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Biochemical and Physiological Determinants of Depressive Symptoms: Assessing Stress Load, Coping Adaptations, and Clinical Biomarkers in Advanced Medical Conditions

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Abstract

Introduction: An informal caregiver's physical burden and the emotional stresses experienced over the course of the person's illness can lead to depressive symptoms. However, the extent to which this association is buffered or magnified by spirituality and specific coping strategies in this Latin region is poorly documented. Objective: To assess the interactive effects of spirituality, caregiver burden (stress load), and coping responses on depressive symptoms among those caring for a person with terminal illness in Loja, Ecuador. Methods: The study employed a nonprobability snowball sampling technique with a sample of 33 informal caregivers in a quantitative, descriptive-correlational, nonexperimental, cross-sectional design. The participants completed a sociodemographic form, the Beck Depression Inventory-II, the Parsian and Dunning Spirituality Questionnaire, the Zarit Burden Interview, and the Brief COPE. Results: Minimal depression (82%); high spirituality (87.9%); no burden (64%); active coping, acceptance, religion, and emotional support were the most commonly reported coping strategies. Caregiver burden, venting, behavioral disengagement, denial, and self-blame were significant factors in the multiple regression model, which accounted for 89.8% of the variance in depressive symptoms ($R = .947$; $R^2 = .898$; $F[16, 16] = 8.761$; $p < .001$). Conclusion: Depressive symptoms among informal caregivers most often reflect a pattern of perceived stress load and coping styles rather than a single factor. Spirituality was also very common, but it independently predicted depressive symptoms after the others were controlled. Findings support programs that provide psychosocial support by teaching coping skills and promoting early detection of burden, and advocate further research on incorporating physiological stress biomarkers.

Keywords:
Informal caregivers; depression; stress load; caregiver burden; coping; spirituality; terminal illness.

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Introduction

Improving transitions to end-of-life care involves not only shifts in the lives of people with terminal illness but also in the lives of those who care for them. The term 'last illness' is typically understood as an advanced, progressive, and incurable condition that generally has a limited length of life, for which the primary goal of treatment shifts from cure to comfort and quality of life (Grupo de Estudios de Ética Clínica de la Sociedad Médica de Santiago, 2000; Auría, 2015). The informal caregiver is a relative tasked with providing a multitude of physical, emotional, and illness-management needs for months or many years without receiving compensation or adequate health training. In most countries in Latin America, it is that person who performs this care (Astudillo & Mendinueta, 2003; López, 2016). Chronic noncommunicable diseases are expected to continue to increase in prevalence due to population aging, and therefore the need for palliative care will too, while at the same time the informal caregiver is at the heart of a care system that often ignores the caregiver (Organización Mundial de la Salud, 2014; Instituto Nacional del Cáncer, 2019). According to Sharma & Banerjee (2025); Sharma et al. (2025) across various bodies of literature in Latin America, prolonged care is consistently related to burden, anxiety, and depression (Hernandez-Cantu, Reyes-Silva, Villegas-García and Pérez-Camacho, 2017; Moreira de Souza & Turrini, 2011).

These consequences are not limited to psychological effects. Chronic caregiving serves as an analogue of ongoing stress – repeated activation of the HPA and SNS leads to an "allostatic load" over time, which disturbs cortisol secretion, immune function, and cardiovascular reactivity (McEwen, 1998). Meta-analysis shows that chronically ill family caregivers exhibit significantly higher levels of depression than nonfamily caregivers (Pinquart & Sörensen, 2003) and higher levels of the proinflammatory cytokine interleukin-6 than nonfamily caregivers (Kiecolt-Glaser et al., 2003); they also demonstrate poorer antibody responses and higher levels of stress hormones than nonfamily caregivers (Vitaliano et al., 2003), as well as higher levels of perceived physical health problems. Numerous similarities exist between the physiological pathways linked to depressive disorders, which are described by depressed mood, anhedonia, and somatic and cognitive symptoms (American Psychiatric Association, 2014); caregiver stress load is a potential pathway to depressive symptomatology. Not all caregivers exposed to the same level of demands experience the same depressive symptoms, however, and researchers have wondered which variables might intervene between this exposure and this symptom expression. In recent years, there has been an increase in two arguments.

Coping behaviors are shown to play a central role in the first, whereas complicated grief is strongly associated with end-of-life caregiving and with the endowment of cognitive and behavioral processes: coping (Bermejo, Magaña, Villacieros, Carabias, & Serrano, 2014). Adaptive coping and resilience are also proposed to mediate complicated grief, which is strongly associated with end-of-life caregiving (Reyna-García et al., 2017). The second focuses on spirituality, which is not just a religious affiliation but the seeking of meaning, transcendence, and connection with the intention of understanding the suffering endured by oneself and others afresh (Koenig, 2005; Sierra-Leguía, Montoya-Juárez, García-Caro, López-Morales, & Montalvo-Prieto, 2019). Montero-Pardo, Jurado-Cárdenas, and Méndez-Venegas (2015) report a set of more stable predictors of burden in a pediatric oncology population, including caregivers' feelings of family support and the severity of the illness, whereas the evidence available on caregivers of adults with terminal illness is more diverse. It derives primarily from descriptive studies that have not explicitly modeled the relationships among depression, the relative contributions of spirituality and burden, and the 14 coping subscales. Arias-Rojas et al. (2021) reported a strong inverse relationship between burden and quality of life in primary caregivers of people with palliative cancer, and Tripodoro, Veloso, and Llanos (2015) attributed the worsening of burden among primary caregivers of palliative cancer patients in Argentina to the annihilation of secondary caregiver networks.

