



Predictors of Physical Health and Subjective Well-Being Among Patients with Diabetes

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Abstract

Chronic diseases are broadly defined as conditions that last a year or longer, limit activities of daily living and require constant medical care. The international literature provides increasingly nuanced conceptualizations of adjustment, revealing that the experience of chronic diseases requires adaptation in multiple life domains. Several studies have looked at the impact of chronic diseases on patients' quality of life and subjective well-being. The data of this correlational study were collected using a protocol of 12 standardized questionnaires administered to 80 patients with type 1 or 2 diabetes. Data from multiple linear regression analyses showed that severity of physical symptoms was among the predictors of participants' satisfaction with their physical functioning (autonomy), global life satisfaction, and negative affective mood. Beliefs in general self-efficacy and dispositional optimism were predictors of global life satisfaction and negative affective mood. Participants' perception of the availability and adequacy of social support from their partners was also predictor of indicators of subjective well-being. Some implications for understanding the dimensions of adjustment of chronically ill patients to specific demands are discussed.

Keywords: Chronic diseases; diabetes; physical health; predictors; subjective well-being

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1. Introduction

Chronic diseases (e.g., respiratory disorders, Alzheimer's disease, Parkinson's disease, chronic kidney disease, cancer, diabetes, arterial hypertension, multiple sclerosis, etc.) constitute a major public health concern due to their substantial economic and social burden (Roca *et al.*, 2015). According to the U.S. Centers for Disease Control and Prevention (2003), chronic diseases are defined as conditions characterized by long-lasting symptoms, limited spontaneous remission, and a low likelihood of complete cure. Current epidemiological projections indicate that the global prevalence of chronic diseases will continue to rise in the coming decades. This trend persists despite the fact that some of these conditions (such as cardiovascular diseases and certain forms of cancer) can be effectively prevented through cost-efficient interventions targeting shared risk factors, including tobacco use, alcohol dependence, unhealthy dietary patterns, and sedentary lifestyles (IOM, 2012; WHO, 2011).

The scientific and research literature provides a substantial body of evidence addressing both risk and protective factors associated with chronic diseases, as well as individual differences in symptom manifestation, subjective illness experiences, and patients' adherence to medically prescribed treatments and regimens. Prior studies have consistently demonstrated that psychosocial, behavioral, and contextual variables play a significant role in shaping how individuals perceive, manage, and cope with chronic illness (Brown, 2006; Chen & Chang, 2012; Falvo, 2014; IOM, 2012; Stanton, Revenson, & Tennen, 2007; Wikman, Wardle, & Steptoe, 2011).

An important dimension that has attracted sustained scholarly attention concerns individuals' adaptation to the emotional demands involved in receiving a diagnosis and coping with the progression of a chronic illness, as well as the ways in which the clinical manifestations of various conditions affect patients' physical, psychological, occupational, and social functioning, together with that of their families (Ciudin & Turliuc, 2016; De Ridder *et al.*, 2008; Hoyt & Stanton, 2012; Roca *et al.*, 2015; Stanton, Revenson, & Tennen, 2007). The present study focuses on identifying the factors that contribute to predicting perceptions of physical health status, as well as indicators of subjective well-being, among patients diagnosed with diabetes.

2. Dimensions of adjustment in patients diagnosed with diabetes

Diabetes mellitus represents a group of metabolic disorders with diverse etiologies, characterized by chronic hyperglycemia. This chronic medical condition occurs when the body produces insufficient insulin or when the insulin produced is ineffective, leading to the metabolic system's inability to adequately regulate and process blood glucose levels (Boyer, 2008). Across all types of diabetes, chronic hyperglycemia is associated with a wide range of acute symptoms and long-term medical complications, including visual impairment, peripheral and autonomic neuropathies, nephropathies, and cardiovascular conditions, among which arterial hypertension is the most prevalent (Boyer, 2008; Landel-Graham, Yount, & Rudnicki, 2003; Martín-Timón *et al.*, 2014). According to data published by J. E. Shaw, R. A. Sicree, and P. Z. Zimmet (2010), the global prevalence of diabetes is projected to reach 7.7% by 2030, corresponding to more than 439 million adults worldwide. For Romania, the authors report an expected prevalence of 10% by the year 2030.

Chronic diseases are progressive in nature; consequently, their impact across multiple domains of patients' individual functioning has received considerable attention from researchers and professionals involved in medical care and rehabilitation. Declines in patients' functioning across various areas (such as physical and psychological vitality, daily activities, participation in family life, and social relationships) often follow an uneven and non-linear course (IOM, 2012; Stanton, Revenson, & Tennen, 2007). One major line of research that has engaged specialists in the field of chronic illness concerns the domains in which patients are required to exert sustained efforts to manage the course of their conditions and to preserve, as much as possible and for as long as possible, their overall physical and psychological health.

The literature identifies five key indicators of successful adaptation to chronic illness (De Ridder *et al.*, 2008; Hoyt & Stanton, 2012): a) effective management of core adaptive tasks (including cognitive restructuring; management of pain and other physical symptoms; seeking, processing, and interpreting relevant information to understand the medical aspects of the illness; handling financial challenges; managing complex emotions; and maintaining close social relationships, among others); b) maintenance of an adequate functional status (encompassing physical mobility, sensory and cognitive functioning, and the ability to perform routine activities) as well as the preservation of social and occupational roles (when the medical condition allows); c) maintenance of quality of life at an optimal level; d) absence of mental disorders; e) low levels of negative affect and/or the promotion of positive affect.

Since the early 2000s, studies focusing on psychological adaptation to medical conditions have increasingly concentrated on identifying factors that explain individual differences in responses to chronic illness. For example, symptom severity and prognosis, the rate of decline in overall health status, fluctuations between symptomatic and asymptomatic periods, treatment adherence, and other clinical characteristics intrinsic to chronic diseases constitute some of the factors that shape the dynamic process of adaptation. Beyond illness-related factors, patients' individual predispositions, as well as characteristics of the environments in which they live, also play a crucial role in the adaptation process (Hoyt & Stanton, 2012; Stanton, Revenson, & Tennen, 2007).

The role played by intrinsic characteristics of chronic diseases in predicting individual differences in patients' adaptation to illness-related demands has not yet been fully clarified. Most studies focusing on medical and psychosocial adaptation (León-Hernández *et al.*, 2023; Papadopoulos *et al.*, 2007; Weng, Hung, & Chi, 2010) have taken into account intrinsic features of diabetes, such as diagnostic type (type 1 or type 2 diabetes), the time elapsed since diagnosis and initiation of treatment, and the presence of comorbidities, among others. Studies have also examined the role of gender, age, educational level, and other indicators of socioeconomic status (e.g., income) in explaining individual differences in overall health status and physical functioning, symptom control, and dimensions of quality of life and subjective well-being among patients diagnosed with diabetes or other chronic conditions (Chiu & Wray, 2011; Taylor, Repetti, & Seeman, 1997; Weng, Hung, & Chi, 2010). In addition, studies have considered three broad categories of variables that may account for individual differences in how patients diagnosed with diabetes adapt to disease-specific demands, as well as in their quality of life and indicators of subjective well-being: a) individual characteristics and predispositions, such as beliefs in self-efficacy regarding blood glucose monitoring and the control of other diabetes-related symptoms (Chen & Lin, 2014; Cherrington, Wallston, & Rothman, 2010; León-Hernández *et al.*, 2023; O'Hea *et al.*, 2009), locus of control related to symptom monitoring and overall health status (Chen & Lin, 2014; O'Hea *et al.*, 2009; Weng, Hung, & Chi, 2010), or dispositional optimism (Luo *et al.*, 2021; Ravindran, Shanmugasundaram, & Madhusudhan, 2022; Tindle *et al.*, 2018); b) changes in life attitudes, reflected in the intensification of religious beliefs and/or practices (Newlin *et al.*, 2010; Rivera-Hernandez, 2016; Saffari *et al.*, 2019; Yuniarti *et al.*, 2013), as well as an orientation toward spirituality (Cesarez, Engebretson, & Ostwald, 2010; Daaleman *et al.*, 2001; Lynch *et al.*, 2012; Newlin *et al.*, 2010); c) social support, as a key resource provided by a patient's social network (Miller & DiMatteo, 2013; Phelps *et al.*, 2011; Rees, Karter, & Young, 2010; Song *et al.*, 2012).

