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Effects of Coping-Infused Dialogue through Patient Preferred Music on Affective State and Pain with Adult Medical Inpatients: Two Randomized Pilot Studies

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Abstract

The purpose of these studies was to determine if the addition of coping-infused dialogue (CID) to patient preferred live music (PPLM) adversely impacted affective state and pain among adult medical inpatients during two studies. Participants were adults hospitalized on solid organ transplant (study 1; *N* = 20) and medical oncology/hematology (study 2; *N* = 39) units. Participants were randomly assigned to one of two conditions: CID-PPLM or PPLM only. Participants completed affective state and pain self-report instruments at pre- and posttest within single-session designs congruent with the CID-PPLM protocol. There was no between-group difference at posttest, indicating that the addition of CID to PPLM did not negatively impact affective state or pain. Concerning within-group data, there were significant pre- to posttest differences in affective states and pain. The addition of CID to PPLM did not adversely impact affective state or pain. However, participants in the CID-PPLM group may have gained more problem solving and coping skills as well as affective and pain benefits. Limitations of the study, implications for clinical practice, and suggestions for further research are provided.

Keywords: medical, coping, patient preferred live music, affective state, pain

Literature Review

When experiencing psychological and physiological stressors that negatively impact quality of life, medically hospitalized adult inpatients may find that their abilities to cope are diminished. Coping strategies are necessary to buffer stress (Felton, Revenson, Hinrichsen, 1984) and can be used to help a patient manage stressful situations through cognitive and behavioral efforts (Lazarus & Folkman, 1984). Thus, coping represents an integral component of stress research (Lazarus, 2006; Semmer & Meier, 2009) because individuals who use effective coping strategies can maintain or improve perceived wellbeing during taxing events (Lazarus & Folkman, 1984). While coping can be an important factor in mitigating the negative impact of stressful events during various medical procedures, hospitalized adult inpatients may have insufficient knowledge of coping strategies to proactively and reactively manage stress. By increasing patients' knowledge of and ability to use effective coping skills, medical professionals may improve patients 'long-term and enduring treatment outcomes.

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Coping is vital as hospitalized adult medical inpatients often face a plethora of stressful circumstances, potentially including: acceptance of role as patient, financial concerns, family issues, cognitive impairment, side effects of and compliance with medication, physical rehabilitation, medication side-effects, uncertainty of prognosis, an uncomfortable environment, and even the possibility of death (Dunkel-Schetter, Feinstein, Taylor & Falke, 1992; Olsbrisch, Benedict, Ashe, & Levenson, 2002). These situations can negatively impact patients' affective states, which subsequently influence their psychological and physiological well-being and long-term outcomes. Educating patients on the importance of coping strategies and their effectiveness can help people manage stressors within and outside the hospital environment, increase their well-being, and potentially impact longer-term and enduring treatment outcomes. Researchers have found that music therapy can be an effective treatment option to help various types of adult medical inpatients reduce pain, improve affective state, and reduce anxiety (Bradt et al., 2014; Clark, 2006; Cook, 1986; Fredenburg & Silverman, 2014; Ghetti, 2011; Hilliard 2003; Lin et al., 2011; O'Callaghan, 2004; Thompson & Grocke, 2008). Within the profession, music therapy interventions for hospitalized adult inpatients are often categorized as active or receptive. Active interventions are designed to dynamically involve the patient in an engaging music experience and can include songwriting, improvisation, and music making. Receptive music experiences typicallyinvolve music listening wherein the patient is not required to actively participate. Both active and receptive experiences can provide distractions from negative health conditions, potentially augmenting a patient's affective state in an immediate manner (Bradtet al., 2014; Crawford, Hogan, & Silverman, 2013; Fredenburg & Silverman, 2014; Thompson & Grocke, 2008).

Receptive music therapy interventions – such as patient preferred live music (PPLM) – may be more suitable for hospitalized medical patients recovering from treatment procedures or experiencing side effects (Chaput-McGovern & Silverman, 2012; Crawford, Hogan, & Silverman, 2013; Fredenburg & Silverman, 2014). Chaput-McGovern and Silverman (2012) studied adults who were recovering from having cancer surgically removed and found that patients preferred PPLM over music-assisted guided relaxation. Crawford, Hogan, and Silverman (2013) gave participants the choice of PPLM or a brief harmonica lesson followed by a blues jam. Of the 38 participants, only one chose the harmonica lesson. Additionally, authors who conducted a review of PPLM as an intervention for adults in medical settings found this receptive intervention to be a preferred and effective treatment (Silverman, Letwin, & Nuehring, 2016). However, while PPLM may immediately improve patients' affective states, PPLM does not target coping strategies or teach patients to proactively identify and manage their stressors. Thus, although adult medical inpatients seem to prefer PPLM as a receptive music therapy intervention and these experiences can immediately augment mood, there is also a need to educate these patients concerning coping skills.

