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Music and Music Intervention for Therapeutic Purposes in Patients with Ventilator Support; *Gamelan* Music Perspective

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Background: Gamelan music is one of folk music for Javanese people. Several research studies testing the effects of music were conducted in Western countries. The music studies for therapeutic purposes used classical music commonly. Even in Indonesia, some researchers may use that music for therapeutic purposes. This concern article explains the perspective music and music intervention as therapeutic purposes, view with Javanese classical music.
Objectives: To explore the evidence of music and music intervention for therapeutic purposes and to describe the perspective of gamelan music used in nursing intervention
Methods: Using five bibliography databases (MEDLINE, CINAHL, Science Direct, Interscience, and Proquest) were searched from 1999-2010 for original clinical reports or reviews that evaluated the use of complementary therapy for therapeutic intervention in patients with ventilator support. The term of complementary therapy, anxiety, and pain were used in a comprehensive search of electronic databases. Articles were screened and excluded based on the title and abstract information.
Results: Music brings about helpful changes in the emotional and physical health of patients, and has the ability to provide an altered state of physical arousal and subsequent mood improvement by processing a progression of musical notes of varying tone, rhythm, and instrumentation for a pleasing effect.
Conclusion: Music can be used for therapeutic purposes, for instance to reduce anxiety, to decrease pain sensation, and some effects of psychological impact. Include, the gamelan music can be offer for patients for Javanese people in Indonesia.

Key words: Music, music intervention, therapeutic purposes

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Background

Several research studies testing the effects of music were conducted in Western countries (Alejandra, 2007; K Angela, Y .F. L Chung, M. F Chan, & W. M Chan, 2005; Chlan, 2000; Guétin, et al., 2009), Thailand (Cholburi, Hanucharurnkul, & Waikakul, 2004; Phumdoung, Youngvanichsate, Jongpaiboonpatana, & Leetanaporn, 2007), China (Wong et al., 2001; Wu & Chou, 2008), and Japan (M Suda, K Morimoto, A Obata, H Koizumi, & A Maki, 2008). The results from these studies suggested that music reduces anxiety and pain. The effects of music were already examined in special populations, such as adult postoperative patients (Agwu & Okoye, 2007; D Aragon, Farris, & Jacgueline, 2002; Chan, 2007), palliative care patients (Horne-Thompson & Grocke, 2008), and ventilator support patients (S Almerud & K Petersson, 2003; Angela et al., 2005; Chlan, 1998; Dileo, Bradt, & Grocke, 2008; Wong et al., 2001). These studies concluded that music aids relaxation, reduce anxiety, and pain relief.

Suhartini (2008) conducted a pilot study regarding to the effects of music on reducing anxiety in patients in intensive care unit of Karyadi Hospital, Semarang Central Java, Indonesia. It revealed that music can produce a beneficial physiological response in patients with anxiety in the intensive care unit. Ninety percent of these patients experienced reduced systolic blood pressure. Also, 95% of these patients had reduced diastolic blood pressure. Furthermore, 60% of these subjects had a reduced respiration rate, and all of them had a reduced pulse rate. This study was a descriptive correlation study using twenty patients, without a control group and without the control of the extraneous variables.

Previous studies have cited the benefits of using music intervention to reduce anxiety in patients with ventilator support. In some of the studies, the patients listened to western music, classical music, new age music (Chlan, 1998), or Chinese music (Wong, et al., 2001). Uses of western music, classical music, and new age music might be preferable, as patients will be familiar with these genres and thus these genres will be more likely to reduce anxiety (Dileo, et al., 2008). Dileo et al explained that western music, classical music, and new age music were used in previous studies because these genres had already been shown to have beneficial effects on the body. One example is classical music, which is widely used with pregnant women to stimulate the intelligence of their unborn babies (Stewart & Walsh, 2005).

In Indonesia, Indonesian people recognize well *gamelan* music. *Gamelan* music originates from Java Island, Indonesia. This music, according to Bodman and DeArment (2009), was characterized by its slow harmony, consistent tone color, and low pitch. Thus, the authors write concerning of *gamelan* as therapeutic purposes for Indonesian people as limited previous Indonesian study had examined the effects of *gamelan* music to therapeutic purposes.

