G Ital Med Lav Erg 2020; 42:2, 133-136
ISSN 1592-7830

Alfredo Raglio[1], Eliana Giambelluca[2], Giulia Balia[2], Chiara Imbriani[1], Monica Panigazzi[2]

Music as support to Occupational Therapy

[1] Music Therapy Research Laboratory, Istituti Clinici Scientifici Maugeri IRCCS, Pavia, Italy
[2] Occupational Therapy and Ergonomics Unit, Istituti Clinici Scientifici Maugeri IRCCS, Pavia, Italy

ABSTRACT. Habilitation, rehabilitation and promotion of well-being is the ultimate goal of the occupational therapy process. Occupational therapy interventions take advantages from interdisciplinary approach, implying that classic rehabilitative models are constantly enhanced by updated evidences in rehabilitation literature and enriched with competences from different fields. Recent literature has showed how music interventions can improve clinical and rehabilitative outcomes at different levels. Physical or occupational therapists, caregivers and care staffs are frequently involved in providing music interventions with or without the support of a music therapist. In particular, occupational therapists can use music as support to the rehabilitation of daily living activities and, in general, as a complementary tool of their work. This paper wants to stress the implementation of music and music therapy techniques and related specific training programs in the field of occupational therapy, pointing and summarizing main workable evidence-based approaches with music in occupational therapy settings.

Keys words: *Music, Music therapy, Occupational Therapy, Rehabilitation, Evidence-based approaches.*

RIASSUNTO. La stimolazione, la riabilitazione e la promozione del benessere costituiscono gli obiettivi finali della terapia occupazionale. Gli interventi nell'ambito della terapia occupazionale traggono vantaggio da approcci interdisciplinari che integrano i modelli classici di riabilitazione e forniscono evidenze e riscontri nella letteratura scientifica. Recentemente gli interventi con la musica hanno mostrato efficacia nel miglioramento degli outcome clinici e riabilitativi. Frequentemente anche operatori dell'ambito riabilitativo (in particolare fisioterapisti e terapisti occupazionali) oltre che caregivers formali e informali, vengono coinvolti negli interventi con la musica, spesso senza il supporto del musicoterapeuta. In particolare, la letteratura mostra come la musica possa supportare la terapia occupazionale nella riabilitazione delle attività quotidiane assumendo un ruolo complementare ma significativo.
Il presente articolo sottolinea e documenta come l'implementazione della musica e di tecniche musicoterapeutiche, unitamente a uno specifico training, possa integrare e arricchire la riabilitazione nei setting di terapia occupazionale attraverso interventi basati su evidenze.

Parole chiave: Musica, Musicoterapia, Terapia occupazionale, Riabilitazione, approcci evidence-based.

Habilitation, rehabilitation and promotion of well-being is the ultimate goal of the occupational therapy process, which means providing functioning and participation by enabling occupation in a broad spectrum of practice settings including inpatients and outpatients hospital services, long term care facilities, early interventions, mental health communities, schools and other (American Occupational Therapy Association, 2015).

Occupational therapists' rehabilitative activities aim at the recovery and strengthening of functional gestures, adapted to the motor capacity of patients and customized on the functional demands of the individual. Depending on the limitations of the clients, occupational therapy can be used also in overcoming cognitive impairments or psychological/psychiatric problems. The occupational rehabilitation intervention is generally based on four macro-areas: a) personal care, b) vocational occupation and education, c) instrumental activities of daily living, and d) play, leisure, recreational activities (Désiron et al., 2015). The main aims of occupational therapy are connected with support and autonomy, favoring participation and social reintegration of individuals and improving their quality of life. Where the body structure is invariably compromised, occupational treatments seek physical, psychological and social adaptation to disability, also modifying tasks and the environment to facilitate clients' life: in this process, loaded with the emotional burden deriving from constant confrontation with his own limits, the patient must be actively involved and constantly motivated, by basing rehabilitation sessions on relevant and rewarding occupations.

Even if it is well established that applications of occupational therapy models in rehabilitation have a significant effect on outcomes in several conditions, this wide diversity of applications brings a lack of knowledge about the best activities or approaches to treatment that should be included in occupational rehabilitation programs for each specific context. Occupational therapy interventions take advantages from interdisciplinary approach, implying that classic rehabilitative models are constantly enhanced by updated evidences in rehabilitation literature and enriched with techniques/methods from different fields. In addition to this premise, the diffusion of the International Classification of Functioning, Disability and Health (ICF) framework (Stucki, 2016) has significantly changed the paradigm of disease, introducing the concepts of func-

tioning, participation and limitation to participation, integrated with social and environmental aspects. This point of view is perfectly compatible with occupational therapy which is evolving within biopsychosocial models and influences from developing innovations and technologies. In this perspective, the rehabilitation field needs to take advantages by constant and profitable exchange of expertise from the entire and heterogeneous rehabilitation team.

