quality of interpersonal relations* (IQRI) and depressive symptomatology, a hierarchical multiple regression was computed, after checking for its assumptions. For the moderation analyses, the values from the predictor variable (IQRI) and for the moderator variable (PF and *satisfaction with functioning*) were standardized to reduce potential problems of multicollinearity, before producing the interaction term between them. Therefore, variables were adapted to a mean of 0 and a standard deviation of 1. Then, variables were designed to correspond to the multiplicative term between the independent variable and the moderator, obtaining several terms: factors of IQRI, PF total, PF domains or satisfaction and the multiplicative term (IQRI factors \* total score of PF, PF domains or *satisfaction*). Later, hierarchical multiple regressions were conducted, entering primarily the IQRI factors (father and mother) as predictors. Secondly, PF and *satisfaction* were inserted as a moderating variable and thirdly, the interaction term between IQRI factors, PF and *satisfaction* was inserted in the prediction of depressive symptomatology. The graphical version of the statistically significant moderating effects was represented in SPSS.

### 3. Results

#### 3.1. Preliminary analysis

Values of *Skewness* and *Kurtosis* obtained did not indicate severe violations to normal distribution. Values of *Skewness*  $< 3$  and of *Kurtosis*  $< 10$  are considered acceptable (Kline, 2005). Then, preliminary analyses were performed to ensure the adequacy of the data to a hierarchical multiple regression analysis. Regarding multicollinearity, no problems were found [tolerance values  $> .10$  and variance inflation values (VIF)  $< 10$ ], indicating the absence of problems in estimation of  $\beta$ 's for PF dimensions, *satisfaction with functioning*, and factors of the IQRI (father and mother versions) (Pallant, 2005; Pestana & Gageiro, 2005). The graphical verification of dispersion of residuals (Scatterplot and PP Plot) confirmed that there are no problems in the normality of the distribution, on homoscedasticity, in linearity and in the independence of the residuals. In respect to the presence of outliers, there were no Cook's Distance values greater than 1 (Cook's Distance (Total) = .115). Therefore, procedures followed made it possible to certify the adequacy of the data to the analysis of results.

#### 3.2. Descriptive analysis

Means and standard deviations for the total sample are shown in Table 1. Adolescents punctuate higher in the *support/depth* dimension than in the *conflict* one.

In order to analyze gender differences among the variables under study, student t-test for independent samples were computed (cf. table 1). Results show that there are statistically significant gender differences at the level of depressive symptoms, [ $t(397.06) = -5.51, p < .005$ ], with girls revealing, on average, higher results than boys ( $M = 11.2, SD = 7.62$ ). With respect to IQRI, boys ( $M = 3.3, SD = .59$ ) revealed greater perception of *support/depth in relation to the mother* [ $t(257.55) = -3.548, p < .005$ ], than girls. Regarding PF and *satisfaction with functioning*, there were statistically significant differences between gender in the *relationship with the family* [ $t$

(363.95) = -.973,  $p < .005$ ] and in the *relationship with friends* [ $t(356.75) = -3.257, p < .005$ ]. Since there were no significant differences between gender in most *IQRI* factors, neither in *satisfaction* nor on the total score of *PF* and its domains, gender was not controlled for in the following analysis, because the main objective of the study was not gender difference analyses.

**Table 1.** Means and standard deviation for the total sample and for both genders.

	Total Sample (N=433)		Male (n=148)		Female (n=282)		<i>t</i>	<i>p</i>
	<i>M</i>	<i>DP</i>	<i>M</i>	<i>DP</i>	<i>M</i>	<i>DP</i>		
CDI	9.8	7.1	7.3	5.3	11.2	7.62	-5.51	.000
Father_Support/Deth	3.1	.70	3.2	.66	3.1	.72	.697	.277
Father_Conflict	2.0	.62	2.1	.62	2.0	.62	.723	.750
Mother_Support/Deth	3.4	.54	3.3	.59	3.4	.50	-3.55	.041
Mother_Conflict	2.1	.59	2.1	.58	2.1	.60	.350	.663
Psychosocial Functioning	1.7	.47	1.6	.43	1.7	.50	-1.12	.052
School performance	1.6	.65	1.7	.70	1.5	.61	1.70	.224
Family relations	1.7	.65	1.6	.54	1.7	.69	-.973	.032
Relationships friends	1.5	.70	1.4	.60	1.6	.74	-3.26	.001
Recreational activities	1.9	1.1	1.9	1.1	1.9	1.1	-.469	.790
Satisfaction	2.0	.73	1.9	.67	2.1	.75	-3.33	.097

