











## Research Article

# Perceived Social Support and Associated Factors among Caregivers of Individuals with Heart Failure: A Convergent Mixed Methods Study

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**Background.** Caregivers are crucial in ensuring that their relatives with heart failure (HF) reach proper self-care levels. Despite this, the demanding nature of caring for others can lead to poor outcomes and the compromise of own needs, which raises the need for perceived social support. Prior research does not offer a thorough knowledge of how caregivers of people with HF regarded social support and the characteristics that went along with it. **Purpose.** The aim of this study was to develop a comprehensive understanding of perceived social support and its associated factors among caregivers of individuals with heart failure. **Methods.** This is a secondary analysis of a convergent mixed-methods design study. The perception of social support, mutuality, anxiety, depression, and quality of life were assessed in 158 heart failure patients and their caregivers (physical and mental dimensions). In 50 caregivers, we also performed semistructured interviews. **Results.** The mixed analysis and integration of qualitative and quantitative inferences revealed two main factors affecting perceived social support. First, caregivers with strong familial network and greater number of caregivers available for tangible caregiving support and moral support perceived increased sense of social support. Second, caregivers with enhanced mental health had increased sense of social support. **Conclusions.** Caregiver perception of social support might be influenced by mental well-being status. To improve caregivers' perceptions of social support and community belonging, it is necessary to create and assess community- and individual-based mental health promotion interventions. To strengthen the perception of support in the heart failure caring process, more dyadic strategies should be established to improve patient-caregiver mutuality.

## 1. Introduction

Caregivers of individuals with chronic illnesses, including heart failure (HF), are prone to experiencing stress and burden which can affect their well-being, quality of life, and ability to provide care to their ill relatives [1, 2]. Perceived social support is an important coping resource and a mediator in the relationships between stress and burden and caregiver outcomes [3]. Prior research has shown the importance of social support in enhancing well-being and quality of life, as well as in reducing depression and anxiety in caregivers [4–7].

Perceived social support is a multidimensional concept comprised of emotional, instrumental, appraisal, and informational support and includes supportive feedback and physical assistance [8]. Broadly, it includes a structural and functional aspect. Structural aspect pertains to the presence and size of one's social network and the number of social ties, exchanges, and interactions among individuals, while functional aspect refers to the quality and depth of social ties, exchanges, and interactions as perceived by the caregivers [9].

The availability of social support is particularly important to the physical and mental health of heart failure caregivers [3]. Heart failure caregivers are responsible for assisting with day-to-day disease management activities, including, but not limited to, symptom monitoring and management, dietary and treatment adherence, and communication with health care professionals, in addition to addressing the emotional needs of the heart failure patient [10, 11], necessitating adequate social support. Prior studies suggest higher levels of social support are related to decreased caregiver burden [8, 12, 13], increased self-esteem [14], improved mental well-being [3, 15, 16], and enhanced ability to cope with stress [17]. However, there is also some evidence indicating that the level of mutuality between the caregiver and patient influences caregivers' stress and the social relationship within the dyad [18]. Given the importance of perceived social support in helping caregivers cope with caregiving-related stressors, prior research has examined the levels and factors affecting perceived social support among caregivers of individuals in other populations, such as cancer [19–21], stroke [22], and palliative care [23], or having specific conditions such as severe dependence in activities of daily living [24].

However, few studies, to date, have focused on perceived social support in caregivers of individuals with heart failure even though these caregivers play an instrumental role in home and community care, symptom management, and self-care of individuals with heart failure [25, 26]. While caring for their loved ones with heart failure, caregivers experience stress, fears, burden, reduced quality of life, uncertainties in the care of their relatives, and reduced social and family interactions [27–29]. In fact, heart failure caregivers often report a lack of support and disease management knowledge which results in uncertainties, in addition to changes in roles and activities, and increased demands to address heart failure

care needs [30, 31]. Heart failure caregivers also experience increased physical, emotional, social, spiritual, and financial burdens affecting their well-being [30], highlighting the need to examine the levels of perceived social support in this population. Therefore, assessment of perceived social support among these caregivers is of utmost importance to inform effective approaches to enhance their abilities to support their relatives with heart failure in disease and symptom management. Since there is a dearth of both qualitative and quantitative studies on perceived social support among caregivers of individuals with heart failure, a mixed methods study was designed to generate a better and more comprehensive understanding of levels and factors affecting perceived social support among caregivers of heart failure.

