Scientific Research Publishing

Psychology, 2025, 16(11), 1355-1371
https://www.scirp.org/journal/psych
ISSN Online: 2152-7199
ISSN Print: 2152-7180

Resilience and Chronic Disease: What's New?

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How to cite this paper: Sá, L. R., Sousa, D. F., Glustak, M. E., & Cal, S. F. (2025). Resilience and Chronic Disease: What's New? *Psychology, 16,* 1355-1371.
https://doi.org/10.4236/psych.2025.1611078

Received: October 15, 2025
Accepted: November 18, 2025
Published: November 21, 2025

Abstract

Resilience (RS), defined as the ability to achieve or recover physical or emotional health after a devastating illness, has the potential to reduce the intensity of stress, anxiety, and depression, which are common in chronic illness. This research consists of an update of the most recent articles released after the authors' previous publication (2015) on the same theme. The aim of this study was to conduct an integrative review of the impacts of resilience on chronic illness over the last 8 years (2013-2021). An exploratory search was conducted on databases such as PubMed, BVS (Scielo and Lilacs), and PsycInfo, using the keywords "resilience", "chronic disease", "resiliência", and "doença crônica". Ten articles that met the inclusion criteria were identified. The studies showed that higher levels of RS favor the use of adaptive strategies such as acceptance and positive reappraisal, while lower RS is associated with worse outcomes regarding pain and overall health. New studies also investigate epigenetics, which studies the influence of life experiences on the activity of our genes, impacting how we deal with situations and whether we develop diseases or not; therefore, experience determines how genetic potential will be expressed. Stress has been considered a pathogenic factor, including both acute stress and stress from daily life, as well as stress experienced during development leading to so-called developmental trauma.

Keywords

Resilience, Chronic Diseases, Lifestyle, Stress, Integrative Review

1. Introduction

Chronic diseases such as heart disease, stroke, cancer, diabetes, and respiratory diseases, according to the World Health Organization (WHO), are the main causes

of death around the world, accounting for almost 70% of cases (Edward, 2013). Understanding which variables are involved in better adaptation to Chronic Disease (CD), and the mechanisms underlying this adaptation, has become very important due to a higher incidence of CD and changes such as earlier diagnosis, improved surgical techniques and therapies have allowed some diseases that were previously fatal to become CD, with greater life expectancy. The study of Resilience (RS), defined as the ability to achieve, maintain, or recover physical or emotional health after a devastating illness, such as some chronic illnesses, losses, or other situations known to generate stress (Felten & Hall, 2001) has proven to be of fundamental importance in the field of health promotion. RS reduces the intensity of stress and negative emotional signs such as depression and anxiety, common in chronic illness (Cal, Sá, Glustak, & Santiago, 2015; Grotberg, 2005; Wagnild & Young, 1993). The development of symptoms in these diseases may be related to psychological processes that can interfere with the functioning of the immune system, increasing the body's vulnerability to the disease (Schiavone, Jaquet, & Trabace, 2013) and even influencing the progression of the disease (Cal et al., 2015).

For Masten (2001), RS is an inferential and contextual construct that involves two dimensions: the presence of adaptation processes and risk factors. (Masten, 2001) In the first dimension, some authors define adaptation based on the evolutionary tasks expected for human beings throughout their development and cultural expectations, such as, for example, performance and skills, (Elder Jr., 1998; Masten, Ann, & Coatsworth, 1995; Waters & Sroufe, 1983) while other researchers, mainly in the health field and prevention of psychopathology, refer to adaptation as the absence of psychopathology and a low level of symptoms. Other scholars, however, include both types of criteria (Masten, Burt, & Coatsworth, 2015).

The definition of adaptation adopted in this study involves both the presence of skills and characteristics that favor competencies related to behaviors called health promoters, and the absence of processes that generate dysfunction and/or psychopathological symptoms. Personality and resilience are fundamental aspects in this adaptation (Greenberg, Lengua, Coie, & Pinderhughes, 1999).

Lifestyle plays a fundamental role in maintaining health and promoting longevity. Both choices associated with a healthy lifestyle and psychological resilience can be critical determinants of survival among the elderly. Previous studies show that maintaining healthy lifestyle practices such as physical activity, drinking tea, and abstaining from alcohol and cigarettes contributes to the survival status of elderly people over 80 years of age (Reis, Colbert, & Hérbert, 2004).