Objectives

This article concerning is to explore the evidence of music and music intervention for therapeutic purposes, and to describe the perspective of gamelan music used in nursing intervention.

Methods

Inclusion criteria

Inclusion criteria in this study are: (a) A study is a nursing intervention; (b) the intervention evaluated was complementary therapy; (c) the outcomes used in the study-included anxiety, vital signs, and mood. This study also excluded from the review if the report was not in English and Indonesian language. This reason based on the practical reason, increased time, expense, and complexity of translating and synthesizing these studies.

Search strategy

Five bibliography databases (MEDLINE, CINAHL, Science Direct, Interscience, and Proquest) were searched from 1999-2010 for original clinical reports or reviews that evaluated the use of complementary therapy for therapeutic intervention in patients with ventilator support. The term of complementary therapy, anxiety, and pain were used in a comprehensive search of electronic databases. Articles were screened and excluded based on the title and abstract information. When the information is not available or unclear in the title or abstract, the full text was obtained for review. The used best evidence approach to identify studies for final inclusion in the paper. This meant that systematic reviews, including meta-analysis, Randomized Controlled Trials (RCTs), and other controlled studies were preferentially considered. If no such trials were found, studies with weaker designs (such as large prospective case series) were review. Study design and sample size of complementary

therapy, specific of the complementary therapy (methods, frequency) outcomes assessed, were extracted from each study and tabulated.

Results and Discussion

Philosophical and Theoretical Effects of Music

Archeological findings show that primitive man used music as a way to "appease the gods." In the sixth century, the Greek philosopher Pythagoras, who is considered the founder of music therapy and geometry, believed that music greatly contributed to health. Pythagoras prescribed music and a specific diet to restore and maintain the harmony of the body and soul (Nilsson, 2008; White, 2000). In the mid 1800s, Florence Nightingale introduced the power of music in hospital wards to aid in the healing process of soldiers injured in the Crimean War. Nightingale also noted the effects of different types of music. She observed that wind instrument pieces with continuous sound or air generally had a beneficial effect on patients. She also observed that instruments that do not produce continuous sounds had the opposite effect. Nightingale believed it was the responsibility of nurses to control their patients' environment in order for healing to take place (Nightingale, 1992, as cited in Nilsson, 2008).

By the late 1800s, recorded music could be used in the hospital setting. During the first half of the 1900s, health care practitioners used music in conjunction with anesthesia and analgesia. The first researcher, Kane (1994), provided intra-operative music to distract patients from the horror of surgery. In 1926, a nurse named Ilsen advocated for the implementation of specific musical prescriptions or treatment regimes. She identified rhythm as the basic therapeutic element in music (Nilsson, 2008).

Music itself is defined as a complex web of expressively organized sound that contains three essential elements: rhythm, melody, and harmony (Chlan & Tracy, 1999). Rhythm is the order in the movement of music. It is the most dynamic aspect and is a key factor in selecting particular pieces of music for specific purposes. For example, body rhythms (respiration, heart rhythm, and gait) are an integral part of human life, and music can play an essential role in harmonizing these rhythms. The melody of music is related to the sequence of musical pitches and the intervals between musical tones. Pitch is a subjective aspect of sound based on the number of cycles of vibration per second; a faster vibration produces a higher pitch. The melody of a musical piece contributes to the listener's emotional response. It is dependent on the way pitches are blended together, with the resulting

combination of sounds described as consonant or dissonant by listeners (Bunt as cited in Chlan & Tracy, 1999).

The harmony of music is nonverbal by nature and appeals to the right hemisphere of the brain. This hemisphere involves intuitive, creative, and imaginative ways of processing information and evokes psycho-physiological responses. It influences the limbic system, the center of emotions, feelings, and sensations (Guzzetta as cited in Chlan & Tracy, 1999). Music harmony provides activation of the brain by causing the release of encephalin and endorphin, which affects the body's natural mood, alters substances, and kills pain (Thaut as cited in Chlan & Tracy, 1999).