Numerous empirical studies have focused on levels and predictors of quality of life (Balboni *et al.*, 2007; Campbell *et al.*, 2004; Karner-Huțuleac, 2012; Katz *et al.*, 2002; Papadopoulos *et al.*, 2007; Park & Park, 2023; Ravindran, Shanmugasundaram, & Madhusudhan, 2022; Saffari *et al.*, 2019; Wikman, Wardle, & Steptoe, 2011), as well as on predictors of subjective, psychological, or spiritual well-being (Daaleman *et al.*, 2001; Huang *et al.*, 2023; Newlin *et al.*, 2010; Park & Park, 2023; Shang *et al.*, 2023; Turgari *et al.*, 2022; Wikman, Wardle, & Steptoe, 2011), among patients diagnosed with coronary artery disease, stroke, bronchial asthma, cancer, type 2 diabetes, myocardial infarction, chronic kidney disease, and related chronic conditions. In a comparative study, A. Karner-Huțuleac (2012) examined 82 patients diagnosed with type 1 or type 2 diabetes,

32 patients undergoing hemodialysis procedures, and 103 clinically healthy adults who served as a control group. Patients presenting symptoms of depression or dementia were excluded from the study. Compared with healthy participants, both patients with diabetes and those diagnosed with chronic kidney failure obtained significantly lower mean scores on quality of life in both the physical and mental health domains. These findings highlighted substantial limitations in domestic and occupational activities among the patients included in the analysis.

Using a correlational design and a protocol comprising 12 standardized questionnaires, the quantitative study whose results are presented in this article aimed to test predictive models in which the dependent variables were: a) patients' perceptions of their physical health status, operationalized as satisfaction with autonomy in performing various activities and/or actions necessary for daily functioning and survival; b) overall life satisfaction; c) negative affective disposition, considered an indicator of emotional well-being. The guiding research question underlying the present investigation was: Which variables make the most consistent contribution to predicting satisfaction with physical health status and indicators of subjective well-being among patients diagnosed with diabetes?

3. The current study

3.1. Aim

Research on chronic illness is inherently multidimensional. The literature in this field includes numerous contributions that have focused on aspects such as the prevalence of chronic diseases, symptom dynamics and the complications that may develop over time, risk factors, medical interventions aimed at symptom control and the recovery of health status and individual functioning, factors contributing to adherence to medical treatments and their effectiveness, the psychological effects of chronic illness at the individual level, social and economic costs, variables that foster resilience in the face of illness and promote positive adaptation among patients and their families (life partners or children), as well as psychological interventions designed to enhance resilience and to facilitate the acquisition of new behavioral patterns oriented toward the maintenance and/or improvement of health status.

A review of the Romanian literature addressing the psychosocial consequences of chronic illness led to the conclusion that references in this area remain relatively limited (Ciudin, 2013; Cristea *et al.*, 2011; Karner-Huțuleac, 2012; Moldovan *et al.*, 2009; Postăvaru, 2014). In contrast, an analysis of the international literature allowed for the identification of a broad spectrum of difficulties encountered by individuals living with various chronic conditions, as well as the factors that contribute to explaining individual differences in the process of adaptation to disease-specific demands.

Building on conceptual contributions and empirical findings from studies examining the impact of chronic illness on patients' functioning, the present study aimed to identify the variables that make the most consistent contribution to explaining differences among patients diagnosed with diabetes in terms of satisfaction with physical health status (personal autonomy) and indicators of subjective well-being. The present investigation was grounded in the premise of a multidimensional approach to the factors contributing to the individual adaptation of patients diagnosed with diabetes to the demands imposed by this chronic condition. In what follows, the methodological framework, results, limitations, and implications of the study are presented.

3.2. Research design, hypotheses and variables

The study was based on a mixed quantitative design, combining a cross-sectional approach with a correlational approach. The responses provided by the surveyed patients were processed and compiled into a raw data set, which was subsequently analyzed using univariate and multivariate statistical procedures. Data collection and quantitative analyses were conducted in order to test the following working hypotheses:

- A. The time elapsed since diabetes diagnosis, the severity of disease-specific symptoms, and the presence of organic comorbidities are negative predictors of patients' satisfaction with autonomy in the domain of physical functioning and of overall life satisfaction, and positive predictors of negative affect.
- B. Among patients diagnosed with diabetes, an external locus of control is a negative predictor of satisfaction with autonomy in the domain of physical functioning and of overall life satisfaction, and a positive predictor of negative affect.
- C. General self-efficacy beliefs, dispositional optimism, orientation toward spirituality, and orientation toward religious beliefs and practices are positive predictors of satisfaction with autonomy in the domain of physical functioning and of overall life satisfaction among patients with diabetes, and negative predictors of negative affect.
- D. Perceived social support from life partners and the extrafamilial social network is a positive predictor of satisfaction with autonomy in the domain of physical functioning and of overall life satisfaction, and a negative predictor of negative affect among patients diagnosed with diabetes.

Some of the independent variables included in the predictive models were categorical (e.g., gender, place of residence, educational level, household income, or organic comorbidity), whereas the remaining variables were quantitative (scores obtained from standardized instruments used to operationalize the time elapsed since diagnosis of type 1 or type 2 diabetes, the severity of disease-specific symptoms, locus of control, orientation toward spirituality, and the availability and adequacy of social support provided by life partners). All dependent variables were quantitative and were represented by scores derived from questionnaires assessing indicators of subjective well-being.

3.3. Participants and procedure

Table 1 presents the main sociodemographic and medical characteristics of the sample of adults diagnosed with type 1 or type 2 diabetes ($N = 80$) who participated in the study. The male-to-female ratio was 2:1. The mean age of respondents was over 53 years. Patients residing in urban areas predominated, with an urban-to-rural residence ratio of 5:1. The vast majority of respondents (98.7%) were either married for the first time or remarried. Approximately 69% of the participants had completed at most secondary education. About 38% were retired due to illness or upon reaching the statutory retirement age, while the remainder were employed (53.7%) or homemakers (8.7%). More than 42% of the study participants reported a monthly household income below 2.000 RON, whereas only 16.2% reported incomes exceeding 4.000 RON.

Tabelul 1. Characteristics of the study participants

Characteristics	<i>n</i>/Descriptive statistics
<i>Gender</i>	
Female	25
Male	55
<i>Age (years)</i>	33-76 ($M = 53.21$; $SD = 9.73$)
<i>Place of residence</i>	
Rural	13
Urban	67
<i>Marital status</i>	
In a relationship, unmarried	1
Married (first marriage)	77
Remarried	2
<i>Education</i>	
General	20
Secondary	35

Higher or above	25
<i>Occupational status</i>	
Employed	43
Retired due to illness	12
Retired (statutory retirement age)	18
Homemaker	7
<i>Household income (RON)</i>	
< 2000	34
2001-4000	33
> 4000	13
<i>Time since diabetes diagnosis (years)</i>	0.08-32 ($M = 7.89$; $SD = 7.28$)
<i>Diagnosis</i>	
Type 1 diabetes	5
Type 2 diabetes	70
<i>Organic comorbidity</i>	
Present	64
Absent	16

Note: M – mean; SD – standard deviation. Diagnosis data were available for $n = 75$

Respondents diagnosed with type 2 diabetes predominated (87.5%). On average, participants had been diagnosed with one of the two types of diabetes for 7.89 years ($SD = 7.28$). Twenty-five patients (31.2%) were insulin-dependent for periods ranging from 1.12 to 17 years ($M = 6.97$; $SD = 3.82$). Organic comorbidity (the co-occurrence of at least two chronic diseases, one of which may represent a complication of diabetes) was another clinical characteristic considered in the study. Most respondents reported that, in addition to diabetes, they suffered from at least one other chronic condition. The most frequently reported secondary diagnosis was arterial hypertension, a condition commonly associated with more advanced stages of diabetes. Another factor that may help explain the high prevalence of organic comorbidity in the present sample is the relatively elevated mean age of participants.

