

The Effects of Live Music versus Tape-Recorded Music on Hospitalized Cancer Patients

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This study compared the effects on hospitalized cancer patients of live music singing and guitar playing to the effects of tape-recorded music of the same material. Subjects were 50 cancer patients ranging in age from 17 to 69. They were randomly selected and placed into the live or taped music categories. Each subject listened to 25 minutes of music. Pre- and post-music mood states were recorded on the Profile of Mood States (POMS) questionnaire. Additional post-music responses were recorded on the author's Summary Questionnaire. The live and taped pre- and post-music scores were compared. The live music subjects reported significantly less ($p < .05$) Tension-Anxiety and more Vigor than did the taped music subjects. In addition live music subjects reported significantly more changes in physical discomfort ($p < .05$), changes in mood ($p < .01$), and changes in mood for the better ($p < .001$); and recommended music sessions for others ($p < .01$). Results indicate the particular effectiveness of using live music to assist in relieving tension and promoting vigor. The human element inherent in live music is believed to be important.

It is becoming increasingly evident that music can provide both physical and emotional comfort to hospitalized cancer patients. Cancer patients often report physical discomfort and feelings of anxiety, tension, depression and loneliness. It is not fully understood why music is so beneficial to patients, although it is probably in part due to the effects that music has on

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physiological processes (Unkefer, 1968) and on the reduction of anxiety (Billler, Olson, & Breen, 1974).

A review of literature indicates limited exploration of the effects of using music with hospitalized cancer patients. Munro and Mount (1978) observed that music therapy could be an important tool for "improving the quality of life" (p. 1029). They reported success in using singing sessions, a variety of instruments, and stereo recordings to help reduce stress and withdrawal and assist in the relief of intractable pain.

Helen Bonny, music therapist, and the late Walter Pahnke, MD, PhD (1972), reported using music as one treatment element in a psychedelic psychotherapy program to treat alcoholism, narcotic addiction, and psychological distress associated with terminal cancer at the Maryland Psychiatric Research Center in Baltimore, Maryland. They reported that the music complemented therapeutic objectives by helping the patient relinquish controls, by facilitating the release of intense emotionality, by directing and structuring the experience, and by contributing toward a peak experience. They also suggested that to beneficially use music in drug and nondrug therapy sessions, high quality stimuli (stereo systems, earphones, etc.) are very important, as is the presence of a skilled therapist who will assist in establishing a close interpersonal relationship.

Literature describing the effects of music on moods and physiological states is available. Music has been found to increase or decrease muscular energy, affect pulse and blood pressure, and decrease metabolism (Diserens & Fine, 1939, cited in Gutheil, 1952). Music stimulates emotional responses and change in mood (Gutheil, 1952). The playing of melancholy music has been found to facilitate positive mood changes in depressed patients (Nucci, 1978).

Although research comparing the effects of specific forms of presentation (i.e., live versus tape-recorded) on hospitalized cancer patients could not be found, research on the effects of live musical activities on human behavior is available. Participation in musical activities has been found to enhance social interaction (Cassity, 1976). Singing was found to result in improved behavior in a group of hospitalized psychiatric patients, while listening to music resulted in no change in behavior of a comparable group (Darbes & Shrift, 1957, cited in Unkefer, 1968). Group rhythms, group singing, and group musical activities "provide communications of a special sort among participants and between participants and onlookers" (Gaston, 1968, pp. 20-21).

In work at Memorial Sloan-Kettering Cancer Center it has been found that live music (guitar playing and singing) elicits more meaningful responses than do tape recordings of similar material. It appears that the form of music presentation is significant. Therefore, research was designed

to search for differences in patient responses and for mood changes that were dependent upon the form in which the music was presented. This study was intended to evaluate the hypothesis that live presentations of music would result in greater positive changes in the emotional and physical states of patients than would taped music presentations.

METHOD

Subjects

The population consisted of 50 hospitalized cancer patients at Memorial Sloan-Kettering Cancer Center in New York City. To qualify, the subjects had to be at least 14 years of age, have no evidence of organic mental syndrome, and be willing to participate. Having met these qualifications, the participants were randomly selected from the total population of the Center's hospitalized patients and randomly assigned by the author to sessions of live or tape-recorded presentations of music, with 25 designated to listen to live music and 25 to tape-recorded music.

