

PAPER

Daily received support and relational functioning in HCT survivors and their caregivers

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Abstract

Objectives: Numerous authors have expressed their interest in adjustment and social support in the context of cancer. However, none of the previous studies has directly examined the models describing the links between daily social support and adjustment fluctuation, particularly at the relational level. This study aimed to verify the additive and buffering models of daily received support regarding the relational level of patient-caregiver relationship, that is, the relationship-related stress and relationship satisfaction following hematopoietic cell transplantation (HCT).

Methods: Two hundred patient-caregiver dyads participated in a 28-day diary study that was started on the first day after post-HCT discharge. The participants rated the extent of daily relationship-related stress, relationship satisfaction, and received support every evening during the study. The analyses were based on the actor-partner interdependence moderation model.

Results: Daily deviations in received support were directly associated with concurrent and lagged daily deviations in relationship satisfaction, regardless of relationship-related stress level in both patients and caregivers. In addition, in caregivers, the effect of daily deviations in received support on relationship satisfaction depended on deviations in relationship-related stress and was significant on the days with higher relationship-related stress.

Conclusions: The findings supported both the additive (in patients and caregivers) and the buffering hypotheses (in caregivers) of daily received support in patient-caregiver dyads during the first month following HCT. The theoretical and practical implications of the findings are further highlighted.

KEYWORDS

adjustment, cancer, daily-diary study, HCT, oncology, patient-caregiver dyads, relationship satisfaction, social support

1 | BACKGROUND

Cancer and its treatment are related to emotional, social, and relational issues that can have a negative impact on the well-being of both

patients and their families and on the patient-caregiver relationship.¹⁻⁵ Hematopoietic cell transplantation (HCT) is a demanding form of cancer treatment for patients. It consists of several stages, including high doses of chemotherapy and/or radiotherapy, autologous or

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allogeneic cell transplantation, patient isolation, lasting several weeks, as well as short- and long-term outpatient periods.⁶ At each stage, both patients and caregivers encounter different challenges. In a short-term outpatient stage, they have to cope with treatment-related adverse effects (ie, various physical symptoms in patients), as well as adherence and compliance.⁷ Success and failure in meeting these demands, as well as external daily hassles (eg, children- or work-related problems), can be a source of stress in both parties, which can spillover at the relational level, affecting their relationship-related stress and satisfaction.^{8,9} Facing demands together can, in turn, favor supportive behaviors in patient-caregiver relationship.

Some research has investigated the role of stress in well-being in cancer circumstances; however, mostly at the individual level. Studies have focused on patient and caregiver experience of distress and its effect on an individual.^{10,11} As the disease is considered a dyadic stressor, disease-related stress and its effect also apply to the relational level.⁸ Previous studies found that *relationship-related stress* (ie, tension that arises in the relationship due to divergent attitudes, goals, and needs or disturbing habits¹²) has a negative effect on *relationship satisfaction* (ie, subjective evaluation of the relationship and positive feelings for one's partner¹³) in the general population, cross-sectionally^{14,15} and longitudinally.¹⁶ Other studies suggested that the negative effect of relationship-related stress may be limited to actor effects in dyads (ie, an impact of the predictor variable on the outcome variable within one person, according to the actor-partner interdependence model¹⁷).¹⁸ Indeed, the partner effect (ie, an impact of one person's predictor variable on the other person's outcome variable) within dyads was opposite, that is, higher relationship stress in males was related to higher relationship satisfaction in females. Yet, none of the previous research examined the association between relationship-related stress and satisfaction in patient-caregiver dyads. The research was limited to predict relationship satisfaction by the partner's individual level of stress. For example, patient distress was found to predict caregiver relationship satisfaction in patient-spouse dyads facing various cancer types.¹⁹

Social support is one of the factors that may contribute to the association between relationship-related stress and satisfaction. *Social support* is defined as "specific transactions whereby one person explicitly receives benefits from another, or it may be experienced through the perception that such help and support is potentially available."²⁰ Thus, the individual may receive or only perceive available support. Among cancer patients or patients following HCT, received support was associated with lower psychological distress^{21,22} or higher relationship intimacy.²³ The benefits of received support were also noted in caregivers or spouses of patients.^{22,23} Indeed, support exchange in disease is a reciprocal process in which a patient is both the support recipient and supporter.⁹ Perceived support was found to be related to better health-related quality of life²⁴ or lower anxiety and lower depressive symptoms²⁵ in HCT patients.