Participants were recruited using a purposive sampling strategy. Most patients were identified by consulting patient lists from three family medicine practices in the municipality of Iași. Inclusion criteria were: a) Romanian nationality; b) completion of at least eight years of schooling; c) involvement in a couple relationship (regardless of its legal status) for at least one year; d) a minimum of six months since diabetes diagnosis; e) absence of current mental disorders and related psychotropic medication. This latter criterion was ensured through consultations with the family physicians in the practices that served as the recruitment pool for the study.

Most questionnaires were administered individually. Prior to completion, participants were provided with an informed consent form, which was read and/or reviewed and subsequently signed. Questionnaire administration was carried out by the first author of the present article; however, in several cases, assistance was provided by the family physicians from the practices involved in recruitment. Responses were anonymous. Participants were assured of the confidentiality of their answers and were informed about the aims of the study and the ways in which the collected data would be used.

3.4. Measures

Questionnaire on sociodemographic characteristics and medical condition-related variables. The variables of interest included: a) gender and age; b) place of residence; c) marital status; d) educational level, occupational status, and household (couple/family) income. Participants were also asked to report: a) the type of diabetes they had (type 1/insulin-dependent vs. type 2); b) the time elapsed since diagnosis; c) the duration of daily insulin administration (for patients with type

1 diabetes who had reached this stage of the illness); d) any additional chronic organic conditions (i.e., comorbidities) they experienced.

Self-Rated Severity of Diabetes-Specific Symptoms Scale. Diabetes-specific symptoms were operationalized based on a commonly used description of the clinical manifestations of this chronic condition. The questionnaire included 15 symptoms (e.g., persistent thirst and/or dehydration, breathing difficulties, visual problems, abdominal pain, skin ulcers with delayed healing, fluctuations in blood pressure, sleep disturbances, and a general sense of malaise, among others). Participants were informed that the symptoms listed were characteristic of their condition and were asked to indicate how frequently they had experienced each symptom during the past few months. Responses were recorded on a graded scale: 0 = *never*, 1 = *almost never*, 2 = *rarely*, 3 = *sometimes*, 4 = *quite often*, and 5 = *very often*. For each participant, a total score was computed as the mean of item scores (possible range: 0-5). Higher scores were interpreted as indicating greater severity of diabetes-specific symptoms.

Self-Assessment Scale for Satisfaction with Physical Functioning (Autonomy). Physical autonomy was conceptualized as an individual's capacity to perform various activities and/or actions necessary for everyday survival (IOM, 2012). Study participants were asked to consider all aspects of their own physical functioning and to rate their level of satisfaction with this dimension using a five-point graduated scale. The response options were as follows: 0 – *completely dissatisfied*, 1 – *rather dissatisfied*, 2 – *rather satisfied*, 3 – *satisfied*. Based on the selected response option, a score was calculated to reflect satisfaction with the level of personal autonomy in physical functioning (possible score range: 0-3).

Adult Nowicki and Strickland's Internality-Externality Scale. To assess locus of control in general (i.e., an individual's belief in their ability to influence the course of events in everyday life) study participants completed the Romanian-language version of a shortened form of the Adult Nowicki and Strickland's Internality-Externality Scale (ANSIE; Nowicki & Duke, 1983; Chelcea, 2004, for the Romanian adaptation). In its original English-language version, the ANSIE instrument comprises 40 items (e.g., "Do you feel that many of the problems in your life will resolve themselves even without your involvement?" or "Do you believe that people's desires positively influence the achievement of their goals?"), to which respondents answer Yes or No. Each response that does not correspond to the scoring key is assigned 0 points, whereas each response that matches the scoring criteria receives 1 point. The total score is obtained by summing the scores across all scale items (possible score range: 0-40). Higher scores indicate an external locus of control, whereas lower scores are indicative of internality. To avoid overburdening the assessment protocol to be completed by study participants and, implicitly, to reduce potential unwanted effects on response behavior (e.g., boredom or fatigue), the Romanian-language version of the ANSIE instrument was shortened to ten items. Items were selected (e.g., "Do you believe that many of the problems in your life will resolve themselves without your involvement?" or "Do you believe that when things go well for you, it is because you have acted effectively?") whose wording was considered representative of the psychological content of the constructs related to internality/externality.

For each respondent, the total score was obtained by summing the scores across the ten items, with each item scored according to the correction key (possible score range: 0-10). Higher scores were interpreted as indicating a cognitive orientation toward externality. For the sample of patients diagnosed with diabetes who participated in the present study, reliability analysis revealed an acceptable level of internal consistency among the items ($KR_{20} = 0.66$).

Life Orientation Test-Revised. To assess dispositional optimism (i.e., expectations regarding positive outcomes of one's own actions or a favorable course of life events) the Romanian-language version (Pruteanu, 2014) of the short form of the Life Orientation Test-Revised (LOT-R; Scheier, Carver, & Bridges, 1994) was used. Patients completed only six items (three positively worded – e.g., "In general, I expect more good things to happen to me than bad ones" – and the remaining items negatively worded – e.g., "I rarely count on good things happening to me"), all targeting

optimism. Neutral items (distractors) were excluded. For each item, participants selected one of the following response options: 0 – *strongly disagree*, 1 – *disagree*, 2 – *neutral*, 3 – *agree*, 4 – *strongly agree*. The total score was obtained by summing the item scores (possible score range: 0-24). Higher scores were interpreted as indicating a greater predisposition toward optimism. Given the small number of items, internal consistency was acceptable ($\alpha = 0.64$).

General Self-Efficacy Scale. Participants' beliefs regarding their own effectiveness in coping with various difficult situations encountered in everyday life were assessed using the Romanian-language version (Băban, Schwarzer, & Jerusalem, 1996) of the General Self-Efficacy Scale (GSES; Luszczynska, Scholz, & Schwarzer, 2005). The instrument is available on the website of the Free University of Berlin (www.userpage.fu-erlin.de). The scale comprises ten items (e.g., "If I persist, I can solve difficult problems" or "No matter what happens, I am prepared to deal with the situation"), to which respondents answer using a four-point Likert-type scale with gradually ordered response options. In the standard format, these options are *never*, *sometimes*, *often*, and *always*. However, these anchors were considered to deviate from those used in the original English-language version, as the latter do not refer to the frequency of one's perceptions of self-efficacy. Therefore, in the present study, the response format included the following anchors: 1 – *does not describe me at all*, 2 – *describes me a little*, 3 – *describes me quite well*, 4 – *describes me perfectly*. These were considered more appropriate, as they more clearly guided the responses of the patients surveyed. The total GSES score is obtained by summing the item scores (possible score range: 10-40). Higher scores indicate a higher level of general self-efficacy beliefs. In the present study, internal consistency was good ($\alpha = 0.86$).

