

A New Approach to Explain the Link between Social Support and Depression in a 2-years Arthritis Rheumatoid Sample. Is there any Moderation Effect of Acceptance?

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ABSTRACT

This study is part of a longitudinal research aimed at analyzing the maintenance of negative emotional states in Rheumatoid Arthritis (RA) during the first 2 years of disease progression. The specific aims of the present study were to examine the associations between social support 1 year after RA diagnosis, acceptance and depression symptoms report 2 years after RA, and also examined the moderation effect of acceptance on the relationship between social support reported 1 year after RA diagnosis and depression 2 years after. The study has a longitudinal design. A battery of self-report questionnaires was completed by 55 individuals with early RA recruited from three health units in Portugal. Each participant completed an assessment battery that evaluated social support (AIMS2), depression (DASS) and acceptance (CPAQ). Data were analyzed with path models using *AMOS 18.0 software*. Social support 1 year after diagnosis directly correlate with depression report 2 years after RA diagnosis. Our results also show that acceptance was negatively associated with depression 2 years after the diagnosis. The path-analysis performed show that when the interaction between social support and acceptance was entered on the model, it produces a significant increase in the model prediction, showing an expressive depression. Acceptance seems to play a significant buffer effect on the relationship between social support 1 year after RA diagnosis on depression symptoms reported 2 years after the diagnosis. This means that it is mainly in those individuals with low levels of acceptance where the social support deficits impact on depression is greater.

Key words: social support, depression, acceptance, rheumatoid arthritis.

Rheumatoid Arthritis (RA) is a chronic disease which leads to high levels of pain, disability, impairment and handicap even early in the course of the illness (Sharpe, Sensky, & Allard, 2001). The multiple disturbing effects of RA on patient's physical, psychological and social functioning, such as the increased functional disability to perform everyday tasks, social, leisure and occupational activities, has been widely recognized (Griffith & Carr, 2001).

Physical deterioration is often associated with changes in mood, and rates of depression are higher in RA samples than in normal population (Covic, Tyson, Spencer, & Howe, 2006; Dickens, McGowan, Clark-Carter, & Creed, 2002; Sharpe *et al.*, 2001). By conservative estimates depression is two to three times more common in patients with

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RA than in general population (Regier, Boyd, Burke *et al.*, 1988). Besides depression is considered the result of chronic pain experience, no prospective study has investigated the causal nature of this association. Furthermore, some studies have also found its association with other factors such as the degree of physical disability (Hurwicz & Berkanovic, 1993; Katz & Yelin, 1994; Newman, Fitzpatrick, Lamb, & Shipley, 1989; Wolfe, Hawley, 1993), disease activity (Hurwicz & Berkanovic, 1993) and disease duration (Newman *et al.*, 1989), levels of social stress experienced and support available (Hurwicz & Berkanovic, 1993; Newman *et al.*, 1989).

A large body of research has examined the way social relationships provide support in times of adversity and although it is acknowledged that depression exists within a social context, literature knows more about the interpersonal mechanisms of pathology than does about the mechanisms that explain how social relationships get under the skin and influence individual pathology (Cohen, 2004; Cohen, Gottlieb, & Underwood, 2000).

Social support has been conceptualized as an important factor in physical and psychological well-being (Penninx, Van Tilburg, Deeg, Kriegsman, Broeke, & Van Eijk, 1997). Literature has also shown its importance in the way individuals deal with RA because in addition to loss of functionality, a chronic disease such as RA magnifies the stress of everyday life and creates new stresses for all family members. This increased stress may promote patient's needs for social support but may also affect those who are more able to provide them support (Newman, Fitzpatrick, Revenson, Skevington, & Williams, 1996).

The behavioral and emotional impact of social support on depression manifests itself through several processes. On one hand, social support can have a direct effect promoting an effective, open and non controlled contact with the present moment decreasing individual's tendency to ruminate about pain and physical limitation. On the other hand, social support can also promote the maintenance of the individual's significant activities and reinforces valued life activities. Connecting with the present moment willingly challenges RA individuals to consider what they want their life to stand for in different life domains (Hayes & Strosahl, 2004, pp.10-11)

A chronic pain disease such as RA may provide the sufferer with many occasions in which their responses to pain may move them away from health life functioning. They may evaluate their pain in a distressing way and take these evaluations to be true. They may also regard pain and other feelings as firm reasons to disengage from important valued aspects of their life, and act to control or avoid painful experiences despite the lack of positive effects these behaviors produce (Dahl, Wilson, Luciano & Hayes, 2005; McCracken & Eccleston, 2005).

Accordingly to Marroquín (2011), emotion regulation is a system of response to the environment with several influences that account for the effects of social support on depression. Although most of the regulatory strategies were firstly conceptualized as adaptive or maladaptive, there is increasing evidence that its adaptive or maladaptive nature depends on the context, including social context.

Although Gross' process model (Gross, 1998) is the most influential, a number of other approaches are also relevant to clinical phenomena. One way to look at the emotional regulation is in terms of approach and avoidance strategies. In fact, Hayes

and colleagues have emphasized maladaptive regulatory strategy such as experiential avoidance as the core problem most individuals face. Experiential avoidance is the attempt to resist contact with one's unwanted thoughts, feelings and sensations. However in the realm of thoughts and feelings, attempts to control unwanted private experiences is seen as the problem rather than the solution and create more problems than they solve (Bach, Moran, & Hayes, 2008; Hayes, Strosahl, & Wilson, 1999; Hayes, Wilson, Gifford, Follette, & Strosahl, 1996).