## 2. Aim and Objectives

The aim of this study is to develop a comprehensive understanding of perceived social support and its associated factors among caregivers of individuals with heart failure. The specific objectives were as follows:

- (i) To determine the levels of perceived social support among caregivers of individuals with heart failure (quantitative)
- (ii) To identify the factors affecting perceived social support (quantitative)
- (iii) To explore the perspectives of caregivers of individuals with heart failure regarding perceived social support (qualitative)
- (iv) To determine the extent to which quantitative data about perceived social support levels and factors are consistent with or divergent from the qualitative data regarding perspectives of perceived social support (mixed methods).

## 3. Methods

**3.1. Design.** This is a secondary analysis of a study using a convergent mixed method approach [29]. This approach allows for the parallel collection of qualitative and quantitative data [32] to elucidate a broader understanding of a phenomenon and generate meaningful understanding from qualitative and quantitative perspectives [33].

**3.2. Study Setting and Sample.** The study was conducted in three European countries: Italy, Spain, and the Netherlands between February 2017 and December 2018. A convenience sample of caregivers was recruited in multiple settings such as an internal medicine ward, outpatient clinic, and private cardiologist medical office. The inclusion criteria were (a) being an informal caregiver (i.e., spouse, child, and friend) for a patient who had been diagnosed with HF according to the guidelines of the European Society of Cardiology [34] from at least 3 months before data collection and (b) being willing to sign the informed consent form. Fifty caregivers participated in the study (20 from Italy, 19 from Spain, and

11 from the Netherlands) and 158 caregivers (85 from Italy, 68 from Spain, and 5 from the Netherlands) completed the quantitative phase.

**3.3. Data Collection Instruments.** The interview guide included 21 open-ended questions that were created based on prior research on the field and the researchers' combined professional experiences; further details can be found in the parent study [29]. The quantitative variables' perceived social support, quality of life, mutuality, anxiety, and depression were collected using valid and reliable instruments; while for sociodemographic characteristics and hours dedicated to caregiving, an ad hoc form was developed.

The Multidimensional Scale of Perceived Social Support (MSPSS) was used [35] to assess caregivers' individual perception of the level of support they received from their social network. This scale consists of 12 items, rated on a 7-point Likert scale, ranging from "very strongly disagree" to "very strongly agree," which assess three different dimensions of social support: family support, friend support, and significant other support. The responses for each of the three subscales are scored separately, with higher scores indicating higher perceived social support. The total MSPSS score is the mean of the three subscale scores and ranges from 1 to 7. In our sample, the MSPSS showed excellent internal consistency reliability (overall Cronbach's  $\alpha = 0.94$ ).

Quality of life was measured for both patients and caregivers using Short Form 8 (SF-8). Each of the eight items is rated on a 5-point Likert scale, ranging from "excellent" to "poor" [36]. The SF-8 generates two summary scores: a physical component score (PCS) that describes the quality of physical health and a mental component score (MCS) that describes the quality of mental health. Scores range from 0 to 100, with higher scores indicating better health-related quality of life. In our study, the SF-8 scale showed excellent internal consistency reliability for both patients (overall Cronbach's  $\alpha = 0.89$ ) and caregivers subsample (overall Cronbach's  $\alpha = 0.92$ ) (patients (physical component = 0.83 and mental component = 0.84) and caregivers (physical component = 0.88 and mental component = 0.87)).

