

Live music intervention for cancer inpatients: The Music Givers format

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ABSTRACT

Objective: The present study intended to evaluate the impact of a standardized format—called the “Music Givers,” based on a single session of music intervention followed by a buffet—on the psychological burden and well-being of hospitalized cancer patients.

Method: The Distress Thermometer (DT), the Hospital Anxiety and Depression Scale (HADS), and self-reported visual analogue scales (score range = 1–10) to assess pain, fatigue, and five areas of well-being (i.e., physical, psychological, relational, spiritual, and overall well-being) were administered to 242 cancer patients upon admission to and at discharge from the hospital. Among them, 103 were hospitalized during which time a live concert took place (intervention group), whereas 139 patients were hospitalized when it did not (control group).

Results: Compared to the control group, patients in the intervention group demonstrated less distress at discharge according to the DT (adjusted estimate of difference = -0.8 , $p = 0.001$), lower HADS–Anxiety (-1.7 , $p < 0.001$) and HADS–Depression scores (-1.3 , $p = 0.001$), and higher scores on all the well-being scales, with the exception of spiritual well-being. In addition, no between-group differences were found in terms of pain and fatigue scores at discharge.

Significance of results: The one-session format of the Music Givers intervention is an effective, standardized, easy-to-replicate, and low-cost intervention that reduces psychological burden and improves the well-being of hospitalized cancer patients. Listening to live music and the opportunity to establish better relationships between patients and staff could explain these results.

KEYWORDS: Cancer, Music intervention, Distress, Anxiety, Depression

INTRODUCTION

Psychological morbidity is a very common consequence of cancer. It has been estimated that between 30 and 50% of patients show a moderate to high level of distress during the course of their illness (Zabora et al., 2001; Carlson et al., 2004). Anxiety, depression, and adjustment to disorders are the most typical manifestation of psychological suffering associated

with a diagnosis of and treatment for cancer (Akechi et al., 2004; Singer et al., 2013). Mitchell et al. (2011) reviewed 94 studies in which patients were assessed by a psychiatric interview for mood disorders. They concluded that some form of mood disorder can be detected in 30–40% of cancer patients. Several negative consequences have been correlated with distress in cancer patients, including: poor quality of life (Brown et al., 2010), long-term hospital stays (Prieto et al., 2002), reduced compliance with treatments (DiMatteo et al., 2000; Berry et al., 2015), higher risk of suicide (Breitbart et al., 2000; Leung et al., 2013), and reduced survival (Kissane, 2009;

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Pinquart & Duberstein, 2010). In this sense, to identify effective interventions to address patient distress is one of the highest priorities in clinical psycho-oncology.

After prayer, music is the most common self-administered strategy used by patients to cope with illness (Zaza et al., 2005), and music interventions have been widely used during different phases of the disease: diagnostic procedures (Danhauser et al., 2010), surgery (Li et al., 2011), chemotherapy (Ferrer, 2007), radiotherapy (Chen et al., 2013), and palliative care (Gallagher et al., 2006; Archie et al., 2013). Most of the evidence supports the beneficial effects of music interventions in reducing anxiety, depression, and perception of pain in cancer patients. Moreover, music may also have an effect on improving heart rate, respiratory rate, and blood pressure (Bradt et al., 2011).

Music interventions in the literature are subcategorized into music therapy (MT) and music medicine (MM) (Dileo, 1999). Music therapy is a process that includes assessment, treatment, and evaluation, and it is based on the relationship between a trained music therapist and a patient. The intervention is tailored to the characteristics of the patient and can include: listening to live improvised or prerecorded music, composing and performing music, and combining music with other experiences (e.g., art or imagery interventions). The purpose of MT is to improve patient well-being in various domains, including relationships, adjustment to disease, and sense of control, among others.

Conversely, in MM interventions, patients passively listen to music, usually prerecorded music provided by hospital staff. An example in oncology is listening to relaxing music through headphones during chemotherapy. The main difference with MT is the absence of a therapeutic relationship with a therapist. Moreover, the intervention is not preceded by an assessment of the patient and does not include an evaluation or discussion of the experience with a professional.

