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HEALTH PSYCHOLOGY | REVIEW ARTICLE

Resilience in chronic diseases: A systematic review

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Abstract: Resilience can be an important factor in health promotion. The aim of the present study was to carry out a review of the literature in the Pubmed and PsycINFO databases, using the descriptors “resilience” and “chronic disease”. The research contemplated publications conducted in the past 20 years from June 1993 to June 2013. Twelve articles that met the inclusion criteria were identified. These articles pointed towards a negative relationship between resilience and depression, anxiety, incapacitation, and somatization, and also found an inverse correlation between resilience scores and the progression of illness (activity of the disease, control of glycemic level, and severity of depression), and an association between resilience and quality of life and health promotional behavior. In conclusion, resilience may influence the process of illness and outcome in health. It is necessary to develop preventive interventions that allow protective factors for resilience to be developed, which could improve the outcomes in health.

Subject: Health and Social Care; Humanities; Medicine

Keywords: systematic review, chronic disease; resilience, stress, depression, anxiety, quality of life

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PUBLIC INTEREST STATEMENT

The article “Resilience in chronic diseases: A systematic review” conducts a review of the literature of the association between resilience and chronic diseases, such as: diabetes mellitus, rheumatoid arthritis, systemic lupus erythematosus, ankylosing spondylitis, cancer, depression, Parkinson’s, chronic kidney disease.

It was found that the persons who have the highest resilience scores had less depression, anxiety, incapacitation and somatization, frequent conditions in patients with chronic diseases. In addition, they presented better quality of life and health behavior and promotion, which is very important in treatment, since it may provide a higher level of well-being and adhesion to treatment.

Those with lower resilience scores experienced worsening of disease activity, difficulty in controlling glycemia, and in the severity of depression.

It was concluded that the resilience may interfere in the process of disease, and that it is necessary to develop interventions that could improve this capacity in patients.

1. Introduction

Resilience is a construct that concerns the human being's capacity to respond positively to the adverse situations an individual faces, even when these pose a potential risk to his/her health or development (Luthar, Cicinatti, & Becker, 2000; Rutter, 2006).

Masten distinguished three important aspects related to the dynamic process of resilience: (1) Individuals at risk showed better results than one expected. (2) Positive adaptation in spite of the experience of stress. (3) A good recovery from the trauma (Masten, Best, & Garmezy, 1990). To item three, Zautra, Arewasikporn, and Davis (2010) added the evidence of new learning, growth and development as consequences of adversity, allowing the individual to be transformed by going through the experience (Zautra et al., 2010).

In this article, resilience is considered the ability to have adaptive responses to adversity, such as in chronic diseases, and situations known to be generators of stress associated with this condition.

There has been growing interest in the potential influence of resilience on health, (Friendli, 2009; The Scottish Government, 2008) and major international funders, such as the Medical Research Council and the Economic and Social research Council in the UK, consider it an important factor for lifelong health and well-being (Medical Research Council, 2010).

Researchers have shown that 7 out of 10 consultations held in primary care concern chronic diseases (Veale, 2003) and therefore, their management has assumed an important role (Chapman, Perry, & Strine, 2005). Chronic diseases are defined by World Health Organization (WHO) as conditions of ill health that accompany the individual for a long period of time, produce incapacity, or residual disability caused by irreversible pathological alterations, demand rehabilitation, and follow-up over a long time, and may present periods of improvement and periods of worsening in acute stages (Barros, César, Carandina, & Torre, 2006). Chronic diseases are frequently accompanied by emotional disorders such as anxiety and depression, which cause psychological impact with harm to the patient's quality of life and well-being (Edward, 2013; Zautra, Johnson, & Davis, 2005). The financial overload resulting from functional limitation and possible social consequences of chronic disease has justified greater attention to the mechanisms of coping, and more recently to the study of the resources of resilience (Yeung, Arewasikporn, & Zautra, 2012).

There are studies that have suggested that resilience has an impact on the treatment of diverse chronic diseases, such as systemic lupus erythematosus (SLE), diabetes, rheumatoid arthritis (RA), juvenil idiopatic arthritis, Chagas disease, etc. (Cal & Santiago, 2013; DeNisco, 2011; Girtler et al., 2010; Mota, Benevides-Pereira, Gomes, & Araújo, 2006; Zautra et al., 2005).