In a study carried out to analyze the association between resilience and lifestyle with the quality of life of adolescents (measured using the HRQoL scale), it was found that resilience was the most prominent positive predictor among the various domains of the scale. This prediction was strongest for the domains of psychological well-being, social support, and school and peer environment; all of

which are major sources of stress in adolescence (Cai, Gao, Hu, Zhou, & Jiang, 2023).

According to Gabor Maté, a mental or physical illness is a consequence of our way of living and is related to the context of social structures, systems of beliefs and assumptions, and values that surround us and permeate all aspects of life. (Maté & Maté, 2023b).

Chronic stress puts the nervous system on alert, distorts the hormonal apparatus, impairs immunity, promotes inflammation, and undermines physical and mental well-being (Harvanek, Fogelman, Xu, & Sinha, 2021).

Bruce McEwen called allostatic load the wear caused to the body to maintain internal balance during unstable and challenging circumstances such as trauma. Many people are doomed to endure high allostatic loads as today's society is experiencing more stress than ever before, especially emotional stress that can lead to negative outcomes, both psychiatric and physical (Harvanek et al., 2021).

Currently, society suffers from illnesses caused by stress due to inequalities, poverty, environmental degradation, and climate change. Millions of people die from diseases that can be avoided due to the lack of resources to eliminate them.

One of the typical markers of stress is inflammation, which is present in a wide range of pathologies from autoimmune disorders to vascular and brain diseases, from cancer to depression (Maté & Maté, 2023a).

Neuroinflammation is defined as an inflammatory response in the brain or spinal cord. In this condition, microglia play an important role, as they perform primary immune system surveillance and macrophage-like activity in the Central Nervous System (CNS), including the production of cytokines and chemokines.

Microglia appear to have a low turnover rate and are susceptible to the potential pro-inflammatory effects of age, injury, or stress. The activation of microglia and an increase in cytokines aim to protect the CNS and benefit the host organism. However, when microglia are increased or chronically activated, it can lead to severe pathologies and neurobehavioral complications such as depression and cognitive impairment (DiSabato, Quan, & Godbout, 2016).

Several studies suggest that RS has an impact on the treatment of several chronic diseases, such as diabetes, rheumatoid arthritis, SLE, Chagas disease, HIV, etc (Cal & Santiago, 2013; Carvalho, Morais, Koller, & Piccinini, 2007; DeNisco, 2011; Girtler et al., 2010; Mota, Benevides-Pereira, & Gomes, 2006) and which can interfere with immune function, causing an increase in vulnerability to the disease, which occurs due to the psychological process involved in becoming ill and resulting from the stress of dealing with the disease and its impactful effects on the person's life (Schiavone, Jaquet, Trabace, & Krause, 2013; Vuitton, de, & Dupond, 1999).

Coping, adherence to treatment, spirituality, and the possibility of seeking social support are aspects that are optimized with a greater capacity for RS (Faria, Revoredo, Vilar, Eulália Maria Chaves, & Eulalia Maria, 2014; Jaser & White, 2011).

High RS scores are directly associated with better physical health and fewer symptoms and inversely related to depression and other psychiatric disorders, in addition to being related to better quality of life (Wagnild, 2009).

In a review, Cal et al. (2015) described articles that highlighted a negative relationship between RS and depression, anxiety, disability, and somatization. (Erim et al., 2010) An inverse correlation was also observed between RS scores and disease progression (ankylosing spondylitis disease activity, blood glucose control, and depression severity). (Brionez et al., 2010; DeNisco, 2011; Wingo, Wrenn, Pelletier, Gutman, Bradley, & Ressler, 2010) and an association between RS, quality of life, and health-promoting behavior (Robottom et al., 2012; Strauss et al., 2007).

Aspects of RS, such as positive emotions, optimism, vitality, and extroversion, are related to increased effectiveness, physical activity, and coping (Ayache & Costa, 2005) and acceptance of social support (Strauss et al., 2007).

