

Reducing Distress in Caregivers of Patients Undergoing Hematopoietic Stem Cell Transplantation With Remotely Accessible Interventions: An Integrative Review

JESSICA OSBURN, MS, APRN, AGACNP-BC[®], OCN[®], ASHLEY MARTINEZ, DNP, APRN, FNP-BC, AOCNP[®], CPHQ, NEA-BC, NPD-BC, and JOYCE DAINS, DrPH, JD, APRN, FNP-BC, FNAP, FAANP, FAAN

From The University of Texas MD Anderson Cancer Center, Houston, Texas

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Correspondence to: Jessica Osburn, MS, APRN, AGACNP-BC[®], OCN[®], The University of Texas MD Anderson Cancer Center, 1515 Holcombe Boulevard, Houston, TX 77030

E-mail: josburn@mdanderson.org

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Abstract

Hematopoietic stem cell transplantation (HSCT) is an intensive treatment requiring the support of a caregiver. This role is a highly demanding responsibility, and caregivers often face distress. In a world that has become highly technological, the aim of this integrative review is to determine the availability and impact of remote interventions in reducing distress in caregivers of HSCT patients. A literature review was conducted using PubMed and Scopus databases. The search included articles published between January 1, 2013, and February 20, 2023. The search yielded 699 unique articles, of which four were included in the final review. The four included studies of the impact of remote interventions on distress or burden in caregivers of adult HSCT patients. Two organizing themes emerged: availability and impact. Availability encompassed intervention accessibility and delivery type while impact considered caregiver quality of life (QOL), mental health, and perceived usefulness. These themes were evaluated in the articles via a variety of validated assessment tools and structured interviews. Ultimately, this integrative review suggests that while remote interventions for caregivers of patients undergoing HSCT are relatively limited, initial studies are perceived as useful and are promising in their potential to improve caregiver QOL and mental health and reduce distress.

Hematopoietic stem cell transplantation (HSCT) is an intensive treatment for hematologic and solid tumor malignancies, as well as noncancerous conditions. It comes with significant risk and responsibility, so much so that patients require a caregiver for medical, practical, and emotional support. The role of a caregiver is often a full-time, 24-hour, 7-day-a-week responsibility, which can lead to significant physical, emotional, spiritual, and financial distress (Applebaum et al., 2016). While the COVID-19 pandemic rapidly shut down most of the world's standard operations, it did not stop patients from needing stem cell transplants. According to the Health Resources and Services Administration, in the United States in 2020, over 22,000 HSCTs were performed (HRSA, 2022). Therefore, over 22,000 individuals served as caregivers of HSCT patients during a global pandemic.

A systematic review of the effect of psychosocial interventions on outcomes for caregivers of HSCT patients concluded that while the interventions were both feasible and acceptable, the outcomes were mixed (Bangerter et al., 2018). As only one study in the review utilized health information technology (HIT), Bangerter et al. (2018) briefly discussed the need to assess the feasibility and acceptability of alternative intervention delivery with web-based or mobile platforms. Notably, the review was conducted prior to the COVID-19 pandemic. Striking more than 210 countries and territories worldwide, this viral pandemic forced much of the population to adapt to the seemingly ever-changing landscape of social distancing, infection precautions, and the transition to remote operations (Saher et al., 2021). The pandemic required medical professionals, educators, researchers, public health authorities, and policy makers, among others, to rewrite the standards of practice in how one approaches patients, students, and the public (Vargo et al., 2021). With health care at the frontlines, professionals and patients quickly became the largest group to utilize technology during the COVID-19 pandemic (Vargo et al., 2021). Whether shifting from in-person to virtual health appointments or transitioning from public conferences to a teleconference model, the provision of health services and communication were the

most frequent activities associated with health care during the pandemic (Vargo et al., 2021). As health-care professionals shifted to virtual care and incorporated technologies into their care delivery, patients and caregivers had to learn to do the same. In consideration of this shift in health-care delivery, the aim of this integrative review is to determine the availability and impact of remote interventions in reducing distress in caregivers of HSCT patients.