Spirituality Questionnaire. Participants' orientation toward beliefs regarding the importance of spirituality in an individual's life was operationalized using the Romanian-language version of the Spirituality Questionnaire (SQ; Parsian & Dunning, 2009). The authors conceptualized spirituality in terms of self-identity, the search for meaning and purpose in one's own existence, self-actualization, and the individual's sense of connectedness both with the self and with the universe as a whole. In its full version, the questionnaire consists of 29 items (e.g., "I have a positive attitude toward myself", "Spirituality helps me understand myself" or "I feel the need to find answers to the mysteries of life") that operationalize four dimensions, as follows: self-awareness (ten items), the importance of spiritual beliefs in an individual's life (four items), spiritual practices (five items), and spiritual needs (nine items). For each item, respondents select one of four gradually ordered response options: 1 – *strongly disagree*, 2 – *disagree*, 3 – *agree* and 4 – *strongly agree*. In the present study, only 19 items were administered, with the self-awareness dimension excluded. For each participant, the total score was obtained by calculating the mean of the item scores (possible score range: 1-4). Higher scores indicated a stronger orientation toward spirituality. For the sample of patients with diabetes who completed the questionnaire, internal consistency was very good ($\alpha = 0.90$).

System of Belief Inventory-15R. Study participants completed the Romanian-language version of the revised System of Belief Inventory (SBI-15R; Holland *et al.*, 1998). In terms of content, the 15 items focus on the following aspects related to religious beliefs and spiritual life in general: a) the extent to which an individual feels they have achieved a clear existential direction and understands the meaning or purpose of their life; b) engagement in specific religious rituals or practices, such as meditation and prayer; c) the individual's relationship with an entity perceived as transcendent or superior (e.g., God); d) the level of social support perceived from a community that shares similar religious and spiritual beliefs. In the present study, participants responded to the SBI-15R items (e.g., "I am certain that God exists in some form" or "I feel calm when I pray or meditate") using a four-point Likert-type scale with gradually ordered response options: 0 – *strongly disagree*, 1 – *disagree*, 2 – *agree*, 3 – *strongly agree*. For each participant, the total score was obtained by summing the scores across all items (possible score range: 0-45). Higher scores were interpreted as indicating a stronger orientation toward religious beliefs and practices, as well as more positive perceptions regarding the availability and adequacy of support from the religious

community to which the participant belonged. In the present study, internal consistency was very good ($\alpha = 0.94$).

Medical Outcomes Study–Social Support Survey. To operationalize social support received from life partners, study participants completed a Romanian-language version adapted from the Medical Outcomes Study–Social Support Survey (MOS-SSS; Sherbourne & Stewart, 1991). This instrument was developed to assess perceptions of the availability of so-called functional support – that is, the extent to which relationships with a life partner or with close friends/relatives serve to maintain personal autonomy and facilitate goal attainment. The items assessing functional support operationalize five dimensions: emotional support, informational support, instrumental (material) support, positive social interactions, and affectionate support. Study participants completed 15 items adapted from the MOS-SSS (e.g., “Can you rely on your spouse to listen to you when you need to talk?” or “Does your spouse show you love and affection?”). For each item, responses were provided using a five-point Likert-type scale with gradually ordered options: 1 – *never*, 2 – *rarely*, 3 – *sometimes*, 4 – *often*, 5 – *always*. The total score was calculated by summing the item scores (possible score range: 0-60). Higher scores were interpreted as indicating higher levels of social support from life partners. Internal consistency was excellent ($\alpha = 0.92$).

Multidimensional Scale of Perceived Social Support. Participants’ perceptions of extrafamilial social support were operationalized using the Romanian-language version of the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet *et al.*, 1988). The scale was designed to assess subjective perceptions of the availability and adequacy of social support (instrumental and emotional) from three specific sources: family (four items – e.g., “My family really tries to help me when I need it”), friends (four items – e.g., “I can talk about my problems with my friends”), and other significant persons who may play an important role in one’s life (four items – e.g., “There is a special person in my life who cares about my feelings”). Because perceptions of family support were also operationalized through items from the MOS-SSS (which assessed support provided by the life partner), only eight MSPSS items were administered in the present study. These items operationalized perceptions of extrafamilial social support (from friends and significant others). For each item, responses were provided on a seven-point Likert-type scale with gradually ordered verbal anchors: 1 – *strongly disagree*, 2 – *disagree*, 3 – *somewhat disagree*, 4 – *neither agree nor disagree*, 5 – *somewhat agree*, 6 – *agree*, and 7 – *strongly agree*. The total score was obtained by calculating the mean of the scores across the eight items (possible score range: 1-7). Higher scores were interpreted as indicating a high level of availability and adequacy of extrafamilial social support. In the present study, internal consistency for the set of eight items was good ($\alpha = 0.85$).

Satisfaction With Life Scale. To assess global life satisfaction, participants in the study completed the Romanian-language version (Balgiu, 2019; Sandovici *et al.*, 2017; Stevens *et al.*, 2012) of the Satisfaction With Life Scale (SWLS; Diener *et al.*, 1985). The items (e.g., “The conditions of my life are excellent” or “So far, I have obtained the important things I want in life”) operationalize the cognitive component of subjective well-being. For each item, responses were provided using a seven-point Likert-type scale with gradually ordered verbal anchors: 1 – *strongly disagree*, 2 – *disagree*, 3 – *somewhat disagree*, 4 – *neither agree nor disagree*, 5 – *somewhat agree*, 6 – *agree*, and 7 – *strongly agree*. The total score was obtained by summing the item scores (possible score range: 5-35). Higher scores indicate higher levels of satisfaction with one’s life considered as a whole. In the present study, internal consistency was good ($\alpha = 0.87$).

Mental Health Index–5. To assess negative affective disposition as a dimension of emotional well-being, the Romanian-language version (Pruteanu, 2014) of the Mental Health Index-5 (MHI-5; Berwick *et al.*, 1991) was administered. The MHI-5 is a screening instrument derived from the Medical Outcomes Study 36-Item Short Form Health Survey and measures mental health; it can be used in studies focusing on quality of life and well-being among individuals diagnosed with chronic illnesses. The instrument consists of five items (e.g., “During the past few months, how often have you felt calm and peaceful?” or “During the past few months, how often have you felt discouraged and downhearted?”). Respondents evaluate their emotional well-being by selecting one of five

response options on a Likert-type scale: 0 – *never*, 1 – *very rarely*, 2 – *sometimes*, 3 – *fairly often*, 4 – *very often*, 5 – *all the time*. The total score is obtained by summing the item scores (possible score range: 0-25). Higher scores (reflecting greater negative affective disposition) indicate lower levels of emotional well-being experienced by the respondent over the past few months. In the present study, internal consistency was good ($\alpha = 0.86$).

3.5. Statistical analyses

Data were analyzed using SPSS for Windows, version 20.00 (IBM SPSS, Chicago, IL). For all quantitative variables of interest, the normality of the distributions was examined, as this is an important prerequisite for the application of multivariate statistical tests (Morgan *et al.*, 2019). For a univariate normal distribution, the values of the skewness and kurtosis indices should be equal to (or close to) zero. However, there is no clear-cut criterion indicating which values of the skewness and kurtosis coefficients are acceptable for concluding that a variable's distribution is (quasi)normal. Some authors (Bowen & Guo, 2012; Morgan *et al.*, 2019) propose critical thresholds of ± 1.00 , whereas others (Sava, 2011) recommend a more restrictive interval of $[-0.80; 0.80]$. The value of the skewness coefficient tends to distort the results of comparative statistical tests; however, the kurtosis coefficient is considerably more problematic, as it may exert a severe impact on tests that rely on the covariance matrix. Results from statistical-mathematical simulation studies suggest that skewness values falling outside the interval $[-2.00; 2.00]$, and kurtosis values outside the interval $[-4.00; 4.00]$, are problematic because they substantially distort the outcomes of multivariate tests (West, Finch, & Curran, 1995).

Comparisons based on sociodemographic characteristics and variables related to the medical status of the surveyed patients were conducted using Student's *t* test for two independent samples ($\alpha = 0.05$ was considered the threshold for statistical significance). For statistically significant differences, effect size was estimated using Cohen's *d* coefficient (Cohen, 1992). Researchers generally consider the following benchmarks for interpreting the magnitude of *d*: 0.20 – small effect, 0.50 – medium effect, and 0.80 – large effect. Values greater than 1.00 indicate very large effect sizes.