From theoretical and practical points of view, it is important to determine how the support works, not just what its effects are. The beneficial role of social support in association between stress and well-being is explained in a 2-fold manner.²⁶ Based on the *hypothesis*

of the additive model, the beneficial effect of social support on well-being is direct and independent of stress level. According to the *buffering model*, social support is beneficial only in high-level stress conditions. The advantage of one of the approaches remains an issue. Previous research indicated that perceived and received supports were directly linked to well-being in cancer settings²⁷⁻²⁹ and buffered the stress effect as well.^{28,29} Support mechanism may depend on support source/type and the adjustment indicator.²⁸ However, these reports concerned the individual level of the association between stress and outcome. In the general population, received support buffered the effect of role-related stress on relationship satisfaction in newlywed couples, although only in females.³⁰

Although numerous authors have expressed their interest in social support and well-being in cancer settings, none of the previous studies has directly examined support hypotheses in association between relationship-related stress and relationship satisfaction in dyads facing cancer, especially following HCT. Prior studies referred to the individual level of these factors rather than the relational one. Meanwhile, it can be expected that general models, mostly associated with individual functioning, will also apply to a specific context, that is, at the level of relationship. Another limitation of most previous studies, investigating the associations of stress, social support, and well-being in the cancer context, is that they adopted the patient-centered focus, apart from the perspective of the relatives. As already mentioned, cancer treatment is a shared experience. Thus, the examination of both patients and their relatives, as well as the adoption of the dyadic unit of the analysis, seems the most appropriate here. On the other hand, most dyadic research has exclusively focused on couples, that is, those who are cohabiting or married, particularly in the context of breast or prostate cancer. Meanwhile, a close caregiver in the disease process may not necessarily be a spouse. In addition, other cancer circumstances, for example, demanding treatment using HCT, are an adaptive challenge for patients and their relatives. Finally, most prior studies did not consider daily fluctuation of stress, social support, or well-being. Previous studies were traditional cross-sectional or longitudinal research, which, from the statistical point of view, focused on the differences between individuals. Patient-caregiver relationship does not usually remain static but changes day by day.³¹ The daily-diary method allows for better examination of changing processes within dyads and thus a study of everyday life of patients and their caregivers as it is lived.

This study attempted to address the above-mentioned issues. The research aimed to examine the additive and buffering models of received support in association between relationship-related stress and relationship satisfaction in patient-caregiver dyads following HCT, using the daily-diary method. This research is a continuation of our examination of social support hypotheses driven from various approaches to social support in dyads facing HCT.³² We applied the actor-partner interdependence moderation model³³ to test the study hypotheses. To separate the correlation effects from the short-time predictions, the concurrent (ie, same-day) and lagged (ie, next-day) effects were examined. We tested the main actor and partner effects

of daily relationship-related stress and received support, and the actor effect of the interaction between relationship-related stress and received support on relationship satisfaction in both patients and caregivers. The main effects indicated how the effects of daily deviations in stress and support (from once's personal mean level) were associated with daily deviations in relationship satisfaction. In turn, the interaction effects indicated how the effects of daily deviations in received support on relationship satisfaction depended on daily deviations in relationship-related stress. A positive actor effect of daily received support on relationship satisfaction (controlled for relationship-related stress) would support the additive model of daily social support. The buffering hypothesis would be supported when the positive effect of daily received support on relationship satisfaction would be stronger on the days when daily relationship-related stress was higher than typical of this person (ie, when the effect of interaction between daily relationship stress and received support would be significant and positive).