A number of studies with chronic pain samples have showed that acceptance of pain rather than avoidance of struggling for control is related to a better emotional, physical, social, and work-related functioning, and also related with a lower use of health services, in both cross-sectional (McCracken, 1998, 2007) and longitudinal studies (McCracken, & Eccleston, 2005; McCracken & Vowles, 2007, 2008; McCracken, Spertus, Janeck, Sinclair, & Wetzel, 1999; Nicholas & Asghari, 2006; Vowles, McNeil, Gross, McDaniel, & Mouse, 2007).

Acceptance is emerging as an important concept in how patients react and adapt to chronic pain conditions. This entails having contact with painful or discouraging experiences without their added influences on behaviors that lead to unnecessary avoidance, limit life and important goals. The same is to say that pain sensations even when intense, need not inhibit living a meaningful life, nor do they need to be fought against, ignored, suppressed or conquered before success can occur (Hayes, Strosahl, & Wilson, 1999). Acceptance provides clinical utility since there is an increasing supportive evidence that greater acceptance is associated with less disability, distress, a better future functioning and success at living according to own values (Dahl, Wilson, & Nilsson, 2004; McCracken, Carson, Eccleston, & Keef, 2004; McCracken & Eccleston, 2005; McCracken, Vowles, & Eccleston, 2005; McCracken & Gutiérrez-Martínez, 2011; McCracken & Yang, 2006).

Despite its importance, acceptance forms only a part of the broad concept of psychological flexibility, and our research was just focused on the two components of acceptance, e.g. activity engagement and willingness to pain. The first component of acceptance concerns the pursuit of daily live activities even when pain is being experienced. This component involves more than just a mental process because it requires that the individual engage in functional and positive activities under the influence of pain. The second component requires the recognition that attempts to prevent or control unwanted internal experiences are ineffective strategies (Kashdan, Morina, & Priebe, 2008; McCracken & Eccleston, 2003; McCracken & Vowles, 2008; McCracken, Vowles, & Eccleston, 2004; Páez, Luciano, Gutiérrez-Martínez, *et al.*, 2008; Ruiz, 2010).

Previous research in chronic pain, but not with RA samples, has suggested that acceptance may be a key process involved in behavioral change (Vowles, McNeil, Gross, McDaniel, & Mouse, 2007). In fact, some authors have pointed out that acceptance predicts lower pain intensity, less anxiety and avoidance, less depression, less physical and psychological disability, more daily uptime and also a better work status (McCracken, 1998; McCracken, 1999; McCracken & Eccleston, 2005).

The relationship between social support and acceptance of pain is probably complex and bidirectional. It is possible to emphasize several ways through which

this relationship occurs. One possible way of social support that influences acceptance promoting the contact with the present moment, which involves taking a stance of non-judgmental awareness and actively embracing the experience as it occurs, “to take what is offered” (Hayes & Strosahl, 2004, pp.7). This allows the patient to take advantage of its positive processes, such as family member’s interactions, contingency management by family and also the maintenance of valued activities. These processes are known as having a protective effect on depression. Another possible pathway is the acceptance of pain which by itself facilitates the use of contextual features available.

Although social support is widely considered to be protective against depression, the mechanisms through which it acts on depressive symptoms are not well known. Considering this lack of knowledge, the present study intended to better understand potential moderation processes of the relationship between social support and the particular case of depression.

Our aim was to examine the associations between social support deficits 1 year after RA diagnosis, acceptance and depression at 2 years of disease progression. As a hypothesis of the study we assume that social support deficits 1 year after diagnosis were positively associated with depression at 2 years of diagnosis. On the other hand, we also hypothesize that acceptance was negatively associated with depression 2 years after diagnosis. So, we should expect that individuals with lower acceptance display more symptoms of depression 2 years after diagnosis.

In addition, we sought to explore whether acceptance moderates the relationship between social support and depression in RA individuals. In the current study, acceptance is expected to buffer the relationship between social support deficits and depression. This means, it is expected that the influence of social support deficits in depression is more prevalent in individuals with low levels of acceptance. It is expected that both the social support and acceptance of pain have a direct effect on depression, but there is also an interaction effect that enhances the isolated effect of each one, and also contributes to the reduction of depression.

METHOD

Participants

Fifty five subjects from three Portuguese health units were purposively sampled for the current study, between June 2005 and May 2010. Inclusion criteria included: (1) age of 18 years, or older; (2) RA diagnostic between 3 to 6 months at the time of the first evaluation, according to the American College of Rheumatology. Exclusion criteria included: (1) an identified terminal illness; (2) the presence of severe psychopathology; (3) included in any interdisciplinary treatment. This study is part of a broader study aimed at analyzing the maintenance of negative emotional states in RA. The first contact with participants was established by their General Practitioner or Rheumatologist, on the day of their appointment and the diagnosis was based on their medical records.