The Benefits of Music

A variety of clinical outcomes has been used to measure the benefits of music and the use of music as therapy. The predominant findings show the efficacy of music as an anxiety-reducing agent for patients in coronary care units (White, 1999), in intensive care units (Chlan, 1998; Chlan, Engeland, Anthony, & Guttornson, 2007; Chlan & Tracy, 1999; Mok & Wong, 2003), and those under acute care (Gagner-Tjellesen, Yurkovich, & Gragert, 2001). Published accounts indicate that music therapy is helpful for patients in dealing with the environment and in coping with critical illness. Music is unlike other interventions, such as imagery or biofeedback, in that music therapy does not require much practice and concentration by patients to be effective. Because of the passiveness of listening to music, music therapy may be an ideal intervention for some patients with low energy, particularly those on ventilator support (Chlan & Tracy, 1999).

Several studies have shown that music therapy has benefit for patients. The benefits of music therapy include for anxiety reduction (Chlan, 1995, 1998; Wong, et al., 2001), relaxation (Chlan, 1998), pain reduction (Good & Ahn, 2008; Hooi, 2007), cognitive function improvement (Goddaer & Abraham, 1994), noise buffer (Steelman, 1990), tolerance exercise (Allison & Steven, 2008), and tolerance to procedure (Mok & Wong, 2003; Broscious, 1999; Miller, et al., 1992).

In order to demonstrate the efficacy of music intervention for hospital patients, Evans (2001) conducted a meta-analysis on this topic. He found that music played via headphones reduced patient anxiety during normal care delivery; however, it had no impact on the anxiety of patients undergoing invasive or unpleasant procedures, such as bronchoscopy,

sigmoidoscopy, or surgery with spinal anesthetic. While music also produced a small reduction in the respiratory rate during the delivery of normal care, it had no impact on the vital signs of patients undergoing procedures. These findings highlight the fact that further research is needed into many aspects of music therapy intervention. Although the evidence is limited, music also appears to improve the mood and tolerance of patients.

A systematic review by Nilsson (2008) concerning the effects of music interventions on anxiety and pain reduction indicated that music resulted in both beneficial physiological (lower vital signs, heart rate, blood pressure, respiratory rate) and beneficial psychological (lower anxiety and pain) outcomes. This systematic review shows that music interventions can have a positive effect on patient anxiety, pain, and vital signs.

In conclusion, both authors found music to be effective during many specific hospital situations and events. It is suggested that music therapy become a modality option for all patients during hospitalization. Therefore, researchers should creatively pursue situations where listening to music produces beneficial outcomes in patients during hospitalization.

Music Intervention Process

Music intervention has two branches: active and passive. In active music intervention, the utilization of instruments or one's own voice is structured to correspond to all sensory organs, as to obtain suitable motor and emotional responses. In the passive branch, listening to specific music is done in order to relax, stimulate, or soothe the body and mind (Keegan, 2001). Furthermore, music intervention has the object of bringing pleasure to the human ear. Music intervention can be done by health professionals to help relax and distract patients. Evans (2002), in a meta-analysis study, promoted music as an intervention method in the context that music played for a patient during a single episode of care could produce outcomes that were achievable during that session of music.

According to Chlan (1999), there are several types of equipment necessary for implementing a music intervention process. They include a music library, headphones, and tape players. Infection control issues must be considered before the implementation of music therapy, and nurses should determine whether their patients enjoy listening to music. If, patients who are intubated should be provided an adequate mode of communication, such as pen and paper or letter board, and reading glasses if needed. Patients should also be assessed for hearing impairment and/or the ability to hear music through headphones. Chlan and Tracy

(1999) develop tool to assess if the patient is enjoying the music or not, a nurse can use the music therapy assessment and implementation tool (MAIT, Table 1).

Table 1 *Music Therapy Assessment and Implementation Tool (MAIT)*

Part 1: Patient Assessment

1. Do you like to listen to music? YES NO
2. Why do you like to listen to music? (for relaxation, stress reduction, pure enjoyment, to pass time, with exercise, for prayer, etc…)
3. What type of music do you enjoy? Check ALL that apply.
   Classical _____ Religious _____ Rock ____ Rhythm and Blues ____
   Country _____ Instrumental_____ New-Age ____ Rap ____
   Jazz _____ Reggae _____ Old-time ____ Ethnic ____
   Other (specify) _____ _____
4. Any specific artist or instrument type you particularly enjoy?
5. Are there any types of music or music selections that you DO NOT like?