Burden levels have been reported similarly among caregivers of patients with dementia (Alonso, Garrido, Díaz, Casquero, & Riera, 2004). However, none of these studies, nor any research to date, included a validated spirituality instrument and a multidimensional measure of coping, which limits the extent to which this study can answer the question of how they all predict depressive symptoms: "To what extent do spirituality, burden, and specific coping strategies concurrently predict depressive symptoms in the informal caregiver of a person with terminal illness?" This is especially applicable to Ecuador, where the Constitution places priority on patients at the end of life in the hands of formal care, differentiated from those with catastrophic or very complex diseases (Asamblea Nacional del Ecuador, 2008), but home-based palliative care still relies largely on family and community networks (Abel, 2018; Martín & Tamayo, 2013). The Catholic religion, which was espoused by a large majority of the population, could be a culturally available coping resource in this context, but, of course, it would not be sufficient to prevent depression. Carrillo-González, Sánchez-Herrera, Barrera-Ortiz, and Chaparro-Díaz (2021) found that, along with

the presence of spiritual resources and support systems, perceived burden varied only with explicit training in coping skills, indicating that, even if present, spirituality does not automatically correlate with lower psychological burden if it is not accompanied by problem-solving training.

Theoretically, this work is related to the transactional model of stress, which proposes that psychological stress is not solely attributed to the stressor (in this case, a relative's terminal illness) but rather to the individual's cognitive appraisal of their resources in response to the stressor (Folkman et al., 1986). In this view, spirituality would be one of several coping mechanisms, more effective when articulated in a client's active planning and acceptance than in merely having it or not. At the same time, the Zarit-Reever-Bach Peterson (1980) burden model, translated into Spanish by Martin et al. (1996), identifies three components that can interact with depression in varying ways, depending on the specific coping strategy: the burden caused by the objective impact of care, the burden due to interpersonal relationships, and the burden due to the caregiver's expectations of self-efficacy.

The general purpose of this research was to investigate the relationships among spirituality, burden, and coping with depressive symptomatology in informal caregivers of people with terminal diseases in the city of Loja, Ecuador. In particular, this study aimed to (a) assess the levels of depression in this sample; (b) evaluate the levels of spirituality, burden, and coping style; and (c) explore how the three variables together explained variation in depression. Burden, coping, and avoidant coping (venting, behavioral disengagement, denial, and self-blame) were hypothesized to be positively correlated with depression, whereas spirituality and active coping strategies were hypothesized to be inversely related to depression.

Materials and Methods

The study adopted a quantitative approach aimed at exploring, describing, and relating the variables of interest (Hernández, Fernández, & Baptista, 2014). Its scope was descriptive, insofar as the levels of depression, spirituality, burden, and coping in the sample were characterized, and correlational, since the degree of association between these variables was examined. The design was non-experimental and cross-sectional: variables were not manipulated, and data were collected at a single point in time between November 2018 and February 2019.

The research used a quantitative approach to explore, describe, and relate the variables of interest (Hernández, Fernández, & Baptista, 2014). It was a descriptive-correlational study in which the levels of depression, spirituality, burden, and coping factors were described and the degree of association among these variables was examined. The design was non-experimental and cross-sectional, indicating that no manipulation was conducted and data were collected between November 2018 and February 2019. The sample consisted of 33 informal caregivers of individuals with terminal illness in the community of Loja (Ecuador). The first caregiver meeting the inclusion criteria was identified and asked to refer others in a similar situation: This method proved effective (non-probabilistic snowball sampling) because this population is not included in any readily available census or institutional database. Recruitment was carried out in rural areas of Loja, in the offices of volunteers at the hospital Solón Espinosa Ayala (SOLCA), and in the inpatient wards of the Isidro Ayora Hospital and the Ecuadorian Social Security Institute (IESS) Hospital. Inclusion criteria were legal age, being an unpaid relative and the main carer of a patient with a terminal disease (oncological, HIV, end-stage heart failure, or similar disease), and living in the Municipality of Loja (Kumar & Mamidala, 2025; Riaz et al., 2024; Sugathan et al., 2024). Those not related by family structure who provided paid care, minors, and those who cared for a person with a transient or non-terminal illness were excluded. Table 1 shows the sociodemographic features of the caregivers and care recipients.

Table 1. *Sociodemographic Characteristics of Informal Caregivers and Care Recipients (n = 33)*

Characteristic	*f*	%
Caregivers		
Female sex	25	75.8
Male sex	8	24.2
Married	18	54.5
Catholic	30	90.9
Incomplete tertiary education	12	36.4
Relationship: son or daughter	12	36.4
Relationship: parent	5	15.2
Relationship: grandmother	5	15.2
Relationship: spouse	4	12.1
Relationship: grandfather	3	9.1
Relationship: other relative	4	12.1
Caregiving on own initiative	29	87.9
Caregiving by family decision	4	12.1
Time in role < 1 year	16	48.5
Time in role ≥ 8 years	5	15.2
Caregiving 6–7 days per week	33	100.0
Available 24 hours a day	13	39.4
Owns home	28	84.8
Care recipients		
Male sex	19	57.6
End-stage renal failure	8	24.2
Metastatic cancer	7	21.2
Breast cancer	4	12.1
Other terminal diagnoses	14	42.4

Note. *f* = frequency. Caregiver age *M* = 36 years; monthly household income *M* = US$520.87, *Mdn* = US$387.00. Care recipient age *M* = 69 years, *Mdn* = 77 years. Other terminal diagnoses include heart failure, prostate, colon, and lower-limb cancer, pulmonary fibrosis, Alzheimer's disease with end-stage heart failure, and an end-stage viral infection (3%–9.1% each). Frequencies were derived from the reported percentages.