METHODS

With the assistance of a research medical librarian, in February 2023, PubMed and Scopus databases were searched using the following terms: (caregiver OR partner OR carer OR family) AND (support OR education OR intervention OR psychosocial OR distress OR stress) AND (hemato OR transplant OR transplants OR transplantation OR stem cell OR bmt).

The initial search generated 699 articles after duplicates were removed. Articles were then screened by title and publication year, and those meeting inclusion criteria were selected for abstract review ($n = 28$). Inclusion criteria required studies be published in English between January 2013 and February 2023, on caregivers with an adult population focus (> 18 years old), and on a hematologic transplant population. Abstracts were individually reviewed for intervention delivery. Those that did not offer a remote accessibility (i.e., telephone, mobile application, web-based intervention, video visit) were excluded ($n = 19$). For those publications that met intervention delivery criteria ($n = 9$), a full-text assessment was completed. Publications that were protocol or feasibility studies, or recommendations for design methodology or intervention development were then excluded. Ultimately, this comprehensive literature search yielded a total of four articles that met the inclusion criteria and were evaluated in this review (Figure 1).

RESULTS

The four articles included one mixed-methods study (Carr et al., 2019), one prospective multi-component study (Fauer et al., 2019), one randomized controlled trial (Pensak et al., 2021), and one longitudinal study (Kisch et al., 2022). While these