In a study of women with osteoarthritis and/or fibromyalgia, it was observed that RS resources can help in the treatment of pain or stress in a population with chronic diseases and suggests that the team of health professionals should be trained to intervene so that, once they know the RS characteristics of patients, they can effectively help them develop coping skills (Girtler et al., 2010; Zautra, Johnson, & Davis, 2005). In the clinical field, it is possible to identify predisposing factors or risk factors for the psychopathology or pathology in question and to develop new intervention strategies that act preventively and therapeutically. (Evers, Zautra, & Thieme, 2011; Feder, Nestler, & Charney, 2009)

This work is justified by a quest to understand the disease from a psychological, spiritual, and emotional perspective, not just a physical one, encompassing the present, past, and future. Understanding the role that traumatic experiences play in people's physical and mental health is essential for developing follow-up strategies that take these conditions into account and thus strengthen these patients' resilience.

The objective of this study is to conduct an integrative review on resilience and chronic illness over the last 8 years (from 2013 to 2021) to identify the impact of resilience on health outcomes, specifically on chronic illness, and to identify what is new in this line of research.

2. Materials and Methods

This is an exploratory study, carried out through an integrative review. The type of study chosen has the advantage of simultaneously including experimental and quasi-experimental, quantitative and qualitative research, providing a more complete understanding of the studied topic (Mendes, Silveira, & Galvão, 2008; Whittemore & Knafl, 2005).

The searches for articles were carried out in the PubMed, BVS (SciELO and LILACS), and PsycInfo databases. All studies published in scientific journals between June 2013 and March 2021 (the last 8 years) were included, using the de-

scriptors "resilience", "chronic disease", "resiliência" and "doença crônica" (since the authors had already reviewed and published them up to June 2013). In order to increase the identification of articles involving chronic disease, according to the WHO, the search terms included "depression", "hypertension", "diabetes mellitus", "cancer", "lupus", and "rheumatoid arthritis". A review was also carried out on the reference lists of the selected studies.

The inclusion criteria were: articles written in Portuguese, English, or Spanish; a sample related to adult patients (over 18 years old). Case studies and reviews were excluded, although review articles were used for contextual framing and were not part of the systematically selected articles.

The search was carried out based on the review eligibility criteria by two independent researchers to avoid bias. In cases where there was no agreement, they were resolved by consensus between both. The selected articles were evaluated in full text, observing whether they met the inclusion criteria of the research. Studies that were not eligible at this stage had their reason for exclusion recorded and were described in the results stage. After evaluating the included studies, PRISMA (Moher, Liberati, Tetzlaff, & Altman, 2009) and a chart were constructed to present the results, and a scientific article was subsequently prepared for publication.

3. Discussion

Studies have shown that higher levels of RS favor the use of adaptive strategies, especially acceptance and positive reappraisal, and patients with lower RS had worse results in the dimensions of pain and general health (Macía, Barranco, Gorbeña, & Iraurgi, 2020). The same positive effect on adaptive capacity was observed in patients with Multiple Chronic Conditions (MCC), with repercussions on the work environment, facilitating the maintenance of employment in patients of working age (Jason, Carr, Washington, Hilliard, & Mingo, 2017). This finding is in line with the study carried out by Black and collaborators, which demonstrated an association between greater engagement and attendance at work among employees who had protective and resilient factors: healthy lifestyle, presence of a spouse, social support, and absence of factors such as alcohol and smoking. On the other hand, workers who did not have these protective factors demonstrated greater presenteeism (when an employee is not functioning fully in the work environment due to illness, injury, or other condition), greater heart rate reactivity—which is associated as a predictive factor for the development of diseases—in addition to less engagement at work (Black, Balanos, & Whittaker Previously Phillips, 2017).

The association between RS and adaptive coping capacity is linked to a higher quality of life for people with cancer (Macía et al., 2020). RS promotes psychological well-being, self-care behavior, greater adherence to physiotherapy routines, exercises, and management of medical information (Shaw et al., 2020). These findings are in line with the study by Moe et al. (2013) (Moe, Hellzen, Ekker, & Enmarker, 2013), who observed that levels of RS medium or low RS levels are

associated with greater vulnerability of patients, regardless of gender, and with a greater association with depression (Terrill et al., 2016) and disabilities resulting from aging and CD (Manning, Carr, & Kail, 2016). Another finding involving depression and resilience is that cognitive behavioral therapy targeting concepts of resilience, such as problem-solving ability, transformation of personal qualities necessary to deal with stress, had a significant relationship with improving resilience to help individuals experiencing depressive symptoms (Songprakun & McCann, 2012).