2 | METHODS

2.1 | Participants and Procedure

The final sample consisted of 200 patient-caregiver dyads. The participants' demographic and clinical characteristics are given in Table 1. Patients were enrolled in the study if they were admitted with the first autologous or allogeneic HCT, were older than 18 years of age, and did not have a history of any other major disabling medical or psychiatric condition. Caregivers were appointed by patients and invited to the study (via phone) if they had close contact and took care of patients during the post-HCT outpatient recovery, were over 18 years of age, and had no history of major medical or psychiatric conditions. Recruitment occurred in a single clinic approximately 2 days after admission before the conditioning treatment. The study protocol was approved by the Ethical Review Board at SWPS University of Social Sciences and Humanities, Faculty of Psychology in Warsaw (No. 24/2014).

The eligible patients who gave their written informed consent (N = 285) participated in the baseline assessment during which demographic items were collected. Patient clinical data were obtained from medical records. In all, 252 caregivers consented to participate. Caregiver demographic items were obtained on the first diary entry. All participants were taught how to complete the diary, particularly with regard to timing and independent diary entries. The daily assessment started on the first day after hospital discharge and lasted for 28 consecutive evenings. All dyads completed self-reporting web-based (12.5%) or paper-and-pencil (87.5%) diaries, which took 6 to 8 minutes (paper versions were returned after the 28-day period). Every evening the participants received a short text message as a reminder. They were also telephoned three times during the study period so that researchers could address difficulties or questions. Dyad flowchart is presented in Figure 1. The drop-out rate was 21%. Sample attrition analyses indicated that only the type of transplant differentiated the dyads that were included in the analysis (N = 200) from those that were not

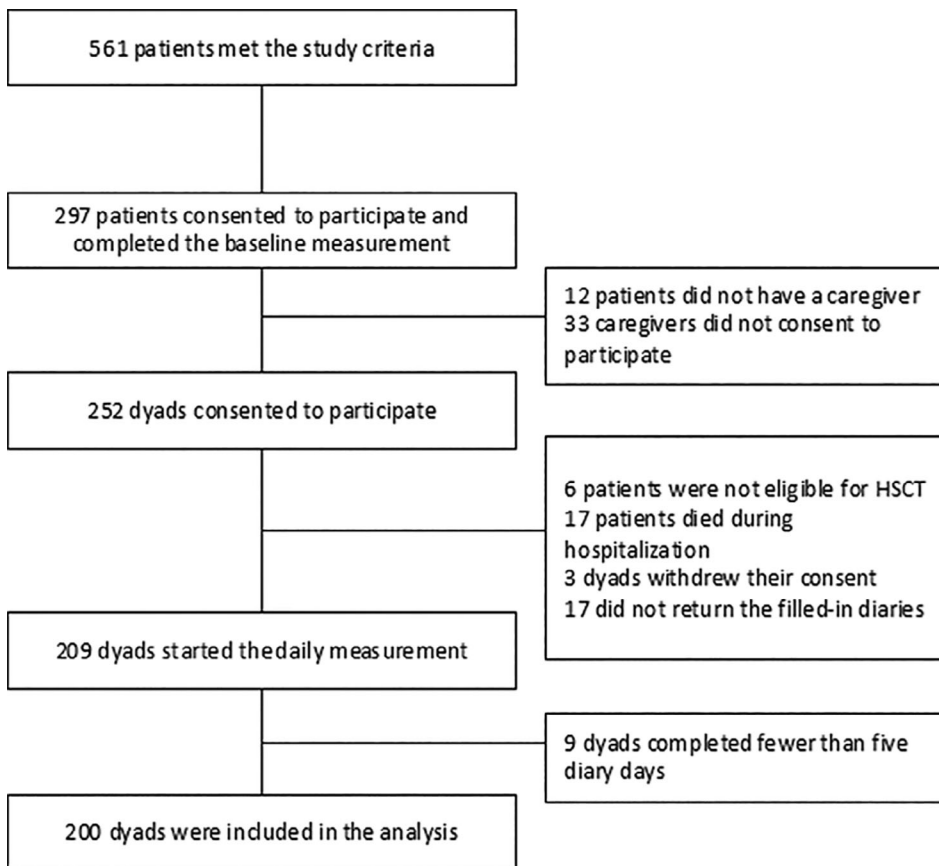
TABLE 1 Sample characteristics (N = 200 dyads)