Using Robb's (2003) Contextual Support Model of Music Therapy as a guiding framework, Hogan and Silverman (2015) designed the Coping Infused Dialogue through Patient Preferred Live Music (CID-PPLM) protocol. In this protocol, structure and predictability were implemented through a standardized and sequential session format and familiar live music. Autonomy support was provided via patient selection of preferred music and patient identified concerns/stressors. Relationship support was provided via a shared music experience. In order to address problem and coping strategies, this protocol was designed to integrate discussion of problem identification and coping skills with receptive music therapy (PPLM) in an adult inpatient medical setting. In the initial pilot study, the researchers found CID-PPLM may be an immediate and effective intervention to improve positive and negative affect and decrease pain in organ transplant recipients. However, the researchers compared CID-PPLM with a no contact control condition and an ensuring limitation was that PPLM was not compared to CID-PPLM to determine if providing PPLM was as effective as CID-PPLM.

It may be that the integration of discussing problems and coping strategies (i.e., the addition of CID) to PPLM may inadvertently function to diminish affective state. However, if PPLM is as effective as CID-PPLM concerning affective state, the addition of therapeutic dialogue consisting of coping strategies may function as an effective compliment to PPLM.

While PPLM is commonly used as a receptive music therapy intervention to immediately improve affective states and decrease pain in hospitalized patients, there is a need to further study the unique components and resultant effects of CID-PPLM in various adult medical settings. Therefore, the purpose of the study was to determine if the addition of CID to PPLM negatively impacted self-reported affective state and pain among adult medical inpatients by comparing CID-PPLM and PPLM only. The central research question was as follows: Will the addition of CID to PPLM adversely impact self-reported affective state and pain among adult medical inpatients when compared to a PPLM only condition?

Studies 1 and 2: Method

Studies 1 and 2: Research Participants

The only inclusion criteria included being an inpatient on the unit, receiving an initial music therapy session with one of the researchers, providing consent, and being able to read and write in English. Patients who did not meet these eligibility criteria, did not speak or write in English, or patients that declined the study due to lack of interest or somatic reasons were not included in the study but still had the option to receive music therapy. Choosing not to participate in the study did not affect the patients' treatment in any way, and participants were not compensated for taking part in the study.

Studies 1 and 2: Design

Congruent with the CID-PPLM protocol (Hogan & Silverman, 2015), the researchers utilized a single session pre-and posttest design. Participants in the CID-PPLM condition completed a pretest, received 20 to 30-min of CID-PPLM, and then completed the posttest. Participants in the PPLM condition completed a pretest, received 20 to 30-min of PPLM, and then completed the posttest. All music therapy sessions were facilitated in each participant's hospital room on the unit. The clinician researchers (CRs) visited the hospital one day per week for two to three hours during the 2014-2015 academic year.

Studies 1 and 2: Procedure

Upon entering each patient's room, one of the two CRs introduced herself and asked if the patient would like to receive music therapy in the form of PPLM. If the patient responded in the affirmative, the CR then asked if the patient would like to participate in a research study. When asked this question, patients were given the option to participate in the research study or receive music therapy only. If the patients chose to participate in the study the CR provided information about the study verbally and in written form and then obtained informed consent. After obtaining informed consent, participants were randomized via a computer program into either the CID-PPLM or PPLM condition. Once participants were randomized into a treatment condition, participants completed a demographic questionnaire and the pretest. Participants in each condition discussed their music preferences with the CR.

Participants were then provided a music menu to choose songs from, consisting of multiple songs from different artists and genres. Participants in the CID-PPLM condition received 20 to 30-min of music therapy consisting of CID-PPLM. Once the session was finished, participants completed the posttest. Participants in the PPLM condition received 20 to 30-min of music therapy consisting of PPLM only and then completed the posttest. These studies were approved by the university and hospital's shared Institutional Review Board and the CRs completed the necessary research training. In studies, the researchers also collected pre- and posttest pain data via a 10-point Likert-type scale, ranging from 1 (no pain) to 10 (highest amount of pain). This scale was used at the request of the hospital nursing staff and was consistent with their pain assessments.