The majority of caregivers were female (75.8%), and 54.5% were married, while 90.9% were practicing Catholics, with a mean age of 36 years. Regarding education, 36.4% began tertiary studies but never completed them; the median monthly income was US$387 (M = 520.87). 36.4% were sons or daughters, 15.2% were parents, 12.1% were grandparents or the parents of the husband or wife, 9.1% were grandfathers, and the remainder were other relatives (uncles/aunts, siblings, and former wives/husbands). In 87.9% of cases, care was initiated by the caregiver, and in 12.1% of cases, it was initiated by family decision; 48.5% of caregivers had taken on the role in less than one year, while 15.2% had done so for 8 years or more. 100% of caregivers spent 6 to 7 days each week caring for the child, and 39.4% spent 24 hours each day caring for the child. Most respondents were male (57.6%), and the mean age of the care recipients was 69 years (Mdn = 77). The most common diagnosis was metastatic cancer (21.2%), followed by end-stage renal failure (24.2%), breast cancer (12.1%), heart failure (7%), prostate cancer, colon cancer, and cancer of the lower limb (3% to 9.1%), Alzheimer's disease with concomitant end-stage heart failure (3.7%), and an end-stage viral infection (3.5%).

The form, adapted from one used in Spain for characterizing people with disabilities, was used to collect

demographic information, including caregiver information (sex, age, marital status, education, income, occupation) and information about the care recipient (sex, age, diagnosis), as well as time, reason, and activities of care. Depressive symptoms were measured using the Beck Depression Inventory-II (BDI-II), originally translated into English by Beck, Steer, and Brown (1996) and then into Spanish by Sanz, Perdigón, and Vázquez (2003). It consists of 21 four-option Likert-type items (0-3) that assess two cognitive and one somatic factor, with cut-off points indicating minimal (0-13), mild (14-19), moderate (20-28), and severe depression (29-63); the internal consistency was found to be .89 in its original version (Beltrán, Freyre, & Hernández, 2012).

Among 204 university students in the city of Bogotá, spirituality was assessed using the Spirituality Questionnaire of Parsian and Dunning (2009), in its Spanish adaptation by Diaz-Heredia, Munoz-Sanchez, and de Vargas (2012). The questionnaire consists of 4 subscales (spiritual beliefs, spiritual practices, spiritual needs, and self-awareness), with each item rated on a 4-point Likert scale. It has an $\alpha = .88$, and the score ranges from low spirituality (1-38), medium spirituality (39-77), and high spirituality (78-116). The Zarit Burden Interview, aimed at evaluating the perceived burden of the caregiver (Zarit et al., 1980), was previously adapted to the Spanish context by Martín et al. (1996) in a group of 92 caregivers of psychiatric patients and was used here as a measure of the burden of care. It consists of 22 five-response-item factors representing three dimensions (impact of care, interpersonal burden, self-efficacy expectations) and has an $\alpha = .88$, with cut scores of less than 46, 46 to 55, and greater than 56 to indicate no burden, mild burden, or severe burden. Coping was assessed using the Brief Coping Scale (BRIEF-COPE), the short form of the original Coping Scale (COPE), translated into Spanish by Crespo and Cruzado (1997), by Carver, Scheier, and Weintraub (1989). It measures 14 subscales (emotional support, venting, behavioral disengagement, denial, acceptance, religion, substance use, positive reframing, humor, self-blame, active coping, planning, instrumental support, and self-distraction) with 28 four-option Likert items and a reliability of $\alpha = .86$. Data collection was performed in two phases.

Potential participants were first identified, informed about the study, and provided written informed consent. The sociodemographic form and the four psychometric instruments (depression, spirituality, burden, and coping) were then administered in turn during individual sessions of 40 to 60 minutes at the caregiver's home or the hospital where they had been contacted. In the second phase, the information was collapsed into five separate databases, one for each instrument, and checked for out-of-range responses or blank forms prior to statistical analysis. Participants completed the instruments in Spanish (the language mastered by both the participants and the research team) with the research team present to clarify the meaning of items but not to suggest answers. As expected, this was especially important for those with lower education and for those fatigued from caregiving duties.

Completed protocols included end-session checks for missing responses, allowing any missing responses to be resolved with the participant on-site. The study followed the Declaration of Helsinki of the World Medical Association to preserve the dignity, privacy, and well-being of researchers studying sensitive psychological variables. All participants were informed orally and in writing of the purpose, the free choice of participation, the right to discontinue participation at any time without any consequences, and the procedure for confidentiality, and signed an informed consent form before data collection. Given the emotional state of the participants, special care was taken in administering the instruments, avoiding additional probing that may increase distress, and, if needed, providing guidance about psychological support services available at Loja, as noted by Ferré (1929), who suggested that research involving family caregivers in palliative care should include a component of support for the participants themselves. Forms were coded with numbers to protect participants' identities, and data were used only for academic research. Both beneficence and nonmaleficence guided the entire process: Participation was not considered to present any physical danger, and any emotional discomfort experienced when recalling the relative's illness was systematically monitored by the research staff (Ortiz, 2016).

The principles of justice were upheld by not discriminating against individuals on the basis of economic status, sex, social status, religious beliefs, or type of illness in the family beyond the methodological criteria outlined above. All data were analyzed using SPSS 23. Descriptive statistics (frequency distributions, means, and medians) were first calculated to describe the group and summarize the distribution of behavior for each study variable. A multiple linear regression analysis was then conducted for the 16 predictor variables (spirituality, burden, and the 14 Brief COPE subscale scores) in relation to the criterion variable, depression, to estimate multiple R, multiple R^2, and unstandardized (B) and standardized (β) regression coefficients. The level of statistical significance was set at $p < .05$.