To estimate multiple regression models, bivariate linear correlations were first computed among the quantitative variables examined in the study (the critical threshold for statistical significance was set at $\alpha = 0.05$). Multiple linear regression analyses were conducted using the *enter* method (Morgan *et al.*, 2019). Within the prediction models, categorical independent variables (e.g., gender, education, household/couple income, or organic comorbidity) were recoded as dummy variables (e.g., 1 = women, 0 = men/reference category; or 1 = income > 2.000 RON, 0 = income < 2.000 RON/reference category). This transformation facilitates the interpretation of the magnitude of the relationship between a dichotomous independent variable, as a predictor, and the criterion variable (Sava, 2011). To optimize the regression models in terms of the number of independent predictor variables and their explanatory power, only quantitative independent variables that showed correlations of $\geq |\pm 0.30|$ with the dependent variables were entered into the models, along with categorical independent variables that yielded mean differences on the dependent variables with at least moderate effect sizes ($d > 0.50$). The unique contributions of independent variables identified as predictors to the explained variance of the criteria were determined by calculating the squared semi-partial correlation coefficient (r^2_{sp}) and converting the resulting values into percentages.

4. Results

In the sample of patients diagnosed with diabetes, the following tendencies were observed (Table 2): a) low mean scores for the severity of diabetes-specific symptoms, locus of control, and negative affective disposition; b) a moderate mean score for dispositional optimism; c) moderate to high mean scores for beliefs in general self-efficacy, orientation toward spirituality, religious beliefs and

practices, extrafamilial social support, satisfaction with autonomy in physical functioning, and global life satisfaction; d) a high mean score for social support received from life partners. The absolute values of the skewness index ranged between 0.005 and 1.15 ($M = 0.34$; median = 0.18). Only for satisfaction with autonomy in physical functioning did the skewness coefficient fall below -1.00 ; however, this deviation was not pronounced. The kurtosis coefficient showed absolute values ranging from 0.01 to 1.14 ($M = 0.51$; median = 0.50). Only for locus of control did the absolute value of this indicator slightly exceed the upper limit.

Table 2. Descriptive characteristics of the distributions for the main quantitative variables

Variables	<i>M</i>	<i>SD</i>	<i>Skewness</i>	<i>Kurtosis</i>
Severity of diabetes-specific symptoms	0.91	0.35	0.005	- 0.01
Locus of control (externality)	3.01	1.88	- 0.03	- 1.14
Optimism	12.18	2.69	0.03	0.40
Self-efficacy	28.85	4.93	- 0.33	- 0.22
Orientation toward spirituality	2.97	0.44	- 0.33	0.55
Religious beliefs and practices	31.01	8.48	- 0.75	0.12
Social support from life partner	46.26	11.51	- 0.80	- 0.46
Extrafamilial social support	5.47	1.00	- 0.58	- 0.69
Satisfaction with physical functioning autonomy	2.40	0.80	- 1.15	0.50
Life satisfaction	24.82	6.05	- 0.16	- 1.03
Negative affective disposition	8.76	4.26	0.18	- 0.53

In conclusion, within the sample of patients diagnosed with diabetes who participated in the study, the distributions of the quantitative variables of interest did not present major deviations from normality. This supported the use of Student's t test for mean comparisons according to sociodemographic and medical status variables, the calculation of correlations among quantitative variables, and the application of multiple linear regression modeling.

Participants' gender had a statistically significant effect on the mean score for satisfaction with autonomy in physical functioning ($t = - 2.81$; $p < 0.01$). The magnitude of this difference was substantial, with a moderate-to-large effect size ($d = 0.69$). Compared with women ($M = 2.04$; $SD = 0.84$), male patients ($M = 2.56$; $SD = 0.73$) reported significantly higher levels of satisfaction with autonomy in physical functioning. By contrast, participants' gender did not have statistically significant effects on global life satisfaction ($t = - 0.90$; $p = 0.371$) or negative affective disposition ($t = 0.61$; $p = 0.540$).

Residence did not show a statistically significant effect on satisfaction with autonomy in physical functioning ($t = - 1.59$; $p = 0.114$). By contrast, residence had significant effects on both global life satisfaction ($t = - 2.57$; $p < 0.05$) and negative affective disposition ($t = 3.24$; $p < 0.01$). The effect sizes for these differences were $d = 0.79$ and $d = 1.00$, respectively. Compared with patients residing in rural areas ($M = 21.00$; $SD = 6.51$), those living in urban areas ($M = 25.56$; $SD = 5.71$) obtained higher scores on the SWLS. Conversely, patients living in rural areas ($M = 12.07$; $SD = 4.29$) tended to report higher levels of negative affective disposition compared with those residing in urban settings ($M = 8.11$; $SD = 3.97$).

Level of education had a statistically significant effect on patients' scores for satisfaction with autonomy in physical functioning ($t = - 2.92$; $p < 0.01$), with a fairly substantial effect size ($d = 0.61$). Patients who had completed at most secondary education ($M = 2.25$; $SD = 0.86$) obtained significantly lower mean scores than those holding a (post)university degree ($M = 2.72$; $SD = 0.54$). In contrast, differences by level of education were not statistically significant for global life satisfaction ($t = 0.54$; $p = 0.590$) or negative affective disposition ($t = 0.96$; $p = 0.338$).

Occupational status did not have statistically significant effects on the dependent variables: satisfaction with autonomy in physical functioning ($t = - 1.63$; $p = 0.107$), global life satisfaction ($t = - 0.92$; $p = 0.359$), or negative affective disposition ($t = 0.40$; $p = 0.685$). By contrast, household income derived from salaries and/or other self-employed activities had statistically significant

effects on both satisfaction with autonomy in physical functioning ($t = -2.76$; $p < 0.01$) and negative affective disposition ($t = 3.02$; $p < 0.01$). The effect sizes were large ($d = 0.74$ for satisfaction with autonomy in physical functioning and $d = 0.75$ for negative affective disposition). Compared with patients whose household income was below 2.000 RON ($M = 2.32$; $SD = 0.84$), those who, together with their life partners, reported household incomes above 2.000 RON ($M = 2.76$; $SD = 0.43$) tended to report significantly higher levels of satisfaction with autonomy in physical functioning. Conversely, compared with patients whose household income was below 2.000 RON ($M = 9.11$; $SD = 4.52$), those earning more than 2.000 RON ($M = 6.92$; $SD = 1.70$) exhibited significantly lower levels of negative affective disposition. By contrast, household income did not have a statistically significant effect on global life satisfaction ($t = 0.98$; $p = 0.326$).

Another variable that showed a statistically significant effect was the comorbidity of diabetes with other organic conditions. Specifically, compared with patients who, in addition to diabetes, also suffered from other organic conditions ($M = 2.29$; $SD = 0.84$), those without comorbidities ($M = 2.81$; $SD = 0.40$) tended to report significantly higher levels of satisfaction with autonomy in physical functioning ($t = -3.52$; $p < 0.01$), with a very large effect size ($d = 1.02$). In contrast, the effects of organic comorbidity were not statistically significant for global life satisfaction ($t = -0.63$; $p = 0.527$) or negative affective disposition ($t = 0.66$; $p = 0.507$).

Given the statistically significant differences with effect sizes greater than 0.60 identified in the comparative analyses: a) participants' gender, level of education, household income, and organic comorbidity were included as independent variables in the multiple linear regression model in which the criterion variable was satisfaction with autonomy in physical functioning; b) residence was included as an independent variable in the regression model in which the criterion variable was global life satisfaction; c) residence and household income were included as independent variables in the regression model in which the criterion variable was negative affective disposition. In addition to these variables, the regression models also included as potential predictors all quantitative variables (e.g., severity of diabetes-specific symptoms, beliefs in general self-efficacy, orientation toward spiritual life) that showed correlations lower than -0.30 or higher than 0.30 with one or another of the criterion variables. The results of the correlational analyses are presented in the following section.