Instruments and Measures

All measures used in the current study were translated into Portuguese by a bilingual translator. Conceptual and lexical similarities of both original and Portuguese versions were verified through back translation procedures.

Demographic variables were assessed with a general checklist including patient gender, age, marital status, profession and years of education and clinical diagnosis. Each participant completed an assessment battery that included several self-report questionnaires:

The Arthritis Impact Measurement Scale 2 (AIMS2: Brandão, Zerbini, & Ferraz, 1995).

The AIMS2 is a self-administered instrument designed to measure the health status component of outcome in a multidimensional fashion using specific scales, summary components, and overall impact measures. AIMS2 instrument is a 78 item questionnaire. The first 57 items are broken down into 12 scales: mobility, walking and bending, hand and finger function, arm function, self-care tasks, household tasks, social activity, support from family and friends, arthritis pain, work, level of tension, and mood. Item 58 concerns respondent satisfaction as with each of the 12 health status scales. Item 59 asks respondents to report how much of their problem with any of these 12 areas is attributable to arthritis. Item 60 questions the patient to prioritize the 3 areas in which he/she would most like to see improvement. Items 61-65 ascertain general perceptions of current and future health. Item 66 estimates the overall impact of arthritis. Items 67 and 68 allow the patient to identify the type and duration of her/his arthritis. Item 69 provides an estimate of medication use. Items 70-72 explore for comorbidity and, items 73-78 deal with demographics. The AIMS scales are scored in a consistent fashion so that a low value indicates a high health status. Factor analyses have shown that the 9 original AIMS scales could be combined into 3 or 5 component models of health status. The 3 component model groups the AIMS measures into a general categories of physical function, affect and symptoms, while the 5 component model combines the AIMS scales into measures physical function, affect, symptom, social interaction and role. Only the social interaction was used for purposes of the present study. This component was composed by social activity and support from family items. Only the social interaction component was used on the present study as a measure of social support, showing an internal consistency, Cronbach's alpha of .83. The test-retest reliability was .56 (6 months between the test and the retest), .78 (1 year) and .57 (2 years).

Chronic Pain Acceptance Questionnaire (CPAQ; McCracken, Vowles, & Eccleston, 2004; translation and adaptation: Costa & Pinto-Gouveia, 2009). CPAQ is a 20-item self-report questionnaire that assesses the acceptance to chronic pain. The questionnaire is comprised of two subscales, the pain willingness subscale and activity engagement subscale. A seven-point (from 0= Never to 6= Always) rating scale is used in each of the 20 items. The measure gives both total score (range from 0 to 156) and partial scores (range from 0 to 54, for the pain willingness subscale; 0 and 66, for the activity engagement subscale); higher results mean high pain acceptance. Cronbach's alpha was .82 and .78, for pain willingness and activity engagement, and correlations between scales of 0.36 (McCracken *et al.*, 2004). Validity has demonstrated by the correlations between pain acceptance, pain intensity, medical care, medication, physical functioning, psychological and social questions. The Portuguese adaptation has a Cronbach's alpha

of .89 for activity engagement, of .83 for willingness for pain and .86 for the total scale (Costa & Pinto-Gouveia, 2009). Validity of the Portuguese adaptation was demonstrated by the associations with psychopathology, self-compassion, experiential avoidance and rumination (Costa & Pinto-Gouveia, 2009). In our study the measure shows a high internal consistency (total scale Cronbach's alpha= .86).

Depression, Anxiety and Stress Scale (Lovibond & Lovibond, 1995; DASS: Pais-Ribeiro, Honrado, & Leal, 2004). DASS is a 42-item self-report measure, and comprised three subscales: depression, anxiety and stress. A four-point (1= It was not at all applied to me; 4= Most of the times were applied to me) rating scale is used in each of the 42 items. Each subscale score may range from 0 to 42; higher results mean greater negative emotional states. The Portuguese adaptation has a Cronbach's alpha ranged between .83 and .93 (Pais-Ribeiro, Honrado, & Leal, 2004). Validity of the Portuguese adaptation was demonstrated by the associations between items and the scales to which they belong and, by the lack of association between items and scales to which they do not belong (Pais-Ribeiro, Honrado, & Leal, 2004). Only depression items were used on our study, showing high internal consistency (Cronbach's alpha= .97). The test-retest reliability was .35 (6 months between the test and the retest), .80 (1 year) and .35 (2 years).

Procedure

This study is part of a broader study aimed at analyzing the maintenance of negative emotional states in RA (Costa 2011, unpublished manuscript). The study was conducted with the formal approval of the institutions. Participants were recruited by the general practitioner or the rheumatologist at the time of their appointment. If participants expressed interest, the researcher asked them to sign the consent form and gave them the questionnaire package. Completion of the questionnaires was anonymous and there was guarantee of confidentiality. Prior to the administration of measures, all participants were told about the purposes of the study. Measurement items were administered to the patients in a physician's office available in the presence of the researcher.

Participants were evaluated in three points of the time; the duration of the intervals was selected for both theoretical and practical reasons (i.e. 3 to 6 months; 1 year and 2 years). The duration of each session was between 60 and 120 minutes. The present study was based on the second and third evaluation performed. In the second evaluation each participant completed an assessment battery that included AIMS2 and DASS; in the third evaluation the participants completed AIMS2, DASS and CPAQ.