The development of symptomatology in chronic diseases may be related to psychological processes, such as stress and resilience, and interfere in the functioning of the immune system, increase the body's vulnerability to the illness (Aspinwall & Tedeschi, 2010; Schiavone, Jaquet, Trabace, & Krause, 2013; Vuitton, de Wazières, & Dupond, 1999). These biologic, neuroendocrine and neural changes that accompany resilience may be associated with the effects of effective coping, leading to a self-efficacy in dealing with disease, and as social skills that improve the ability to use social support (Aspinwall & Tedeschi, 2010; Rutter, 2012).

Resilience implies resistance to environmental risk experiences or to stress and adversity, and it is related to individual differences in people's response to stress, besides the protective factors. The risk factors are the stressful occurrences of life, and in the case of chronic disease, in addition to these situations, the difficulty in dealing with them. Thus, on acceptance of one's limits and non-adhesion to treatment are considered risk factors that harm recovery. Moreover, there are social and economic conditions, such as unemployment and incapacitation, in addition to affective losses, depression, and anxiety (Rutter, 1987) that may consist of an emotional burden, and which demand constant care and adaptive processes.

These factors cannot be seen in isolation, but the interactions and processes of development must be considered (Rutter, 2006, 2012).

It is well known to researchers that protective factors involved in resilience, such as optimism and positive mood, self-esteem, self-care, independence, social support, and reduced anxiety, are related to the influence on health, including biologic processes such as neuroendocrine and immune function. Furthermore, there are meta-analyses that point out the relationship of these factors with the progression of disease, symptoms, and mortality (Chida & Steptoe, 2008; Grey, Boland, Yu, Sullivan-Bolyai, & Tamborlane, 1998; Howell, Kern, & Lyubomirsky, 2007; Rasmussen, Scheier, & Greenhouse, 2009).

Another study affirms that some patients have found the strength to face the disease in spiritual inspiration, with this being a protective factor for resilience in CDs (Sutanto et al., 2013).

However, the relationship between resilience (and not only protective factors) and health has not yet been sufficiently explored. This is so, not only with regard to the psychological and quality of life aspects, but also as regards the impact on physical health and disease progression.

The main objective of this study was to carry out a review of the literature about resilience and chronic disease (CD), and to identify whether resilience could have an influence on the process of illness and outcome in health, in addition to corroborating the public's understanding of the role played by psychology in mental-bodily health, especially as far as chronic diseases are concerned.

2. Methods

PRISMA guidelines (Moher, Liberati, Tetzlaff, & Altman, 2009) were used to conduct this review and the search was carried out by two independent reviewers in the following databases: Pubmed and PsychINFO, in which a search was conducted for studies published from June, 1993 up to June 2013, (the last 20 years) using the descriptors "resilience" and "chronic disease". To increase identification of studies involving chronic disease defined by WHO, the search terms were expanded to include "depression," "hypertension," "diabetes mellitus," "cancer," "lupus," and "RA". In addition, a manual review was conducted of reference lists of the relevant studies extracted from the databases searched.

