1. INTRODUCTION

One can simply listen to music without moving the body. Therefore, music therapy can be applied to patients who have lost their will to move. Music therapy performed in a group session may lead patients to learn their roles in society, and may be regarded as one of psychosocial treatments. Scientific evidence showing the effectiveness of music therapy is limited, however. Music activities have influence on emotional and rewarding systems in the brain [1,2]. Those studies suggest that music therapy has some positive effects on psychiatric disorders.

The following two reasons make it difficult to organize scientific investigations in a hospital. First, one have to overcome ethical problems if one would like to conduct investigations in a hospital, where they give top priority to providing proper medical treatments for patients. Second, modern medical treatment involves a team of professionals, including doctors, nurses, clinical psychologists, and occupational therapists; it is necessary to make adjustments in a way that each member of the team can agree with each other concerning how they select their candidates, when and where they administer medical treatments, and how they evaluate their intervention.

Only a few studies on psychosocial treatment for psychiatric disorders exist. Jung and Newton [3] utilized the Cochrane Reviews and extracted 28 studies on psychosocial treatments against schizophrenics and other mental disorders. They categorized those studies into four levels. Four studies were classified as “strong support that merits application,” five as “moderate support that warrants consideration of application,” and the others as “not supported.” Among four studies classified as “strong support that merits application,” just one report dealt with music therapy. Scientific reports on music therapy, which employ randomized controlled trials, are generally rare [4]; nevertheless, music therapy has been tried to be applied for a variety of mental disease, including schizophrenia.

Schizophrenia [5] is a typical psychiatric disorder, which is characterized by clear changes of symptoms as the disease progresses (Fig. 1). Positive symptoms, such as auditory hallucination and delusion, appear in the acute phase. Following this phase, negative symptoms, typically blunted affect and emotional withdrawal, which are characterized by inactivity, develop in the chronic phase. Once the disease gets into this stage, usually a circle of recovery and recurrence is repeated over the long-term course.

Treatments for schizophrenic patients consist of physical treatment, which is typically antipsychotic treatment, and psychosocial treatments, like behavioral therapy, occupational therapy, and music therapy. Although antipsychotics suppress some symptoms, they cannot cure deficits in social functions, such as communication disorders. The physical conditions of the patients should be ameliorated first by medication. Immediately after the medication takes effects on the physical conditions, psychosocial activities (for example, having interpersonal communications or hobbies) should be introduced to lead the patients to further recovery.

Matsui [6] listed ten characteristics of music that are suitable when music is utilized in a treatment. One of the most important characteristics may be that music directly affects a person’s emotions without necessarily putting to use an intellectual process. In other words, neural codes conveying music go directly to the brainstem from the hearing organ. Since music therapy does not necessarily depend on patients’ verbal communication ability, it is often suitable for patients with chronic schizophrenia, who usually suffer from deficits in communication.

The following section introduces reports examining therapeutic effects of music therapy.
Fig. 1  The main stages in the progress of schizophrenia. In most of the cases, medication treatment initiates at the beginning of the acute phase. Antipsychotic treatment is administered first, in order to alleviate symptoms. Then, psychosocial treatment, including music therapy, is prescribed.

2. MUSIC THERAPY FOR SCHIZOPHRENIC PATIENTS

Gold et al. [7] evaluated the effects of music therapy on people with schizophrenia, including schizophrenic disorders. This review was included in the Cochrane Library, a database constructed with systematic reviews of reports on clinical trials including randomized controlled trials. Gold et al. recognized four highly reliable studies out of 34 papers. These four studies showed that treatments utilized music therapy combined with standard procedures improved negative symptoms and social functioning more effectively, than treatments utilizing only standard procedures. Mössler et al. [8] published an updated Cochrane review focusing on music therapy for people with schizophrenia. They reviewed 85 papers including papers that had been reviewed by Gold et al. [7], and recognized eight reliable studies. They suggested that applying music therapy along with standard treatments was more effective in mitigating negative symptoms, depression, and anxiety, and improving social function, than providing only standard treatments. Some aspects of cognitive functioning and behavior seemed to be improved in some cases. Silverman [9] conducted a meta-analysis of evidence-based music therapy. Only three out of 52 papers were approved and selected as high-quality studies. Majority of the papers were excluded, due to lack of randomized controlled trials and low quality of evidence.