The positive relation within the patient-caregiver dyad was measured with the mutuality scale (MS) for both patients and caregivers, which includes 15 items, rated on a 5-point Likert scale, ranging from "strongly disagree" to "strongly agree" [37]. The MS also has four dimensions: love, shared pleasurable activities, shared values, and reciprocity. The total score was calculated as the mean of all item scores which ranges from 0 to 4, with higher scores indicating higher levels of mutuality in the relationship. In our study, the MS showed excellent internal consistency reliability for both patients (overall Cronbach's  $\alpha = 0.98$ ) and caregivers subsample (overall Cronbach's  $\alpha = 0.98$ ).

The Hospital Anxiety and Depression Scale (HADS) was used to assess the symptoms of anxiety and depression in the caregiver sample [38]. The HADS includes 14 items, with 7 items each for the anxiety and depression subscales, rated on a 4-point Likert scale, ranging from "0" to "3" indicating the

extent to which caregivers have experienced each symptom over the past week. The possible range of scores for each subscale is 0–21, with higher scores indicating higher levels of anxiety or depression. In our sample, the HADS showed good internal consistency reliability for anxiety subscale (overall Cronbach's  $\alpha = 0.83$ ) and depression subscale (overall Cronbach's  $\alpha = 0.81$ ).

**3.4. Data Collection.** For qualitative data, individual semi-structured interviews were conducted with caregivers. Interviews were then audio-recorded and stored on a digital device. Quantitative data, on HF patients and caregivers, were collected after they accepted to be enrolled. Specifically, for those caregivers who were enrolled in the qualitative phase, quantitative data were collected after the interview, with the intention of having an already elaborated reflection about the experience of caregiving, without influencing the narration.

**3.5. Data Analysis.** Quantitative data analyses were performed using IBM Statistical Package for Social Sciences (SPSS) version 26.0. Descriptive statistics were used to present participants' demographic characteristics. Multiple linear regression analysis was conducted to identify factors associated with caregivers' perceived social support. The predictor variables were caregivers' quality of mental and physical health, patients' quality of mental and physical health, caregivers' mutuality, patients' mutuality, and caregivers' anxiety and depression. Missing data were excluded listwise, and a complete case analysis was performed.

Content analysis according to Mayring [39] was performed on qualitative data, with the support of NVivo 12. Data were analyzed using a deductive approach applying the specific technique of content structuring [39]. We developed an a priori codebook composed of codes related to the items of MSPSS scale domains (family support, friend support, and significant other support). Hence, we applied the first-round coding using Verbal Exchange Coding. This type of coding allowed us to detect the verbal expressions from the verbatim transcript interview referring to the perceived social support according to the MSPSS items [40]. Subsequently, we performed a second round coding using pattern coding in order to identify overarching themes through the abstraction from individual codes. Pattern coding aims to develop the "meta-code," the category label that identifies similarly coded data and involves identifying patterns or relationships [40]. This kind of coding allows defining a structure through codes and categories previously identified.

Once independent analyses were finalized, results were merged using joint displays. The mixed methods integration was completed using the merging integration procedure that entails combining qualitative and quantitative data analyses and interpretation levels to generate a meaningful understanding [33, 41]. The quantitative data about overall scores of MSPSS across three domains were compared with the qualitative themes to examine if any confirmed, divergent, or expanded meta-inferences could be generated [42]. Complete reporting was done using the criteria for

reporting mixed methods studies in health services research (GRAMMS) checklist [43].

**3.6. Validity and Reliability/Rigor.** Verbatim transcriptions were randomly checked before the analysis to ensure accuracy (10% of the total interviews). Lincoln and Guba trustworthiness criteria for rigor were applied. We collected interviews from caregivers of different ages to achieve integration and to have different points of view about the same phenomenon. Thick description of qualitative data was provided in accordance using contextualized and relational narrative [44]. Furthermore, data were collected in three different countries in Europe, with different attitudes, beliefs, and policies regarding family caregiving. This allowed us to have a different perspective about caregiver's experience and improved credibility. A persistent and long investigation before the interviews allowed the researchers to become familiar with the participants to ensure credibility in the knowledge about the phenomenon. In addition, data in the original language are available to ensure the credibility of transcription and to preserve the cultural identity of the participants [29].