Little consideration has been given to the resilience of patients with chronic diseases such as systemic lupus erythematosus and its association with treatment adherence. Studies show that patients with this condition are associated with an increased prevalence of depression and anxiety. However, little attention has been paid to the patient's ability to deal with critical moments of the disease, although the importance of self-efficacy, prior health knowledge, and adaptability as promoters of medication adherence in rheumatological diseases has been highlighted (Mendoza-Pinto et al., 2021).

Regarding the methodology of the selected studies: six articles used a cross-sectional study design, one was an interventional study—all participants underwent similar positive interventions, with the impact being assessed later, two cohort studies and one qualitative study, using semi-structured interviews and narrative analysis methods.

Epigenetics, an expanding field that investigates the impact of life experience on the activity of our genes, according to Candace Lewis, considers that science is increasingly proving the holistic model of who we are. We are more than what is contained in our skin; it is everything that surrounds us. Factors such as poverty, racism, and deterioration of urban centers can have a direct impact on our genetic and molecular functioning (Epel et al., 2004).

Genes help create the language of existence, but it is through the gears of epigenetics that they are activated, accentuated, or attenuated. One of the mechanisms of epigenetics is to add certain DNA molecules and sequences to change gene function, modifying the number of receptors for certain chemical messengers and influencing interactions between genes. In other words, experience determines how our genetic potential will be expressed.

A study conducted by SZYF and his team (Szyf, Weaver, Champagne, Diorio, & Meaney, 2005) studied epigenetics, with important implications for the way we view behavior and health. The researchers observed the receptor molecules in the brain, responsible for modulating stress, which would guarantee adequate behavior in the presence of stress. People who had poorly regulated stress reactions were more anxious, less able to face environmental and everyday challenges, and showed excessive stress even under normal circumstances.

The underlying mechanisms of metabolic diseases are multifaceted, and both genetic and non-genetic factors are critically responsible for the initiation and development of metabolic diseases. Emerging evidence indicates that epigenetic reg-

ulation plays a crucial role in the occurrence and progression of diverse metabolic diseases. Deciphering the epigenetic regulation of metabolic diseases is crucial to understanding metabolic disease initiation and progression, and to developing novel preventive or curative therapeutic strategies in clinical metabolic disease management (Wu et al., 2023).

The quality of early maternal care has an impact on the biochemical ability of offspring's brains to respond to stress in healthy ways well into adulthood. Crucial epigenetic markers, that is, the way in which certain genes are expressed, were different in the brains of mice that had received more or less care in contact with their mother. And in turn, the descendants transmitted to their own descendants the type of maternal care they had received. SZYF et al. showed that in female descendants the quality of maternal care affects the receptor activity of estrogen, a fundamental female hormone, impacting maternal care patterns in successive generations (Champagne et al., 2006).

Initially, when Post-Traumatic Stress Disorder (PTSD) arrived in diagnostic manuals, it only focused on dramatic incidents such as rapes, robberies, and accidents to explain the origin of emotional breakdowns in patients. Gradually, it began to be understood that the most severe dysregulation occurs in people who, as children, did not have a consistent caregiver.

One of the most important discoveries in psychology, neuroscience, and psychiatry was that the failure to establish secure early attachment bonds leads to a diminished ability to regulate negative emotions (Dozier, Stovall-McClough, & Albus, 2008).

Attachment research has shown that people learn to regulate their emotional activation largely as a function of the ability to establish physical and rhythmic attunement with important figures in the early caregiving environment. (Bowlby, 1969) Having a history of chronic lack of harmony with individuals' caregivers predisposes people to have difficulties managing negative emotions later in life (Bowlby, 1969).