Reports on music therapy for people with schizophrenia have increased. Although a few studies met a reasonable scientific standard, they exhibited significant effects of music therapy.

3. TWO TYPES OF MUSIC THERAPY: PASSIVE AND ACTIVE

Music therapy can be classified into two categories: passive and active therapies. The former centers on listening, whereas the latter involves singing and playing musical instruments. As sub-classifications, each of them is categorized into group and individual music therapy.

3.1. Passive Music Therapy

Passive music therapy is considered as one of coping techniques with auditory hallucination and delusion, including conversation with others, watching TV, etc. [10]. It is also applicable to people with schizophrenia, who are suffering from insomnia; listening to music before going to bed improved patients’ sleeping qualities [11]. Bloch et al. [11] conducted an investigation involving 24 outpatients with schizophrenia to examine sleep latency and sleep efficiency after the music was played. They compiled a 40-minute relaxation music CD for their study. After listening to the CD for a week, their sleep latency and sleep efficiency were improved. Depression and psychiatric symptoms also improved.

3.2. Active Music Therapy

Active music therapy is applied for people with schizophrenia to alleviate both passive and negative symptoms, e.g., agitation, reduction in activity, communication disorder, etc. Since symptoms of schizophrenia exhibit entirely different aspects depending on the stages, we have to examine effects of music therapy separately in each stage. We will discuss the effects of music therapy in the two phases, acute and chronic, one by one.

Music therapy employed during the acute phase has to finish the intervention within a relatively short period of time. Mainly psychotic symptoms are assessed before and after the intervention in the acute phase. Music therapy employed during the chronic phase lasts for a relatively long period of time. Mainly psychotic symptoms, social functioning and quality of life are assessed in the chronic phase.

3.2.1. Active Music Therapy for People in the Acute Phase

Talwar et al. [12] conducted an experiment, in which 81 acute schizophrenic patients were randomly assigned to either an intervention group (33 schizophrenics to undergo music therapy) or a control group (48 schizophrenic patients). Patients in the two groups were provided with the same nursing care, occupational therapy, and other treatment, except for application or absence of music therapy. The patients were asked to participate in a 45-minute session individually, which was held once a week for twelve weeks. Positive and negative syndrome scale [13], global assessment of functioning scale [14], and client satisfaction questionnaire were used. The total score of positive and negative syndrome scale was improved in the music therapy intervention group.

Ulrich et al. [15] randomly assigned 37 acute schizophrenic patients either an intervention group or a control group: the former consisted of 21 patients who received music therapy in groups, and the latter consisted of 16 patients. The patients played music-based games in groups,
using rhythm instruments: 45-minute sessions were held 1.6 times a week on average. Improvements in patients’ self-assessment scores and the scale for assessment of negative symptoms [16] scores were observed. However, the study involved a small number of subjects and no placebo intervention was provided for the control group.

Peng et al. [17] randomly assigned 67 schizophrenic patients in an acute phase either an intervention group (32 patients who participated in music activity) or a control (35 patients) group. The intervention group received 50-minute session of group music therapy five times a week for 2 weeks in addition to standard care. The brief psychiatric rating scale [18] scores were significantly reduced for the intervention group, compared to the control group.

