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# The THRIVE model: A framework and review of internal and external predictors of coping with chronic illness

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## Abstract

This article explores the ways in which people cope with social and clinical dimensions of their chronic conditions. Existing literature was reviewed to categorize factors identified as being key. They were sorted into six groupings which are reflected by the acronym THRIVE: therapeutic interventions, habit and routine, relational-social, individual differences, values and beliefs, and emotional factors. We found little evidence to suggest different conditions prompt unique coping responses; rather, a range of common factors were observed across diverse conditions. The THRIVE framework not only summarizes current literature but provides a starting point for further research and development of future interventions.

## Keywords

chronic illness, coping, factors, framework, literature review

## Introduction

In recent years, the research literature has seen a surge of interest in the topic of chronic disease. Such interest is driven by multiple factors, including the fact that the prevalence and incidence of chronic diseases are on the rise globally. In particular, the World Health Organization notes that the burden of chronic disease is predicted to increase even more in the future and that this is mostly driven by cardiovascular diseases (e.g. heart attacks and stroke), cancers, chronic respiratory diseases (such as chronic obstructed pulmonary disease and asthma), and diabetes (World Health Organization (WHO), 2018). Moreover, advances in screening, technical care, medical interventions, and everyday management of chronic conditions means that many forms of disease are detected and treated earlier (e.g. early detection of heart disease might allow individuals to take actions such as behavior changes or taking medication sooner). This means that, in many cases, diseases that might have led to early mortality in the past have now been transformed into conditions that people live with for longer periods of time (Bernell and Howard, 2016; Livneh and Martz, 2007; Sidell, 1997). In addition, comorbidity of chronic disease is on the rise (Harrison et al., 2017; van Oostrom

et al., 2016). Living longer with chronic conditions means that how people adjust to and manage over time (including dealing with pain and discomfort, physical impairment, psychological consequences, changes in social relationships, and changes in lifestyle) is becoming even more multifaceted and important (Gathchel and Oordt, 2003).

Because the prevalence of chronic disease is on the rise, because people are living longer with their conditions, and because multi-morbidity is becoming more common, it is critical to understand how individuals adjust and cope with chronic illness. Although there are several defining characteristics of chronic illness and ways of conceptualizing it (Burish and Bradley, 1983), here we

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focus on chronic illness as a health condition that persists over time and becomes a part of a person's everyday life. Consistent with this, we follow Thrall (2005) who suggests, "Although the literature does not support a single uniform definition for chronic disease, recurrent themes include the non-self-limited nature, the association with persistent and recurring health problems, and a duration measured in months and years, not days and weeks". Due to the ongoing nature of chronic disease, not only can both the clinical features and medical treatment make a significant impact on coping outcomes, but a diverse range of factors inevitably shape the ongoing experience of living with the condition. Because of this, we borrow the classic social science distinction between the terms "disease" and "illness." While the former refers to the objectively measurable biological and clinical reality of a condition, the latter refers to the subjective, psychological, and social experience (Sperry, 2006). We suggest that, in addition to the biologically determined nature of the disease itself, a variety of internal and external factors can influence the subjective experience, which can have a significant an impact on coping outcomes.

This article explores the existing literature on living with chronic disease, identifying the wider range of factors that may predict how people across different conditions cope with, adjust to, and manage this status over time. We conceptualize coping as those efforts a person makes to manage a range of demands that are appraised as taxing, difficult, or exceeding their existing resources (Lazarus and Folkman, 1984; White, 1974). Moreover, we take the view that coping is an essential "stabilizing factor that can help individuals maintain psychosocial adaptation during stressful periods" (Holahan et al., 1996; Moos and Moos, 1986; Moos and Schaefer, 1984). Here, we focus on indicators of positive coping outcomes, including physical functioning, social functioning, and psychological adjustment. In conducting the review, we seek to create a practitioner-friendly framework to categorize and organize the different factors that have been identified as key to predicting positive coping responses.

Existing work on coping suggests that when people become aware of their chronic condition and are faced with the news that it will be for the rest of their life, they must find ways of adjusting to their new circumstances (De Ridder et al., 2008; Taylor and Aspinwall, 1996). One common experience in the early stages of chronic disease is a general feeling of loss (Craig and Edwards, 1983; Sidell, 1997). This comprises a number of different aspects: loss of the pre-illness state of health and self-image, resulting in a sense of grief; the experience of not being in control of the course of disease, resulting in a sense of powerlessness; and loss of the sense of independence. Together, these factors can lead to a sense of being controlled by the disease (Sidell, 1997). In addition, a patient may also face uncertainty about their future, experience stigma and fear of

abandonment, or have feelings of being isolated and out-cast (Pollin, 1994).

In contrast with acute conditions, coping with a chronic condition is conceptualized as an ongoing process that is never completely achieved (Moss-Morris, 2013). This enduring nature of coping arises from the fact the condition may change over time or entail cyclical episodes, and specific symptoms may alter over time in response to different treatment regimens and patient responses. As a result, coping successfully with a chronic illness is rarely about finding ways to return to a pre-illness state and instead signifies establishing long-lasting ways to adjust to a new sense of self (Livneh, 2001).