Poor affect regulation, caused by early adverse experiences, is compounded by disturbed behaviors resulting in the face of stress, such as temper tantrums and emotional withdrawal (Shaver & Mikulincer, 2002). Problems with affect regulation have universal effects on the development of the mind and of the brain, and lead to significantly increased utilization of medical, correctional, social, and mental health services (Drossman et al., 1990). Socioeconomic circumstances can alter the epigenome, the network of epigenetic influences on genes. One study observed higher rates of inflammation in African Americans than in people of Caucasian ethnic origin. Due to the epigenetic effect that persisted even when comparing people of the same socioeconomic status (Thames, Irwin, Breen, & Cole, 2019), it was found that the experience of racism and discrimination accounted for more than 50% of the difference between blacks and whites in the activity of genes that increase inflammation (telomeres?). Furthermore, studies have shown that damage caused by traumatic experiences can be passed genetically to the next generation (Dias & Ressler, 2014; Yehuda et al., 2016). The Adverse Childhood Experi-

ences Study (ACES), in 2014, studied 17,000 people, conducted for more than 3 decades by the Centers for Disease Control and Prevention (CDC) and Kaiser Permanente, found a strong link between the number of adverse childhood events and increased rates of heart disease, cancer, diabetes, chronic liver disease, alcoholism, depression, stroke, and sexually transmitted diseases. Furthermore, children who experienced 4 or more adverse events were more likely to experience heart disease and were 2 times more likely to develop autoimmune disease (Dias & Ressler, 2014).

Based on this evidence, this work, different from the review by Cal et al. (2015), seeks to address the effects of stress in relation to chronic diseases and to invite reflection on how to include actions in public policies capable of dealing with a world increasingly traumatized and sickened by wars, pandemics, socioeconomic differences, and unemployment, among other current issues.

4. Conclusion

It can be inferred that resilience has been demonstrated to be a fundamental coping strategy for patients with chronic diseases. People who had higher levels of resilience were associated with better quality of life recorded in questionnaires, better adherence to treatment for the diseases they suffer from, as well as greater knowledge about them. Furthermore, resilience has been demonstrated as a tool to protect workers affected by chronic illnesses and has been associated with a lower rate of absenteeism, as well as a longer period of job stability. Thus, it can be concluded that a therapeutic approach offered by health professionals that aims to strengthen patients' resilience can be an efficient strategy for longitudinal care, offering a better prognosis for the clinical conditions that afflict them, also improving their quality of life. No studies have yet been carried out that directly demonstrate how strengthening resilience, as a differential approach in the treatment of people with chronic diseases, impacts their survival, a topic that can be addressed in future work. To advance this field, future research should employ longitudinal cohort studies or Randomized Controlled Trials (RCTs) that specifically evaluate resilience-based interventions and monitor their effects on clinical outcomes, disease progression, and survival rates over time. Such study designs would provide stronger causal evidence on the long-term impact of resilience strengthening in patients with chronic diseases.

Authors' Contributions

Research design and development, analysis, and interpretation of the work—Cal, S. F.; Sá, L. R.; Glustak, M. I.; Sousa, D. F.

Research design and development, analysis and interpretation of the work, writing and critical review of the article—Cal, S. F.; Sá, L. R.

Conflicts of Interest

The authors declare no competing interests.