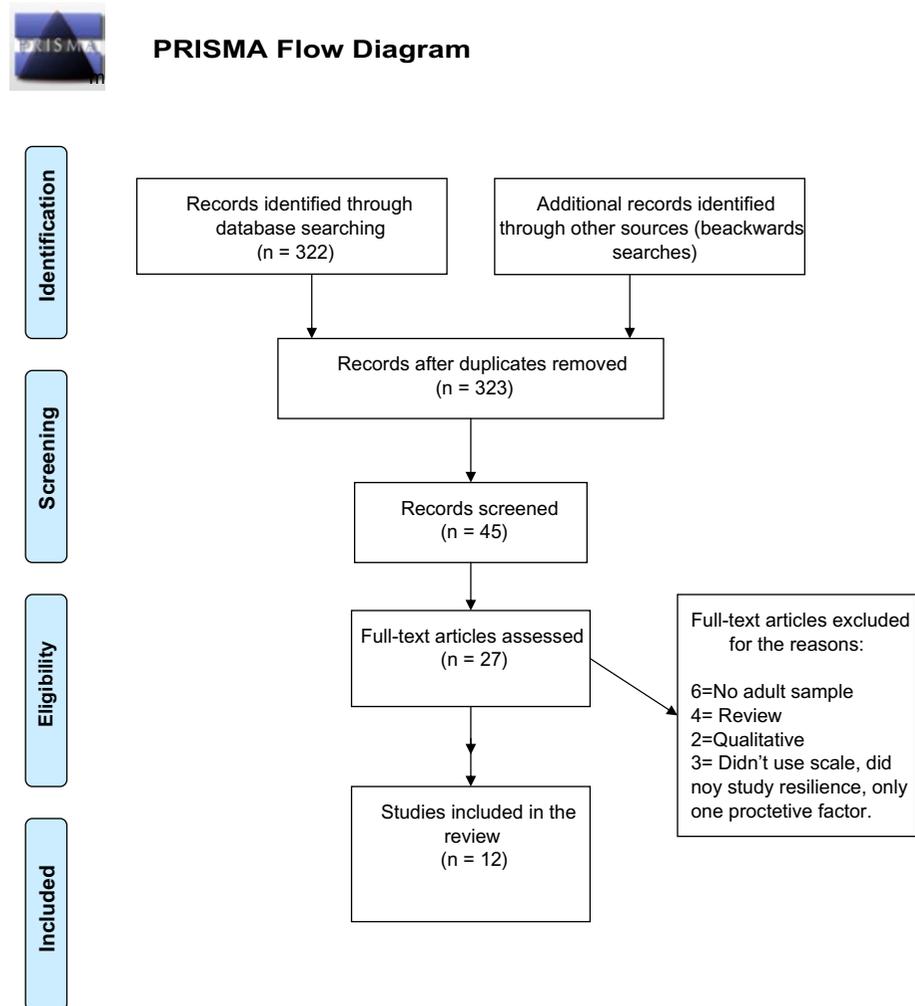
Articles with reference to experimental studies were included in accordance with the following criteria: (1) Method compatible with that of randomized clinical trials, cohort studies, prospective studies, cross-sectional studies, and case control studies published in scientific journals. Studies of cases and systematic reviews were excluded. (2) Written in English or Spanish. (3) Adult sample (18 years or older) with diagnosis of CD. (4) Published in the last 20 years, from June 1993 up to July, 2013. This period was arbitrarily chosen for practical reasons, so as not to make the review very extensive, however, it has also been precisely in these last 20 years that the main studies about resilience have appeared.

Studies were excluded if they claimed to measure resilience, but did not use a resilience scale capable of evaluating internal resources that facilitate the ability of negotiating, managing and adapting to significant sources of stressor trauma (Windle, Bennett, & Noyes, 2011). Articles that studied conditions frequently occurring in CD, such as pain and incapacitation, were not included if they did not specify the CD studied. Abstract were screened in accordance with the inclusion criteria, by one, and checked by a second person. The date of the last search was July 2013, and it was done in February 2014 (Figure 1).

3. Results

The search in the databases led to 322 articles being identified, with 242 found in Pubmed and 80 in PsycINFO, of which 46 were selected for a more detailed analysis. Of these, two were excluded because they were duplicates, 14 articles were selected because they met the inclusion criteria, and

Figure 1. PRISMA flow diagram.



of these, two were excluded afterwards because of methodological questions (the instrument used evaluated only the affective domain), therefore the review was composed of 12 articles (Table 1).

The selected articles referred to pathologies such as RA, ankylosing spondylitis, systemic erythematosus lupus, cancer, hepatitis, diabetes mellitus, depression, skin disorders, Parkinson's disease, and chronic kidney disease.

4. Discussion

The articles found were predominantly of the descriptive methodological, cross-sectional and prevalence or case-control type. A lack of randomized clinical trials that studied resilience in the diverse CDs was observed, perhaps due to the fact that this is a new topic, but one that increasingly arousing interest among researchers.

Five articles (Brionez et al., 2010; Erim et al., 2010; Holden et al., 2012; Mangelli, Gribbin, Buchi, Allard, & Sensky, 2002; Ponarovsky, Amital, Lazarov, Kotler, & Amital, 2011; Robottom et al., 2012; Wingo et al., 2010) found an inverse relationship between the resilience scores and anxiety and depression scores, which suggests that high resilience scores may protect against the development of psychiatric diseases, of which there is high prevalence in chronic conditions (Bachen, Chesney, & Criswell, 2009; Erim et al., 2010). Robottom et al. also found a negative relationship between the resilience scores and incapacitation and somatization; and an association between resilience and

