

RESEARCH BRIEF

A Telemedicine-Delivered Nursing Intervention for Cancer-Related Distress in Rural Survivors

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OBJECTIVES: To evaluate preliminary efficacy, fidelity, and integrity of data collection of a nurse-led, telemedicine-delivered video visit intervention aimed at improving management of rural survivors' cancer-related distress symptoms.

SAMPLE & SETTING: 21 rural survivors participated in a nurse-led telemedicine intervention delivered six weeks after the end of active cancer treatment.

METHODS & VARIABLES: Participants' symptom management was measured with the Short Form Survivor Unmet Needs Survey, a four-factor, 30-item instrument that measures the unmet needs of adult survivors. Data were collected preintervention and six weeks postintervention.

RESULTS: The mean difference between pre- and postintervention survey scores was -0.24 , representing an overall improvement in management of unmet needs. The unmet emotional needs domain had the highest mean preintervention score and the largest mean reduction. All effect sizes were small.

IMPLICATIONS FOR NURSING: A nurse-led, telemedicine-delivered video visit intervention may improve rural survivors' symptom management during early survivorship. Comparison with a control group using a sample size powered to detect clinically meaningful differences is an important next step to fully evaluate the impact of this model of care.

KEYWORDS cancer survivors; nursing intervention; rural health; telemedicine; cancer-related distress

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Oncology nurses are well-positioned to support survivors in managing post-treatment cancer-related distress (CRD) (i.e., the physical and psychosocial symptoms that emerge from cancer and its treatment) (Holland et al., 2013). Following completion of active treatment, survivors may experience physically distressing symptoms (e.g., pain, difficulty sleeping, fatigue), as well as psychologically distressing symptoms such as grief, anger, fears about their health, and concerns about the impact of cancer on their lives (Holland et al., 2013). Left unmanaged, CRD can lead to long-term reductions in quality of life (Aaronson et al., 2014). At worst, it can result in suicide, for which survivors living in rural areas of the United States are at higher risk (Aboumrad et al., 2018; Ivey-Stephenson et al., 2017).

Despite evidence that telemedicine can improve health access for rural populations, few telemedicine-delivered video interventions have been evaluated with a rural sample (DeGuzman et al., 2021; Douthit et al., 2015; Marcin et al., 2016; Zahnd & Ganai, 2019). Researchers have evaluated digital interventions with survivors; however, the majority used either web-based or telephone (i.e., audio only) delivery methods. Very few published studies have tested the efficacy of telemedicine video visits (Chen et al., 2018; Skrabal Ross et al., 2020; Willems et al., 2020). Telemedicine-delivered telephone interventions are useful for reaching populations with limited internet access, but compared with telemedicine video visits, they have limited utility for detecting psychosocial signs of CRD, which require an assessment of both verbal and nonverbal cues (DeGuzman et al., 2020). Compen et al. (2018) compared psychological distress between Dutch cancer survivors receiving either an in-person or video visit mindfulness and cognitive behavioral therapy intervention. Both the in-person and telemedicine interventions produced improvements in psychological distress, but the

telemedicine group had greater long-term reductions in distress (Cillessen et al., 2018). However, the researchers did not use a rural sample. Provision of equitable care requires development and testing of video visit interventions for nonurban populations (DeGuzman et al., 2020).

A pilot study by DeGuzman et al. (2022) was conducted to improve rural access to post-treatment CRD management. The researchers developed and piloted a telemedicine-delivered, CRD screening and referral video visit evaluation targeted at rural post-treatment survivors of head and neck cancer (HNC). Although 90% of participants in this study identified themselves as having high distress, no survivors ultimately accepted further psychosocial help (DeGuzman et al., 2022). This article follows up on that study to separately evaluate the effect of the intervention on survivors' ability to manage their own symptoms. The primary purpose of this pilot evaluation was to evaluate the short-term effect of a telemedicine-delivered nursing intervention on survivors' CRD symptoms over a six-week period and to gather data to inform a clinical trial. A secondary purpose was to evaluate the fidelity of the intervention and the ability to collect data at multiple time points.

Methods

This study used a single-arm quasiexperimental design to identify the short-term effect of a nurse-led telemedicine-delivered intervention on HNC survivors' CRD symptoms. The research was approved by the University of Virginia Institutional Review Board for Health Sciences Research. In accordance with the board's guidelines, verbal consent was obtained from all participants before surveys were administered.

Comprehensive Assistance: Rural Interventions, Nursing, and Guidance (CARING) is a template for a one-time telemedicine video visit in which an oncology nurse conducts CRD screening and symptom management approximately six weeks following the conclusion of a survivor's cancer treatment. For this 20-minute visit template, the nurse assesses the patient's distress using the National Comprehensive Cancer Network Distress Thermometer and Problem List, a well-established tool for detecting CRD in the practice environment (Dabrowski et al., 2007). The Distress Thermometer and Problem List was modified for this study such that the nurse asked the participant to respond to each individual item rather than obtaining one score for the overall tool. The nurse initiated the intervention by stating the following:

In order to understand how you are doing, I am going to use a tool called a distress screening tool. I will read a list of problems you may have been experiencing. The list includes things that some cancer survivors experience, but you might experience only a few or even none of them.