### 3.3. Study of predictive effects

A multiple regression analysis (enther method) for the total sample was held, in order to understand whether the factors of *IQRI* in mother and father versions and the *PF* domains, had a significant predictive effect of depression. Results showed that *IQRI* factors yield a significant model [ $R^2 = .171$ ;  $F_{(4, 428)} = 22.130, p < .01$ ], explaining 17.1% of the variance in depressive symptomatology. The perception of *support/depth* in relation to the father appears as a predictor of depressive symptomatology ( $\beta = -.249, p < .01$ ), as well as the perception of *conflict with the mother* ( $\beta = .312, p < .01$ ). Both factors contribute significantly and independently to the prediction of depression. Therefore, we can observe that less perception of *support/depth* in relation to the father and greater *conflict perception with the mother* are associated with higher levels of depressive symptomatology. With regard to *PF* domains, results showed a significant model [ $R^2 = .099$ ;  $F_{(4, 428)} = 11.788, p < .01$ ], explaining 9.9% of the variance in depressive symptomatology. *School performance* comes across as a predictor of depressive symptomatology ( $\beta = .121, p < .01$ ), as well as the *relationship with family and friends* (respectively:  $\beta = .182, p < .01$ ;  $\beta = .151, p < .01$ ), contributing significantly and independently in the prediction of depression. Thus, low *school achievement* and poorer *relationships with family and friends* relate to higher levels of depressive symptomatology. Regarding the total score of *PF*, results revealed a significant model [ $R^2 = .076$ ;  $F_{(1, 432)} = 35.488, p < .01$ ], explaining 7.6% of the variance in depressive symptoms. The total score of *PF* showed to be predictive of depressive symptoms in adolescents ( $\beta = .276, p < .01$ ), contributing significantly and independently to the referred symptomatology. With regard to *satisfaction with functioning*, a significant model [ $R^2 = .169$ ;  $F_{(1, 432)} = 87.723, p < .01$ ] explaining 16.9% of the variance in depressive symptomatology was found, also revealing to be predictive of depressive symptomatology ( $\beta = .411, p < .01$ ). Therefore, worst *PF* and poor *satisfaction with functioning* are related to higher levels of depressive symptomatology.

### 3.4. Moderating analyses

Hierarchical multiple linear regressions were performed to explore the possibility of a moderating effect of *psychosocial functioning* (total note and respective domains) and of *satisfaction with functioning* on the relationship between the *quality of interpersonal relationships* and depressive symptomatology. Only statistically significant results of the moderations will be presented.

3.4.1. Study of the moderating effect of school performance on the relationship between quality of interpersonal relationships and depressive symptoms

With regard to *school performance*, analysis of the regression coefficients for *school performance (SP)*, for perception of *support/depth in relation to both parents* and perception of *conflict with the mother*, revealed no moderating effects. However, the interaction of the factor *conflict with the father* with *school performance* showed a significant effect ( $\beta = -.127, p = .007$ ). Both variables are, individually, predictors of depressive symptomatology (*conflict factor*:  $\beta = .242, p < .01$ ; *school performance*:  $\beta = .137, p = .003$ ) (cf. Table 2).

**Table 2.** Coefficients of regression for the three steps of the hierarchical multiple regression (N = 433)

Model	Predictors	$\beta$	t	p
1	P_Conflict	.242	5.178	.000
2	P_Conflict	.231	4.955	.000
	SP	.137	2.948	.003
3	P_Conflict	.247	5.302	.000
	SP	.143	3.084	.002
	P_Conflict*SP	-.127	-2.728	.007

Variables *conflict with the father* and *school performance* were inserted into distinct steps in the regression model, producing a statistically significant model [step 1:  $R^2 = .242, F_{(1)} = 26.808, p < .01$ ; step 2:  $R^2 = .278, F_{(2)} = 17.990, p < .01$ ]. In the third step, the interaction term was inserted and a statistically significant was also obtained, with a slight increase in  $R^2$ , that is, an increase in the variability explained with regard to depressive symptomatology [ $R^2 = .093, F_{(3)} = 14.654, p < .01$ ]. The interaction term suggests that there is a moderating effect of *school performance* on the relationship between the perception of *conflict with the father* and depressive symptoms. In this way, it was found that the interaction term is a significant predictor, explaining 9.3% of variance (cf. Table 3).