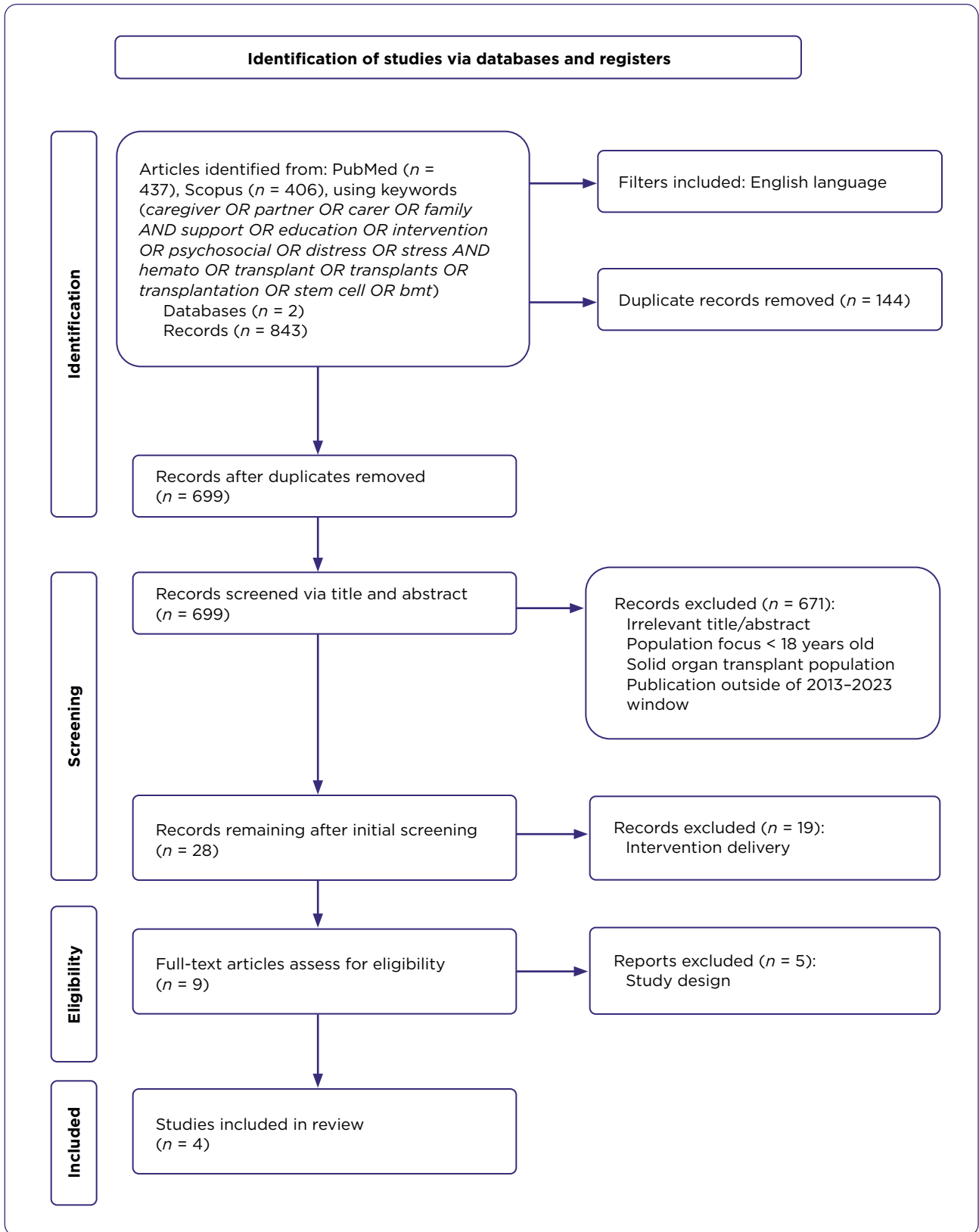


Figure 1. PRISMA flow diagram. Adapted from Moher et al. (2009).

studies varied in terms of design, sample size (range 14–56), geographic distribution (academic medical centers within the United States, HSCT centers in Sweden), and intervention delivery (telephone, video, mobile application, website), they all studied the impact of remotely accessible interventions for caregivers of patients undergoing HSCT.

The results from this review are organized by availability and impact of the interventions and are summarized in Table 1. Availability is characterized by accessibility and delivery type to evaluate remote intervention dissemination. Impact assesses three elements: quality of life (QOL), mental health, and perceived usefulness. Together, these three elements define and serve as a measurement of remote intervention effectiveness in reducing distress in HSCT caregivers.

Availability: Accessibility/Delivery Type

All four studies implemented technological modalities aimed at reducing distress in caregivers of HSCT patients. These modalities were accessible to caregivers in an inpatient, outpatient, or a remote setting and delivered via multiple methods of communication technology, including telephone, video visit, website, or integrated application.

In a prospective qualitative study, Fauer et al. (2019) developed Bone Marrow Transplant (BMT) Roadmap, a tablet-based HIT application, to address unmet needs for caregivers of adult and pediatric patients undergoing HSCT for the first time. The BMT Roadmap application was integrated with the Epic MyChart electronic health record in which patients and caregivers could instantly access relevant clinical information, clinical trial enrollment, and the discharge checklist. Caregivers were given an Apple iPad embedded with BMT Roadmap for the duration of the patient's hospitalization. While specific metrics were not reported on accessibility, Fauer and colleagues discussed that the security requirement to log into the hospital wireless network posed a technological barrier.

In a randomized controlled trial, Pensak et al. (2021) tested the feasibility and usability of Psychoeducation and Skills-Based Mobilized Intervention (Pep-Pal), a mobile self-administered intervention for stress management in caregivers of patients with advanced cancer. Pep-Pal was

adapted from a prior validated Cognitive Behavior Stress Management (CBSM) intervention to deliver an enhanced version of Psychoeducation, Paced Respiration, and Relaxation (PEPRR). As a web-based intervention, Pep-Pal provided remotely accessible stress management training through video-guided prerecorded CBSM sessions. Of the caregivers who were randomized to the intervention group ($n = 26$), only 10 (38.5%) watched seven of nine full-length Pep-Pal sessions, which did not meet the *a priori* criterion for usage. While accessibility was not directly measured in this study, the website could be accessed asynchronously using a smartphone, computer, or tablet.

As a substudy of the Pensak et al. (2021) study, Carr et al. (2019) explored the usability and acceptability, with suggestions from caregivers for future adaptation of the previously described Pep-Pal program. Carr et al. (2019) noted in their study that of the 26 caregivers randomized to the Pep-Pal intervention group, 64% accessed the intervention with a desk or laptop computer, 42% with an iPad or tablet, and 21% with their smartphone.