When I read each one, just say "yes" if you have experienced it in the past week (including today) or "no" if you have not experienced it in the past week. If the answer is "yes," I will ask you to rate how much distress it is causing you from 0 to 10, with 10 being the most distress.

Next, the nurse guided a discussion of the survivor's highest-rated issues, with issues rated higher than 3 being an indication of high distress, consistent with published guidance (Hoffman et al., 2004). Finally, the nurse provided targeted education and guidance in these areas, identified areas of high CRD that were not resolved through discussion and education, and offered appropriate referrals to further supportive care services. To ensure fidelity of the intervention, a member of the research team observed the first eight video visits and provided feedback to the nurse regarding deviations from the protocol.

Symptoms were measured with the Short Form Survivor Unmet Needs Survey (SF-SUNS), used with permission from the author (Campbell et al., 2014). The SF-SUNS is a 4-factor, 30-item shortened version of the original 89-item SUNS survey, a psychometrically rigorous instrument for measuring the unmet needs of adult cancer survivors one to five years after cancer diagnosis. Survivors are asked to rate their level of cancer-related unmet needs (i.e., lingering issues that have not been successfully addressed) over the past month on a five-level scale as follows: 0 (no unmet needs), 1 (low unmet need), 2 (moderate unmet need), 3 (high unmet need) or 4 (very high unmet need). Examples of unmet needs include "dealing with fears about cancer spreading," and "telling others how I was feeling emotionally." The four factors on the SF-SUNS are unmet information needs (3 items), unmet work and financial needs (8 items), unmet access and continuity of care needs (6 items), and unmet coping, sharing and emotional needs (13 items). Cronbach's alpha for the four factors ranges from 0.85–0.95, and the interclass correlation between the SF-SUNS and the original SUNS survey is above 0.9 for all domains. The shortened version was found to successfully differentiate between groups of survivors with different levels of unmet needs. The SF-SUNS has been used to evaluate multiple

survivorship populations such as determining the most common unmet needs among survivors of childhood acute lymphoblastic leukemia (Lamore et al., 2021) or assessing the impact of unmet emotional needs on quality of life in multiple myeloma survivors (Pereira et al., 2020). To evaluate a nurse-led model of care, Taylor et al. (2019) used the SF-SUNS to assess changes in unmet needs in lymphoma survivors after an intervention.

Survey data were collected at two time points: within one week of the intervention, and six weeks postintervention. Survey completion was measured as either complete (at least 50% of questions answered) or incomplete, in accordance with guidance provided by the SUNS scoring guide (Filsinger et al., 2011).

This pilot study was designed to assess the feasibility of implementing the intervention and was not powered to assess statistical significance of improvement or to compare to a control group. Because of this, a descriptive statistical analysis was used to assess the pilot study data. For the symptom analysis, mean domain scores were calculated by summing all item responses within each domain and dividing by the total number of answered responses, in accordance with scoring guidelines (Filsinger et al., 2011). Standard descriptive statistics were calculated for overall and domain-specific results for before and after the intervention as well as change as a result of the intervention. Cohen's *d* was used to calculate effect sizes (Cohen, 1992). All analyses were performed using SAS, version 9.2.

Results

SF-SUNS data were collected between June 2019 and July 2020. Twenty-one patients participated in the intervention. Of these, 17 participants completed the preintervention survey and 12 completed the postintervention survey. However, because one of the 12 did not complete the preintervention survey, only 11 paired surveys were available for analysis. Data from all 11 survey pairs were 100% complete, requiring no data imputation. At the beginning of the study, a research team member phoned participants to conduct interviews. Changes to research protocols stemming from the COVID-19 pandemic required researchers to vacate their offices in March 2020, and researchers did not have access to secure telephone lines. From that point, participants were emailed a link to the survey, which was housed on a HIPAA-secured site through the University of Virginia. Of the 13 participants prior to COVID-19, seven

TABLE 1. Sample Characteristics Stratified by Survey Completion (N = 21)

	All	Both	One	None
Characteristic	\bar{X}	\bar{X}	\bar{X}	\bar{X}
Age (years)	59.9	59	58.6	66.7
Characteristic	n	n	n	n
Gender				
Male	11	6	4	1
Female	10	5	3	2
Race				
Black	2	2	-	-
White	16	8	6	2
Other ^a	3	1	1	1
Ethnicity				
Hispanic	1	1	-	-
Non-Hispanic	20	10	7	3
Cancer site				
Thyroid	8	6	2	-
Oral cavity	6	2	2	2
Pharynx	4	1	3	-
Other	3	2	-	1
Cancer type				
Squamous cell carcinoma	11	3	5	3
Papillary thyroid carcinoma	8	6	2	-
Other	2	2	-	-
Cancer stage				
Early	15	6	6	3
Late	6	5	1	-

^aParticipants marked Asian or did not respond

Note. No differences between groups as evaluated with Fisher's exact test for categorical variables and Kruskal-Wallis for age variable.

completed both surveys, five completed one survey, and one completed no surveys. Of the eight participants after COVID-19, four completed both surveys, two completed one survey, and two completed no surveys. Fisher's exact test showed no difference in completion before and after the procedural changes resulting from the COVID-19 pandemic (two-sided *p* value = 1).