The literature suggests that coping, as an ongoing process of making adjustments, can be divided into general- and illness-related adaptive tasks (Moss-Morris, 2013; Moos and Schaefer, 1984). General tasks include maintaining social relationships, sustaining an acceptable emotional balance, restoring and maintaining self-image and a sense of competence, and preparing for a more uncertain future. Illness-related tasks include handling specific symptoms, disability, and treatment, as well as preserving relationships with healthcare staff (Moss-Morris, 2013). Taken together, the key message in the literature is that, in addition to any biomedical understanding of a chronic disease, the range of features that make up the illness-experience mean that coping is a complex, dynamic, and multifaceted process driven by multiple factors (Moss-Morris, 2013; Pollin, 1994; Sperry, 2006; Stanton et al., 2007). This article sets out to further delineate what the existing literature has to say about what the most important determinants of coping with chronic illness are. We further discuss our objectives in the next section.

## Objectives

The purpose of this review is to describe the full range of factors that have been identified in previous research as being as key to how a patient copes with their chronic condition. The aim of this review is to provide a general overview and heuristic framework that captures factors that relate to coping with chronic illness in general, rather than those that are solely specific to a particular condition. We do so in the hope that future work might go on to explore the range of factors in the context of different chronic illnesses, which might determine successful or unsuccessful coping.

While some existing reviews have examined styles of coping with stressful situations more generally, they have largely viewed coping in very broad terms, without a focus on chronic illness per se (Penley et al., 2002; Skinner et al., 2003). Nevertheless, this existing literature suggests individuals can have qualitatively different responses to, and ways of coping with, stress. Moreover, these coping responses have been shown to predict more or less positive adjustment (Penley et al., 2002). Other work has used a

much more fine-grained approach by focusing on the determinants of coping with specific types of chronic illness, including cancer, cardiovascular disease, and rheumatic diseases (Anderson et al., 1985; Hagedoorn et al., 2008; Kaplan and Keil, 1993; Petticrew et al., 2002). We differ from these two streams of past work in that our objective is to provide an overview of both internal and broader social and environmental external factors that help individuals adapt to and cope with chronic illness generally. We do so on the basis that there may be many common features in terms of stressors and responses among different chronic conditions. By conducting a review that examines the general category of chronic illness, rather than focusing narrowly on one specific condition, our aim is to compile a comprehensive typology of relevant coping factors across different forms of chronic illness.

## Methods

In order to conduct a broad review of the literature on chronic illness, our analysis included both qualitative and quantitative studies. We did so on the grounds that these two approaches have the potential to explore elements that may not necessarily be captured by the other (Price, 2017). Qualitative research is often concerned with detailed understanding of the subjective experience of participants and the behavior of particular groups in given contexts. However, such research does have potential drawbacks in that it can often lack objectivity, be lower in reliability, and not have the ability to assert causality or directly generalize to other contexts. Quantitative research, in contrast, is often able to draw more generalizable conclusions about behavior in large populations and to provide answers to specific research questions. However, it is often criticized for overlooking the richness of human experience and behavior, and answering simple questions by drawing only on those variables that are easily quantifiable.

Both types of research paper were systematically reviewed utilizing the databases PubMed, OvidSP, and Science Direct. Both PubMed and OvidSP have pros and cons, and so we used them both to maximize the breadth of our review into the medical science literature. PubMed is a government-sponsored system and is freely accessible by anyone who can access the Internet. Ovid is a privately owned system developed by Ovid Technologies. Ovid's primary advantage is that the user can search different databases in several disciplines using the same interface. PubMed is generally easier to search than Ovid, but it can return large numbers of irrelevant articles unless the user is familiar with the advanced search techniques of the system. Ovid can be more difficult to learn, but complex and precise searching is easier to do on Ovid than on PubMed. It allows a greater level of control over a search which can result in retrieval of

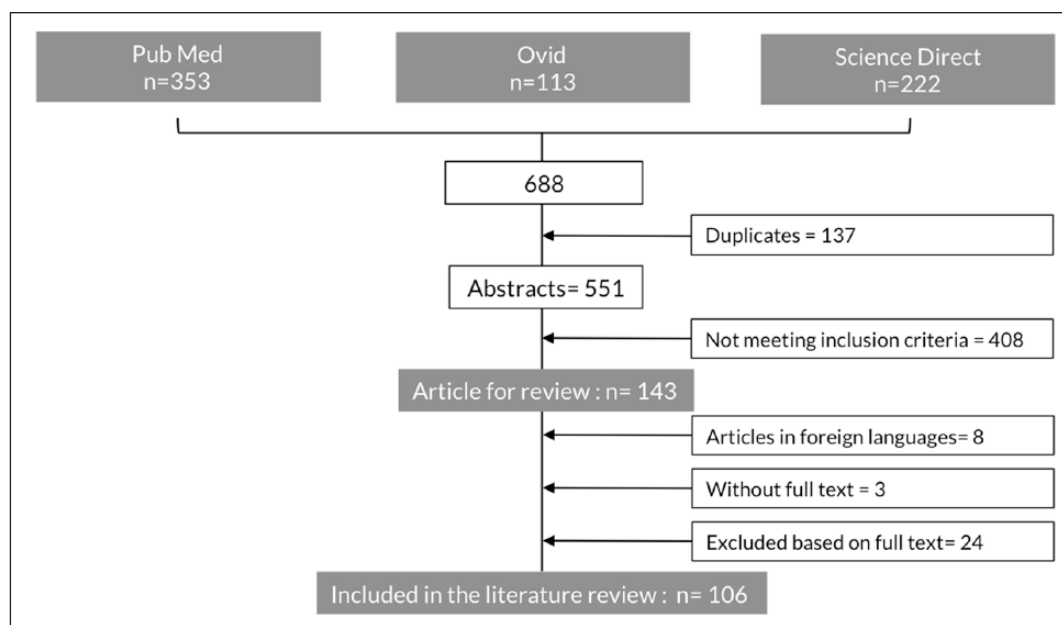
fewer irrelevant articles. One major advantage of PubMed is that it is readily updated not only with printed literature but also with literature that has been presented online in an early version before print publication by various journals. Because of these pros and cons (Falagas et al., 2008; Kelly and St Pierre-Hansen, 2008) we wished to search both of these databases. Science Direct is provided by a vendor named Elsevier. Science Direct, as its name suggests, is a strong database for researching scientific topics; however, it also allows use to access social science topics, like psychology, which we felt was important in our context (College, 2014). Thus, we used these three databases in order to cast a wide net and capture what the existing research in medical science and psychology has to say about the factors that predict coping with chronic illness.