Results and Discussion

Regarding household economic status, 84.8% of caregivers had their own home. Most (51.5%) of family income was from paid work, with 24.2% from a family business and 15.2% from community or family assistance. 6.1% Human Development Grant (3%) was also an important source of family income. Almost all (81.8%) said they had no problem caring for their mother while also doing other things, and 90.9% said they had no significant problem with leisure activities; 9.1% said they had fewer leisure activities or were unable to travel or go on vacation. Prior to their role as a caregiver, 36.4% of them were in school, and 27.3% were homemakers. The modal demographic for informal carers in this sample is a married Catholic woman aged 36 with a monthly income of about $387 USD and less than tertiary education. Caregivers in Loja have higher education levels than those reported by Arias et al. (2014), who used a sample of 256 caregivers from Colombian border regions, and by Ávila and Vergara (2014), who studied 127 caregivers from the Colombian Caribbean, where 42.6% did not attend primary school. The mean age is significantly different from the one obtained by Rizo, Molina, Milián, Pagán, and Machado (2017) in Cuban oncology caregivers (M = 57 years), which may be due to the predominant family relationship, with over one-third of caregivers in Loja being family members, versus family members being more common when the care recipient is older. For the first specific objective, Figure 1 shows the distribution of depressive thinking as measured by the BDI-II. Eight caregivers (82%) were in the minimal (mild) depression group; half (6%) were in the moderate depression group, and the other half were in the severe depression group.

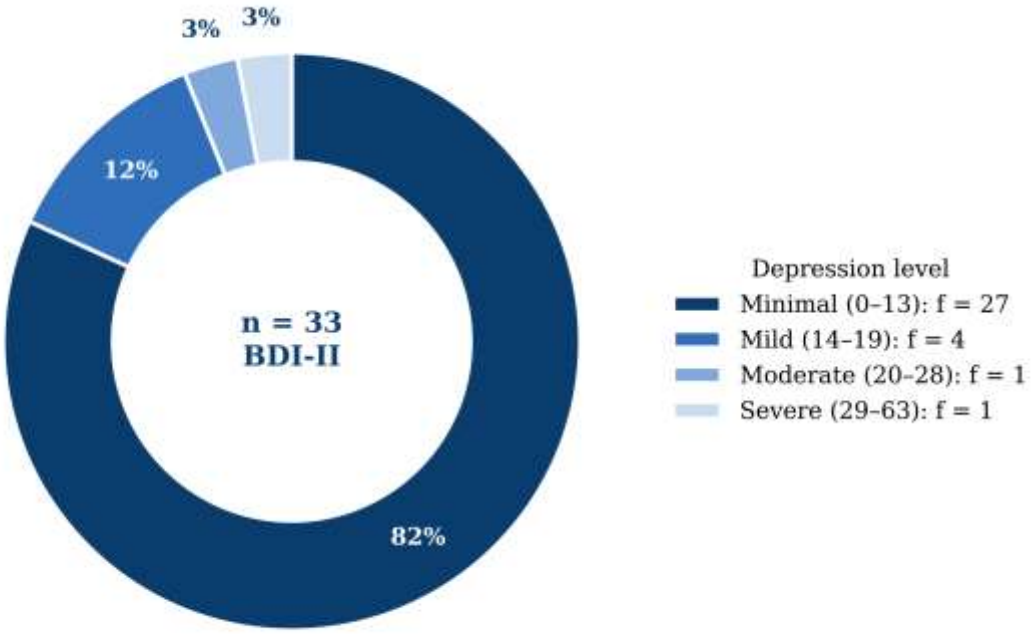


Figure 1. **Distribution of depression levels among informal caregivers (n = 33).**
Note. Based on the Beck Depression Inventory-II (Sanz, Perdigón, & Vázquez, 2003). *f* = frequency.

It is clear from this highly asymmetric profile that caring for a relative with a terminal illness does not inevitably result in a general weakening of affect. This differs from findings by Garzón et al. (2018), who reported that depression was predominantly mild or moderate among 35 Cuban caregivers, and from those by Velázquez and Espín (2014), who found high levels of depression among most of a Cuban sample of 24 caregivers. Rather than indicating a fundamental contradiction, these discrepancies reflect the heterogeneity of the construct "informal caregiver of a terminally ill person," which encompasses a very broad range of situations in terms of chronicity, family relationship, secondary support, and the meaning assigned to care. A combination of a relatively short duration of caregiving (under one year in almost half the cases) and a predominantly voluntary motive to care (87.9% in the Loja sample) may account for the low intensity of depressive symptoms found in this sample. Framing

caregiving as a shared family responsibility, rather than as a responsibility imposed on them, can reduce the emotional impact (Palacios & Jiménez, 2008). In the second specific goal, Figure 2 shows the spiritual awareness scores from both the Parsian questionnaire and the Dunning questionnaire. None of the caregivers scored at the low spirituality level; 87.9% scored at the high spirituality level, and 12.1% scored at the medium spirituality level.

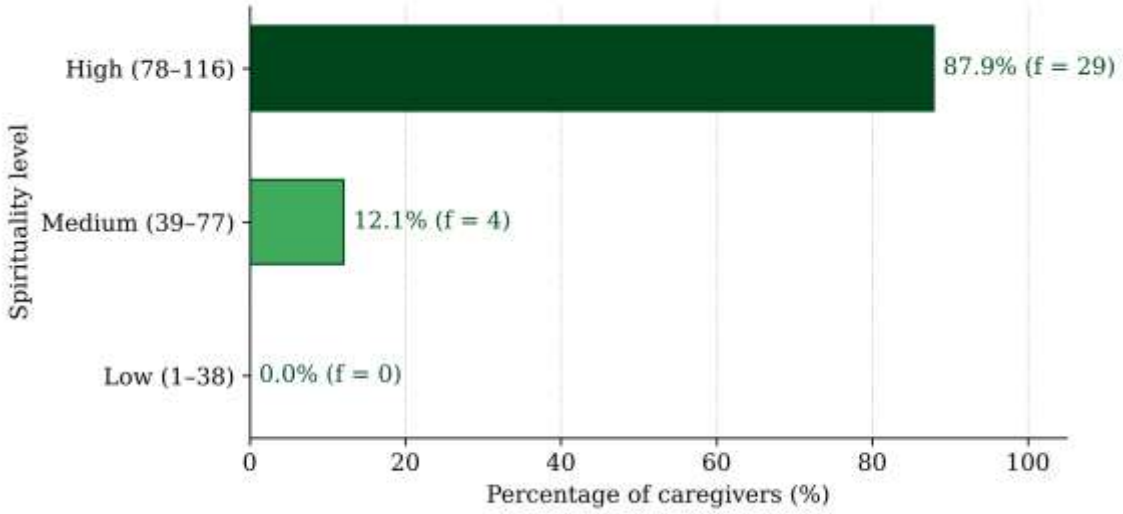


Figure 2. **Level of spirituality among informal caregivers (n = 33).**

Note. Based on the Parsian and Dunning Spirituality Questionnaire, Spanish adaptation by Díaz-Heredia, Muñoz-Sánchez, and de Vargas (2012). *f* = frequency.