The age of the patients who participated in the study showed low or negligible correlations with scores for satisfaction with autonomy in physical functioning ($r = 0.07$; $p = 0.536$), global life satisfaction ($r = 0.05$; $p = 0.640$), and negative affective disposition ($r = -0.13$; $p = 0.270$). Likewise, the length of time since diabetes diagnosis exhibited negligible and statistically non-significant correlations with both satisfaction with autonomy in physical functioning ($r = 0.10$; $p = 0.355$) and global life satisfaction ($r = -0.07$; $p = 0.536$). By contrast, the correlation with negative affective disposition was statistically significant, although modest in magnitude ($r = 0.25$; $p < 0.05$).

For the severity of diabetes-specific symptoms, the pattern of correlations with the dependent variables was more consistent. Specifically, the severity score showed negative correlations of moderate magnitude and statistical significance with both satisfaction with autonomy in physical functioning ($r = -0.37$; $p < 0.01$) and global life satisfaction ($r = -0.36$; $p < 0.01$). Patients who reported greater severity of diabetes-specific symptoms tended to report lower levels of satisfaction with autonomy in physical functioning and lower global life satisfaction.

As expected, the severity of diabetes-specific symptoms was positively associated with negative affective disposition, with a relatively strong and statistically significant correlation ($r = 0.42$; $p < 0.001$). Patients reporting more severe diabetes-specific symptoms also tended to obtain higher scores for negative affective disposition. The correlation between locus of control (externality) and patients' satisfaction with their autonomy in physical functioning was statistically significant; however, its magnitude was below 0.30 ($r = -0.28$; $p < 0.05$). Correlations with global life satisfaction ($r = -0.05$; $p = 0.640$) and negative affective disposition ($r = 0.18$; $p = 0.095$) were not statistically significant. By contrast, patients' beliefs in their own general self-efficacy and their predisposition toward optimism exhibited much more consistent patterns of correlations with

indicators of subjective well-being. Thus, general self-efficacy scores were positively correlated, with meaningful magnitudes and statistical significance, with both satisfaction with autonomy in physical functioning ($r = 0.35$; $p < 0.01$) and global life satisfaction ($r = 0.64$; $p < 0.001$). The correlation with life satisfaction was particularly strong. In addition, general self-efficacy was negatively correlated with negative affective disposition, with a substantial and statistically significant association ($r = -0.57$; $p < 0.001$). Patients who reported higher levels of general self-efficacy also tended to report higher levels of satisfaction with autonomy in physical functioning and global life satisfaction, as well as lower levels of negative affective disposition. In turn, dispositional optimism was positively associated, with fairly strong and statistically significant correlations, with satisfaction with autonomy in physical functioning ($r = 0.38$; $p < 0.001$) and global life satisfaction ($r = 0.46$; $p < 0.001$). Moreover, dispositional optimism was negatively correlated, with a substantial and statistically significant magnitude, with negative affective disposition ($r = -0.52$; $p < 0.001$). Patients who were more oriented toward optimistic thinking tended to report higher levels on satisfaction indicators and lower levels of negative affective disposition.

Orientation toward spiritual life was significantly associated, with a fairly strong magnitude, only with global life satisfaction ($r = 0.38$; $p < 0.001$). Patients who attributed greater importance to spiritual aspects in their lives reported higher levels of global life satisfaction. By contrast, orientation toward spirituality did not show statistically significant correlations with satisfaction with autonomy in physical functioning ($r = 0.06$; $p = 0.560$) or with negative affective disposition ($r = -0.07$; $p = 0.536$). Patients' orientation toward religious beliefs and practices exhibited a similar pattern of correlations with indicators of well-being.

Thus, this variable was positively associated, with a fairly strong and statistically significant magnitude, with global life satisfaction ($r = 0.41$; $p < 0.001$). Correlations with satisfaction with autonomy in physical functioning ($r = 0.15$; $p = 0.180$) and negative affective disposition ($r = -0.19$; $p = 0.089$) were not statistically significant. Variables related to social support showed statistically significant correlations with all indicators of well-being. It can be observed that patients' perceptions regarding the availability and adequacy of social support from life partners exhibited more consistent correlations with well-being indicators compared with the pattern of correlations identified for extrafamilial support. Thus, support from life partners was positively associated, with a fairly strong and statistically significant magnitude, with satisfaction with autonomy in physical functioning ($r = 0.36$; $p < 0.001$). In addition, support from life partners was positively correlated, with a much stronger and statistically significant magnitude, with global life satisfaction ($r = 0.62$; $p < 0.001$), and negatively correlated, with a substantial and statistically significant magnitude, with negative affective disposition ($r = -0.56$; $p < 0.001$).

In turn, extrafamilial social support was positively and statistically significantly associated with both satisfaction with autonomy in physical functioning ($r = 0.26$; $p < 0.05$) and global life satisfaction ($r = 0.37$; $p < 0.01$). However, the correlation with satisfaction with autonomy in physical functioning was modest in magnitude. Moreover, extrafamilial social support was negatively correlated, with a magnitude greater than 0.30 and statistical significance, with negative affective disposition ($r = -0.34$; $p < 0.01$). Patients who believed they benefited from support provided by their life partners and by other extrafamilial sources tended to report better levels of satisfaction with autonomy in physical functioning and global life satisfaction, as well as lower levels of negative affective disposition.

Table 3 presents the regression coefficients obtained for the model (01) in which satisfaction with autonomy in physical functioning served as the criterion variable. The model was statistically significant ($R = 0.58$; $R^2_{\text{adjusted}} = 0.272$; $F_R = 4.68$; $p < 0.001$). Taken together, the independent variables explained 27.2% of the variance in satisfaction with autonomy in physical functioning.

The only negative predictor of satisfaction with autonomy in physical functioning was the severity of diabetes-specific symptoms, which accounted for 4.45% of the variance in the dependent variable across the patients investigated.

Table 3. Results of the multiple regression analysis (model 01)

Variabile independente	B	SE	β
Gender (0 = male; 1 = female)	- 0.19	0.18	- 0.11
Education level (0 = up to secondary; 1 = (post)university)	0.19	0.19	0.11
Household income (0 = < 2.000 RON; 1 = > 2.000 RON)	0.03	0.24	0.01
Severity of diabetes-specific symptoms	- 0.56	0.25	- 0.24 *
Organic comorbidity (0 = absent; 1 = present)	- 0.34	0.21	- 0.17
General self-efficacy	0.009	0.02	0.05
Dispositional optimism	0.04	0.03	0.14
Social support from life partner	0.01	0.009	0.17

Note. The model included the intercept in the equation. SE = standard error. * $p < 0.05$. DV = Satisfaction with autonomy in physical functioning

Table 4 summarizes the regression coefficients for the model (02) in which global life satisfaction served as the criterion variable. The model was statistically significant ($R = 0.77$; $R^2_{\text{adjusted}} = 0.547$; $F_R = 12.93$; $p < 0.001$), with the independent variables jointly explaining 54.7% of the variance in global life satisfaction scores.

Table 4. Results of the multiple regression analysis (model 02)

Independent variables	B	SE	β
Residence (0 = rural; 1 = urban)	1.34	1.34	0.08
Severity of diabetes-specific symptoms	- 4.39	1.39	- 0.25 **
General self-efficacy	0.36	0.13	0.29 **
Dispositional optimism	0.02	0.24	0.01
Orientation toward spirituality	0.50	1.69	0.03
Religious beliefs and practices	0.12	0.09	0.17
Social support from life partner	0.14	0.05	0.27 *
Extrafamilial social support	0.42	0.60	0.07

Note. The model included the intercept in the equation. SE = standard error. * $p < 0.05$; ** $p < 0.01$. DV = Global life satisfaction

The severity of diabetes-specific symptoms emerged as a negative predictor of global life satisfaction, accounting for 5.66% of the variance in participants' SWLS scores. In addition, beliefs in general self-efficacy and social support from life partners were positive predictors. These two variables individually explained 4.41% and 3.53% of the variance in global life satisfaction, respectively.