Part II: Implementation steps

1. Determine if the patient enjoys listening to music
2. Determine reason/goal for using music therapy with particular patient
3. Provide patients with music menu or suggest a tape based on assessment data
4. Determine a mutually agreeable time and length for music therapy session with the patient and/or family members
5. Complete all nursing care prior to music therapy session
6. Gather all necessary equipment (tape player, headphones, and batteries). Ensure that equipment is in good working order
7. Assist patient to a comfortable position as necessary. Assist patient to ensure equipment is in good working order
8. Ensure call-light is within reach and enhance the environment to suit the patient's wishes (e.g., draw blinds, turn off lights, close the door, etc…)
9. Post a "Do Not Disturb" sign to prevent unnecessary patient interruptions
10. Inform patient that he or she will not be disturbed during the music therapy session unless medically necessary or the patient requests attention.

Intervention evaluation:

1. Ascertain how patient feels post-music therapy session
2. Did the patient enjoy the music?
3. Determine if mutually agreeable goals were meet
4. Determine if any changes or modifications are needed for future music therapy sessions

Additional comments:

Note. From Music Therapy Assessment and Implementation Tool (MAIT). Reprinted from "Music Therapy in Critical Care: Indications and Guidelines for Intervention," by L. Chlan and M.F. Tracy, 1999, *Critical Care Nurse, 19*, p 39. Copyright by 1999 by InnoVision Communications.

Various types of music were used in previous research studies. The genre and duration of soothing music did not seem to influence the effectiveness of music intervention. These results are confirmed by a review that explored the use of music and its effects on anxiety during short waiting periods (Cooke, Chaboyer, & Hiratos, 2005). The Cochrane

review found that the positive effects of music were similar in studies in which patients selected the type of music and those in which patients did not choose the type of music (Cepeda, Carr, Lau, & Alvarez, 2006). It appears that the tempo of the music is the most important factor; slow and flowing music with 60-80 beats per minute has the most positive effect on patients (Nilsson, 2008). It has been suggested in the literature that music used therapeutically should be non-lyrical, consist predominantly of low tones, be comprised mostly of strings with minimal bass, and have a maximum volume level of 60 decibels (Staum & Brotons, 2000).

Effect of Music on Anxiety Reduction in Patients with Ventilator Support

Music has virtues for anxiety reduction. With music therapy, patients enjoy the intervention more and find it beneficial.. In patients with ventilator support, several studies made on music therapy have found that music is effective in making positive changes in anxiety, vital signs (heart rate, systolic blood pressure, and respiratory rate), pain, sedation, tolerance, satisfaction, mood, and length of stay. Research findings indicate that music is a safe and effective intervention for patients with ventilator support, in particular for reducing anxiety via nonpharmacological agents. Music can be used for several purposes.

According to Cooke, Holzhauser, Jones, Davis, & Finucane (2007), the theoretical basis of music as an intervention for anxiety lies in its ability to promote relaxation through its effect on the autonomic nervous system. It is widely accepted that the auditory stimulation of music occupies a number of neurotransmitters, thereby diverting feelings of anxiety, fear, and pain, resulting in a more positive perceptual experience. The character of these stimuli determines the patients' altered feeling states, including the reduction of stress and anxiety. When he or she is listening to music, his or her awareness of the passage of time becomes hazy, since they focus on the music. This aids in relaxation.

Music has an impact on brain activity and cerebral blood oxygenation. For example, a study by Suda, Marimoto, Obata, Koizumi, & Maki (2008) was conducted on emotional responses to music in major and minor modes, which were measured with the Optical Topography (OT) system. The study demonstrated that a localized area of the brain responded to music under stressful conditions, and produced haemoglobin changes in cerebral blood oxygenation, which was detected as a focal increase. The findings suggested that the major mode of music, which induces happiness, does relieve stress effectively. This

may occur because music decreases the post stress response of the hypothalamus-pituitary-adrenal axis.