Kisch et al. (2022) remotely targeted the support needs of caregivers in a qualitative, longitudinal study. In this study, 27 family caregivers of patients undergoing allogeneic HSCT participated in the Carer Support Needs Assessment Tool Intervention (CSNAT-I) prior to transplantation and 6 weeks post-transplant. CSNAT-I conversations were delivered remotely by telephone or video-visit. While accessibility was not specifically addressed in the study, as a remote intervention both caregivers and nurses who led the CSNAT-I conversations reported the phone conversations as positive experiences in which they were able to build a trusting relationship. However, additional feedback identified that the inability to read body language or interpret reactions/emotions over phone conversation was a disadvantage.

Impact: Quality of Life (QOL)

For this review, caregiver QOL includes physical capacity, social relationships, and environment (Martin et al., 2021). Psychological state can also be a component of QOL but is reported singly in a later section of this review under the umbrella of mental health. With this understanding, three of the articles in this review considered caregiver QOL.

Table 1. Literature Review Results

		Availability		Impact	
	Accessibility	Delivery type	Quality of life	Mental health	Perceived usefulness
Carr et al., 2019	Remotely accessible	Self-administered web-based intervention. Participants used a computer or laptop (64%), iPad or tablet (42%), or smartphone (21%).	Pep-Pal was associated with improved caregiver interpersonal situation, improved interactions between caregiver and patient, and reduced burden of caregiving. Four major themes related to caregiver experience emerged, including (1) putting the caregiver first, (2) guilt, (3) isolation and loneliness, and (4) late traumatizing effects. Pep-Pal was reported to help shift caregivers' focus and prioritize their own mental, physical and emotional needs.	Pep-Pal was reported to help manage stress as a caregiver ^a .	Caregivers reported an overall satisfaction with the delivery of Pep-Pal ^b . 21% of caregivers indicated they would find a mobile app more useful ^b . Caregivers found 8/9 of the full-length Pep-Pal sessions to be helpful; "improving intimacy" was the only session to not achieve a satisfactory usefulness score ^b .
Fauer et al., 2019	Remotely accessible, available only during inpatient hospitalization	BMT Roadmap is a HIT application integrated with MiChart via Apple iPad (mobile app).	Per CQOLC, BMT Roadmap use, anxiety, and fatigue were associated with QOL ($p = .05$). CQOLC-burden subscale scores decreased in caregivers from baseline to discharge ($p = .007$).	BMT Roadmap use was associated with an overall increase in vigor, decrease in anxiety, distress, depression, and fatigue from baseline to discharge per POMS-2 and STAI.	Data indicated BMT Roadmap was perceived to be useful, and activation increased from baseline to discharge per PAM-C. Scores did not differ between adult and pediatric groups, but perceived usefulness scores in the adult group correlated with depressive symptoms, QOL, fatigue, and distress ($p \leq .05$).
Kisch et al., 2022	Remotely delivered in outpatient setting	CSNAT-I conversations were delivered remotely by telephone conversation or video-visit.	No data reported.	Caregivers felt more relieved and at peace following CSNAT-I conversations.	CSNAT-I was highly accepted as an intervention and participation demand from caregivers was high.
Pensak et al., 2021	Remotely accessible	Self-administered via mobilized website. Accessible at any time via smartphone, computer or tablet.	Females within the intervention group reported increase in overall sexual function as compared to TAU per FSFI ($p = .05$). Males within the intervention group reported improved sexual functioning per MSHQ although not statistically significant.	Change in HADS-A and CES-D scores did not differ significantly between intervention and TAU groups. Pep-Pal was associated with significant reductions in perceived stress and increased ability to learn stress management skills per PSS and MOCS-A.	Of those randomized to the intervention group ($n = 26$), 38.5% watched ≥ 7 sessions while 23% watched ≤ 4 sessions. A <i>priori</i> hypothesis and criterion for success (that participants would watch at least 75% or 7/9 sessions) was not met.