Table 1 presents characteristics of the sample, stratified by survey completion. Kruskal-Wallis tests showed no statistical differences in survey scores related to personal characteristics (*p* = 0.629). Table 2 presents changes in each domain and the overall SF-SUNS score after the intervention. The mean

overall preintervention score was 0.67 (SD = 0.6) and the mean postintervention score was 0.54 (SD = 0.4). For the 11 paired survey participants, there was a mean reduction in overall SF-SUNS score ($\bar{X} = -0.24$), representing an improvement in unmet needs. The unmet emotional needs domain had the highest preintervention mean score ($\bar{X} = 1.02$) and the largest mean reduction ($\bar{X} = -0.39$), and the unmet work and financial needs domain had the smallest preintervention mean score ($\bar{X} = 0.29$) and the smallest mean reduction ($\bar{X} = -0.02$). All effect sizes were small, with unmet emotional needs being the largest (Cohen's $d = 0.332$).

Discussion

All domains showed an improvement in symptoms after the intervention, with the largest improvement in the emotional domain. Of note, participants in the study had very high unmet needs in the emotional domain relative to the other domains, and even though they were reduced, unmet emotional needs remained high compared with those of survivors measured in prior research. The SF-SUNS emotional health domain of rural hematologic cancer survivors has been measured at 0.66 (Tzelepis et al., 2018), whereas participants in this study rated their emotional health unmet needs at 1.02 prior to the intervention and 0.77 after the intervention. The high rating in this study may be explained by two factors. Participants were surveyed six weeks after the conclusion of active treatment, whereas most of the survivors in the hematologic study were 3 years post-treatment. Furthermore, this study evaluated symptoms of HNC survivors, who are known to have a high number of lingering unmet needs. Multiple studies have found that a high percentage of HNC survivors continue to experience symptoms several years into the survivorship phase including pain, difficulty swallowing, dry mouth, taste change, and fatigue, as well as diminished quality of life related to symptoms, appearance, mood, shoulder dysfunction, anxiety, activity,

KNOWLEDGE TRANSLATION

- Management of rural survivors' cancer-related distress may improve with a nurse-led, telemedicine-delivered intervention.
- Results of this study should be evaluated in a controlled study to determine the impact of the intervention versus usual care.
- Evaluating nurse-led interventions for rural survivors may require retention strategies tailored to retain this hard-to-reach population.

chewing, and swallowing (Cramer et al., 2018; So et al., 2014; Wells et al., 2015).

Results of this study should be interpreted cautiously. The primary limitation is the small sample size that resulted from a high number of intervention participants ($n = 10$) failing to complete one or both surveys. Because survey completion rates were similar before and after COVID-19 lockdown procedures, the nature of the sample may have driven the limited response rate. The study was conducted with rural survivors, who can be difficult to retain in research studies (Gilbertson-White et al., 2019; Nichols et al., 2021). Effect sizes were small, and they did not differentiate the impact of time and the intervention. Because of the study's single-arm, pre-post design, it is unclear if participants would have experienced an improvement in emotional symptoms without the intervention. Comparison to a control group can allow estimation of separate effects.

Challenges recruiting and retaining a sample of rural survivors may have contributed to the small number of clinical trials that address accessible care in this population. However, evaluating innovative nursing models of care is critical to addressing unmet needs among rural survivors. A video visit is ideal for managing survivors' psychosocial symptoms using methods such as nursing assessment and therapy, and

TABLE 2. Results of Survivorship Unmet Needs Survey

Unmet Needs Domain	Preintervention		Postintervention		Change		Cohen's d
	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD	
Overall	0.67	0.6	0.54	0.4	-0.24	0.46	0.26
Access and continuity of care needs	0.43	0.48	0.32	0.41	-0.21	0.37	0.25
Coping, sharing, and emotional needs	1.02	0.91	0.74	0.77	-0.39	0.81	0.33
Information needs	0.67	0.75	0.5	0.7	-0.24	0.84	0.23
Work and financial needs	0.29	0.5	0.38	0.59	-0.02	0.22	0.17

Note. A higher number indicates a greater level of unmet needs.

it is well within the scope of cancer nursing practice (Brant & Wickham, 2013; DeGuzman et al., 2020). To achieve the sample needed to complete a rigorous analysis, future studies should be designed with particular attention to participant retention tailored to this hard-to-reach population. Additional resources may need to be leveraged for this purpose, particularly for studies with a time horizon longer than six weeks.

Conclusion

A nurse-led, telemedicine-delivered symptom management video visit intervention may reduce rural HNC survivors' unmet needs during early survivorship. Comparison with a control group using a sample size powered to detect differences is an important next step to fully evaluate the impact of this model of care. Researchers evaluating interventions in rural survivors should anticipate and plan for challenges retaining participants.

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