The limbic system, predominantly the hypothalamus, gathers and houses neurons. When the stimulus (music) is recognized by auditory sensations, it can alter mood or emotion. While individuals often recognize at the conscious level the influence music has on mood, auditory stimuli can also penetrate the unconscious mind and promote their own changes in perception and mood (Seaward, 2002).

Music promotes relaxation through physiological and psychological entrainment (Seaward, 2002). Musical stimuli and physiological responses (heart rate, respiration rate, and blood pressure) are composed of vibrations and consist of oscillations. When using music to provoke anxiety reduction through entrainment, it is important that the music should have a tempo at or below a resting heart rate (< 80 beats per minute). Moreover, the music should have a fluid melodic movement, pleasing harmonies, regular rhythm without sudden changes, and tonal qualities (Chlan, 2009). See Table 2 for the distinctive qualities of music.

Table 2 *The Distinctive Qualities of Music*

Tone:	An initial sound or vibration
Pitch:	The frequency of oscillations or vibrations. The higher the pitch, the more rapid the vibrations. A high pitch is thought to produce sympathetic nervous arousal, while a low pitch is thought to be conducive to relaxation.
Intensity:	Relative loudness or amplitude of vibrations. High intensity has the effect of emotional domination and coerciveness, while low intensity is considered more tranquil and serene.
Timbre (tone color):	Timbre is what makes the same notes played on different instruments sound very different.
Harmony:	The ratio and relationship between tones (sounds) and their rhythmic patterns.
Interval:	The units of the musical scale and the vertical distance between notes, giving rise to structure of melodies and harmonies
Rhythm:	Rhythm is described as the time pattern (horizontal distance) of music that seems to elicit such strong emotional responses. The bass frequencies most influence the rhythm of music

Note. From *Managing Stress: Principles and Strategies for Health and Well-being* (p. 381), by A. Watson and N. Drury, 1987, as cited in B.L. Seaward, 2007, London: Jones and Bartlett Publisher, Inc. Copyright 2002 by the Jones and Bartlett Publishers.

A finding from the existing studies is that the optimum time for music intervention is 15-30 minutes. The duration of preoperative or postoperative music intervention ranged from five minutes to four hours, but in the majority of the studies, music intervention was conducted for 15-30 minutes (Good & Ahn, 2008; Haun, Maainous, & Looney, 2001;

Masuda, Miyamoto, & Shimizu, 2005; McRee, Noble, & Pasvogel, 2003; Saendelbach, Halm, Doran, Miller, & Gaillard, 2006). Some of studies did not report the duration of the listening time (Allen, et al., 2001; Laurion & Fetzer, 2003; Taylor, Kuttler, Parks, & Milton, 1998; Twiss, Seaver, & McCaffrey, 2006). In general, the existing studies used headphones to provide music to the patients, although one study used loud speakers (Shertzer & Keck, 2001) and two studies did not report whether headphones or loudspeakers were used (McCaffrey, 2009; Tse, Chan, & Benzie, 2005).

Another investigator explained that music has been found to significantly reduce state anxiety ratings (as measured by the Spielberger State Anxiety Inventory), when the therapy consists of 30 minutes of the patient listening to his or her preferred music (Chlan, 1998; Wong, Lopez-Nahas, & Molassiotis, 2001). Practice guidelines suggest that music intervention given twice a day for a minimum of 20 minutes can induce relaxation (Chlan, 2000). Nevertheless, there are not enough research studies to support these guidelines. The ideal dosage of music intervention is not known. Therefore, further investigation is needed to determine the appropriate frequency and length of the intervention in order to guide nurses in implementing music intervention for patients with ventilator support. In this study, the researcher alloted 20 minutes for listening to music for patients with ventilator support, twice a day.

Another concern about music intervention is adjusted volume. There was not study that explains the ideal volume of the music. Chlan and Tracy (1999) suggested that small portable cassette tape players with adjustable volume and bass controls are convenient, compact units for music intervention. However, one study reported that music volume for inducing relaxation should have a maximum volume level of 60 decibels (Staum & Brotons, 2000).