**3.7. Ethical Considerations.** This research conformed with the Helsinki Declaration. Before data collection, both patients and caregivers completed the informed consent forms once the research protocol was approved by each center's ethics committee. The participants had the freedom to leave the study whenever they wanted without facing any repercussions; participation was voluntary and unpaid. The cooperating universities' secure archives held the data sets.

## 4. Findings

**4.1. Demographics.** In total, 158 caregivers participated in the study. Most of the caregivers were female (71.5%) with a mean age of 57 (SD 14.4), were married (74.7%), had a high school diploma (34.8%), and were employed (33.6%). Most caregivers (87.3%) reported that they only had the basic necessities to live and were living in cohabitation with their relatives with heart failure (56.3%). Most of the caregivers identified themselves as the spouse (39.9%), son/daughter (34.2%), and son/daughter-in-law (10.1%) of the patients they cared for (Table 1).

**4.2. Quantitative.** The mean score for perceived social support was 4.87 (SD 1.51) with the highest mean scores on family (mean 5.51 and SD 6.0), significant other (mean 5.10 and SD 5.75), and friend (mean 4.00 and SD 4.5) support subscales. Most caregivers reported high (59.5%) and moderate (24.7%) levels of perceived social support. The mean scores for all the predictors are presented in Table 2.

The regression analysis determined the relationship of predictors (caregivers' quality of mental and physical health, patients' quality of mental and physical health, caregivers' mutuality, patients' mutuality, caregivers' anxiety and depression, and hours of caregiving per week) with the

TABLE 1: Sociodemographic data.

Characteristics	Caregivers ( <i>n</i> = 158)
Age	Mean 57.0 SD 14.4
Gender	<i>n</i> (%)
Male	45 (28.5)
Female	113 (71.5)
Marital status	<i>n</i> (%)
Married	118 (74.7)
Separate/divorced	7 (4.4)
Single	31 (19.6)
Widow	2 (1.3)
Education	<i>n</i> (%)
Primary school	33 (20.9)
Secondary school	41 (25.9)
High school	55 (34.8)
Degree	24 (15.2)
Relation with patients	<i>n</i> (%)
Son/daughter	54 (34.2)
Wife/husband	63 (39.9)
Son/daughter in law	16 (10.1)
Brother/sister	5 (3.2)
Friend	3 (1.9)
Others	14 (8.9)
Cohabitation	<i>n</i> (%)
Yes	89 (56.3)
No	68 (43.0)
Employment	<i>n</i> (%)
Homemaker	20 (12.7)
Employee	53 (33.6)
Retired	41 (25.9)
Unemployed	17 (10.8)
Unemployed (because of caring)	26 (16.5)
Financial status	<i>n</i> (%)
Serious financial problems	7 (4.4)
Having the necessities to live	138 (87.3)
Having more than enough to live well	13 (8.2)

caregiver's perceived social support. This model is statistically significant, explaining 19.7% of the variability in MPSS,  $F(9, 148) = 4.090$ ,  $p < 0.01$ , and  $R^2 = 0.197$ . However, only three variables, namely, caregivers' mutuality ( $p = 0.037$ ), patients' mutuality ( $p = 0.006$ ), and caregivers' quality of mental health ( $p = 0.017$ ) significantly related to caregivers perceived social support. Specifically, caregivers' mutuality ( $\beta = 0.224$ ) and caregivers' quality of mental health ( $\beta = 0.281$ ) were positively associated with caregivers perceived social support, while patients' mutuality ( $\beta = -0.284$ ) was negatively associated with caregivers perceived social support (Table 3).