Demographic and clinical data	Patients	Caregivers
Male (n, %)	114 (57)	59 (29.5)
Female (n, %)	86 (43)	141 (70.5)
Age (mean, SD; yrs)	47.85 (13.48)	47.38 (13.11)
Education (mean, SD; yrs)	14.18 (3.32)	14.07 (3.29)
Employment: yes (n, %)	74 (37.0)	123 (61.5)
Length of the relationship (mean, SD; yrs)	25.34 (12.26)	25.34 (12.26)
Relationship ties (n, %)		
Spouse/partner	155 (77.5)	155 (77.5)
Mother/father	22 (11.0)	16 (8.0)
Daughter/son	16 (8.0)	22 (11.0)
Sister/brother	6 (3.0)	6 (3.0)
Other	1 (.5)	1 (.5)
Primary diagnosis (n, %)		
Leukemias and other myeloid neoplasms	35 (17.5)	-
Lymphomas	96 (48.0)	-
Multiple myeloma	62 (31.0)	-
Other cancer types	7 (3.5)	-
Time since diagnosis (mean, SD; mos)	21.89 (24.07)	-
Medical comorbidities (mean, SD)	.95 (1.30)	1.06 (1.47)
Type of transplant (HCT) (n, %)		
Autologous (autoHCT)	148 (74.0)	-
Allogeneic (alloHCT)	52 (26.0)	-
Conditioning (n, %)		
Myeloablative (MA)	194 (97.0)	-
Non-myeloablative (NMA)	5 (2.5)	-
Reduced intensity (RIC)	1 (.05)	-
Treatment toxicity—WHO Scale (mean, SD)	17.98 (4.56)	-
Acute GvHD (only for alloHCT recipients; n, %)	18 (34.6)	-
Days from HCT to discharge (mean, SD)	18.51 (9.32)	-
autoHCT recipients	14.45 (3.52)	-
alloHCT recipients	30.08 (10.91)	-
Daily diary days (mean, SD)	26.21 (4.47)	25.68 (4.45)

Note: Leukemias and other myeloid neoplasms include acute lymphoblastic leukemia, acute myeloid leukemia, chronic myelogenous leukemia, myelodysplastic syndrome, and myeloproliferative disorders. Lymphomas include Hodgkin and non-Hodgkin type. Other cancer types include a solid tumor and other cancers. Conditioning is a preparatory treatment for HCT which varies in intensity from lower- (RIC) to higher-intensity (MA). The WHO scale is a 20-item questionnaire to assess treatment toxicity.³⁴ The assessment was made by a physician at the end of hospitalization. Higher scores indicated greater toxicity of treatment (total score = 0-80). GvHD = graft-vs-host disease, which is a medical complication following allogeneic HCT.

(N = 52). Allogeneic HCT (as compared to autologous HCT) was associated with an increased likelihood of belonging to the non-completers (B = .98, SE = .36, P < .001, OR = 2.68).

FIGURE 1 Dyad flowchart



2.2 | Measures

2.2.1 | Daily relationship-related stress

The participants used a five-point scale ranging from 1 (*not at all*) to 5 (*very strongly*) to answer the question: "How stressful was my relationship with my study partner today?" Higher scores indicated greater daily relationship stress as reported by the participants (total daily score: 1-5; Level-2 means: $1.34 \pm .69$ in patients and $1.48 \pm .81$ in caregivers).

2.2.2 | Daily received support

The participants completed six items from the Berlin Social Support Scale (BSSS)³⁵ adapted to the daily procedure. They rated the extent of support received from the study partner (eg, "She/He listened to me and showed understanding of my feelings") on a particular day using a four-point scale ranging from 1 (*not at all*) to 4 (*very strongly*). Higher scores indicated greater daily received support as reported by the participants (total daily score: 6-24; Level-2 means: 18.20 ± 4.22 in patients and 16.33 ± 4.70 in caregivers). Level-1 reliabilities were .89 for both study partners, while Level-2 reliabilities were .90 for patients and .91 for caregivers.