Note. BMT = bone marrow transplant; CQOLC = Caregiver Quality of Life Index-Cancer; CSNAT-I = Carer Support Needs Assessment Tool Intervention; CES-D = Center for Epidemiological Studies Depression Scale; FSFI = Female Sexual Function Index; HADS-A = Hospital Anxiety and Depression Scale-Anxiety; HIT = health information technology; MiChart = Michigan Medicine's EHR; MOCS-A = Measure of Current Status-Part A; MSHQ = Male Sexual Health Questionnaire; PAM-C = Patient Activation Measure, caregiver version; Pep-Pal = Psychoeducation and Skills-Based Mobilized Intervention; POMS-2 = Profile of Mood States Second Edition; PSS = Perceived Stress Scale; QOL = quality of life; STAI = State-Trait Anxiety Inventory; TAU = treatment as usual.

^aMeasured via 5-point Likert scale questionnaire.

^bMeasured via the Helpfulness of Intervention Sessions Questionnaire and semistructured exit interviews.

Fauer et al. (2019) and Pensak et al. (2021) directly measured QOL, whereas Carr et al. (2019) reported on items related to QOL as part of a larger study.

Fauer et al. (2019) prospectively assessed the impact of BMT Roadmap, previously described, on 39 caregivers of adult ($n = 20$) and pediatric ($n = 19$) patients undergoing first-time HSCT. This multi-component study measured “person-reported outcome measures” (PROMs) at baseline (hospital admission), discharge, and day 100. The Caregiver Quality of Life Index-Cancer (CQOLC) was used to assess QOL. While QOL did not change over time, in univariate analysis CQOLC-burden subscale scores decreased in caregivers (both pediatric and adult) from baseline to discharge ($p = .007$, both groups). In multivariate analysis accounting for BMT Roadmap use, depression, anxiety, fatigue, and overall QOL were lower at discharge ($p = .04$).

Pensak et al. (2021) evaluated the impact of Pep-Pal, previously described, on distress in a randomized controlled trial of caregivers of patients undergoing HSCT, enrolled in a phase I clinical trial, or diagnosed with stage IV disease. Caregivers were randomized to the Pep-Pal ($n = 26$) or treatment as usual (TAU; $n = 30$) groups with quantitative assessments completed prior to randomization (baseline) and after intervention at 12 weeks post-baseline. Pensak et al. (2021) measured sexual health as a secondary outcome of the intervention via the Female Sexual Function Index (FSFI) and Male Sexual Health Questionnaire (MSHQ). Mean scores were reported at baseline and post-intervention with higher scores indicating better overall sexual function (FSFI) and functioning satisfaction (MSHQ). In the Pep-Pal group ($n = 19$), FSFI scores improved from 9.26 to 14.12, whereas TAU ($n = 23$) scores decreased from 6.45 to 5.66. Data from FSFI indicated that women in the intervention group reported a statistically significant increase in overall sexual function as compared to TAU ($F = 5.07$, $p = .05$). While male caregivers within the intervention group ($n = 7$) reported increased sexual functioning satisfaction post Pep-Pal as compared to baseline (17.71 vs. 15.57, respectively), findings were not statistically significant.

As a substudy of a larger trial of Pep-Pal for caregivers, Carr et al. (2019) analyzed both quan-

titative data from intervention participants ($n = 26$) and qualitative data from semi-structured individual interviews of 14 of those intervention participants. While QOL was not measured using a validated instrument, aspects of QOL such as interpersonal situation, caregiver-patient relationship, and burden of caregiving, were measured via a 5-point Likert scale questionnaire assessing Pep-Pal usability. Scores were reported for both the entire intervention cohort ($n = 26$) and the interview group ($n = 14$). Reported mean scores for the overall group and the interview group indicated that participants agreed that use of Pep-Pal improved caregiver interpersonal situation (3.12 and 3.14 respectively), improved interactions between the caregiver and the loved one (patient; 3.23 and 3.29, respectively) and reduced the burden of caregiving (3.04 and 3.0, respectively). Further thematic analysis of qualitative interviews completed via inductive approach and open coding in ATLAS.ti identified four major caregiver experience themes, including (1) putting the caregiver first, (2) guilt, (3) isolation and loneliness, and (4) late traumatizing effects. Caregivers reported that Pep-Pal helped them to refocus and prioritize their physical, emotional, and mental needs.

