

## Guqin music therapy to alleviate sleep disturbances in Chinese cancer patients

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## RESEARCH ARTICLE

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**Abstract:** Both in Chinese and in western cancer patients sleep disorders are a frequent and serious complication. The present study used qualitative methods to explore sleep-related benefits of Guqin music therapy in Chinese psycho-oncology and suggests a corresponding theoretical framework which encompasses psychological, neuroscientific and ontological components. In sharp contrast to receptive music therapy which mainly speaks about listening in general, the present study suggests that therapeutic outcomes may considerably depend on individual modes of aesthetic perception. Although some perspectives suggest international transferability of this approach, aspects such as Buddhist belief in re-incarnation or Daoist awareness of permanent transitions may qualify too simple cross-cultural applications. Despite the encouraging results which suggest Guqin music therapy for the improvement of sleep quality in (gastric) cancer patients, further studies are needed for broader clinical and rehabilitative implementation.

**Keywords:** Cultural sensitivity; Guqin; Psycho-oncology; Sleep disorders; Daoist ontology

## 1. Methodology

The present study is part of a collaboration between Beijing Normal University and the Cancer Hospital of Beijing University and aims at the development of a genuine Chinese form of music-based psycho-oncology. Meta-methodological considerations suggest to distinguish four areas: (i) research type and research characteristics; (ii) generation of qualitative data; (iii) development of a music therapeutic model and (iv) construction of a theoretical framework.

Formally, the present research complies with the criteria of qualitative research. Secondly, it is consistent with the characteristics of exploratory trials and features of case series studies. It basically aims at the discovery and identification of benefits of Guqin-therapy in gastric cancer patients, particularly concerning sleep disturbances and sleep-associated issues.

Relevant insights were derived from interpretation of qualitative data of in-depth interviews, which started with pre-defined items and continued – in a sense similar to focus groups or qualitative factor analysis (cf. Mastnak, 2021a) – to explore the quality of inner dynamics between music and the psyche. Additionally to verbal data, also body language, poems, which were written by the patients and expressed key issues of life and cancer, and aesthetic facets of the Guqin music served as raw material for multi-disciplinary data-processing.

The present research also contains the development of a Guqin-based model of music therapy in psycho-oncology. To optimise music therapeutic interventions it used a modified form of action research, an approach which has gained ground in health-care areas (Cordeiro & Soares, 2018) and is characterised by participatory interaction, alongside ideas of grounded theory. A key principle of action research, which goes back to Kurt Lewin (cf. Adelman, 1993), encompasses a well-defined sequence of loops, each consisting of three typical moments: (i) the application of an intervention; (ii) the evaluation of this method and, according to the evaluation; (iii) the improvement of the intervention.

The initial Guqin therapeutic intervention was constructed on Chinese, e.g. Daoist, aesthetics, own experiences with playing and listening to the Guqin, and comparative considerations involving data from receptive music therapy. The evaluation process referred to qualitative patient data and included psychosomatic responses, aesthetic experiences and subjective explanations. By means of micro-syntheses, data and their interpretations were used to modify and/or improve each previous intervention model.

Finally, principles of systemic meta-syntheses were used to identify the three most relevant cornerstones: psychology, neurophysiology and Chinese ontology of music and harmony. Integrating these strikingly different areas can be seen as a sort

of meta-theoretical ‘mixed-method-approach’ and resulted in a novel theoretical framework to explain sleep-specific benefits of Guqin music in Chinese psycho-oncology.

## 2. Introduction

### 2.1. Sleep disorders in cancer patients

Sleep disorders are relatively frequent in cancer patients, although associations between individual sleep disorders and particular tumours are still not very clear. A recent study (Mogavero et al., 2021) emphasised that accurate assessment of sleep disorders in cancer patients is necessary to improve the patients’ health, survival, response to therapy, quality of life and reduction of comorbidities/complications, hence the authors’ attempt to assess the evidence highlighted in relevant research of the last ten years on the correlation between each specific category of sleep disorder and several types of tumour, based on their anatomical location such as head-neck (including the brain and thyroid), lung, breast, ovary, endometrium, testes, prostate, bladder, kidney, gastrointestinal tract, skin, bone and haematological malignancies.