The present paper aimed at stressing the implementation of music and music therapy techniques and related tailored training programs in the field of occupational therapy summarizing main workable evidence-based approaches with music in that setting.

Music is generally considered a pleasant and significant experience for most people as well as one of the most frequent human activities. Due to its strong impact on the brain and, consequently, on motor, cognitive, emotional and sensory systems, the role in of music in the therapeutic-rehabilitative field is being increasingly validated (Raglio, 2018; Moumdjian et al., 2017; Sihvonen et al., 2017). Recent literature has showed how music can improve clinical outcomes at different levels (van der Steen et al., 2018; Magee et al., 2017; Sihvonen et al., 2017; Geretsegger et al., 2017; Geretsegger et al., 2014), also depending on different approaches and tailored interventions including: a) music therapy, b) music listening, and c) music-based interventions (Raglio & Oasi, 2015). Music therapy refers to relational or rehabilitative approaches. In the first case the relationship is the core of intervention while rehabilitative approaches focus on motor, cognitive and sensory rehabilitation. Music listening interventions include individualized or experimenter-selected music listening. In the individualized music listening approach playlists are mainly self-selected (created on the basis of patient's musical tastes); in the experimenter-selected music listening the music therapist creates playlists on the basis of specific music parameters taking into account patient's therapeutic needs. Music-based interventions (c) consist in making or listening to music to improve the general conditions of the patient but without any specific therapeutic aim and method/rationale. Music listening and making in these cases are not tailored to meet the patient's needs but rather to promote well-being, socialization as well as to improve mood and motivation. In other cases, music can be considered as "complementary" to other rehabilitation techniques, requiring the integration of different professional's expertises. Some of these mixed approaches can be found in the literature, for example music-based neuro-rehabilitative approaches, conducted by physical or occupational therapists (Chong et al., 2014; Pohl et al., 2013; Villeneuve et al., 2011), "caregiver singing" approach, through which formal or informal caregivers try to reduce behavioral disturbances in persons with dementia, in particular during annoying medical procedures or daily living activities (e.g., to take a bath, to eat, etc.) (Hammar et al., 2011), but also some music listening experiences, in which music is used by different professionals to improve psychological or behavioral aspects, to induce relaxation or reducing pain (Yeager,2019; Yangöz & Özer, 2019). In all these practices, physical or occupational therapists, caregivers and care staffs are frequently involved in musical choices and in providing music interventions with or without the support of a music therapist. In particular, occupational therapists can use music as support to the rehabilitation of daily living activities and, in general, as a complementary tool of their work.

In a recent paper, Craig (Craig, 2008) has described how music can be applied to occupational rehabilitation techniques, through three mainly methods: "music-assisted occupation" (when music – singing or music listening - accompanies activities creating a positive relational climate and inducing relaxation, e.g. during bathing, in some clinical conditions such as in dementia, when patients could show behavioral disturbances); "music as occupation" (when music is used as activity, e.g. playing a music instruments as a tool for upper extremity functions rehabilitation) and "music in preparation of occupation" (e.g., when a patient is encouraged to listen to music before an occupational activity in order to promote relaxation). Despite music being used in clinical practice, there is actually a general lack of research protocols and systematic analysis of the results about the application of music in occupational therapy. As there is evidence for the effectiveness of music therapy, the scarcity of or small effect of these music-enhanced occupational therapy interventions could be due to insufficient use of music. In few studies (Chong et al., 2014; Villeneuve et al., 2014; Pohl et al., 2013; Lim et al., 2011) the occupational therapist is involved in interventions with music, alone or together with the support of a music therapist. On the other hand, this collaboration is not always possible, in particular in contexts where, for different reasons, music therapy practice is not implemented in clinical settings: as a consequence, a specific training in some music therapy techniques/activities, focused on the knowledge of both theoretical aspects and musical competences, it's critical important to allow a beneficial use of music in the therapeutic-rehabilitative field. In this innovative scenario, the Occupational Therapy could benefit from the implementation of specific music therapy training programs, based on a continuing education given by music therapists, to allow occupational therapist to use music more appropriately as an adjuvant therapy. According to our knowledge and clinical experiences, a specific training focused on introducing music in occupational therapies should be oriented toward the following four areas of intervention:

a) *the use of music (rhythmical and melodic patterns) in neuromotor rehabilitation*. The intervention aims at supporting movements and, in the case of use of music instruments, to improve fine and gross motor rehabilitation;

b) *sonification techniques*. Through the association between movements mapped by a sensor and corresponding sounds, it is possible to provide an audio-feedback to the rehabilitative exercises. This technique aims at easing the integration of auditory and sensory-motor systems and improving patients' motivation;

c) *free and structured use of musical instruments*. Improvisational techniques and/or guided exercises could

promote expression and communication, reduce behavioral disturbances as well as stimulate and improve cognitive functions;

d) *individualized music listening*. The customized selection of music playlist music to be played during different times of taking care of the patient could improve psychological symptoms and/or improve motivation.

Detailed description of music techniques, settings and populations are reported in Table I.

Table I. ***Possible interventions with music in Occupational Therapy***

Music/Music Therapy Techniques	Settings	Activities Description and Aims	Use of music (Craig's definitions)	Clinical Fields/Population
Active music approaches (Neurologic Music Therapy Techniques or similar approaches)	Neuromotor Rehabilitation (especially upper limb, fine and gross motor rehabilitation)	Music-supported movements (Occupational Therapist support motor rehabilitation with rhythmical and melodic - sometimes harmonic- patterns describing temporal, spatial and strength parameters related to the movements) Rehabilitation can also include the use of musical instruments to improve motor functions and the range of motion	Music-Assisted Occupation (when Occupational Therapists support motor rehabilitation with music) Music as Occupation (when patients use music instruments during rehabilitative exercises)	Neurological diseases (stroke, Parkinson's disease, multiple sclerosis, traumatic brain injury, spinal cord injury, cerebral palsy, etc.)/ adults and children
Sonification Techniques	Neuromotor Rehabilitation (in particular upper limb and hands)	Synthesized sounds are associated to movements mapping. Sounds represent movements and the modulation of sonorous-music parameters makes possible to change the perception of movements. Occupational Therapist leads the patient during exercises and manages the "sonification" system (sensor+music software). Sonification aimed at improving motor functions, facilitating the integration of auditory and sensory-motor systems and improving patients' motivation	Music-Assisted Occupation	Neurological diseases (stroke, multiple sclerosis, traumatic brain injury, cerebral palsy, etc.)/ adults and children
Improvisational music therapy techniques	Relational setting	Occupational Therapist can stimulate music interaction and non-verbal communication using simple free or structured music patterns (mainly rhythms and melodies) to improve relational and communicative skills and to promote emotional expression	Music as Occupation	Psychiatric, Neurologic and Oncological diseases/ adults and children
Structured music exercises	Rehabilitative setting	Occupational Therapist can stimulate patients through specific music exercises to stimulate and improve cognitive functions (memory, executive functions, attention, etc.)	Music as Occupation	Neurological diseases (stroke, multiple sclerosis, traumatic brain injury, etc.)/ adults and children
Music listening	Relational and rehabilitative settings	Occupational Therapist can use Individualized music listening and or therapist-selected music playlist: a) to reduce anxiety, pain or stress conditions; b) to facilitate relaxation; to increase motivation. Music listening approaches can be used as a treatment or before/after occupational activities	Music in preparation of Occupation (when music listening is proposed before occupational activity) or Music as occupation (when music listening is proposed as a treatment to improve patients' general conditions)	Psychiatric, Neurologic, Oncological diseases/adults and children; Pain Medicine

In light of these preliminary remarks, it is reasonable to understand how occupational therapists can use music as a possible "auxiliary level" making the rehabilitative process more effective and strong in several clinical areas such as neurology and neurorehabilitation, psychiatry, oncology and pain medicine. The implementation of therapeutic music-based techniques during occupational training, in terms of tailored musical stimuli, can improve the overall functionality of patients, reduce pain threshold and increase emotional and cognitive involvement as well as resistance to fatigue. Music can be considered an important mean of self-expression and interpersonal communication, within individual and group occupational activities. Also, music can promote interaction and socialization, helping to ensure patients' engagement.

Specific trainings and evidence-based protocols of intervention are needed to strengthen the implementation of music and music therapy techniques in the field of occupational therapy.

References

American Occupational Therapy Association. (2015). 2015 Salary and workforce survey. Bethesda, MD: AOTA Press.

Chong, H.J., Han, S.J., Kim, Y.J., Park, H.Y., & Kim, S.J. (2014). Relationship between output from MIDI-keyboard playing and hand function assessments on affected hand after stroke. NeuroRehabilitation, 35, 673-80. doi: 10.3233/NRE-141166.