Impact: Mental Health

Mental health, as defined by the Centers for Disease Control and Prevention, includes one’s emotional, psychological, and social well-being, and impacts how one manages stress, relates to others, and makes healthy choices (2021). All four of the studies in this literature review addressed mental health. While Fauer et al. (2019), Carr et al. (2019), and Pensak et al. (2021) all cited mental health as a measurable intervention outcome, Kisch et al. (2022) did not directly measure mental health outcome but noted the theme.

In the prospective study assessing the impact of BMT Roadmap, Fauer et al. (2019) measured mental health via the Profile of Mood States Second Edition (POMS-2) and State-Trait Anxiety Inventory (STAI) at three timepoints: baseline (hospital admission), discharge, and day 100. The POMS-2 assessment scaled distress with subscales of depression, vigor, and fatigue. The researchers reported an overall increase in vigor. Anxiety, distress, depression, and fatigue

decreased from baseline to discharge with the use of the BMT Roadmap. However, specific metrics were not reported.

The Carr et al. (2019) substudy of a larger Pep-Pal trial used both quantitative and qualitative data to describe caregiver perceptions of the Pep-Pal intervention. Using a 5-point Likert Scale questionnaire, intervention participants ($n = 26$) and interviewees ($n = 14$) completed a 10-question assessment on Pep-Pal usability, with higher scores reflecting a stronger level of agreement. Both the interviewees and larger group reported that the Pep-Pal website helped manage stress as a caregiver, with mean scores of 3.43 and 3.42, respectively.

In the larger Pep-Pal trial, Pensak et al. (2021) measured mental health with the Hospital Anxiety and Depression Scale (HADS-A), Center for Epidemiological Studies-Depression Scale (CES-D), the Perceived Stress Scale (PSS), and the Measure of Current Status-Part A (MOCS-A) scale at baseline and 12 weeks after intervention. HADS-A change scores from base to post-intervention did not differ significantly between Pep-Pal and TAU groups, with baseline scores of 11.15 and 11.57, respectively, and post scores of 8.50 and 9.37, respectively. Like HADS-A, CES-D change scores did not differ significantly between the Pep-Pal and TAU groups either at baseline or post-intervention, with baseline scores of 12.73 and 13.60, respectively, and post scores of 10.77 and 12.07, respectively. In contrast, reductions in perceived stress from baseline to post-intervention were significantly greater in the Pep-Pal group as compared to the TAU group, with PSS baseline scores of 23.46 and 22.30, respectively, and post-intervention scores of 19.15 and 20.17, respectively ($p = .05$). Data also indicated that the Pep-Pal intervention significantly increased the ability to learn stress management skills as reported by the MOCS-A questionnaire ($p = .01$). Pep-Pal and TAU MOCS-A scores at baseline were 21.50 and 24.17, respectively compared to 27.23 and 24.73, respectively, at post-intervention.

Kisch et al. (2022) remotely targeted family caregivers' support needs in the context of HSCT via a qualitative, longitudinal study. Using the CSNAT-I, assessments were remotely performed before HSCT and 6 weeks after HSCT for 27 participants. CSNAT-I is a conversation-based as-

essment that enables caregivers to identify and prioritize their specific support needs. After completion, exit interviews with caregivers were conducted via semi-structured telephone interviews. These interviews evaluated the caregivers' experience with CSNAT-I. Inductive qualitative content analysis of the exit interviews and written summaries of the CSNAT-I conversations indicated that caregivers felt more relieved and at peace after the CSNAT-I conversations, appreciating that the conversations focused on caregiver needs.

Impact: Perceived Usefulness

All four articles in this review included evaluation of perceived usefulness by the patient caregiver. Perceived usefulness was directly measured as an outcome in studies conducted by Fauer et al. (2019), Carr et al. (2019), and Pensak et al. (2021). Kisch et al. (2022) did not directly measure perceived usefulness, but the theme is addressed.