Table 5 summarizes the regression coefficients for the third model (03), in which negative affective disposition served as the criterion variable.

Table 5. Results of the multiple regression analysis (model 03)

Independent variables	B	SE	β
Place of residence (0 = rural; 1 = urban)	- 1.72	0.98	- 0.15
Household income (0 = < 2.000 RON; 1 = > 2.000 RON)	- 0.91	0.99	- 0.07
Severity of diabetes-specific symptoms	3.11	1.06	0.25 **
General self-efficacy	- 0.16	0.09	- 0.18
Dispositional optimism	- 0.31	0.15	- 0.20 *
Social support from life partner	- 0.10	0.04	- 0.27 *
Extrafamilial social support	- 0.09	0.43	- 0.02

Note. The model included the intercept in the equation. SE = standard error. * $p < 0.05$; ** $p < 0.01$. DV = Negative affective disposition

The model was statistically significant ($R = 0.74$; $R^2_{\text{adjusted}} = 0.505$; $F_R = 12.50$; $p < 0.001$). Collectively, the independent variables explained 50.5% of the variance in negative affective disposition scores. Once again, the severity of diabetes-specific symptoms emerged as a positive predictor of negative affective disposition, accounting for 5.38% of the variance in participants' MHI-5 scores. In addition, dispositional optimism and social support from life partners were negative predictors, each explaining 2.62% and 3.45% of the variance in negative affective disposition, respectively.

Thus, the results obtained through multiple linear regression modeling partially confirmed three of the working hypotheses (A, C, and D) that guided the present investigation. Working hypothesis B was not supported.

5. Discussion

Individuals living with a chronic illness face a wide range of difficulties and challenges, some of which may be perceived as insurmountable. Chronic diseases affect most domains of patients' lives, including autonomy in physical functioning, the performance of daily activities, family life, social relationships, recreational activities, occupational functioning, economic well-being, and psychological well-being (Boyer, 2008; De Ridder *et al.*, 2008; Stanton, Revenson, & Tennen, 2007). However, the demands specific to chronic conditions must be differentiated according to diagnosis and to particular medical characteristics inherent to each condition, which may contribute to distinct adaptive patterns among patients (Rolland, 1987). For example, compared with patients suffering from end-stage chronic kidney disease (characterized by multiple physical health complications and a high level of functional impairment) individuals living with diabetes (a nonfatal chronic condition) may experience lower levels of psychological stress. This is because diabetes-related symptoms are relatively manageable, especially when patients are consistently motivated to maintain their health and engage in goal-oriented behaviors, such as adherence to daily medication, compliance with dietary recommendations, and careful monitoring of blood glucose levels.

On the other hand, a range of patients' characteristics and predispositions may also play an important role in the dynamics of adaptation to the specific demands of a chronic medical condition (Hoyt & Stanton, 2012; Stanton, Revenson, & Tennen, 2007). Studies conducted across a variety of clinical samples (including patients with diabetes mellitus, neoplastic diseases, chronic kidney disease, and others) have identified a substantial body of predictors of individual differences in psychosocial adaptation and its indicators, such as subjective well-being. Variables identified in this context include beliefs about self-efficacy in managing symptoms and the course of the illness (Campbell *et al.*, 2004; Cherrington, Wallston, & Rothman, 2010), locus of control (Chen & Lin, 2014; Weng, Hung, & Chi, 2010), dispositional optimism (Kostka & Jachimowicz, 2010; Shand *et al.*, 2015), and orientation toward spirituality and/or religious beliefs and practices (Balboni *et al.*, 2007; Freire de Medeiros *et al.*, 2017), among others. In addition, field studies have highlighted the contribution of social support in explaining differences among patients with various chronic medical conditions with respect to indicators of adaptation to illness-specific demands and measures of subjective well-being (Miller & DiMatteo, 2013; Phelps *et al.*, 2011; Song *et al.*, 2012).

Through the correlational study we conducted, we aimed to test predictive models in order to identify the variables that make the most consistent contributions to explaining differences among patients diagnosed with diabetes with respect to satisfaction with physical health status (autonomy in personal functioning), global life satisfaction, and negative affective disposition (an indicator of emotional well-being). We found that, among the independent variables considered, the severity of diabetes-specific symptoms was the most consistent predictor across all three criteria. Specifically, greater severity of diabetes-specific symptoms was associated with lower levels of satisfaction with autonomy in physical functioning and global life satisfaction, as well as with higher levels of negative affective disposition. This finding is consistent with evidence reported in previous studies

conducted on samples of patients diagnosed with diabetes. For example, in an investigation examining depressive symptoms in a sample of patients with type 2 diabetes, Leedom and colleagues (1991) reported significant differences in depression levels between patients with medical complications and those without complications, as well as compared with a control sample of healthy individuals.

In the context of analyzing the consequences of chronic illnesses, the variable referring to impaired physical functioning or associated disabilities denotes patients' inability to perform physical tasks that are essential for adaptation to everyday demands (IOM, 2012). These tasks include a wide range of instrumental activities (e.g., personal care, obtaining and preparing food, feeding, laundering clothes, and personal hygiene, etc.) that are necessary for daily living. The level of physical functioning and autonomy in the performance of daily roles must be delineated with reference to the stage of the chronic illness, that is, to the severity of clinical symptoms (IOM, 2012). When patients diagnosed with diabetes experience a general decline in physical functioning, their capacity to initiate various activities and to remain engaged in them over extended periods tends to diminish. In advanced stages of insulin-dependent diabetes, which are often characterized by physical health complications (e.g., visual impairment, arterial hypertension, acute myocardial infarction, renal insufficiency, etc.), patients are at increased risk of significant deterioration in functional status. As a result, they may become progressively less able to engage in domestic roles, maintain relationships with family members, or participate in occupational and social activities that require physical mobility and psychological well-being. The persistence of symptoms over time may lead to reduced satisfaction with one's overall physical health, level of functional autonomy, and life as a whole, as well as to an increased risk of experiencing anxiety and/or depression.

Another predictor of global life satisfaction among the surveyed patients was their beliefs regarding their own capacity to overcome everyday difficulties and solve life problems. Scores obtained on the GSES explained 4.41% of the variance in global life satisfaction. This finding is convergent with results reported in other studies (Katz *et al.*, 2002). In general, individuals characterized by a strong sense of self-efficacy tend to approach threatening situations (such as living with a chronic medical condition) with the confidence that they can exert control over them, thereby minimizing the impact of psychological stress and being less vulnerable to experiencing anxiety or depression (Bandura, 1994) or to declines in quality of life. Studies focusing on factors that contribute to patients' adaptation to the specific demands of chronic illnesses have operationalized this variable primarily in relation to the more narrowly defined domain of symptom control and management of overall health status (Campbell *et al.*, 2004; Cherrington, Wallston, & Rothman, 2010; Katz *et al.*, 2002). Patients who perceive themselves as capable of managing the symptoms of a chronic illness over time tend to have greater confidence in their own abilities and consistently engage in positive, health-oriented behaviors aimed at maintaining both physical and psychological well-being. Moreover, this characteristic may help alleviate psychological strain among life partners who assume caregiving responsibilities for patients with chronic conditions (Campbell *et al.*, 2004).