A pilot study was recently conducted with 31 cancer patients in order to compare the effectiveness of

MM and MT. These results did not demonstrate any significant differences between the two treatments in terms of improving psychological outcomes (i.e., anxiety, mood, and relaxation) and pain (Bradt et al., 2015). More research is required in the field of oncology to determine which one of these interventions is more effective in cancer patients.

The oncology unit at Massa Carrara hospital in Tuscany, Italy, has since 2009 been promoting a new sort of experience called “Donatori di Musica” (“Music Givers”), which is aimed at organizing and managing live concerts in the oncology departments of participating hospitals (Toccafondi et al., 2013). Despite the fact that the Music Givers interventions are closely related to MM interventions (i.e., the musicians are not music therapists and do not have a therapeutic relationship with the patients), it has evolved into a specific and repeatable format.

The main features of Music Givers are the following:

1. The intervention is divided into two phases: a live concert followed by a buffet (Table 1).
2. Continuity/regularity: Music Givers are not limited to occasional happenings but include regular weekly concerts performed at the same place on the ward, on the same day of the week, and at the same hour. It is a concert season that begins in September and ends in July.
3. Quality: To ensure high-quality standards, the participants have a reputation for being senior musicians who are selected by the art commission of the Music Givers organization.
4. Empathy: The musicians do not wear formal attire. They dialogue with the public by presenting the music and explaining why they chose certain pieces. Doctors and nurses do not wear a white coat, and patients are encouraged to wear street clothes.
5. Not-for-profit: Musicians are not paid, the concerts have no admission charge, and the seats

Table 1. *The phases of the Music Givers intervention*

Phase	Features
Phase I ^o : the live concert	Length: 45–60 minutes Type of music: classical Concerts performed by professional musicians Musicians show a friendly attitude toward the public and explain the piece
Phase II ^o : the buffet	Length: 60 minutes The buffet is prepared during the concert by volunteers Patients, their relatives, the musicians, and hospital staff participate together at the buffet

are strictly reserved for patients, their relatives, and hospital staff.

6. An oncology department that wants to host a Music Givers event must have a place where concerts can be performed.

Some of these features are among those recommended by patients in order to improve music interventions in oncology settings (i.e., live music on the ward, free entry, and a good-quality sound system) (O'Callaghan et al., 2014). This format for a music intervention has been steadily growing in popularity in Italy, now involving nearly 200 Italian and international performers. At present, eight oncology departments, located in different towns and regions, are hosting such interventions with this specific format, and several other departments have already given their consent to begin the initiative. The oncology departments that host Music Givers interventions are required to adopt and enforce the entire original format in all its aspects.

A first study was conducted that investigated the short-term effect of the Music Givers intervention on patient anxiety (Toccafondi et al., 2016). Using the State–Trait Anxiety Inventory with the 111 inpatients who participated in the Music Givers event, we found a significant decrease in state anxiety two hours after the experience compared to two hours before. Starting from this result, we were interested in understanding whether taking part in this format could influence patients' psychological outcomes not only in the short term, but also in the days following hospitalization.

The aim of our present study was to evaluate the effectiveness of a single session of the Music Givers intervention in reducing—between admission and discharge—the levels of distress, anxiety, and depression, and in improving the psychological well-being of hospitalized cancer patients. We carried out a quasiexperimental study to investigate this effect.

METHODS

Study Sample

Our study was carried out at the medical oncology unit of Massa Carrara's AUSL 1 Hospital in Tuscany, Italy. During the period of study, participation was proposed to all patients consecutively hospitalized, regardless of site or stage of tumor. The exclusion criteria were as follows: (1), age under 18 or over 90 years, (2) cognitive impairment, (3) comorbid psychotic illness, (4) learning disabilities, (5) severe symptoms due to illness or the side effects of therapy that precluded, because of physical limitations, the

ability to participate in the Music Givers intervention and/or to fill out questionnaires autonomously; and (6) a hospital stay >7 days. Particular care was exercised to avoid coercion to join the study, emphasizing that participation was totally free and voluntary and that nonadherence would not alter the care provided by the staff of the ward. Because the oncology department did not have a dedicated psychological service, patients included in the study did not receive psychological interventions during their hospitalization.