In the Fauer et al. (2019) prospective study to assess the impact of BMT Roadmap in adult and pediatric caregivers, usefulness was measured at discharge by a 6-item, 7-point Likert scale to assess perceived usefulness. Total scores range from 6 to 4, with lower scores indicating greater usefulness. Scores did not differ between the adult and pediatric groups but correlated with depressive symptoms, QOL, fatigue, and distress ($p \leq .05$) in the adult group only. Further, activation could be considered an indirect measure of perceived usefulness in the Fauer et al. (2019) study. Activation, defined as caregiver's skills, knowledge, and confidence for patient management, was measured via Patient Activation Measure, caregiver version (PAM-C). Activation was measured at admission, discharge, and day 100. Data indicated that BMT Roadmap was useful, with activation increasing from baseline to discharge in both caregiver groups ($p = .001$).

In the pilot randomized controlled trial of Pep-Pal, Pensak et al. (2021) assessed perceived-usefulness as session completion by those randomized to the intervention group. The usage criterion for success (that participants would watch at least 75% or 7/9 Pep-Pal sessions) was not met. Of those who were randomized to the intervention group ($n = 26$), only 38.5% watched ≥ 7 sessions, while 23% watched ≤ 4 sessions.

Perceived usefulness in the Carr et al. (2019) substudy of the Pep-Pal trial was measured via the Helpfulness of Intervention Sessions Questionnaire ($n = 26$) and semi-structured exit interviews ($n = 14$). Caregivers who participated in the interviews reported overall satisfaction with the delivery method of Pep-Pal, but 3 of 14 caregivers indicated that a mobile application would be more useful than the web-based format. The researchers defined usefulness as a session with mean helpfulness score at or above 5/10 on the Helpfulness of Intervention Sessions Questionnaire. Using this criterion, caregivers in both groups found eight of the nine full-length Pep-Pal sessions to be helpful. The only session that did not achieve a satisfactory usefulness score was “Improving Intimacy,” with mean scores of 4.61 and 4.19 in interviewees and Pep-Pal caregivers, respectively.

Kisch et al. (2022) remotely targeted family caregivers’ support needs using CSNAT-I, assessments, and conducted semi-structured telephone exit interviews. While not a direct measure of usefulness, these interviews evaluated the caregivers’ experience with CSNAT-I. Inductive qualitative content analysis of the exit interviews indicated that not only was participation demand from caregivers high, but CSNAT-I was also highly accepted as an intervention.

DISCUSSION

Hematopoietic stem cell transplantation is an intensive, potentially curative treatment for thousands of individuals every year. Caregivers are essential partners in this highly strenuous treatment process and face physical, emotional, and financial stress within this role. The importance of understanding the demand on caregivers of HSCT patients and intervening to reduce their distress is paramount. This integrative review considers currently available, remotely accessible interventions to reduce distress in caregivers of patients undergoing HSCT. Apart from the Kisch et al. (2022) study, all studies in this review considered HIT as a strategy to reduce distress in caregivers and patients undergoing SCT. Health information technology-enabled tools have the capability to effectively engage, support, and optimize outcomes of patients and caregivers in the outpatient setting (Bangerter et al., 2022). Whether interventions

were conducted via telephone, video visit, website, or integrated application, three of the studies reported an overall positive impact as indicated by increased QOL, mental health, and perceived usefulness (Carr et al., 2019; Pensak et al., 2021; Kisch et al., 2022).

In the Fauer et al. (2019) study, BMT Roadmap was perceived as useful and burden was noted to decrease through discharge, but greater perceived usefulness of BMT Roadmap correlated with lower QOL, increased depression, fatigue, and distress. While the reason for this outcome is not completely understood, Fauer and colleagues (2019) suggest that adult caregivers who faced increased levels of distress, fatigue, and depression were more reliant on BMT Roadmap as a supportive tool and source of information. This may then suggest that caregivers were not retaining, understanding, or benefitting from information provided on BMT Roadmap.