Table 1. Result of review of literature on resilience and chronic disease

Author	Diagnosis	Scales		Study Design	Results	
		Resilience	Outcomes		Resilience	Health outcomes
Mangelli et al. (2002)	Rheumatoid Arthritis (American College Rheumatology ACR) (n = 89)	PWB	RADAI, HAQ, HADS	Cross-sectional	PWB < community sample. Inverse bivariate correlations between depression and anxiety and each of the PWB subscales scores, although these correlations were stronger for depression. Inverse correlation between HAQ score and the environmental mastery (PWB subscale)	There were significant bivariate correlations between each of the variables (pain, RADAI and HAQ) and depression or anxiety (Spearman RS range 0.39-0.55, all $p < 0.001$)
Strauss et al. (2007)	Cancer (n = 208)	RS Scale	MFI, SF-12	Clinical trial (non randomized)	RS had little influence on treatment during RT. RS is a powerful predictor of QoL	MFI showed fatigue level > normal population and at end of radiotherapy (RT) the level was even higher IC (0.46-4.53), $p = 0.040$
Erim et al. (2010)	Hepatitis (clinical) (n = 81)	SOC	SCL-9-R, F-SOZU, BDI	Cross-sectional	In general the scores for SOC were similar to those of a normal sample $M = 4.95$, $SD = 0.9$	Altos escores para depressão e ansiedade principalmente nos pacientes com pouco tempo de diagnóstico
DeNisco (2011)	Diabetes mellitus (clinical) (n = 71)	RS Scale	HABA1c	Cross-sectional	Negativa correlação entre SOC e depressão, ansiedade e sintomas gerais	BDI ($t = 3.32$, $p = 0.001$) HAS ($t = 3.06$, $p = 0.003$) HADS ($t = 4.08$, $p = 0.01$)
Wingo et al. (2010)	Depression (n = 792)	CDRISC	CTQ, BDI	Cross-sectional	Significant negative correlation between HbA1c level and RS scores, $r = -0.270$ e $p = 0.023$. RS may influence glycemic control in this sample	One third of the sample identified themselves as disabled (n = 24, 33.8%)
Brionez et al. (2010)	Ankylosing spondylitis (ACR) (n = 294)	BRCS	BASDAI- AS, VPMI, PHQ-9, AHI	Cross-sectional	Income was significantly correlated with RS, lower income reporting low RS. Duration of illness and diet played no significant role in RS scores	The HbA1c levels ranged from a low of 4.9 to a high of 13.2. The mean HbA1c level was 7.2%, the median was 6.7%, and the SD was 1.6
Ponarovsky et al. (2011)	Skin disorders (clinical) (n = 112)	SOC	MINI, HAS, HDS	Cross-sectional	Severity of depression inversely related to RS ($\beta = -0.5$ $p < 0.0001$). Increase of 5 points on the CDRISC (range 0-40) was associated with a decrease of 2.5 points on the CDRISC	48% of the participants had no depression (BDI ≤ 9), 22% had mild depression ($9 < BDI \leq 18$), and 30% had moderate or severe depression (BDI ≥ 19)
					Childhood abuse and trauma exposure contributed to depressive symptom severity while resilience mitigated it	In the moderate/severe range, 62% had experienced no abuse, 20% had one type of sexual, physical, or emotional abuse, 8% had two types of abuse, and 9% had three types of abuse
					Resilience coping ($p = 0.203$) fell short of significance	Psychological variables contributed to the variance in BASDAI (additional 33%)
					Negative correlations between scores on the SOCs and scores on the HAS ($p < 0.01$) and HDPS ($p < 0.01$). High SOCs scores may protect against the development of psychiatric illness	Higher helplessness ($p < 0.001$) and depression ($p < 0.001$) were significantly associated with higher BASDAI score

(Continued)

Table 1. (Continued)