**Table 3.** Model of the three steps of the hierarchical multiple regression, with the factor of conflict with the father as a predictor of depressive symptoms and the SP (school performance) as moderator (N = 433)

Model	F	p	R	$R^2$
1	26.808	.000	.242	.059
2	17.990	.000	.278	.077
3	14.654	.000	.305	.093

To better understand the moderation effect, a graphic of the results was obtained (cf. figure 1). Two levels were considered for the *factor conflict* (below and above average) and also for *school performance* (if we tried to put 3 levels for *school performance* with the criterion of the low level to be up to  $M - 1 SD$ , we would influence the interpretation of the chart, since the data was not likely to meet in the previously mentioned level). Having into account the main effects, it is possible to verify that lower levels of conflict and higher levels of *school performance* are related to less depressive symptoms.

With regard to interaction, we can say that a low perception of *conflict in relation to the father* and a *high school performance*, predict lower levels of depressive symptoms compared to a poor *school performance*. However, when the perception of *conflict in relation to the father* is high, besides the existence of a tendency towards higher levels of depressive symptoms regardless of *school performance*, these two levels of *school performance* tend not to differentiate in the

prediction of depressive symptomatology. Therefore, when perception of *conflict* is high, this is the predominant factor in determining greater depressive symptomatology, with *school performance* values (low or high) tending to have relatively similar effects at the level of these symptoms. It can also be observed that lower values of *conflict with the father* and good *school performance* can serve as a protective factor of depressive symptomatology.

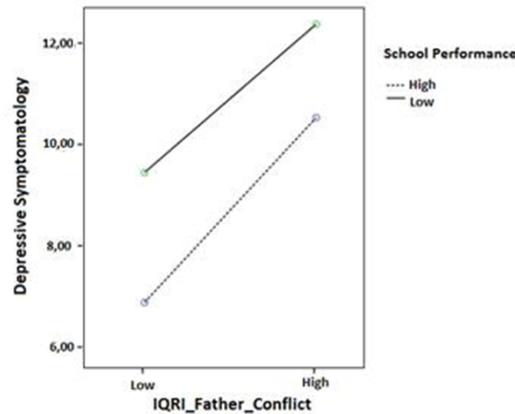


Fig. 1. Graphic representation of the moderating effect of SP (school performance) on the relationship between the factor conflict with the father and depressive symptoms

#### 3.4.2. Study of the moderating effect of satisfaction with functioning on the relationship between quality of interpersonal relationships and depressive symptomatology

Regarding *satisfaction with functioning*, analysis of regression coefficients, for the perception of *support/depth in relation to both parents* and perception of *conflict with the mother*, showed that there were no moderating effects. However, the factor *conflict with the father* in interaction with *satisfaction with functioning* revealed a significant effect ( $\beta = -.095$ ,  $p = .030$ ). Both variables independently are equally predictors of depressive symptomatology (*factor conflict*:  $\beta = .242$ ,  $p < .01$ ; *satisfaction*:  $\beta = .381$ ,  $p < .01$ ) (cf. tabel 4).

Table 4. Coefficients of regression for the three steps of the hierarchical multiple regression (N = 433)

Model	Predictors	$\beta$	$t$	$p$
1	<i>P_Conflict</i>	.242	5.178	.000
2	<i>P_Conflict</i>	.177	4.033	.000
	<i>Satisfaction</i>	.381	8.686	.000
3	<i>P_Conflict</i>	.192	4.344	.000
	<i>Satisfaction</i>	.377	8.638	.000
	<i>P_Conflict*Satisfaction</i>	-.095	-2.176	.030

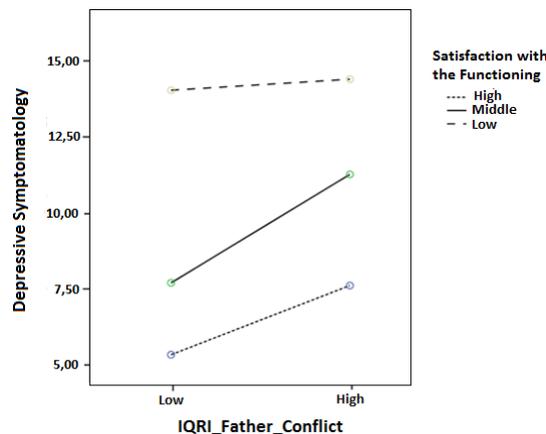
The *factor conflict with the father* and *satisfaction* were included in the regression model in distinct steps, producing a statistically significant model [step 1:  $R^2 = .242$ ;  $F_{(1)} = 26.808$ ,  $p < .01$ ; step 2:  $R^2 = .447$ ,  $F_{(2)} = 53.450$ ,  $p < .01$ ]. In the next step, the interaction term was inserted, obtaining a statistically significant model, with a slight increase in  $R^2$  [ $R^2 = .456$ ,  $F_{(3)} = 37.521$ ,  $p < .01$ ], that is, there was an increase in the variability explained in regard to depressive symptomatology. The analysis of the interaction term suggested the existence of a moderating effect of *satisfaction with functioning* on the relationship between the perception of *conflict with the father* and depressive symptomatology. In this way, it was found that the interaction term is a

significant predictor, explaining 20.3% of the variance (cf. Table 5).