2.2.3 | Daily relationship satisfaction

The participants completed a three-item Kansas Marital Satisfaction Scale³⁶ adapted to the daily approach. They assessed how satisfied they were (i) with their study partner "today," (ii) with their contact with the study partner "today," and (iii) with their relationship with their study partner "today," using a five-point scale ranging from 1 (*not at all*) to 5 (*very strongly*). Higher scores indicated greater daily relationship satisfaction as reported by the participants (total daily score: 3-15; Level-2 means: 12.67 ± 2.59 in patients and 11.87 ± 2.65 in caregivers). Level-1 reliabilities were .71 for both study partners, while Level-2 reliabilities were .92 for patients and .98 for caregivers.

2.3 | Statistical analysis and data preparation

Multilevel structural equation modeling (MSEM) was used to test the additive and buffering models of daily received support in patient-caregiver dyads. The modified code provided by Laurenceau and Bolger was applied.³⁷ The focus was made on Level-1 of the analysis, although MSEM estimates both levels, that is, Level-1 (within-dyad, that is, the deviations from the personal mean) and Level-2 (between-dyad, that is, the differences between dyads). In concurrent MSEM, daily relationship satisfaction (for both patients and caregivers) was

TABLE 2 Results of concurrent and lagged MSEM: the actor and partner effects of daily relationship-related stress (RRS) and received support (RS) on relationship satisfaction in patients and caregivers (N = 200 dyads)

Outcome Effects	Concurrent relationship satisfaction			Next-day relationship satisfaction			
	Patient		Caregiver	Patient		Caregiver	
	Est. (SE)	95% CI	Est. (SE)	Est. (SE)	95% CI	Est. (SE)	
Fixed							
Intercept	11.76 (.95)***	[10.21; 13.32]	12.94 (.91)**	11.08 (1.10)***	[9.28; 12.89]	12.34 (1.03)***	[10.65; 14.03]
Patient RRS	-.51 (.06)***	[-.61; -.41]	-.06 (.04)	-.12 (.05)*	[-.21; -.04]	-.01 (.06)	[-.11; .08]
Patient RS	.19 (.02)***	[.16; .22]	.04 (.01)**	.06 (.01)***	[.05; .07]	.02 (.01)	[.00; .05]
Patient RRS × Patient RS	.01 (.03)	[-.04; .06]	-	-.04 (.02)	[-.07; .01]	-	-
Caregiver RRS	-.10 (.04)**	[-.15; -.04]	-.49 (.06)***	.02 (.04)	[-.04; .07]	-.06 (.05)	[-.15; .02]
Caregiver RS	.01 (.01)	[-.01; .02]	.23 (.01)***	.01 (.01)	[.00; .02]	.07 (.01)***	[.05; .08]
Caregiver RRS × Caregiver RS	-	-	.06 (.02)**	-	-	.01 (.02)	[-.02; .03]
Random							
Intercept variance	1.49 (.16)***	[1.23; 1.76]	1.80 (.21)***	1.48 (.16)***	1.22; 1.74]	1.80 (.20)***	[1.47; 2.13]
Residual	1.14 (.09)***	[.99; 1.29]	1.55 (.11)***	1.59 (.15)***	[1.34; 1.84]	2.18 (.17)***	[1.90; 2.47]
Patient-caregiver residual covariance	.07 (.03)*	[.02; .11]	-	.22 (.05)***	[-.14; .30]	-	-

Note: Participants' age, sex, education, employment, relationship ties/length, as well as conditioning regimen, transplant type, complications, and time were controlled in both concurrent and lagged MSEM. In lagged MSEM, previous-day relationship satisfaction was also controlled.

Note: Effect sizes (calculated by the following formula: $f^2 = \text{[variance explained for a model with a given effect - variance explained for a model without the given effect]}/\text{[1-variance explained for a model with the given effect]}^2$) ranged from *small* (for lagged effects in patients), *small-to-medium* (for concurrent effects of RRS, partner effects of RS, and interaction effect) to *medium/medium-to-large* (for concurrent actor effects of RS).