Regarding the sociodemographic characteristics of the sample, 90.9% were Catholics, which is consistent with the results obtained by Montalvo et al. (2018), who found that the highest level of spirituality was most common among caregivers in Colombia. However, this does not imply a strong connection between spirituality and direct modulation of depressive symptoms; in fact, a high prevalence of spirituality does not equate to high regression scores. The results of the Zarit Burden Interview are summarized in Figure 3. Overall, 64% of caregivers presented with no burden, 15% with mild burden, and 21% with severe burden.

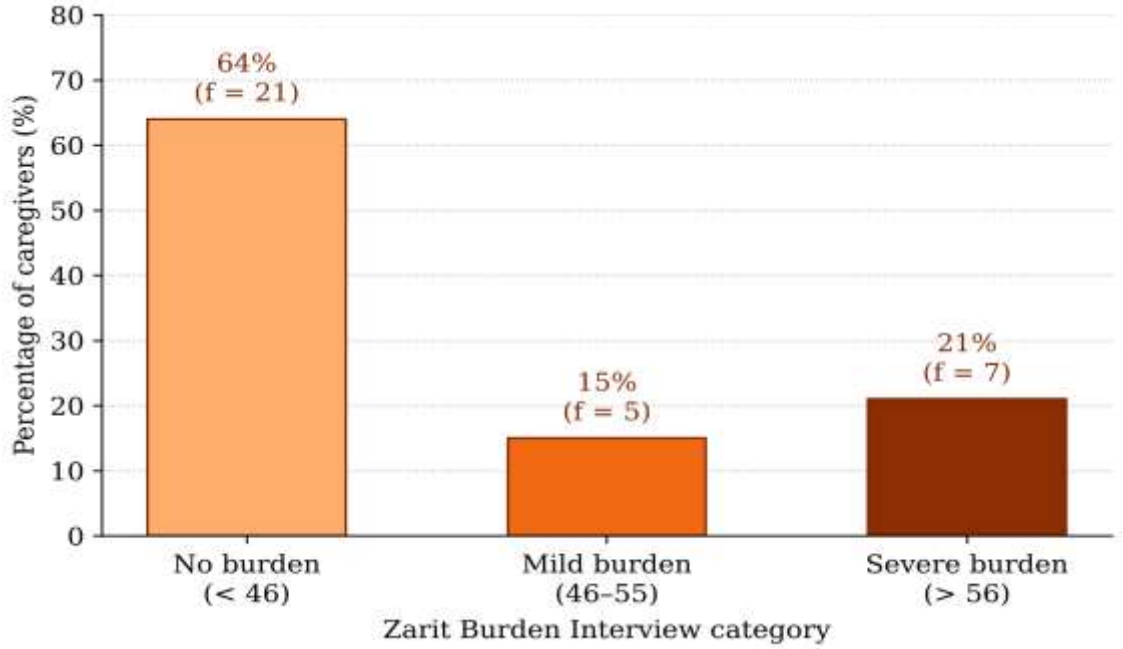


Figure 3. **Level of burden among informal caregivers (n = 33).**

Note. Based on the Zarit Burden Interview, Spanish adaptation by Martín et al. (1996). *f* = frequency.

The distribution differs slightly from that reported by Navarro, López, Climent, and Gómez (2017) among 153 Spanish informal caregivers, where burden was also not predominant, but it differs from the distribution reported by Benítez and Carreño (2015) among Colombian informal caregivers of people with chronic illness, where the absence of burden was accompanied by a higher proportion of mild burden. One potential cause of these low burdens could be the short duration of the caregiving role and the presence of secondary family support networks, as shown by previous studies (Arias-Rojas et al., 2021). Notably, there is a large minority of people (21%) with a severe burden and a majority without burden. The mean number of days spent caring was six to seven days per week, and nearly 40% of the sample were available the entire day, meaning that differences in burden can't be attributed solely to time spent. These differences are more likely due to how caregivers perceive the demands of care and to the resources that may be mobilized, as specified by the transactional model of stress (Folkman et al., 1986). The known actions of this subsystem over sleep, immune control, and cardiovascular health suggest it is also the most likely to be maintained in a hyper-activated state (McEwen, 1998; Vitaliano et al., 2003). Identifying these caregivers is therefore important not only for preventing depression but also for their physical health – particularly in long-term care. The Brief COPE was used to obtain the coping profile detailed in Table 2 and illustrated graphically in Figure 4. Three sets of strategies can be identified. Among the various items listed, emotional support (42.4 %, very high – high score category), acceptance (45.5 %), religion (42.4 %), planning (45.5 %), instrumental support (42.4 %), and self-distraction (42.4 %) make up the first category of scores, which were predominantly very high or high. Characterized by a preponderance of active or adaptive strategies, these seven strategies attempt to mobilize and activate oneself and/or others to facilitate resolution or coping with the stressful situation.