The following Boolean search was conducted: In [Title/Abstract], (*Chronic illness OR chronic disease OR non-communicable disease*) AND (*adjustment OR coping style OR acceptance OR appropriation OR attunement*) AND (*model OR framework OR assessment*). We searched for original papers and review articles that had been peer-reviewed. Articles selected for inclusion had to be published in either English or French and had to have passed ethics review at their institution, thereby conforming with standards outlined in the Declaration of Helsinki (Rickham, 1964). Excluded from the review were papers describing work on genetic diseases, acute diseases, and child/adolescent populations. Articles that met the inclusion criteria were read and assessed for their quality and relevance (see Figure 1 for details).

The research team assessed the resulting collection of papers for mention of internal and external factors related to coping with a chronic illness. We also noted what specific condition, or set of conditions, each article examined. The analysis of the articles followed an inductive approach, with a focus upon whether the papers proposed models, theories, or frameworks to describe the process of coping with, or adapting to, a chronic illness. We then grouped the predictive factors into meaningful segments, which are further outlined in the "Results section."

## Results

A total of 106 articles that met the inclusion criteria and passed quality assessment were identified. These articles were published between 1976 and 2016. Ninety-eight of them were published in English, while eight articles were published in French. The origins of the included articles were United States ( $n=42$ ), Australia ( $n=15$ ), Canada ( $n=9$ ), United Kingdom ( $n=7$ ), France ( $n=6$ ), Germany ( $n=4$ ), Sweden ( $n=4$ ), Netherlands ( $n=4$ ), Italy ( $n=3$ ), Spain ( $n=2$ ), Portugal ( $n=2$ ), Denmark ( $n=2$ ), Iran ( $n=2$ ), Belgium ( $n=1$ ), Taiwan ( $n=1$ ), Israel ( $n=1$ ), Greece ( $n=1$ ), Ireland ( $n=1$ ), and Turkey ( $n=1$ ). The studies



**Figure 1.** Articles in the review process.

included 29 review articles and 77 original research articles. Of the latter, research designs varied; the majority adopted a cross-sectional design ( $n=33$ ), while the others included cohort studies (prospective and retrospective,  $n=14$ ) and randomized controlled trials ( $n=6$ ). The remaining studies ( $n=24$ ) included mixed-methods studies, secondary data analysis, and questionnaire or scale validation.

Given that many of the studies reported more than one relevant coping factor, the results of our review present factors that are not necessarily mutually exclusive and many papers span more than one topic area. Nevertheless, one distinction that emerged was that the majority of the included papers divided factors into those that were external to the person (environmental and social factors) and those that were internal to the person (psychological and behavioral factors). We initially drew on this distinction to organize our findings, but as the papers were reviewed in detail, we noted that the factors fell into six broad different themes that did not entirely accord with this distinction, namely, *Therapeutic interventions* (external), *Habit and routine* (external and internal), *Relational-social factors* (external), *Individual differences* (internal), *Values and beliefs* (internal), and *Emotional factors* (internal). The resulting acronym, THRIVE, provides a framework to summarize the literature in a meaningful way, integrate previous conceptualizations of coping with chronic disease, and invites one to ask whether there are similarities that emerge across the different types of chronic disease in terms of what factors predict positive coping outcomes. We present our analysis of the literature using the THRIVE framework below.

### *Therapeutic interventions*

Our review highlighted that one important determinant of positive coping outcomes was the presence of therapeutic interventions. We define the term therapeutic intervention broadly as including any intervention on the part of a third-party practitioner, be it medical, practical, or psychological, that is intended to improve the patient's physical functioning and psychological well-being. Some of the interventions reported in the literature were those that helped patients gain knowledge or skills in a given domain. A total of 13 articles discussed the roles of programs, workshops, and rehabilitative interventions for patients and/or their caregivers (Andersen et al., 2014; Andersson, 1996; Beck et al., 2010; Bova et al., 2008; Doñate-Martínez et al., 2016; Fredette, 1990; Heim et al., 2001; Hobbs et al., 1999; Johnson and Raterink, 2009; Lewis et al., 2008; Reavley et al., 2009; Reuben et al., 2013; Zettler et al., 1995). The aims of such therapeutic interventions included providing more knowledge and updates related to the chronic condition, teaching new coping skills, improving adherence behavior, exploring ways to gain satisfaction in work or life, examining the emotional consequences of illness, and incorporating new healthcare technologies care. Such interventions have been shown to be associated with more positive moods (Reavley et al., 2009), disease acceptance (Zettler et al., 1995), increased quality of life (Bova et al., 2008; Doñate-Martínez et al., 2016; Heim et al., 2001), as well as improvements in patient knowledge and self-care behaviors (Lewis et al., 2008). For example, in the domain of women coping with HIV, a life skills training workshop was shown to enhance antiretroviral medication adherence,

increase mental well-being, and reduce stress (Bova et al., 2008). In another example, patients coping with multiple chronic diseases showed better outcomes in terms of patient knowledge, as well as improved medical and health adherence behaviors after being exposed to an educational intervention delivered by pharmacists (Lewis et al., 2008).