Design and data analysis

The study has a longitudinal design with self-reports measures. To investigate the relationships between social support 1 year after RA diagnosis, depression reported 2 years after and acceptance, Pearson Correlation Matrix was performed using PASW Statistics (v.18; SPSS Inc, Chicago, IL).

The moderation model was analyzed with path models using AMOS 18.0 software, an extension of multiple regression models. The moderation model has three causal paths that feed into the outcome variable of depression related two years after diagnosis: the

impact of the social limitation one year after the diagnosis as a predictor (Path a), the impact of acceptance as a moderator (Path b), and the interaction or the product of these two (Path c). The moderator hypothesis is supported if the interaction (Path c) is significant (Figure 1).

In addition to these basic considerations, it is desirable that the moderator variable be uncorrelated with both the predictor and the dependent variable to provide a clearly interpretable interaction term (Baron & Kenny, 1986). There are three types of moderator effects according to Sharma, Durand, and Gur-Arie (1981). The first type of moderator effect is called a homologizer for which the true relation between the independent and the dependent variable does not change across levels of the moderator. The second and third forms of moderator effects change the form of the relation between the independent and the dependent variable. If the moderator variable is also a significant predictor of the dependent variable, the moderator variable is called a quasi-moderator, the second type of moderator. If the moderator variable is not a significant predictor of the dependent variable it is called a pure moderator, the third form of a moderator (MacKinnon, 2008).

Another property of the moderator variable is that moderators and predictors are at the same level in regard to their role as causal variables antecedents to certain criterion effects. The same is to say that the moderator variables always function as independent variables (Baron & Kenny, 1986).

In our study, the independent variable was social support as measured by AIMS2 (Brandão, Zerbini, & Ferraz, 1995). The dependent variable was depression, measure by DASS (Lovibond & Lovibond, 1995; DASS: Pais-Ribeiro, Honrado, & Leal, 2004). Acceptance was assumed to be the moderator and was measured using the CPAQ (McCracken, Vowles, & Eccleston, 2004; translation and adaptation: Costa & Pinto-

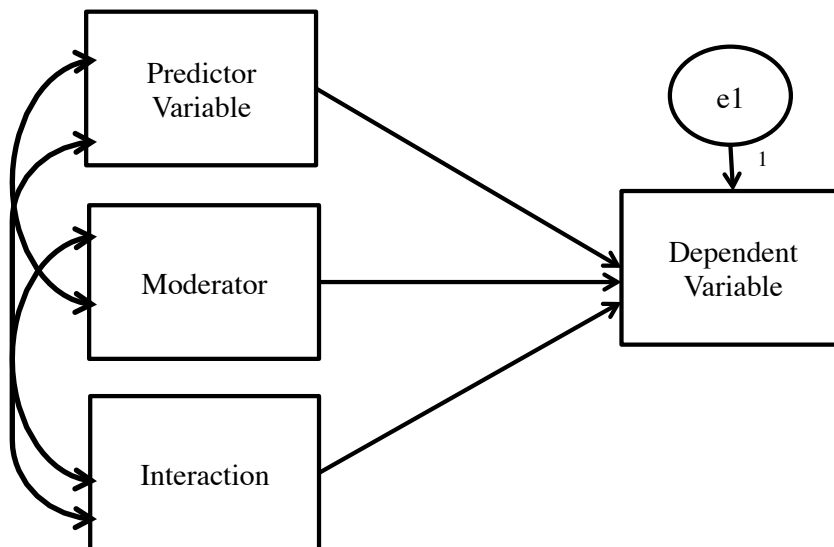


Figure 1. The Moderation Model.

Gouveia, 2009). Besides the independent variable (i.e. social support) and the moderator variable (i.e. acceptance) were evaluate in different times (i.e a year after RA diagnosis and 2 years after the diagnosis), both were consider at the same level in regard to their role as causal variables antecedent to depression effects (i.e. the dependent variable).

RESULTS

From the 60 patients with RA recruited from the specialist for the longitudinal study, 1 was excluded because of the co-morbidity of severe psychopathology (psychosis) and 4 declined to take part. As such, 55 participants gave their informal consent. There were no differences between those who declined to take part in the study and our sample.

The sample included 55 adults (11 male; 44 female participants) with RA, with a mean age of 52.82 years old ($SD= 18.86$) and 55.93 years old ($SD= 17.84$), for males and females respectively. Table 1 presented descriptives. Concerning marital status, 80% of the participants were married or in a relationship, 5.5% were single, 5.5% were divorced and 9.0% were widows. Concerning the professional situation, 30.9% of patients were retired and 69.1% were employed. The mean of educational background was 6.18 years of education ($SD= 3.03$) for males and 6.68 years of education ($SD= 4.36$) for females. The educational background demonstrates no associations with AIMS2, CPAQ and DASS.