Studies 1 and 2: Participant Enrollment

Participants were enrolled in the study from September 2014 to May 2015 resulting ina sample size of 20 (study 1; solid organ transplant patients) and 39 (study 2; medical oncology/hematology patients).

Studies 1 and 2: Quantitative Analyses

To determine if there were between-group differences at pretest, the researchers conducted independent samples *t*-tests. To determine the effects of the addition of CID to PPLM, the researchers utilized an ANCOVA, with pretest scores as the covariate, posttest scores as the dependent measure, and group as the fixed factor using SPSS 19.0. Effect sizes were interpreted according to Kotrlik, Williams, and Jabor (2011): small $\leq$ .08; medium .09-.24; large $\geq$ .25.

Study 1: Method

Study 1: Research participants

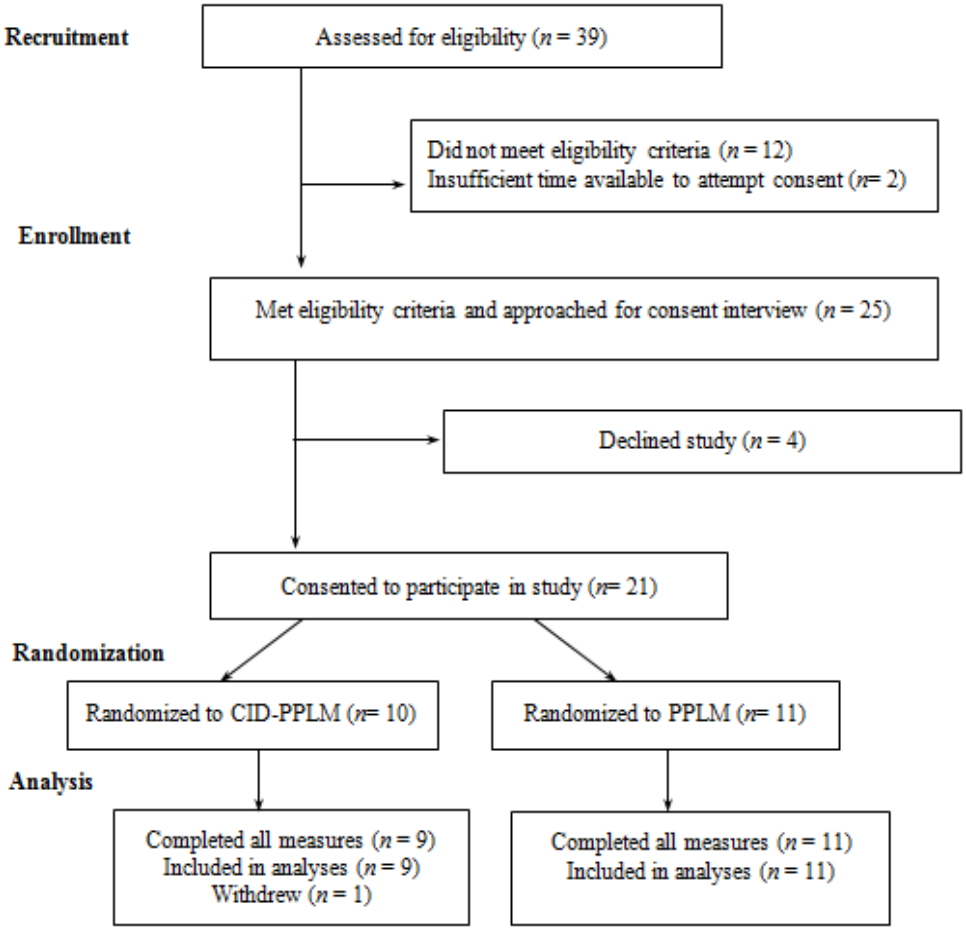
Participants (N = 20) were inpatients on a solid organ transplant unit in a large Midwestern research hospital.