The 50 subjects ranged in age from 17 to 69, with the mean age of the tape-recorded music group being 49.4 and the mean of the live music group 36.4. A *t*-test comparing the ages indicated that the tape-recorded group was significantly older than the live music group, $t(48) = 3.22, p < .01$. There were 14 males and 11 females in the tape-recorded category, and 16 males and 9 females in the live category. A chi-square test indicated that the distribution of sexes in the two groups was not significantly different, $X^2(1) = .083, p > .05$. Subjects varied in diagnoses, with their illnesses including 22 different types of cancer. The most common types of cancer (occurring in three or more subjects) were: breast, embryonal sarcoma, leukemia, lung, lymphoma, osteogenic sarcoma, ovary, rectum, and testes. Although the types of cancer did not occur equally in the two groups, no pattern in their occurrence by group was found. Subjects also varied in length of illness and all were in "fair" to "good" condition during the tests.

The subjects were contacted by the music therapist within the hospital setting. In general, the subjects and the music therapist were strangers. However, prior to the study, four of the subjects in each category knew the music therapist superficially in another capacity (as receptionist in the same hospital). All sessions of music were held individually in the subject's hospital room with the exception of two subjects' sessions, which were held in their floor conference rooms.

Apparatus

In both the live and tape-recorded sessions the subject was presented the same list of 16 songs, including "Moon River," "Blowin' in the Wind," "Kum ba yah," "Here Comes the Sun," "Bill Bailey," "You've Got a Friend," "It's a Small World," and "You Light Up My Life." In addition, each subject was given a consent form to sign. The materials utilized in the live sessions of music were a guitar and the author's books of words to songs. The materials in the tape-recorded sessions of music included a Sony cassette tape recorder and eight cassette tapes which contained taped recordings of the author playing guitar and singing each of the 16 songs.

Questionnaires

The subject's responses were recorded on two questionnaires: the standard Profile of Mood States (POMS) and the author's Summary Questionnaire.

POMS. The POMS is a standard questionnaire which is considered reliable and valid, and has internal consistency (Buros, 1978). It consists of 65 5-point adjective rating scales which are factored into six mood scores: Tension-Anxiety, Depression-Dejection, Anger-Hostility, Vigor, Fatigue, and Confusion. Each of the six mood states is defined by adjectives descriptive of the mood. For example, the Tension-Anxiety factor is defined by heightened musculoskeletal tension, such as "tense," "shaky," "panicky," "relaxed," "restless," and "anxious." The Depression-Dejection factor represents a mood of depression accompanied by a sense of personal inadequacy. Some adjectives describing this factor are "blue," "hopeless," "unworthy," "lonely," and "worthless." The Vigor factor is defined by adjectives suggesting high energy and activity, including "lively," "energetic," "cheerful," "alert," and "carefree." Subjects score the adjectives in response to how they feel according to the following ratings: 0 = not at all, 1 = a little, 2 = moderately, 3 = quite a bit, and 4 = extremely. Scores for each of the six mood factors are obtained by summing the responses for the adjectives defining the factor. A Total Mood Disturbance score is obtained by summing the scores across all six factors, weighing Vigor negatively (McNair, Lorr, & Droppelman, 1971).

Summary Questionnaire. The Summary Questionnaire (see Figure 1), administered after the post-music POMS questionnaire, was designed to summarize physical discomfort before and after music, change in mood, direction of mood change, and thoughts concerning recommending music sessions for others. The Summary Questionnaire consists of five questions requiring one response each, scored by the subjects on a scale from 0, not at all, to 10, a great deal.

Figure 1: Summary Questionnaire

1. How much physical discomfort were you aware of having before the music session? a great deal 10 _____ 0 not at all
2. Did the music session change your physical discomfort? a great deal 10 _____ 0 not at all
3. Did the music change your mood? markedly 10 _____ 0 not at all
4. Was your mood changed for the better? markedly 10 _____ 0 not at all
5. Would you recommend music sessions for others? very strongly 10 _____ 0 not at all

Procedure

Each subject had an individual session. He/she was seated in bed or on a chair and was given a verbal description of the procedure, an approximation of which is:

You will fill out a questionnaire right before listening to the music. This questionnaire is a list of words to which you assign the number which best describes how you feel right now. You then will choose five songs, listen to the music, and fill out the same questionnaire again right after the music, answering according to how you feel then. There will be one additional short questionnaire at the end. I will be here to answer any questions.

The music therapist told each subject receiving tape-recorded presentations that the recordings were of her singing and playing guitar. The subject was then given a consent form to read and sign.