## 5. Qualitative Findings

### 5.1. Factors Enhancing Personal Sense of Perceived Social Support

**5.1.1. Familial Network for Tangible Assistance and Moral Support.** The caregivers expressed that the presence of a strong familial network for tangible (actionable) assistance in caregiving tasks and moral support was critical for enhanced perceived social support. Caregivers noted that

TABLE 2: Descriptive statistics for quantitative variables.

Independent variables	Mean	Std. D
Quality of mental health (caregivers)	74.46 (range 0–100)	20.64
Quality of physical health (caregivers)	75.36 (range 0–100)	18.89
Quality of mental health (patients)	61.46 (range 0–100)	22.63
Quality of physical health (patients)	53.63 (range 0–100)	21.83
Mutuality (patients)	3.13 (range 0–4)	0.91
Mutuality (caregivers)	2.99 (range 0–4)	0.98
Caregivers anxiety	6.35 (range 0–21)	4.48
Caregivers depression	5.67 (range 0–21)	4.32
Perceived social support (dependent variable)	4.87 (range 1–7)	1.52
Hours of caregiving per week	30.39	28.28

TABLE 3: Regression analysis on perceived social support of caregivers.

Variables	Unstandardized coefficients		Std. coefficients			95% CI for B	
	B	Std. error	Beta	t	Sig	Lower bound	Upper bound
(Constant)	4.807	0.875		5.493	0.000	3.078	6.536
Mutuality (patients)	<b>-0.474</b>	<b>0.170</b>	<b>-0.284</b>	<b>-2.782</b>	<b>0.006</b>	<b>-0.810</b>	<b>-0.137</b>
Mutuality (caregivers)	<b>0.347</b>	<b>0.165</b>	<b>0.224</b>	<b>2.100</b>	<b>0.037</b>	<b>0.020</b>	<b>0.673</b>
Caregivers anxiety	-0.059	0.039	-0.173	-1.502	0.135	-0.136	0.018
Caregivers depression	-0.018	0.039	-0.051	-0.456	0.649	-0.095	0.059
Quality of physical health (patients)	0.005	0.008	0.079	0.711	0.478	-0.010	0.021
Quality of mental health (patients)	0.004	0.007	0.053	0.476	0.635	-0.011	0.018
Quality of physical health (caregivers)	-0.016	0.009	-0.194	-1.808	0.073	-0.032	0.001
Quality of mental health (caregivers)	<b>0.021</b>	<b>0.009</b>	<b>0.281</b>	<b>2.404</b>	<b>0.017</b>	<b>0.004</b>	<b>0.038</b>
Hours of caregiving per week	0.004	0.004	0.067	0.825	0.410	-0.005	0.012

The bold values indicate the values that are significant.

family members offered their support in the decision-making process and in implementing the caregiving tasks. One of the caregivers described how her daughter helped her in making critical decisions about caregiving.

*“I have my daughter who is an incredible help. She has helped me make important decisions to deal with many situations such as dad’s illness and dealing with mum’s situation. Also, my other son, but my daughter being a girl understands you more surely so there is a very close relationship between us. She helps me a lot, let’s say she’s my point of reference now.” (Italian woman, 55 age)*

Readiness to receive help when requested is perceived by caregivers as a valuable support resource during challenging times. They recognized the importance of strong familial network as a source of help. Moral support was mainly perceived in the chats that caregivers may have with their relatives. When they find themselves in a situation of need, women caregivers rely on the support of family members of the same gender. Our findings show that the possibility to talk and confide in each other is perceived as a source of moral support and increases the sense of closeness

*“We talk a lot as a family, that’s what makes us get along. It is what makes them feel close to me. My mother and I talk three times a day, and with my sister, we could spend three hours on the phone every day, for the whole year.” (Spanish woman, 52 age)*