The connection between cancer and sleep disorders is complex and involves issues such as cancer-related fatigue (Medysky et al., 2017), which is a commonly reported and debilitating side effect of cancer and/or cancer treatment. Additionally, clinical studies raised hypotheses about possible associations between sleep duration and cancer-specific mortality (Stone et al., 2019), and the controversially discussed problem whether quantitative and qualitative parameters, such as sleep duration (cf. Chen, 2018), have to be considered as risk indicators of cancer sheds light on the complexity of holistic oncology, psycho-oncology included.

The relevant interdisciplinary spectrum is broad. To give a representative example, Allison Soucise et al. (2017) suggested that certain aspects of sleep, such as sleep duration and sleep quality, may be associated with the development of aggressive tumour characteristics in postmenopausal women. Moreover, facets of sleep behaviour and associated development of tumour features seem to differ by race, in the cited study explicitly between non-Hispanic Whites and African Americans. Additionally to the fact that the effect of music therapy may significantly depend on a patient’s cultural background, culturally sensitive music therapy in cancer patients is also nourished by such results of anthropological oncology.

### 2.2. Music therapy to treat sleep disorders

There is good evidence that music therapy helps to treat insomnia and comparative research (Dickson & Schubert,

2019, 142) can help to identify mechanisms and modes, how music improves sleep:

- (1) relaxation, where music encourages physiological or psychological relaxation;
- (2) distraction, where music acts as a focal point to distract from inner stressful thoughts;
- (3) entrainment, synchronization of biological rhythms to beat structures in music;
- (4) masking, obscuring noxious background noise with music;
- (5) enjoyment, listening to preferred, emotionally relatable or pleasant music;
- and (6) expectation, individuals cultural beliefs around music.

The topic ‘music therapy for better sleep’ is multifaceted and involves a broad spectrum of relevant issues. Sleep has a significant impact on neurologic function and cognitive endurance, while sleep deficiency may go hand in hand with chronic health problems. Dealing with these issues, Joanne Loewy (2020) focused on the potential of music to induce sleep in illness and wellness and called music therapy an efficient as well as cost-effective intervention.

Both in sleep medicine and in music therapy, sleep quality is considered an important matter of concern. Dealing with the question of whether music can improve sleep quality in adults with primary insomnia, a systematic review and network meta-analysis (Feng et al., 2018) concluded that music intervention offers clear advantages for adults with primary insomnia and pointed out that listening to music as well as music-associated relaxation were probably the best options for these purposes. In-depth analyses of our studies in Beijing, however, suggest that sleep-therapeutic effects of music cannot be narrowed down to listening and relaxation. Although these are key factors in music-based sleep therapy (Cordi et al, 2019), related research should not ignore other key factors such as individual modes of listening, psychosomatic re-balancing, or ontological perspectives of harmony, such as described in Daoism (cf. Chen, 2018).

Not only sleep duration, but also sleep quality matters: using the Pittsburgh Sleep Quality Index (PSQI), a Turkish study (Kavurmaci et al., 2020, 22) showed that music therapy increased the sleep quality of students and highlighted that ‘being one of the nonpharmacological treatment approaches intended for solving sleep problems, music therapy is a pain-free, safe, and affordable treatment method without any side effect that could be used in every area of health’.

### 2.3. Music and sleep therapy in Chinese psycho-oncology

Broadly speaking, music therapy to alleviate typical symptoms of sleep disorders and to improve sleep quality often refers to the general notion of ‘listening to music’ (cf. Dickson & Schubert, 2020), but does not consider that various

modes of listening may have a decisive impact on how music modulates the patient's psychosomatic system (cf. Mastnak & Köhler-Massinger, 2017). In this context, mindfulness-based music therapy in psycho-oncology is in the ascendant and involves a broad spectrum of issues such as cancer-associated pain and anxiety (Liu et al., 2019). These perspectives are directly related to complex inner connections between sleep and cancer, as well as the multifaceted potential of culturally sensitive music therapy to alleviate sleep disorders in oncological patients.

Since the introduction of oncological social psychology in China in the 1990s, medical humanities have greatly gained importance. Both scientific research and clinical practice cast light on the significance of culturally sensitive approaches, and the Chinese Cancer Psychology Committee and the Anti Cancer Association provide an interactive academic platform for professionals in cancer psychology. The '2020 Annual Meeting of Chinese Oncology Psychology' in Guangzhou was dedicated to 'Humanities, Innovation, Sharing – Promoting Comprehensive Psychosocial Support' and may be regarded as the cradle of advanced Chinese psycho-oncology (cf. Mastnak & Mao, 2021).