**Table 5.** Model of the three steps of the hierarchical multiple regression, with the factor conflict with the father as a predictor of depressive symptomatology and satisfaction as moderator (N = 433)

Model	F	p	R	R <sup>2</sup>
1	26.808	.000	.242	.059
2	53.450	.000	.447	.196
3	37.521	.000	.456	.203

To better understand the effect of moderation, a graphic of the results was computed (cf. figure 2). Two levels were considered for the *factor conflict* (below and above average) and three levels for the *satisfaction* (low: till  $M - 1 SD$ ; medium: between  $M - 1 SD$  and  $M + 1 SD$ ; and high: above  $M + 1 SD$ ). Having into account the main effects, it is possible to verify that lower levels of *conflict with the father* and higher and medium levels of *satisfaction with functioning*, are related to lower levels of depressive symptomatology. With regard to the interaction, we can say that when perception of *conflict with the father* is low, medium and high levels of *satisfaction with functioning* tend not to differentiate, leading to lower levels of depressive symptoms, compared with low levels of *satisfaction*. However, when perception of *conflict* is higher, depressive symptomatology tends to be similar when *satisfaction* is low or medium. Low scores on factor *conflict with father*, as well as high levels of *satisfaction*, can function as a protective factor of depressive symptomatology. The same is not true when perception of *conflict* is high, where low and middle levels of *satisfaction*, boost depressive symptomatology. When perception of *conflict with the father* is high, *satisfaction with functioning* assumes great importance in the prediction of depressive symptomatology, since low and middle levels of *satisfaction* tend to be similar in predicting high scores of depressive symptoms in adolescents.



**Fig. 2.** Graphic representation of the moderating effect of satisfaction with functioning on the relationship between the factor conflict with the father and depressive symptomatology

#### 4. Discussion

Literature has shown that lack of *quality in interpersonal relationships (IQRI)* can contribute to deficit conditions on adolescents' mental health (Kenny et al., 2013), limiting *psychosocial functioning* at the level of *school performance, relations with family and friends*, as well as at the level of *satisfaction with life* (Greer, Kurian & Trivedi, 2010). Social support and *psychosocial*

*functioning* have been indicated as significant predictors of depression (Costello et al., 2001; Nilsen et al., 2013; Singh et al., 2015). Most research on depression considers gender as an important variable to be measured, since there are significant differences between genders in relation to the prevalence and manifestation of this disruption (Nolen-Hoeksema & Girgus, 1994; Twenge & Nolen-Hoeksema, 2002).

The present research aimed to study the moderating effect of *psychosocial functioning* on the relationship between *quality of interpersonal relationships* and depressive symptomatology, in a sample of Portuguese adolescents.

It should be noted that, with regard to gender differences, it was found that girls show higher *levels of depressive symptoms* in relation to boys. This conclusion goes accordingly to literature findings (Nolen-Hoeksema & Girgus, 1994; Twenge & Nolen-Hoeksema, 2002). With regard to *IQRI* factors, it was found that girls' perception of *support/depth* in relation to the mother is higher than boys' perception, which corroborates the results of another study (Pinheiro et al., 2013). For the remaining factors of the *IQRI* in relation to the father and the mother, no statistically significant differences were found, which does not corroborate the results of other studies indicating that boys reveal greater *conflict* relationships with the father and the mother (Matos et al., 2013; Pinheiro et al., 2013). With regard to *PF* domains, it was found that girls have worse *relationships with family members* and *friends* than boys, which confirms the results of other studies (e.g. Singh et al., 2015). Regarding *satisfaction with functioning*, the total score of *PF* and its domains, no statistically significant differences between genders were found. To the best of our knowledge, there are no investigations with which we can compare these results.