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Annex

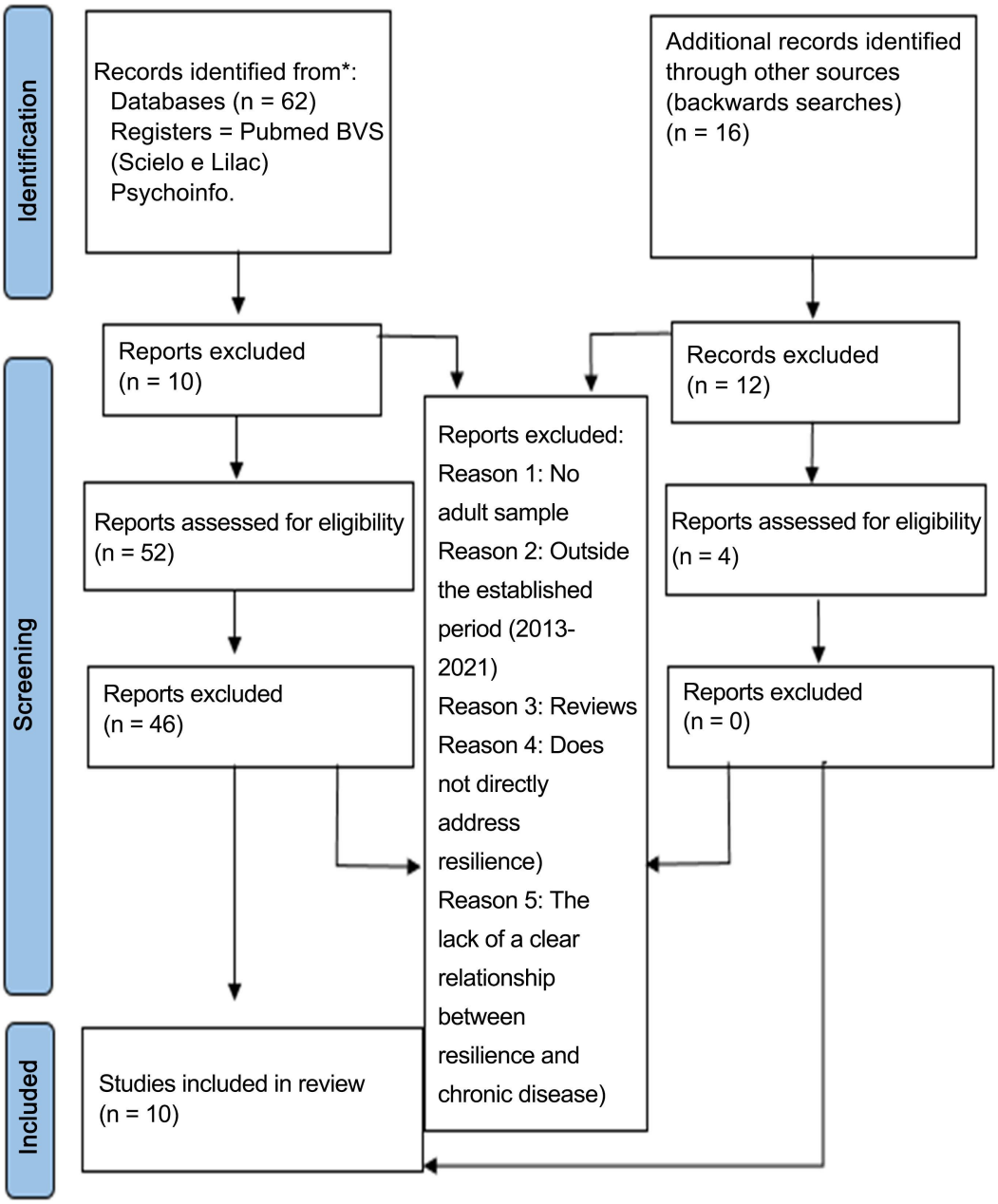
Identification
Screening
Included
Records identified from*:
Databases (n = 62)
Registers = Pubmed BVS (Scielo e Lilac)
Psychoinfo.
Additional records identified through other sources (backwards searches) (n = 16)
Reports excluded (n = 10)
Records excluded (n = 12)
Reports excluded:
Reason 1: No adult sample
Reason 2: Outside the established period (2013-2021)
Reason 3: Reviews
Reason 4: Does not directly address resilience)
Reason 5: The lack of a clear relationship between resilience and chronic disease)
Reports assessed for eligibility (n = 52)
Reports assessed for eligibility (n = 4)
Reports excluded (n = 46)
Reports excluded (n = 0)
Studies included in review (n = 10)

Table A1. Table of selected articles.