Chinese psycho-oncology is facing a dual challenge: on the one hand to make use of successful Western approaches and to create a genuine Chinese way of psycho-oncology on the other. These aims go hand in hand with one of the main objectives of the present article: culturally sensitive and arts-based psycho-oncology for China, particularly Chinese music therapy to improve sleep in gastric cancer patients.

### 3. Findings

#### 3.1. Psycho-oncological Guqin practice

Music-based psycho-oncology being a novel approach in China, the present qualitative exploratory study was designed to identify possible benefits of music-associated interventions to help oncological patients, particularly in advanced stages of gastric cancer.

Playing the Guqin requires high technical and musical abilities, hence the decision to use receptive music therapy and not to suggest creative experiments, which would have yielded poor sound quality and thus failed to sense the true spirit of Guqin. While also Western music therapy, such as Guided Imagery and Music (Muller, 2010), provides receptive models, the present intervention is based on Chinese aesthetics and traditional Chinese music philosophies.

In individual music therapeutic sessions, the first author played, both performing traditional tunes and improvisations,

exclusively for the stomach patient. Trying to respond to the patient's physiological and psycho-affective state, she synchronised entities such as the music pulse and the patient's respiration, or tried to tailor music expression to his/her facial expression. In contrast to certain Western forms of expressive arts therapy (cf. Goren-Bar, 2019), the present research identified subtle 'feedback-loops' involving symbolic representation and aesthetic responsiveness rather than one-dimensional artistic expression of inner processes.



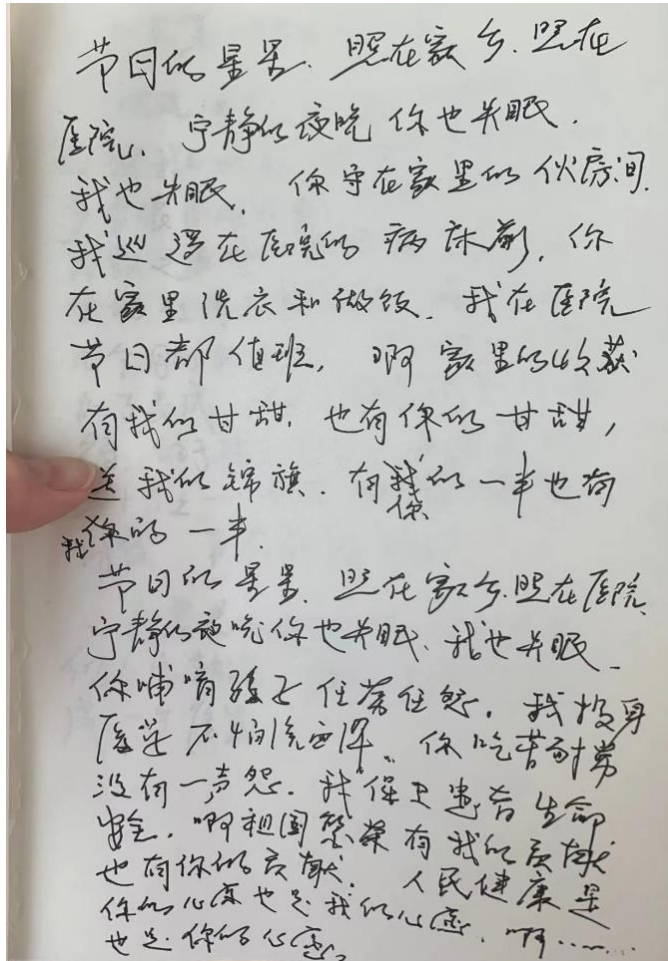
Guqin music therapy for gastric cancer patients

The psycho-oncological Guqin activities referred to in this article caused a broad spectrum of responses, which may directly or indirectly modulate sleep conditions and are related to various psychological phenomena: (i) patients began to describe their emotional and aesthetic feelings associated with listening to the Guqin music; (ii) they spontaneously expressed their gratitude for being treated mindfully, sometimes describing the overwhelming experience of being wonderfully sheltered by good forces; (iii) patients spoke about traumatising experiences such as unlucky marriage, sometimes even by an outburst of suppressed grief and despair; (iv) patients responded in a non-verbal way such as shedding tears or changing facial expression from fear to calmness.