Various outcome measures were recorded in these existing studies. These included patients' anxiety, pain, and physiological responses. Mostly, the existing studies measured physiological response outcomes before and after music intervention; however, the bulk of the studies did not clearly mention when the investigator measured the outcomes. The researchers mentioned that they measured physiological responses immediately after music intervention (Good & Ahn, 2008; Haun, et al., 2001; Masuda, et al., 2005; McRee, et al., 2003; Wu & Chou, 2008). There is no standing evidence concerning the ideal measurement

time for documenting physiological responses. Thus, the researcher measured physiological responses every ten minutes during the intervention.

Music Preferences

Music encompasses many styles, such as New Age, classical, orchestra, jazz, popular, and country. Music also has many forms, such as slow and relaxing or fast and arousing. For example, there are several types of classical music of varying tempos and rhythm. Typically, classical composers write three movements of varying tempos in symphonies and concertos. The andante and adagio movements are considered by most to be calming in nature. New Age music has begun to assimilate synthesized music and sounds from nature, including ocean waves, dolphins, songbirds, and babbling brooks. Although some experts think that classical music is the best for relaxation because of its consistent tone and form, an imposed choice of musical style can be bothersome to the listener (Chlan, 2003).

If music is to induce anxiety reduction, according to Seaward (2002), it should be conducive to return the body to homeostasis. This involves two criteria: the music should be instrumental or an acoustic selection with a slow tempo and the selection should be enjoyable rather than disturbing. Musicologists suggest that bass and percussion instruments parallel the strengths of physical well-being, woodwinds and strings (violins) strengthen emotional well-being, and strings (cello and piano) augment mental well-being, and synthesizers and harps nurture the soul. In addition, listeners will have a more beneficial response towards music that is most closely related to their own preferences.

Music preference is determined by culture and environment. Several studies have already been done in Western countries using classical, New Age, and jazz music (Sofia Almerud & Kerstin Petersson, 2003; Kei Angela, Yuet Foon Loretta Chung, Moon Fai Chan, & Wai Ming Chan, 2005; Aragon et al., 2002; Barnason et al., 1995; Chlan, 1998). In Africa, Sudan uses cultural music from healing rituals for music therapy (Jones, Baker, & Day, 2004). In China, one study used Chinese and Hong Kong music to reduce anxiety in patients undergoing surgical procedures (Mok & Wong, 2003). In Malaysia, Hooi (2007) also conducted a study that used Malaysian music to reduce anxiety and pain in female patients undergoing surgical procedures. In Korea, women reported that they wanted to listen to American music as well as Korean folk songs and religious music. This study's purpose was to pilot-test the effects of music on pain after gynecologic surgery in Korean women and to

compare pain relief between those who chose American music with those who chose Korean music (Good & Ahn, 2008). Accordingly, these findings support the importance cultural cues have in forming music preferences.

In order to provide patients with their music preferences, numerous studies have asked a variety of patients to pick their preferred music. These included New Age (Nilsson, Rawal, & Unosson, 2003; Nilsson, Unosson, & Rawal, 2005; Yilmaz et al., 2003), classical (Cruise, Chung, Yogendran, & Little, 1997; Lewis, Osborn, & Roth, 2004; Nilsson, Rawal, Enqvist, & Unosson, 2003; Shertzer & Keck, 2001), slow instrumental (Gaberson, 1995), piano (Lauren, 2007; McRee et al., 2003), pan flute (Ikonomidou, RehnstrBm, & Naesh, 2004) and Malay music (Hooi, 2007). Music that is preferred by its listeners will enhance its effectiveness, as compared to music in general. Because music preferences can change over time, the cycle of preference formation can involve different variables each time (Walworth, 2003). For that reason, it is important to offer patients music of different styles and forms that are culturally relevant as well as suitable to the listener. Providing an option to decide on the music, according to patients' preferences and familiarity, will further improve the effectiveness of music therapy.

Gamelan Music

In Indonesia, music is a big part of culture. Among all the works of art, music is what has possibly most influenced the Indonesian tradition and culture. Indonesia has many musical forms and types. There is music that comes from traditional culture, which has dynamic nuances. The variety of music in Indonesia lends itself to be used for many purposes. The functions of music in the Indonesian community include expressions from the heart, entertainment, communication, representation of the symbolic, religious ritual, and the fostering of social relationships (Silaban, 2006).