**5.2. Social Sources for Emotional Refuge.** Caregivers expressed that having social sources for emotional refuge was valuable in enhancing their perceived sense of social support. Two key social sources were mentioned, namely, health care professionals and grandchildren. Older caregivers find the little ones in the family to be a source of joy and emotional refuge. Being able to look after their grandchildren is a reciprocal exchange of support that the little ones return by giving joy by making the grandparents feel useful and address their stress and negative emotions. For example, one of the caregivers shared

*“We have six grandchildren who do more than support us and do not make us think from morning to night evening.” (Italian woman, 70 age)*

Caregivers noted that often healthcare professionals would use humor to change the state of their mind enabling them to increase their perception of closeness to the caregiver-patient dyad during difficult times. Many caregivers expressed that having health care professionals who are able to reignite their internalized joy was beneficial during emotionally challenging day. For example, one of the caregivers shared her feelings about the family doctor.

*“We are fortunate to have a family doctor who sometimes plays down many problems and gives us serenity, we always consult him” (Italian woman, 79 age)*

### 5.3. Factors Hindering Personal Sense of Perceived Social Support

**5.3.1. Inadequate Social Protection Services.** Some conditions beyond the caregivers' control affect the perceived support. Social policies that do not protect the caregiver-patient dyad increase the sense of isolation and social abuse. The caregivers noted that lack of health system level support regarding the rights, care, and needs of informal caregivers negatively affected their sense of perceived social support. They felt that their work was not appreciated for the care and support that they were offering for their relatives with heart failure. The caregivers were particularly concerned that if something happened to them, their loved ones would be left by themselves because informal caregivers' importance and work are ignored.

*“Talk everywhere in the Netherlands; oh, informal caregiver who is so burdened, we have to help them, no! informal caregivers do not count in the Netherlands as a person. Informal caregiver help . . . because that. . . Never, never pay anyone, you are being bullied, you are, you have been mentally abused, you have been financially abused. All sides just so far . . . leave caregiver no more room, informal caregiver get sicker . . . Last year I have had horrible problems for my heart, for my shaking of my hands, for I also for community, I have applied for my husband accompaniment.” (Dutch woman, 55 age)*

**5.3.2. Family Structure.** Family structure changes the perception of support around the caregiver. Those caregivers that were the only child in their family felt that they were alone and could only rely on familial network during stressful times. They noted that not having siblings or close family members led to a greater sense of abandonment and loneliness. This loneliness affects their physical and emotional strength to cope with caregiving demands and self-care.

*“It's just that she goes to a lot of trouble in this as I'm an only child, if something happens to her, I'm left alone; and so more or less between the two of us we support each other” (Spanish woman, 63 age)*

**5.4. Mixed Methods Analysis.** This analysis generated one confirmed and one discordant finding and illustrated using joint display [45]. First, the familial network was considered to be important for enhanced social support. Second, the presence of friends was not recognized as an essential element contributing to increased sense of social support based on qualitative data (see Table 4 joint display 1).

The second merged analysis identified two confirmed and one discordant factor that contributed to caregivers' perceived social support. Three meta-inferences were generated: improved mental well-being of caregivers increased their sense of social support, stronger familial network and additional caregivers enhanced perceived social support, and better relationship with patients decreased the sense of perceived social support (see Table 5 joint display 2).

## 6. Discussion

This study aimed to understand the factors affecting perceived social support among caregivers of people with heart failure. The mixed analysis and integration of qualitative and quantitative inferences revealed two main factors affecting perceived social support. First, caregivers with strong familial networks and a greater number of caregivers available for tangible caregiving support and moral support perceived an increased sense of social support. Second, caregivers with enhanced mental health had an increased sense of social support. Previous studies note that social support can improve mental well-being and reduce depression and stress among caregivers [4–6]. Findings of a meta-analysis conducted by Harandi et al. [46] also noted that increased levels of perceived social support could reduce stress, anxiety, and distress, thereby improving mental health. While the effect of social support on mental health is evident, our study found that having improved perceived mental health and well-being can improve social interactions among caregivers. There also may potentially be a bidirectional relationship between mental health and social support in caregiving, with some research suggesting that social support may act as a mediator in the relationship between caregiving quality of life indicators and depression in heart failure caregivers [3].