Results of regression analyses revealed that perception of *support/depth in relation to the father* and perception of *conflict with the mother* are independent and significant predictors of depressive symptoms, having found that *support/depth* is associated to less depressive symptomatology, while high levels of conflict are predictors of more depressive symptoms. These results meet the results found in previous studies (Marques, Matos & Pinheiro, 2014; Marques, Pinheiro, Matos & Marques, 2015; Matos, Pinheiro & Marques, 2013; Pinheiro, Matos & Marques, 2013). Regarding the association between *PF* and depressive symptomatology we can conclude that better *relations with family* and *friends*, as well as better *school performance*, are predictors of less depressive symptomatology. These results corroborate results found in previous studies (Greer et al., 2010; Judd, Akiskal, Zeller et al., 2000; Lewinsohn et al., 1995). It would be expected that participation in *recreational activities* was also related to depressive symptoms, since studies have shown that a greater number of pleasurable activities are associated with less depressive symptomatology in adolescents (Gledhill & Garralda, 2010), but that was not the case. Concerning the total score of *PF* and *satisfaction with functioning*, results showed that both variables significantly and independently predict depressive symptomatology. Therefore, worst *PF* and poorer *satisfaction with functioning* are related to higher levels of depressive symptomatology, corroborating previous studies results (Costello et al., 2001; Greer et al., 2010; Nilsen et al., 2013; Singh et al., 2015).

It was subsequently examined the moderating effect of *PF* and of *satisfaction with functioning*, in the relationship between *quality of interpersonal relationships* and depressive symptomatology. Results revealed, by the analysis of the interaction term, a non-statistically significant moderation effect of *PF* total score. Before this result, it was important to conduct more tests to check if there was a moderating effect of the multiple domains of *PF*. With regard to *PF* domains, *relationships with family* and *friends* and *recreational activities*, analysis of the interaction term suggested that there was no moderating effect.

With regard to the interaction between the *factor conflict with the father* and *school performance*, there was a significant moderating effect of *school performance*. A low perception of *conflict with the father* and a high *school performance* predict lower levels of depressive symptoms,

compared with poor *school performance*. When perception of *conflict in relation to the father* is high, this is the predominant factor in determining greater depressive symptomatology, with *school performance* values (low or high) tending to have relatively similar effects at the level of these symptoms. Thus, lower values of *conflict with the father* when associated with high levels of *school performance*, can serve as a protective factor of depressive symptomatology. With regard to the other factors of the *IQRI* (father and mother versions), no moderating effect of *school performance* was found.

Finally, we analyzed *satisfaction with functioning* (evaluated by the adolescent) as a moderator variable in the relationship between the various factors of the *IQRI* (father and mother versions) and depressive symptomatology. A moderating effect was found in the sense that when perception of *conflict with the father* is low, medium and high levels of *satisfaction* tend not to differentiate, leading to lower levels of depressive symptoms, compared with low levels of *satisfaction*. However, when perception of *conflict* is high, depressive symptomatology tends to be similar regardless of *satisfaction* values. We can see that low scores on the *factor conflict with the father*, as well as high levels of *satisfaction*, can function as a protective factor of depressive symptomatology. The same is not true when the *factor conflict* is high, where medium and low levels of *satisfaction* can boost depressive symptoms. When perception of *conflict with the father* is high, *satisfaction with functioning* assumes great importance in the prediction of depressive symptoms, since low and middle levels of *satisfaction* tend to be similar in the prediction of higher scores of depressive symptoms in adolescents. Regarding the other factors of the *IQRI* (father and mother versions), a moderating effect of *satisfaction with functioning* was not found. After an extensive literature search, it was found that no other studies relate to the moderating effect of *PF* and *satisfaction with functioning* in the relationship between the *IQRI* and depressive symptomatology. Thus, this research becomes fundamental as it can serve as a driving force for future studies.

The present study presents some limitations that should be taken into account in the interpretation of the results. Since the investigation followed a transversal *design*, it does not allow to draw causality conclusions. We suggest that future research carry out a longitudinal design. In addition to this fact, the sample was collected only in certain geographical areas of the country (North and Center) and involved only non-clinical population not allowing the generalization of results for all adolescents and for clinical population. The absence of significant results may be due to the fact that this is a sample of the community, in which adolescents tend to have low depressive symptomatology and good indicators of quality of interpersonal relationships and psychosocial functioning, taking into account the range of possible scores. The time of completion of the research protocol was also long (about 45 minutes), which may influence adolescents' responses, since there is a likelihood of loss of concentration and motivation. Time of completion happens because the evaluation protocol of the broader research project in which the present study is inserted is constituted by various scales besides the ones used in this study.

It is important to note that results obtained in this study could be crucial to the development and improvement of programs of prevention of depression in adolescents, because they enhance the importance of implementing a parental component in this kind of programs.

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