Study 1: Instrument

The Quick Mood Scale (Woodruffe-Peacock, Turnbull, Johnson, Elahi, & Preston, 1998) was used to assess participants' mood. The Quick Mood Scale has 12 items, which assess six categories of mood: wide awake/drowsy, relaxed/anxious, cheerful/depressed, friendly/aggressive, clear-headed/confused, and well-coordinated/clumsy. Participants rate how they are feeling with a positive and negative aspect of each category (e. g. wide awake and drowsy) as not at all, a little, moderately, very, or extremely. To score the scale, answers are converted to numerals, with 0 representing "not at all" and 4 representing "extremely." The negative score is subtracted from the positive score, and 4 is added to yield a positive result between 0 and 8. A higher score indicates a more positive mood. The correlations between the items of the Quick Mood Scale and the equivalent Profiles of Mood Scale (POMS) are between 0.64 and 0.79, except for the well-coordinated/clumsy scale, which does not have an equivalent on the POMS. Test-retest correlations are also high. Raters also perceived the Quick Mood Scale as easier to complete than the POMS and completed it more quickly. Over 50% of raters also indicated that the Quick Mood Scale would provide a more accurate assessment than the POMS. Because of these qualities, the Quick Mood Scale lends itself to single session designs as well as settings where participants are required to complete the instrument multiple times.

Study 1: Results

Figure 1 depicts the flow of participants through the phases of study 1.



There was no statistically significant difference ($p > .05$) between groups in any demographic or pretest measures. For study 1, descriptive statistics of demographic information appear in Table 1and demographic frequency data appear in Table 2.

Table 1: ***Study 1 demographic descriptive statistics***

	CID-PPLM ($n = 9$)		PPLM ($n = 11$)	
	M	*SD*	*M*	*SD*
Age	60.00	12.12	56.00	9.67
Days in the hospital	6.11	4.91	6.54	4.20

All $p > .05$

Table 2: ***Study 1 demographic frequencies***

		CID-PPLM (n = 9)	PPLM (n = 11)
Gender			
	Female	3	5
	Male	6	6
Ethnic background			
	African American		1
	American Indian		1
	Caucasian	9	8
	Other		1
Diagnosis			
	Bilateral nephrectomy & diabetes	1	
	Bladder infection	1	
	Bowel obstruction	1	
	Cirrhosis	1	
	Diabetes and pancreatectomy	1	
	DRESS syndrome	1	
	Kidney and pancreas transplant rejection		1
	Kidney donation complication		1
	Kidney transplant		1
	Liver disease and diabetes		1
	Liver failure	1	3
	Organ donor		1
	Pancreatic graft—medication complication	1	
	Pancreatitis		1
	Pneumonia	1	1
	Spleen, pancreas, and gall bladder failure		1

All $p > .05$

Correlational analyses revealed significant correlations between all pre- and posttest measures except the Clear-headed/Confused subscale of the Quick Mood Scale. There was no statistically significant difference ($p > .05$) between groups at posttest, indicating that the addition of CID did not negatively impact mood or pain. Pre- and posttest statistics by treatment group are depicted in Table 3.

Table 3: Study 1 pre and posttest statistics by treatment group

	Pretest				Posttest			
	CID-PPLM		PPLM		CID-PPLM		PPLM	
Dependent measure; statistics	*M*	*SD*	*M*	*SD*	*M*	*SE*	*M*	*SE*
Pain; $F(1, 17) = .897, p = .357$, partial $\eta^2 = .050$	5.11	3.10	3.18	2.60	2.89	0.43	3.45	0.39
Wide awake/Drowsy; $F(1, 17) = 1.101, p = .309$, partial $\eta^2 = .061$	5.11	1.53	5.00	1.61	6.18	0.42	5.83	0.38
Relaxed/Anxious; $F(1, 17) = 1.125, p = .304$, partial $\eta^2 = .062$	5.11	1.69	4.36	1.69	6.15	0.31	6.60	0.28
Cheerful/Depressed; $F(1, 17) = 2.06, p = .169$, partial $\eta^2 = .108$	5.44	1.59	5.81	1.17	6.05	0.33	6.69	0.30
Friendly/Aggressive; $F(1, 17) = .406, p = .532$, partial $\eta^2 = .023$	6.78	0.83	6.55	0.82	6.71	0.19	6.88	0.17
Clear-headed/Confused; $F(1, 17) = 0.733, p = .404$, partial $\eta^2 = .041$	6.44	1.42	5.54	1.56	6.33	0.34	6.73	0.30
Well-coordinated/Clumsy; $F(1, 17) = 1.382, p = .256$, partial $\eta^2 = .075$	4.00	1.73	4.45	1.97	5.02	0.38	5.62	0.34

As there was no significant between group difference at pre- or posttest, we combined the CID-PPLM and PPLM only groups and conducted repeated measures ANOVAs to determine if there were within-group differences from pre- to posttest. Significant within-group differences were found in measures of pain, wide awake/drowsy, relaxed/anxious, cheerful/depressed, and well-coordinated/clumsy. In all variables, posttest scores were more favorable than pretest scores. Data from these analyses are depicted in Table 4.