Following this, the subject was given the pre-music POMS questionnaire and was told again to complete it according to how each felt "right now." The subject filled out the questionnaire, during which time the music therapist remained nearby in order to answer any questions that he/she might have. After completing this pre-music questionnaire each subject was given the list of songs and asked to choose five. The subject was told that he or she could choose the order in which the songs were to be played, if desired.

The subject then listened to approximately 25 minutes of music, either live (the music therapist sang the five songs and played guitar to accompany) or tape-recorded (the music therapist played cassette recordings of

her singing the selected five songs with guitar accompaniment). The music therapist told each subject that the volume could be altered according to her/his desire.

The music therapist was present during the session to produce/administer the music and to answer any questions the subject might have. At no point during the session, however, was the hypothesis of the study discussed with the subjects.

After the music session, the subject was given the post-music POMS questionnaire and was told to fill it out according to how she/he felt "right now, after the music." The subject completed the questionnaire and the music therapist stayed nearby to answer any possible questions. After each subject completed this questionnaire, the subject was given the Summary Questionnaire.

The music therapist described the questionnaire as follows: "This is a Summary Questionnaire. For each question assign a number on the line from 0 to 10 which best describes your answer. Feel free to add any comments you may have."

The subjects then filled out the Summary Questionnaire. The author reviewed the questionnaires before leaving to insure that all items were answered. She asked subjects for any additional comments they might have. The consent form and the authorized protocol were placed in the subjects' charts and a personal data sheet to record the subjects' data was completed.

RESULTS

The pre- and post-music scores of the live music group were compared with the pre- and post-music scores of the taped music group. The analysis of covariance, which statistically adjusts post-tests by removing potential sources of bias from an experiment (Winer, 1962), was used to compare the POMS pre-music and post-music scores on the six factors and on the Total Mood Disturbance Score. The *t*-test was used to compare the means of the Summary Questionnaire scores. Collected data was analyzed using two-tail tests and $p < .05$ as the level of significance.

The results of the POMS pre- and post-music scores (see Table 1) indicate that there were significant differences between the adjusted post-music means of the live and taped music groups on two factors: Tension-Anxiety and Vigor. As can be seen from the table, an analysis of the Tension-Anxiety factor showed that there was significantly more post-music tension reported by the taped music group than by the live music group. An analysis of the Vigor factor showed that there was significantly more post-music vigor reported by the live music group than by the taped music group.

Table 1: Analysis of Covariance for Six POMS Factor Scales

Item	Taped Music		Live Music		F-ratio
	Pre-music	Post-music ^a	Pre-music	Post-music ^a	
Tension-Anxiety	7.68	3.17	8.92	35	6.34*
Depression-Dejection	8.80	6.75	14.60	4.25	2.44
Anger-Hostility	5.64	2.54	8.20	2.10	.26
Vigor	15.40	17.09	15.20	20.35	6.18*
Fatigue	7.60	6.26	9.88	4.26	2.74
Confusion	2.56	1.06	3.88	26	2.53
Total Score	16.88	3.06	30.28	-10.02	5.71*

Note: *DF* = 1, 47

^aPost-music mean adjusted by pre-music mean

**p* < .05

It can also be seen that the other four factor scores did not change significantly, but did move in the direction hypothesized. There were less post-music Depression-Dejection, Anger-Hostility, Fatigue and Confusion reported by the live music group than by the taped music group.

As can also be seen in Table 1, the Total Mood Disturbance score, which gives an estimate of the affective states of the six POMS factors, shows that there is a significant difference between the post-music live and taped adjusted means. Thus, the adjusted post-music means of the live group is significantly less than the adjusted post-music means of the taped group. The negative Total Mood Disturbance Score of the post-music live group (-10.02) is explained by the fact that the Vigor factor is weighed negatively when adding the factor scores to obtain the total score. Again, this score shows that when considering all six factors, there were significantly less Tension, Depression, Anger, Fatigue, and Confusion and more Vigor post-music in the live music group than in the taped music group.

The results of the five items on the Summary Questionnaire are shown in Table 2. It can be seen that there were significant differences on each item except the first. In each case, the live music group reported more positive changes than did the tape-recorded music group.