Data Collection

Patients' clinical data were provided by oncologists. The Music Givers event took place once a week (Wednesdays at 7:00 p.m.) in a space within the department of oncology. For each participating patient, we recorded whether or not the Music Givers intervention had been provided during their period of hospitalization.

The Hospital Anxiety and Depression Scale (HADS) (Zigmond & Snaith, 1983) was used to assess anxiety and depression. This is a multiple-choice test that includes 14 items: 7 on depression and 7 on anxiety. Answers are scored on a 4-point Likert-type scale. The total score ranges from 0 to 21 for each subscale (anxiety and depression). Psychological distress was assessed using the Distress Thermometer (DT) (Roth et al., 1998), which is a rapid and simple-to-use instrument developed by The National Comprehensive Cancer Network. The patient is asked to indicate their level of distress on a 0–10 visual analogue scale and to point out possible problems in the following areas: emotional, spiritual, family, physical, and practical. Pain and fatigue were assessed by a self-reported visual analogue scale (score range = 1–10).

Patients also filled out the Multidimensional Well-Being Scale. This is a brief and practical self-report instrument used to assess patients' current well-being in five areas: physical, psychological, relationships, and spiritual, as well as overall state of well-being. Each area is represented by a 10-point line, where 1 stands for "absolute uneasiness" and 10 for "complete well-being." This scale was developed by the authors and is currently being validated.

Statistical Analysis

The usual univariate and bivariate descriptive statistics were performed in order to compare the baseline characteristics of the two groups. Multiple regression models, including questionnaire score upon admission to the hospital and length of hospital stay, were fitted to test the effect of exposure to a Music Givers session on distress, anxiety, depression, and

well-being. An intention-to-treat analysis was adopted: people who were in the hospital when the Music Givers session occurred were considered to be part of the treatment group even if they did not actually attend the concert and buffet. Analyses were performed using the STATA 12 statistical package.

Ethics

Our study received the approval of the local ethics committee of the AUSL 1 Massa Carrara Hospital. Informed consent was obtained from all included participants.

RESULTS

Description of the Sample

Some 263 inpatients were invited to participate in our study, 242 (92%) of whom accepted and were asked to fill out the questionnaires both upon admission to the hospital and at discharge. Low levels of interest regarding the aim of our research and being engaged in diagnostic or therapeutic procedures were the main reasons cited by the patients who refused to participate.

Among the 242 participating patients, 103 were in the hospital when Music Givers events took place (Music Givers group). Among them, 80 participated in the concerts and buffet, and 23 did not because their medical condition did not allow them to get out of bed. The control group was composed of 139 patients, who had been hospitalized when Music Givers interventions did not take place.

Table 2 illustrates the sociodemographic and clinical characteristics of the sample. Overall, about two-thirds of patients in both groups were hospitalized for 3 days. From a clinical point of view, most patients were affected by pancreatic cancer (45.2%) and were in the metastatic phase of the disease (81.7%). Patients hospitalized when the Music Givers intervention took place reported significantly longer hospital stays. The reason for this may be due to the observational nature of the study, since a longer hospital stay made it more likely to be of assistance during a Music Givers intervention.

Effects of the Intervention on Distress, Anxiety, and Depression

Upon admission to the hospital, patients showed a borderline level of distress according to the DT (Music Givers group = 4.8 ± 2.6 ; control group = 4.6 ± 2.9), as well as borderline HADS scores (Music Givers group: HADS-A = 7.8 ± 4.4 , HADS-D = 8.0 ± 4.7 ; control group: HADS-A = 7.8 ± 4.2 , HADS-D = 7.8 ± 4.3).