The presence of a strong familial network and the availability of additional caregivers enhanced perceived social support among caregivers. Previous studies demonstrated that having a strong family network and relationships can increase the sense of support and security in caregivers of individuals with chronic illnesses such as chronic obstructive pulmonary disease [47] and cancer [20, 21]. The qualitative findings of this study also noted that lack of adequate caregivers and being a single caregiver (i.e., family structure) hinder an increased sense of perceived social support. This further offers some evidence that sharing caregiving tasks among family members or other caregivers such as friends and distant relatives can provide a greater sense of social support.

The quantitative and qualitative findings corroborated the perceived social support-promoting factors. However, the qualitative findings also revealed limited social protection services for caregivers could affect their mental well-being and the sense of support required to adequately care for their loved ones. This finding brings to attention the need to develop more policies to support informal caregivers in caring for their relatives with chronic illnesses at home and in community settings. More social protection services and resources should be made available to caregivers through governmental bodies. It was found the caregivers used social sources for emotional refuge. However, the participants did not offer a more in-depth understanding of the nature and type of social sources. Healthcare professionals and grandchildren were identified as social sources, but further qualitative inquiries to understand the role and influence of other social sources such as friends and acquaintances can be useful for designing community-based social support

TABLE 4: Joint display of quantitative data on domains of social support and qualitative findings.

Quantitative inferences	Qualitative inferences	Mixed methods meta-inferences
Inference 1: caregivers indicated increased family support available during the caregiving of their relatives with heart failure	Inference 1: caregivers noted that presence of a familial network for moral support and tangible assistance in caregiving enhanced their sense of social support Data evidence: <i>"I have my daughter who is an incredible help. She has helped me make important decisions to deal with many situations such as dad's illness and dealing with mum's situation"</i> (Italian woman, 55 age)	Confirmed: presence of strong familial network was perceived to enhance social support of caregivers of individuals with heart failure
Data evidence: caregivers reported high scores on the family subscale of MSPSS (mean 5.51, SD 6.0)		
Inference 2: caregivers recognized the importance of friends as an element of increased perceived social support	No qualitative data	Discordant: presence of friends was considered important for social support in quantitative data, but in their interviews, friends were not identified as an element of increased sense of social support
Data evidence: caregivers reported moderate scores on the friends subscale of MSPSS (mean 4.00, SD 4.5)	Data evidence: no qualitative data	

TABLE 5: Joint display of factors associated with caregivers perceived social support.

Quantitative inferences	Qualitative inferences	Mixed methods meta-inferences
Inference 1: when the patients perceived a positive relationship with caregivers, caregivers felt less supported by others, maybe because there was a more dyadic collaboration  Data evidence: with each one-unit increase in mutuality_patient, there was a decrease in perceived social support for 0.474 units	Inference 1: relationship between caregivers and their patients and its impact on perceived social support was not identified in qualitative data  Themes: no relevant theme Data evidence: no supporting data	Discordant: there was no evidence to support the belief that more collaboration among patient and caregivers decreased caregivers' perceived sense of social support
Inference 2: When caregivers recognize positive relationships with patients, they tend to feel more supported socially	Inference 2: strong familial network for caregivers to seek tangible physical and moral support increased their sense of perceived social support  Themes: familial network for tangible assistance and moral support Data evidence: "I come from a strong family, a combative mother who taught us many things, to always go forward and not to look behind. When we need something there is my daughter comes to our rescue" (Italian woman, 71 age)	Confirmed: having a strong familial network and multiple caregivers who are able to provide tangible and moral support to each other is a factor enhancing the sense of social support
Data evidence: with each one-unit increase in mutuality_caregiver, perceived social support increased by 0.347 units	Inference 3: caregivers used social sources for emotional refuge and felt mentally strong when such sources were available  Themes: social sources for emotional refuge Data evidence: "I have my daughter who is an incredible help. She has helped me make important decisions to deal with many situations such as dad's illness and dealing with mum's situation" (Italian woman, 55 age)	Confirmed: improved perceived mental well-being is an essential factor affecting perceived social support
Inference 3: when caregivers had improved mental well-being, they maintained strong social support by pursuing social relationships	Data evidence: with each one-unit increase in SF8_Mental_caregiver, perceived social support increased by 0.021 units	