BMT Roadmap emerged as a promising HIT tool aimed at reducing distress in caregivers of patients undergoing HSCT. As previously mentioned, while those who faced increased levels of distress, fatigue, and depression perceived BMT Roadmap as more useful, the Fauer et al. (2019) study reported an overall increase in vigor and decrease in anxiety, distress, depression, and fatigue from baseline to discharge in all caregivers with the use of BMT Roadmap; however, specific metrics were not reported. Without specific metrics, the level of impact is uncertain, and this lack of information limits future adaptations and studies as one cannot adequately compare future outcomes. One such future adaptation is expanding BMT Roadmap to the outpatient setting. As per the Fauer et al. (2019) study, BMT Roadmap was only accessible to patients and caregivers while hospitalized. This serves as an area of opportunity for access expansion: BMT Roadmap could be utilized in both the inpatient and outpatient setting thus serving as a support tool for caregivers beyond the hospitalization period.

Like BMT Roadmap, Pep-Pal appears to be a promising HIT tool aimed at reducing distress in caregivers of HSCT patients. However, given that utilization criterion was not met, Pensak and colleagues (2021) suggested that caregivers chose only those Pep-Pal sessions most relevant to them.

Carr et al. (2019) noted that the only Pep-Pal session that did not achieve a satisfactory usefulness score was “Improving Intimacy.” The failure to meet the *a priori* hypothesis in the Pensak et al. (2021) study indicates that the majority of offered sessions were not deemed useful, perceived as a priority, or addressed needs as anticipated by Pep-Pal developers. This may indicate the need for the Pep-Pal sessions be better tailored and relevant to specific caregiver needs.

While not a new concept, recent advances in HIT innovation and accessibility, especially during the COVID-19 pandemic, have solidified remote interventions as a standard operation in health-care facilities. According to the Office of the Assistant Secretary for Planning and Evaluation, the use of telehealth surged during the COVID-19 pandemic (Karima et al., 2022). Its use increased from < 1% of visits to as much as 80% when pandemic prevalence was high (Karima et al., 2022). Telehealth, or telemedicine, uses real-time, audio-visual communication tools and electronic information to support clinical functions such as patient education, remote monitoring and care delivery, and adjuvant supportive therapies connecting patients, caregivers, and providers (Balestra, 2018). Telehealth will continue to grow as it offers improved patient access, cost savings, and better outcomes with engaged patients (Balestra, 2018). The Assistant Secretary for Planning and Evaluation discovered via the Census Bureau’s Household Pulse Survey conducted April to October 2021, that while one in four respondents had accessed telehealth services in the last 4 weeks, significant disparities remained: video telehealth rates were lowest among those without a high school diploma, > 65 years in age, and in Latino, Asian, and Black populations (Karima et al., 2022). This survey highlights the need for remote interventions and increased accessibility for vulnerable groups.

While the need for remotely accessible interventions to reduce distress in HSCT is evident, this review is limited by the few available studies that address this need. Despite an initial search generating 669 articles, only four studies met inclusion criteria. This review is further limited as the Carr et al. (2019) study is a substudy of the Pensak et al. (2021) study; thus, both studies analyzed the same remote intervention.

IMPLICATIONS

This review identified four studies considering remote interventions to reduce distress in caregivers in patients of HSCT patients. This limited result alone indicates the need for continued development, implementation, and validation of remotely accessible interventions for caregivers. As health-care providers continue to expand access to patients via telehealth, remote care and resources are not only becoming an expectation of patient caregivers, but also an area of opportunity to provide additional support.

Further, these resources should be accessible to caregivers throughout the duration of the transplantation process as the need for support expands beyond that of the inpatient environment. Additionally, as evidenced by the Pensak et al. (2021) and Carr et al. (2019) studies, future targeted interventions should better address specific caregiver needs. This may be achieved through focus groups or research that engages HSCT patients and caregivers in the design and development of future applications. Active engagement of caregivers in intervention development can streamline interventions and directly prioritize caregiver needs, wishes, priorities, and concerns.

CONCLUSION

In a world that has become largely dependent on technology, few remote interventions are available to reduce distress and support caregivers of HSCT patients. However, the interventions that are available are promising as evidenced by an overall positive impact on perceived usefulness, QOL, and mental health. Well-designed and validated remotely delivered interventions can increase accessibility, reduce distress, and positively impact caregivers of patients undergoing HSCT. ●

Disclosures

The authors have no conflicts of interest to disclose.

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