Table 3 shows that the level of distress in the Music Givers group decreased during the days spent in hospital (admission = 4.8 ± 2.6 ; discharge = 4.0 ± 2.6), whereas no statistically significant difference was observed in the control group (admission = 4.6 ± 2.9 ; discharge = 4.6 ± 3.1). Multiple regression models, adjusted for baseline level of distress and for length of hospital stay, revealed a significant difference between the intervention and control groups at discharge ($p = 0.001$).

A similar trend appeared on both scales of the HADS, in which there was a reduction in the scores of patients in the Music Givers group, while an increase was observed among those in the control group. Multiple regression models, adjusted for baseline level of distress and length of hospital stay, showed a significant difference between the intervention and control groups at discharge ($p < 0.001$ for HADS-A and $p = 0.001$ for the HADS-D).

Effects of the Intervention on Visual Analogue Scales

Mean scores on the visual analogue scales, upon admission and at discharge, are reported for both the intervention and control groups in Table 3. The scores on all well-being scales for patients in the Music Givers group improved at discharge. The comparison with patients in the control group was statistically significant according to the multiple regression model, except for spiritual well-being.

The whole sample showed a moderate level of pain upon admission to the hospital (Music Givers group = 3.1 ± 2.1 ; control group = 3.0 ± 2.4). A similar trend was found for the fatigue scale (4.1 ± 2.4 vs. 3.9 ± 2.6). In both groups, pain decreased during hospitalization by ~ 1.0 and fatigue by ~ 0.5 points. After adjusting for score at admission and length of hospital stay, no statistically significant differences were found between the two groups in terms of pain and fatigue scores at discharge.

DISCUSSION

The findings of our study are congruent with the results of previous research on music interventions in oncology, which highlights the beneficial effects of music on hospitalized cancer patients (Archie et al., 2013; Bradt et al., 2011). In our research, we demonstrated the effectiveness of the Music Givers intervention, based on a single session of live music followed by a buffet, in influencing the psychological outcomes of cancer inpatients during their hospital stay. These results indicate a significant reduction in distress, anxiety, and depression at discharge among patients hospitalized when the Music Givers

Table 2. Basic demographic and clinical characteristics of participants

Characteristics of participants	Total, <i>N</i> = 242		Hospitalized when Music Givers took place, <i>n</i> = 103		Hospitalized when Music Givers did not take place, <i>n</i> = 139		<i>p</i>
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	
Age, mean							0.437
18–49	33	13.6	13	12.6	20	14.4	
50–59	56	23.1	29	28.2	27	19.4	
60–69	81	33.5	31	30.1	50	36.0	
≥70	72	29.8	30	29.1	42	30.2	
Gender							0.148
Female	147	60.7	68	66.0	79	56.8	
Male	95	39.3	35	34.0	60	43.2	
Marital status							0.385
Single	10	4.2	6	5.8	4	2.9	
Married	202	84.2	82	79.6	120	87.6	
Divorced	12	5.0	6	5.8	6	4.4	
Widowed	16	6.7	9	8.7	7	5.1	
Primary tumor site							0.257
Breast	21	8.8	7	6.9	14	10.2	
Lung	26	10.9	7	6.9	19	13.9	
Colorectal	25	10.5	9	8.8	16	11.7	
Pancreas	108	45.2	51	50.0	57	41.6	
Other	59	24.7	28	27.5	31	22.6	
Spread of tumor							0.490
Regional	40	18.3	19	20.4	21	16.7	
Metastatic	179	81.7	74	79.6	105	83.3	
Phase of disease							0.605
Diagnosis	26	10.9	9	8.8	17	21.4	
Treatments	115	48.1	51	50.0	64	46.7	
Followup and/or rehabilitation	15	6.3	4	3.9	11	8.0	
Relapse/recurrence	13	5.4	6	5.9	7	5.1	
Progression of disease and palliative care	70	29.3	32	31.4	38	27.7	
Treatment received ¹							
Chemotherapy	199	82.2	86	83.5	113	81.3	0.658
Radiotherapy	50	20.7	20	19.4	30	21.6	0.681
Surgery	89	36.8	40	38.8	49	35.3	0.568
Mos. from diagnosis							0.874
0–6	87	37.3	38	38.0	49	36.8	
7–12	67	28.8	27	27.0	40	30.1	
≥13	79	33.9	35	35.0	44	33.1	
Days of hospitaliza-tion							0.004*
2	15	6.2	2	1.9	13	9.4	
3	161	66.5	70	68.0	91	65.5	
4	27	11.2	10	9.7	17	12.2	
5	18	7.4	5	4.9	13	9.4	
6	9	3.7	6	5.8	3	2.2	
7	12	5.0	10	9.7	2	1.4	