Inspired by listening to the Guqin, some patients began to also use poetic forms to express sad life experiences, anxieties, as well as desires or hopes and wrote poems, which they recited accompanied by the Guqin. Regarding the multifaceted realm of East Asian music therapy, this phenomenon is akin to the Korean therapeutic model of Creative Pansori (Kim & Mastnak, 2016), where (mostly depressive) patients are encouraged to express relevant experiences and feelings by using elements of this traditional genre of musical storytelling, which is performed by a vocalist (here the patient) and a drummer (in Creative Pansori the therapist). Benefits of Guqin-associated writing also resemble typical features of therapeutic writing in the West, which are summarised by Haertl and Ero-Phillips (2019, 15): 'perspective taking, enhanced



understanding of the self and others, the spiritual nature of writing, and the promotion of health and healing [...] There is power in written expression and the personal sharing of one's story. Writing shows promise not only as a therapeutic tool during the intervention but as an ongoing avocational activity with many personal and health benefits'.



Lyrics are written by a patient with gastric cancer

Although this form of Guqin music therapy was originally designed to alleviate cancer-associated anxieties, several patients fell asleep – a somehow irritating reaction which gave rise to further scientific investigations and resulted in the important differentiation between trance processes and true 'good sleep'. Dealing with Guqin-induced altered states of consciousness encouraged a novel model of Guqin hypno-therapy and associated multi-disciplinary research, which is not the core topic of this article, though.

Studies on this music-induced 'good sleep' in cancer patients suggest the following key moments: (i) Guqin therapy reduces sleep-obstructing and sleep-irritating factors such as specific cancer-related anxieties or pain; (ii) the sound of the Guqin creates a soothing atmosphere, which perceivably differs from

sterile clinical environments or (possible) hostile conditions at home; (iii) prevalence of sleep disorders in gastric cancer patients is high and often caused by a broad spectrum of factors such as pain, stress or despair, but also 'cancer-related fatigue' (Saligan et al., 2015; Mohandas et al., 2017), which obstructs rather than leads to healthy sleep – as far as we can actually use the term 'healthy' in the context of cancer. In other words: Falling asleep during Guqin therapy may be seen as efficient compensation of previous cancer-caused sleep deprivation; (iv) from a cognitive-behavioural therapeutic point of view, Guqin therapy may help cancer patients to reinforce good-sleep-attitudes and provide music-based sleep-training methods, also for application in extra-therapeutic surroundings, e.g. at home; (v) sleep-related data finally substantiate the hypothesis that Guqin therapy may have an impact on neurophysiological conditions of sleep, which we discuss in the context of the theoretical framework below.

From the 'performing' music therapist's perspective, Guqin-related aesthetics were essential and contained (i) high artistic authenticity, alongside a deep subjective identity with the Guqin's sound and spirit; (ii) the awareness that music of the Guqin is mirroring 5000 years of Chinese culture as well as the Chinese 'aesthetic soul'; (iii) the unique timbre of the Guqin is inextricably intertwined with a deep sensation of eternity and the universe, and echoes with all the subtle nuances of the human psyche; (iv) the pureness of Guqin-aesthetics goes hand in hand with the actualisation of beauty – as an ontological principle as well as the deepest and most sublime joy humans may experience.

### 3.2. A multi-modal theoretical framework

The various hierarchical pyramids of today's evidence-based medicine, such as concerning prognostic or therapeutic studies (cf. Burns et al., 2011), are based on so-called 'levels of evidence', which were originally described in a report by the Canadian Task Force on the Periodic Health Examination in 1979 and mainly focus on effect sizes estimated through quantitative empirical research and inferential statistics. From this perspective, randomised controlled trials and meta-analyses of RCTs provide the highest levels of evidence, while qualitative research, such as in-depth case series studies, is often degraded as methodologically weak or insufficient. From a meta-perspectival point of view, by contrast, we have to identify the epistemological value of different research designs and understand that, for instance, meta-analyses of RCTs are no appropriate means to explore the qualitative features of anxiety in cancer patients or to generate systemic theoretical frameworks.

On the basis of qualitative data about Guqin music therapy to alleviate symptoms of cancer-associated sleep disturbances and improve sleep quality in cancer patients, we used principles of systemic meta-syntheses (cf. Mastnak, 2021b) to develop a theoretical framework which is based on psychological, neuroscientific and ontological cornerstones.