3.2.2. Active Music Therapy for People in the Chronic Phase

Tang et al. [19] randomly assigned 76 schizophrenic patients in either a music therapy intervention group or a control group. Patients in the intervention group attended one-hour sessions five times a week for more than one month. In the 19 music therapy sessions, they listened to music, sang, and played musical instruments in groups, including improvisation. The scale for assessment of negative symptoms [16] and disability assessment schedule [20] were used to examine the efficacy of the therapy. A marked improvement in negative symptoms among patients in the intervention group was observed. They increased their ability to converse with others, reduced their social isolation, and increased their level of interest to external events. Tang et al. suggested that music therapy should be widely adopted because it has no side effects and can be implemented at a low cost.

Yang et al. [21] randomly assigned 70 chronic schizophrenic patients to a music therapy intervention group (40 patients) and a control group (30 patients). Forty patients in the intervention group listened to and played music, learned musicology, and played music-based games. The two-hour individual and small-group sessions were held six times a week for three months. The scale for assessment of negative symptoms [16], the brief psychiatric rating scale [18] and others, were used to examine the efficacy of the therapy. Yang et al. reported improvements in negative symptoms and social functioning in the music therapy intervention group.

In our previous studies [22,23], we examined the effects of group music therapy sessions for chronic schizophrenic patients with randomized controlled trials. We conducted music therapy sessions for the experimental group in addition to standard treatment. A control group received only the standard treatment. We treated the experimental group patients on a weekly basis for a session of about one hour a week over a 12-week period. The main activity of the patients during these sessions was playing chords accompanying familiar tunes together on tone chimes. We performed a principal component analysis utilizing scores for positive and negative syndrome scale [13] and rehabilitation evaluation Hall and Baker [24]. No major change appeared in the control group, whereas changes in various directions appeared in the experimental group. The directions of change seemed to depend on the subjects’ relationship with music in everyday life. We must pay close attention to individual differences when introducing music therapy.

Hayashi et al. [25] employed a control group in the same hospital as an intervention group, and examined the effects of music therapy for chronic schizophrenic patients. They provided music therapy intervention for 34 female patients who had been hospitalized for a long time. A total of 15 weekly sessions (one hour for each) were held for over four months, and the positive and negative syndrome scale [13] and quality of life scale [26] were used to examine the efficacy of the therapy. Hayashi et al. reported significant improvements in negative symptoms, as assessed with the positive and negative syndrome scale, and quality of life scale scores.

4. COGNITIVE FUNCTION
AND MUSIC THERAPY

Schizophrenic symptoms include cognitive dysfunction [27]. Cognitive dysfunction refers to impairment in memory, attention, and motion processing that can be identified by neurophysiological examinations. Cognitive dysfunction strongly affects functional outcome (for example, social, occupational, and personal satisfaction) of people with schizophrenia [28]. The improvement in cognitive dysfunction is related to recovery of a social function. Studies are in progress to clarify the relationship between neurocognitive functioning and rehabilitation [29].

Glicksohn and Cohen examined the effect of music listening on performance of cognitive task carried out by schizophrenic patients [30]. The patients were instructed to perform a Stroop task with or without music. Two pieces of music were used: Eine Kleine Nachtmusik (Serenade in G major) by Mozart and the Adagio in G minor by Albinoni. The patients completed the Stroop task more rapidly when they listened to music. Fewer errors were made when the patients performed the task while listening to music, and when the Adagio in G minor was played rather than Eine Kleine Nachtmusik in G major. Glicksohn and Cohen discussed that schizophrenic patients usually aroused too much, and that the relaxing effect of music reduced their levels of arousal and increased their attention to Stroop stimuli.

Moritz et al. [31] conducted an experiment in which 27 schizophrenic patients and 32 healthy adults performed a task to choose an appropriate title from four alternatives.
(one correct and three lure titles) for each picture. Three lure titles were very similar to the correct one, and the participants were allowed not to answer when it was difficult for them to make a decision. The participants performed the task under three conditions: no music, happy music (Take Five by The Dave Brubeck Quartet), and anxiety-evoking music (the theme from Halloween, a horror movie directed by John Carpenter). Deluded patients answered more than the healthy adults did; the patients did not refuse to make decisions even in unpredictable situations or when the four titles appeared similar to each other. Anxiety-evoking music strengthened this tendency, i.e. deluded patients made more decisions compared to non-deluded patients or healthy controls.