¹ Patients may have received more than one treatment.

* *p* < 0.05.

event took place, compared to stable or worsened scores among patients in the control group.

Most studies in the literature that describe one session of music intervention were carried out to evaluate the effectiveness of these interventions in improving psychological outcomes during diagnostic procedures (Danhauser et al., 2010) and treatments

(Ferrer, 2007; Chen et al., 2013), and/or to alleviate pain in cancer patients (Huang et al., 2010). However, in these studies, the pre–post measure of psychological variables occurred within a brief time-frame, usually over the course of a few hours (e.g., before–after a session of chemo- or radiotherapy). This same methodology was employed by us as well in a

Table 3. Mean score (SD) of DT, HADS, and visual analogue scales upon admission to the hospital and at discharge, and estimates of adjusted effect of the intervention (multiple regression coefficient [MRC])

Scale	Hospitalized when Music Givers took place, <i>n</i> = 103		Hospitalized when Music Givers did not take place, <i>n</i> = 139		Effect of the intervention MRC (<i>CI</i> _{95%})	<i>p</i> value
	Admission	Discharge	Admission	Discharge		
DT	4.8 ± (2.6)	4.0 ± (2.6)	4.6 ± (2.9)	4.6 ± (3.1)	−0.8 (−1.3; −0.3)	0.001
HADS–A	7.8 ± (4.4)	6.6 ± (4.5)	7.8 ± (4.2)	8.3 ± (4.5)	−1.7 (−2.5; −1.0)	<0.001
HADS–D	8.0 ± (4.7)	7.2 ± (4.6)	7.8 ± (4.3)	8.3 ± (4.7)	−1.3 (−2.0; −0.6)	0.001
Pain	3.1 ± (2.1)	2.2 ± (1.5)	3.0 ± (2.4)	2.2 ± (2.6)	−0.01 (−0.3; 0.3)	0.945
Fatigue	4.1 ± (2.4)	3.7 ± (2.2)	3.9 ± (2.6)	3.3 ± (2.3)	0.2 (−0.1; 0.6)	0.208
Physical well-being	5.6 ± (2.0)	6.2 ± (1.8)	5.8 ± (2.2)	5.9 ± (2.3)	0.4 (0.01; 0.8)	0.045
Psychological well-being	5.8 ± (2.3)	6.5 ± (2.2)	5.9 ± (2.3)	5.9 ± (2.6)	0.8 (0.3; 1.3)	0.001
Relational well-being	7.0 ± (2.3)	7.3 ± (2.2)	7.6 ± (2.0)	7.4 ± (2.2)	0.4 (0.04; 0.7)	0.030
Spiritual well-being	7.0 ± (2.6)	7.3 ± (2.3)	7.1 ± (2.3)	7.0 ± (2.5)	0.4 (−0.04; 0.8)	0.075
Overall well-being	5.7 ± (2.2)	6.4 ± (2.1)	6.2 ± (2.1)	6.2 ± (2.3)	0.5 (0.1; 0.9)	0.010

*CI*_{95%} = 95% confidence interval; MRC = multiple regression coefficient.

previous study of the Music Givers intervention (Toccafondi et al., 2016). The present study adds information about the longer-term effects of a single session of music intervention in reducing the psychological suffering of hospitalized cancer patients, measured at discharge.