In ancient times in the Indonesian community, music was used for religious ritual, and at the same time, to cure the sick. Others offered a religious ritual for the ill that was accompanied by music and dance to worship the Lord with prayers for the recovery of the patient. Traditional Indonesian culture involved the belief that music could cure disease. This belief was greatly embedded in animism, and later influenced by Buddhism and Hinduism during the pre-Islamic period (Suherjanto, 2004).

Indonesia has many genres of its traditional music. For example, *angklung*, *kacapi*, and *suling* are types of music from *Sunda*, and *gamelan* music is from Java and Bali. *Angklung*, *kacapi*, and *suling* are usually played at interludes between songs in a performance of the classical song-form *tembang Sunda*. The term refers to the two plucked string instruments and the flute. There is a higher-pitched *kacapi rincik*, a lower-pitched *kacapi indung*, and a *suling* ornamenting the melody (Department of Tourism and Indonesian Culture, 2005). However, the most popular genre is *gamelan* music from Java and Bali islands (Sumarsam, 1984).

Java, the most populated Indonesian island, is located in the south-western part of the archipelago. Java has a rich musical tradition, in addition to being a popular location for western music. One of the forms of well-known traditional music from Java is *gamelan*. *Gamelan* derives from the word *gamel*, which means to strike or to handle, and is a generic term refering to an ensemble which is comprised predominantly of percussive instruments (Sumarsam, 1984). Gamelan instruments are mostly metallophone and gong type instruments which produce tones when struck with mallets *(tabuh).* Other types of percussion instruments included in the gamelan ensemble are a wooden xylophone *(gambang)* and a set of two headed drums *(kendhang)*, which are played with the palm and/or fingers. There are a few instruments of the gamelan ensemble which are not percussion instruments; they include a two-string bowed instrument *(rebab)*, a plucked zither-type instrument *(celempung or siter),* and a bamboo flute *(suling)* (Hatch, 1979; Sumarsam, 1984).

In the traditional Indonesian perspective, the gamelan is sacred and is believed to have supernatural power. Both musicians and non-musicians are humble and respectful to the gamelan. Incense and flowers are often offered to the gamelan. It is believed that each instrument in the gamelan is guided by spirits. It is also forbidden to step over any instrument in a gamelan, because it might offend the spirit by doing so. Some gamelan are believed to have so much power that playing them may exert power over nature. Others may be touched only by persons who are ritually qualified. In Javanese gamelan, the most important instrument is the *Gong Ageng*. Javanese musicians believe that *Gong Ageng* is the main spirit of the entire gamelan (Department of Tourism and Indonesian Culture, n.d.).

In recent study, the effects of music intervention on anxiety reduction in patients with ventilator support, Suhartini (2010) found in their research that gamelan music was effective to reduce the level of anxiety in patients with ventilator support. The gamelan music was also

to be effective to reduce the physiological responses in patients with ventilator support. Indeed, researchers can use the gamelan music for therapeutic purposes. However, it is very important for future research to investigate the music fit with the musical concepts.

Conclusion

In conclusion, music in all its many styles can be considered a way to affect profoundly the human condition and to have a positive influence on relaxation and anxiety reduction. Music is finally being recognized scientifically as possessing a strong therapeutic quality. Music brings about helpful changes in the emotional and physical health of patients, and has the ability to provide an altered state of physical arousal and subsequent mood improvement by processing a progression of musical notes of varying tone, rhythm, and instrumentation for a pleasing effect. Entrainment theory suggests that oscillations produced by music are received by the human energy field and various physiological responses entrain with or match the oscillations of the music.

Gamelan music is a kind of Indonesian ethnic music. Gamelan music has a slow rhythm, consistent tone color, and approximately 60 – 80 beats per minute. Numerous previous studies provided a choice for patients to choose their preferred music. This study, nevertheless, offered culturally appropriate music for patients with ventilator support. Therefore, as a summary, it is important to provide music that is culturally relevant to the listeners. Various clinical studies demonstrated that, under certain conditions, music can alter psychological and physiological responses; however, the exact means to institute music as intervention are still not completely understood. Research studies highlight the need for further research and replication of studies to fully evaluate the effect of the music.

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