Author	Diagnosis	Scales		Study Design	Results	
		Resilience	Outcomes		Resilience	Health outcomes
Robottom et al. (2012)	Parkinson's disease (n = 83)	RS-15	OARS, SF-12, BRI-18, AES, FSS LOT-R, RSE, LOC, UPDRS, MMSE, HY	Cross-sectional	>RS correlated with less disability and better physical and mental QOL ($p = 0.006$). <RS was correlated with decreased psychiatric symptom burden, less depression ($p < 0.001$), less anxiety ($p = 0.002$), less somatization ($p = 0.002$). >RS correlated with less total apathy ($p < 0.001$), and with less fatigue ($p < 0.001$)	Average disease duration was 6.8 (WFE/5.4) years. The average T-UPDRS was 39.2 (WFE/18.9) and average Hoehn and Yahr stage was 2.3 (WFE/0.9)
Holden et al. (2012)	Depression (n = 63)	CDRISC	BDI, ATQ, RSES, RAS, The Stressful Life Events Scale, SS-A SWBS, DSS:12	Cross-sectional	Depressive symptoms were significant and negatively associated with resiliency ($r = -0.48$, $p < 0.01$) and spiritual well-being [$r = -4.7$, $p < 0.01$]	Depressive symptoms were significant and positively associated with negative and ruminative thinking ($r = 0.79$, $p < 0.01$), low self-esteem ($r = 0.58$, $p < 0.01$), stressful life events ($r = 0.43$, $p < 0.05$), low social support ($r = 0.46$, $p < 0.01$), depression stigma ($r = 0.36$, $p < 0.01$), and indication of chronic diseases ($r = 0.34$, $p < 0.01$)
Cal and Santiago (2013)	Lupus (ACR) (n = 45)	RS	MINI-PLUS	Cross-sectional	Patients with risk of suicide had lower RS scores. Patients <35 years had <RS scores. Means of RS 136.1 ± 13.704 in a range of 104-163, with 8.9% with low RS, 70% medium RS, 20% high RS	53% of patients had depressive disorder (n = 24), 35% (n = 16) presented risk of suicide, of whom 9 (17%) low risk, 1 (2%) moderate risk, and 6 (13%) high risk
Ma et al. (2013)	Chronic kidney disease (CKD) (n = 150)	RS Scale	CDF, GFR calculation	Cross-sectional	A significant positive correlation was found between health promoting behavior and resilience in all study subjects. RS between groups was influenced by educational level ($\chi^2 = 7.714$, $p < 0.05$), occupation ($\chi^2 = 6.818$, $p < 0.05$) and presence or absence of diabetes ($\chi^2 = 16.617$, $p < 0.001$). Pre-ESRD (end stage renal disease) group had lower resilience than either high-risk or early CKD groups	Out of a total of 150 participants, 26.6% (n = 40) were high-risk group subjects. The pre-ESRD group included 40% (n = 60) participants, and 33.3% (n = 50) participants in the early CKD group. Most were married, unemployed, and had diabetes
Min et al. (2013)	Cancer (n = 152)	CDRISC	HADS, FSSQ	Cross-sectional	RS levels were negatively associated with emotional distress $p < 0.001$. In patients with metastatic cancer, RS was a significant protective factor for emotional distress (adjusted OR = 0.14, 95% CI = 0.02-0.79, $p = 0.02$)	83 (54.6%) were considered as having "emotional distress". FSSQ score was significantly lower in distressed cancer patients than those in their non-distressed

Notes: ACR is the American College Rheumatology, PWB is the Ryff's six subscale model to evaluate psychological well-being, RADA1 is the Rheumatoid Arthritis Disease Activity Index, HAQ-Health Assessment Questionnaire, HADS is the Hospital Anxiety and Depression Scale, RS is the Wagnild and Young's Resilience Scale, MFI is the Multidimensional Fatigue Inventory, SF-12 is the Medical Outcomes Study Short Form 12, SCL-9-R is the Symptom Check List, F-SOZU is the Social Support Questionnaire, SOC is the Sense of Coherence, BDI is the Beck Depression Inventory, HABA1c is the Glycosylated hemoglobin level, CDRISC is the Connor Davidson Resilience Scale, CTQ is the Childhood Trauma Questionnaire, Traumatic Events Inventory is the 10 items, BASDAI is the AS Disease Activity Index, VPMI is the Vanderbilt Pain Management Inventory, PHQ-9 is the Patient Health Questionnaire, BRC5 is the Brief Resilient Coping Scale, AHI is the Arthritis Helplessness Index, MINI is the Mini International Neuropsychiatric Interview, HAS is the Hamilton Anxiety Scale, HDS is the Hamilton Depression Rating Scale, ATQ is the Automatic Thoughts Questionnaire, RSES is the Rosenberg Self-Esteem Scale, RAS is the Relationship Assessment Scale, The Stressful Life Events Scale, SS-A is the Social Support Appraisals Scale, SWBS is the Spiritual Well-Being Scale, DSS:12 is the Depression Stigma Scale, RS-15 is the Resilience Scale OARS is the Older American Resource and Services Scale, BRI-18 is the Brief Symptom Inventory, AES is the Apathy Evaluation Scale, FSS is the Fatigue Severity Scale, LOT-R is the Life Orientation Test, LOC is the Multidimensional Health Locus of Control, UPDRS is the Unified Parkinson's Disease Rating Scale, MMSE is the Mini-Mental State Examination, HY is the Hoehn and Yahr, MINI-PLUS is the Mini International Neuropsychiatric Interview, CDF is the Health to Promote Lifestyle Scale, GFR calculation, FSSQ is the Duke-University of North Carolina Functional Social Support Questionnaire, T-UPDRS is the measures of disease severity.