Authors/ Year	Study Type/ Sample Size	Scale	Objective	Results
ZIARKO, M. et al. (2019) (Ziarko et al., 2019)	Quantitative study, (Cross-sectional) N = 85	HADS, CSQ, Ego-Resilience Scale, Polish adaptation, Visual Analogue Scale.	To compare whether patients differ in intensity of pain, anxiety and depression depending on the type of treatment they are undergoing. In addition, what are the determinants of these affective states in patients treated with different methods?	The results imply that the choice of treatment differentiates the intensity of pain. Those who were using biologic agents reported lower levels of pain compared to those who were using anti-inflammatories. It was also observed that there were distinct configurations of conditions that led to anxiety and depression in both the anti-inflammatory and biologic agent groups.
MACÍA, P. et al. (2020) (Macía et al., 2020)	Cross-sectional N = 74	(ER-20 items Resilience Scale), (CERQ-Cognitive Emotion Regulation Questionnaire-Short), Exploratory Factorial Analysis (EFA), General Health Questionnaire SF-12	Explore which coping strategies are most used, to find out whether higher levels of RS and an adequate coping style are related to a better quality of life and better adaptation to the disease	>RS: better at using adaptive strategies, with acceptance and positive reappraisal being the most frequent. Regarding the perception of quality of life, people with lower RS showed differences in the dimensions of pain and general health, which were worse. Significant association between RS and adaptive coping, which are also positively linked to the quality of life of people with cancer.
ROBINSON, M. et al. (2017) (Robinson, Hanna, Raine, & Robertson, 2019)	Historical control study. Quanti-qualitative study N = 24	SWEMWBS, GSE, NHS Qualitative techniques for diary writing and content analysis	To assess whether the participation of adults and elderly people in a mental health RS course for people with chronic diseases can increase the perception of RS of older participants.	The research showed significant gains in participants perceived RS at the end of the course, with no significant decline after the 3-month reassessment. Interviews and journal narratives highlight positive experiences around well-being, condition management and increased social bonding.
MOE, A. et al. (2013) (Moe et al., 2013)	Cross-sectional Study N = 79 women and 41 men	RS, SOC, PIL, STS, SF-36	To examine inner strength, defined as connection, steadfastness, flexibility, and creativity, and its relationship to mental and physical health in a sample of older women and men with chronic illnesses living in their homes.	Experiencing connection, strength, flexibility and creativity were the same for women and men. Those who presented medium and low RS reported feeling more vulnerable. A significant correlation was observed between the variables inner strength and mental health for the total sample.
MANNING, L. et al. (2016) (Manning et al., 2016)	Longitudinal cohort study N = 10.753	LBQ, ADLs, IADLs, SRS (guided by the Wagnild and Young Resilience Scale (RS), shortened version of the Center for Epidemiologic Studies-Depression (CES-D) scale.	Test two hypotheses: 1. people with higher levels of RS will have lower levels of disability 2. RS will accompany the association between the onset of a new chronic condition and its consequent disability	RS protects against limitations in Activities of Daily Living (ADL) that are often associated with aging. RS mitigates a considerable number of deleterious effects that are consequences of the onset of chronic diseases and their consequent incapacity.

Continued

TERRIL, A. L. et al. (2014) (Terrill et al., 2016)	Cross-sectional N = 1862	CD-RISC, PHQ-9, PROMIS, PRO-D-SF, NRS, PRO-PI-SF, PRO-F-SF.	To examine RS in aging individuals with long-term physical disabilities: Muscular Dystrophy (MD), Multiple Sclerosis (MS), Spinal Cord Injury (SCI) with the aim of: measuring their RS, and determining whether they differed by demographic or medical variables and assessing the role of RS in their symptoms (pain, fatigue, depression) and also in their quality of life (QoL)	Participants who were depressed were significantly less resilient than those who were not depressed. Elderly participants in the study demonstrated a connection between their higher levels of RS and their older age. Duration of disability was not associated with RS. This suggests that RS may be more related to life experience than to the specific length of time living with a disability. Length of disability did not correlate with RS. This implies that RS may be more linked to someone's overall set of life experiences than to the specific length of time living with a disability.
JASON, K. J. et al. (2017) (Jason et al., 2017)	Retrospective cohort	LBQ, SRS	To examine the protective effect of resilience on the relationship between individual and contextual risks, including Multiple Chronic Conditions (MCC), and labor force transitions (exiting the labor force, working fewer hours, working the same hours, or working more hours). The study was guided by two questions: 1. When controlling for individual risks, contextual risks, and stressful life events, how do MCCs affect later-life work transitions? 2. Is the relationship between MCC and transitions at work modified by the level of RS?	Not only does RS appear to facilitate better adaptation to MCC, but it also appears to facilitate employment retention. Those with higher levels of RS experience longer time in the workforce compared to those with lower levels of RS. As RS increases, the impact of MCC onset decreases, implying that there is an opportunity to counter the negative effects of MCC after onset. Despite additional risk factors, MCC acts as a barrier to older adults' continued engagement in the workforce. However, RS plays a key role in mitigating the detrimental impact of MCC. It is prudent to pay closer attention to the factors affecting individuals with MCC so that they can manage their chronic conditions sufficiently to remain employed for as long as they wish.
QIU, C. et al. (2019) (Qiu, Shao, Yao, Zhao, & Zang, 2019)	Cross-sectional N = 220	CCI, Hypertension-specifc Symptom Scale, 21-item Self-management Scale (Chinese version), CD-RISC-10 (cChinese version), SF-12,	To investigate whether and how self-management and psychological resilience may moderate the connections between symptoms and Health-Related Quality of Life (HRQoL) in individuals with hypertension in China.	Self-management and psychological RS may moderate the relationships between symptoms and health-related quality of life. This implies that additional interventions to improve patients' HRQoL would be optimized by considering the connections between self-management, psychological RS, and their symptoms.