Table 4: Study 1 pre- to posttest ANOVA results

		Pretest		Posttest	
Measure	Statistics	M	SD	M	SD
Pain	$F(1, 19) = 6.452, p = .020$, partial $\eta^2 = .254$	4.05	2.93	3.20	2.37
Wide Awake/Drowsy	$F(1, 19) = 7.795, p = .012$, partial $\eta^2 = .291$	5.05	1.54	5.85	1.69
Relaxed/Anxious	$F(1, 19) = 32.11, p = .001$, partial $\eta^2 = .628$	4.70	1.69	6.40	1.14
Cheerful/Depressed	$F(1, 19) = 10.823, p = .004$, partial $\eta^2 = .363$	5.65	1.35	6.40	1.47
Friendly/Aggressive	$F(1, 19) = 1.00, p = .330$, partial $\eta^2 = .050$	6.65	0.81	6.80	0.70
Clear headed/Confused	$F(1, 19) = 2.923, p = .104$, partial $\eta^2 = .133$	5.95	1.54	6.55	1.00
Well-coordinated/Clumsy	$F(1, 19) = 12.844, p = .002$, partial $\eta^2 = .403$	4.25	1.83	5.35	1.50

Study 2: Method

Study 2: Research Participants

Participants (N = 39) were inpatients on a medical oncology/hematology unit in a Midwestern research hospital in the United States. Patients on the unit were either being hospitalized for chemotherapy or radiation treatment for the first time or returning for treatment cycles.