better quality of physical and mental life, which is in agreement with the literature (Robottom et al., 2012; Strauss et al., 2007) and between resilience and health promotion behavior such as adequate nutrition, stress reduction, self-realization, and appropriate sports (Ma et al., 2013). Recent studies have begun to understand the subjacent biologic process associated with resilience, which has resulted in a model of resilience that integrates the biologic, emotional, and psychological processes (Rutten et al., 2013; Wagnild, 2009).

DeNisco, Erim et al., and Wingo et al. and Brionez et al. studying resilience in different chronic diseases found an inverse association between resilience and HbA1c levels (glycosylated hemoglobin level) in diabetes, the degree of depression in patients with hepatitis C and the levels of activity of the disease in ankylosing spondylitis (BASDAI-ankylosing spondylitis activity index), respectively, which makes us think that the capacity of resilience may have had an influence on the progression of illness, (DeNisco, 2011; Erim et al., 2010; Wingo et al., 2010) and corresponds with the observations of Ponarovsky et al. (2011) and Aspinwall and Tedeschi (2010). Further studies will be necessary to explore this aspect.

Furthermore, patients with low resilience scores have less capacity to deal with patterns of stress and other challenges resulting from the process of becoming ill (Erim et al., 2010; Ma et al., 2013; Min et al., 2013). These patients may demand greater care from health professionals, who need to be trained to meet this demand, hence the importance in developing psychosocial support (Cal & Santiago, 2013; Erim et al., 2010) and coping strategies for these conditions (Jaser & White, 2011).

Over the last years, in the field of the psychology of health, a large number of researches have been conducted and investments made in studies on the development and prevention of serious diseases and premature mortality (Smith, Orleans, & Jenkins, 2004). Researches that identified traditional risk behaviors, such as smoking, inadequate diet, and lack of physical activity, are main sources of morbidity and mortality, have become broader in scope. As a result they have identified psychosocial risk factors, such as social isolation, socioeconomic status, personality characteristics (for example, hostility and pessimism), and persistent negative mood (such as depression). In addition, there have been studies related to the effects of stress and emotions as general mechanisms associated with diseases. Individual differences in self-esteem, *emotional self-regulation*, family dynamics, and social relationship are related to the increase in risk factors for physical diseases and premature mortality. Moreover, they point towards strengthening the link between the sciences of prevention and psychology of health. There are evidences that behavior and risk factors in health may be changed by means of interventions that could improve the outcomes in health (Bolier et al., 2013; Smith et al., 2004). Some researchers consider resilience an active process that can be promoted by development of protective factors by means of interventions such as psychotherapy (Bolier et al., 2013; Feder, Nestler, & Charney, 2009; Girtler et al., 2010).

In conclusion, the articles pointed towards negative relations between resilience and depression, anxiety, incapacitation, and somatization (Erim et al., 2010; Holden et al., 2012; Robottom et al., 2012; Wingo et al., 2010). An inverse correlation was also found between resilience scores and the progression of illness (activity of the disease in ankylosing spondylitis, control of glycemic level, and severity of depression) (Brionez et al., 2010; DeNisco, 2011; Wingo et al., 2010), and an association between resilience and quality of life and health promotional behavior (Robottom et al., 2012; Strauss et al., 2007).

In some cases, resilience may be determinant of self-care behaviors and naturally influence the results; therefore, the association between resilience and the process of illness must be considered in the sense of seeking to pay greater attention to interventions that strengthen the protective factors of resilience in the chronic patient.

The limitations of this study are the fact that no qualitative studies were included because they were not found, and of the absence of a larger number of randomized and controlled clinical trials.

An important aspect of chronic disease is that in the selected articles, the coping strategy was not sufficiently explored as regards its association with resilience, which could be a topic of future researches, well as controlled studies that evaluates the relationship between resilience and immunity.

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Competing Interests

The authors declare no competing interests.

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