Prior to analyses the original data were carefully screened for multivariate, univariate normality and outliers. Skeweness and Kurtosis are two ways that a distribution can be nonnormal. Our results showed that the absolute values of the standardized Skeweness and Kurtosis did not showed severe biases (Skeweness $< |3|$ and Kurtosis $< |10|$ some authors consider that the variables are near to the normal distribution) (Kline, 1998). Outlier's analysis was performed with Mahanalobis Distance- MD^2 (i.e. $p_1; p_2 < .05$, as a possible outlier). MD^2 suggested possible outliers observations. Those observations were not deleted, because they are a source of variability related to the phenomena under study. The means, standard deviations, Skeweness, Kurtosis and Cronbach alfa for the variables in study are showed in Table 2.

Table 1. Sample demographic characteristics.

| | | Male (n= 11) | Female (n= 44) |
|-----------------------|--------------------|---------------|----------------|
| Marital state | Single | 1.8% | 3.6% |
| | Married | 16.4% | 63.6% |
| | Separate/ divorced | 1.8% | 3.6% |
| | Widower | - | 9.0% |
| Profession | Employed | 16.4% | 52.7% |
| | Reformed | 3.6% | 27.3% |
| Socio-economic status | Low | 14.5% | 54.5% |
| | Middle | 5.5% | 25.5% |
| Age | Mean (SD) | 52.82 (18.85) | 55.93 (17.83) |
| Education | Mean (SD) | 6.18 (3.02) | 6.68 (4.35) |

Table 2. The means, Standard Deviations, Skewness, Kurtosis and Cronbach alfa for the variables in study.

| | <i>M</i> | <i>SD</i> | Minimum- Maximum | <i>Skewness</i> | <i>Kurtosis</i> | K-S | <i>p</i> |
|----------------------------|----------|-----------|---------------------|-----------------|-----------------|-------|----------|
| Social Support (1 year) | 12.03 | 3.13 | 6-22.50 | .632 | 1.215 | .917 | .277 |
| Depression (2 years) | 5.927 | 9.959 | 0-39 | 2.218 | 4.402 | 2.120 | .000 |
| Acceptance (2 years) | 59.96 | 13.26 | 24-88 | -.659 | 1.149 | .979 | .293 |

Table 3 illustrates the Pearson Correlations between social support 1 year after RA diagnosis and depression 2 years after. The Pearson correlations showed that social support deficits 1 year after the diagnosis were positively and moderately correlated with depression report 2 years after RA diagnosis ($r = .467$; $p \leq .001$). Table 3 illustrates the Pearson Correlations between acceptance and depression 2 years after RA diagnosis. Results showed that acceptance was negatively and highly correlated with depression symptoms reported 2 years after diagnosis ($r = -.694$; $p \leq .001$).

In the first model we explored the effect of social support deficits 1 year after the diagnosis on depression report 2 years after RA diagnosis. The model consists of two observed variables; the independent exogenous variable is social support and the dependent endogenous variable is depression. Figure 2 represents the final model with the standardized path coefficients and the estimated standard error. Table 4 shows the standardized coefficients of the model. The path coefficient was statistically significant ($p < .05$).

The analysis converged to an admissible solution. The model accounts for 22% of depression variance scores. As we can observe (Figure 2), the final model indicates

Table 3. Correlation (and statistical significance) between Social Support, Acceptance and Depression.

| | Depression (2 years) | Acceptance (2 years) |
|-------------------------|----------------------|----------------------|
| Social Support (1 year) | .467 (.000) | -.227 (.095) |
| Acceptance (2 years) | -.694 (.000) | -- |

Table 4. Standardized coefficients of the three models tested.

| | | Estimate | S.E. | C.R. | <i>p</i> |
|--------------|---|----------|------|--------|----------|
| First Model | Depression (2 years) ← Social Support Deficits (1 year) | .467 | .382 | 3.882 | .001 |
| Second Model | Depression (2 years) ← Social Support Deficits (1 year) | .326 | .287 | 3.613 | .001 |
| | Depression (2 years) ← Acceptance (2 year) | .620 | .068 | -6.862 | .001 |
| Third Model | Depression (2 years) ← Social Support Deficits (1 year) | .228 | .266 | 2.725 | .006 |
| | Depression (2 years) ← Acceptance (2 years) | -.606 | .060 | 7.581 | .001 |
| | Depression (2 years) ← Interaction | -.219 | .018 | -3.887 | .001 |

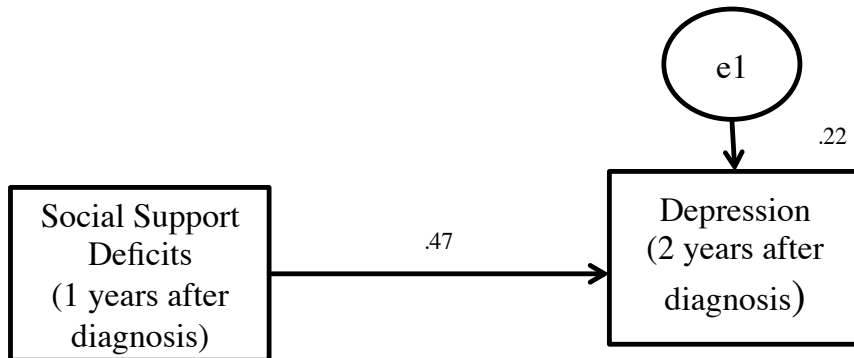


Figure 2. The effect of Social Support (1 year after the diagnosis) on Depression (2 years after RA diagnosis).

a direct effect of social support deficits (1 year after diagnosis) on depression (2 years after RA diagnosis) of .47.