### 3.2.1. Psychological perspectives

Although we widely agree with common psychological explanations how music may alleviate sleep disorders and improve sleep quality, the present research suggests that effects cannot be narrowed down to relaxation as the main therapeutic agent, but also involve the following aspects, which may directly or indirectly influence sleep characteristics:

(i) Guqin music therapy unleashes inhibited affects and stimulates emotional flow such as concerning suppressed anger towards a painful relationship or marriage; (ii) Guqin creates an aesthetic and yet 'real' world of inner peace and a certain feeling of safety and wholeness; (iii) while getting immersed in the sound of Guqin, painful thoughts are fading and gradually lose their detrimental power or obsessive-compulsive features. Such experiences may even reach a music-induced state of 'nothingness' akin to meditation in Zen Buddhism (cf. Lomas et al., 2017); (iv) listening to the (responsive) Guqin creates a feeling of being understood and reduces the impression of abandonment and isolation. Moreover, it evokes mindfulness, both in the sense of Buddhist spirituality, alongside its role in health-care practices (Kalra et al., 2018), and as the interreligious bridge, e.g. between Buddhism and Christianity (Kopel & Habermas, 2019); (v) a profound, 'non-cognitive' awareness of continuity between heaven and the self, the soothing rhythm of transformation as a cosmic principle, hence one's reversion to the Dao, and a mystical actualisation of the inner bond with ancestors; (vi) perception of beauty as root cause of existence, as well as divine universal order, both in a traditional Chinese and Western sense (cf. Moulin, 2020), even transcending the arts-therapeutic principle of transforming pain into beauty (Ettun et al., 2014) – in other words: the music-induced illumination (cf. Austin, 2013) of a holistic-spiritual haven given by eternal harmony.

### 3.2.2. Neuroscientific perspectives

In their fundamental article, Mona Lisa Chanda and Daniel J. Levitin (2013, 179) gave a comprehensive introduction into the neurochemistry of music and evaluated 'the evidence that music improves health and well-being through the engagement of neurochemical systems for (i) reward, motivation, and pleasure; (ii) stress and arousal; (iii) immunity; and (iv) social affiliation'. Meanwhile, several studies explored the

neuroscientific parameters of musical activities such as music processing by hierarchically structured sequences in the brain, the interplay of the hemispheres, the role of mirror neurones or the function of neuro plasticity (cf. Wang & Agius, 2018). This also involves highly specific topics such as neuroendocrinological features of Chinese and Western music-based sex therapies (Mastnak, 2020).

Together with neuroscientific research on music, insights into neurobiological mechanisms of sleep (Saper, 2013), as well as the neurophysiology of sleep regulation and neural circuitries of wakefulness and sleep (Scammell et al., 2017; Schwartz & Klerman, 2019; Schwartz & Roth, 2008), encourage the construction of hypotheses about underlying mechanisms of Guqin-based sleep-therapy. Regarding the complex system of sleep and wakefulness, we assume that music-related neural and neuroendocrine mechanisms are particularly connected with (i) the interplay between hypocretin/orexin (cf. Ebrahim et al., 2002) from the lateral hypothalamus and GABA, together with Galanin, in the ventrolateral preoptic area as a certain 'switch' between wakefulness and sleep, and (ii) multiple processes in the ascending reticular activating system (ARAS), alongside modulation of norepinephrine, histamine and 5-HT. In other words, specific modes of music listening and music activities may control sleep mechanisms through music-related cortical and sub-cortical mechanisms.

### 3.2.3. Ontological perspectives

The third cornerstone of our multimodal-theoretical framework is based on ancient Chinese philosophy, particularly on principles of Daoism. In this context, we do not consider Daoist thought as a myth or a sort of illuminated fantasy, but an approach to the roots, the essence and the truth of existence. In this context, harmony is a key principle, and – similar to our approach – Annamaria Di Fabio and Akira Tsuda (2018, 1) suggested a highly convincing 'psychology of harmony and harmonization' which bridges the gap between the West, e.g. referring to Pythagoras, and China:

In Eastern philosophy and thought the definition of harmony has deep roots, as it develops and continues to flourish at its best. Generally in Eastern culture the concept of harmony is central to the teachings of Confucius [...] In fact the world "he" (harmony) is one of the most recurrent characters in Mencius [...] If in the Tao Te Ching (The book of the Ways and its Virtue), an ancient Chinese philosopher (605 BC–531 BC) highlighted the importance of living in harmony with nature to realize equilibrium and internal peace of mind [...], the Confucian classics underlined harmony as a

principle of reference for interpersonal relationships and social roles, fundamental to the solidity of families and prosperity of society [...] The importance to harmonize with others by goodness without senselessly following others was underlined [...] Confucianism refers also to a “grand harmony,” considering that the world includes many different things that can be harmonized even if they are in constant change and highlighting the confidence in an ultimate harmony among the things in the world.