In addition to interventions aimed at training, skills, and rehabilitation, psychological therapeutic interventions have been shown to predict positive coping outcomes (Ball et al., 2003; Bekelman et al., 2016; Berghmans et al., 2012; Brassington et al., 2016; Coventry et al., 2015; Moss-Morris, 2013; Ngo, 2013; Prevedini et al., 2011; Skaczkowski et al., 2013; Turner et al., 2014; Van Os et al., 2014). In many cases, psychological therapies sought to develop more flexible patient responses to enable a richer and more meaningful life. Other psychological interventions have focused on appropriate ways of regulating and expressing emotions (De Ridder et al., 2008). Such interventions have been linked to higher reported quality of life (Skaczkowski et al., 2013), improved health status (Bekelman et al., 2016), more positive mood states (Van Os et al., 2014), as well as decreased depression and better self-management (Coventry et al., 2015). In one example, an “Acceptance and Commitment Therapy” (ACT) group intervention for people with long-term health conditions was shown to lead to improvements in symptoms linked to depression and anxiety (Brassington et al., 2006). In another example, a multi-pronged intervention led to decreased depression and better self-management among those with heart disease, diabetes, or both (Coventry et al., 2015).

### *Habit and behavioral factors*

The second theme to arise out of this review was that forming positive habits and engaging in relevant behaviors and routines are key predictors of positive coping outcomes (McSorley et al., 2014; Weinert et al., 2008). The literature on self-management suggests that many chronic diseases can be effectively controlled by changing relevant behaviors and forming positive habits (Kong et al., 2015). Habits refer to repeated behaviors that become somewhat automatic over time (Verplanken and Aarts, 1999). For example, establishing a routine is an important coping factor. While positive routines that foster disease management (e.g. following medical regimens, adopting a modified diet, and exercising) can promote positive coping outcomes (De Ridder et al., 2008; Kong et al., 2015), research also suggests that maintaining routines that are not dictated by an illness mindset are important (McSorley et al., 2014). For example, continuing to interact with and manage social relationships, or ongoing engagement with hobbies can foster positive coping outcomes (McSorley et al., 2014; Sidell, 1997). In one study, when men with prostate cancer were able to maintain elements of their normal daily routines, they also reported being better able to cope and maintain a positive frame of mind (McSorley et al., 2014).

Positive habits can also be a very relevant factor when the chronic illness itself requires some type of behavior change as a form of management (De Ridder et al., 2008; Weinert et al., 2008). For example, some chronic illnesses require ongoing actions such as seeking relevant medical care, taking medications, or making lifestyle changes such as exercising and eating a better diet (Sidell, 1997; Weinert et al., 2008). Other conditions require that a patient seeks out information, resources, and appropriate care (Weinert et al., 2008). The general conclusion is that patients who are able to engage in appropriate behaviors and other elements of self-care exhibit fewer symptoms, better physical functioning, and improved psychological adjustment (De Ridder et al., 2008; Sidell, 1997; Weinert et al., 2008). However, it has been suggested that such forms of self-management can sometimes be perceived to take a large amount of time and effort, and that this burden can lead to difficulties in terms of self-management, as well as non-compliance (De Ridder et al., 2008).

One means of encouraging positive self-management, even under challenging conditions, is to foster patient empowerment. The concept of patient empowerment suggests that engaging in relevant behaviors can be linked to positive health outcomes among those with chronic disease (Aujoulat et al., 2008). Whereas the traditional compliance-oriented approach views patients as relatively passive recipients of medical decisions and instructions, the empowerment-oriented approach views patients as actively involved in their own choices and behaviors. Importantly, patient empowerment has been linked to increased acceptance of and adjustment to chronic illness among affected individuals (Aujoulat et al., 2008).

An additional relevant type of behavior identified in our review concerns engaging in goal-management strategies. In particular, individuals can use three complementary strategies: adjusting personal goals when they become threatened by the chronic illness, maintaining goals that are within reach so that a person perceives opportunities to attain them, and searching for new goals that complement existing goals or replace unattainable goals. In the domain of arthritis, these goal-management strategies have all been linked to positive outcomes, such as decreased anxiety and depression, as well as increases in reported well-being and purpose in life (Arends et al., 2013).

### *Relational/social factors*

The third set of factors arising from the review concerns patients’ interactions with people around them. Social support has been defined in different ways (Thoits, 1982), including the degree to which a given person’s needs for affection, approval, belonging, and security are met by significant others (Kaplan et al., 1977). More recent conceptualizations of this construct suggest that it can include offering emotional concern and caring, instrumental aid,

information, or appraisal information (i.e. information relevant to self-evaluation (House, 1981). Although the spouse is often the most significant source of support, recent research suggests that a wide range of people can contribute substantively to the management of chronic illness (Vassilev et al., 2013). In general, our review confirms previous observations that perceived helpfulness of social support is associated with better overall adjustment, less symptomatology, and higher self-esteem (Ashton et al., 2005; Manne and Sandler, 1984).