A second model explores the effect of social support deficits 1 year after the diagnosis and acceptance on depression reported 2 years after RA diagnosis. This model consists of three observed variables: the independent exogenous variable is social support (1 year after diagnosis) and acceptance (2 years after); the dependent endogenous variable is depression (2 years after RA diagnosis) (Figure 3). The model accounts for 58% of the variance scores of depression. As can be observed in Figure 3, the final model indicates

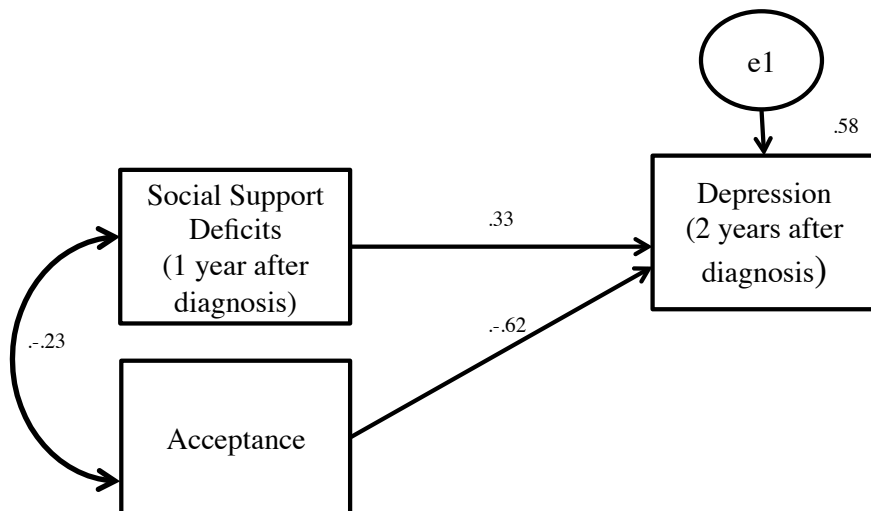


Figure 3. The effect of Social Support (1 year after the diagnosis) and Acceptance on Depression (2 years after RA diagnosis).

a direct effect of social support deficits (1 year after diagnosis) on depression (2 years after RA diagnosis) of .33 and also a direct effect of acceptance on depression of -.62.

Finally, a third model was performed to explore the moderate effect of acceptance in the relation between social support deficits 1 year after the diagnosis on depression report 2 years after RA diagnosis. We proposed a causal model of social support deficits (1 year after diagnosis) with direct effects on depression (2 years after RA diagnosis) moderate by acceptance. Figure 4 represent the final model with the standardized path coefficients and the estimated standard error. Table 4 shows the standardized coefficients of the model with all path coefficients statistically significant ($p < .05$).

All path coefficients were statistically significant ($p < .05$). Final model accounts for 67% of depression variance scores. Final model indicates a direct effect of social support deficits (1 year after diagnosis) on depression (2 years after RA diagnosis) of .23 and also a direct effect of acceptance on depression of -.61. The moderation effect between the two variables was -.32.

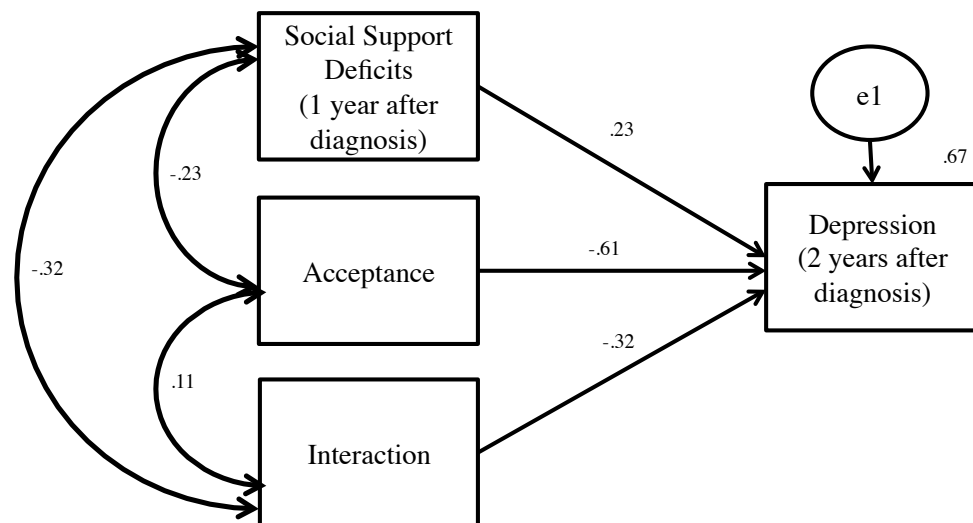


Figure 4. The effect of Social Support (1 year after the diagnosis), Acceptance and the Interaction factor on Depression (2 years after RA diagnosis).

DISCUSSION

The aim of the present study was to examine the associations between social support 1 year after RA diagnosis, acceptance and depression symptoms 2 years after diagnosis. Our study also explored the moderation effect of acceptance on the relationship between social support 1 year after RA diagnosis and depression 2 years after.