Table 2. *Predominant Category of Coping Strategies Among Informal Caregivers*

Coping strategy	% in predominant category	Predominant category
Emotional support	42.4	Very high
Venting	45.5	Very low
Behavioral disengagement	60.7	Very low
Denial	60.7	Very low
Acceptance	45.5	Very high
Religion	42.4	Very high
Substance use	90.9	Very low
Positive reframing	33.4	Medium
Humor	63.6	Very low
Self-blame	45.5	Very low
Active coping	51.5	High
Planning	45.5	High
Instrumental support	42.4	High
Self-distraction	42.4	High

Note. Based on the Brief COPE (Crespo & Cruzado, 1997). The predominant category is the one with the highest relative frequency among the five possible categories (very low, low, medium, high, and very high) for each subscale. $n = 33$.

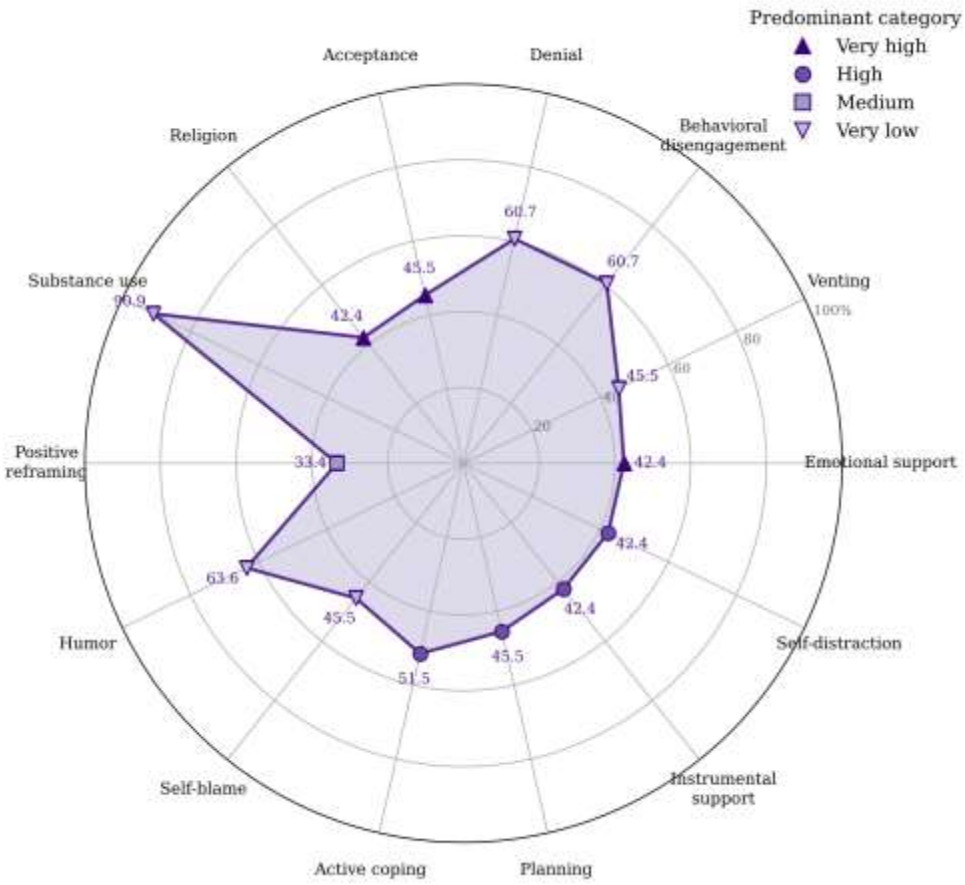


Figure 4. **Predominant profile of coping strategies among informal caregivers (n = 33).**
Note. Authors' elaboration based on data obtained with the Brief COPE (Crespo & Cruzado, 1997). Each point represents the percentage of caregivers in the category with the highest relative frequency for the corresponding strategy.

Only positive reframing is included in the second block at the medium level (33. 4%). This implies that, even when the caregiver successfully accepts that the relative is sick, the caregiver may or may not derive positive meaning from the experience. This distinction is relevant because "acceptance" and "positive reframing" are not always the same process, although both are thought to be emotion- focused strategies. The third block, with very low scores, groups venting (45. 5%), behavioral disengagement (60. 7%), denial (60. 7%), substance use (90. 9%), self- blame (45. 5%), and humor (63. 6%). Their low use functions as additional protection, since these are usually considered “avoidant” or “dysfunctional,” and, as seen in the regression analysis, these strategies result in higher depression levels when they are present. Unlike other cultures, where caring behaviors are a possible coping mechanism for substance use (García, Manquián, & Rivas, 2016), the highest percentage of the profile was found in the very low category, showing that alcohol and other substances are not relevant coping pathways in this sample. These adaptive strategies are mostly similar to those identified by Ávila and Vergara (2014) as being helpful to caregivers for enhancing their quality of life, and to Chen et al. (2015) as being effective for reducing the burden for caregivers caring for older people with dementia, which includes active coping, planning, instrumental support, and self-distraction, with the former three strategies shown to reduce caregivers' depressive symptoms. To address this a third specific multiple linear regression was conducted. The multiple correlation coefficient was R = .947 -- this indicated a very strong association between the 16 predictors and depression. The coefficient of determination R^2 = 0. 898, adjusted R^2 = 0.795, means that the proposed model explained 89. 8% of the variance in depression in this sample, F (16, 16) = 8. 761, p <. .001. The statistical significance of the predictors is outlined in Table 3, and the predictors that reached significance are summarized in Figure 5.