Continued

SHAW, Y. et al. (2019) (Shaw et al., 2020)	Qualitative study (ethnographic data collection and narrative analysis methods)	Interview and transcript analysis.	To examine the development of RS among patients with Rheumatoid Arthritis (RA), describe the process of RS development and the strategies used by patients to cultivate it.	RS development promotes psychological well-being as well as self-care behaviors, such as adherence to physical therapy/exercise routines or managing personal medical information. Patients with Rheumatoid Arthritis (RA) use a variety of emotional and behavioral management strategies to increase their SR with varying degrees of success when facing different challenges: results show that respondents can cope successfully in some areas of their lives, but not as well in others. Awareness of RS development strategies may benefit patients, health professionals, and researchers developing behavioral interventions and social support programs in the context of RA and other CDs.
ROJAS, M. et al. (2017) (Rojas et al., 2018)	Cross-sectional N = 188	(SLAQ), (SSPRO) (ESSPRI) Disease Activity: Routine Assessment of Patient Index Data 3 Resilience: Brief Resilience Scale (BRS)	To evaluate the relationship between RS and clinical outcomes in patients with autoimmune rheumatological diseases.	Physical disability and social dysfunction are directly associated with poor adaptation to illness. Patients with rheumatic Autoimmune Diseases (ARDs) who experience worse clinical outcomes have better stress management and develop a better response to adversity. Furthermore, as previously reported in studies of minority groups, factors such as spirituality and culturally relevant activities may have contributed to resilience. RS in patients with ARDs is an ongoing process influenced by age, socioeconomic status, and duration of illness. Previous factors associated with RS (e.g., occupation, level of education) were not associated with it in this study, thus suggesting that these characteristics do not play a key role in the development of resilience in these patients.

*HADS: Hospital Anxiety and Depression Scale; CSQ: The Pain Coping Strategies Questionnaire; CERQ: Cognitive Emotion Regulation Questionnaire-Short; SWEMWBS: Short Warwick-Edinburgh Mental Well-being seven-item scale; GSE: General Self-Efficacy scale; MSPSS: Multidimensional Scale of Perceived Social Support; NHS: Health Scotland, University of Warwick and University of Edinburgh; RS: Resilience Scale; SOC: Short-version questionnaire to measure Sense of Coherence; PIL: Purpose in Life Test; STS: Self-Transcendence Scale; SF-36: Short Form 36 Health Survey Questionnaire; LBQ: Leave-Behind Questionnaire; ADLs: activities of Daily Living; IADLs: Instrumental Activities of Daily Living; SRS: Simplified Resilience Score; CD-RISC: 10-item Connor–Davidson Resilience Scale; PHQ-9: Patient Health Questionnaire-9 item version; PROMIS: Patient-Reported Outcomes Measurement Information System; PRO-D-SF: Depression-Short Form; NRS: Numeric Rating Scale; PRO-PI-SF: Pain Interference-Short Form; PRO-F-SF: PROMIS Fatigue-Short Form; CCI: Charlson Comorbidity Index; SF-12: Short Form 12 Health Survey.