Our first prediction was that social support 1 year after diagnosis would directly correlate with depression report 2 years after RA diagnosis. Studies about stress in general give indirect support on the benefits of supportive relationships, with evidence that social relationships provide support in times of adversity, being positively related to physical and mental health, including depression (Cohen, 2004; Cohen, Gottlieb, & Underwood, 2000).

Our results show that social support deficits 1 year after RA diagnosis were positively associated with depression 2 years after diagnosis. That is to say that individual with high deficits on social support 1 year after the diagnosis also report high levels of depression after the 2 years assessment. This probably means that individuals, who have deficits on social support 1 year after RA diagnosis in addition to the loss of functionality, tend to conceptualise themselves with evaluative self-referential relations like “I am a sick person”, “I am an invalid person”, “I am a limited person”. They also tend to describe the ongoing experience in terms of self; this means that the experience becomes fused with content that they used to define and describe themselves (conceptualized self). In fact, thoughts about the self, rise up to the level of a story that contains itself several details, a cause-effect relationship, an explanation about contemporary behaviour (Hayes & Strosahl, 2004, pp.8-9). As Hayes *et al.* (1999) say “we humans do not merely live in the world, we live in the world as we interpret it, construct it, view it or understand it, (...) derived stimulus relations dominate over other behavioural processes (pp.181-182). This data corroborates our prediction and was in accordance to previous studies related to psychosocial factors in RA and also with studies on depression prevalence (Dickens, McGowan, Clark-Carter, & Creed, 2002; Nicassion, 2010; Sharp, Sensky, & Allard, 2001). In fact, literature has shown strong relations between social support and better psychosocial adjustment, in both cross-sectional and longitudinal studies with different RA durations (Evers, Kraaimaat, Geenen, & Bijlsma, 1998; Newman *et al.*, 1996). Literature has also shown that social support resources influence health in patients with chronic diseases, promoting skills to deal with symptoms and related stress.

In a longitudinal study conducted on a 91 RA patients with the aim of examining determinants of psychological and its course, Evers, Kraaimaat, Geenen e Bijlsma (1997) found that gender, pain and functional status, disease impact on daily life, life events, and perceived social support were related to psychological distress (anxiety and depression) shortly after diagnosis and coping strategies were related to distress levels only 1 year later. Multiple regression analysis of change in anxiety and depressed mood revealed that a decrease of psychological distress after 1 year could be predicted by males, an initially less severe inflammatory activity and an initially more extended social network. In addition, a decrease in distress was related to improvements in clinical status. Evers *et al.* (1997) results focus the importance of a demographic, clinical, life stressors and social resources multimodal assessment for understand distress and identify risk factors in the first stage of disease. Results also indicate that personal coping resources appear to become more important predictors of distress later in disease.

Our results also show a meaningful and negative association between social support deficits 1 year after RA diagnosis and acceptance. That is to say that individuals with high deficits on social support 1 year after RA diagnosis report low levels of

acceptance. This means that individuals, who feel lonely, ignored, frustrated and also have low levels of acceptance, will react with avoidance and fusion against unwanted private experiences. The disease and their thinking about it become so fused that it become inseparable. Their basic beliefs about what goes on in a good life plan can often be turned into life suppressing rules form. However individuals seem to interact more with the products of thinking than with the process that underlie thinking (Hayes & Strosahl, 2004).

A major theme put forward into our study is that attempts to control negatively valued aspects of experience may increase suffering in some contexts. Instead of relieving or controlling adverse private events such as pain or the perceived threat, patients must accept those experiences and focus on long term meaningful goals. Medical conditions such as chronic pain fit readily into an experiential avoidance perspective. Because some of the special properties of language, we attempt to avoid thoughts of an adverse event such as pain, as we attempt to avoid the aversive event itself. Further, any event, thought or activity related to will also begin to be avoided but the unwillingness to remain mindful of pain can have serious consequences (Dahl, 2009; Páez *et al.*, 2008).

These results are consistent with the idea that one possible psychological process that relate social support and acceptance might be the fact that acceptance promotes the contact with the present moment, allowing the individual to take better advantage of its positive processes such as the interactions with family members.

In addition, our results show that acceptance is negatively associated to depression 2 years after RA diagnosis. That is to say individuals with low levels of acceptance report high symptoms of depression. These data is consistent to our predictions and is also in accordance to previous studies that have already suggested the associations between acceptance and a better emotional, physical and social functioning, less care and medication uses and a better work status (McCracken, 1998; McCracken, Carson, Eccleston, & Keef, 2004; McCracken & Eccleston, 2003; McCracken & Gutiérrez-Martínez, 2011; McCracken, Spertus, Janeck, Sinclair, & Wetzel, 1999; McCracken, Vowles, & Eccleston, 2005; Viane, Crombez, Eccleston, *et al.*, 2003). So, willingness to experience pain and to engage in activities regardless pain may lead RA patients to a more healthy life functioning. In fact, struggling with pain often intensifies the focus on pain and interferes with daily life more consistently according to one's values. From this perspective, the road to psychological health involves consistently orienting chronic pain patients towards living a more valuable life on the long run. This is to say that it helps patients to let go of this struggle with pain to start living here and now, in pursuit of valued directions (Dahl, 2009).