Most subjects commented to the music therapist at the conclusion of the session. All those in the live music group verbally expressed really “liking” and “enjoying” the “soothing” music. A few subjects in the taped music group commented that they liked the author’s singing and guitar playing but that when listening to tape-recorded music, they prefer to hear either original artists or orchestrated reproductions. These subjects also added

Table 2: *t*-Test Scores for Five Items on Summary Questionnaire

Item	Taped Music		Live Music		<i>t</i>
	Mean	<i>SD</i>	Mean	<i>SD</i>	
1. How much physical discomfort were you aware of having before the music session?	2.56	3.06	2.52	2.65	.05
2. Did the music session change your physical discomfort?	2.92	3.90	5.40	4.35	-2.12*
3. Did the music change your mood?	5.40	3.81	8.12	2.42	3.01**
4. Was your mood changed for the better?	5.96	3.65	9.24	1.54	4.15***
5. Would you recommend music sessions for others?	8.40	2.43	9.76	.88	-2.63*

Note: These items have a range of 0 to 10 with a midpoint of 5: 0=not at all, 10=a great deal.

DF=48

**p* < .05

***p* < .01

****p* < .001

that they probably would have felt “better” if the author had presented the music live at their bedsides. One subject commented that she always preferred tape-recorded music to live music because she felt “freer to listen without verbally responding.”

DISCUSSION

The results support the theory that live music effects emotional and physical changes in hospitalized cancer patients significantly more than does tape-recorded music of the same material. Overall, the live music group felt much better after listening to live presentations of music. The subjects who listened to live music were, in particular, less tense and anxious and more vigorous after the music. These subjects showed more change from before the music to after the music than did subjects who listened to tape-recorded versions of the same material. The taped music subjects showed some, though not much, change from before the music to after the music sessions.

Since there were such differences between the two groups' post-music responses, it is logical to assume that the form of presentation, live or tape-recorded, is important. Both forms of music presentation have important elements to be considered. Live music presentation, in this study, features the presence of a human being (body and voice) as an originator of the musical sounds. This results in close contact with another person for the listener. Such contact might be meaningful to a hospitalized cancer patient. The stimuli in this form of presentation (human body, human voice, and guitar) could by their nature potentiate the diminishing of a patient's feelings of isolation and thus effect change of mood for the better.

The live form of music presentation has an energizing element; it provides for a flow of energy from the source, the nearby human body, human voice, and guitar, to the listener. It is a prevalent theory that when human beings come into contact with one another, there is an automatic interchange of energy. It is also known that when human beings vocalize and make sounds, their breathing becomes more activated and there is an increase in their systems' energy flow; they become "charged" (Lowen, 1975). In addition, music is composed of the energizing elements of sound and rhythm (Gaston, 1968). Human beings coming into contact with other persons who are "charged" and are emitting energized sounds through music are likely to become stimulated. Their listening bodies respond by becoming energized as well. This energizing element inherent in the live form of music presentation could account for the significant changes in the Vigor factor for the live music group (see Table 1).

Live music also includes as an element the subtle communication of thoughts and feelings that exists when persons are within each others' presence. It is known that when one individual is in the immediate presence of another, a multitude of gestures, acts, expressions, and minor events become available, whether desired or not, through which one can intentionally or unintentionally perceive the character and attitudes of the other (Goffman, 1967). Also it is known that individuals' body languages communicate messages (Fast, 1971). This subtle communication existing naturally between people is enhanced by the addition of live music, in this case the human voice, when the source is a person, a "self," expressing verbal and nonverbal messages (e.g., "I like you, I like me"). In music therapy, the therapist's feelings about self and patient are communicated to and felt by the patient, and are essentially the foundations upon which therapy either succeeds or fails. In the case of live music presentation then, very real, basic, and important thoughts and feelings can be and are expressed to the listener through music via the voice, body language, and facial expression. The listener, in turn, feels, perceives, and expresses. This

is communication which exists particularly when the source of the music, a person, is in the presence of the listener.

The tape-recorded form of music presentation naturally does not possess the human elements that the live form of music presentation does. On the other hand, it may enhance the listener's "looking in" and exploring the unconscious world. Bonny and Pahnke (1972) have used music extensively to help individuals explore the unconscious. Good quality recordings played on hi-fi or stereo systems can be very stimulating and are important tools in music therapy.

In this study, the recordings, which were generally of good quality and in good condition, were played on a new Sony tape recorder. The results indicate that this form of presentation of music is less effective than live presentation of music. The source and medium of the music in this case is the tape recorder, a machine, an object to which people relate differently than to a person. The music produced through a tape recorder is less energized and apparently less stimulating, especially, as in this case, when specialized sound effects usually present in studio taped versions of recordings are absent (e.g., effects which bolster a singer's voice). The music in this case is seemingly not as effective in expressing feelings and eliciting changes in mood and behavior.