It is notable that, at the time of admission to the hospital, both groups presented borderline-level scores on the HADS scales. At discharge, however, only patients in the Music Givers group showed a mean score under the commonly utilized threshold of 8 for HADS subscales (Bjelland et al., 2002), whereas the mean score of patients in the control group was above this limit. In this sense, Music Givers turns out to be an effective intervention to control the psychological symptoms of patients hospitalized for brief periods (approximately two-thirds of patients in our sample stayed in hospital for three days).

We also found higher well-being scores among patients in the Music Givers group at discharge, with the exception of spiritual well-being. This finding is in line with studies that evaluated the influence of music interventions on the spirituality of cancer patients. Hanser et al. (2005) did not find any effect on the spirituality of 70 women with metastatic breast cancer after three individual music therapy sessions. More recently, a randomized clinical trial was conducted with 113 adolescents/young adults undergoing stem cell transplantation (Robb et al., 2014). After six sessions of a therapeutic music video intervention, patients showed a moderate but not significant improvement in terms of spiritual perspective and self-transcendence. The statistically significant difference on the psychological well-being scale might be attributed to the reduction among Mu-

sic Givers group patients, and to the concomitantly increased symptoms of anxiety and depression in the control group. The improvement in relational well-being is congruent with the results of studies that found music intervention to be effective among cancer patients for facilitating connections between patients and family members (Teut et al., 2014), and also in promoting a better relationship between patients and staff (O'Callaghan & Magill, 2009). We also found that the two groups differ significantly with respect to physical well-being, although no differences were found in pain and fatigue scores. The efficacy of medical treatments administered to patients during their hospital stay may explain the similar decrease of pain and fatigue in both groups. The improvement in physical well-being might be explained by the influence of Music Givers events on other variables—related to physical well-being but different from pain and fatigue—not considered in this study. Otherwise, the intervention might affect the perception of physical well-being rather than the intensity of symptomatology.

The positive results obtained with use of the Music Givers format may be explained on the basis of multiple factors. First, listening to music has been related to beneficial effects for cancer patients, including escape from worries related to the illness and treatments and the evocation of pleasant memories and imagery (Bradt et al., 2015), as well as feelings of relaxation and happiness (O'Callaghan et al., 2014; Teut et al., 2014). In addition, sharing the concert and the buffet may offer an opportunity to establish better relationships between patients and staff (O'Callaghan & Magill, 2009; Khan et al., 2015), to reinforce in patients feelings of being cared for from a holistic point of view, and to promote a more

positive perception of the oncology department (Moss et al., 2007).

Its low cost is one factor that may facilitate replicability of the intervention presented herein on other oncology units. Indeed, the musicians are not paid, and staff do not participate as professionals. Instead, they join the event after working hours. The only costs of the intervention are the buffet and the sound system. These costs were partially defrayed by organized patients' associations in the form of assistance to the Italian oncology departments that hosted Music Givers events.

Limitations of the Study

The present study has some limitations. First, all the data came from one department of oncology in Tuscany, a region of Italy. The generalizability of these results to patients in the rest of Italy or in other countries should be explored in future studies. Second, the study did not include a qualitative investigation aimed at obtaining an in-depth understanding of the subjective experiences of patients who took part in the Music Givers intervention. Future research should also investigate these issues.

Conclusions

In conclusion, our study demonstrates the efficacy of a standardized, replicable, low-cost, and one-session music intervention, which consists of a live concert and a buffet, in reducing the psychological burden and improving the well-being of cancer patients during their hospitalization.

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DISCLOSURES

The contributing authors hereby declare that they have no conflicts of interest, including specific financial interests and relationships or affiliations, relevant to the subject matter or materials discussed in the present manuscript.

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