As McCracken and Eccleston (2005) point out, acceptance may be a limited word for all that it implies. As it is currently conceptualized it includes patients seeing thoughts about disease as just thoughts, being present with potentially disturbing thoughts, feelings and bodily sensations without defense or struggling, and choosing actions that move them toward things they most value in life in the presence of these unwanted internal experiences.

Taking into account this data and recent findings suggesting that patients with high levels of acceptance have a low growth rate of depression through time even

when pain and physical limitation are in progress (Pinto-Gouveia, Costa, & Maroco, 2012, submitted), we further investigated whether acceptance has a buffer effect on relationship between social support deficits 1 year after RA diagnosis and depression 2 years after RA.

The path-analysis performed to explore the effect of social support deficits 1 year after the diagnosis on depression reported 2 years after RA diagnosis, show that social support deficits (1 year after diagnosis) account for 22% of the variance scores of depression (2 years after RA diagnosis). When acceptance was add in the model, variance scores of depression increases for 58%. Finally, when the interaction is add in the final model variance scores of depression increase for 67%. Path-analysis results show that acceptance is the best predictor of depression symptoms reported 2 years after RA diagnosis with a β value of $-.62$. When the interaction between social support deficits and acceptance was entered on the model, it produces a significant increase in model prediction, showing a significant effect on depression. This means that it is mainly on those individuals with low levels of acceptance where the impact of social support deficits on depression is higher.

Besides more research is needed on the basic question of how this emotional regulation process is influence by social support, our study adds to previous knowledge concerning the relation between social support deficits and depression by suggesting that acceptance has a significant moderator effect on this relationship.

It is a shared goal to understand how social sources can interact to treat or prevent depression on RA context, but this effort requires a clear understanding of how pathology can be influence from the outside.

The notion that this process of emotion regulation may be subject to several social influences and these influences may account for social support effects on depression have important implications on early RA management. On the one hand, it is possible to suggest a helix development in which acceptance enables contact with the present moment and a better use of the available resources. Also, the use of the available social resources promotes acceptance of pain and limitation. On the other hand, acceptance and social support enhance each other through the helix as protectors of depression. Our results provide further indirect support on the road to such interpretation, showing that the influence of social support deficits on depression is high on individuals with low levels of acceptance.

The development of depression in these individuals confirms the inability of this group of patients to recognize its disease, accept it and continue to function in spite of it. Emotions tell us our needs, they motivate ourselves to make changes but this study showed that RA individuals, who find themselves overwhelmed by their emotions, fearful of their feelings and unable to deal with, have high levels of depression. They believe their feelings and sensations prohibit effective behavior.

It has been widely proved that Acceptance and Commitment Therapy (ACT) based interventions have benefits on emotional, physical and social functioning of patients with different chronic pain conditions by increasing psychological flexibility; this means, the ability to act effectively in accordance with personal values and goals besides potential interfering thoughts and feelings. The current findings therefore shed light on the role

of low levels of acceptance or flexibility in conditions of low social support showing that individuals with high levels of acceptance even with few social resources can use them, because social support resources are able to bring them into the present moment. On the other hand, individuals with low social support and low levels of acceptance are fused to the evaluations of themselves as a disabled, limited or dependent person.

ACT is a model of therapy, not a specific protocol, and the expressed goal is not to reduce symptoms such as pain, physical limitation, depression, but to improve functioning by increasing psychological flexibility, or the ability to act effectively according to personal values, even in the presence of negative experiences such as pain. There is a broader research supporting ACT's fundamental processes, and preliminary evidence regarding their mediational role in ACT outcomes. Literature shows at least 11 clinical trials, including several that are randomized and controlled, showing that ACT improves outcomes in several chronic pain samples, particularly on functioning and mood, although pain severity may be less affected. Research also shows that ACT is better than the waiting list or no treatment and displays comparable results to cognitive behavioral therapy (Society of Clinical Psychology, 2012).

ACT based psychopathology model is not based on formal diagnosed *per se* but on the functional dimension of experiential avoidance. Acceptance involves taking an intentionally open, receptive and nonjudgmental posture with respect to different aspects of experience and fully experiences the most difficult internal events, in the service of a pursuit of our valued directions in life (Bach, Moran, & Hayes, 2008; Hayes, Strosahl, & Wilson, 1999).

Our data should be evaluated considering some methodological limitations. Firstly, acceptance was only evaluated in the third time of assessment. Secondly, the assessment of variables relied on participant's self reports may be particularly prone to bias. Finally, the use of a clinical sample with a specific chronic pain conditions reduces the interpretation problems of results focus on literature but cannot be generalized to other groups.

This research has highlighted influence of social support deficits on depression on individuals with low levels of acceptance. It seems possible to suggest a helix development in which acceptance enables contact with the present moment and a better use of the available social resources. Also, the use of the available social resources promotes acceptance of pain and limitation. Oppositely, acceptance and social support enhance each other protecting against depression.

Accordingly individuals with high levels of acceptance even with few social resources can use them, because social support resources are able to bring them into the present moment. Instead, individuals with low social support and low levels of acceptance are fused to evaluations of themselves as disable, limited.

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