The literature suggests two different means by which such social support can exert a positive effect on coping outcomes. First, it can buffer or protect the patient from the negative effects of stress (Cohen and Wills, 1985; Weinert et al., 2008) as well as wider cultural forces, such as stigmatization and social exclusion. Mitigating these can lead to more positive self-esteem, greater perceptions of control over the environment, and feelings of worth, importance, and prestige (Riegel, 1989). Indeed, in the domain of chronic coronary heart disease, social support has been proposed to be the major factor in determining coping outcomes (Riegel, 1989).

Second, other papers highlight the ways social support can offer the ill person a range of different resources (Craig and Edwards, 1983). Practical support can include financial aid or services; informational support, such as guidance and advice; and appraisal support, which refers to the value of confiding in someone else and reflecting on one's situation. In addition, other resources are less tangible; a spouse, caregiver, or family member can provide support through empathy and compassion. In one example, men with prostate cancer spoke about their reliance on their wives/partners, who provided both emotional and instrumental support (McSorley et al., 2014). It is worth noting that while most of the literature on social support reports on its positive effects, this is not invariably the case. Social support may not be effective if the social relationship is characterized by disapproval or misunderstanding (Stanton et al., 2007). If social support is felt to be inappropriate, feelings of self-efficacy and control can become threatened, and the relationship becomes one of dependency, which can have negative coping consequences (Abraído-Lanza, 2004).

While social support often comes from family members, spouses, close friends, and caregivers, support groups with members who share a similar situation can also be an important source (Carolan et al., 2014; Dibb and Yardley, 2006; Leshem, 2003; Wholey et al., 2013). These were described as having a number of specific roles. For example, support groups allow individuals to secure more information, to talk to others who understand their symptoms, to learn how to cope with symptoms, to pursue the belief that only another person with the same disease truly understands how they feel, to deal with symptoms that frighten them, and to derive enjoyment helping others help themselves (Scordo, 2001). The amount of and the perceived

helpfulness of such social support were both related to better psychological adjustment (Manne and Sandler, 1984). Finally, the literature also points out that healthcare providers often function as significant social actors. As such, they can serve as a source of support that can contribute psychological well-being, as well as their more overt clinical and medical focus (Cole et al., 2006).

### *Individual differences*

We use the term “individual differences” to refer to relatively enduring or dispositional factors a person has that can be associated with positive coping outcomes. Variables that are unique to the patient, such as current age, gender, ethnicity/cultural background, health status, severity of symptoms, and socio-economic status, are viewed as individual characteristics that can impact coping outcomes (Livneh, 2001; Moss-Morris, 2013; Stanton et al., 2007). For example, those who are lower in socio-economic status often have more negative coping outcomes because they (a) experience more intense stressors and (b) have less resources to cope with these (Stanton et al., 2007). In addition, some research reports gender differences, wherein women are more likely to report depressive symptoms than men and have been shown to rely more on interpersonal relationships to cope (Stanton et al., 2007).

Moreover, differences in terms of disposition or personality traits predict coping outcomes. Some of the research shows that successful adaptation to a chronic disease is more strictly related to patient personality (Beck et al., 2010; Lefèvre, 2000) than to the severity of the disease itself (Olbrisch and Ziegler, 1982). Personality differences that relate to using oppositional coping styles were linked to less positive physical, cognitive, emotional, and behavioral outcomes (Beck et al., 2010). Other research shows that individual differences in coping style are a significant factor that can be linked to adjustment to chronic illness (Arends et al., 2013; Lazarus and Folkman, 1984). One review of adjustment to multiple sclerosis found that those who tended to engage in emotion-focused coping (such as avoidance and wishful thinking) exhibited worse adjustment, while those who utilized problem-focused coping strategies such as seeking social support showed better coping and adjustment (Dennison et al., 2009).

Other individual differences that were identified as positive dispositions included high self-esteem, hardiness, and dispositional optimism (Weinert et al., 2008). Self-esteem refers to the level of general positivity with which the person views the self (Rosenberg, 2015). Patients who exhibited higher levels of self-esteem were more likely to experience more positive psychological well-being and better quality of life—for example, patients with inflammatory bowel disease or rheumatoid arthritis (Abraído-Lanza, 2004; Dibb and Yardley, 2006). Another relevant individual difference was the construct of hardiness (Kobasa, 1982;

Pollock, 1989; Weinert et al., 2008), a personal characteristic that reflects commitment, defined as a tendency to appraise demands as challenging rather than threatening, as well as to have a sense of control over one's own personal outcomes (Pollock, 1989). Presented as a personality characteristic that can be drawn upon as a resource, hardiness has been described as an essential feature for enduring adaptation (Kobasa, 1982; Weinert et al., 2008).

In addition, optimism, which refers to an individual disposition that is characterized by cross-situational consistency in the tendency to expect favorable outcomes for the self, has been shown to exert positive effects on health and recovery times (O'Brien et al., 1995; Stanton et al., 2007). Optimism also has been shown to be associated with psychosocial adjustment, an increased sense of well-being, decreased psychological stress, and renewed vigor (Walker et al., 2004). For example, optimism allowed individuals with rheumatoid arthritis to more effectively set realistic goals and manage their condition (Walker et al., 2004). Moreover, optimism was shown to relate to the choice of the coping strategies employed: optimistic patients were more likely to address problems judged to be under their control and were able to moderate their emotions when facing uncontrollable problems (Walker et al., 2004).