Craig, D.G. (2008). An overview of evidence-based support for the therapeutic use of music in occupational therapy. Occupational Therapy in Health Care, 22, 73-95. doi: 10.1080/J003v22n01_06.

Désiron, H.A., de Rijk, A., Van Hoof, E., & Donceel, P. (2011). Occupational therapy and return to work: a systematic literature review. BMC Public Health, 11, 615. doi:10.1186/1471-2458-11-615.

Geretsegger, M., Elefant, C., Mössler, K.A., & Gold, C. (2014). Music therapy for people with autism spectrum disorder. Cochrane Database of Systematic Reviews, 6, CD004381. doi: 10.1002/14651858.CD004381.pub3.

Geretsegger, M., Mössler, K.A., Bieleninik, Ł., Chen, X.J., Heldal, T.O., & Gold, C. (2017). Music therapy for people with schizophrenia and schizophrenia-like disorders. Cochrane Database of Systematic Reviews, 5, CD004025. doi: 10.1002/14651858.CD004025.pub4.

Hammar, L.M., Emami, A., Engström, G., & Götell, E. (2011). Finding the key to communion - Caregivers' experience of 'music therapeutic caregiving' in dementia care: A qualitative analysis. Dementia, 10, 98-111. doi.org/10.1177/1471301210392994.

Lim, H.A., Miller, K., & Fabian, C. (2011). The effects of therapeutic instrumental music performance on endurance level, self-perceived fatigue level, and self-perceived exertion of inpatients in physical rehabilitation. Journal of Music Therapy, 48, 124-148.

Magee, W.L., Clark, I., Tamplin, J., & Bradt, J. (2017) Music interventions for acquired brain injury. Cochrane Database Systematic Review, 1, CD006787. doi:10.1002/14651858.CD006787.pub3.

Moumdjian, L., Sarkamo, T., Leone, C., Leman, M., & Feys, P. (2017). Effectiveness of music- based interventions on motoricity or cognitive functioning in neurological populations: a systematic review. European Journal of Physical Rehabilitation Medicine, 53, 466-482. doi:10.23736/S1973-9087.16.04429-4

Pohl, P., Dizdar, N., & Hallert, E. (2013). The Ronnie Gardiner Rhythm and Music Method – a feasibility study in Parkinson's disease. Disability and Rehabilitation, 35, 2197-2204. doi: 10.3109/09638288.2013.774060.

Raglio, A. (2018). Music and neurorehabilitation: Yes, we can! Functional Neurology, 33, 173-174.

Raglio, A., & Oasi, O. (2015). Music and health: what interventions for what results? Frontiers in Psychology, 6, 230. doi:10.3389/fpsyg.2015.00230.

Sihvonen, A.J., Sarkamo, T., Leo, V. Tervaniemi, M., Altenmüller, E., & Soinila, S. (2017). Music-based interventions in neurological rehabilitation. Lancet Neurology, 16, 648-660.

Stucki, G. (2016). Olle Höök Lectureship 2015: The World Health Organization's paradigm shift and implementation of the International Classification of Functioning, Disability and Health in rehabilitation. Journal of Rehabilitation Medicine, 48, 486-93. doi:10.2340/16501977-2109.

van der Steen JT, Smaling HJ, van der Wouden JC, Bruinsma MS, Scholten RJ, & Vink AC. Music-based therapeutic interventions for people with dementia. Cochrane Database of Systematic Reviews, 7, CD003477 doi: 10.1002/14651858.CD003477.pub4.

Yangöz, Ş.T., & Özer, Z. (2019). The effect of music intervention on patients with cancer-related pain: A systematic review and meta-analysis of randomized controlled trials. Journal of Advanced Nursing. doi: 10.1111/jan.14184.

Yeager, J. (2019). Relaxation Interventions for Antepartum Mothers on Hospitalized Bedrest. American Journal of Occupational Therapy, 73, 7301205110p1-7301205110p7. doi:10.5014/ajot.2019.025692.

Villeneuve, M., Penhune, V., & Lamontagne, A. (2014). A piano training program to improve manual dexterity and upper extremity function in chronic stroke survivors. Frontiers in Human Neuroscience, 8, 662. doi: 10.3389/fnhum.2014.00662.

Correspondence: *Raglio Alfredo, Ph.D., Istituti Clinici Scientifici Maugeri IRCCS, Music Therapy Research Laboratory, Scientific Institute of Pavia, Via Maugeri 10, Pavia 27100, Italy, Phone/Fax +390382593797, alfredo.raglio@icsmaugeri.it*