Note: Additional random effects (variances and covariances) and Level-2 effects are available upon request.

Note: *P < .05; **P < .01; ***P < .001.

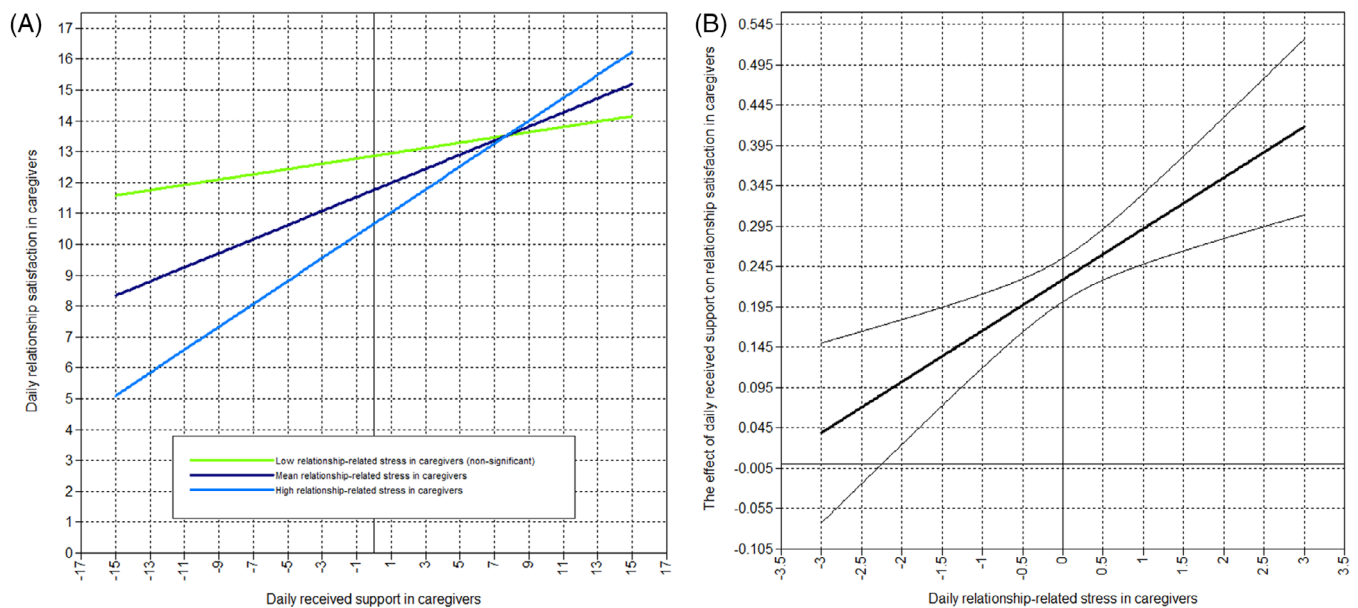


FIGURE 2 Concurrent association between daily received support stress and relationship satisfaction in caregivers as a function of their daily relationship-related stress (RRS). A, Simple slopes for the days with mean (typical) daily RRS, as well as lower and higher than typical daily RRS. B, The regions of significance of interaction (solid line = interaction effect, thin lines = 95% confidence interval; when the y-zero-line is included in the confidence bands, the effect of daily deviations in received support on relationship satisfaction in caregivers is not significant; this effect is not significant below -2.26 of daily RRS, that is, approx. 3.5 standard deviations below the mean)

predicted by person-centered daily relationship-related stress, received support, relationship-related stress by received support interaction, and the linear time trend (centered on the middle time point). Both actor and partner effects of predictors were examined (except time and interactions, which concern only actor effects). In the lagged analysis, next to the previous-day predictors, a previous-day relationship satisfaction was controlled. This allowed to predict an increase or decrease in daily relationship satisfaction in time. In both concurrent and lagged MSEM, possible confounders (ie, age, sex, education, employment, relationship ties/length, conditioning, transplant type, and complications) were controlled. We used the maximum likelihood as an estimator. Analyses were conducted using the Mplus statistical package version 8.³⁸