Another type of individual factor reported in the literature is the importance of a given social role (e.g. spouse, parent, employee). Because a chronic condition can often lead to more negative consequences for coping by impinging on a role identity, having a clearly defined social role helps preserve a patient's self-concept (Abraído-Lanza and Revenson, 2006). For example, in the case of patients with arthritis, psychological well-being was lowest among those for whom the illness affected their employed work and eroded this aspect of their self-identity that they previously valued highly (Abraído-Lanza and Revenson, 2006).

### *Values and beliefs*

While the individual-difference factors above refer to relatively consistent and enduring dispositional differences, we note that values attitudes, and beliefs (which are characterized as being more changeable over time and situations) can also be related to positive coping outcomes. For example, research highlights the crucial role that differences in beliefs and values around spirituality can play in predicting positive health and psychological outcomes (Abraído-Lanza et al., 2004; Andersen et al., 2014; Bai et al., 2015; Bergman et al., 2011; Bovero et al., 2016; Dobratz, 2016; Kharamé et al., 2014; Weinert et al., 2008; Whitford and Olver, 2012; Whitford et al., 2008; Wijesinghe and Parshall, 2016). For example, spirituality was an important predictor of quality of life for Italian patients with advanced cancer (Bovero et al., 2016) and was highly associated with adopting a "fighting spirit" in Australian patients with early stage cancer (Whitford and Olver, 2012). Factors linked to

religion and spirituality have been described as a personal resource for coping among Buddhist nuns (i.e. the impermanence of life meant that chronic illness was not resisted) (Wijesinghe and Parshall, 2016). Religious belief was key for Latinos coping with arthritis (Abraído-Lanza et al., 2004) and predicted a better quality of life for patients with end-stage renal disease in Iran (Kharamé et al., 2014).

Other relevant positive psychological beliefs that involve thoughts about the nature, course, and consequence of the disease can also be strong predictors of patient adjustment (De Ridder et al., 2008). For example, beliefs and cognitions such as acceptance, perceptions of control, and positive reinterpretation can predict better psychological and physical functioning (Taylor et al., 2001). "Acceptance" is a term used in the literature to describe willingness to acknowledge the true existence of the illness and incorporate it into one's overall lifestyle; this is in contrast to resignation, which was associated with a sense of fatalism (Weinert et al., 2008). Other articles discussed acceptance in terms of an accurate appraisal of the situation (Craig and Edwards, 1983). Acceptance was presented as a strong predictor of coping in many of the papers reviewed, and it was linked to positive outcomes such as optimism and reduced psychological distress (Büssing et al., 2008; Moss-Morris, 2013; Walker et al., 2004). Within health psychology, beliefs regarding personal control, often termed self-efficacy, relate to the degree of confidence that one can carry out a behavior necessary to achieve a desired goal (Craig and Edwards, 1983; Weinert et al., 2008). Self-control is associated with what actions a patient takes to change things for the better, which leads to greater positive psychological well-being (Andersson, 1996). As a result, self-efficacy, combined with a sense of acceptance as described above, can determine how passive or active patient coping strategies are. In the case of arthritis patients, for example, self-efficacy led to a greater ability to alleviate the experience of pain (Abraído-Lanza, 2004; Abraído-Lanza et al., 2004).

Beliefs about gains or positive outcomes as a result of the chronic illness, often labeled "benefit-finding" in the literature, also can lead to positive coping outcomes (Gois et al., 2012; Moss-Morris, 2013). The ability to reinterpret the situation in a positive way can lead to practical benefits. Among patients with diabetes, those who reinterpreted the situation in positive ways were able to adopt better dietary habits and gain a sense of self-responsibility (Gois et al., 2012; Moss-Morris, 2013). Similarly, patients with prostate cancer who positively reinterpreted the situation reported being able to adopt a more positive attitude regarding their condition (McSorley et al., 2014). Positive beliefs about continuity of the self and one's life can also lead to positive coping outcomes (Östman et al., 2015). Given that chronic illness is invariably associated with a series of changes, losses, and setbacks, maintaining some sense of continuity in life is linked to a sense of predictability and adjustment (Östman et al., 2015). More generally, finding meaning in



the experience of chronic illness also leads to more positive coping outcomes (Stanton et al., 2007), while seeing some form of personal growth stemming from the experience is linked to better adjustment (Skaczkowski et al., 2013; Stanton et al., 2007; Tedeschi and Calhoun, 1996).

### *Emotional factors*

Emotions can play a crucial role in the adjustment process. As the chronic illness moves to the forefront of a patient's life, the process of reconciling emotions is of utmost importance (Whittemore et al., 2002). While positive and expressive emotional responses generally tend to lead to favorable coping outcomes, negative and repressive emotional responses tend to predict negative adjustment (Folkman and Moskowitz, 2000; Moskowitz, 2001; Whittemore et al., 2002). Within the literature on coping with chronic illness in particular, research suggests that while avoidant and inhibiting emotional responses tend to lead to poor outcomes, the expression of emotions tends to lead to positive adjustment (De Ridder et al., 2008). In a similar vein, avoidant behavioral responses more generally lead to negative adjustment, while approach-oriented coping responses generally lead to more positive adjustment (Stanton et al., 2007). In addition, being able to express emotions can lead to positive coping outcomes. Participants in a support group for irritable bowel disease who received mutual encouragement to express their emotions exhibited better coping responses (Leshem, 2003). Effective nursing strategies, in the case of diabetes self-management, can help participants to acknowledge emotions, identify temptations, and indicate boundaries, which subsequently leads to increased self-confidence (Whittemore et al., 2002).