In Guqin music therapy, Daoist aesthetics (cf. Mattice, 2017), which substantially differ from European traditions of aesthetics (cf. Levinson, 2005), play an important role and involve issues such as Daoist practices of self-cultivation and the idea of an artful life, which has an important impact on many areas in everyday life as well as public health and clinical practice. In Guqin therapy we understand aesthetics as an ontological principle of the universe which is mirrored in nature, human life and the arts. It is not only a feature or an appearance but contains universal and dynamic healing power.

Under the guidance of professor Yu Danhong 余丹红, the Shanghai Conservatory of Music has established a new research group on aesthetics in music education, where the second author of this article particularly represents the domain of aesthetics and health. This research group also focuses on cross-cultural aesthetic issues and intends to explore applied Chinese aesthetics, music therapeutic issues included.

#### 4. Discussion and Conclusion

Although individual benefits were considerably high, the present Guqin music therapy model is facing important challenges, particularly with regard to standardisation and clinical implementation. Not least due to economical considerations, hospitals tend to prefer group therapies. Given that in the present music therapeutic model the Guqin player precisely responds to a single patient, e.g. his/her breathing rhythm or facial expression, possibilities of generalisation have to be explored, alongside group-therapeutic benefits such as the feeling of mutual support and understanding. Standardised implementation also involves the question about application modes and efficiency of recorded Guqin music, as well as online-therapies.

In arts therapeutic domains we have been faced with two contradictory positions: on the one hand, the assumption that ‘good things in the world always cross-over’ and the approach of cultural sensitivity in arts-related therapies on the other, hence the theoretical conflict between cultural appropriation and common human experience. According to the BNU research centre of arts therapies, however, these positions do

not form an absolute incompatibility or incoherence but have to clearly distinguish anthropological invariants, such as the human feature of desire and love, and cultural symbolisation and embedment, hence the discussion to what extent Guqin music therapy is also applicable in global psycho-oncology.

These discussions also touch upon heterogeneous views of disease, diagnosis, healing and therapeutic efficacy. By way of illustration, the World Health Organisation’s ICD provides an internationally applicable guideline for the diagnosis, and in global oncology, Western approaches such as chemotherapy, radiation therapy and cancer surgery have become a common standard. Nonetheless, there are myriads of traditional or complementary medical systems in the world, some of them with great impact on national public health systems, such as Chinese medicine (TCM) not only in China but also in several Western countries. However, also less famous traditions have to be taken into consideration, e.g. the health-related heritage of the Hmong, an Asian ethnic group originally from southern China that later migrated to the northern regions of Laos, Vietnam and Thailand, and also to the United States. In this context, Ali et al. (2020) stated:

The Central Valley of California is well known to be the home to the largest Hmong population in the US. However, despite the presence of such a large Hmong community in the Central Valley, our knowledge of their cultural perceptions of medicine is limited. Based on local Central Valley health providers’ experiences and observations, the Hmong people have a number of health-related challenges that differ from those of the general population, and this should be considered when dealing with their healthcare needs. In this report, we present a quick guide about the Hmong community and their health-related issues. We hope this will help clinicians and researchers better understand the Hmong community, which in turn would help provide a better quality of healthcare to the Hmong.

This is precisely what we are speaking about: although healing traditions of various ethnicities may considerably differ from standpoints of Western medicine, they still may greatly impact on the acceptance and efficiency of curative processes in the relevant population. These issues are complex and involve different factors such as genetics, spirituality or the collective (cultural) unconscious in the sense of C.G. Jung, which is a heterogeneously discussed concept, though (Mills, 2019).

In the context of arts-based therapies, this ethno-medical perspective is inextricably intertwined with traditional aesthetics, as well as ontologies and cosmologies of beauty,



hence their importance in BNU arts-therapeutic research. There is still a big gap between typically medical research on arts-based therapies and artistic approaches in medical domains: while the first tends to ignore artistic and aesthetic perspectives, the second has a tendency to feel reluctant to respect standardised research designs or epistemological criteria of theory of science. In short: Guqin music therapy is not only a novel approach in psycho-oncology, but also a model which may inspire interdisciplinary in-depth investigation and encourage open-minded syntheses to unearth the essence of the healing arts.

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