Of the 200 dyads, 141 (70.5%; patients—83%; caregivers—75%) completed at least 26 diary-days. The missing values were below 11% (from 7.2% for patient daily relationship stress to 10.8% for caregiver received support). The final dataset consisted of 4710 daily reports from 200 dyads. Only patient daily relationship-related stress was associated with missing records that is, a steeper decrease in daily relationship stress was observed in participants without missingness ($P < .05$). Missing values were handled within MSEM using a full information maximum likelihood method.

3 | RESULTS

Table 2 presents the results of concurrent and lagged MSEM. In line with the additive model, daily deviations in received support predicted

concurrent deviations in relationship satisfaction in both patients and caregivers. On the days with higher than usual received support (ie, higher than an average/typical day), the relationship satisfaction was higher in both partners, independently of the negative effect of relationship-related stress. The magnitude of the direct actor effect of received support was similar in patients and caregivers ($\Delta\chi^2 = 4.1$, $P = .393$). Moreover, in line with the buffering model, the effect of daily received support depended on relationship-related stress in caregivers (Figure 2). Interaction was probed using the Johnson-Neyman technique.⁴⁰ The positive effect of daily received support on relationship satisfaction was significant on the days when daily relationship-related stress was typical or higher than usual. On the days when daily relationship-related stress was lower than usual (ie, below the score of -2.26 which corresponds to approximately 3.5 standard deviations below the mean of daily relationship-related stress), the effect of daily deviations in received support on relationship satisfaction was not statistically significant. Moreover, two partner effects were statistically significant, namely patient daily received support was positively associated with caregiver relationship satisfaction, whereas caregiver relationship stress was negatively related to patient relationship satisfaction.

In lagged MSEM, in line with the additive model, the higher than usual daily received support was, the higher next-day relationship satisfaction was (regardless of the lagged effect of relationship-related stress) in both patients and caregivers. This effect was similar in patients and caregivers ($\Delta\chi^2 = .27$, $P = .992$). The remaining actor and partner effects were not statistically significant.

4 | DISCUSSION

This study aimed to verify the additive and buffering models of daily received support with regard to the relational level of patient-caregiver relationship, that is, the relationship-related stress and relationship satisfaction in post-HCT treatment period. To the best of our knowledge, this research has been the first to address this issue. The obtained results supported both the additive and the buffering models of daily received support in patient-caregiver dyads during the first month following post-HCT discharge. Several implications of the findings can be considered.

First, the widely studied mechanisms of social support in cancer circumstances from the individual perspective turn out to be significant also at the relational level. Our findings are consistent with the previous studies (focused on the individual level), especially with those documenting the additive effect of social support in cancer patients.²⁷⁻²⁹ Thus, the effect of received support was clearly favorable for relationship satisfaction in both post-HCT patients and their caregivers, regardless of the negative effect of daily relationship-related stress. In this sense, our results are also in line with the previous studies, which did not directly test the hypotheses of social support but confirmed the general beneficial effect of social support in cancer patients²¹⁻²³ and their caregivers.^{22,23}

Second, when we focused on both patients and caregivers, we found the differences in social support effects in both parties involved in the post-HCT treatment process. In caregivers, the buffering model was confirmed as well, although only in the concurrent analysis. This result is in line with the prior research indicating a divergent function of social support depending on a different role in the relationship.³⁰ It shows that caregivers can experience greater relational benefits from the support they receive, especially when they experience a higher level of relationship-related stress. This may result from the specific situation in which they find themselves. Caregivers often perform many roles, which entails many responsibilities and challenges that can be a burden on the caregiver, especially during the first month of care after patient discharge. Indeed, the stress level in caregivers may be higher during that period. This tendency was partially demonstrated in our sample. Although the average relationship-related stress in both patients and caregivers was relatively small, it was higher and had greater variability in caregivers than in patients.