Although its contribution to the explanatory power of the regression model was more modest, dispositional optimism emerged as a predictor of negative affective disposition. Patients who identified themselves as optimistic tended to report lower levels of negative affective states (e.g., nervousness, restlessness, feelings of discouragement). The predictive role of optimism with respect to indicators of cognitive and emotional well-being has also been documented in other investigations based on samples of patients diagnosed with neoplastic diseases (Gustavsson-Lilius *et al.*, 2012; Rajandram *et al.*, 2011). One of the key aspects of optimism, viewed as a stable dispositional characteristic, involves the general belief that when individuals are confronted with negative life events or when the world they live in goes through turbulent periods, good will ultimately prevail. Compared with pessimistic individuals, those who obtain higher scores on optimism tend to experience unpleasant physical symptoms, anxiety, or depression to a lesser extent and to employ more effective strategies for adapting to stressful life demands (Reivich & Gillham,

2003). Evidence from studies conducted on samples of patients diagnosed with neoplastic diseases supports the hypothesis that optimism can function as a buffer against the negative effects of stress, both among patients and their life partners (Gustavsson-Lilius *et al.*, 2012; Ruiz *et al.*, 2006). Most often, patients living with diabetes experience anxiety related to the progressive deterioration of their health status and to concerns about their own life security, even when they are aware that the condition does not pose an immediate lethal risk. Some patients may exhibit a tendency toward catastrophizing symptoms, the course of the illness, and their personal future. Alongside other factors (such as beliefs regarding self-efficacy in coping with illness-related demands and encouragement and support from life partners), an optimistic outlook may help patients diagnosed with diabetes overcome the difficulties they encounter in understanding their symptoms and prognosis, as well as in identifying ways to keep the condition under control.

Patients' perceptions regarding the availability and adequacy of social support from life partners emerged as one of the predictors of subjective well-being indicators. Accordingly, patients who believed they benefited from support provided by their life partners tended to report higher levels of global life satisfaction and lower levels of negative affective disposition. Numerous studies have conceptualized social resources as protective factors against psychological stress, maladaptation, and declines in well-being among patients living with chronic medical conditions who require support from family members and significant others to cope with illness-related demands (Phelps *et al.*, 2011; Song *et al.*, 2012). Family support has also been identified as one of the important factors contributing to the development and maintenance of adherence to medical treatments and to a healthy lifestyle among patients diagnosed with diabetes (Miller & DiMatteo, 2013). Social support may moderate the relationship between psychological stress and indicators of subjective well-being (e.g., life satisfaction), as demonstrated by Phelps and his collaborators (2011) through the analysis of data obtained from a sample of Spanish patients diagnosed with type 2 diabetes. Thus, even under conditions of high stress, patients who benefit from support provided by their life partners may achieve better levels of subjective well-being indicators. These findings support the buffering hypothesis regarding the role of social support in mitigating the negative impact of stress (Cohen & Pressman, 2004).

6. Limitations and further research directions

The study we conducted has several limitations that should be considered when interpreting the results. These limitations also suggest directions for refining future investigations into the impact of chronic illnesses on patients and their families. A first limitation concerns the participant recruitment strategy: the sample consisted of patients diagnosed with diabetes who were managed within three primary care (family medicine) practices. Using a convenience sampling approach, all patients who expressed their consent to complete the questionnaires and met the eligibility criteria were included in the study. Beyond the relatively modest sample size, the recruitment strategy we employed entails a risk of selection bias with respect to the identification of typical cases within the clinical population of patients with diabetes. Accordingly, the medical profiles of participants were highly heterogeneous in terms of time elapsed since diabetes diagnosis and, for some individuals, the presence of additional organic comorbidities. For example, patients diagnosed with type 2 diabetes were predominant in the sample.

In future investigations, we intend to recruit more homogeneous samples with respect to time since diagnosis, type of diabetes, and the presence of organic comorbidities. It is well established that receiving a chronic diagnosis and the severity of the medical treatments initiated immediately thereafter are associated with a higher risk of escalation of acute psychological stress symptoms (Hack & Degner, 2003). The variables examined in the study were collected exclusively using a questionnaire-based method. Information regarding medical status or the presence of disabling conditions relevant to eligibility for inclusion in the respondent sample was obtained from patients' medical records, which were reviewed in the context of discussions with the medical staff in the

practices that served as recruitment sites. The aggregation of these data provided a partial objective perspective on the medical risks presented by the surveyed patients.

However, respondents' subjective perspectives on their chronic condition did not include aspects such as the level of information regarding the determinants of diabetes, symptoms and disease course, or expectations concerning the (im)predictability of the illness. In addition, dimensions of subjective well-being were operationalized using two of the most widely employed screening instruments for global life satisfaction and negative affective disposition (the SWLS and the MHI-5). Although the instruments we used possess solid psychometric properties and are widely accepted within the scientific community, they are relatively general in nature and, as such, may distort patients' responses when they are asked to express global impressions of their own well-being or quality of life. In future research, we plan to employ more specific and psychometrically refined (multidimensional) instruments. Such measures will allow for a more nuanced delineation of individual profiles and of differences among patients diagnosed with diabetes with respect to facets of life satisfaction and dimensions of well-being in cognitive, emotional, and social functioning. In the study we conducted, we did not focus on variables that might be relevant for explaining differences among patients diagnosed with diabetes in terms of functional and psychosocial adaptation to the specific demands of this chronic condition. For example, we did not examine coping strategies or styles of adaptation to stressful life demands. In future research, we intend to address this limitation. Another limitation concerns the cross-sectional nature of the study design underlying data collection, as all variables were measured concurrently. This aspect did not allow for the interpretation of results in causal terms. Consequently, one direction we intend to pursue involves the use of a longitudinal design extending over a period of at least 2–3 years.

Within the context of such a design, patients diagnosed with diabetes from a homogeneous sample (well defined in terms of clinical and sociodemographic characteristics) could be followed starting from the moment of diagnosis. This approach would allow for a clearer examination of the impact that the communication of the diagnosis has on short-term psychosocial adaptation, as well as on fluctuations in quality-of-life indicators and well-being over time. These outcomes could be monitored across different stages of disease progression and in relation to other life events that may occur concurrently.

7. Conclusions

It is well known that chronic diseases represent the leading risk factor for mortality worldwide, which is why they have attracted increasing interest from researchers, public health professionals, and medical specialists. The complexity of this issue requires, in addition to a strictly medical approach, careful consideration of psychosocial aspects, as there is a causal chain linking the dynamics of chronic illnesses to broader socioeconomic dynamics. Through their long-term consequences, chronic diseases constitute a major risk factor for the individual development of family members and for the functioning of the family system as a whole.

The study we conducted aimed to explore the role played by the general medical characteristics of diabetes (one of the most prevalent chronic conditions) patients' predispositions, and their perceptions regarding the availability and quality of social support from life partners and from individuals outside the couple/family system (e.g., friends) in predicting well-being in physical functioning and subjective well-being. The predictive models we tested indicated that, among the individual characteristics of patients diagnosed with diabetes, only beliefs in general self-efficacy and orientation toward optimistic thinking contributed sporadically to the prediction of subjective well-being indicators, with optimism showing a more modest contribution. Among the general medical characteristics of diabetes, the severity of diabetes-specific symptoms demonstrated the most consistent contributions to predicting patients' satisfaction with autonomy in physical functioning, global life satisfaction, and negative affective disposition. On the other hand, results

from the multiple linear regression analyses in which subjective well-being indicators served as criteria highlighted the predictive role of social support provided by life partners. The study we conducted contributes to the enrichment of the literature addressing differences in patients' adaptation to the specific demands of chronic illnesses by providing empirical evidence that confirms the predictive role of individual characteristics and support from the social network.

In conclusion, our study highlights that physical health and subjective well-being among patients with diabetes are influenced by multiple biological, psychological, and social factors. The findings suggest that effective disease management, emotional stability (as an attitudinal personal feature), and social support play an important role in improving patients' quality of life. Furthermore, the research emphasizes the importance of multidisciplinary interventions that combine medical treatment with psychological support in order to enhance both physical health and overall well-being of the patients. Therefore, a holistic approach to diabetes care is essential for preventing complications and promoting a healthier and more satisfying life for individuals living with diabetes.

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