The design of this research study had both assets and limitations. The study was benefited by its questionnaires and tests of measurement. The POMS is reliable and allows for an exploration of a wide range of subjects' feelings. The statistical test of measurement, the analysis of covariance, accounted for subjects' pre-music individual differences. This study was also benefited by the one-to-one environment that the music therapist attempted to maintain during each session of music, an environment that prevented as much as possible the intrusion of interfering events.

On the other hand, this study was limited by the size of its sample. In addition, it did not measure variables such as type of cancer, length of illness, length of hospital stay, amount and type of musical background, and amount and type of psychological and social support available. These variables were not considered in this study. They were, however, controlled for through random assignment of subjects to the two groups. The subjects' age was measured; the taped music group was found to be significantly older ($p < .01$) than the live music group. It is not known what effect, if any, this age difference had upon the results of this research study.

This study provided an opportunity for the subjects to choose the songs they wanted to hear. This element of song choice may have affected the research results. It is possible, for example, that some subjects chose to hear "happy" songs and thus responded happily, while other subjects chose "reminiscent" songs which elicited sad feelings and responses. More con-

control in this area might elicit different responses. Also, although most subjects chose the songs they wanted to hear after filling out the pre-music POMS questionnaire, some subjects saw the list and chose songs before filling out the questionnaire. More control in this area might have better assessed pre-music attitudes.

It is also important to consider that some of the subjects may have guessed what the desired responses were and provided them to make the experimenter feel successful. The possibility of this effect is increased by the fact that the experimenter was the musician playing the music under both conditions. Although it is believed that this factor did not influence the results of this study to a great degree, and that it was controlled since both groups heard the experimenter and would have wanted to help her, more experimental control could be provided by having an independent questioner.

This study provides music therapists and other professionals in the mental health field with important data concerning the effectiveness of using live music with hospitalized cancer patients to elicit positive changes in mood and behavior. These findings have implications for treatment and can be used by music therapists and other professionals in planning activities to effect therapeutic change. Of importance is the impact that the human element and the caring presence of the music therapist have on patients. A therapist, when considering a treatment plan for a patient burdened with tension and anxiety and depressed by feelings of loss and separation, could effectively promote change through the use of live music.

It is hoped that this study has provided insight into an important aspect of the care and management of persons hospitalized with cancer. It is also hoped that this preliminary investigation will be a stepping stone to further studies and greater use of the vast potentialities of music to aid in healing the human body, mind, and soul.

REFERENCES

- Billor, J.D., Olson, P.J., & Breen, T. The effect of "happy" vs. "sad" music and participation on anxiety. *Journal of Music Therapy*, 1974, 11, 68-73
- Bonny, H.L. & Pahnke, W.N. The use of music in psychedelic (LSD) psychotherapy. *Journal of Music Therapy*, 1972, 9, 64-87.
- Buros, O.K. (Ed.). *The eighth mental measurement yearbook*. Highland Park, New Jersey, Gryphon Press, 1978.
- Cassity, M.D. The influence of a music therapy activity upon peer acceptance, group cohesiveness, and interpersonal relationships of adult psychiatric patients. *Journal of Music Therapy*, 1976, 13, 66-76.
- Fast, J. *Body language*. New York: Pocket Books, 1971.
- Gaston E. T. Man and music. In E.T. Gaston (Ed.), *Music in therapy*. New York: Macmillan, 1968.

- Goffman, E. *Interaction ritual*. Garden City, New York: Anchor Books, 1967.
- Gutheil, E. A. *Music and your emotions*. New York: Liveright, 1952.
- Lowen, A. *Bioenergetics*. New York: Penguin, 1975.
- McNair, D., Lorr, M., & Droppleman, L.F. *Profile of mood states (POMS) manual*. San Diego, California: Educational and Industrial Testing Service, 1971.
- Munro, S., & Mount, B. Music therapy in palliative care. *Canadian Medical Association Journal*. 1978, *119*, 1029-1034.
- Nucci, A. The use of music in individual psychotherapy (Doctoral dissertation, New York University, 1978). *Dissertation Abstracts International*, 1978, *38*, 5097B-5098B. (University microfilms No. 78-03, 028)
- Unkefer, R.F. Adult behavior disorders. In E.T. Gaston (Ed.), *Music in therapy*. New York: Macmillan, 1968.
- Winer, G.J. *Statistical principles in experimental design*. New York: McGraw-Hill, 1962.

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