In terms of positive emotions, the specific emotion of hope, which refers to an emotional experience that involves "fearing the worst but yearning for better and believing the wished-for improvement is possible" (Lazarus, 1999, 2006), has been linked to positive adjustment to chronic disease. Two aspects of hope appear to predict positive coping outcomes among those living with a chronic condition. First, hope leads to the important belief that a favorable outcome is possible. Second, hope helps individuals to visualize how that outcome might come about (Craig and Edwards, 1983; Walker et al., 2004).

A range of other emotional states are also associated with coping outcomes. In terms of negative emotional states of mind, depression is common among people with chronic illness and can impair the ability to adjust, as well as detract from quality of life (Davis and Gershtein, 2003; Weinert et al., 2008). High levels of depression can predict lower quality of life in adults with various chronic conditions (Patrick et al., 2000). Loneliness, which refers to a deficit in feelings of human intimacy as well as negative feelings about being alone (Hall and Havens, 1999), can negatively affect coping outcomes (Weinert et al., 2008).

### *Specific illness profiles*

While our overall goal was to highlight coping factors that are generally important across various illness types, we noted that a number of studies discussed adapting to a specific chronic illness (or illnesses; see Table 1). However, analysis of these articles revealed that there was no evidence to suggest individual conditions were associated with a particular subset of coping factors. Therefore, it was not possible to identify condition-specific profiles in terms of ways people cope with their illnesses.

Nevertheless, what is striking in this analysis is the extent to which many conditions span the range of factors identified by the THRIVE framework. This suggests that despite the obvious unique clinical characteristics of each disease and its treatment and management, much of the overall experience of coping with a chronic illness may well be quite similar across conditions. This possibility has important implications, given its suggestion that, from the patient perspective, the internal psychological factors and the external social and contextual factors that determine successful coping may share commonalities across different forms of chronic illness.

### **Discussion/conclusion**

Our analysis highlights how coping with a chronic illness often depends upon the interactions between the patient, the disease, the caregiving system, the medical care system, and broader social and environmental factors. We noted that the factors could usefully be grouped according to six different themes, which we label to produce the acronym THRIVE, reflecting how therapeutic interventions, habit and routine, relational-social factors, individual differences, values and beliefs, and emotional factors all relate to coping outcomes. While therapeutic interventions and relational-social factors reflect more external predictors of coping outcomes (environment or external actions), the others tend to be more internal (tied to the individual). We hope the THRIVE framework not only offers a memorable way to group this wide range of factors but also serves to emphasize the multidimensional nature of coping with a chronic condition.

We also drew on the THRIVE framework to examine those articles that focused primarily on a single specific condition, to examine whether individual conditions might have their own profile of factors. We found a variation in the determinants of coping, even within studies of the same conditions, which suggests that, while clearly the clinical manifestation of different chronic diseases are distinct, often the ways in which patients experience them, and the range of things they have to cope with is more general. The framework demonstrates that it is crucial to broaden the scope relating to coping and adaptation beyond a biomedical understanding of the condition—from the biological nature of the disease to the

**Table 1.** Adaptation according to chronic illness studied.

	Therapeutic interventions	Habits and behavior	Relational/social factors	Individual differences	Values and beliefs	Emotional factors
Multiple diseases or body systems	Brassington et al. (2016) Coventry et al. (2015) Doñate-Martínez et al. (2016) Lewis et al. (2008) Prevedini et al. (2011)	Aujoulat et al. (2008) De Ridder et al. (2008) Verplanken and Aarts (1999) Weinert et al. (2008) Sidell (1997)	Cohen and Wills (1985) Cole et al. (2006) Stanton et al. (2007) Wholey et al. (2013)	Kobasa (1982) Livneh (2001) Moss-Morris (2013) O'Brien et al. (1995) Pollock (1989) Cole et al. (2006) Stanton et al. (2007)	Aujoulat et al. (2008) Craig and Edwards (1983) De Ridder et al. (2008) Dobratz (2016) Moss-Morris (2013) Stanton et al. (2007) Weinert et al. (2008) Wijesinghe and Parshall (2016)	Craig and Edwards (1983) De Ridder et al. (2008) Lazarus (1999) Lazarus (2006) Moskowitz (2001) Stanton et al. (2007) Naaman et al. (2009)
Cancer	Fredette (1990) Heim et al. (2001) Naaman et al. (2009) Reavley et al. (2009) Skazkowski et al. (2013) Turner et al. (2014)	McSorley et al. (2014) Naus et al. (2009) Turner et al. (2014)	McSorley et al. (2014) Pasacreata and Pickett (1998) Poole et al. (2001) Scordo (2001)	Lazarus and Folkman (1984) Reavley et al. (2009)	Andersson (1996) Bai et al. (2015) Bergman et al. (2011) Bovero et al. (2016) Chao et al. (2010) Gilbert et al. (2013) Heppner et al. (2009) McSorley et al. (2014) Skazkowski et al. (2013) Whitford and Oliver (2012) Whitford et al. (2008)	Naaman et al. (2009)
Diabetes	Berghmans et al. (2012) Johnson and Raterink (2009) Johnson and Raterink (2009) Zettler et al. (1995) Bekelman et al. (2016)	Johnson and Raterink (2009)	Moreira et al. (2013)	Berghmans et al. (2012) Luyckx et al. (2008) Page-Carruth et al. (2014) Dalteg et al. (2011) Östman et al. (2015) Oxlad and Wade (2006)	Bazzazian and Besharat (2012) Berghmans et al. (2012) Dupain (2007) Gois et al. (2012) Zettler et al. (1995) Badger (1990) Dalteg et al. (2011) Östman et al. (2015)	Whittemore et al. (2002)
Cardiovascular			Karademas (2014) Riegel (1989) Waltz (1986)			Badger (1990) Niven (1976)
Neurological disease	Beck et al. (2010) Reuben et al. (2013)			Beck et al. (2010) Wilson et al. (2007)	Pakenham and Samios (2013)	Aydemir et al. (2012)
Rheumatic and autoimmune diseases		Arends et al. (2013)	Abraido-Lanza et al. (2004)	Abraido-Lanza (2004) Abraido-Lanza and Revenson (2006) Arends et al. (2013) Dennison et al. (2009) Walker et al. (2004)	Abraido-Lanza (2004) Walker et al. (2004)	Walker et al. (2004)