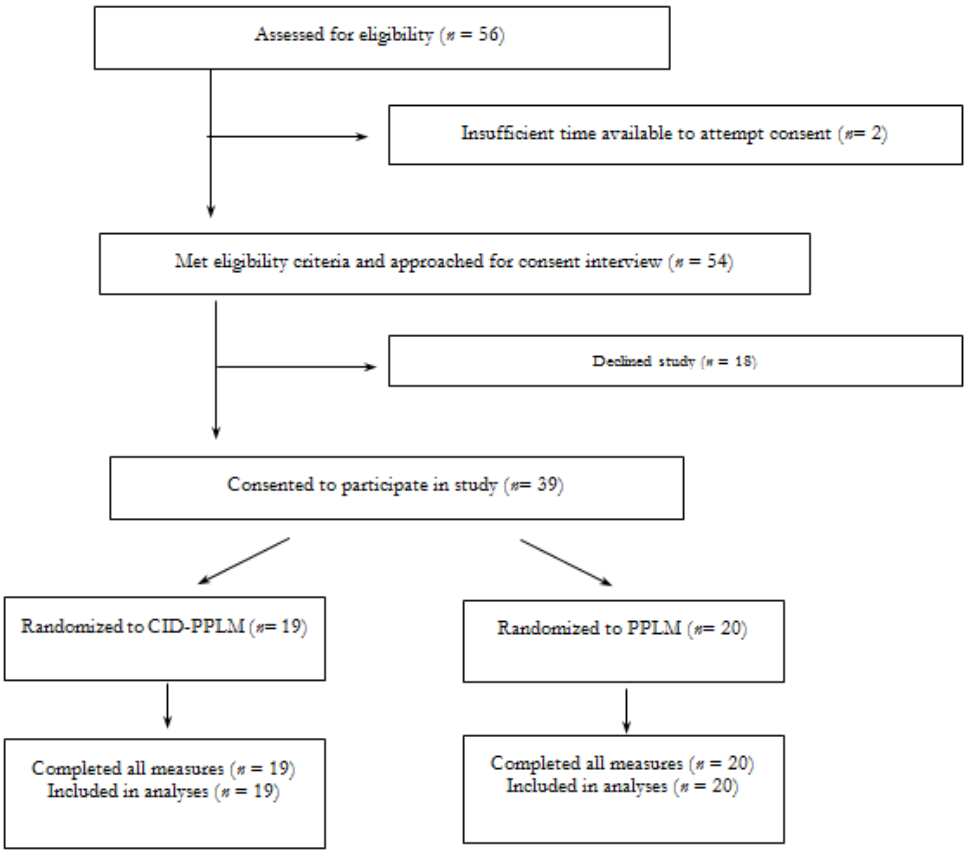
Study 2: Instrument

The researchers utilized the 10-item Positive and Negative Affect Schedule short form (I-PANAS-SF; Watson, Clark, &Tellegen, 1988) to measure patients' self-report of positive and negative affect. This 10-item short form psychometric instrument was modified from the original 20-item Positive and Negative Affect Schedule (PANAS) (Watson, Clark, &Tellegen, 1988). The psychometric inventory consists of two categories that describe positive and negative affect states.

Words describing positive affect (PA) include inspired, alert, excited, enthusiastic, and determined. Words describing negative affect (NA) include afraid, upset, nervous, scared, and distressed. Participants provide self-report measures on their affect through a 5-point Likert-type scale ranging from 1 (very slightly or not at all) to 5 (extremely). A high PA score indicates that the participant is alert and enthusiastic, and a high NA score indicates that he or she is distressed (Watson, Clark, &Tellegen, 1988). Each category of affect is scored independently and then the scores are compared. This psychometric inventory is recommended in the medical setting because it is straightforward and can be administered more than once to find immediate effects in PA and NA. The I-PANAS-SF has high reliability, with a PA reliability ranging from .86 to .90, and NA ranging from .84 to .87 (Watson, Clark, &Tellegen, 1988).

Study 2: Results

Figure 2: Study 2 Participant Flow Chart



There was no statistically significant difference in demographic or pretest data ($p > .05$). Gender, ethnic background, and type of cancer are depicted in Table 5, and demographic descriptive statistics concerning participants' ages and length of hospitalization are in Table 6.

Table 5: Study 2 demographic frequencies of Sex, Ethnic Background, and Type of Cancer

		CID-PPLM (n = 19)	PPLM (n = 20)
Sex			
	Female	9	6
	Male	10	14
Ethnic Background			
	Caucasian	17	17
	Other	2	3
Type of Cancer			
	Angiosarcoma		1
	Aplasticanemia	1	
	Cancer of the Blood		1
	Cancer of the Kidneys		1
	Cancer of the Mouth		1
	Hemophagocytic Lymphonistiocytosis		1
	Leukemia	4	3
	Liver Cancer		1
	Lung Cancer	2	
	Lymphoma	6	6
	Multiple Myeloma	2	1
	Myelodysplastic Syndromes	3	
	N/A		1
	Pancreatic Cancer	1	1
	Renal Cell Carcinoma		1
	Urethral Cancer		1

All $p > .05$

Table 6: Study 2 demographic descriptive statistics

	CID-PPLM		PPLM	
	M	*SD*	*M*	*SD*
Age	60.37	13.68	56.30	14.44
Days in the hospital	3.74	3.02	4.73	6.25

All $p > .05$

There were significant correlations between pre- and posttest scores in all variables ($p < .05$). There was no statistically significant difference ($p > .05$) between groups at posttest indicating that the addition of CID did not negatively impact mood or pain. Pre- and posttest statistics by treatment group are depicted in Table 7.

Table 7: Study 2 pre and posttest statistics by treatment group

	Pretest				Posttest			
	CID-PPLM		PPLM		CID-PPLM		PPLM	
Dependent measure; statistics	*M*	*SD*	*M*	*SD*	*M*	*SE*	*M*	*SE*
Pain; $F(1,36) = 0.013, p = .910$, partial $\eta^2 = .000$	2.58	1.61	2.28	1.71	1.92	0.16	1.95	0.16
Positive affect; $F(1,36) = .002, p = .965$, partial $\eta^2 = .000$	16.12	5.91	15.75	4.82	19.36	0.75	19.4	0.74
Negative affect; $F(1.36) = .078, p = .782$, partial $\eta^2 = .002$	8.47	3.67	9.60	4.71	7.10	0.63	7.35	0.61

As there was no significant between group difference at pre- or posttest, we combined the CID-PPLM and PPLM only groups and conducted repeated measures of ANOVAs to determine if there were within-group differences from pre- to posttest. Significant within-group differences were found in measures of pain, positive affect, and negative affect. In all variables, posttest scores were more favorable than pretest scores. Data from these analyses are depicted in Table 8.