Ceccato et al. [32] developed an original method, the Sound Training for Attention and Memory (STAM), to examine the effects of music therapy against deficits in attention and memory. The STAM utilized music to draw attention and to stimulate memory of patients. Several tasks were contained in the STAM: the patients had to stop walking when the music stopped playing, and had to start walking again when the music resumed; they listened to drum music, and clapped their hands with the same rhythm they had just heard. Eight of 16 patients with schizophrenia (experimental group) took the STAM, and another eight patients (control group) participated in improvisational music therapy. The paced auditory serial addition test [33], Wechsler memory scale [34], and life skills profile [35] were used to assess the effects of the STAM. Improvement in only the life skills profile score was found in the control group, whereas improvements in scores of both Wechsler memory scale and life skills profile were found in the experimental group, which suggested possible effects of the STAM on memory.

Further research should be conducted to examine the relationship between music therapy intervention and cognitive functioning, taking into account patients’ musical preferences.

5. COMMUNITY MUSIC THERAPY

Community music therapy is practiced in a local community where candidates of music therapy live. Community music therapy aims at both profits of a local community and increasing chance to develop a social network, which in turn leads to improvement in the quality of life. Primary goal of community music therapy is to improve the health of local community residents with a disorder [36].

Grocke et al. [37] applied community music therapy to people with mental disorders. Twenty-nine local community residents with schizophrenia and other mental disorders participated in 10 sessions (an one-hour session per week for 10 weeks). They sang, improvised, wrote lyrics and music, and finally recorded their music. Quality of life (WHO quality of life-bref) [38], social interaction anxiety scale [39], and brief symptom inventory [40] were utilized as quantitative measurers; focus group interview and analysis of their original lyrics were performed to obtain qualitative measurer. A significant improvement in the quality of life was observed. “Music therapy gave joy and pleasure,” “they took pride in their song,” “living with mental illness is difficult,” and “coping with mental illness requires strength” were some of the samples obtained in the qualitative analysis.

The local community residents with mental disorders found that spending time in a relaxing place served to improve their quality of life and to prevent recurrence of illness.

6. MUSIC THERAPY AND ADHERENCE TO TREATMENT

Hannibal et al. [41] provided one-year music therapy for 27 people with schizophrenia and personality disorder, and conducted follow-up observations for one year. About 10% of the patients, who were less than usual, discontinued the treatment. It was suggested that the patients with severe mental disorder might adhere to music therapy treatment.

To assess the efficacy of seven different psycho-educational programs, including programs for coping skills, medical management, art classes, and music therapy, a questionnaire was employed for 73 mentally ill patients living in intermediate care facility. Music therapy was regarded as more useful, effective, and favorable than other activities [42].

Preventing recurrence of schizophrenia is important because the disease get worse in a vicious circle of recurrence. Music therapy may help patients to adhere to treatment.

7. CONCLUDING REMARKS

Music therapy focusing on people living with schizophrenia was introduced. Only a few evidence-based studies supported some parts of effects of music therapy. Further investigation is required to examine its therapeutic effects. However, music therapy is employed in a hospital and a local community, because its positive effects are expected.

Music therapy can have positive and negative effects depending on diseases. It is analogous to the relationship between antipsychotics and symptoms: every antipsychotic has its own adaptive and maladaptive symptoms [4]. Moreover, the effects of music therapy change direction according to how people accept music in their everyday life [22,23]. Thus, intervening with music therapy should be introduced carefully, considering an individual’s musical background. Having such viewpoint should be important for establishing an effective treatment protocol of music therapy.
therapy, and it is also important if we would like to improve the quality of music therapy. We hope that further research will be conducted on music therapy in the field of psychiatric treatment, and progress in these studies will be reflected in clinical settings to help patients live an enriched life.

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REFERENCES
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