Table 3. *Multiple Regression Coefficients Predicting Depressive Symptoms*

Predictor	*B*	*SE*	β	*t*	*p*
(Constant)	−11.754	12.550		−0.937	.363
Spirituality	0.091	0.161	.176	0.566	.579
Caregiver burden	**0.277**	**0.083**	**.511**	**3.334**	**.004**
Active coping	1.000	1.122	.177	0.891	.386
Planning	−0.081	0.992	−.013	−0.082	.936
Instrumental support	−2.914	1.524	−.519	−1.912	.074
Self-distraction	−1.013	1.069	−.206	−0.947	.358
Emotional support	0.129	0.976	.028	0.132	.897
Venting	**3.292**	**0.727**	**.618**	**4.528**	**< .001**
Behavioral disengagement	**−2.447**	**0.781**	**−.429**	**−3.132**	**.006**
Denial	**2.502**	**0.698**	**.443**	**3.583**	**.002**
Acceptance	1.604	0.913	.280	1.757	.098
Religion	−1.393	1.158	−.316	−1.203	.247
Substance use	2.332	1.184	.249	1.970	.066
Positive reframing	−0.864	1.147	−.162	−0.754	.462
Humor	0.578	0.611	.126	0.946	.358
Self-blame	**1.938**	**0.845**	**.426**	**2.293**	**.036**

Note. Criterion variable: depression (BDI-II). *B* = unstandardized coefficient; *SE* = standard error; β = standardized coefficient. Statistically significant predictors ($p < .05$) are shown in bold. Model summary: $R = .947$, $R^2 = .898$, adjusted $R^2 = .795$, standard error of the estimate = 3.563, $F(16, 16) = 8.761$, $p < .001$.

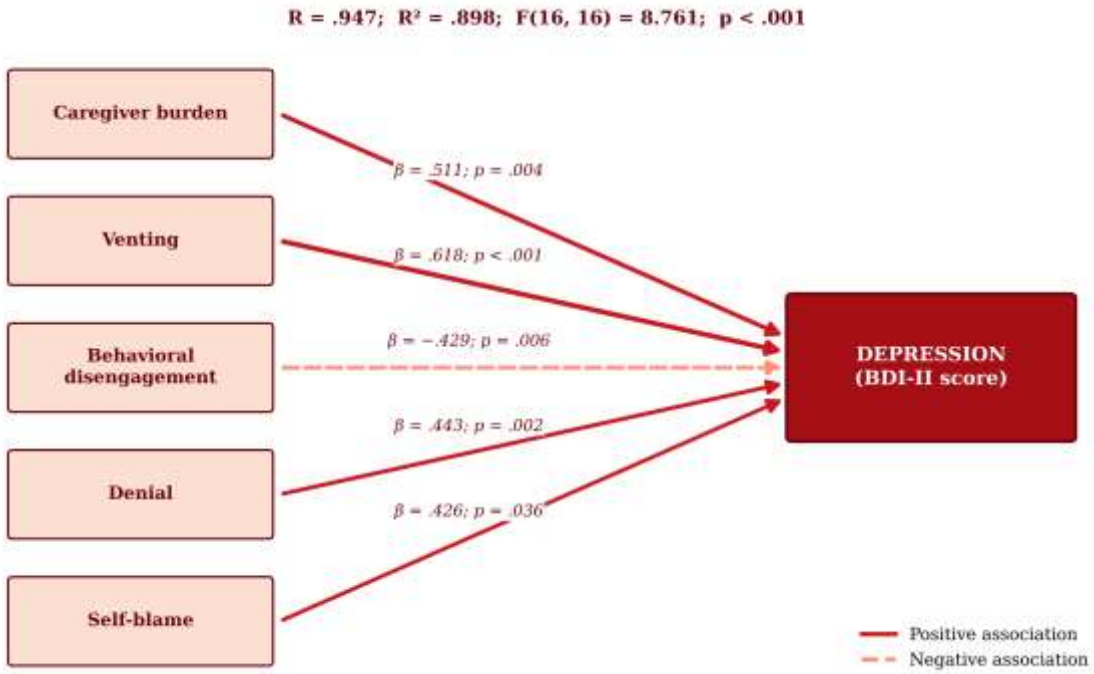


Figure 5. **Model of significant predictors of depression in informal caregivers.**

Note. Authors' elaboration based on the standardized coefficients (β) of the multiple regression analysis. Only variables with $p < .05$ are shown.

Five variables reached statistical significance: caregiver burden (B = 0.277, β = .511, p = .004), venting (B = 3.292, β = .618, p < .001), behavioral disengagement (B = −2.447, β = −.429, p = .006), denial (B = 2.502, β = .443, p = .002), and self-blame (B = 1.938, β = .426, p = .036). Four of these were positively linked with depression (increased burden, venting, denial, and self-blame were associated with increased depressive symptoms), whereas behavioral disengagement showed a negative coefficient (though it is commonly considered avoidant and maladaptive). Although most caregivers did not have clinically relevant burden, the presence of burden emerged as a significant positive predictor, confirming that an increase (in the milder range of the scale) in perceived stress load is associated with a proportional increase in depressive symptoms. This is consistent with other studies that identified burden as one of the variables with the greatest predictive power for psychological distress in informal primary caregivers (Montero-Pardo et al., 2015). It also aligns with the notion that sustained caregiving stress has been associated with allostatic overload and with decreased levels of pro-inflammatory cytokines linked to depressive symptomatology (Kiecolt-Glaser et al., 2003; McEwen, 1998; Vitaliano et al., 2003).

By summarizing findings on the importance of monitoring early symptoms of burden, even when burden is not a primary symptom, this work makes available, for the first time, the (cumulative) effects of burden on mood. In the other direction, four low-prevalence depression predictors (venting, behavioral disengagement, denial, and self-blame) correlated significantly with depression, consistent with León, Slachevsky, and Miranda (2017), who found that avoidant strategies were most prevalent at the highest levels of depressive symptomology in a sample of 166 informal caregivers. Unlike García et al. (2016), who reported relatively low self-blame scores, the current sample showed a significant score after controlling for all other factors. This underscores the clinical relevance of recognizing self-blaming language at an early stage, because although much of the burden depends on circumstances, self-blame is likely a deeper attributional tendency and often requires targeted psychotherapeutic action to prevent escalation before these patterns reach more extreme levels of depression (Guardiola-Wanden-Berghe & Sanz-Valero, 2021). The unfavorable relations between the two behavioral dimensions of the concept disengagement are the most unexpected results from this research. In the present model, the standardized coefficient for behavioral disengagement was negative, whereas Reyna-García et al. (2017) described this disengagement as a maladaptive coping strategy correlated with higher burden among caregivers of pediatric oncology patients. However, it would be better to view this effect as statistical suppression, because the avoidant strategies (behavioral disengagement, venting, and denial) share a significant portion of the variance in the coefficient.