Table 8: Study 2 within-group ANCOVA results

		Pretest		Posttest	
Measure	Statistics	*M*	*SD*	*M*	*SD*
Pain	$F(1, 38) = 12.028, p = .001$, partial $\eta^2 = .240$	2.42	1.65	1.94	1.29
Positive Affect	$F(1, 38) = 32.661, p = .001$, partial $\eta^2 = .492$	15.92	5.31	19.38	4.59
Negative Affect	$F(1, 38) = 10.501, p = .002$, partial $\eta^2 = .217$	9.05	4.22	7.32	3.29

Discussion

The purpose of these twopilot studies was to determine if the addition of CID to PPLM deleteriously impacted affective states and pain among patients on a solid organ transplant (study 1) and medical oncology/hematology (study 2) unit when compared to a PPLM only condition. After a single music therapy session, there was no significant between-group difference in affective state or pain, indicating that the addition of CID to PPLM did not adversely impact affective state or pain. Additionally, there were significant within-group differences from pre- to posttest, indicating positive outcomes concerning affective states and pain regardless of treatment condition (i.e., CID-PPLM or PPLM only). Moreover, results were consistent regardless of the participant group (solid organ transplant patients or medical oncology/hematology patients) or affective state instrument, potentially indicating that CID-PPLM and PPLM function across diagnoses and perhaps generalize to other adult medical populations. The results of this study are congruent with previous research indicating that music therapy in the form of PPLM can improve affective states and pain (Chaput-McGovern & Silverman, 2012; Clark, 2005; Crawford, Hogan, & Silverman, 2013; Ferrer, 2007; Madson& Silverman, 2010; Silverman, Letwin, &Nuehring, 2016) in adult medical patients.

The current study reported improvements in affective state and pain after receiving CID-PPLM or PPLM. From the results of this study, the addition of CID did not detract from the consistently positive affective state benefits of PPLM. However, the addition of CID facilitated a dialogue between the CR and the patient to discuss and develop coping strategies for local and global stressors.

When working with adults in medical environments, PPLM can be used to accompany the discussion of coping strategies, and the CID-PPLM protocol could be an effective tool to help improve immediate affective states and potentially longer-term and enduring treatment outcomes.

Limitations of the current study include the small and heterogeneous sample. A larger sample would lend greater strength to the research findings. Another limitation is the dual role of the CRs, who administered study measures, provided music therapy sessions, analyzed data, and contributed to the manuscript. It is possible that the researchers' dual roles influenced study participants' responses. Additionally, the current studies did not utilize a no contact control group. However, Hogan and Silverman (2015) compared the effects of CID-PPLM to a waitlist control condition and found that participants who received CID-PPLM reported more favorable affective states and pain. A final limitation is the absence of follow-up measures to determine maintenance of treatment gains.

Future researchers may continue to investigate the CID-PPLM protocol via treatment dismantling by studying a CID only (i.e., talk-based interventions concerning local and global stress and coping skills *without* PPLM) condition. Also, examining the effects of CID-PPLM concerning coping on patients' coping self-efficacy would provide an additional perspective on the effectiveness of the CID-PPLM intervention. Follow-up studies could be used to determine if and how patients utilized coping skills learned during CID-PPLM. Future researchers might consider lengthening the CID-PPLM for adults hospitalized for longer durations and studying if treatment dose yields greater benefits to coping, affective state, and pain. By incorporating qualitative paradigms, researchers could further examine participants' perceptions of CID-PPLM and PPLM and the potential mechanisms by which they function.

The purpose of this study was to determine if the addition of CID to PPLM adversely impacted affective state and pain with patients on a medical oncology/hematology unit. As there was no between-group difference, the addition of CID to PPLM did not negatively impact results. Affective states and pain were more favorable after both CID-PPLM and PPLM. As PPLM has been an effective receptive music therapy intervention with adult medical populations and there were no between group difference in the current study, CID-PPLM may be an ideal protocol for immediately improving affective states, decreasing pain, and increasing cancer patients' knowledge of coping skills to assist in recovery. Future research is warranted.

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