interventions involving wider social groups perceived as sources.

The study has several implications for diverse socio-cultural and geographic contexts. The study demonstrated the multifaceted nature of perceived social support. Healthcare professionals and social workers can use the findings to better support caregivers in caregiving efforts through offering emotional and caregiving support. The nature of perceived social support can vary across cultures and contexts. Therefore, healthcare professionals and social workers should be cognizant of the sociocultural factors and diversity when offering services and designing psychological support interventions to enhance social support. Finally, healthcare administrators in acute and social care settings and professionals should ensure that training resources and services are readily available to caregivers living in low resource settings.

**6.1. Areas for Future Research.** Based on the study findings, several areas for future research have been highlighted for diverse sociocultural and geographic contexts. Future research should focus on examining the bidirectional relationship between mental health and social support, specifically the effect of anxiety, stress, and distress on both mental health and social support. Research can also examine the relationships of perceived social support, mental health of caregivers, and its impact on the care outcomes of their relatives with chronic illness. Further research can provide more insights into the differences in perceived sense of support perceived by immediate family members and friends and acquaintances and also a better understanding of what strong social support entails for various types of caregivers can offer insights into improving the informal caregiving process. Further research into the nature of social protection services available to caregivers across different European countries as well as around the world can be valuable to examine the disparities in the resource availability to informal caregivers. More economical and cost-based analysis can also focus on designing protection services and assessing their cost-effectiveness and impact on the care of patients. Further studies using social network analysis can be used to explore the influence of various social relationships and interactions on the caregiving journeys of caregivers. Such analyses offer valuable insights into understanding how social relationships, perceived social support, and type of social sources impact the caregivers' caregiving.

**6.2. Limitations.** This study offered an explanatory view of factors affecting caregivers' perceived social support without capturing the nuanced complex interplay and evolution of factors over time. However, considering that it is a secondary analysis, some of the following limitations could not have been controlled. Most of the caregivers were female, limiting the generalizability of the study findings. Additionally, since caregivers often experience burnout, there is a possibility of recall bias. Moreover, clinical details about patients' NYHA class, severeness of the symptoms, and ejection fraction were

lacking, impeding further development. Therefore, future longitudinal studies should be designed by considering these limitations to better understand the interplay of these factors over time. Our sample comprised European caregivers which may affect the generalizability and transferability of findings to other populations in North America, Asia, and Africa. Caregiving is context-dependent; therefore, future inquiries in other contexts may provide valuable insights.

## 7. Conclusions

Increased sense of social support plays an instrumental role in improving the caregivers' ability to care for their loved ones with heart failure. When caregivers feel a strong connection and relationship with their families and are able to readily access them for moral support and tangible support, they are able to devote more efforts into care of their relatives with the illness. Using the social support promoting and hindering factors as baseline, researchers and practitioners can design and evaluate community-based social support interventions to facilitate caregivers in the care of their loved ones with heart failure and other chronic illnesses.

## Data Availability

As part of IARR's encouragement of open research practices, the authors have provided the following information: this research was not preregistered. The data used in the research cannot be publicly shared due to ethical restrictions but are available upon reasonable request from the corresponding author.

## Conflicts of Interest

The authors declare that they have no conflicts of interest.

## Authors' Contributions

Ahtisham Younas and Marco Di Nitto contributed equally.

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