The limited data make interpreting the coefficients challenging: they should be considered as a group rather than individually. 87.9% of the sample reported high levels of spirituality, which seems a substantial difference, but it was not a significant independent predictor (β = .176, p = .579). This does not imply that spirituality is unrelated to caregivers' well-being; it may act indirectly to buffer against depression through coping mechanisms such as religion and acceptance, both of which had high scores in this sample. The interpretation critically engages with Krishnakumar and Neck (2002), who argued for overreaching of religion and for the search for meaning that may manifest in other ways, such as art and connection with nature. Plausible indirect pathways may exist if the spirituality measured here reflects largely its religious-institutional aspect, as one might expect it to have an indirect impact via religious coping. Ferris and Librach (2005) found a spiritual aspect to caring that needs to be addressed alongside practical coping resources if these are to become effective for well-being. Likewise, active coping (β = .177, p = .386), planning (β = −.013, p = .936), instrumental support (β = −.519, p = .074), and emotional support (β = .028, p = .897) did not reach significance in the adjusted model despite their high descriptive scores. Their function might therefore be not to actively treat existing depressive symptoms but to enable a stable baseline of (post-OCD) well-being, a focus that isn't always explicitly described in purely descriptive studies.

The model suggests that depression among informal carers of individuals with terminal cancer is a function of a specific combination of factors, rather than any single factor alone, in line with the Transactional Model of Stress (Folkman et al., 1986), which proposes that psychological distress arises when the stressor, perceived resources, and actual coping strategies come together. Spirituality and active coping strategies are thus not universal protective factors, as they may be ineffective in the presence of other coping patterns that are avoidant (e.g., uncontrolled venting, denial of the actual nature of the illness, self-blame). These findings have practical implications for developing psychosocial programs for informal carers, which should focus on training in active coping (planning, acceptance, and seeking instrumental support) while not neglecting the importance of spirituality, whether culturally or subjectively valued. They also call for early screening for self-blame and denial in primary care and home palliative care, and for creating a safe space to express emotions by giving caregivers places to share how they feel in a controlled way rather than venting.

Limitations and Scope for Future Research

Some comparisons and limitations need to be taken into account when drawing conclusions from these results. First, the small sample size (N = 33), consistent with the challenges of obtaining a probabilistic sample of this population, limits the statistical power of the multiple regression analysis and is likely to yield unstable estimates and explain only a small portion of the variance, as in the case of behavioral disengagement: there were 16 predictors for 33 cases, which is a high ratio. Second, the cross-sectional design itself makes it impossible to draw causal conclusions: for instance, it is unclear whether self-blame leads to depression or whether depression is likely to facilitate the self-blame discourse. Third, given the lack of a population registry of informal caregivers, the most feasible method would have been snowball sampling, which could have selected a relatively homogeneous sample of social networks, affecting the generalizability of the results regarding spiritual aspects. Fourth, the results are determined by self-report measures, which can be susceptible to social desirability bias, especially when appraising variables like substance use and self-blame.

Finally, although a physiological approach to the caregiver stress-load concept was used, no biochemical or physiological measures were collected, so no inferences can be drawn about the postulated biological pathways. However, a strength of the study is that four constructs—depression, spirituality, burden, and coping—were assessed together in the same participants using validated instruments, a rare approach in the regional literature, allowing more detailed multivariate analysis than would be possible in studies focusing on each construct. To more clearly elucidate the directionality of the relationships among negative coping, burden, and depression, future studies should employ more expansive, longitudinal designs with larger sample sizes and variable-selection methods less prone to collinearity, such as regularized (Lasso) regression or SEM. Assessing whether coping adaptations buffer the physiological and psychological impacts of caregiving would be possible if the analysis included clinical indicators of stress load (such as salivary cortisol profiles, inflammatory markers [e.g., interleukin-6 and C-reactive protein], and autonomic markers [heart rate variability (HRV)]). Extending these findings to other provinces of Ecuador with varying sociodemographic and religious factors would also increase the model's generalizability; mediation models involving religious coping and religious acceptance of the findings relating spirituality and trauma would further broaden the model's generalizability.

Conclusion

Young, college-educated, and assuming care on their own, the informal caregiver of persons with terminal illness in Loja is mostly young, mostly Catholic, and spends a significant portion of the day, often the entire day, providing care. The most common condition in this population was mild depression, which argues against the notion that caring for a dying relative will automatically result in widespread psychological decline; however, a small minority of those who cared for a dying family member showed moderate to severe depression, which should be addressed and given particular clinical attention. Spirituality was strongly present in most caregivers and is a culturally relevant coping style for this population, but despite shared high levels, it was not present in its own right as a predictor of depression; its protective effect, if it exists, seems to be mediated via other coping styles, notably religion. In most caregivers, caregiver burden was not observed, but it was confirmed as a significant positive predictor of depression, suggesting that any moderate increases in the stress load perceived by the caregiver would impact mood. Although the most common coping strategies were not independently predictive of depression, the less common strategies (venting, denial, self-blame) were, and all had a positive association with depression, confirming their maladaptive nature. The negative association with behavioral disengagement is likely due to a statistical suppression effect and not to a true protective factor. In total, the model (spirituality, burden, and the 14 coping subscales) accounted for almost 90% of the variability in depression, further supporting a multifactorial configuration of depression rather than a single determinant in these caregivers. The integration of early monitoring of stress load with training in adaptive coping would therefore seem to be a good option to consider for interventions, and future research should include physiological markers to elucidate the pathways from caregiving stress to depression.

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