Third, our analyses concerned the within-person variability in associations between relationship-related stress, received support, and relationship satisfaction. Thus, our findings confirmed the reports from the previous studies (focused on between-person differences) on a dual role of social support,²⁷⁻²⁹ further expanding their scope by within-dyad daily fluctuation in support processes. In patients and caregivers, the relationship satisfaction was higher on the days when support receipt was higher and relationship-related stress was lower than usual (supporting the additive hypothesis). Relationship satisfaction was also greater when the previous day support receipt was higher than usual. Some prior studies have already reported a positive effect of daily received support, however, neither in relation to relational indicators nor from a dyadic perspective.^{23,29} According to the

buffering hypothesis, a beneficial role of daily deviations in received support in high-level conditions of daily relationship-related stress was observed. A positive association between daily received support and relationship satisfaction was stronger if daily relationship-related stress was higher. In addition, in both patients and caregivers, the effect of daily relationship-related stress was in line with the expectations and previous findings^{14,15}, although it was correlative only. This may imply an inverse dependence between daily relationship stress and satisfaction, which requires further research.

4.1 | Study limitations

The heterogeneity of the sample may limit the generalizability of the study. In patients, it was related to different primary diagnoses and the transplant conditions (ie, a predominance of autologous transplant and high-intensity conditioning). In caregivers, it was related to sex and relationship ties, that is, women and romantic partners were predominant in the caregiver group. However, all these variables were controlled in the analyses and did not alter the study findings. Nevertheless, if possible, future studies on the relational level of well-being in dyads should include larger groups of non-married or non-cohabiting dyads, and equal sex distribution in patients and caregivers. Next, most dyads completed paper diaries whose filling time is more difficult to monitor (than electronic ones) and may affect the results. Another limitation of the study was the skewness of variables, particularly regarding relationship-related stress level, leading to the so-called "floor effect." Generally, the relationship-related stress was low/very low, whereas the received support and relationship satisfaction were at a high level. Testing the buffering model under such conditions could be biased. Future studies on the buffering effect of daily received support in dyads should be conducted under conditions potentially characterized by more tension between the patient and the caregiver. For example, greater tension may be expected just before admission for HCT when the individual stress level may have a spillover effect on the relationship (ie, relationship-related stress) or in a long-term outpatient period when individuals return to their usual functioning (ie, the family does not function in "extraordinary" conditions). New research could also consider the effect of various support types in the additive or buffering models of social support. It can be expected that the mechanism of daily emotional or instrumental support may differ in dyads facing cancer treatment.

4.2 | Clinical implications

The obtained results indicate the importance of daily interactions in the patient and caregiver relationship—every day is important and what happens during that time. They also designate the direction of micro-interventions in dyads facing HCT. In line with the results supporting the additive model, getting daily support from relatives or caregivers may be conducive to a better daily relationship assessment (even on the next day). It can also minimize the negative impact of

daily relationship-related stress on relationship satisfaction on that day, particularly in caregivers, which results from the buffering model. In other words, receiving support day-by-day fosters a relationship, also by means of circular effects (eg, higher patient daily received support was associated with higher caregiver daily relationship satisfaction). Obviously, daily support to each other can contribute to the depletion of individual resources. Therefore, clinicians should prevent support resources from depletion in patient-caregiver dyads through education or specific individual or group interventions. In addition, they should pay special attention to renew these resources, which is of crucial importance to effective adjustment to the cancer treatment.

5 | CONCLUSIONS

The findings supported both the additive and the buffering models of daily received support at the relational level: both daily deviations in received support and relationship-related stress (in patients and caregivers), as well as their interaction (in caregivers) were linked to daily relationship satisfaction, providing valuable insights for improving relational adjustment in the daily life of patient-caregiver dyads following HCT.

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CONFLICT OF INTEREST

The authors declare no potential conflict of interest.

DATA AVAILABILITY STATEMENT

The data underlying this study contain potentially identifying information (as comes from two related persons) and cannot be publicly shared. Interested researchers can contact the corresponding author (A.K.) with data accession requests.

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