(Continued)

Table 1. (Continued)

	Therapeutic interventions	Habits and behavior	Relational/social factors	Individual differences	Values and beliefs	Emotional factors
Psychiatric diseases	Ball et al. (2003) Hobbs et al. (1999) Ngo (2013) Van Os et al. (2014)	Hobbs et al. (1999) Ngo (2013)		Hobbs et al. (1999) Van Os et al. (2014)	Büssing et al. (2008) Ngo (2013)	Büssing et al. (2008)
Kidney diseases			Starzomski and Hilton (2000) Kiebles et al. (2010) Leshem (2003)	Starzomski and Hilton (2000) Olbrisch and Ziegler (1982) Voth and Sirosis (2009)	Kharamé et al. (2014) Kiebles et al. (2010) Voth and Sirosis (2009)	Leshem (2003)
Inflammatory bowel disease			Ashton et al. (2005) Bova (2001)	Ashton et al. (2005) Bova (2001)	Taylor et al. (2001)	Bova et al. (2008)
HIV/AIDS	Bova et al. (2008)					
Chronic pain	Andersen et al. (2014) Angel et al. (2012)				Andersen et al. (2014) Angel et al. (2012)	
Allergic diseases		Lefèvre (2000)		Lefèvre (2000)		
Others diseases or condition	Andersson (1996)	Kong et al. (2015)	Dibb and Yardley (2006) Gibson et al. (2005) Manne and Sandler (1984)	Dibb and Yardley (2006) Gibson et al. (2005) Manne and Sandler (1984)	Dibb and Yardley (2006) Gibson et al. (2005) Kharamé et al. (2014) Simmons et al. (2007) Tedeschi and Calhoun (1996)	Folkman and Moskowitz (2000)

more subjective and intersubjective experiences of illness. Furthermore, the wide range of factors, across different areas—both internal and external—suggests that all chronic conditions are inherently “biopsychosocial,” and that depending on the social and cultural expectations, opportunities, and resources, the same clinical condition can have very different impacts on an individual’s life.

### Practical implications

In terms of practical implications, we propose that the THRIVE framework is a useful starting point for practitioners, support providers, and patients themselves for thinking about factors that might facilitate positive coping outcomes. As we note, focusing on relevant internal factors (such as personal habits, individual differences and preferences, values and beliefs, and emotional factors), as well as seeking out relevant external resources (such as therapeutic interventions and social support) is a fruitful strategy to think about coping as a complex and multifaceted task. We note that internal and external factors are not mutually exclusive of each other and often work together in a synergistic fashion. For example, therapeutic interventions (an external factor) might be utilized to help individuals deal with counter-productive emotions (an internal factor, for example, Reavley et al., 2009; Zettler et al., 1995). Moreover, accessing an appropriate social support network and connecting with other patients (i.e. external factors related to social support) may be pivotal in terms of by suggesting alternative coping mechanisms (Leventhal et al., 1997) and leading to greater acceptance (Orfgen and Dijkstra, 2016), which are both internal factors. Thus, we propose that rather than looking at only internal (e.g. De Ridder et al., 2008; Penley et al., 2002; Skinner et al., 2003) or external (e.g. Gallant, 2003) factors in isolation, it can be more effective to consider the role of internal and external factors, and how they might interplay to result in better adjustment and positive coping with chronic illness.

### Limitations

By reviewing the extant literature, we have attempted to explore how patients cope with chronic disease. However, the results should be interpreted with caution for a number of reasons. First, our aim was to search for articles that examined coping and adjustment to chronic illness in general. As such, the list of illnesses included in the 106 reviewed articles is not exhaustive in that it does not include all chronic diseases.

Although we present analyzing factors of coping with chronic illness across differing types of chronic conditions as a strength, it is also worth noting this may also be a potential limitation, given individual conditions and even individual people are, of course, unique. As one researcher notes, it can be difficult to make generalizations when

studying illness because there are always exceptions to the rule (Lorig, 1993). Because of this, our framework is merely intended to be a heuristic to guide researchers to think about the diverse scope of factors that might be relevant when facilitating positive adjustment to chronic illness: it is not an invitation to ignore important differences between conditions and individuals.

Despite the above limitations, we hope that our review sheds light on the factors that predict positive coping outcomes among those dealing with chronic disease. Our analysis suggests that six key areas are important for helping chronic disease patients thrive: therapeutic interventions, habit and behavioral factors, relational-social factors, individual differences, values and beliefs, and emotional factors. By summarizing the literature in this way, it is possible to identify important predictors of positive coping outcomes across different chronic conditions, and think about how they might potentially interact with each other. We hope this work can serve as an impetus to those wishing to further examine adjustment to chronic disease.

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